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AGRICULTURAL LIBRARIANS & USERS COMMUNITY
(NCALUC-2018)
(04th – 05th September, 2018)**

**RE-ENGINEERING OF AGRICULTURAL
LIBRARIES AND EMERGING TECHNOLOGIES:
CHALLENGES AND OPPORTUNITIES**

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FOREWORD

दिनांक / Date :

Libraries are welcoming spaces inviting us towards information, and they provide services that help us understand it. Libraries have always been in the forefront in adopting new technologies to meet the challenges of information explosion as well as to enhance access to diverse and distributed electronic resources and publications. Since Libraries have adopted modern technologies, it is high time that the library professionals should also acquire new skills to offer networked information services to the potential users in an efficient and effective manner. The 21st Century library is in a position to support and indeed lead the change in the education system with effective delivery of information and prove that 'New technology deserves new thinking'. The abundance of resources and technology for easy access and retrieval of information via the Internet is posing a challenge to educators to rethink their traditional roles and practices; and also to consider the unique value they add to a world in which information is everywhere.

Access to electronic information resources in this part of the world has been limited due to the high cost associated with accessing such resources and poor information technology infrastructure. External factors such as these should not obscure what a librarian should do to aid, extend and energize learning and teaching. Even with limited resources, librarians can develop exceptional approaches to energizing information programmes with the right support and leadership.

In recent years, several library consortia such as the INDEST, UGC-INFONET, ICAR-CeRA, Krishikosh, Agricat etc., were launched for accessing electronic resources in higher education and research institutes. The full use of such electronic resources by academicians and researchers is yet to reach an optimum level. The organizers of the National Conference have rightly chosen the topic "Re-Engineering of Agricultural Libraries and Emerging Technologies: Challenges and Opportunities" to address the issues currently faced by the information providers as well as information users.

I would like to thank and express my appreciation to Dr. K. Veeranjanyulu, President, AALDI and Dr. Hans Raj, Organizing Secretary, NCALUC-2018 for organizing the National Conference successfully.



(Rameshwar Singh)

PREFACE

The theme of the National Conference of Agricultural Librarians & Users Community (NCALUC-2018) is carefully preferred as “Re-Engineering of Agricultural Libraries and Emerging Technologies: Challenges and Opportunities” because of its importance and relevance to the present global scenario. The editors had to reject some papers which did not fit into the theme and/or ‘not up-to-the-mark’ based on the comments of the peer reviewers, which is inevitable. The papers received from the width and breadth of the country are grouped under the following themes:

1. Re-engineering Agricultural Libraries
2. Emerging Library Technologies
3. Open Access Resources in Agriculture
4. Measuring Research Output
5. User Studies in LIS

We earnestly hope that this National Conference will create awareness and interest among LIS professionals and policy makers about emerging technologies in agricultural libraries and enable them to upgrade their libraries keeping pace with the technological advancements.

We record our sincere thanks to Dr. Rameshwar Singh, Hon’ble Vice-Chancellor, Bihar Animal Sciences University, Patna, Bihar, who readily agreed to host the National Conference and spared his precious time to write the Foreword for this volume in a short notice.

The Editors emphasise that the views expressed in the papers are that of the respective authors only. AALDI and Bihar Animal Sciences University, Patna (Bihar) or the Editors are in no way responsible for the thought content of the articles.

Finally, the Editors are thankful to all those who have contributed, supported and encouraged directly or indirectly to make this national event a great success. We hope this volume would be useful to the students, researchers, practicing information professionals, agricultural library staff, policy makers and faculty in Library and Information Science.

- Editors

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DIGITAL INITIATIVES FOR AGRICULTURAL RESEARCH AND EDUCATION UNDER ICAR IN INDIA

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INTRODUCTION

Timely access to information is becoming more and more crucial for survival in every sphere of life and agriculture sector is no exception. In the present competitive world, moving towards what we perceive as knowledge society, the access to right information at anytime, anywhere, about anything has gained high significance. This off course does not mean that the earlier societies were not aware of importance of information or were not knowledgeable. The information played very important role even in ancient time when hunters & gather of the sub-continent evolved into agri-pastoral society, domesticated plants, animals and learned farming using draft animals, inventing tillage, seeding, intercultural operations, harvesting, and primary processing and prospered as interregional/international traders. They were knowledgeable enough to evolve into present day society. The crucial difference now is the speed with which you can access information, the magnitude of available information and removal of geographical boundaries to access information. The developments in computer technology itself revolutionized the world and the sudden growth in telecommunication methodologies provided the necessary synergy to create a catastrophic change breaking every boundary and connecting the planet into one giant network of information and knowledge.

Today, the information has become absolutely important input in agriculture along with seed, fertilizers, pesticides, land, water and environment. The contribution of public extension system in disseminating information and attaining self-reliance in food production is very well recognized. But in this changing time, traditional public extension system is not sufficient to address multi faceted problems faced by farmers. The existing public extension system is also constrained by limited resources, wide ratio between farmers and extension workers and also by added responsibility of handling emerging issues like marketing

extension, agri-business, quality conscious consumers and WTO. The need of the hour is to evolve a comprehensive agriculture extension system shared by all the stakeholders. These stakeholders could be farmers co-operatives, progressive farmers, agricultural consultants, consultancy firms, farmers organizations, unemployed agricultural graduates, non-governmental organizations, Krishi Vigyan Kendras (KVKs –Farm Science Centers), agri-business companies, input dealers, newspapers, agricultural magazines, private television channels, private sector banks, market information systems, weather forecasting agencies, agro-advisory services etc.

The convergence of computers and communication technologies has open up vast arena of Internet and Intranet. One cannot ignore the silent revolution taking place in the communication systems in Rural India, thus, paving way for "Cyber Extension" initiatives. Concept of Village Information Kiosks is fast spreading to blocks/mandals and villages empowering Indian farmers to digitized access of vital information available through the Internet. There are dozens of cyber-experiments going on in rural India, which have unequivocally demonstrated the power of Internet and Information Technology. The overwhelming response and eagerness of farmers to use such systems is now paving the way for replicating cyber extension initiatives in large numbers. In such a scenario, the demand for authentic and credible digital information sources has risen in agriculture sector especially in research, education or extension. End to end value chain development requires quick access to diverse type of information.

In the present era of knowledge revolution the organization, capturing, preserving and reusing of knowledge has become absolutely essential for any organization to keep itself competitive and efficient. Digital repository with open access policy may cater the needs of National Agricultural Research and Education System (NARES) with centralized hosting of content but decentralized management. The basic idea of open access (OA) policy is to limit the permission barriers for the user and making the content available online without any permission and price barriers. Thus, OA is free, immediate and a permanent online access to research articles for anyone in the world to improve upon the existing research findings. The ICAR adopted the open access policy (<http://icar.org.in/en/node/6609>) for easy access of information to the community of research, faculty and extension workers. The main points of ICAR, OA policy are:

- Each ICAR institute to setup an Open Access Institutional Repository.
- ICAR shall setup a central harvester to harvest the metadata and full-text of all the records from all the OA repositories of the ICAR institutes for one stop access to all the agricultural knowledge generated in ICAR.
- All the meta-data and other information of the institutional repositories are copyrighted with the ICAR. These are licensed for use, re-use and sharing for academic and research purposes. Commercial and other reuse requires written permission.
- All publications viz., research articles, popular articles, monographs, catalogues, conference proceedings, success stories, case studies, annual reports, newsletters, pamphlets, brochures, bulletins, summary of the completed projects, speeches, and other grey literatures available with the institutes to be placed under Open Access.
- The institutes are free to place their unpublished reports in their open access repository. They are encouraged to share their works in public repositories like YouTube and social networking sites like Facebook ®, Google+, etc. along with appropriate disclaimer.
- The authors of the scholarly articles produced from the research conducted at the ICAR institutes have to deposit immediately the final authors version manuscripts of papers accepted for publication (pre-prints and post-prints) in the institute's Open Access repository.
- Scientists and other research personnel of the ICAR working in all ICAR institutes or elsewhere are encouraged to publish their research work with publishers which allow self- archiving in Open Access Institutional Repositories.
- The authors of the scholarly literature produced from the research funded in whole or part by the ICAR or by other Public Funds at ICAR establishments are required to deposit the final version of the author's peer-reviewed manuscript in the ICAR institute's Open Access Institutional Repository.
- Scientists are advised to mention the ICAR's Open Access policy while signing the copyright agreements with the publishers and the embargo, if any, should not be later than 12 months.
- M.Sc. and Ph.D. thesis/dissertations (full contents) and summary of completed research projects to be deposited in the institutes open

access repository after completion of the work. The metadata (e.g., title, abstract, authors, publisher, etc.) be freely accessible from the time of deposition of the content and their free unrestricted use through Open Access can be made after an embargo period not more than 12 months.

- All the journals published by the ICAR have been made Open Access. Journals, conference proceedings and other scholarly literature published with the financial support from ICAR to the professional societies and others, to be made Open.
- The documents having material to be patented or commercialised, or where the promulgations would infringe a legal commitment by the institute and/or the author, may not be included in institute's Open Access repository. However, the ICAR scientists and staff as authors of the commercial books may negotiate with the publishers to share the same via institutional repositories after a suitable embargo period.

OA is a process and expects full compliance over a period of time. Therefore, the OA policy is a first step in the journey towards formal declaration of openness in the system.

WHY OPEN ACCESS INSTITUTIONAL REPOSITORY NEEDED?

Institutional repository is a “Digital Collection that captures, preserves, archives and provides policy based access to the intellectual output of an institution”. It can be perceived as an organization based set of services which the organization offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members. Researchers, faculty and authors in quest for greater impact of their intellectual work share their hard work in the form of research papers, technical bulletins, books etc., with commercial publishers and they don't have to look for the commercial income from it. Their interest is wide dissemination and further follow-up of their research output. On the other hand publishers owing to commercial interest put high subscription cost, thus, restricting the circulation. This creates an impact barrier. On the other hand, researchers, faculty and scientific workers look for easy access to relevant scientific and other literature but do not have easy access to most of the literature for want of monetary cost required to be paid to publishers. This leads to creation of an access barrier. These structural problems with scholarly

publishing can be addressed to great extent by creating Open Access Digital Repositories.

For an institutions, an open access digital repository can go long way in raising the profile and prestige of the institution, provide efficient management of institutional information assets, accreditation and performance management. In long-term such digitally accessible organizational knowledge repository results in cost savings. For the research community it provides an alternative route to free research communication process and helps avoids time lag and unnecessary duplication. However, there are some concerns with respect to quality control - particularly peer review, IPR and copyright issues, etc. In fact, if institutional repository is seen as complementary to the commercial publishing not intended to totally replace it, it can help and advice on IPR issues as outputs are easily available in digitally searchable form. The open access institutional repository can help and advice on formulation of further research strategy for acquisition of relevant knowledge to meet the goals of an organization.

IMPORTANCE OF DIGITIZATION AND PRESERVATION

As we are aware,the digital world is a binary world where all the information is represented as bits, 0s and 1s as against conventional analog representation where infinitely variable nature of information is preserved. Contents in every format and medium held by library, manuscripts to maps, moving images to musical recordings can be converted to suitable digital format. In addition to hardware, software needed for conversion and creation of digital content, the required practices for describing the digital content and their retrieval are also developing fast. The advantages of digital content normally outweigh the loss of fidelity in converting the information from continuous to discrete form due to following advantages:

- Wider and easy policy based access,
- Easy presentation and maneuvering of data,
- Compression of large storage space,
- Fast, multi-dimensional and semantic retrieval,
- Reproducibility and repackaging in different forms,
- Simultaneous & endless reusability,

- Digital resources are best for facilitating access to information but questionable when it comes to traditional library role of authentic preservation.
- Digital content is machine-legible only whereas conventional content is eye-legible.
- Digitized information needs computer hardware and software which are often proprietary and become obsolete very fast, requiring conversion to newer formats and technologies.
- Transition from one file format to other may not produce exactly same file, although, there may not be any loss of intellectual content.
- Assuring integrity of digital file and keeping track of versions is another challenge.
- Active human intervention for refreshing and migration of data is required for maintaining it in the fast changing digital technology environment.
- The life expectancy of digital media, the quality of its manufacturing, the number of times the media is accessed over its lifetime, the quality of the device used to write to or read from the media are matter of concern and need careful media handling, storage temperature, humidity and cleanliness of the storage environment.
- DNA-storage: The researchers of the Chinese University of Hong Kong used encoded *E. Coli* plasmid DNA (a molecule of DNA usually present in bacteria that replicate independently of chromosomal DNA) to encrypt the data and store it in the bacteria. Then, by using a *novel information processing system* they were able to reconstruct and recover the data with error checking. Based on the procedures tested, they estimate the ability to store about 900 terabytes (TB) in one gram of bacteria cells. That is the equivalent of 450 hard drives, each with the capacity of 2 terabytes (2000 GB). Another advantage of the system is that the bacteria cells abundantly replicate the data storage units thereby ensuring the integrity and permanence of the data by redundancy. Genetic codes have been preserved using similar strategy by nature. (http://2010.igem.org/Team:Hong_Kong-CUHK/Project)

NEED OF INSTITUTIONAL REPOSITORY (IR)

Institutional repository is a Digital Collection of information which captures, preserves, archives and provides policy based access to the intellectual output of an institution. It can be perceived as an organization based set of services which the organization offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members. IR helps in increased control by scholars and the academy over the system of scholarly publishing. IR provides scholarly information free of cost or at fair and reasonable price. However, IR should be seen as complementary channel, not intended to replace commercial publishing. The IR increases the visibility and citation impact of an institution's intellectual output and provides unified access to an institution's output. The IR act as digital platform to preserve institution's intellectual assets and help in providing and managing open access to institution's intellectual assets.

Taking the clue from this, strategy of 'replication and evolution' can help manage data preservation, even on magnetic media of today for very long time. Indian National Agricultural Research & Education System (NARES) has a very large collection of conventional knowledge base in agriculture and allied sciences, spread over the country in Institutes and State Agricultural Universities. Digitization of these valuable archives would allow online access to researchers, teachers and students to which they would not otherwise have an easy access. Therefore, Indian Council of Agricultural Research (ICAR) took several digital initiatives to capture and manage knowledge in NARES, one of the largest agricultural research & education system in world. These initiatives came in the form of several subprojects under the World Bank supported National Agricultural Technology Project (NATP) and National Agricultural Innovation Project (NAIP), a major initiatives to reform the way research and development is done in our traditional system. CeRA, E-Granth, Rice Knowledge Management Portal (RKMP), Agroweb, Agripedia, MIS/FMS, ICAR journal portal, supercomputing for Bioinformatics, Computing facilities, etc. are the few impacts making initiatives on digital access has been started by ICAR[NAIP, 2014].

- (i) **KrishiKosh a Digital Repository of NARES:** Indian National Agricultural Research & Education System (NARES) is a huge repository of knowledge and information on crop sciences, horticulture, resource management, animal sciences, agricultural engineering, fisheries, agricultural extension and agricultural education. Digital technologies and online access to information

resources have brought increased expectation from library and information services. For researchers, fast access to existing scientific outputs and archived scholarly information on the topic of interest is as crucial as current scientific knowledge. The modes of services that librarians and information professionals provide has thus become very important and have undergone fundamental changes over past few decades. Digital resources, digital services and access technologies continue to create new opportunities, new challenges and new expectations. Union catalogue, digital repository and digital libraries are the new paradigms which have been taken up to facilitate researchers, teachers, students, extension professionals. ICAR also has declared adoption of open access policy for proper utilization of Intuitional knowledge. It has been observed that in the recent years subscription to journals by libraries of ICAR Institutes / State Agricultural Universities (SAUs) has been on the decline mainly because of the increase in the cost of reputed relevant journals and books coupled with reducing fund availability for the purpose. At the same time, the research/educational activities must always keep pace with the international competition for which all important journals and books should be made available to researchers/teachers in the NARES. Maintaining a traditional form of library with hardcopies is becoming labour-intensive and adds to the cost. Each and every library cannot be sustained without adequate funds. NARES must take advantages of sweeping changes taking place globally. Considering these facts the importance of digital repository and digital library under e-Granth becomes more relevant. The institutional repository can hold all the intellectual outputs of the NARES system in the form of digitized institutional publications, technical reports, annual reports, lectures, authors collection in the form of preprints, reprints etc. These contents to which one can easily have open access, essentially captures all the intellectual work being done under NARES. The same intellectual output when gets published in the form of research papers in the commercial journals become inaccessible due to high cost. Thus institutional repository provides alternative source of scientific information to support our quality research and teaching. KrishiKosh is available at <http://krishikosh.egranth.ac.in> and provides open access to most of its content.

KrishiKosh is a versatile open access digital repository catering to the needs of NARES and has architecture of centralized hosting of

content but decentralized management. The KrishiKosh is hosted at the data center of Indian Agricultural Research Institute (IARI), the premier research institute and deemed university under NARES. Each institute or university can manage and administer its own repository which is integral part of KrishiKosh. The KrishiKosh has been designed by using open source software DSpace which has been suitably configured to meet the requirements of NARES. Each institution in NARES has been configured as community in DSpace having its own collections and logo. Each community and collection can be given independent rights to registered users for uploading and managing the contents. Thus, KrishiKosh is a collectively managed, centrally aggregated repository with integrated search facility. The major objectives of KrishiKosh are to create a digital Institutional Repository of important institutional publications including rare books and old journals and make them open access under NARES. The need for improving accessibility coupled with preservation is necessity for implementation of KrishiKosh under E-Granth. To create dependable digital storage and an efficient Integrated Content Management System (ICMS), an open source software DSpace has been customized to meet the requirements. It provides following functionalities:

Improve Accessibility: The ICMS makes the holdings more accessible to scholars, teachers, academics and the general public, both within the premises as well as to those who cannot personally visit the NARES libraries but want to access the contents through the internet, under open access policy.

Enhanced Search ability: All holdings are grouped communities and collections based on institutions, subjects, themes or other criteria making large amount of information easily available on any subject matter for teaching, research and development. Any researcher looking for content on any subject or themes can have a unified access to content on all media types (manuscripts, photographs, audio-video, etc.) thereby making the searching much easier and faster.

Preservation: Preservation of all the rare documents in electronic form is an important objective. Also, once the documents are scanned and digitized, preservation of the originals can be ensured for a much longer period as the need to handle the physical documents is eliminated or minimized to a great extent since documents are made available through the ICMS.

Content Selection: High power committees of subject matter experts have identified the content of intellectual and academic value to be included in the repository. Other institutions have identified the content in consultation with subject matter experts approved by the Directors/ Vice-Chancellors. The identified content was then harmonized centrally to avoid duplication.

Various types of archival material at NARES comprises of rare books, old journals, reports, newsletters, annual reports, success stories, special bulletins, convocation addresses, endowment lectures, author's collections, preprints, reprints, patents, manuscripts, periodicals, grey literature, photographs, existing digital content, audio-video recordings.

It is NARES's intention to make the Metadata for all records (and categories) freely available to all, however the actual records would be accessible based upon its access category.

All of NARES's holdings are classified under the following three access categories:

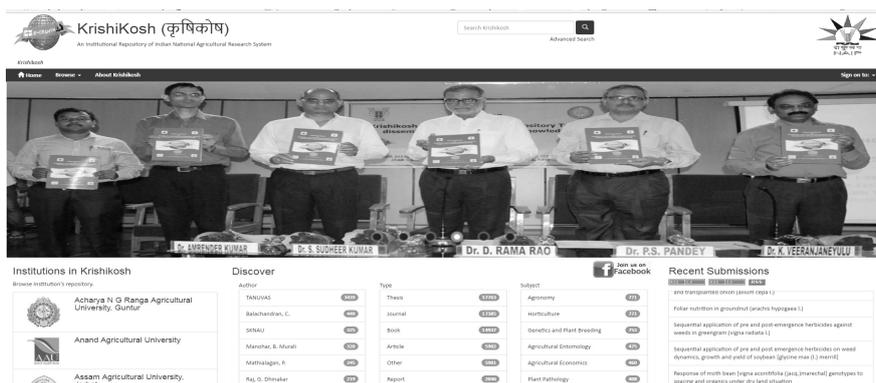
Public Access : Any record that can be made available to public at large shall fall under this category

Privileged Access: Records classified under this category shall be accessible to only to those individuals or organizations that have a privileged status with NARES (such as other national / state archives / research and academic institutes / eminent researchers etc.). Others (the world at large) would have to seek prior permission / approval from IARI to access any Record classified as Privileged Access.

Prohibited Access: Records which are accessible ONLY to NARES authorized officials, due to their confidential and sensitive nature as defined by statutory rules and regulation.

Thus, KrishiKosh is a digital repository which captures, preserves, archives and provides policy based access to the intellectual output of Indian NARES. It is a unique repository of knowledge in agriculture and allied sciences, having collection of old and valuable books, institutional publications, technical bulletins, project reports, lectures, preprints, reprints, thesis, records and various documents spread all over the country in different libraries of Research Institutions and State Agricultural Universities (SAUs). The home page of this repository is given below and can be visited through the link (<http://krishikosh.egranth.ac.in/>). At present KrishiKosh has more than 16 million digitized pages in

more than 71,000 digital items (volumes) like old books, old Journals, reports, proceedings, reprint, research highlights, training manuals, historical records. More than 26,000 thesis are submitted at Krishikosh by various SAUs / Institutions and value addition has been done by making these full Text searchable.



Krishikosh platform is an Institutional Repository for collecting, preserving, and disseminating information in digital form for the intellectual output of an institution. In this repository, some important terminology such as Community, Sub Community, Collection, Item and Bitstream needs to be understood. The explanations of these terminologies are given below.

Community: Community is the top level reference term which describes the University/ICAR Institute group. Generally the right to create a Community is with the Administrator of the Krishikosh.

Sub Community: This is second level of hierarchy. It may describe departments/ division under the University/ICAR Institute.

Collection: Collection is a part of Community or Sub-community in which we can add different categories like books, thesis, journals, newsletters etc. Creating collection is necessary to post the document under Krishikosh.

Item: The record/document which is uploaded in collections is termed as item.

Bitstream: It is the file which will be uploaded in the Krishikosh preferably a searchable pdf/a or pdf file.

(ii) **Integrated Digital Ensemble of Agricultural Libraries (IDEAL):** To strengthen the digital library initiatives, more

advanced Library Management Software, compliant to open international standards is necessary for easy data portability and data sharing. Koha is open source software which has been identified for implementation in the NARES libraries with expert support, intensive trainings. In-house capacity building has been part of the strategy. All further advanced library automation system like RFID for automated library services can be built only on robust Library Management System compliant to international standards for data compatibility and portability. Koha has been implemented in the 38 libraries under NARES. Koha is a full featured Integrated Library System (ILS), downloadable free under GNU General Public License, maintained by a dedicated team of software providers and library technology Koha OPAC page at IARI, New Delhi professionals from around the globe. Authorized user may modify the codes to adapt it to local needs and redistribute it. Koha has robust Cataloging, Circulation, Patrons, Search, Serials control, Acquisition, Reports and Administration modules along with utility Tools and OPAC. By adopting it, the customer becomes 'joint stake holder' in the product. Koha is well tried and tested software and has demonstrated both stability and scalability, is being used in hundreds of libraries worldwide. It is an example of Collaboration and Resource Sharing. Software solutions are freely available to all libraries worldwide. Libraries benefits from the contributions of other participating library systems. Being an open source software it has benefit of being free from vendor lock-in whereas, in proprietary software, source code is 'closed' and support and future development of the product solely rely on the success and resources of a the single vendor. If the vendor goes down or does not cooperate, your product support is gone. Open source solutions rely on stable code bases developed and supported by many providers worldwide. Koha is compatible with existing technologies viz. RFID, and being open source developing software, compatibility with any new Library Technology will be available in future also. The IDEAL platform has been developed on Software as Service (SaaS) architecture with independently configured instance for each library having OPAC and staff clients running on centralized servers along with option to run local mirror for individual library. It can be accessed at <http://ideal.egranth.ac.in>. All the libraries of NARES can join IDEAL platform to get themselves integrated to Virtual Digital Library of NARES and get freedom from

maintaining hardware and software locally for day to day functioning of their own library. This enables them to focus more on their core competency of managing their library more efficiently [Jain *et. al.*, 2014; Jain *et. al.*, 2016].

(iii) Integrated National Agricultural Resources Information System: INARIS was taken up as a sub-project under National Agricultural Technology Project (NATP). The goal for this project was to design and develop a flexible Central Data Warehouse (CDW) of agricultural resources and databases on different subjects. The target users of information systems and decision support system developed under this project are

- (i) Research Managers
- (ii) Research Scientists
- (iii) General Users.

In this project a state of art Central Data Warehouse (CDW) of agricultural resources of the country has been developed at ICAR-IASRI, New Delhi. This provides systematic and periodic information to research scientists, planners, decision makers and developmental agencies in the form of On-line Analytical Processing (OLAP) decision support system. It has been implemented with active collaboration and support from 13 other ICAR institutions, namely NBSSLUP Nagpur (for soil resources), CRIDA Hyderabad (for agro-meteorology), PDCSR Modipuram (for crops and cropping systems), NBAGR Karnal (for livestock resources), NBFGR Lucknow (for fish resources), NBPGR New Delhi (for plant genetic resources), NCAP New Delhi (for socio-economic resources), CIAE Bhopal (for agricultural implements and machinery), CPCRI Kasargod (for plantation crops), IISR Calicut (for spices crops), ICAR Research Complex for Eastern Region Patna (for water resources), NRC-AF Jhansi (for agro forestry) and IIHR Bangalore (for horticultural crops). In all 59 databases on agricultural technologies generated by council, research projects in operation and related agricultural statistics from published official sources at least from the year 1990 onwards at the district level were integrated into this information system. Subject-wise data marts were created; multi-dimensional data cubes have been developed and published on Internet/Intranet. The validation checks have been implemented wherever possible. The information of this data warehouse are available to user in the form of decision support system in which the all the flexibility of the

presentation of the information, it's on line analysis including graphic is inbuilt in to the system. The system also provides facility of spatial analysis of the data through web using functionalities of Geographic Information System (GIS). Apart from this, subject wise information system has been developed for the general users. The user of this system has the access of subject wise dynamic reports through web. The facilities of data mining and generation of ad-hoc querying were also extended to limited users. Therefore, the dissemination of information from this data warehouse for different categories of users is through web browser with proper authentication of the users. The web site of the project is already launched (www.inaris.gen.in) and the multidimensional cubes, dynamic reports, GIS maps and information systems are already available to the users. This project is viewed to strengthen the information system conceptualized by ICAR. Other agencies, in particular, the planning portfolio, are eagerly waiting for such a decision support system. Based on the interaction among the basic resources like soil, water, climate, animal and vegetation that form the prime components of the production system this data warehouse will help in determining the carrying capacity of the region. The project aims at giving suitable opportunity on multi-disciplinary mode through enhanced linkages among research institutes and other development agencies by providing first hand information on problems and potential in production systems. This data warehouse may be intensively used with an ultimate aim of enhancing better quality of life of the farming community and society at large

- (iv) **Establishment of an Online System for NET/ARS - Prelim Examination:** A state-of-the-art infrastructure facility for conducting examination of ARS/NET of ASRB was created under the subproject with the major objective to develop the capability to change over from on-site to on-line Examination for NET/ARS Prelim. The on-line examination network consisting of one Data Center (DC) at the ASRB, One Disaster Recovery (DR) site near its premises, and 23 Examination Centers (or Nodal Centers) across the country was set up. These Examination Centers were created at 21 ICAR Institutes and two SAUs considering that the management control would be better at these locations being part of the NARES family. These centers were equipped with necessary hardware and software that was developed and customized as per the requirements of the ASRB.

- (v) **Establishment of Supercomputing Hub for Indian Agriculture:** During the last decade, genomics has witnessed an information explosion. Genomic databases contain huge amounts of information that are not amenable to traditional analytical approaches. The analysis of genomic sequences for drawing valid conclusion is highly computer intensive and needs different tools and technique. Apart from this, there is need to design and develop databases and data warehouse of genomic data of local species and commodities to facilitate researchers. Software and web browser based systems need to be developed for visualization, mapping and interpretation of these genomic sequences. Also, there is hardly any consolidated efforts are made for collection, compilation, storage and knowledge mining of indigenous agricultural genomic resources. In order to keep pace with the research and developments in agricultural bioinformatics at global level, country needs expertise and exposure in this area of research. Therefore, there is an urgent need to establish this National Agricultural Bioinformatics Grid (NABG) which will help in developing databases, data warehouse, software and tools, algorithms, genome browsers and high-end computational facilities through systematic and integrated approach in the field of agricultural bioinformatics. The first supercomputing hub for Indian Agriculture in bioinformatics called ASHOKA (Advanced Super-computing Hub for OMICS Knowledge in Agriculture) was established at the IASRI in New Delhi under the National Agricultural Bioinformatics Grid (NABG) sub-project of NAIP (<http://www.nabg.iasri.res.in>). The hub consisting of supercomputing systems at the NBAGR, NBPGR, NBFGR, NBAIM and NBAIR constitutes the National Agricultural Bioinformatics Grid in the country.
- (vi) **Development and Maintenance of Rice Knowledge Management Portal (RKMP):** RKMP (<http://www.rkmp.co.in>) is a technical highway for sharing the knowledge of Rice by using new Information and Mobile Technology. It helps the departments which are working in agricultural activities to reach the farmers through extension advisory services, in the best possible way. This platform are built on Microsoft Web 2.0 technology, it caters to location specific information needs of farmers and research officials through IP based customization on 24X7 bases. RKMP is operating by providing content in local language. RKMP operates in multiple domains e.g. Extension and Farmers that provides

production know how, practices, FAQs etc., in local languages and English. In research domain, various services are provided such as AICRIP Intranet, archives of AICRIP data (27000 datasets), communities of practice (CoP), bio-informatics suite, approach papers, India Rice Research Repository (i3R), status papers on rice for different states etc.

The portal works on two e-learning platforms which provide learning opportunity to scientists and extension workers simultaneously. This portal also caters to information needs of exporters and farmers through the trade information system. It also provides indexing of mandi prices of paddy from regulated market yards (from Agmarknet). Policy makers can directly access area, production, productivity trends of last four decades up to district level. In a first kind of an attempt, the users can upload the content as a registered user, irrespective of institutional affiliation. RKMP Nodal officers (AICRIP Scientists from State Agricultural Universities) will validate and approve your content before it is displayed online with due credit to the contributors.

- (vii) **Agroweb-Digital Dissemination System for Indian Agricultural Research (ADDSIAR):** An attempt was made to create a common gateway to ICAR Institutes to act as a one stop window for getting access to all the information about National Agricultural Research and Education System in India. Accordingly, the ADDSIAR was conceived with the broad objective to improve the web presence of ICAR and its Institutes through their websites by making the websites more dynamic and developing a brand image of ICAR. Website Uniformity Guidelines for the ICAR was developed and disseminated which outlined the Standards and Content Management Strategies (CMS) to be employed by all the ICAR Institutes. The ADDSIAR established at the Directorate of Knowledge Management in Agriculture (DKMA) is committed to promote ICT driven technology and information dissemination system for quick, effectual and cost-effective delivery of messages to all the stakeholders in agriculture. Keeping pace with the current knowledge diffusion trends, the Directorate is delivering and showcasing ICAR technologies, policies and other activities through print, electronic and web mode [Tyagi *et. al.*, 2014].
- (viii) **Engaging Farmers; Enriching Knowledge, Agropedia:** Agropedia is a comprehensive and integrated model of digital content organization in the agricultural domain. It aims to bring together a community of practice through an ICT mediated

knowledge creating a common platform with an effort to leverage the existing agricultural extension system. There are three groups of agencies/institutions on this project with different roles & responsibilities (<http://agropedia.iitk.ac.in/>)

ICT Resource Institutions: IIT Kanpur (agropedia platform); IIT Bombay; IIITM Kerala (multi-modal delivery); NAARM

Agricultural Information and Learning Resources: G B Pant University for Agriculture and Technology, Uttarakhand; University of Agricultural Sciences, Dharwad with two KVK's in Maharashtra through the IIT Bombay network.

ICT4D Interface Partners: ICRISAT, with its VASAT project in India and the NAARM will provide the facilitation support for agricultural research scientists and educators and the ICT4D actors. ICRISAT is the consortium leader, which has overall responsibilities for the outputs and deliverables. ICRISAT is uniquely positioned because of its long-standing formal and working relationship with nearly all the partners. Its strength in IT innovations for human development has been described in the IEEE Spectrum (Feb 2004). Its long standing partnership with the FAO (especially in AGROVOC work), and its position as the hosting centre of many CGIAR activities in India, add further strength in implementing this project in a consortium mode. Agropedia has been developed as a common platform for all kinds of information related to Indian agriculture. In one of the first attempts worldwide, the practice of crop knowledge models has been defined and developed to create architecture for accumulating known codified and approved information about crops. This was accomplished with the support of Food and Agriculture Organization (FAO), Rome. Knowledge models (KMs) are the structural representation of knowledge by using symbols to represent pieces of knowledge and relationships between them, which can be used to connect to the knowledge base in agropedia using semantic tools. KMs have been represented using Concept Map (C-Map) tools. KMs have been designed with the intention of using them for indexing and browsing the content that we gather in the repository. A template for objects and relationships within the KMs as well as guidelines to develop KMs were formulated by the NAIP- KM team of IITK with the assistance and support of FAO. Agropedia an agricultural knowledge management portal (<http://www.agropedia.iitk.ac.in>) was developed as an open platform to facilitate exchange and delivery of information

between the agricultural community through a web portal and mobile phone networks.

- (ix) **E-Publishing of Scientific Journals for Indian NARES:** The E-Publishing and Knowledge System in Agricultural Research (EPKSAR) portal developed in the Project has made significant impact on the publishing process and manuscript management of research journals through the implementation of ICT in research journal publishing. Implementation of e-publishing (<http://epubs.icar.org.in/ejournal/>) has resulted in making the entire publishing process quick, transparent and paperless resulting in the improvement of overall efficiency are being published using the developed ICT enabled platform and are available on-line now. Open Access policy in ICAR for enhanced dissemination and sharing of Indian agricultural research is the outcome of the sub-project.
- (x) **Consortium for E-Resources in Agriculture (CeRA):** The Consortium for e-Resources in Agriculture, popularly known as CeRA, facilitates online access to about more than 3400 journals in agriculture and allied sciences to all researchers comprising; scientists, teachers, faculty, research fellows and students in the National Agricultural Research System (NARES) through IP authentication. This is the first of its kind for facilitating 24 x 7 on-line accesses of select journals in agricultural and allied sciences to all researchers. At present, there are 147 members (along with regional stations, KVKs and colleges) in CeRA comprising ICAR Institutes, SAUs, NRCs, PDs, etc. in the NARES. About 3,490 journals are now accessible in CeRA [(<http://cera.iari.res.in> & <http://www.jgateplus.com>), which is now the most sought after on-line platform by scientists/teachers in the NARES for literature searchthrough IP authentication. The website (<http://cera.iari.res.in>)has been developed in Joomla platform using PHP, HTML languages in frontend and MySQL database in the backend. Contents in the site comprises general information on CeRA, committees, feedback, available journal lists, information on workshops and important news, important publications, manual, etc. – accessible to general public and information on financial details, agreements with publishers, invoice, unprocessed data, SOEs, etc. – under secured access. In this way, all information of the Consortium is available in one platform. The second website (<http://www.jgateplus.com>) is the updated version of (<http://cera.jccc.in>)developed at the time of launch workshop. This

site contains metadata of all journals available in CeRA and accessible through IP authentication. Besides, the contact details of each member and the nodal officer of CeRA have to access to generate reports on hits/downloads and DDRS. This is the online platform for access to CeRA journals. Some of the important options facilities available in this platform are: advance search, my favorite journals and live chat with the service provider for online solution to a given problem. The impact of CeRA in research publications is revealed through Web of Science, which indicate qualitative and quantitative increase in the number of published papers during post CeRA (2008-12) than Pre-CeRA (2003-07). CeRA acts like a catalyst to enhance agricultural research, education and extension activities of NARES institutions. This would not have happened but for the constant help and co-operation of all CeRA members all along. The subscription at one place, instead of subscribing individually, provides an efficient way of subscription of research journal under the NARES in terms of time, space and budget [Chandrasekharan et. al., 2012; NAIP (2014)]

- (xi) **Development of E-Courses for degree level programmes in agriculture and its allied areas:** As the traditional methods of educating the new generation of tech-savvy students are found wanting, the need for use of new technologies in agricultural education is gaining momentum. Hence, 425 user-friendly and multimedia-based e-courses for the under-graduate students were developed in seven disciplines viz., agriculture, dairy science, veterinary science and animal husbandry, fisheries science, horticulture, home science, and agricultural engineering comprising 15820 lessons. A dedicated portal on e-courses covering all the seven disciplines was made available at <http://ecourses.iasri.res.in>, so that the user community could access the desired e-Course contents anytime and anywhere. Off-line DVDs were also distributed to all the SAUs, DUs and other academic institutions in India on demand.
- (xii) **Implementation of Management Information System (MIS) including Financial Management System (FMS) in ICAR**
- ICAR took an initiative to develop and Enterprise Resources Planning (ERP) solution that will take care of all Institutes and Centers of ICAR as a whole. ICAR-IASRI was identified as a leading center for development and successfully implements MIS (including FMS) System which includes solution for Financial

Management, Project Management, Material Management, and Human Resource Management & Payroll at ICAR. Major Benefits of this approach are:

- Centralized data management system across all institutes.
- Finally, creating an IT environment in ICAR across all disciplines.

ERP system was planned under the sub-project entitled Implementation of Management Information System including Financial Management System in ICAR. An ERP system integrates different parts of the business processes and their activities such as planning, purchasing, inventory, sales, project, finance, human resources, etc. Establishment of a Central Data Centre (CDC) of ICAR was further added under the sub-project and the CDC was established at IASRI to address the requirement of MIS-FMS including web hosting and unified messaging solution. The software of ICAR-ERP was developed in the project using Oracle ERP available at <http://icarerp.iasri.res.in>. The ICAR-ERP solution facilitates efficient and effective planning and management of resources. The system integration processes were carried out in the five major functional areas *viz.* Financial management; Project management; Material management; Human resource and Payroll system. The solution is developed using Java as a driving engine with a backend of Oracle, the system is designed and implemented in centrally and is used by accessing URLs on java enabled Browsers (<http://www.iasri.res.in/misfms/>).

- (xiii) Strengthening Statistical Computing for NARES:** Under this sub-project, emphasis was given to strengthen the high end statistical computing environment for the scientists in NARES. Availability of a very healthy statistical computing environment for the scientists in NARES containing a very powerful, all inclusive, a modern, efficient and precise general purpose statistical software package for undertaking a probing, in-depth and accurate analysis of data generated from agricultural research. This is expected to bring a revolution in the analysis of agricultural research data. Exploratory data analysis, which previously was avoided because of non availability of the high end statistical package, would become a common feature of all agricultural research. The power of the package to graphically display dynamic, interactive visual research can enrich the knowledge of agricultural scientists and illuminate concepts which

without statistical software package was more difficult to comprehend earlier (<http://www.iasri.res.in/sscnars/>).

DISCUSSION

The green revolution in India benefits the livelihood of farmers immensely and enhances agricultural productivity as well. However, there is a demonstrable need for a new revolution may be called digital revolution that may bring the farmers, researchers and policy makers together for smart solutions. In the new digital era with booming mobile, wireless, and Internet technologies, ICT has penetrated even in poor smallholder farms and in their daily activities. The ability of ICTs may become a powerful tool for farmers to access and organize the available knowledge through the digital initiatives taken by ICAR. It facilitates the implementation of technologies –both new and traditional– and transforming patterns of learning and interactive strategies among researchers for real time solutions.

The digital initiatives especially that of E-Granth and CeRA have consistently enhance the quality and quantity of research output in terms of research papers, methodologies and patents. This is because of the fact that all publishers/journals in agricultural sciences are available on CeRA platform and all institutional repository especially thesis are available on E-Granth portal. Thus, these initiatives play a key role in the research and developmental activities in NARES. ICT application based sub-projects have resulted in better and economic access to quality publications for researchers and students. This has greatly impacted the overall quality of the research publication from the NARES. The National Agricultural Bioinformatics Grid (NABG) provides the platform for research and development in agricultural bioinformatics for inter-disciplinary research in cross-species genomics along with the capacity building. It is expected that, in due course of time information and knowledge generated through research on bioinformatics from the genomic knowledge base will start flowing downward to researchers to users and experimentations in different sectors of agriculture can be able to evolve internationally superior competitive varieties/breeds and commodities in agriculture. It is also estimated that the total amount of information doubles every four to five years. ICTs are crucial in coping with the explosion of knowledge in agricultural sciences such as genomics huge data were generated. Supercomputing facility available with advanced statistical tools were utilized to convert these knowledge's into an information.

RKMP is strengthening the research, extension, farmers, private sub-systems, partnerships and networks for the better flow of rice knowledge. It is also providing vital scientific information and contributing to overall rice development in the country. The developed portal helped to strengthen communication infrastructure among the stakeholders, improve tools for collecting data and information, nurture scientific communities in the field of rice, provide platform for collaborative action and information sharing, initiate steps for integrating information systems and improve the knowledge sharing culture throughout various key players and stakeholders in the rice sector. The E-Publishing portal has made significant impact on the publishing process and manuscript management of research journals through the implementation of ICT in research journal publishing and Implementation of e-publishing. ERP system was also developed for Management Information System including Financial Management System in ICAR. An ERP system integrates five major functional areas *viz.* Financial management; Project management; Material management; Human resource and Payroll system e-governance system. The ERP system assists the implementation of policy frameworks and to monitor progress for any organization. For strengthen the high end statistical computing environment for the researcher, faculty and students in NARES, statistical computing environment were provided for efficient and precise general purpose statistical systems for undertaking a probing, in-depth and accurate analysis of data generated from agricultural research. This is expected to bring a revolution in the analysis of agricultural research data for knowledge discovery.

The digital portal provides actionable information to community and policy maker on disaster prevention in real time along with advice on risk mitigation technique. This portal made significant impact in the field of risk management. Through regular and systematic surveillance, disastrous situations can be avoided by detecting the events well in advance. Using these technologies advice on the risk mitigation technique can be generated or communicated to the policy makers (RKMP portal can give information in advance on pests disaster in the rice crop. Internet technologies capture pest information from fields and produce – instant and customized pest reports to the plant protection experts to advise the state agriculture agencies who further advise concerned farmers and the same information is available for agricultural policy planners.)

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RE-ENGINEERING OF AGRICULTURAL LIBRARIES AND EMERGING TECHNOLOGIES: CHALLENGES & OPPORTUNITIES

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INTRODUCTION

The traditional mode of running library services in agricultural libraries seems to be over now. The main reasons for this seems to be the combination of negative growth in funding, increase in prices of agricultural information resources and necessary investments in technology, human resource development and increasing expectation of the users. Agricultural libraries of SAUs & ICAR institutes have experienced these problems during last 8-10 years. Operating with less funding during these years have led to the cancellation of some of the agricultural resources. The number of subscriptions have somewhat declined and expenditure on the books, journals etc. have increased due to enhancement in conversation rates & other factors. As the increase in funding of the agricultural libraries is not in foresight, it calls for re-engineering of the roles of the agricultural libraries, their services and mode of operation. The recent developments in ICT have put a lot of pressure on investments in ICT and the development of new competencies in the agricultural librarians. The number of constraints, pressures and developments has been responsible for initiating the re-engineering of library services in the agricultural libraries.

MEANING OF RE-ENGINEERING

The term re-engineering was first introduced by Michael Hammer in the July-August 1990 issue of Harvard Business Review article, "Re-engineering Work: Don't Automate, Obliterate."

According to Hammer and Champy (1993), "Re-engineering is the fundamental rethinking & radical redesign of business processes to achieve dramatic developments in critical contemporary measures of performance such as cost, quality, service and speed."

Your Dictionary (www.yourdictionary.com/reengineering) defines re-engineering, "the application of technology and management science to modification of existing systems, organizations, processes and products in order to make them more effective, efficient and responsive."

NEED OF RE-ENGINEERING OF AGRICULTURAL LIBRARIES

- to cope up with the challenges posed by agricultural information explosion
- to fulfill the agricultural information needs of the users
- to redesign agricultural information retrieval services
- to provide relevant agricultural information to the users/ clients

PLAN FOR RE-ENGINEERING AGRICULTURAL LIBRARY SERVICES

For the re-engineering of library & information services in the agricultural libraries the agricultural librarians will have to draw a plan stepwise detailed as under:

(a) What services are to be re-engineered?

For this, first of all identification of the processes & services of agricultural libraries is required e.g.

- facilities in agricultural libraries
- library collection
- manual processes of library operations

(b) Constitution of Re-engineering Team: Constitution of re-engineering team of experts is a must for achieving the desired goals

(c) Status of Current Operations in Library: Detailed report should be prepared for the operations which are to be automatized

(d) Vision Document for New Services: This document is to be prepared for providing instant access to library resources to the clients / readers

(e) Actions Needed for Re-engineering: For providing excellent information services to users, the physical layout of the agricultural libraries needs to be redesigned wherever required

- Separate stack area for books, periodicals, Textbook section, Reports section, Theses Section, Rare Books Section etc.
- Multimedia Unit / Digital Library Unit
- Separate Reading Halls for students & teachers
- Separate Technical Section, Reference Section, Reprographic Section etc.

AGRICULTURAL LIBRARY COLLECTION

Agricultural librarians should develop collection in digital format which should include the under mentioned items:

- Membership of E-Consortia
- E-Resources in agricultural sciences
- On-line databases
- E-books, e-journals
- CDs / DVDs

AUTOMATION OF LIBRARY PROCESSES

For improving efficiency, library house-keeping operations in most of the agricultural libraries have already been automatized with standard library software

RE-DESIGNING OF AGRICULTURAL LIBRARY SERVICES

The library & information services are required to be redesigned in the following way with the assistance of IT:

- CAS services should be provided by Email / WhatsApp
- On-line Resource Sharing
- On-line information retrieval system
- Institutional Repository
- NDL of India

For serving the users in a better way, agricultural librarians need to exploit the modern ICT facilities fully. At present the agricultural libraries could exploit only few possibilities of ICTs and could not achieve Universal Bibliographical Control and the required efficiency and effectiveness has not been achieved because of this users as well as library professionals are not satisfied.

HUMAN RESOURCES

Re-engineering human resources requires:

- To acquaint the library staff about their roles in the changed scenario
- To organize in-service training programs for upgrading their skills

RE-ENGINEERING OF AGRICULTURAL INFORMATION RESOURCES

The agricultural librarians have a tendency to ignore the handling of printed books & journals due to paper technology is a very costly operation involving a lot of staff costs on initial as well as on continuous basis (shelving, reshelving, checking in and out etc.) besides the expenses of library building & maintenance. Accordingly with the launching of e-books, e-journals, agricultural libraries may be able to render services based on e-resources at a lower cost than what is the case with printed books, journals etc. There are lot of savings when library staff don't have to cope with printed books & journals and the numerous tasks connected with them. The cost saving will not only be in the traditional technical services but in customer services too. When the users are able to access the e-resources from their desktop, the workload of customer service staff is reduced i.e. fewer loans, overdue notices and less photocopying. For the reengineering of library services & resources following may be considered:

- (a) Conventional Resources to Internet Resources:** 24×7 information access has made Internet as popular source of information and has changed the culture of readers
- (b) Books to E-Books:** No library can be self sufficient as far as books are concerned. For satisfying the information needs of the users, agricultural libraries are procuring more and more e-books. Further a number of e-books are also available free of cost on the web.
- (c) Serials to e-Serials:** For agricultural research e-serials are very much essential for providing nascent information to the agricultural scientists / researchers. Now a days, the e-serials have become the main source of agricultural research information and their usage, popularity has increased tremendously. Agricultural scientists have free access to e-serials 24x7 from their desktops and this is their most appealing feature.
- (d) E-Consortia's:** No agricultural library is able to be self reliant in itself and as such digital medium was found to be effective solution to provide access to users. Because of this the consortia approach has been adopted in SAUs & ICAR Institute Libraries. Actually pooling and sharing of agricultural information resources, facilities and document delivery service is the need of

the hour which requires collaborative & coordinated efforts from the agricultural librarians

- (e) **Web Based Services:** Web based clearing of library services, digital document delivery to remote users, development of full text databases, institutional repositories, user education and literacy, website maintenance & marketing of agricultural information are some of the major areas that need special attention for improving the situation.

MAJOR HURDLES

For reaping the benefits of ICT in agricultural libraries following seems to be the major hurdles:

- Knowledge of ICT amongst the Agricultural Library Professionals
- Vision and support of policy makers

IN-SERVICE TRAINING OF LIBRARY PROFESSIONALS

In-service training of library staff is very much essential. As far as the training in modern ICT is concerned, it is O.K. in most of Agricultural Institutes / SAUs. Training on various aspects like communication, public relations etc. are the need of the hour.

FLEXIBILITY IN VARIOUS DIVISIONS/SECTIONS/ UNITS

The various Divisions/ Sections/ Units in the library should work in an integrated & flexible manner for achieving maximum economy & service efficiency.

LIBRARY ORIENTED TEACHING AND LEARNING

SAUs & ICAR Institutes should design the courses and their evaluation system in the line of IITs, IIMs, and IISc. etc. where library and self learning are in pivotal position.

VACANT LIBRARY POSITIONS

In most of the SAU & ICAR Libraries enough of sanctioned posts are lying vacant. This is actually retarding the growth and development of libraries to a greater extent.

STAFF POLICIES

There is no proper staff policy for the library staff in ICAR Institutes and for subordinate library staff in SAUs.

CLASSIFICATION OF LIBRARY STAFF AS ACADEMIC

In ICAR Institutes, Library staff has been linked to Technical Services staff thus hindering their growth & promotion. Many talented professionals have left the ICAR Libraries for the betterment of their career prospects. As far as SAUs are concerned their position is better as far as staff on UGC Cadre is concerned. For subordinate Library Staff, the situation in SAU Libraries is also not encouraging. Need of the hour is to classify the Library Staff in ICAR Libraries at par with faculty/scientists on the lines of UGC.

PRESERVATION OF AGRICULTURAL DIGITAL RESOURCES

Digital preservation has several challenges such as short media life, obsolescence of hardware and software with the passage of time etc. A policy is required to be developed at national level for preservation of Knowledge Resources for the posterity.

MULTILINGUAL DATABASES

Management and development of multilingual databases in agricultural sciences is one of the major problems faced. Most of the agricultural libraries have either transliterated the information for developing their OPAC or left out such documents from the in-house database.

UNION CATALOGUE

Major hurdle in pooling and sharing of information resources in India is the lack of Union Catalogues in Agricultural Sciences in India. Effective mechanism for the development and maintenance of Union Catalogues in agricultural libraries is the need of the hour.

CONFUSING DESIGNATIONS OF LIBRARIANS

At present the designations of library staff are quite confusing particularly in ICAR Institutes and for subordinate library staff in SAUs. A committee of ICAR & SAUs should look into it and consider the implementation of uniform and distinct pattern of designations.

INTERACTIVE WEBSITES

All Agricultural University Libraries should develop and maintain websites with Content Management System. WEBOPAC of all documents should be accessible. Remote users should be able to reserve, renew, clear dues through on-line payment etc. through the website.

PROFESSIONAL COMPETENCIES

There is a wide gap between the required competencies and those imparted in Library Schools. As a result of which most of the library professionals are not fully equipped to efficiently handle the challenges posed by modern ICTs in information management. Accordingly LIS Courses should be restructured to imbibe enough technical competencies amongst the Library Professionals. This further requires that the curriculum of LIS should be revised periodically. As there seems to be no effective mechanism to control the standard of LIS courses offered in India as such it is suggested to constitute a body like Library Council of India (LCI) on the analogy of BCI.

CONCLUSION

Agricultural Librarians will have to take continuous steps for putting the critical mass of the agricultural & allied content on the user's desktop by procuring more and more electronic resources. They are required to invest in

- Requisite hardware / software,
- developing large document server systems,
- establishing a common user interface to available e-resources,
- initializing in-service training programs periodically

Further the agricultural librarians will have to look at developments outside the libraries and prepare for the radical changes in order to survive.

AGRICULTURAL DIGITAL LIBRARIES (ADL) AND THEIR FUTURE

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ABSTRACT

Agricultural digital libraries play a vital role in generation and dissemination of agricultural information. The basic function of agricultural digital library & information centers is the preservation and dissemination of agricultural information in digital form. The web technology promoted the development of agricultural digital library and delivered the information to the agricultural scientists/students/extension workers at their desktops. Agricultural digital library is nothing but transformation from traditional agricultural library. The digital library concept comes into existence in the 21st century. Virtual library, electronic library, libraries are without walls and digital library are synonymous to each other. Using digital library, access anyone, anytime and anywhere in any form. This paper focuses on the functions, benefits & services of the agricultural digital libraries.

Keywords: *Agricultural Digital Libraries; E-Libraries-Agriculture*

INTRODUCTION

Agricultural digital libraries are today's agricultural information depositories and that their collections are in digital form. They attempt to provide instant access to digitized information resources. Agricultural Digital libraries are libraries of this information society as they are able to meet variety of user's demand in no time. The collection in agricultural digital libraries include electronic resources like e-books databases and e journals, etc. as well as they also include digitized print resources. Now a day's digital libraries are must as the concept of digital libraries is to bring libraries closer to the user. Due to information explosion it is difficult to bring all information together at once. So the agricultural digital libraries are able to bring different information resources together. In India, agricultural libraries are heading towards digital age in order to meet changing users' needs and to provide them authentic and reliable sources of information in world of Wikipedia and Google. The chief

sources of information in agricultural services are: CAB, AGRIS and AGRICOLA.

Many libraries, museums, or other organizations have digitized different collections, such as pictures, books, audio files, and video clips, to make them available on the Web. Agricultural digital libraries are defined as the collections of digitized or digitally born items that are stored, managed, serviced, and preserved by libraries or cultural heritage institutions, excluding the digital content purchased from publishers. Digital libraries present a variety of resources created in digital format as well as those converted from analogue materials through digitization efforts, including print materials, manuscripts, images, audio, and video[7]. Agricultural digital libraries are highly dynamic and ephemeral in technical collection and informational needs. In addition, the digital library structure by nature is highly complex. This complexity can cause problems in information retrieval, giving rise to help seeking situations for the user, especially for blind users, who rely on screen readers to access agricultural digital libraries.

WHAT IS DIGITAL LIBRARY?

In digital library, information is stored in bits and bytes, which need the computers to write/store & read/retrieve the information. In simple terms, in digital libraries information resources are stored in computer and the readers can use them any time, at any place. Users get remote access to the desired resources. Digitally libraries are the libraries without walls & are focused towards providing authentic resources of information to its users.

Digital libraries are those libraries which are fully automated and all resources are in digital format and the access to the information available is provided electronically to a remote user as well as conventional user. Digital libraries are electronic version of hybrid libraries.

- According to A.N. Yorkey, “The digital libraries are electronic libraries having large and diverse repositories of electronic objects. The digital objects include text, images, maps, sound, and videos, catalogued and include, business and government databases as well as hypertext.”
- A **digital library**, **digital repository**, or **digital collection**, is an online database of digital objects that can include text, still images, audio, video, or other digital media formats. Objects can consist of digitized content like print or photographs, as well as born-

digital content like word processor files or social media posts. In addition to storing content, digital libraries provide means for organizing, searching, and retrieving the content contained in the collection.

- Digital libraries can vary immensely in size and scope, and can be maintained by individuals or organizations [4]
- Agricultural digital libraries are those libraries which have digitized and e-resources of agricultural based studies in their collection. These libraries are very helpful for research and development of agricultural studies as well as for farmers too.

WHY AGRICULTURAL DIGITAL LIBRARY IS IMPORTANT?

Now a day's agricultural information handling is very difficult task because of agricultural information explosion. There are so many resources (print and e-resources) which are a complex task to manage. So, following are the:

1. Digital libraries are accessible any time (24×7) and anywhere help agricultural scientists/ extension workers/farmers/students to get information whenever they want.
2. Resources present in agricultural digital library require less physical space as compare to traditional library.
3. Unlike traditional library, there is no issue of stock verification, limited physical copies, weeding of books etc. i.e. long time preservation.
4. Cost effectiveness is higher compared to traditional agricultural libraries, as in digital libraries there is one time investment of money, etc.

FUNCTIONS OF AGRICULTURAL DIGITAL LIBRARY

- Access to large amounts of agricultural information to users wherever they are and whenever they need it. [3]
- Access to primary information sources.
- Support multimedia content along with text.
- Network accessibility on intranet and internet
- User-friendly interface
- Hypertext link navigation
- Client-server architecture

- Advanced search and retrieval
- Integration with other digital libraries.

PURPOSE OF AGRICULTURAL DIGITAL LIBRARY

- Strengthen communication and collaboration between and among agricultural universities/ ICAR Institutes.
- Take leadership role in the generation and dissemination of knowledge
- Promote efficient delivery of information economically to all users.
- Expedite the systematic development of procedures to collect, store, and organize, information in digital form.
- Encourage co-operative efforts in research resources, computing and communication networks.[3]

SCOPE

The Agricultural digital Libraries available in various forms are restricted not only to the size of files and the format contents which are available in a structured form of software on CD-ROM including video clips, full length movies, but also extend its rapid communication, Boolean search, browsing of information on internet through World Wide Web. Also, digital libraries impart knowledge to local farmers by help of various orientation programs, workshops etc. which are based on basic knowledge required in farming.

BENEFITS OF AGRICULTURAL DIGITAL LIBRARY

The benefits of agricultural digital libraries as a means of rapid and smooth accessing books, archives and images of various types are now widely recognized by agricultural scientists, extension workers, farmers & students. As compared to traditional libraries, agricultural digital libraries have to save & store much more agricultural information, simply digital information requires less physical space to contain it. Some benefits are as follows:

- No physical boundary: The readers of agricultural digital library not need to go to the library physically, people get information from worldwide can gain access to the same information, as long as an internet connection is available. [1]

- A major benefit of agricultural digital libraries is that readers can access 24x7(any time) and anywhere to the information.[1]
- Agricultural digital libraries can provide very user friendly interfaces, giving clickable access to its resources properly and the readers is able to use any search term (word, title, name, phrase and subject) to search the entire collection of digital libraries.
- In case of any loss of document a backup copy is stored in hard-disc.
- It also helps in book selection as books mostly foreign edition is available on net including review of the content.
- The rare collection can be converted into digital medium, where in the digital copy is just like original in terms of color, clarity and visibility and the same time original can be stored safely.
- Fourth law of library science is implemented on digital libraries i.e. save the time of users as well as a library staff.

LIMITATIONS OF AGRICULTURAL DIGITAL LIBRARIES

There are some limitations of digital libraries also, which are as follows:

- Lack of screening or validation
- Lack of preservation of a fixed copy (for the record and for duplicating scientific research
- Lack of preservation of “best in class”
- Costs are spread and many become hidden
- Job loss for traditional publishers and librarians
- Difficulty in knowing and locating everything that is available, and differentiating valuable from useless information.

SERVICES OF AGRICULTURAL DIGITAL LIBRARIES

Agricultural digital library services are similar to those of traditional libraries. The difference is that, digital collections are in digital forms some services are as follow:

- The agricultural digital library is the gateway to the exciting new resources and network that comprise the global information environment.
- Agricultural digital collection and services will supplement rather than replace the traditional collection and services.

- The productions, which are in electronic form and stored in digitalized bit form, include. [6]
 - (a) Electronics mail (E-mail)
 - (b) File transfer (FTP)
 - (c) Electronic journal (E-Journal)
 - (d) Electronic new (E- News)
 - (e) Technical reports.
- The most important changes agricultural digital libraries bring may be in advancing, agricultural information learning to the learner.
- Agricultural digital libraries require digital librarians as they are required to select, acquire, organize, make accessible, and preserve digital collections, as well as plan, implement and suggest digital services.

AGRICULTURAL DIGITAL LIBRARY TYPES AND CONTENT

The Agricultural digital Library community is clearly increasing in number and volume as more and more people get connected to high speed internet connections, more people get involved in distance learning, more people get used to online communication, governments, institutions and commercial companies realize the potential in digital deliveries. Developments like these have prepared the ground for a large number of different types of Agricultural Digital Libraries throughout the world. It is difficult to classify a phenomenon with a definition still under debate but for the purpose of this short introduction, the Agricultural Digital Libraries can be grouped as under[2]:

- Agricultural Digital Libraries at scientific societies
- Agricultural Digital Libraries at Commercial publishers
- Agricultural Digital Libraries as Agricultural Universities and ICAR Institute
- Agricultural Digital Libraries at Museums and other cultural heritage organizations.

FUTURE DEVELOPMENTS

According to the most recent understanding, the ADLs of the future will be able to operate over a large variety of information object types - far wider than those maintained today in physical libraries and archives. These information objects will be composed of several multi-type and

multimedia components aggregated in an unlimited number of formats. These, for example, can mix text, tables of scientific data and images obtained by processing earth observation data, or they can integrate 3D images, annotations and videos. These new information objects will offer innovative and more powerful means to researchers for sharing and discussing the results of their work. In order to be able to support these objects, the ADL functionality has to be appropriately extended far beyond that required to manipulate the simple digital surrogates of the physical objects. In order to support these objects the ADL may need considerable resources. For example, the creation and handling of the new documents may require access to many different, large, heterogeneous information sources, the use of specialised services that process the objects stored in these sources for producing new information, and the exploitation of large processing capabilities for performing this task.[5]

ADLs are only in the beginning of long and winding road. One of several future stops on that road is called the semantic web. It is a vision trying to remedy the Babel problem of today's web by machine processable language ontologies. Ontologies provide a shared understanding of a topic of interest among humans and computers. The mere mass of agricultural information that is added every second to the Web, calls for machine process ability. How can the future semantic web help Agricultural Digital Libraries? The simple answer is that if there are some common schemes in the form of ontologies helping in naming and cataloguing digital objects this would enable interoperability. The user would think he is navigating one single Agricultural Digital Library system but in reality he would be using a multitude of distributed systems. By creating standard machine processable ontologies, ontology editors, annotation tools and inference engines that deduce new knowledge from already specified knowledge (as outlined above by Feng et al) it will be easier in the future to add semantic markup and metadata to documents making them not only richer in content but also much easier to get hold of. Content management technologies will be the big thing of the future. [5]

CONCLUSION

It's clear that agricultural digital library provide information to the readers in digital form with the help of web on readers desktop. Due to agricultural information explosion it is difficult to bring all information at one platform. Agricultural digital libraries provide an effective means to distribute data management area. Agricultural digital libraries present

benefits and limitation for all readers. Best part of agricultural digital libraries is that No physical boundaries the readers of agricultural digital library not need to go physically in the library. The agricultural digital libraries have to overcome the inhibitions and look ahead for the betterment of information service to the readers.

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HUMAN RESOURCE DEVELOPMENT AND TRAINING IN LIBRARY AND INFORMATION SCIENCE

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ABSTRACT

This paper overviews the Human Resource Development and Training in Library and information science. As the amount of available data grows in the library, the problem of managing the information and cater the information to the end user. So Library staff play key role in all library works. Now a days, there has been a considerable increase in the attention given to personnel development, training and management in libraries. Library staff training and development is a crucial element in ensuring positive user experiences within libraries. Training and development is at the heart of an organization that seeks continual growth and improvement. It is a process of learning provided to new and existing employees acquiring knowledge and technical skills and developing attitudes of behavior in order to be more effective in their jobs. However, there are still many roadblocks which prevent the release of the human potential that exists within our libraries today. But with some efforts, programs and systems in the work place, these can be diagnosed and removed. Staff development contributes greatly to effective provision of library and information services, staff training alone did not contribute to staff effectiveness. Staff development must be complemented with other human resource management strategies such as reward, promotion, job rotation, etc. In this paper Human Resource Development and Training in Library and information science.

Keywords: *Human Resource Development; Human Resource Training*

INTRODUCTION

Library professionals are still to be fully engaged in the provision of information services to organizations and society. The creation of quality filtered collection of information is more important than ever and librarians have a key role to play. The library and its staff are the focal

point and play a very important role in the automation and other library services. Staff awareness and participation before installation are crucial to the success of the new system or services. It is also equally necessary that the library staff should have computer knowledge and professional experience. A library being an information collection, organization and dissemination agency, it has implications both for the workforce, their professional education and training. Professionals engaged in the information transfer process require up-to-date knowledge and skills for which continuous education and training facilities are required. Developing skills of the information professionals depends on a mixture of formal education practical training on the job.

HUMAN RESOURCE DEVELOPMENT (HRD)

Human Resource Development is the framework for helping employees develop their personal and organizational skills, knowledge, and abilities. Human Resource Development (HRD) is qualitative change in the personality of human being so that the manpower is effectively utilized in the libraries for optimum utilization of resources and for providing better library services. Human Resource Development (HRD) is a process of raising productive potentialities of manpower resources in terms of knowledge, skills and capabilities through appropriate mechanisms such as education & training, counseling, career planning, performance or self appraisals, awards or rewards etc. among all these, education and training play a vital role in strengthening both academic and professional capabilities of human resource to meet the goals of an organization. This is also true in case of Library and information profession to develop appropriate human resources to work in different types of libraries / information and documentation centers and in different environment as well. Therefore, library and information science education is the strong motivator behind not only to improve professional knowledge and understanding different concepts but also to up skill the abilities, capabilities and competencies in a complex working environment. R. Jayagopal in his book Human Resource Development: Conceptual Analysis and Strategies defined "Human Resource Development as a process of measurement and reporting of the need value of people as organizational resource. It involves accounting for investment in people and their replacement cost, in addition to accounting for the economic value to an organization".

BENEFITS OF HRD

- (i) Human Resource Development motivates the professionals and employees and creates a favorable psychological climate and environment.
- (ii) HRD inculcates team spirit and reduces tensions between individual and professional groups.
- (iii) HRD reveals the educational or training needs of the workforce with the result, training and development programs become more effective.
- (iv) HRD brings out the best talent of employees, which contributes to the socio-economic and cultural growth and development of the country

Functions of HRD

- (a) Training and Development
- (b) Organizational Development
- (c) Career Development
- (a) Training and Development
- (a) Training and Development are meant for refining the information skills and approaches of the library professional work in different libraries.

Training

Improving the Knowledge, skills and attitudes of employees.

- (i) Employee orientation
- (ii) Skills and technical training
- (iii) Coaching
- (iv) Library Management training
- (v) Refresher course

Training

Improving the Knowledge, skills and attitudes of employees.

- (i) Employee Orientation: Employee orientation is the process of introducing employees to their new jobs and work environments.
- (ii) Skills and Technical Training: Training is teaching, or developing in oneself or others, any skills and knowledge that relate to specific useful competencies.

- (iii) **Coaching:** Coaching is a form of development in which a person called a coach supports a learner or client in achieving a specific personal or professional goal by providing training and guidance.
- (iv) **Library Management Training:** This training guide to all participant how to run different section of the library.
- (v) **Refresher Course:** A refresher course is a training course in which people improve their knowledge and learn new developments.

Development

Development: Preparing for future responsibilities, while increasing the capacity to perform at current job.

- (i) Management Training
- (ii) Supervisor development

Development

Development: Preparing for future responsibilities, while increasing the capacity to perform at current job

Management Training: Management training is training activity that focuses on improving an

- (i) Individual skills as a leader and manager
- (ii) Supervisor development
- (b) **Organizational Development:** The process of improving an organization's effectiveness and member's well being through the application of behavioral science. Both micro and macro changes are implemented to achieve organizational development.
- A. **Organizational Development:** The process of improving an organization's effectiveness and member's well being through the application of behavioral science. Both micro and macro changes are implemented to achieve organizational development.
- (c) **Career Development:** Process by which individuals progress through series of changes until they achieve their personal level of maximum achievement.
 - (i) Career Planning
 - (ii) Career Management
 - (iii) Feedback and Counseling
 - (iv) Job Rotation

- (v) Team Work
- (vi) Leadership Development.

Career Development: Process by which individuals progress through series of changes until they achieve their personal level of maximum achievement.

- (i) Career Planning: Career planning is the ongoing process where you: Explore your interests and abilities; strategically plan your career goals
- (ii) Career Management: Career management is conscious planning of one activities and engagements in the jobs one undertakes in the course of his life for better fulfilment, growth and financial stability.
- (iii) Feedback and Counseling: feedback and input from the employee count the HR has to deploy all his tactics and tools ready
- (iv) Job Rotation: Job rotation is the systematic movement of employees from one job to another within the organization to achieve various human resources objectives such as orienting new employees.
- (v) Team Work: When all staff work for common goal.
- (vi) Leadership Development

Need of HRD and training programs

- (i) Impact of Information Technology
- (ii) Demands for Specialized Services
- (iii) R & D Activities.
- (iv) Growing knowledge exploitation
- (v) Increasing number of users
- (vi) Proliferation of literature

CONCLUSION

An organization can achieve its goal, if sufficient opportunities are provided to its employees to enrich their potential by proper policies and programmes in the area of their interest. Without development and training program a professional cannot contribute to achieve organization

goal and professional enhancement. So Human Resource Development and Training program play key role in any organization.

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USE OF SOCIAL NETWORKING IN VETERINARY SCIENCE

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ABSTRACT

As a busy vet, it can be extremely challenging to develop and foster relationships with our clients in the short time we have during an appointment. Research has shown, however, that it is these relationships that create loyal clients, and that those loyal clients will want to share their experience with their own friends and family through word of mouth. So, how can we overcome this hurdle of time constraints and still connect with our clients? The answer is simple: through veterinary social media marketing. The aim of this paper is to highlight just a few of the many benefits Social Networking can have for your practice.

Keywords: *social networking, social sites, veterinary practice*

INTRODUCTION

Through social networking, people can use networks of online friends and group memberships to keep in touch with current friends, reconnect with old friends or create real-life friendships through similar interests or groups. Besides establishing important social relationships, social networking members can share their interests with other like-minded members by joining groups and forums. Some networking can also help members find a job or establish business contacts.

Why your Hospital should have a Blog

- **Client education:** If you've recently seen a number of Kennel Cough, Leptospirosis, Feline Calicivirus or Parvovirus cases, a blog post is an excellent opportunity to educate clients about prevention and treatment. Posting in-depth medical information (that you may not have time to share during an appointment), including a list of symptoms, is beneficial to your clients and can help boost vaccination compliance and the need for frequent examinations.
- **Promote your services:** If you're offering a new service or have recently purchased a new instrument (ultrasound, endoscopy) that

you are eager to show off, promoting it on your blog can get clients' and potential clients' attention. You need to explain how their pets can benefit from your new services. Clients can't utilize these services if they don't know about them.

- **Continuing education:** Your clients can recognize your commitment to their pets' health when you post continuing education conferences and courses that you and your staff members attend. List some of the interesting lectures that you have attended and a few facts about each.
- **Have fun:** Often, clients may only see you when their pet is seriously ill. Your blog can show them your lighter side share funny pet stories or anecdotes about the brighter side of veterinary medicine. Post candid shots of the hospital staff or share photos of your own pets with your clients.
- **Personal and hospital information:** Weddings, birth announcements, milestone anniversaries and the arrival of new pets add a personal touch to your relationship with your clients.
- **Increase search engine rankings:** Blogs have the added benefit of increasing your hospital website's search engine rankings. The greater your hospital's presence on the internet, the more often your website is picked up by Google, Yahoo and other search engines, making it easier for potential clients to discover your hospital

How Veterinary Hospitals can benefit from Social Networking?

My Space, Facebook, Twitter, LinkedIn – every month, it seems, there's a new social networking website on the Internet that everyone is talking about. One may even already be using some of these sites to connect with old friends and classmates. But social networking sites have many applications apart from establishing personal and professional connections. Adding your veterinary hospital to MySpace, Facebook and other social networking services is a fast, easy way to promote your veterinary practice, improve your search engine rankings and connect with clients.

Search engines increasingly are turning to social networking sites for search results, and the more relevant information you have on your MySpace, Facebook or LinkedIn account, the better your rankings. The higher your search engine ranking, the easier it is for potential clients to find your website, make appointments, and come to your veterinary hospital. Having a social networking presence makes it easier for current

clients to recommend your hospital to friends in their own social networks, further increasing potential client opportunities.

Social networking can also be used to strengthen your relationship with clients. Often, your only interaction with clients may be when a pet is seriously ill. Sharing inspiring or funny anecdotes on your blog or candid photos of the staff allows you to connect with clients and build a rapport in a less-stressful, more positive manner. Media outlets are also turning to social networking sites in search of sources for news articles. Maintaining a social networking presence keeps you on reporters' and bloggers' radar – which may result in media coverage of your practice. Because most social networking sites are free, they present an excellent method to easily and inexpensively market your practice

Branding

Your clients already know about the quality veterinary care you provide to their animals, but to really solidify your brand, you need to connect with people on a personal level. Veterinary social media marketing lets you engage with your existing clients and reach prospective clients in a way that advertising and other forms of marketing simply can't. The more time you invest in social media, the more you will be able to interact with your audience and the more likely they will be to recommend your page to their own networks. This means increased exposure for your brand, which leads to further growth of your veterinary practice.

Customer Service and Feedback

Social media platforms provide the perfect method for delivering customer service through direct interaction with your clients and prospects. It's also an excellent way to gather valuable feedback and, more importantly, address that feedback when it's not positive. Suppose a client who was dissatisfied with something that happened during a recent visit to your clinic posted a negative review online. With veterinary social media, you can respond in a positive and timely manner, satisfying the unhappy customer while also showing prospects that you care and do what's necessary to correct problems if and when they arise.

New Client Acquisition

Public forums like Facebook are powerful tools when it comes to lead generation. Veterinary practices can benefit from these social platforms by offering promotions and other specials that will both please existing clients as well as attract new ones, ultimately resulting in an overall boost in business.

Good Will

Social media has essentially broken down the barriers that busy veterinary practices once faced and provided a convenient means to connect with customers and prospects. Not only are you able to interact with people on a professional level, but you can now reach them on a more personal and emotional level as well. You can communicate directly with your followers, ask them for feedback, and provide them with valuable online resources for their pet needs. Most importantly, you can show existing clients and interested prospects that you are there for them, that you are listening, and that you truly care. These positive interactions foster good will, which is an essential part of keeping your current clients happy and attracting new ones at the same time.

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ROLE OF LIBRARY IN PERSONALITY AND SKILL DEVELOPMENT OF USERS

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ABSTRACT

The purpose of a library in human personality development is to educate the community in the widest sense. Society consists of various groups of community belonging to one or other social group, such as shopkeepers, businessmen, technicians, bureaucrats, clerks, students, educationists, teachers, engineers, doctor, intellectuals, mechanics, agriculturists, farmers, labors, etc. The interest of knowledge of these different groups of people within the society is very much varied according to their needs. Different skills must obtain information relating to the internal and external environments of Library information science and should acquire the knowledge and skills such as leadership, team building, management etc.

Keywords: *Personality development, Library profession, Human personalities, Communication skills*

INTRODUCTION

Personality development is defined as a process of developing and enhancing one's personality. Personality development helps an individual to gain confidence and high self esteem. Personality development also is said to have a positive impact on one's communication skills and the way he sees the world. Individuals tend to develop a positive attitude as a result of personality development. Allport (1980) defines personality as the dynamic organization within the individual of those psychophysical systems that determine his or her unique adjustment to the environment. Personality development is directly affected by certain excellent behavioral traits like -soft skills, verbal skills and to some extent non-verbal communications.

Libraries are especially important now when the whole idea of education is stressing more and more independent learning and acting. All citizens must be able to find and use information. It is the key raw

material - but it is a zero resource, if there are no access points to it and if documents are in chaotic order. Generally, literacy is considered to be the ability to read, write, speak, and Compute at a certain level. Functional literacy involves skills needed to cope at an adult level in everyday situations, such as reading a newspaper or a novel. Libraries add a degree of sophistication, support and richness of content, all of which will encourage creativity, quality research and participation of the citizen in the global digital world that we are living.

Library in the 21st century?

A library is a means of access to information, ideas and works of imagination.

The library experience may be the key to understanding your place in the world, the pleasure of a children's story, advice on securing a safe water supply, or the record of the healing wisdom of an elder.

The publicly-funded library is one of the most democratic of institutions, serving the needs of the community it serves. As a public space it helps define a sense of that community, providing a safe meeting point. At different points in their lives, people see libraries as a:

- ❖ place of wide-eyed discovery
- ❖ tool for life-long learning
- ❖ support for political and social enquiry
- ❖ Lots of ideas and inspiration
- ❖ source of answers to factual questions
- ❖ place to acquire new skills
- ❖ community centre
- ❖ local studies resource
- ❖ a place of sheer pleasure and enjoyment.

Services to be provided by the Libraries

National libraries, for example, usually are required to collect and preserve the national publishing output of the country it serves, making sure that it is available not only for current users, but also for future generations.

Public libraries typically provide services free of charge to anyone who wishes to use them, although lending is often restricted to residents of the locality. Many provide literacy programmed reader development

promotions and act as an information point for the availability of local/public services.

The importance of libraries

Over the past few years we have witnessed severe cuts in library service budgets resulting in the reduction of services, most notably by closures, shorter opening hours, staff cuts and the replacement of library staff with typically unsustainable and fragmented volunteer-run services. Cuts are often made in the name of austerity measures, yet in austere times libraries are of particular importance to the disadvantaged in our communities.

For many people the word “library” conjures up images of books and not much more. Although books remain a core feature and are beneficial in many more ways than commonly understood, libraries have a much wider and more significant reach than books alone. There are some skills developed by library in human personality:

- 1. Technical Skill:** It is the ability to work with resources in a particular area of expertise. A surgeon must know how to do surgery. An accountant must know how to keep the accounts. Without the technical skill, one is not able to manage the work effectively. The first line supervisor in a manufacturing industry needs greater knowledge about the technical aspects of the job compared to the top boss. In a small manufacturing organization, even the top boss who owns the company needs to know a lot of technical skills. In a relatively small organization, where you yourself are the owner and at the top management level, you need a lot of technical skill yourself.
- 2. Human Skill:** If you have highly developed human skills and if you are aware of your own attitudes, assumptions, and beliefs about other individuals and groups, you are able to see their usefulness and limitations. And you are likely to accept others’ viewpoint, perceptions and beliefs, which might be different from yours. Human skills can be developed without any formalized training for some. Many others are to be individually aided by their immediate superiors who themselves should possess the human skill in order to be able to impart the skill.
- 3. Conceptual Skill:** Conceptual skill means the ability to see the organization as a whole and it includes recognizing how the various functions of the organization depend on one another. It also makes the individual aware how changes in any one part of the

organization affect all the others. It extends to visualizing the relationship of the individual business to the industry, the community and the political, social and economic forces of the nation as a whole.

4. **Presentation Skills:** First; they need to be motivated and inspired to undertaking the tasks which you are presenting. Project leaders from other sections need to be persuaded of the merits of your project and to provide any necessary support. Second; it allows you to ask questions and to initiate discussion. Finally, presentations can be fun. They are your chance to speak your mind, to strut your stuff and to tell the people what the world is really like. While you hold the stage, the audience is bound by good manners to sit still and watch the performance.
5. **Communication Skills:** Communication has a great importance in providing better services to users. He communicates the value of library service to decision makers, staff and users. When he provides information to the user he must communicate clearly and respectfully with customers and colleagues. Always Demonstrates active listening skills with customers and colleagues in his workplace. Communication is not only must be effective with users only but must have ability to as with all effective communication, you should decide (in advance) on the purpose of the conversation and the plan for achieving it.
6. **Time Management Skills:** Time management is one of those skills no one teaches you in school but you have to learn. It doesn't matter how smart you are if you can't organize information well enough to take it in. And it doesn't matter how skilled you are if procrastination keeps you from getting your work done. The time management is very effective for supervisory positions.
7. **Leadership Skills:** Leading people requires that the leader must understand the values, personality, perception and attitudes of the people. As an individual you act differently from another individual because of your values, personality, perception and attitudes. This is a very important factor to be understood in relation to the other person who may be your superior or subordinate. There are some activities in to understand each of these factors Value, Personality, Attitude etc.
8. **Planning Skills:** As part of the management process you attempt to define the future state of your organization. You are not trying to predict the future, but rather to uncover things in the present to

ensure that the organization does have a future. Hence planning skills will include:

- Being able to think ahead,
- Ability to forecast future environmental trends affecting the organization,
- Ability to state organization objectives,
- Ability to choose strategies that will help in attaining these objectives with respect to future trends, and managers are expected to acquire skills to interact with intermediate planning systems such as using a computer.

9. **Organization Skills:** As you have seen, planning specifies the future course of direction of an organization. The organizing process follows the planning process. While planning specifies what will be achieved *when*, organizing specifies who will achieve what and how it will be achieved.
10. **Controlling Skills:** The skill of controlling consists of actions and decisions which managers undertake to ensure that the actual results are consistent with desired results. In planning for the organization the management sets the objectives, which are the desired results for the organization to attain. Any deviation between the actual and the planned results must be corrected by the management by taking appropriate actions and decisions.
11. **Decision-Making Skills:** Decision-making skills are present in the planning process. They pervade all other areas such as organizing, leading and controlling. Think for yourself at the level you are, and whether you take a good or a bad decision, it will ultimately influence in a big or a small way your performance.
 - Acknowledge that libraries provide crucial services, particularly to individuals and communities experiencing hardship.
 - Give a commitment to engage with communities to design services that meet their needs and aspirations.
 - Ensure library services are properly resourced and staffed.
 - A commitment to a service that is publicly funded, managed and run by paid professional staff.
 - Recognize that properly funded library services contribute to the health and well-being of communities and complement (but should not replace) the work of other public services.

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ROLE OF SOCIAL NETWORKING FOR THE DISSEMINATION OF INFORMATION IN AGRICULTURAL LIBRARIES

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ABSTRACT

This paper discusses the role of Social Networking in Agricultural Libraries for the betterment of providing the library services to their users. As we know the main objective of library is to fulfill all the demand as well as requirement of the patrons. Today social networking performs vital and important role in providing library services very quickly and in a short span of time. Social networking service is an online service, or website that focuses on building and reflecting social relations among people. The people connected through networks. Most of the social networking services are web-based and let people connected over the internet such as e-mail, messenger and many more. Social Networking in libraries connects easily LIS professionals to one another and share information quickly related to their field. Popular social networking site are now taking more participation in libraries for the purpose of resource sharing and also to establish healthy relations among people.

Keywords: *Social Networking, Social Networking Sites, Benefits of Social networking in libraries, goals of Social Networking.*

INTRODUCTION

Social Networking is where people develop networks of friends and associates. It forges and creates links between different people. A social network can form a key element of collaborating and networking. Libraries get modernize using social networking. Social networking helps in aiding libraries Librarian has to be updated so that he provides his service nicely to patrons. And for that he must know how to use various applications. Social networking makes people updated in their relative field as well as in other fields also.

What is Social Networking?

Social Networking is a composition is a composition of individuals or organizations, which are attached with one or more individuals such as friends, neighborhood, and small communities. Social Networking is the use of internet based social media programs to make connections with friends, family, customers and clients. It is defined as chain of individuals and their personal connections.

Why social networking in Libraries?

1. Socializing
2. Exchanging information & views
3. Create Blogs
4. Time Utility
5. Lower cost
6. Taking advices
7. Build Credibility
8. Discussions
9. Instant Messaging
10. Marketing of Library Services

Goals of social networking

1. Build community
2. Promote Library services
3. Promote Library holding
4. Promote Library Events
5. Communication with Patrons
6. Gather and Track Valuable Feedback
7. Provide Recommended Resources

Features of Social Networking

1. Messaging
2. Build profile
3. News
4. Communities
5. Like Buttons
6. Gaming

7. Upload audio video contents
8. Create pages

Benefits of Social Networking Sites to Libraries

1. Social Networking sites will facilitates collaborations and promote effective communication between Librarians and their patrons.
2. It will generate flow of information excluded from search engines and library catalogues.
3. It will help librarians and libraries to keep pace with technologies and compete effectively.
4. The crucial aim of librarians is to make library resources available to patrons. Social networking sites will help to achieve this goal easily.

CONCLUSION

Nowadays Social Networking is very useful for the agricultural libraries so that they can easily get linked with other libraries. Adopting social networking in libraries it brings visibility to the library, its collection, and enhances its services and their reach; along with these benefits it also brings responsibilities too. These services demand commitment, aware of current technologies trends, regular monitoring, and marketing of the service and product. Social networking makes services easily reaches to patrons in less span of time.

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REACHING TO THE UNREACHED FARMERS THROUGH INDIGENOUS TRADITIONAL KNOWLEDGE MANAGEMENT & E-PUBLISHING

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ABSTRACT

This paper provides an overview of unreached farmers, Information Needs by Farmer, Source of Information used by Farmers, Problems faced by farmers in Information Access. Electronic publishing (also referred to as E-Publishing or digital publishing) includes the digital publication of e-books, databases, EPUBs, and electronic articles, and the development of digital libraries and catalogues. The Paper focus on Farmers suicide which is very complex phenomenon, and also explain the role of Agricultural Library and Librarian in e – publishing & Documentation & Knowledge Management in Agriculture OF ITK and concluded that how Library & Librarian a suggestive and curative method knowledge management can be a useful way to integrate all the knowledge for the community.

Keywords: *Farmers, Indigenous Traditional Knowledge Management & E-Publishing, Information Needs, Information literacy.*

INTRODUCTION

The problem of farmer's suicides, also known as the Agrarian crisis is the rampant phenomenon of suicides among Indian farmers from 1990 to the present. It has been exacerbated by the inability to repay growing debt often taken from local moneylenders and microcredit banks to pay for high priced high yield seeds marketed by MNCS and the non-implementation of minimum support prices (MSP) by State governments. During the duration from 1998 to 2018, it has resulted in the suicides of 300,000 farmers in the country, often by drinking pesticides themselves.

Indian government has not published data on farmer suicides since 2015. National Crime Records Bureau director Ish Kumar said that the data is under scrutiny and the report for 2016 is likely to be published later. As of 2017, farmer suicides have occurred in large numbers

in Maharashtra, Andhra Pradesh, Telangana, Tamilnadu, Karnataka, Madhya Pradesh, Bihar, Uttar Pradesh, Chhattisgarh, Orissa & Jharkhand. Various reasons have been offered to explain why farmers commit suicide in India, including: floods, drought, debt, use of genetically modified seed, public health, use of lower quantity pesticides due to less investments producing a decreased yield. Therefore, to bring down the suicides among farming community, some preventive measures should be taken viz. crop insurance, extension services, agriculture credit, contract farming etc. These services need to be strengthened.

We Librarians divide Farmers into two categories: Reached & Unreached. Reached Farmers have the chance to know the information needs, collect the information and use the information. They get “information” in their family, community and village and whole society. They may not have heard but, if they search, it is not hard for them to find the information. Unreached farmers are carrying out their farming with insufficient knowledge. Being a diverse ecological and socially background country.

Unreached farmers are carrying out their farming with indigenous knowledge. Being a diverse ecological and socially background country, India is lagging behind the developed countries in agriculture sectors. To manage all the knowledge available in public, as well as private domain, it needs to integrate and make it accessible to all the stakeholders of agriculture, especially farmers. As a suggestive and curative method knowledge management can be a useful way to integrate all the knowledge. Knowledge management is basically about acquiring and storing knowledge and providing better access of right knowledge to the right person at the right time. In current changing scenario knowledge viewed as important input for agriculture which should be localized, context and content based.

Information has become the most important element for progress in society. According to Kemp “information has been described as the fifth need of man ranking after air, water, food and shelter”. Everyone needs information about everything even in his day today life. In agriculture environment, relevant and timely information helps farmer’s community to take right decision to sustained growth of agriculture activity. Use of information in agriculture sector is enhancing farming productivity in a number of ways. Providing information on weather trends, best practice in farming, timely access to market information helps farmer make correct decisions about what crops to plants and where to sell their product and buy inputs.

Findings revealed that farmers need various types of information related to agricultural activities, and also they use diverse information sources for accessing of such information. Several farmers affirmed that they are not well acquainted with modern techniques of agriculture as a result, they rarely use such techniques. Because of many new challenges and factors, they are not satisfied with agricultural information, and in several cases their satisfaction level is very low. It is recommended that there must be proper solution for which farmers faces many problems

Information Needs by Farmer

As far as information needs of Farmers is concerned, majority of the farmers majority (40.58%) of the farmers need daily information, while (47.43%) farmers need information sometimes. Only 0.12 % farmers are stated that they do not need information for agriculture activities.

As for the distribution of respondents with respect of information need is concerned, majority (40.58%) of the farmers need daily information, while(47.43%) farmers need information sometimes. Only 0.12 % farmers are stated that they do not need information for agriculture activities, as per the study of Rural Farmers done in Maharashtra reported in 2012 by Nitin Bhagachand Bachhav. Farmers need variety of information such as-

- New crop production
- Seeds availability
- Insecticide availability
- Water Management
- Fertilizer availability
- Weather Information
- New Agriculture equipment's
- Market information of Agricultural production
- Bank Credit Information
- Transport Facilities
- Government Scheme
- Animal Husbandry
- Crop Insurance
- Irrigation
- Medicinal Plants
- Medicinal Plants

Source of Information used by Farmers-

- Agricultural Exhibition
- Agricultural Information Centre
- Community Information Centre
- Cooperative Banks
- Government Office
- Human source of Information available in family and their in particular community eg. Teachers, Community Leaders etc.
- Leaflet/Brochure/Poster etc.
- Newspaper
- Other farmers or colleague
- Library (Books, Journals, Magazines etc.)
- Radio
- T.V.
- With the help of local people in village &

We can observe that Internet & Mobile Phones is the most powerful & main media for “Communication & other purpose” available at the source of farmers. It is good sign that most of the farmers of the rural area are now use or familiar with the mobile device.

Problems faced by farmers in Information Access

- Agricultural information on radio and TV is always aired at odd hours
- High rate of illiteracy
- Inability to access formal Channel of information
- Inadequate contact to extension agent
- Lack of guidance in using Internet & Mobile literacy
- Lack of personal interest and special knowledge
- Low level of Income
- Shortage of power

A. Reaching through--Documentation & Knowledge Management in Agriculture OF ITK (Indigenous Traditional Knowledge): Indian agriculture has immense scope in sustaining the livelihood of millions of farmers. Being a diverse ecological and socially background country. India is lagging behind the developed countries in

agriculture sectors. To manage all the knowledge available in public, as well as private domain, it needs to integrate and make it accessible to all the stakeholders of agriculture, especially farmers. As a suggestive and curative method, knowledge management can be a useful way to integrate all the knowledge. Knowledge management is basically about acquiring and storing knowledge and providing better access of right knowledge to the right person at the right time. In current changing scenario knowledge viewed as important input for agriculture which should be localized, context and content based. The origin of indigenous knowledge can be traced back to the ancient period. People used such knowledge from generation to generation for their livelihood in an unaccounted manner. There are no written documents for recording and dissemination of such knowledge. It found that such knowledge system is essential for development. It must be gathered and documented for a particular community.

The traditional knowledge is vital for the well-being and for sustainable development as it has evolved after thousands of years of observation and experience. By linking the indigenous knowledge systems of the people with farmer, research and extension, the output of researches can be made more fertile and usable. ITK (Indigenous Traditional Knowledge) is a valuable asset to indigenous and local rural communities who depend on ITK for their livelihood as well as to manage and exploit their local ecosystem in sustainable manner. However, there is still a long distance to cover in scientific validation of Indigenous Agricultural knowledge. Farmers have wealth of knowledge, which eventually do not extinct but transfer from generation to generation on its own strength and influence. It is very important to concretize this experience into a system. Identifying, documenting and incorporating ITK in agricultural extension organization are essential to achieve agricultural development. ITK system provides a frame of reference for strengthening agricultural extension programmes. The participatory technologies that are developed through ITK integration will provide diversified technological options. Indigenous Traditional Knowledge being low in cost will also benefit national economy besides sustainable agricultural development. Documentation has great practical utility in almost every activity of human life such as health, animal health, livestock management, food, agriculture, timber, dye, religious ceremonies etc. It provides useful clue in planning projects for conservation of biological diversity, sustainable uses of natural resources, indigenous health practices etc. It increases awareness

among younger generation to revive and restore pride among the farmers themselves. It is commented that the collection and storage of indigenous knowledge should be supplemented with adequate dissemination and exchange among interested parties using newsletter, journals and other media.

Methods and Techniques of ITK:

Agro-ecosystem analysis; (a) Mapping (historical, social etc),
(b) Transect walk

Analysis of journals and newspapers:

Continuous interactions during on-farm

Decision tree analysis

Documentation of oral histories experiments

In-depth interview of farmers

Manual discriminative analysis

SWOT analysis

Use of local resource persons

B. Reaching through E –publishing: Government has taken initiative for preventing farmer's suicide but efforts made by them are little compared to intensity of issue. Consequently, the issue of farmers suicide have become more serious day by day in Maharashtra & in India. Many educationalists, economists, philosophers, policy workers, social workers suggested different ways to solve the problem, but cannot solve the problem of farmers. But "Information and digital literacy", is one of basic structural change is essential to increase confidence among the farmers community in India. These can be possible only through Reaching out to unreached farmers & Strengthening reached farmers, through the re-engineering of Agricultural libraries and emerging technologies & active role of librarian.

Different trends of E-publishing:

- E-books--is electronic versions of books, which are delivered to readers in digital formats. There are a large number of devices being developed to make reading e-books easier for readers. Special software, which makes documents or pages of a book easier to read on a screen, is also being developed by software companies.

- Electronic Databases--Due to the advancement in technologies, agricultural university libraries moved from traditional to digital environment. To meet the ever-increasing demands of users, agricultural libraries are now subscribing a large number of e-databases. The adequate computer literacy in using the existing databases has become the need of the hour. E-databases such as “AGRIS, AGRICOLA, CAB abstract, and Agriculture & Natural resources” were highly recommended for farmers.
- Electronic journals-- also known as e journals, e-journals, and electronic serials, are scholarly journals or intellectual magazines that can be accessed via electronic transmission. Being in electronic form, articles sometimes contain metadata that can be entered into specialized databases, such as DOAJ or OACI, as well as the databases and search-engines for the academic discipline concerned. An increasing number of journals are now available as online open access journals, requiring no subscription and offering free full-text articles and reviews to all. Individual articles from electronic journals will also be found online for free in an ad-hoc manner: in working paper archives; on personal homepages; and in the collections held in institutional repositories and subject repositories.
- Digital Content-- generally refers to the electronic delivery of fiction which is shorter than book-length, nonfiction, documents and other written works of shorter length. Publishers of digital content deliver shorter sized works to the reader via download to handheld and other wireless devices. Technology used for delivering digital content includes Adobe PDF, XML, HTML, WAP (Wireless Application Protocol) and other technologies. The security of the data being delivered is the major concern of publishers
- Electronic Ink--is a developing technology that could have a huge impact on the media and publishing industries. Electronic Ink could be used to create a newspaper or book that updates itself. The technology could also be used on billboards, clothing, walls and homes to allow content to appear. In addition, this content could be programmed to change at any time. For example, you could have a billboard that rotates different ads, or you could receive a coupon in the mail that is frequently updated with the latest offer. For media companies,

the possibilities are almost endless. Someday your electronic newspaper will simply update itself every day. E Ink Corporation, a new company with major investors, and Xerox are two companies currently developing this technology.

- Email publishing, or newsletter publishing-- is a popular choice among readers who enjoy the ease of receiving news items, articles and short newsletters in their email box. The ease of delivery and production of email newsletters has led to the development of a massive number of available email newsletters, mailing lists and discussion lists on a large variety of topics many authors and writers publish their own newsletters in order to attract new readers and to inform their fans about new books and book signings.
- Web publishing-- is not a novel practice any longer, but it continues to change and develop with the introduction of new programming languages. HTML is still the most widely used web programming language, but XML is also making headway. Nearly every company in the World has some type of website, and most media companies provide a large amount of web-based content. Staying informed Keeping up with the e-publishing world requires a constant watch of news headlines and frequent visits to your favorite websites

Benefits of e-Publishing for Librarian of Agricultural Library

- Promotion of Library Content- Librarian can ensure their users and staff, not to miss out on the digital content available to them. Various Publishers promotional tools can, support library and spread the word throughout their library: Books, Journals, Agricultural Databases, Platforms, Posters, promotion of trial, and user guides.
- Become an expert-Librarian can Gain-in-depth knowledge. Librarian can visit or schedule a training session for one of e-product or platforms. Librarian can stay up-to-date by meet the expert, Tutorials & Training sessions,
- Librarian Portal-Some publications develops Librarian Portal in order to provide administrators with a simple solution for managing users, accessing title lists and monitoring usage statistics.
- Staying up-to-date-There are several ways to stay updated and keep in touch with publishers and on the latest topics in the

agriculture.. Here librarian can find news, updates and upcoming events that we attend and host, over the web and in person.

- Meet with Publisher: Librarian can See their whereabouts and register their interest with in-person events, conferences and regional meetings. Publisher attends key librarian conferences around the globe and would love to talk to them. Librarian can also find out what special events and workshops they are hosting on their dedicated regional pages.
- Attend a webinar-Explore our series of live, educational, online talks designed for librarians and information managers. Librarian can free to attend & expect to gain insight into emerging new information technologies and some of the most pressing issues in the agricultural industry today.

CONCLUSION

We have tried to put look at the potential of information in affecting the agricultural sector as a whole. The study has reported that, there is growing awareness & importance of information and its use among the farming community. Farmers must be able to get information delivered to them at a time and place of their choosing and it will be beneficial to farmer's to realize productivity gains from the adoption of new farming practices and actions to mitigate crop losses. K Sarada has rightly emphasized that there is need of the hour to set up the Community Information Centres (CIS) as nodal point for all information services for the benefit of society.

It can be concluded that traditional knowledge is vital for the well-being and for sustainable development, as it has evolved after thousands of years of observation and experience. By linking the indigenous knowledge systems of the people with farmer, research and extension, the output of researches can be made more fertile and usable. ITK is a valuable asset to indigenous and local rural communities who depend on ITK for their livelihood as well as to manage and exploit their local ecosystem in sustainable manner. Farmers have wealth of knowledge, which eventually do not extinct but transfer from generation to generation on its own strength and influence. It is very important to concretize this experience into a system. Identifying, documenting and incorporating ITK in agricultural extension organization are essential to achieve agricultural development. Indigenous Traditional Knowledge being low

in cost will also benefit national economy besides sustainable agricultural development.

The problem cannot solve through economic package alone what is needed in social and spiritual interventions so that farmer realise that suicide is not the way out they should understand that they need to develop self-confidence. The future generation should have the mental strength to face life challenges Mobile phones can act as catalyst to improving farm productivity and rural incomes, the quality of information, timeliness of information and trustworthiness of information are the three important aspects that have to be delivered to the farmers to meet their needs and expectations. We feel that counselling and education in the form of information literacy along with digital literacy would immensely help farmers overcome this shocking, difficult and complex situation.

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A PERSPECTIVE STUDY OF CLOUD COMPUTING IN AGRICULTURAL LIBRARY SERVICES

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ABSTRACT

Information and Communication Technology (ICT) has forced the libraries to change in its functioning and processing of the information. Libraries have witnessed automation, digital library, open source management, institutional repositories and so on due to advancements in technologies. At present, libraries are moving in advanced level called cloud computing. In cloud computing, the libraries need not have the software, operating system and applications in the premises, which will be available with the service providers. Through this technology, the users can access the information from any part of the world, and helps to save the money, time and resources. The future librarians can provide the services effectively without bothering about the technical problems of software, hardware. In this context, an attempt is made to study about cloud computing, origin, different types, its impact in libraries, advantages and disadvantages.

Keywords: *Cloud Computing; Library Services; Information and Communication Technologies; Library automation; Database Storage; Resource Sharing.*

1. INTRODUCTION

In the recent past, advances in Web technology on the Internet have generated immense data and managing these data with the existing database management tools designed in the recent past were different than the today's environment. Changes in the technologies have brought a sea change in the library functioning and processing of information. Continuous changes in the information management have forced the libraries to accept the technological advancements and satisfy the information needs of the users' in many ways¹. In the present digital environment, every library has electronic information. Libraries also have printed form of books and user records. If the library data is available in single place, it will help the group of libraries to access the data in one

place. This kind of cooperation among the libraries will increase the efficiency of libraries. Sharing of data will increase efficiency and overall cost for sharing the resources. The digitization and integrating the data by eliminating the duplicate data becomes cloud.

Cloud computing will be the one stop solution to share the information virtually emerged as on- demand computing tool for network access in the form of shared computing concept. Now-a-days, cloud computing is the key term is being used in the world of Information Technology and it is the new kind of computing where the virtual resources are shared among the users². Through the cloud computing, it is possible to share the network, servers, software, applications, storage, and services. The user need not buy all the software, hardware, applications, networks and so on and need not depend on the traditional library. Instead, they can log in to the system and get only required services, for which only they have to pay. In this method, the users will pay for what they have used i.e. pay-per-use model.

Cloud computing helps the academic libraries to save the money, time and resources without having the software, OS, hardware in the library premises, which are must to access the information at present. The future libraries may be in the cloud so that libraries can focus directly for materials and services if the libraries hardware and software are directly controlled by the cloud computing. In this study, the authors have made an attempt to study about the cloud computing, its origin, types, its application in libraries and features.

2. WHAT IS CLOUD COMPUTING?

According to Mladen A. Vouk, “Cloud Computing is a service oriented architecture, reduced information technology overhead for the end user, greater flexibility, reduced total cost of ownership, on demand services and many other thing ³”

Michael Armbrust (et.al) defined ‘cloud computing refers to both the applications delivered as services over the Internet and the hardware and systems software in the data centres that provide those services ⁴.

2.1 Origins of Cloud Computing

The present state of cloud computing starts with emergence of Internet. The implementation of Virtual Machine came in 1970s, when IBM released VM, allowed distinct computers processing with same environment. In this method, each user will have computer with

processor, memory and other peripherals, but others will share majority of the resources. Tele-communication network enabled to start ARPANET (Advanced Research Projects Agency Network), which is the forerunner for the today's Internet. In 1971, first e-Mail was sent. In 1971, CompuServe and Source both went online showing that commercial service providers can also host Internet. 1993, Mosaic, a graphical-based browser emerged and soon after netscape, which was used and anaged by average users. During 2000, Salesforge.com is the pioneer in delivering enterprise-class applications over a web site. In 2002, Amazon web services gave option to users to access, store and solution through Internet and in 2006, they went even elastic compute cloud (EC2), in which developers may rent space for running their applications. In 2009, Google and Microsoft delivered applications to common users and business companies in the form of simple services⁵. IBM and Soft Layer were the leading in the cloud-based services.

2.2 Types of Cloud Computing

Cloud is not a technology, whereas it is process of utilising the powers of servers in the virtual environment.

Public Cloud

From the name itself, it is identified that public cloud is meant for public. Through this computing, the resources such as hardware, software, and services are provided to the public by third party on payment basis. Data access through this clod is safe and free e-Mail service is the best example for public cloud. When the Internet started, e-Mail services, which is nothing but cloud is knowingly or unknowingly started using public cloud.

Private Cloud

In private cloud, cloud service will not be available to the general public and it is meant for the private i.e. internal data centres.

Community Cloud

Community cloud is meant for specific group of people or organizations. Through this method, several community or organization will join together and establish cloud service. In this method, one of the organizations may hoist cloud infrastructure and infrastructure will be shared among the users or organizations.

Hybrid Cloud

In hybrid cloud, more than one cloud bound together. Hybrid cloud is more useful, which provides more facilities and flexibilities for optimum use of the resources and accomplishing the tasks.

Purpose of Cloud Computing in Libraries

Research in cloud computing has devoted much of time to study the issues and problems and technologies are witnessing sea changes because of the emergences of cloud computing. It is a package of computing services and applications on the web. Cloud computing is the alternative to the traditional computing and in cloud computing, hardware, software and operating systems are rented through Internet. Unlimited number of web-based applications are offered through cloud computing as a concept of pay for use like paying the payment for what we spoke on postpaid telephone. In the cloud computing, the user need not bother about infrastructure, installation, maintenance, security and so on, which are looked after by the cloud service provider⁶.

Libraries are witnessing tremendous changes from the very beginning of traditional form. In the beginning, libraries have used floppy disks followed by CD-ROMs (Compact Disk –Read Only Memory) to procure or to provide information service to the users. Now the trend is changed with storage of information on Internet, Digital Library, Library Consortia, Institutional Repositories, etc. Most of the people in near future may not work with their PC-based computers, instead, they will work with web-based online environment, where all the software will be loaded in the domain. People will be free from installing software, purchasing of hardware and services. Now, the latest stage in which libraries rely is on cloud computing, which is latest developments and provides more benefits to the libraries. Through the cloud, libraries can be connected for sharing of information, which is easier. In this computing, the library can pay for what it has used. Since the libraries are moving towards paperless society, librarians have to depend on cloud based computing services, where spending huge amount for hardware, software, networks and services can be minimized. It is also predicted that with short period of time, most of the libraries in India have a chance to join in the cloud computing, there by all the collections, services and systems will be available through cloud. Fig. is an example of cloud computing in libraries.



Fig 1. Cloud computing in Libraries

(Source: Google Images, <https://www.google.co.in/imghp?hl=en&tab=wi&ei=-zkQVNyKGoi9uATH0oHYCQ&ved=0CAQQqi4oAg>)

3. TYPES OF CLOUD SERVICES FOR LIBRARIES

3.1 Infrastructure as Service

In this method, the service providers will provide the hardware components to the libraries. Servers with available capacity, communication technology and OS for utilising the services will be provided by the vendor and it is the library's part to enter the service level agreement with the third party for hardware requirements. In this way, the libraries need not worry about the capacity of server, platforms, and communication technologies to be purchased for providing the service. The company what the libraries has used will charge the cost. The librarians job is just uploading the information over the web from any part of the world, and can access the information. In India, companies such as Infosys, Bangalore, TCS, and Wipro are some of the companies providing infrastructure as service.

3.2 Platform as Service

In this method, the service provider will give software and programming languages to the users. For instance, .NET, JAVA, UNIX environment will be provided by the vendor. In libraries, operating system required for library operations will be provided by the vendor is a platform as a

service. Some of the service providers are Windows Azure, Google AppEngine.

3.3 Software as Service

Software as service is another service, which will be extended by the vendor on demand. The librarians need not worry about the installation and maintenance of the software, which is major issues for most of the librarians to use the new software. In this method, the librarians can work with software from any part of the world if they have Internet connection.

4. CURRENT TREND OF CLOUD COMPUTING IN LIBRARIES

Cloud computing is emerging field in the IT, which is advanced level of distributed computing, grid computing, and distributed databases. In this digital environment, many libraries are sharing the databases with OCLC. In the library, storing of the data is the major task, which needs data server, technology, data backup, maintenance and technical manpower to look after all the network related activities. Moving towards cloud is, the database will be taken over by the cloud company so that the database will be physically available with the cloud company and it is the duty of the librarians to provide service only⁷.

Most of the software and hardware vendor companies such as Microsoft, Google, Wipro, Infosys, and TCS have already entered in to cloud computing. Whereas libraries are service, oriented centres have the major role in procuring the information, organizing and disseminating the same to the users in the right time.

Cloud computing in libraries is at the initial stage and it is predicted that within short period, all the library collection, services, will be through cloud. Libraries are very much interested to provide cloud based computing services to the users, but in the real sense, initial budget, identifying the good service companies and technical skill of the library professional in use of advanced technology were the constraints for any library. OCLC is one of the best example for cloud computing, which has come into force long back itself for sharing libraries data. WorldCat is the OCLC's large database is available through web. OCLC is also providing number of library administration services such as acquisition, cataloguing, circulation and other library activities. Web share management system, provides collaborative platform, through which the libraries can share their resources, services and problems with the library community through clouds.

But, it is real that some of the services like digital libraries, open sources, library websites, usage of web 2.0, social networks already running in a successful mode. Some of the services like Dura cloud for developing digital libraries/institutional repositories OCLC, Google are also in the cloud computing service. In the present day, many of the commercial and open source organizations have started clubbing the cloud along with their services, but application of cloud is not fully accepted in Indian libraries⁸.

4.1 Advantages of Cloud Computing in Library Services

Following are the advantages of using cloud computing

1. Service oriented architecture: the cloud is provided which has access to resources, software, networks, and applications through web, which is controlled by remotely located data centres.
2. Pay per use model: it works on demand. We can demand the service for certain period like for few days or few weeks
3. Cost effective: The resources, services, software etc. are shared by group of institutions by cutting down the individual institutes cost. Comparing to the traditional method of computing, cloud computing billing may be comparatively less
4. Portability: since the service is available over the web, the service can be availed through browser from any part of the world.
5. Eco-friendly: since it is pay for use model, consumption of electricity will be minimum. Hence, it helps green computing
6. 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 this computing, the storage capacity can be adjusted according to the needs of the institute, since the storage is controlled by the service provider
7. Flexible and Innovative: new technologies will be informed as and when available with the service provider and the service utilized will be more flexible when comparing with the traditional computing
8. Cloud OPAC: Most of the institutes in the world are having the catalogue over the web. These catalogues are available with their institutes local server made it available over the web. If the catalogue of the institutes made it available through cloud, it will be more benefit to the users to find out the availability of materials.

9. When the data comes to cloud, the data becomes cloud, which can be shared among the users. The need for storage in local server, installation, maintenance and backup is removed so that the librarians can concentrate on innovative services⁹.

5.2 Limitations of Cloud Computing in Library Services

Any technology will have its own limitations. Below mentioned are some of the limitations in Cloud Computing.

- Moving to the trusted cloud computing service will become a challenging task.
- Security: Library deals with information and has large volume of information. In order to have cloud computing the data has to be uploaded to the cloud machine. Hence, there should be strict service level agreement before entering into the process.
- Reliability: reliability is the big question in cloud computing. Once entered in to cloud computing, if the companies satisfy as per the service agreements, it will be good. Otherwise, there is a chance of having discomfort.
- Data backup, intellectual property rights are the other problems, which has to be taken care before.

CONCLUSION

The Indian Council of Agricultural Research and University Grant Commission in principle accepted the fact that the development in the field of educational institutions and agricultural institutions is possible only by creating the infrastructure for imparting education in the field supported with adequate library and information service facilities. Therefore, it is need of the hour to adopt various tools and techniques of information communication technology to make the library and information services user-friendly to meet the changing information needs and information seeking behavior of the users. It is also important to know the IT competencies of the library professionals who are working in these libraries.

Though Cloud computing is one of the emerging topics, its implications in libraries is at the initial stage. However, it is going to occupy the libraries within short period since it has more benefits than the traditional computing. Cloud computing in libraries will help the librarians to work ore on information services because in cloud-based services, librarians have no role on installation, maintenance, problems

and upgrading. Though the cloud service has much more flexibilities, there are some issues such as security, legal issues, privacy and trustworthy of the company to be resolved before moving to the cloud service. Therefore, it is the time to the librarians to understand more about cloud services and issues to cope up with the new technology.

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APPLICATION OF RFID TECHNOLOGY FOR UPGRADING LIBRARIES OF NARES SYSTEM

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ABSTRACT

Information Technology (IT) has influenced all spheres of modern library activities from simple to high level research and development work. As we are well aware of both the sustained demand for traditional library resources and facilities, and the necessity for the modern library to evolve with new technologies to accommodate changing user needs. The current technologies allow us to access a broader range of information and resources than ever before, and libraries must keep up in order to provide the best service possible. RFID (Radio Frequency Identification) is the latest technology to be used in library theft detection systems. Unlike EM (Electro-Mechanical) and RF (Radio Frequency) systems, which have been used in libraries for decades, RFID-based systems move beyond security to become tracking systems that combine security with more efficient tracking of materials throughout the library, including easier and faster charge and discharge, inventorying, and materials handling.

Keywords: RFID, Library Security System.

INTRODUCTION

Indian Digital Ensemble of Agricultural Libraries (IDEAL) is a platform of Indian Agricultural Libraries for Agricultural Libraries of Indian National Agricultural Research & Education System (NARES) which enables them to adopt Integrated Library Management System for their day to day operations of all their library functionality. It is a software platform built on 'Software as a Service' (SaaS) concept to provide hassle free, ready to use, international standards based platform for sharing library holdings through a union catalogue (AgriCat). Indian Council of Agricultural Research, New Delhi (ICAR) has made mandatory to implementation of KOHA open source software is mandatory among all State Agricultural Universities (SAUs) to install for library automation. KOHA has comprehensive features including basics and advanced and it is being used worldwide. However, in this direction council is very much

particular about to implement automation among all SAU's in India, and also planning to support under library strengthening grants to those libraries which are under a common platform of KOHA. It may be noted that, the council also providing financial support to all SAU's headquarter libraries for implementation of RFID technology for safeguarding of library materials and implementation of library management system only so that all libraries may be linked with single window to share their resources.

WHAT IS RFID?

Radio- Frequency Identification (RFID) is the use of radio waves to read and capture information stored on tag attached on an object. A tag can be read from up to several feet away and does not need to be within direct line-of- sight of the reader to be tracked. The RFID device serves the same purpose as a bar code or a magnetic strip on the back of a credit card or ATM card; it provides a unique identifier for that object. And, just as a bar code or magnetic strip must be scanned to get the information, the RFID device must be scanned to retrieve the identifying information.

RFID TECHNOLOGY FOR LIBRARIES

RFID is a combination of radio-frequency-based technology and microchip technology. The information contained on microchips in the tags affixed to library materials is read using radio frequency technology regardless of item orientation or alignment (i.e., the technology does not require line-of-sight or a fixed plane to read tags as do traditional theft detection systems) and distance from the item is not a critical factor except in the case of extra-wide exit gates. The corridors at the building exit(s) can be as wide as four feet because the tags can be read at a distance of up to two feet by each of two parallel exit sensors. The targets used in RFID systems can replace both EM or RF theft detection targets and barcodes.

This technology helps librarians reduce valuable staff time spent scanning barcodes while charging and discharging items. RFID is a combination of radio - frequency-based technology and microchip technology. The information contained on microchips in the tags affixed to library materials is read using radio frequency technology, regardless of item orientation or alignment. The RFID gates at the library exit(s) can be as wide as four feet because the tags can be read at a distance of up to two feet by each of two parallel exit gate sensors.

WHY RFID FOR LIBRARIES?

The use of RFID reduces the amount of time required to perform circulation operations. Reduces staff stress and increases management efficiency in:

- Fastest, easiest, most efficient way to track, locate & manage library materials
- Efficient Book circulation management
- Automatic Check-in and Check-out
- Library inventory tracking in minutes instead of hours
- Multiple books can be read simultaneously
- Unique ID of the RFID tag prevents counterfeiting
- Automated material handling using conveyor & sorting systems

COMPONENTS RFID TECHNOLOGY

An RFID system for library normally consists of RFID tags, a self check-out station, a self-return system/ book drop system, a staff work station, a tagging/programming station, security gate/s, a shelf scanner for inventory/digital library assistant, conveyor belts and sorting systems, etc. Products should stand out on quality, reliability and scalability.

A COMPREHENSIVE RFID SYSTEM HAS FOUR COMPONENTS

- 5.1 RFID tags that are electronically programmed with unique information
- 5.2 Readers or Sensors to query the tags
- 5.3 Antenna/ Security gate
- 5.4 Server on which the software that interfaces with the integrated library software is loaded

RFID Tag: The tag is paper thin, flexible and approximately 2”x 2” in size which allows it to be placed inconspicuously on the inside cover of each book in a library’s collection. It consists of an attached antenna and a tiny chip which stores vital bibliographic data including a unique ID number to identify each item. The heart of the system is RFID tag which can be fixed inside a books back cover or directly on to CDs and Videos. There are three types of tags i.e. Read only/Worm and read/ write.

Readers or Sensors to query the tags: RFID readers or receivers are composed of a radio frequency module, a control unit and an antenna to interrogate electronic tags via radio (RF) communication. The reader powers an antenna to generate an RF field. When a tag passes through the field, the information stored on the chip in the tag is interpreted by the reader and sent to the server, which, in turn communicates with the integrated library system when the RFID system is interfaced with it.

RFID exit gates sensors (readers) at exits are basically two types. One type reads the information on the tags going by and communicates that information to a server. The server, after checking the circulation database, turns on an alarm if the documents are not properly checked out. Another type relies on a theft type in the tag that is turned on or off to show that the item has been charged or not, making it unnecessary to communicate with the circulation database. It plays a crucial role in detecting un-borrowed or improperly checked-out library document. Theft detection is an integral feature of the chip within the RFID tag which performs both the item identification and antitheft function

Antenna/ Security Gate: The antennas produce radio signals to activate the tag and read/write data to it. Antennas are the channels between the tag and reader, which controls the system's data acquisitions and communication. The electromagnetic field produced by an antenna can be constantly present when multiple tags are expected continually. Antennas can be built into a doorframe to receive tag data from a person's thing passing through the door.

Server: The server is the heart of some comprehensive RFID systems. It is the communications gateway among the various components. It receives the information from one or more of the readers and exchanges information with the circulation database. Its software includes the SIP/SIP2 (Session Initiation Protocol), APIs (Applications Programming Interface) NCIP (National Circulation Interchange Protocol) or SLNP necessary to interface it with the integrated library software but no library vendor has yet fully implemented NCIP approved by NISO. The server typically includes a transaction database so that reports can be produced.



Optional Components:

Optional RFID system includes the following components:

- 6.1 Book-Drop (Return Station),
- 6.2 Hand Held Readers,
- 6.3 Intelligent Trolleys, and
- 6.4 Inventory Control

Book-Drop (Return Station): The book drop system consists of book drop with screen and receipt printer. It allows patrons to automatically return the library documents. A reader installed in a book drop allows reading of the RFID tags as patron drops off the documents. It eliminates the labour-intensive steps of check-in and deactivation of the security protection by the library staff. It automatically checks- in the document, takes them off the patron's library account and reactivates the security function.

Hand Held Readers: Hand held readers offer ease to the library staff, be it stocktaking, searching or asset weeding. The devices are made with industry grade components backed with 30 hours of battery life.



Intelligent Trolleys: Intelligent trolley is the revolutionary product and unique one. It gives library patrons the speed to check-in books. Library staff also find it easier to re-shelve books as the trolleys allow you mobility along the rack aisles putting books back where they belong.

Inventory Control: Inventory and shelf reading can be carried out with a portable reader. The reader transmits identification number to the server, which in turn sends it to library management software and response is returned in real time. Alternatively, information may be downloaded with library management software for inventory control. Shelf Management system makes it easier for the library staff to locate and identify the documents on the shelves.

**Application of RFID in upgradation of Libraries**

Book Drops: The book drop system consists of book drop with screen and receipt printer. It allows patrons to automatically return the library documents. A reader installed in a book drop allows reading of the RFID tags as patron drops off the documents. It eliminates the labour-intensive

steps of check-in and deactivation of the security protection by the library staff. It automatically checks-in the document, takes them off the patron's library account and reactivates the security function. What makes our Auto Sort products different are the care we give to your books and your staff.



RFID Transponder or Tagging: It is the most important link in any RFID system. It has the ability to store information relating to the specific item to which they are attached, rewrite again without any requirement for contact or line of sight. Data within a tag may provide identification for an item, proof of ownership, original storage location, loan status and history. RFID tags have been specifically designed to be affixed into library media, including books, CDs, DVDs and tapes.

Staff Work Station: Staff work station is a staff assisted station which is used in a library for charging and discharging documents, programming of new documents, sorting of documents, etc. It consists of a reader and a PC. For doing programming/tagging of a new library document with the help of staff work station, it is first put on the reader, the accession number of the document is read with the help of barcode scanner and then the data is downloaded from the library management system.¹⁵ Staff stations are used at circulation and tagging desks and to understand the need to multi-task. The library staff stations can double up and add speed to tagging or double up to speed circulation. Ergonomically designed to suit a routine condition of libraries are using time and motion study.

The Patron self check-out station: It is basically a computer with a touch screen and a built-in RFID reader, plus special software for personal identification, book and other media handling and circulation. After identifying the patron with a library ID card, a barcode card, or his personal ID number (PIN), the patron is asked to choose the next action (check-out of one or several books). After choosing check-out, the patron puts the book(s) in front of the screen on the RFID reader and the display will show the book title and its ID number (other optional information can be shown if desired) which have been checked out.

Shelf Management: This solution makes locating and identifying items on the shelves an easy task for librarians. It comprises basically of a portable scanner and a base station. The solution is designed to cover three main requirements:

- Search for individual books requested

- Inventory check of the whole library stock
- Search for books which are miss-helved

Advantages of RFID Systems

RFID has many advantages and one of the main ones being that it reduces the amount of time required to perform circulation operations. This allows for easier and faster check out time for patrons and staff. RFID use can be a controversial topic when libraries choose to convert their collections to be able to take advantage of the technology. There is little doubt that RFID will become more ubiquitous in the future, however, a library should weigh the advantages and disadvantages. Many of the advantages of RFID revolve around the actual use in libraries and using the technology to free up librarians for duties that involve more interaction with the patrons. Many of the disadvantages revolve around the technology also, but include issues surrounding security and privacy.

Reduction of staff duties

- Reduction of staff injuries
- Reliability
- Tag life and appearance
- Less time needed for circulation operations: Implementing RFID will considerably reduce the amount of time required to issue, receive, transport, sort & shelve library materials
- Efficient Inventory management: Inventory management can be done using a handheld reader without closing the library and is at least 20 times faster compared to existing barcode based system
- Reducing Repetitive Stress Injuries (RSI): Taking inventory in a RFID based system doesn't require physical deshelfing & shelving of library materials
- Patrons will spend less time waiting in check-out lines by using Self Check in - Check out systems
- Patrons find what they are looking for quickly & easily
- Reminders for due dates allows patrons to submit borrowed materials in time
- Use of book drops & return chutes for returning library material, allows for flexible timings

RFID enabled patron cards allows for easy patron identification.

RFID systems frees up staff to work on other duties because patrons are put in a position that they are able to check out their own materials using a self-check out system similar to what is found in grocery stores. It also reduces that amount of staff injuries in that it prevents that number of stress injuries from happening. Stress injuries results from having to flip materials over or hold them at a certain angle so that they barcode can be scanned. Tag life is long than previous systems. It is estimated that the tag life will last for about ten years.

DISADVANTAGES OF THE RFID SYSTEM

Reduction of staff duties

Cost

Susceptibility of tags

Big brother and invasion of patron privacy

Reduction of staff duties fall into both categories because in some instances with the implementation of automation in libraries it may require a reduction in staff in library in some areas which is not always good. Another huge disadvantage is the one of privacy. Privacy invasion has been a popular topic of discussion in libraries. As librarians we are to protect the privacy of the patrons that we serve and with implementation of automation the question of whether patrons privacy still private has become a question. As this technology improves I'm sure that the issue of privacy will continue to be an issue until something is done to confirm the protection of patrons' private information.

CONCLUSION

RFID in the library speeds up book borrowing, monitoring, books searching processes and thus frees staff to do more user-service tasks, and it is still a relatively new technology. So far, many of State agricultural university libraries in the India have implemented RFID, mostly for self-service and the vast majority of these libraries are positive about their RFID investment and its benefits. It is quite clear from the above discussion that an RFID system may be a comprehensive system that addresses both the security and resources tracking needs of a library. RFID in the library is not threat if best practices guidelines fallowed, that it speeds up book borrowing and inventories and frees staff to do more user service tasks.

Although, the RFID technology is quite expensive, still it has yielded excellent results for the all the organization. The technology is set to become more popular in India with more deployment in the coming time in different libraries of SAU's. It has been proved that this technology reduces the labour, costs and provides efficient results, which leads to full proof security and access control. The only barrier in the implementation is high cost of it, but it is expected that in coming days the cost will come down further and very early we will see mass adoption of this technology among all SAU's libraries in India.

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BASU LIBRARY: VETERINARY KNOWLEDGE RESOURCE CENTRE IN BIHAR

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ABSTRACT

This paper attempts to describe the current status of Bihar Animal Sciences University Library including Library collection, Library automation and implementation of KOHA Library Management Software in BASU Library. It also highlights the features available in the KOHA software i.e. Acquisition, Circulation, OPAC etc. Bar-Coding, Membership, Automation of library activities and library services were implemented in the library. The other Knowledge resources available at BASU Library i.e. CeRA, Agricat, Krishikosh etc. are also profiled.

Keywords: *Library automation, CeRA, OPAC, Library and Information Services, Institutional Repository.*

INTRODUCTION

Bihar Animal Sciences University, Patna came into existence in 2017 with its headquarter at Patna. Bihar Animal Sciences University, Patna has grown into well established and fully equipped functional University with latest learning techniques. The University has sophisticated equipments and well equipped facilities for execution of major three organs of University, i.e., Teaching, Research and Extension. Under this University, there are now three constituent Colleges, Bihar Veterinary College, Patna, Sanjay Gandhi Institute of Dairy Technology, Patna and College of Fisheries at Kisanhganj.

The Bihar Animal Sciences University, Patna was established in on 29th August 2017. The University awards undergraduate degree of B.V.Sc. & A.H. and offers M.V.Sc. course in 15 subjects, M.Sc. in one subject and Ph.D. by course work in 12 disciplines.

BASU has also following Sub-stations to conduct research programme

1. Institute of Animal Health and Production, Patna
2. Exotic Cattle Breeding Farm, Patna

3. Central Poultry Farm, Patna
4. State Goat Breeding Farm, Purnea
5. State Animal Farm, Gaya
6. State Buffalo Farm, Sipaya, Gopalganj

OBJECTIVES OF BASU

The University has been established to achieve following objectives:

- Making provision for imparting education towards development of quality human resource in different branches of study in Veterinary and Animal Sciences.
- Furthering the advancement of learning and conducting of research.
- Undertaking extension education.
- Promoting partnership and linkages with national and international educational institutions.
- Establishing vital linkages with the concerned line departments working in the fields of animal husbandry, fisheries and dairy development, animal treatment technology in the State, by whatever name called, governed by the Government of Rajasthan as well as the Central Government.

The BASU offered following education programme:

Table 1 Educational programme offered by BASU

S. No	Programme	Duration	Intake
1	Bachelor of Veterinary Science & Animal Husbandry	5Years 6 month (from 2016-17)	60(51 State +9 VCI)
2	Master in Veterinary Sciences	2Years	38
3	B.Tech. (Dairy Technology)	4 Years	40
4	P.G. in Dairy Technology	2 Years	03
5	Bachelor of Fisheries Sciences.	4 Years	40
6	Ph.D. in Veterinary Anatomy, Animal Breeding & Genetics, Animal Nutrition, Veterinary Microbiology, Veterinary Medicine, Veterinary Surgery & Radiology, Veterinary Obstetrics & Gynaecology, Veterinary Pathology, Veterinary Physiology, Veterinary Parasitology, Livestock Production Management and		

FACULTY PROFILE OF BASU

Bihar Animal Sciences University (BASU), Patna, Bihar was carved out of Bihar Agricultural University recently by subsuming its two existing colleges namely Bihar Veterinary College (BVC), Patna and Sanjay Gandhi Institute of Dairy Technology (SGIDT), Patna. The total faculty strength in both the constituent colleges of BASU is 67, out of which 7 are Professors, 3 Associate Professors and 57 Assistant Professors. All the faculty members of the university in different ranks are actively involved in teaching, research and extension. The university has a good chunk of young faculty members. Their numbers in different age groups namely 30-40 Years, 40-50 Years, 50-60 Years and 60-65 Years are 31%, 52%, 9% and 8%, respectively. The representation of female and male faculty members is 13% and 87%, respectively in the university. The faculty members of the university belong to Bihar (91%) as well as other states (9%) of India. Of all the faculty members, 60% are Doctorate degree holders whereas only 40% are Master's degree holders.

TEACHING INSTITUTIONS OF BASU

BIHAR VETERINARY COLLEGE, PATNA

The Bihar Veterinary College was established on 2nd April 1927 by Sir Henry Wheeler. From 2017, it is under Bihar Animal Sciences University. This college is the only veterinary college in Bihar. It caters to the needs of Bihar by carrying out teaching, research and extension education programs pertaining to livestock production and health problems. Presently, the college has 17 departments. All these departments have experienced faculty and laboratory facilities with adequate infrastructure for undergraduate and postgraduate teaching and research. A well- equipped veterinary clinical complex is available to cater to the demands of large and small animal health care. In addition, the college has an elite dairy herd and a poultry farm which provide adequate facilities for teaching and research. The College of Veterinary Science offers the following programs of study:

1. B.V. Sc. and A.H.
2. M.V. Sc.
3. Ph.D.

SANJAY GANDHI INSTITUTE OF DAIRY TECHNOLOGY (SGIDT), PATNA

Sanjay Gandhi Institute of Dairy Technology, Patna is a constituent college of Bihar Animal Sciences University, Patna. The institute conducts teaching, research and extension in the area of dairy technology and runs a four - year degree program called Bachelor of Dairy Technology (B. Tech. D.T.). From the year 2017, post graduate program has also been started in the Department of Dairy Technology. The institute has adopted the course curricula as per the recommendation of the Deans' Committee constituted by the ICAR, New Delhi and presently the courses are offered as per the 5th Deans' Committee of ICAR.

COLLEGE OF FISHERIES, KISHANGANJ

A new College of Fisheries is being established in Kishanganj and it will start functioning from July 2018. MOUs have been signed with some ICAR Fisheries institutes to strengthen academics and research capabilities of the college. The College of Fisheries Science started Four year degree programme in Bachelor of Fisheries Sciences at Kishanganj.

BASU LIBRARY KNOWLEDGE RESOURCES

Bihar Animal Sciences University, Patna came into existence in 29 August 2017, with its headquarter at Patna. Bihar Animal Sciences University, Patna has grown into well established and fully equipped functional University with latest learning techniques. Similarly, University central library and individual college libraries are well developed with modern facilities and updated material so as to provide latest printed and digital information on vast Veterinary Science. Central library is situated at the middle of the university campus facilitating users an easy approach from all directions. It occupies a total area of 1100 square feet. Since automation is emerging as boon for present day libraries BASAU Library changed itself from a traditional library to a modern library with the adopting ICT for library's automation. BASU Library has a Knowledge Resources (Total collection 22000) on the following subject/ disciplines.

- Veterinary Anatomy,
- Animal Breeding & Genetics,
- Animal Nutrition,
- Veterinary Microbiology,

- Veterinary Clinical Medicine,
- Veterinary Surgery & Radiology,
- Veterinary Obstetrics & Gynaecology,
- Veterinary Pathology
- Veterinary Preventive medicine
- Veterinary Public Health and Epidemiology
- T.V.C.C.
- Veterinary Physiology and Biochemistry
- Veterinary Parasitology,
- Livestock Production Management
- Animal Husbandry and Extension Education
- Livestock Product and Technology
- Veterinary Pharmacology and Toxicology

PARTICIPATION IN DEVELOPING KRISHIKOSH AT NATIONAL LEVEL

Krishikosh is an Institutional Repository under NARS. This repository is having collection of old and valuable books, records and various documents spread all over the country in different libraries of Research Institutions and State Agricultural Universities (SAUs) including BASU. BASU Library also digitized and made available their old/rare collection on Krishikosh. Krishi Prabha, a full-text electronic database of Indian Agricultural Doctoral Dissertations submitted by research scholars to the State / Deemed Agricultural Universities is also available in Krishikosh.

AVAILABILITY OF ONLINE ACCESS OF CERA AT BASU

National Agricultural Innovation Project (NAIP) has launched CeRA successfully on 30 April 2008 and access of the CeRA is given to the 154 Institutes/SAUs through I.P. address. Now CeRA is second largest consortia in India. The CeRA covers the journals of Springer verlag, Annual Reviews, CSIRO Australia and J-gate publishers on Agriculture, Veterinary Sciences, Fisheries, Crop Sciences, Socio- economic, Computer Sciences, Soil Sciences, Animal Sciences etc. Thus the consortium provides agricultural information of more than 3800 journals through cost-effective manner into 154 Institutes/SAUs including BASU Library. This facility is helpful to smaller Library who is find it difficult to subscribe international scientific journal. It is providing a new and

competitive research environment where the scientists will have greater access to quality research material and spend less time in literature search. BASU Library also providing document delivery to all concern users.

USERS OF BASU LIBRARY

The users of BASU Library can be generally classified into Policy maker, the managers, faculties, scientists, students, and farmers

Managers: This category of users of BASU library is Vice Chancellor, Head of the department, Dean. They require the following information for effective decision-making:

- human and physical resources
- research, extension and development projects
- budgeting
- physical targets

Faculties: This category of users includes personnel involve in teaching in the university, as well as various research and extension units. Their information requirement can be listed as follows:

- research and extension trends in veterinary and related disciplines
- animal and veterinary resources,
- economic and social indicators feedback from fields
- results of previous research at both national and international levels

Students: This category of users include post graduate students, PhD students studied in the various discipline, as well as various research and extension units. Their information requirement can be listed as follows:

- Information about book on particular topics
- Availability and use of National and International databases
- Availability and use of different e-resources

Animal Farmers: The farmers and the public are most important category of users. They may require information on aspects like the following:

- input/output prices
- market information
- Location specific, cattle breed, etc.

- improved techniques and methods
- complete package of practices
- information about input supply system

HISTORY OF COMPUTERIZATION OF BASU LIBRARY

Till the 2017, all technical works like cataloguing, reference services provided by either with the help of Library catalogue card or personal efforts. In 2017 it was decided with the help of ICAR to implement KOHA Library management software at BASU Central as well its colleges Libraries. .

BASU has adequate facilities, such as, classrooms, laboratories and instructional farms, in each of the academic institution. Bihar Animal Sciences University Patna, Central Library has more than 22000 knowledge resources. Many knowledge based services like reference, reprographic, Internet Browsing, e-resources are provided by the library for its users. Present State of the Art Since automation is emerging as boon for present day libraries; BASU Library changed itself from a traditional library to a modern library with the introduction of different technologies available for library's automation. The library uses KOHA LMS. It is an integrated multi-user library management system that supports all in-house operations of the Library. It covers all the basic as well as advanced operations and services of the library. Bibliographical records of all the documents available in the BASU can now be accessed through the OPAC.

BASU Central Library followed Charging and discharging system through KOHA book reader. BASU Central Library, having Computer lab having 7 computers. BASU have implemented KOHA (Library Management Software) to uniform Open source software KOHA. It facilitates the following task:

PREPARATION OF MEMBERSHIP CARDS

For making membership card of bonafied members of BASU library, a proforma was circulated, in order to make avail the BASU Library facility and the members were advised to submit their form along with pass-port size photo. After collecting the data from members the Membership cards were prepared by the BASU Library.

BAR-CODING ON BOOKS AND MEMBERSHIP CARDS

The application of barcode system is principally quite suitable for circulation job of library. Besides, the job of library inventory and periodical control can also be effectively carried with the help of barcode technology. Bar-coding option is also available in KOHA software. After completion of bar-codes, bar-code strips were pasted on spine of the book, title page of the book and end of the book.

CIRCULATION ACTIVITIES OF LIBRARIES

Library circulation or library lending comprises the activities around the lending of library books and other material to users. A circulation or lending section is one of the key departments of a BASU library. It provides lending services and facilities for return of loaned items. Renewal of materials is also handled at the circulation desk. After the implementation issue and return of the books are being done electronically by using bar-code scanner and the same is intimated to borrowers through SMS and mail, on their registered mobile number and mail account

WEB OPAC FACILITY

Web OPAC is the Online Public Access Catalogue, which allows users to access the library Resources. Web OPAC module is utilized both within the library and externally giving the same functionality/looks for clients accessing the catalogue regardless of location It is very important feature of the KOHA software. By using this option, user can know from their seat whether the required book is available in the library or issued or not available in the Library.

CHALLENGES OF BASU LIBRARY

Some of the challenges of BASU Library are as under:

- No permanent policy for collection development
- No policy of weeding out of publications
- No policy for exchanges of publications
- Shortage of professional Manpower
- Space problem in the Library,
- Weeding out of materials is absolutely necessary in the BASU library. Librarians need to weed out materials that have become obsolete.

FUTURE PLAN OF BASU CENTRAL AND COLLEGES LIBRARIES

Bihar Animal Sciences University, Patna is a newly established university marching ahead with a motion of extension and consolidation of existing infrastructural facilities. Thus the University has to strengthen and enhance the available library facilities, books as well as infrastructure for all the three Constituent colleges of BASU. Looking to ever increasing spectrum of education funds are required under ICAR Grants towards Library Strengthening for Agricultural Universities as follows:

1. **Works:** Construction of new library buildings for Central Library at BASU, Patna and separate Library for Its all colleges.
2. **Library Collection Development:** Books, Reference Material, Text Books etc has to be purchase for BVC, SGIDT and College of Fisheries, Kishanganj., Library .
3. **E-Resources:** e-Journals, other than CeRA, e-Books, e-Reference Books, CD-ROM database related to Veterinary Science, Dairy Sciences and Fisheries Sciences has to be purchase for BASU and its college Library.
4. **Equipment & Library Furniture:** UPS, Computers, Scanners, e-Kiosk/furniture and fixtures, air conditioners, Photocopiers, Water-Coolers, Book-Racks, Almiras etc., has to be purchase for all BASU Central and college libraries..
5. **RFID Implementation:** RFID System should be implemented in all the colleges as well as Central Library of BASU.
6. **Recruitment of Professional Manpower:** At present, No professional Manpower is available in all Colleges and Central Library of BASU. Therefore, minimum professional and technical manpower should be provided to all the Libraries.

CONCLUSION

BASU Library has a good collection which is hardly available in other Veterinary libraries in the country. Institutional Repository Krishikosh solves this problem to the extent. BASU Library has contributed in Krishikosh Institutional Repository under NARS and play a vital role in this regard by collecting very important documents like Books/ Journals/ administrative/ research / Commission reports/ committee reports/ which are very useful but not to be found easily, and preserving them in digital form, so that any reader could find out one's required publication/information through ICAR's Common Institutional

Repository. BASU Library has completed their Library automation and implemented KOHA Library management software to carry out their day to day work. Still, BASU Library is required support from BASU Authority for recruitment of Library professional to manage these knowledge resources effectively and provide high speed internet connectivity and other equipment. BASU Library has future responsibility to support Krishikosh Institutional Repository, so that all knowledge available at BASU Library can also be merged into Krishikosh and Agricat for better use in entire NARS scientific community.

AGRICULTURAL KNOWLEDGE MANAGEMENT THROUGH ICT IN INDIA

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ABSTRACT

Knowledge Management comprises of a range of strategies and practices used in an organization to identify, create, represent, distribute, and enable adoption of insights and experiences. Such insights and experiences comprise knowledge, either embodied in individuals or embedded in organizational processes or practice. Knowledge Management efforts typically focus on organizational objectives such as improved performance, competitive advantage, innovation, sharing of lessons learned, integration and continuous improvement of the organization. KM efforts can help individuals and groups to share valuable organizational insights, to reduce redundant work and training time for new employees, to retain intellectual capital as employees' turnover in an organization, and to adapt to changing environments and markets. The value of Knowledge Management relates directly to the effectiveness with which the managed knowledge enables the members of the organization to deal with today's situations and effectively envision and create their future. In the past few years, there has been a growing interest in treating knowledge as a significant not only as organizational but as national resource also. Keeping in view the value of Knowledge Management in the field of Agricultural Sciences, the government of India have begun promoting a class of information systems, referred to as knowledge management systems (KMS). These KMSs supports creation, transfer, and application of knowledge in organizations and outside organisation for students, researchers, scientists and farmers. This paper provides an overview to various Knowledge Management Initiatives taken by the different government organizations in the field of agricultural sciences viz. KrishiKosh, Agrotags, Agropedia, e-Sagu, AAQUA, KrishiShiksha, DEAL, Agro-Sense, CRS, AgMooc, CeRA, National Agricultural Bioinformatics Grid, Krishi, krishijagran, agricultural products india.

Keywords: *Agricultural Knowledge Management, AKM, Krishikosh, AgMooc, CeRA, Agropedia, e-Sagu.*

RE-ENGINEERING OF LIBRARY AND KNOWLEDGE CENTRE-NAVSARI AGRICULTURAL UNIVERSITY

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“Reengineering posits a radical new principle: that the design of work must be based not on hierarchical management and the specialization of labor but on end-to-end processes and the creation of value for the customer-Michael Hammer.”

ABSTRACT

This paper explores how libraries can re-shape to better reflection on the requirements and challenges of today's digital technology. The Author presents Journey of Processes, Facilities and User's needs, which will help libraries to re-position, re-profile, and re-structure to better quality management system. Finally, the paper examines critical capacity and capability challenges and proposes some innovative steps to addressing the significant skills gaps. Changes in digital technology offer significant opportunities to advance the quality of education for students and faculty. Changes in digital technology can serve as a vehicle, to expand the educational reach. Author elaborates the summary of initiatives undertaken by them for successful “Re-Engineering of Library & Knowledge Centre-Navsari Agricultural University” with systematic implementation.

Keywords: *Re-engineering, Redesigning, Library Facilities, User needs, Navsari Agricultural University.*

INTRODUCTION

Hammer and Champy (1993) define reengineering as “the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical contemporary measures of performance, such as cost, quality, service and speed”. The rethinking is fundamental because it assumes nothing; it asks ‘why’ and ‘what should be’ not ‘what is’. ‘Process’ refers to making a map of steps used to complete any routine job in the business. According to Collins English Dictionary, Re-engineering means the restructuring of a company or part of its

operations, especially by utilizing information technology. 'Reengineering' refers to changing those routine work steps, to increase job speed and productivity.

Librarianship is experiencing rapid change. Various internal as well as external factors are reshaping the role of libraries. Librarians and information specialists have debated the idea of marketing for the information sector. Several things have compelled us to learn about marketing and using it. Following factors are responsible for encouraging the library profession to develop a marketing approach in its operations and services. :

- The information explosion (rapid growth of reading material)
- The technology revolution;
- Escalating library costs/ budget cuts
- Increase of user based services
- Networking demands/ complexity in information requirements
- Competition by database vendors
- Reading habits among people declining due to reasons such as onslaught of television and Internet

E-resources were also increasing tremendously day by day. Before 25 years, there was a 386 model of computer, but now core Intel 11 processors are available in the market. Floppies are getting converted into CD's and DVD's. Now the Pen drives of 64 GB and so on is not new to us. Hard Disk storage capacity was just 100 MB that time, but now that capacity is in 500 GB/1TB/2TB. Now we can keep our own library of 10,000+ books with us due to such latest technologies like tablet. Gujarat is having 85.96% Internet and broadband subscriber base in the country as on April 2018. This is nothing but Changing Landscape of Library & Information Centres due to "Re-engineering of libraries with application of Technological Revolution". Here in this my paper I want to portrait changing landscape of "Library & Knowledge Centre-Navsari in Agricultural University".

This library was college library of N.M. College of Agriculture during the year 1965, It was renamed as Campus library by Gujarat Agriculture University in the year 1972. Again it renamed as University Central Library in the year 1988 with inclusion of new faculty of Horticulture and Forestry. When the Navsari Agricultural University came into existence on May 1, 2004, it was converted into University Central Library. From 2010 we have started redesigning from old system to new, and

improving the library collection, services and ambience, by adopting new technologies and converting the library, to a modern information Centre with the objective of putting the end users in contact with the information needed by them, whether it is on paper or stored digitally. At present it is working as the University Library and Knowledge Centre. Library is located in the Centre of Navsari Campus at approachable walking distance from various colleges and hostels. Library is having good infrastructure facilities spread over an area of 5600 Square meter (60256 Sq. feet').

A] Redesigning Library Processes

In this Re-Engineering of Library & Knowledge Centre-Navsari Agricultural University, we have decided that some kind of quality management system should be established in our higher institution. This sets new challenges for the university library. The fact is that quality management can be used as a tool for leadership within the Library, improving the Library's processes and redesigning the Library within & outside the University. This module had helped us to reworking on different processes of library. In addition it had helped us to identify the processes, that require urgent attention through its inbuilt process prioritization engine.

Library processes are not only an important part of the daily job, they're the thread that keeps the back end of libraries together. What patrons don't see is a complex system, where the threads of the library processes cross and intertwine to ensure the front-end experience runs as smoothly as possible.

In order to discuss the challenges that meet the library processes, it's important to define what a process is. "Process", is a series of actions or steps taken, in order to achieve a particular end. A natural series of changes. A systematic series of mechanized or chemical operations that are performed in order to produce something. An instance of a program being executed in a multitasking operating system, typically running in an environment that protects it from other processes.

I-Process of Collection Development

Collection Development is one of the most important, yet challenging, components of the library. Before resources can be shelved and then circulated from the library, they need to be physically prepared. Library materials go through processing so that they can be located, used, and returned to the library from which they originated. Each item in the library must go through physical processing including the applicant of

accession numbers, circulation cards, pockets, plastic covers, laminates, or cases to protect materials, barcodes, (automated systems), detection strips or slips, property stamps etc. Impact of information technology, we have to solve problems of collection developments needed in this digital era, such as Problem of user-friendly environment, Problem of user training, Problem of digital divide, Problem of library classifications, Problem of staff development, Problem of procurement & Preservation system, Problem of technological up-gradation, Compatibility with organizational culture & the most important financial constraints for collection development.

Library Collection (Status of the year 20-08-2017)	Numbers
Books	70297
Graatis Books	1922
E-Books	780
Bound volumes of periodicals	10927
M.Sc. Theses	2209
Ph.D. Theses	469

Journal / Periodicals Subscription (Status of the year 20/08/2018)	Numbers
Indian	148
Foreign	32
Through CeRA	3578
Gratis	65

E-Resources-E-resources have many advantages such as it used by many users simultaneously, it do not require physical processing, it allows remote access, it supports searching capabilities, accommodate unique features such as links to related items, easy downloading, automatic updating, eliminates printing and posting cost. We have re-engineered our library thorough building good collection of following E-Resources.

CDs/DVDs-532
Online Databse-a-Indian (CMIE Commodities, Indiastate, Biotropica, J-Gate)
b-Foreign (CAB Abstract, VET Abstract)

Library had migrated from Soul 2.0 to Cloud based KOHA Library Management System with integration of four sub libraries to match global library management practices and to cut down over all Information Technology infrastructure management cost.

Digitization was emphasized by ICAR to strengthen Krishiprabha project presently it's available in Krishikosh. Library has completed digitization of all theses and project report (from 1976 to 2016) and uploaded 2123 theses on Krishikosh portal. 264 digitized question papers were also uploaded on Krishikosh portal accessible to all the students of all Agricultural Universities in India.

II-Active Role Library Committee

Since the Library has to cater to the needs of variety of clientele such as faculty, research scholars, post graduate and under graduate students, institute administrators as well as specialists, non-teaching staff, agricultural workers engaged in neighborhood institutions and a wide range of subject fields are to be represented in our book stock with prime thrust for meeting the needs of students and faculty members. Besides this, for smooth functioning of the library and safe guarding the interest of all sections of the library users, formation of policies, rules & regulations and implementing the library policies in a judicious manner, an infrastructure is needed for the library. To meet the all the above new challenges our "Library & Knowledge Centre-Navsari Agricultural University" is advised by a Library Advisory Committee with the following constitution and representatives. The committee consist of the following members: Dr. C.J.Dangaria, Vice-Chancellor of Navsari Agricultural University as- Chairman; Principal & Dean of Affiliated colleges, Director of Student Welfare, Professors, Registrar, Student Representative, Account Officer cum Comptroller, Professor & Associate Professors, Directorate of I.T., & University Librarian – Member Secretary (ex-officio). The significant initiative has been taken by the Library Committee are:

- Building and Maintaining Knowledge Repository for renewal of subscription amount of online database (e-Resources) i.e. CAB Abstract, J-Gate Complete, India state, CMIE Commodities and Bio-Tropica.
- Library membership has been extended for life time membership of Current Science Association and gets the journal of current science issue free of cost through life time membership.
- Formulated knowledge and information archiving and management policy at the institute, through proposal for modernizing, dynamic and digitalizing of the University Library.
- Formulate various policies related to library like collection development, purchase, space eg. to purchase necessary

books for University Library, departmental library of various colleges of NAU, Navsari, remote Log-in Facility for accessing online resources, purchase foreign journals, periodicals, bulletin, magazines and newspapers of vernacular language as well as in English.

- Library is extended reading facility with the separate reading room of University Library till 9:00 p.m. for library users of late night usage purpose, also on Sunday & the library is opened on demand and as per need of the library users even on public holidays.

B] Revamping Library Facilities

Consortium for E-Resources in Agriculture and Krishiprabha Indian Agriculture Doctoral Dissertation Repositories:

University Library, NAU, Navsari is linked with consortium for e-Resources in Agriculture for online journals (CeRA) and Krishikosh” Indian Agriculture Doctoral dissertation (Theses) repositories for encouragement of better reading environment. Efforts have been made to provide online journal services and online thesis database for scientist and student community of NAU, Navsari. Total 135 requests have been attended and 73 full length papers were received and distributed to concern library users. Similarly 179 users have collected full length thesis information of his interest from University Library, NAU, Navsari through Krishiprabha and Krishikosh database.

Significant Achievements:

- E-Theses submitted by students of NAU under Ph.D. and Master degree programme are managed through digital repository. Library has also provided all India Agricultural University Ph.D. theses through KRISHIKOSH
- Total 212 Ph.D. theses and total 1923 M.Sc. theses uploaded by University Library in KrishiKosh.
- Total 1,11,928 Library users were used the CeRA and KrishiKosh.
- Bibliographic records of library have been updated with KOHA Library Management Software.
- Library has started Wi-Fi Internet facility for the users.
- Library membership has been automated and circulation of books and other publications were also done through KOHA Library Management Software.

- Succeed in increasing the membership of library users and made them for rigorous use of the library.
- Succeed in development of good collection by arranging book exhibition in University Library.
- e-Library has been made more dynamic & Improvement of Infrastructure like implementation of wireless technology, CCTV, fire proof server room, up-gradation of server, desktops etc.

C] Reviving User's Needs

The role of Library and Librarian is changing according to change and development in ICT. User need is different according to their profession. Library must try to satisfy the users need by giving variety of services. While doing this we have taken into consideration i.e. Existing content, Search terms, Reader facing staff & User research. We have tried our level best by giving them information they need as quickly as possible. Hence it satisfy the user and also obey the first law 'Information for use' in this technological world.

- The main mandatory function of the library is to provide all kinds of scientific and technical database information especially in the fields of Agriculture, Horticulture, Forestry, Veterinary, Biotechnology, Agribusiness Management, Agri-engineering, Fisheries, Information Communication Technology as well as other basic and allied science to the students, scientist, teachers, researcher and extension workers and all type of readers.
- To satisfy thirst for knowledge and developing reading habit of library users, as well as availing reading resources for maximum hours to the library users, the University library timing is scheduled from 7.30a.m. to 8.00p.m. from Monday to Saturday. The library is opened on sunday and demand and as per need of the library users even on public holidays.
- E-Theses submitted by students of NAU under Ph.D. and Master degree programme are managed through digital repository. Library has also provided all India Agricultural University Ph.D. theses through KRISHIKOSH.
- During the year 2013-14,2014-15,2015-16, 2016-17, 2017-18 ICAR released a cumulative exuberant grant of Rs 211.29 lakhs towards "Library Strengthening in Agricultural Universities." to University Library, NAU, Navsari in which Rs 211.29 lakhs were spent towards purchase of textbooks, reference books, several books related to

competitive examinations and other related books. e-books, e-journal, e-database, e Resource, e-equipments, furniture etc.

- By regularly conducting ‘My Favorite Book Talk‘in library, by which the reading habit among the library users was developed.
- National workshop on “KOHA Professional Training” was held during February 13 to 15, 2014 in the university library under e-Granth project in which 19 participants took part from across the India.
- The existing University library automation has been completed according to ICAR guidance OSS, KOHA Library Management Software.
- Through Improvement of Infrastructure like implementation of wireless technology, CCTV, fire proof server room, up-gradation of server, desktops etc., we had got success in increasing the membership of library users and made them for rigorous use of the library & we have proud to say that total 2,71,982 Library users have used the CeRA and KrishiKosh.
- National Workshop on “J-Gate@CeRA” was hold during 8th October,2016 in the University Library in which 75 participants took part from across the India.

We have succeeded in expanding our library membership as:

Members	No. of Library Membership
Diploma Students	57
Faculty	642
PG students	512
Ph.D Students	118
UG Students	677
Total	2009

Academic Year	Student's Statistics	Staff's Statistics
2012-13	53,035	1,653
2013-14	89,747	4,596
2014-15	71,520	1,803
2015-16	73,059	1,816
2016-17	90,962	1,820
2017-18	1,11,603	854

- We have class room fitted with OHP and Screen at University Library for teaching “ PGS-501--Library & Information Services

Course” whereby we create awareness for various e-resources and in-house trainings from time to time. Under this course, we teach: e-library, Internet base services, Online e-Resources/ e-Database etc., CeRA , Krishikosh, Open Access Sources, OPAC (Online Public Access Catalogue) and Catalogue, Classification etc. -to more than 250 PG students every year at our of “Library & Knowledge Centre-NavsariAgricultural University”.

- Book Exhibition gives motivation to read by offering them a wide selection of books to choose from, that they can look at before they decide to buy. Our book exhibition gives them an even bigger selection because we get books from many different publishers. This gives them the chance to instill a love of reading that lasts a lifetime. Our book exhibition helps teachers/faculties/our research students to see and buy books they might want for their classroom, reference or research. We are Succeeded in development of good Collection Development, by arranging book exhibition in University Library.
- Library user education programme has great importance to educate our readers about library culture. The systematic user education programme overcomes the lack of resources to optimum stylization of existing resources and services. We undertake a systematic programme of library orientation and extension lectures which gives results for their developing various skills and library ethics in their use. For this we take help of Lecture Method, Tutorials & Demonstration, Books & Printed Guides, Computer Aided Instruction, E-resources available at our source.

CONCLUSION

Libraries in general and academic libraries in particular worldwide are seriously trying to enhance the provision of information. However, the changes both in information technology and information needs of users, make it necessary to reassess and reengineer the work processes of the libraries, to enable them to achieve their institutional goal. BPR as a business-focused methodology for radical change works in collaboration with information technology. Library professionals should adopt BPR in their organization's portfolio of change management strategies to lead their libraries, into the future of continuing rapid developments in information technology, continuing fiscal restraint, and continuing increase in user expectations.

In today's knowledge economy, library and information services are viewed as saleable products. More importantly, libraries have started treating their users as 'knowledge customers.' Marketing is comprehensive term that describes all the processes and interactions that result in satisfaction for users and revenue and brand for the information institute. To have sustainable marketing strategy librarian must know his audience/readers to pass message. Root cause of failure should be analyzed in re-engineering, the ways and methods to avoid the risk should put forward with the help of SWOT analysis, the entire library system should be evaluated properly. To cope with the changing paradigm, librarians have to possess required knowledge and skills, to apply it in real field situation. The personal brand is an attempt to manage or control what people think of you and magnify the positive traits. In some ways it also works to improve quality or reputation on the line. Academic librarians can create most positive stereotype by customizing library and information services with their own flavor of personal brand, of long last relationship. We can say we became successful in "Re-Engineering of Library & Knowledge Centre-Navsari Agricultural University" with systematic implementation of methods and tools in Redesigning Library processes, revamping library facilities and reviving user's needs.

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ROLE OF EMERGING TECHNOLOGIES IN THE CHANGING SCENARIO OF AGRICULTURAL LIBRARIES

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ABSTRACT

This paper attempts to profile the role of emerging technologies in the changing scenario with special reference to agricultural libraries. Emerging web technologies like Web 3.0, RFID, Remote access and special initiatives by Indian agricultural libraries such as Agricat, IDEAL, CeRA, etc are also discussed.

Keywords: *Web Technology, WWW, Online Learning, Meta Data, AGRICAT, IDEAL, CeRA, RFID.*

INTRODUCTION

Today's, role of emerging technologies in libraries is becoming more important to fulfill the user need in digital era. It is obvious, without technical knowledge, library and information professionals find difficulties to play effective role in the present era of information technology. Hence, there is an urgent need to transform the way of delivering knowledge based services.

Today's emerging IT technologies and web based digital information can be more effective and useful for the users and also to the librarians in order to disseminate the information. Therefore, libraries and information centers are becoming powerful platforms of knowledge sharing.

Age of Web Technology

Web technology is a collaborative name mainly for World Wide Web (www). It tends to focus more specifically towards technology for creation, maintenance, development and support for web-based applications.

World Wide Web

An information system on the Internet which allows documents to be connected to other documents by hypertext links, enabling the user to

search for information by moving from one document to another. Other sense, it is interlinked hypertext documents using by internet. In WWW the web browser easily find web page, contain text, images, video and through hyperlink.

Web 1.0: First implementation of the web and first stage in the World Wide Web, which was entirely made up of web pages connected by hyperlinks i.e. HTML, HTTP, URL.

- Static IP content based web page and hyperlink for read anywhere any time online information easily depended on web designer without dynamic presence.
- Web 1.0 one directional and used for read only.
- Static sites (not dynamic site) and they are only information resources
- Example- Role of librarian in web 1.0: Creation of websites, Creation of hyperlinks

Web 2.0: Second generation of web and it is a platform where more interaction with minimum control for collaborate work.

- It is also called Web 2.0 Social Web. Facilitate for collective work and useful for social networking for information exchange.
- Web 2.0 have a dynamic content with blog.
- Web 2.0 used for read and write.
- Rich internet application-Experiences, brought from desktop to browser
- Web oriented architecture-web services, RSS feeds
- Web 2.0 is flexible in web designing, modification, updating, content generation etc.
- Social web-personal digital photo

Characters Web of 2.0 - Search, Finding information through key word search, Blog-searching blog. Web application- apps Tag, Signal, Authoring, Link to other websites, Flickr, You tube, Amazon, Slide share etc.

Web 3.0 The Web 3.0 known as the **Semantic Web** for online learning.

- Web 3.0 technology is using for continue to develop for online instructoring.
- Web 3.0 provides Semantic social information and

- Web 3.0 working Multi-user virtual environment.
- Web 3.0 worked on Open Source Software Platform Koha etc

Emerging Technology

Blog, Wikis: RSS-Desktop Social Networking, Instant messaging, Podcasting, FOLKSONOMIES Tagging keywords on websites, Social Bookmarks, Twitter, Toolbars, video you tube, Tool bars, Photo, Library thing, Blog , Web OPAC , Video, U Tube, Twitter, Web base – online aggregators, create account to access, Mobile, Borrower and email client

Blogs: Blogs provide commentary or news on a particular subject, other function as more personal online dairies. A typical blog combines text, images, and links, to other blogs, Web pages, and other media related to its topic. The ability of reader to leave comment in an interactive format is an important part of many blogs. In nutshell blogs are easy to manage websites.

Application of Blogs in Libraries: Blogs serve as a platform where the users can file their concerns, queries and suggestions regarding the services and activities of the library

- Blog can also be used for the collection development where the users request the resources
- Blogs can be used as a tool for marketing of the information as well as the library.
- Can be used as a tool for posting Minutes of the Meetings for actions
- Blogs can serve as discussion forum

WIKIS: Wiki easily edited by any one, A web site that can be edited by any reader. Wikis offer the opportunity to share knowledge and information, but they are not usually considered “authoritative” or “scholarly”. Because people can invent facts or pass off ideas as facts on a wiki, they contain a lot of suspect information or cite sources, these are still not considered reliable or trustworthy.

Application of Wikis in Libraries: Wikis can be used for social interaction and discussion among the librarians & users as well. Promoting professionals develop with the creation of forums to exchange ideas on specific areas

- Freely accessible and open content on any given subject or concept for intermittent consultant

- An internal communication medium for sharing information amongst the library's staff
- Reference resources wiki can be built

RSS (Really Simple Syndication) RSS is structured XML-based metadata schema used to distribute news items, primarily through a web medium. The contents of the news items are organized into a set of standardized xml elements: title, link (URL), date of publication, description, language, webmaster, copyright, and several others.

Application of RSS (Rich Site Summary) in libraries: Announcement of the availability of new books and other resources in a given subject area

- Librarians can subscribe to RSS from the sources for compiling their customized alerts.
- Promote events organized in the library Users.
- Integrating library services through RSS feeds
- Announce availability of new research and learning opportunities in various academic/research

Instant Messaging (IM): IM is a form of real-time communication between two or more people based on typed text, images etc. IM has become increasingly popularly due to its quick response time, its ease of use, and possibility of multitasking. It is estimated that there are millions of IM users, using for various purposes viz: simple requests and responses, scheduling face to face meetings, or just to check the availability friends.

Applications of Instant Messaging: Instant clarifications for the Questions from users and vice versa.

- Online meetings
- For providing virtual services

Podcasting: A podcast is a series of audio or video digital-media files which distributed over the Internet by syndicated download, through web feeds, to portable media players and personal computers.

Application of Podcasting in Libraries: The library that works hard to produce audio content such as recording of programs or library tours, podcasting can be effective means of making that content more widely available

- Podcast highlights about new resources

- Podcast enables librarians to share information with anyone at any time.
- Podcasting can be a publishing tool for users and librarians' oral presentations

Tagging: A tag is keyword that is added a digital object (e.g. a website, picture or video clip) to describe it, but not as part of a formal classification system. The concept of tagging has been widened far beyond website bookmarking and services like Flickr (Photos), you tube (video) and Audio (podcasts) allows a variety of digital artifacts to be socially tagged.

Applications of tagging in libraries: Tagging can be applied to the Learning Management Systems (LMS) for editing the subject headings from the user point of view and thereby enhancing the indexing and relevancy of the searches, making the collection more dynamic. Tagging would greatly facilitate the lateral searching

Social Bookmarks/Networking sites: Social Bookmarking is a method for Internet users to share, organize, search, and manage bookmarks of web resources. Unlike file sharing, the resources themselves aren't shared, merely bookmarks the reference them.

Applications of Social Bookmark in libraries: Simplifying bibliographic distribution lists, users can describe them by providing specialized knowledge.

- Elaborating link services recommended from specific fields of knowledge
- Sharing resources with other users who are using them for research
- Promoting participation and interactive with users

Applications of Social Networks in libraries: Libraries can create a page to reach to new users: Social networking could enable librarians and patrons not only to interact, but to share and change resources dynamically in an electronic medium:

For building network the interested group in discussing the common interest .User content can be added to the library catalogue, including users book reviews or other comments

Remote Access: Remote access is the ability to get access to a computer or a network from a remote distance. It's ability to access and use digital information from a location off-site from where the information is physically located.

Library Resources: Electronic-books, Electronic journals, Electronic thesis and Dissertation, Electronic Lecture notes and course materials, Electronic Internet sites

Library Services for Remote Access: Catalog, Reference, Research Guides, Information Delivery

Library Information: Contact information, Operational Hours, Policies, Linkage from University Homepage

Cloud Computing: Cloud computing is a paradigm in which information is permanently stored in servers on the internet and cached temporarily on clients that include desktops, entertainment centers, table computers, notebooks, wall computers, hand held , sensors, monitors, etc. Cloud computing conveys the use of information technology services and resources that are provided on a service basis.

Cloud Computing Application to the library: Hosting library websites, backing up media collections, or storing and accessing bibliographic data

- Visit to libraries, focus groups and over a decade of engagement in the library automation world
- Understand the importance of personalization .(OPAC)
- Understand that the cloud may also be a valuable information resource (via face book, blog)
- Understand converged devices are everywhere (iphone)

Semantic Web: The base of the Semantic Web is data integration. By using metadata, “display only” Data is converted to useful information which can be located, evaluated, and delivered by software agents. Web 3.0 technologies will assist online instructors in the areas of course development, learner support, assessment, and recording. Online users will benefit through semantic web. But Semantic web www contains millions of page. Semantic Web The base of the Semantic Web is data integration. By using metadata, “display only” data is converted to meaningful information which can be located, evaluated, and delivered by software agents. Web 3.0 technologies will assist online instructors in the areas of course development, learner support, assessment, and recording. Online users will benefit through semantic web. But Semantic web www contains millions of page. Features Semantic web-Next evolution of web. Improved web technologies in order to generate share connect content through search and analysis base Artificial intelligence-Robot Computer, mobile can understand information like humans in order to provide faster and more relevance result

- 3Dgraphics: three dimensional design is being used extensively in website in web.03 museum guide, library guide, computer game, e commerce, geospatial context
- Connectivity: Information is more connected through segmented metadata
- Presence in everywhere. Content is accessible by multiple application. Every device to be connected through web. Services can be used every where
- The Semantic Web is the extension of the World Wide Web that enables people to share content beyond the boundaries of applications and websites.
- Semantic Web describes methods and technologies to allow machines to understand the meaning or semantics of information.

Emerging Technologies in Agricultural Libraries

In agricultural libraries, emerging technologies uses as a digitization of resources, availability of resources on Website, Libraries Available on URL,, LIS Operation with Open Source Software, Data arrangement, classification, Data, Metadata, Data conversion and data entry in MARC, bar-coding, Circulation Self Check and Self Out, Drop Box, Browsing, Retrieval, E Resources, E Books, E-Journals, Online Journals, Use of Databases, Online Sharing, Alerts Overdue, DDR, Web browsing, Online Journals, Consortium for e-Resources in Agriculture CeRA@JCCC (CeRA), Jgateplus, , e-Granth, Krishikosh, Institutional repository Union Catalogue (Agricat 2.0), E-Krishisiksha, CAB Abstracts, e-Thesis Repository, Theses Database, Book Database, Journal database, Krishikosh, AGRICAT, Libraries available on IDEAL platform, online database, e Book/ e-Library Krishi Portal, e-Resources, Online Public Access Catalogue (OPAC), In house Repository, Online library information, Barcode based circulation, Reading services/Loan privilege, e-Bank, e- service, e-Documentation Services, e-Bibliography and Abstracting Services, Reference Services, Online Awareness Training Programmed, e-portal, e courses for UG, PG and Ph.D. Students. RFID, Video Conferencing, Massive Open Online Courses, Online Research Guidance, Use of Social Networking, Use of Whatsapp, Mobile Apps, Library apps, Krishikosh Mobile apps, Face Book, Twitter, Messenger, emails for dissemination of information, Translator, Use of Search Engines, Browsers for Surfing, Smart Classroom for delivering Lectures, Multimedia, RFID, Ezpoxxy For Remote Access, Anti Plagiarism tools etc.

AgriCat: AgriCat is the Union Catalogue of the holdings of major libraries of the ICAR Institutes and SAUs. It has been created with the partnership of OCLC WorldCat. The IGKV Library is also a member library of egranth. www.agricat.worldcat.org

Consortium for e-Resources in Agriculture (CeRA): The ICAR has provided Consortium On-line e-Resources service called CeRA (Consortium for e-Resources in Agriculture) under NAIP project from 2008 onwards. It is providing access to thousands journals in Agriculture and allied disciplines. The user ID and Passwords have been circulated to all the Colleges of the University, Research Stations and also to all the patrons of the University to utilize the e-Resources effectively. www.jgateplus.com

Krishi Kosh: KrishiKosh is an Institutional Repository under National Agricultural Research System (NARS). The repository of knowledge in agriculture and allied sciences, having collection of old and valuable books, records and various documents spread all over the country in different libraries of Research Institutions and State Agricultural Universities (SAUs). More than one lakh thesis up lode of in this repository <http://krishikosh.egranth.ac.in/>

Integrated Digital Ensemble of Agricultural Libraries (IDEAL) <http://ideal.egranth.ac.in/>:

IDEAL is a ready platform for Agricultural Libraries of Indian National Agricultural Research & Education System (NARES) which enables them to adopt Integrated Library Management System for their day to day operations of all their library functionality. It is a software platform built on 'Software as a Service' (SaaS) concept to provide hassle free, ready to use, international standards based platform for sharing library holdings through an union catalog (AgriCat). An integrated digital library delivered at the desk of researchers, faculty and students of NARES can definitely boost the quality of research output and save time. A robust set of servers along with failover servers operational at the data centre of ICAR-Indian Agricultural Research Institute (IARI), Pusa, New Delhi provide hosting facilities for customized Koha open source software running independent instances for each library. Any library under NARES willing to be part of IDEAL needs to bring their catalog data to standard format and learn how to use Koha ILMS for library functioning.

E-Learning Portal on Agricultural Education (e-Krishisiksha): Education Division undertakes planning, development, coordination and

quality assurance in higher agricultural education in the country and, thus, strives for maintaining and upgrading quality and relevance of higher agricultural education through partnership and efforts of the components of the ICAR-Agricultural Universities (AUs) System comprising State Agricultural Universities (SAUs), Deemed to be universities (DUs), Central Agricultural University (CAU) and Central Universities (CUs) with Agriculture Faculty. Under financial support of NAIP, all the e-Course Contents available on this website have been developed by subject matter specialist of the respective disciplines at State Agricultural Universities in India and Deemed Universities of ICAR, New Delhi. The courses material is prepared as per ICAR approved syllabus for the benefit of under-graduate students already enrolled in Indian Agricultural Universities.

Agricultural Database CAB Direct Online: CAB Direct is CABI's online database platform, providing a single point of access to all of your CABI database subscriptions. CABI has worked with development partners from across academia and industry to develop the next generation of the CAB Direct platform. Designed around the way researchers work, CAB Direct has completely new features to help you get more out of the literature, a more intuitive user experience, and has a new look and feel. CAB Direct is the only online platform built specifically to help you get the most out of CABI's world class databases, CAB Abstracts and Global Health. Through CAB Direct we can access to: over 11.5 million bibliographic records, over 350,000 full text articles hosted by CABI and many other authoritative reviews, news articles and reports www.cabdirect.org

Science Direct: is a website which provides subscription-based access to a large database of scientific, agricultural and medical research. It hosts over 12 million pieces of content from 3,500 academic journals and 34,000 e-books. The journals are grouped into four main sections: *Physical Sciences and Engineering*, *Life Sciences*, *Health Sciences*, and *Social Sciences and Humanities*. Article abstracts are freely available, but access to their full texts generally require on subscription basis. www.sciencedirect.com/

E-Books Agricultural Libraries have e-Books on Agriculture and allied sciences which can be accessed through I.P. and User ID and Password

basis. The e-Books are very much useful to the Teachers, Scientists, Extension Specialists and Students to browse the important content on agricultural and allied sciences.

www.crcnetbase.com, www.kopykitab.com asapglobe.com: Agricultural Libraries have e-Books on Agriculture and allied sciences which can be accessed through I.P. , mylibrary Agricultural Libraries have Pearson e-Books on Agriculture and allied sciences which can be accessed through I.P., e-Books Taylor & Francis <http://crcnetbase.com/>, e-Books CABI www.cabi.org/cabebooks/, Elsevier e-Books/e-Books on SciVerse Science Direct www.sciencedirect.com, Astralebooks.com astral e-Books on Agriculture and allied sciences which can be accessed through I.P., IndiaStat & AgriStat- Statistical Database: indiastat.com is an authentic storehouse for socio-economic statistics about India. Provides statistical data, current happenings with a statistical approach, articles from scholars on subjects of social and economic importance etc. www.indiastat.com. DELNET: Provides access to more than two crore bibliographic records of books, journals, articles, CD's etc. The internet Library Loan/document Delivery Services are one of the most popular services of DELNET. The main objectives of DELNET are to promote resource sharing among the Member-Libraries by collecting, storing and disseminating information by offering networking services to users. <http://delnet.nic.in/>& connectivity with other library network NDL etc.

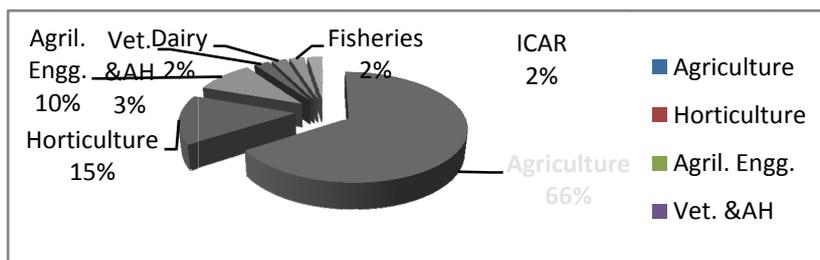
EZProxy: The Agricultural Libraries has implemented EzProxy middleware software to provide remote access to web-based licensed resources offered by the library. The server authenticates library users against local authentication authorization. It is useful to access all the Library subscribed on line resources in a single platform.

Other technologies Mobil apps, Internet, Online Collaboration, RFID, Self services Circulation, KOHA ,Online DDR, Copying Scanning, Metadata, ICT, IPR, Information Literacy, anti plagiarism software, Virtual and Remote Services, Web design etc.

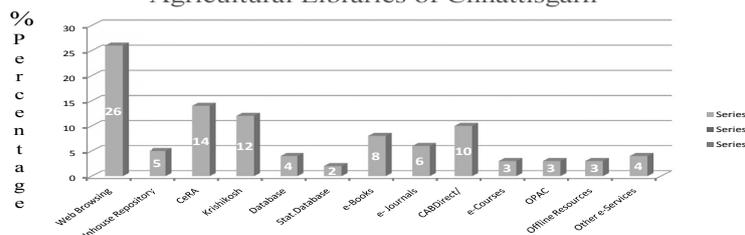
Status of Agricultural Libraries in Chhattisgarh: In Chhattisgarh 42 agricultural libraries are functioning under IGKV and CGKV in following manner.

S.No.	Name of Library	No. of Libraries
1	Indira Gandhi Agricultural University (IGKV)	01
	• College of Agriculture Libraries	26
	• College of Horticulture Libraries	06
	• College of Agriculture Engineering Libraries	04
2	Chhattisgarh Kamdhenu Vishwavidyalaya (CGKV)	01
	• College of Vet. & Animal Husbandry	01
	• College of Dairy & Food Technology	01
	• College of Fisheries	01
3	National Intt.of Biotic Stress Management(ICAR) Library	01
	TOTAL	42

% Wise Status of Library In Chhattisgarh



Uses of Emerging Technology in Agricultural Libraries of Chhattisgarh



During the recent study analysis of e-Resources use pattern in the Nehru Library, found i.e most of the user use library for web browsing and e-Resource facility that is, CeRA, Krishikosh and eBook and online journals.



USES OF EMERGING TECHNOLOGIES IN AGRICULTURAL LIBRARIES OF CHHATTISGARH

Points of Attention

Library professionals should give emphasis on:

- Mind set for bringing change
- User needs, reading habits and learning process
- Library activities and its services in present scenario
- Library professionals should give emphasis on information resources/e-Resource /digitization Emphasis on operation the technology
- Emphasis on automation using hardware and LMS software in library services
- Emphasis on service design and delivery/ website / Union Catalogue/IDEAL/ /Document Delivery services, Repository
- Vision of e-Library, digital or virtual library
- To think differently and inspire others to think differently,
- User oriented library services not document oriented
- Knowledge of World Wide Web and web 1.0, Web 2.0 Web 3.0 and Semantic Web
- Knowledge of metadata creation.
- Marketing Library and Information Services/ OPAC/website
- Library Services at user work place and beyond the borders.
- Uses of learning tools in library services; Mobile, kindle, laptop eBooks/e-resources/ e-Book Readers, Zoom-Ex Instant Text Reader
- Access of Library Services all time 24X7
- Motivate for the use of electronic information Services
- E-Database Services-Document Delivery Services
- E-Mail ,E-CAS & SDI Services, E-Indexing, Abstracting Services E-Reference Services
- Freedom for use of scanning and reading appliances, reading machine, PC, Projector, Screen reader. Talking Books: Talking news papers, Voice Reorganization: Note pad etc.

- Learning resources like books, journals, database and other relevant information sources should be made readily available for use with the help of IT Tools in digital form.
- Concentrate transforming Library Services to end users
- Subject/Research Guide to connect all resources by Subject-wise at one place
- Creation of library Website with hyperlink
- Mobile Applications, QR Code, etc.
- Open Access to all institutional repositories
- User Awareness Programme (UAP)/ User Orientation Programme (UOP)
- Self issue/return circulation, Online reserve/renew documents RFID
- Information KIOSK
- New Arrivals Alert of Books & Periodicals E-Newsletter (Monthly) • Alerts Overdue,
- Conducting workshops, seminars
- Subject / Research Guide/ Library Blog LibGuide and
- Emphasis on team work
- Library services provide in collaboration mode with using information technology, networking, consortium and resource sharing in digital mode etc.
- Librarian should emphasis more use of E-resources
- Support literacy
- Create digital literacy in the community
- Focused on Diversity
- Focused on Metadata skills
- Cooperation: Much more cooperation needed in Digital era.
- Open protocols: Open protocols need to have open protocols for server/browser connection, deal effectively with small customers.
- Ability to Adopt New Technologies
- Troubleshooting New Technologies
- Database Development
- Digital Archiving and Preservation

- Use of e-Resources-e-Books, e-Journals, online/offline books, journals and other e- resources, etc.,
- Web Based Collection: Good Website, and essentiality of Online Public Access Catalogue (OPAC)
- Metadata Base Catalogue: Cataloguing in Modern Form
- E-Repository: Institutional Repository will be strengthened i.e. Krishikosh, Shodhganga, and Shodhgangotri.
- Consortium: The library consortia will be strengthened i.e. Consortium for e-Resources in Agriculture, UGC Info net, INDEST, and ERMED.
- MOOCs: Massive Open Online Courses (MOOCs) are free online courses available for anyone to enroll. MOOCs provide an affordable and flexible way to learn new skills, advance your career and deliver quality educational experiences at scale. MOOC.org is an extension of edX, a leader in online learning and education
- Remote Access Library: EZproxy access and authentication software allows libraries to deliver to e-content simply and effectively. EZproxy facilitates a single sign-in to e-content using existing library-issued credentials, such as a library card number and PIN or username and password.

CONCLUSION

Up gradation of technology is never ending process. Earlier libraries were using web services to provide online services but in present scenario, emerging technology in agricultural libraries functioning as a tools to bridge the gap between the library professionals and the user. Need, to provide quick information, everywhere at any time to users, library professional should think beyond the boundary. Overall it can be concluded that, library and information professionals can play a vital role for the changing scenario of libraries if they update themselves according to uses of emerging technologies. Certainly, in era of web technology, library and information services will tremendously improved.

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10. E-Learning Portal on Agricultural Education <http://ecourses.iasri.res.in/>
11. FAO: Food and Agricultural Organization of the United Nations <http://www.fao.org/home/en/>
12. <http://cera.iari.res.in/index.php/en/> AGRICAT <http://egranth.ac.in>
13. IDEAL Indian Digital Ensemble of Agricultural Libraries <http://ideal.egranth.ac.in/>
14. IGKV Digital Library : e-Books, <http://igkv.kopykitab.com/> ,
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17. Indian Council of Agricultural Research Journals
<http://epubs.icar.org.in/ejournal/>
18. Indira Gandhi Krishi Vishwavidyalaya <https://igau.edu.in>,
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RFID TECHNOLOGY

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ABSTRACT

A library is a growing organism. As it grows in size the problems associated with the maintenance and security of the documents also grows. The researchers have always helped the librarian in solving their problems. To solve the problems of arranging documents in order they have given classification scheme. To solve the problems of searching documents they have given cataloguing guidelines. To automate the counter activities they gave us bar-codes. Bar-codes have served the librarians and libraries for a long time, and now it is slowly getting replaced by RFID (Radio Frequency Identification).

Keywords: RFID- COMPONENTS; RFID-TAGS

INTRODUCTION

RFID (Radio Frequency Identification) is the latest technology to be used in library theft detection systems. Unlike EM (Electro-Magnetic) and RF (Radio Frequency) systems, which have been used in libraries for decades, RFID-based systems move beyond security to become tracking systems that combine security with more efficient tracking of materials throughout the library, including easier and faster charge and discharge, inventorying, and materials handling.

RFID is a combination of radio-frequency-based technology and microchip technology. The information contained on microchips in the tags affixed to library materials is read using radio frequency technology regardless of item orientation or alignment (i.e., the technology does not require line-of-sight or a fixed plane to read tags as do traditional theft detection systems) and distance from the item is not a critical factor except in the case of extra-wide exit gates. The corridors at the building exit(s) can be as wide as four feet because the tags can be read at a distance of up to two feet by each of two parallel exit sensors.

RFID in Libraries

Librarians are always known as early adopters of technology, as seen in case of Computer and later in case of Bar-codes. Later have seen

standards like MARC and OCLC becoming popular among libraries for sharing bibliographic information with other libraries. The last decade have seen various library automation software being emerging as next wave of automation in libraries. Today patrons can visit library's catalogue any time they wish to with use of library's website.

Library communities have always shown eagerness in experimenting new technology and have improved patron services today as a result of those efforts. RFID Technology is going to be next wave to automation in Library industry. RFID plays vital role in redefining the library process to make everyone's job easier right from patron to library staff. RFID provides a platform to automate most of the process performed by the library staff like Check in – check out, sorting, stock management and inventory. Library staff whose job is meant to be helping patron, use library resources at the fullest, is always busy handling the books. RFID helps to automate this process and provides them an opportunity to better utilize their time in serving patrons.

Components of an RFID System

A comprehensive RFID system has four components:

1. RFID tags that are electronically programmed with unique information
2. Readers or sensors to query the tags
3. Antenna produces radio signals to activate the tag
4. Server on which the software that interfaces with the integrated library software is loaded.

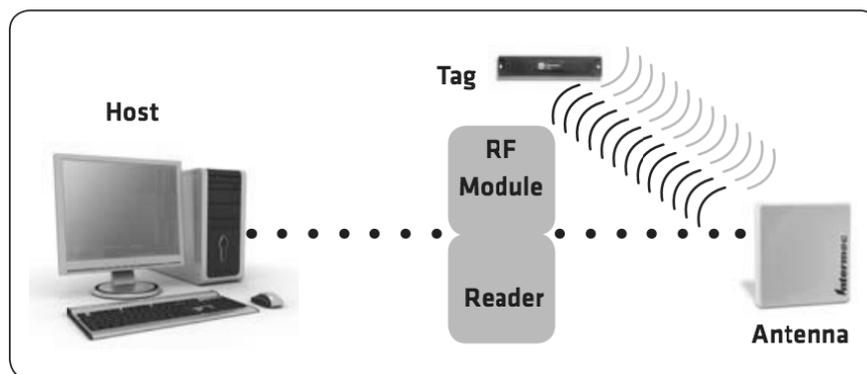


Fig. 1 RFID System Components

RFID Library Management System

Using RFID in libraries saves library staff's time by automatizing their tasks. An establishment that uses RFID library management saves a book reader, precious time that he would have been spent, waiting for his turn in a queue for borrowing or returning a book. Taking care of books and making them available to the book readers are important tasks. Most of the library staff's time is spent in recording information of incoming and outgoing books.

Borrowing and returning of books can be fully automatized with the help of self checkin/out systems. This system involves installation of special software. A person using this system to borrow books, is presented with options on a computer screen. The person has to identify himself with a code, which is preferably a personal identification number, or any form of unique identity code. Books selected by the person are identified by the system's built-in RFID reader. And, the surveillance bit in the book's tag is deactivated by the system. When a book is returned, the check-in/out system activates the surveillance bit.



Fig. 2 RFID Library Management Systems

1. **Tagging:** RFID tags have been specifically designed to be affixed into library media, including books, CDs, DVDs and tapes. It is thin, flexible and thus can be laminated between paper and plastic. With special method to attach to books, patron is totally unaware that the tag is there.
2. **Book-drop/Return Station:** The Book Drops can be located anywhere, within or outside the library. Possible remote locations outside the library include MRT/ train stations, shopping centers,

schools, etc. This offers unprecedented flexibility and convenience of returning library items at anytime of the day, even when the library is closed.

3. **Self Check-in/Checkout Station:** The Patron Self Check-out station is basically a computer with a touch screen and a built-in RFID reader, plus special software for personal identification, book and other media handling and circulation. After identifying the patron with a library ID card, a barcode card, or his personal ID number (PIN), the patron is asked to choose the next action (check-out of one or several books). After choosing check-out, the patron puts the books in front of the screen on the RFID reader and the display will show the book title and its ID number (other optional information can be shown if desired) which have been checked out.
4. **Anti-theft Detection:** The EAS Anti-Theft Gate is used to detect RFID tag that is equipped with EAS (Electronic Article Surveillance). It can detect the RFID tags within 1 meter range without interference of magnetic items, upon detecting of Armed RFID tags, the alarm will sound on the gate. It has option to trigger a Camera to record patrons who trigger the alarm to the Surveillance Station.
5. **Shelf Management Solution:** The LibBest™ Shelf Management Solution makes locating and identifying items on the shelves an easy task for librarians. It comprises basically of a portable scanner and a base station.

The solution is designed to cover three main requirements:

- Search for individual books requested
- Inventory check of the whole library stock
- Search for books which are miss-helved

Advantages of RFID in Libraries

- **Reliability:** Correctly operating readers and tags can have near 100% detection rates. Since the tags and sensors communicate with the Integrated Library System (ILS) it is possible to know exactly which items are moving out of the library. The high reliability is especially important when RFID is used in theft detection.
- **High-Speed Inventorying:** A unique advantage of RFID systems is their ability to scan books on the shelves without tipping them out or removing them. A hand-held inventory reader can be moved rapidly across a shelf of books to read all of the unique identification information. Using wireless technology, it is possible

not only to update the inventory, but also to identify items which are out of proper order.

- **Long Tag Life:** RFID tags last longer than barcodes because nothing comes into contact with them. Most RFID vendors claim a minimum of 100,000 transactions before a tag may need to be replaced.
- **Automated Materials Handling:** Another application of RFID technology is automated materials handling. This includes conveyor and sorting systems that can move library materials and sort them by category into separate bins or onto separate carts. This significantly reduces the amount of staff time required to ready materials for reshelving. Given the high cost of the equipment, this application has not been widely used.

Disadvantages of RFID in Libraries

- **High Cost:** The major disadvantage of RFID technology is its cost. While the readers and gate sensors used to read the information typically cost around \$2,000 to \$3,500 each; and the tags can cost as little as 10 cents or as much as \$50 depending on the type of tag, the application and the volume of the order.
- **Accessibility to Compromise:** It is possible to compromise an RFID system by wrapping the protected material in two to three layers of ordinary household foil to block the radio signal. It is also possible to compromise an RFID system by placing two items against one another so that one tag overlays another. That may cancel out the signals. This requires knowledge of the technology and careful alignment.
- **Lack of Standard :**The tags used by library RFID vendors are not compatible even when they conform to the same standards because the current standards only seek electronic compatibility between tags and readers. The pattern of encoding information and the software that processes the information differs from vendor to vendor, therefore, a change from one vendor's system to the other would require retagging all items or modifying the software.
- **Removal of Exposed tags:** RFID tags are typically affixed to the inside back cover and are exposed for removal. This means that there would be problems when users become more familiar with the role of the tags. In Indian libraries, it is a major challenge to keep the tags intact.

CONCLUSION

The RFID system is a comprehensive system that addresses both the security and materials tracking needs of a library. It is important to educate library staff and library users about RFID technology before implementing a program. RFID technology introduces an ethical dilemma for librarians. The technology allows for greatly improved services for patrons especially in the area of self check out, it allows for more efficient use of professional staff, and may reduce repetitive stress injuries for library workers. RFID technology is not only emerging but also more effective, convenient and cost efficient technology in library security. This technology has slowly begun to replace the traditional barcode on library items. The RFID tag can contain identifying information such as a book's title or material type, without having to be pointed to a separate. The information is read by an RFID reader, which replaces the standard barcode reader commonly found at a library's circulation desk.

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MOBILE TECHNOLOGY AND ITS APPLICATIONS IN LIBRARY SERVICES: FEATURING CHANDIGARH UNIVERSITY

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ABSTRACT

The development of information and communication technologies (ICT) has changed applications in the library from the traditional library to the hybrid digital library, then automated file stages, web 2.0 library and mobile phone services. Nowadays, cell phones have become the essential part of human life for communication and also helps the students in e-learning. In this paper mobile technology has been discussed and focus on its application and challenges in library services. With the help of mobile devices, libraries can produce new services and provide faster access to their collection. The participation of mobile library services has created opportunities and challenges for academic libraries.

Keywords: Mobile Technology; Mobile Library Services

INTRODUCTION

In the era of the explosion of information, it is difficult to provide users with the information they need at the right time. Mobile technologies have made access to communication and information very convenient and timely for users in their homes and offices and anywhere they travel with their mobile phones or PDA (Personal Digital Assistants). Mobile devices are truly personal devices. Search histories and physical locations can be used to produce more accurate and personalized information and services.[1] It is estimated that the world will have 4.68 billion mobile users by the end of 2018 [2]. India has over 775.5 million mobile users in 2018 [3].

Mobile technology has now developed the trend of "Libraries in hand". Mobile devices can access information from the remote source in a very short time. At present, many university and university libraries have a digital collection and are accessible through computers. However, since mobile phones can be used as a good alternative to access digital

libraries. Digital collections may be available through the digital library on users' mobile phones [1].

ICTs have removed all barriers and promoted rapid cross-border communication. Addressing the fundamental challenges of life and responsibility has informed the invention and use of information technology. These support library-to-user, user-to-library, and user-to-user interactions online. It is possible thanks to the global mobile communication system (GSM). Mobile phones have revolutionized everyday life around the world [4].

Mobile devices and services offer great flexibility for those who wish to use library services. With a simple 3G/4G connection, a user can access eBooks and multimedia content from anywhere through the virtual library. Smartphone's can access networks and stream content on a network, provide on-demand content and make a hard copy of the content superfluous[5].

2. LIBRARY SERVICES WITH MOBILE DEVICE

In the age of information and communication technology, university libraries changed its services and housekeeping operations for providing access to its collection. Libraries are deeply interested in information dissemination channels, such as mobile phones, telephone lines, cellular networks and the Internet. Academic libraries have been challenged to meet the needs of their users because their target market (researchers, teachers, university students and graduates) is highly demanding and dynamic. The Internet and the World Wide Web (www) have allowed university professors, researchers and students to find what they need without having to go to the library. Like most service institutions, university libraries must participate in the marketing of their products and services. From the point of view of marketing communications, the challenge for most libraries is to attract users to the library.

Mobile phones and email are important tools to facilitate timely processing and answer questions from users inside and outside the library user community. Most university libraries have their own telephone line, which is used primarily for administrative purposes and is located in the library administrator's office. Mobile phones can be used at the offices that request it. Short message services (SMS) or text services available on all mobile phones can be used to instruct users of university libraries about upcoming events and new arrivals. University libraries should be aware of the changing needs of their clientele. Renewal notifications can

be sent to alert users that books arrive almost due or late. Mobile websites offer free text messages for mobile services on the Internet [1].

3. ADVANTAGES OF MOBILE PHONE SERVICES

3.1 Mutual Capabilities

The mobile web provides users with quick access to information and allows them to interact with library staff for specific references outside the library[1].

3.2 Easy to Access Information

Through the mobile web, the user can access the information anywhere and at any time, and will be of great help to users who cannot visit the library in person and provides a constant link to the required information resources[1].

3.4 Time Saving

Mobile devices provide users with navigation and search of library resources. Users do not have to wait for the library transaction counter to renew / reserve books and then save the user's time[1].

3.5 Personalized Service

The mobile library service is a specialized and personalized service that allows you to interact with library professionals and obtain specific references[1].

3.6 User Participation

Libraries can enrich the OPAC by allowing users to incorporate content created by the user, such as notes or images uploaded by users[1].

3.7 Fulltime Access

All online resources available on the desktop are also accessible through a mobile device [1].

4. MOBILE LIBRARY SERVICES BY MOBILE TECHNOLOGY

4.1 SMS Notification Services

Libraries can provide alerts to the latest news, events and SMS and MMS updates wherever they are going. Users can receive instant notifications with notice alert such alert as about new arrival of documents with returns from the user, information about the availability of reserved documents for collection, evaluation of overdue books, unpaid fines, reminders to return library items, renewal of books, library brochures,

subscriptions to electronic publications, schedule changes, information about important events, loan request. It can be used to disseminate information about newly acquired documents, regardless of the forms. These warning notifications can be generated automatically using an integrated library management system / software. SMS messages can be sent to a group of users simultaneously through many free applications and intermediate sites / clients [5].

4.2 E-learning, Distance Learning & Formal Education

The students are very versatile in the use of their mobile phones and several mobile applications. University libraries can take advantage of the orientation of the implementation of library services through mobile devices to support distance learning, formal education and research activities in an online learning environment by making information resources universally. Library services should also be integrated with the teaching and research practices of the institutes / universities, the scientific community or other clients that provide services [5].

4.5 Database Access

The library and institutions provide access to their databases and resources. The user simply has to enter the search terms and see the results designed specifically for mobile viewing. Libraries provide access to a variety of resources and databases. This service includes the OPAC (online public access catalog), integrated search and original document look. The OCLC's WorldCat mobile application driver allows users to search and find books and other available documents in their local libraries through a web application that can be accessed from a PDA or smart phone [5].

4.6 Personal Library

My library or a personal library has a virtual space where users can find and choose information and resources from their library. Users can read alerts, view records, renew resources, request articles, monitor interlibrary loans and document delivery requests, create e-mail notifications of new books and magazine articles, set preferences for searching for documents catalog, etc. Some mobile web service provides the personal library facility [5].

4.7 E-Resources with Mobile Interfaces

Some publishers already offer e-books (text and audio) accessible through mobile phones. Provides access to a variety of databases and digital resources such as e-books, electronic journals, web databases,

essays, and audio, books, streaming music, movies, images and databases of items that can be used on mobile phones. These collections can be downloaded from the library websites on users' mobile devices, or libraries lend mobile devices with collections already present on them. Libraries can use MMS on mobile devices to share photos, videos and audio. Most eBook publishers offer 24/7 access to library subscriptions from any campus internet terminal as well as mobile devices such as iPads, Android devices and Kindle [5].

4.8 Text Reference Service and Research Consultation

Library users can request anything from librarians with live chats and mobile text messages. Reference service can be provided by sending and receiving SMS. Immediate feedback is also possible from the user side. If the library receives a large volume of requests that require short answers, such as dictionary definitions, facts or service information, librarians can provide immediate answers and link to articles / references in real time. The library staff also provides a reference service to researchers via mobile phone. Researchers can interact with library staff for consultation and suggestions via mobile phones such as specific definitions and information content [5].

4.9 Library Virtual/ Audio Tours

The virtual / audio tours of the library, the education / incentive / orientation programs were enough significant in bringing non-users to libraries and also helping users or remote users located in different geographical locations. Library users who do not have the time or desire to attend an on-site workshop can access library tours on their mobile devices. The tours of the audio / virtual libraries can be produced quickly enough, at low cost, and could reduce the amount of time spent by staff to help new users navigate the library and explain the available facilities. It can be easily provided either as a download from the library website or on mobile devices [5].

4.10 QR Codes on Mobiles

The QR code is synonymous with "rapid response" and essentially two-dimensional barcodes that may contain any alphanumeric text often used to store URLs, text, etc., known as "mobile tags". Data can be translated into a QR code from any QR generator, many of which are available for free download. Users simply enter the data to be translated and the generator produces the code, which can then be viewed electronically or in print format. Decoding information can be performed with any mobile

phone camera that has a QR reader, available free online for most devices [5].

4.11 OPAC on Mobile Phones

Libraries can provide their catalog on mobile devices. Libraries must interact with software vendors to create WebOpac optimized for mobile devices. For example OCLC the WorldCat mobile application driver allows users to search and find books and more documents available in their local libraries through a web application that can be accessed from a PDA or a smart phone [1].

4.12 Journal Finder

Library Journal Finder provides access to full text journal, magazine, and newspaper content as well as links to titles held in print. For example, the American University Library offers the ability to search magazines/ journal using mobile phones [6].

4.13 News and Events

Information on job announcements, academic research contests, library events like orientation program, inventory verification, recall of books, thematic conferences relationships with academic work, awards and so on can be given using mobile devices for update the user's knowledge. Short messages on events and library news can be sent to users personally [6].

4.14 Suggest a Purchase

Librarian can receive the suggestions from the users via mobile phones. In such cases users need not to visit the libraries and write the requirements in a register [6].

4.15 RSS Feed

Users can subscribe to RSS feeds using software on mobile phones. When library updates any information, phone will be able to receive the new information [4].

5. LIMITATIONS OF MOBILE TECHNOLOGY

5.1 Defining Content for the Mobile library

Present mobile devices are limited by the speed to access internet connection, small screens, slow processing and limited storage capabilities. One of the most important barriers is the limited memory of mobile devices. An important factor in a successful mobile library is how

technology or media affects the information displayed, defining how much and what type of information is appropriate [1].

5.2 Design of the Format

The formation of contents is suitable for a desktop computer may not be suitable for a mobile device because of the limitation of a small screen size. Content for mobile display should be in smaller segments and information needs to be re-organized. Such as the size of the text, images, graphics and tables, and the size and physical location of the pop-ups will need to be redefined [1].

5.3 Separate the Content from the Format

The successful mobile library is one that should work for a wide range of devices. In other words, it should be device-independent. This goal can be solved by efforts to expand the functionality and flexibility of Web browsers that separate content from the format [1].

5.4 Display Models

This is an important challenge for library professionals to select display model because display models for various operating systems and browsers vary. Library should use a program to recognize if the device is a laptop or a mobile device. Next, the system chooses the appropriate style sheet and display model to specify the page view. Although both sets of style sheets and display models cause design and maintenance problems [1].

5.5 Lack of a Standard

Limitations in existing technologies, present operating systems and web browsers make a challenge for mobile library creators. Currently they do not have the capacity or flexibility for an application to display correctly on all devices. Mobile library developers must maintain a standard to properly display content on devices [1].

5.6 Managing of PDF Documents

The most mobile library has links to learning resources in Adobe PDF format. But, there is a problem to PDF support on Blackberry devices i.e. Blackberry user cannot view a PDFdocument using its web browser. To avoid this problem, documents widely used in the mobile library site are re-organized into HTML for viewing with a Blackberry [1].

5.7 Managing of Multimedia File Types

This is a major challenge for future development, because complex and large learning objects require Flash, Shockwave, Java applets and other plug-ins because the mobile library site contains links to a wide variety of audio and video files. There is problem to support audio/video for the model being tested and all of these may not work on the all mobile devices [1].

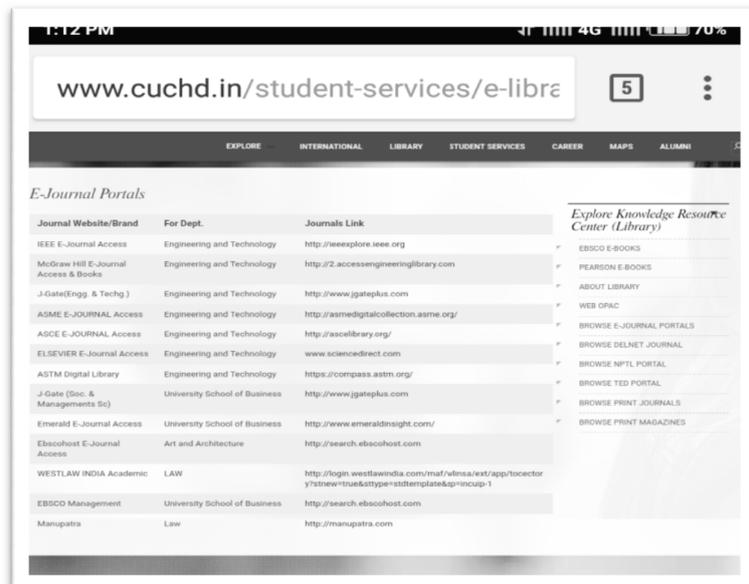
6. MOBILE WEBSITES

The Library websites (with or without OPACS) which are especially designed for viewing on mobile devices. Some companies and organizations also develop mobile versions of their Web site that are better optimized for viewing on mobile devices [7].

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- Medline Plus Mobile. The site also contains prescription drug information, medical dictionary, and current health news. Access: <http://m.medlineplus.gov>.
- World Cat Mobile. Search the World Cat catalog for books, movies, music, games, and more. Results include items available at local libraries.

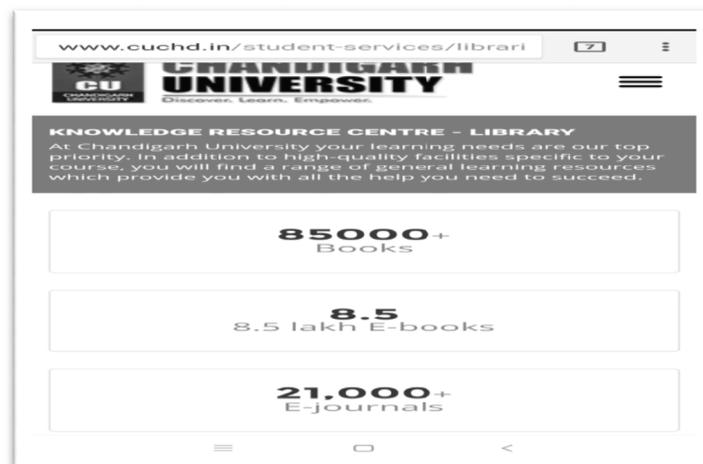
7. USE OF MOBILE TECHNOLOGY IN CHANDIGARH UNIVERSITY LIBRARY

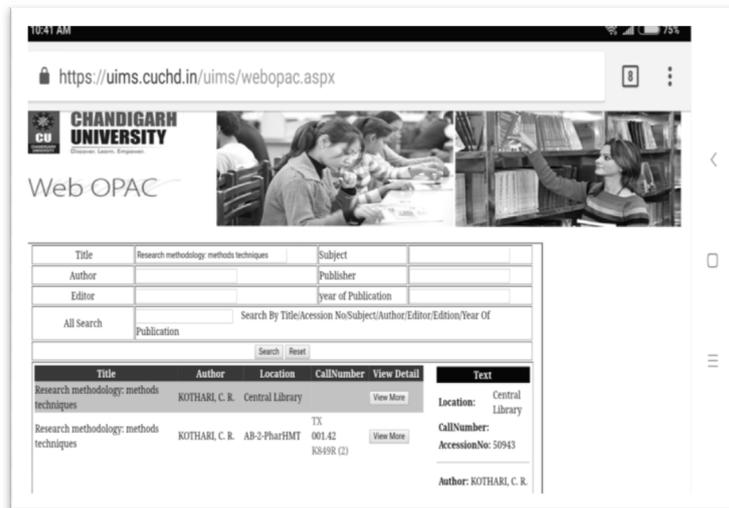
- Chandigarh university management also provides library services through mobile phones/tabs/laptops etc.
- It is providing various features to accesses information through mobile device which can access through LAN and Wi-Fi connectivity within the campus.
- It is providing 8.5 lakh E-books and 12 E-journal databases with 21,000+ E-journals. The students/ faculty/ staff can also access the resources of National Digital Library of India (NDL) which consist of 7 lakh books, 3 lakh research papers, 95,000 + theses [8].



Features of CU Mobile Web

- Web OPAC service
- E-resources access through Wi-Fi within the campus
- Get Status of Issued & history of books
- Get instant notifications/updates
- View/Update your Profile
- View Campus Daily Activities and Announcements





CONCLUSION

There is a growing influence of mobile technology in libraries, especially as regards access to the network. It is becoming more accessible and reliable and mobile applications have been widely accepted in teaching, learning and research. This trend will likely continue, and one way libraries can respond to this emerging trend is to make the library's website easily accessible via web-enabled mobile devices. Mobile devices can offer more opportunities for students to actively participate in their learning and participate fully in the social nature of learning. Librarians may encourage, through competitions or other means, the development of student applications that make the content and services of the library more useful to specific user groups [9]. Libraries should make informed choices about what they want to offer in this area and act accordingly and only time will tell if a fully mobile library, in terms of services and collections, will become a common place.

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FUTURE ACADEMIC AND RESEARCH LIBRARIES: TRENDS, TECHNOLOGIES AND CHALLENGES

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ABSTRACT

The paper reviews academic and research library's position with reference to the predictions made by the New Media Consortium (NMC) Report 2017. The article briefly describes to selected trends, technologies and challenges in academic and research libraries. The article infers that academic and research libraries are responding to the emerging trends through innovative practices and services. The paper predicts that there is a great scope for improvement in the services of academic and research libraries.

Keywords: *NMC horizon report; emerging trends – academic libraries; library technologies -development*

1. INTRODUCTION

The change is a law of nature and everything in this world keep changing. This is certainly applicable to the academic and research libraries. Like all other fields there are continuous changes in higher education too. But this time there are amazing changes in higher education due to the multifold, accelerated and wide affecting developments in the educational technologies.

The New Media Consortium (NMC) Horizon Report 2017 Library edition made certain predictions about the emerging trends, technologies and challenges in Academic and Research Libraries worldwide. The NMC Horizon Report: 2017 Library Edition was produced by the NMC in collaboration with the University of Applied Sciences (HTW) Chur, Technische Information Bibliothek (TIB), ETH Library, and the Association of College & Research Libraries (ACRL). The internationally recognized NMC Horizon Report series and regional NMC Technology Outlook series are part of the NMC Horizon Project, a comprehensive effort established in 2002 that identifies and describes important developments in technology and decision-making in education

around the world. The NMC Horizon Report 2017 library edition highlights six trends, six developments and six challenges in technology or practices that are likely to enter the mainstream the next five years (2017-2021). Total 18 topics selected by the 2017 Library Expert Panel related to applications of technology for learning, research, and information management are examined. The topics are placed directly in the context of their possible impact on the core missions of academic and research libraries, and detailed in succinct, non-technical, and unbiased presentations. Everyone has been tied to essential questions of relevance or policy, leadership, and practice. To plan for the future, it's important to look back. In reflecting on the three library-focused editions of the NMC Horizon Report, larger themes have emerged. Certain topics such as research data management and embracing the need for radical change reappear, regularly voted into the report by a now vast body of education leaders and technologists. The information below show the findings from the past two library editions as well as the 2017 edition. (In some cases, for consistency, the topic names have been slightly modified from the report where they originally appeared.) In observing the numerous overlaps from edition to edition, it has been noted that while topics may appear repeatedly, they only represent the broad strokes of library transformation; each trend, technology development and challenge evolves over time, with fresh perspectives and new dimensions revealed every year. For example, scholarly records today are not what they were yesterday. Progress in open access and new research formats have expanded the spectrum of possibilities for how information is stored, accessed, and communicated. Also noteworthy are topics that were almost included in the report. Because the expert panel votes on which topics they believe are poised for the deepest impact, some received many votes, but not enough to be featured among the 18 here.

2. OBJECTIVES

The paper aims to review academic and research libraries emerging trends, technologies and challenges identified by the NMC Horizon Report, 2017 library edition. The objectives of the present research are to identify which technological trends noted in the NMC Horizon Report 2017 library edition applicable to or have influenced academic and research libraries.

3. METHODOLOGY AND SCOPE

This paper is a 'literature review' paper and for this relevant literature has been searched by going through the NMC Horizon Report 2017. However, only selected literature is cited as evidences for expected predictions to the emerging trends in academic and research libraries. The NMC Horizon Report 2017 library edition identified total 18 expected trends, technology development and challenges. These trends, technology developments and challenges will have direct or indirect influence on academic and research libraries. Therefore, only those six trends are dealt in this paper.

4. GROWING TRENDS TAKING OVER ACADEMIC AND RESEARCH LIBRARIES

Spreading digital fluency is now a core responsibility of academic and research libraries, and Artificial Intelligence and the Internet of Things (IoT) are counterbalanced to amplify the utility and reach of library services like never before. These are just two of the revelations part of the New Media Consortium's (NMC) University of Applied Sciences (HTW) Chur, Technische Information Bibliothek (TIB), ETH Library, and the Association of College & Research Libraries' (ACRL) Annual Horizon Report: 2017 Library Edition.

The report, which decides the trends and technologies that will have a dramatic influence on academic and research libraries in the next five years. There were 75 experts composed of library leaders, librarians, technologists, industry leaders, and other key stakeholders from 14 countries—aims to help leaders seeking inspiration, models, and tactical insight around strategy and technology deployment for academic and research libraries.

Key trends accelerating technology: The trends that will affect technology use and adoption in academic and research libraries are:

(Short-Term, 1-2 years):

Research Data Management: The growing availability of research reports through online library databases is making it easier for students, faculty, and researchers to access and build upon existing ideas and work. "Archiving the observations that lead to new ideas has become a critical part of disseminating reports," says the report.

Valuing the User Experience: Librarians are now favoring more user-centric approaches, leveraging data on patron touchpoints to identify needs and develop high-quality engaging experiences.

(Mid-Term, 3-5 years):

Patrons as Creators: Students, faculty, and researchers across disciplines are learning by making and creating rather than by simply consuming content. Creativity, as illustrated by the growth of user-generated videos, maker communities, and crowdfunded projects in the past few years, is increasingly the means for active, hands-on learning. People now look to libraries to assist them and provide tools for skill-building and making.

Rethinking Library Spaces: At a time when discovery can happen anywhere, students are relying less on libraries as the sole source for accessing information and more for finding a place to be productive. According to an EBSCO survey on how college students conduct research, 68% start their research process by using Google and Wikipedia. As a result, institutional leaders are starting to reflect on how the design of library spaces can better facilitate the face-to-face interactions.

(Long-Term, 5 or more years):

Cross-Institution Collaboration: Within the current climate of shrinking budgets and increased focus on digital collections, collaborations enable libraries to improve access to scholarly materials and engage in mission-driven cooperative projects. Library organizations are also facilitating the sharing of e-resources. For example, members of the Lebanese Academic Library Consortium benefit from economies of scale through cooperative purchasing of subscriptions to major databases.

Evolving Nature of the Scholarly Record: Once limited to print-based journals and monographic series, scholarly communications now reside in networked environments and can be accessed through an expansive array of publishing platforms. “As different kinds of scholarly communication are becoming more prevalent on the web, librarians are expected to discern the legitimacy of these innovative approaches and their impact in the greater research community through emerging altmetrics tools,” notes the report.

5. IMPORTANT DEVELOPMENTS IN TECHNOLOGY FOR ACADEMIC AND RESEARCH LIBRARIES

Due to the trends currently affecting academic libraries, the technologies that all libraries should take note of include:

(Short-Term, 1-2 years):

Big Data: Libraries are ideally situated to serve academia, government, and business as information collectors, curators, and analysts. In particular, NMC Horizon Report 2017 mentions, “libraries can serve an integral function as collaborators and enable education institutions to make informed decisions that reflect and serve real learner needs.”

Digital Scholarship Technologies: Academic libraries are as focused on helping scholars understand new processes for research as they are in supporting the production of scholarly inquiry, requiring them to work with diverse workflows, tools, and content. One example of this new type of environment is the University of Leiden’s Centre for Digital Scholarship that recently opened in the Dutch University’s Library. Its focus is to support and facilitate research projects at the institution in conjunction with other research institutes and national and international support organizations. The Centre fields inquiries regarding the creation and management of digital collections, long-term preservation, and metadata, among other topics.

(Mid-Term, 3-5 years):

Library Services Platforms: Library services platforms (LSP) represent a “new conceptual approach to library automation, meeting current needs for a cohesive system that is web-centric, provides comprehensive print and electronic resources management, and keeps pace with the operational needs of changing library environments,” highlights the report. Stellenbosch University — First South African Customer to Choose Ex Libris Alma for Optimizing Library Services go.nmc.org/stellen Investing in Ex Libris Alma was a strategic decision for Stellenbosch University. The university plans to leverage the advantages of a unified library management system to better manage its print and electronic resources, improve user experience, and maintain its ranking as a top-tier academic institution.

Online Identity: Online identity encompasses a wide array of contextual and technical identifiers that exist in an ontological taxonomy. According to the report, this development is “escalating in importance for libraries for two reasons: 1) online identity is part of the broader view of

digital literacy, and 2) research outputs can be attributed to an author across the web to reveal their growing body of work, also crystalizing the content's relationships to other scholarly research.”

(Long-Term, 5 or more years):

Artificial Intelligence: As academic and research libraries begin to uncover ways in which AI can improve patron services, research processes, and learner outcomes, there is a need to develop guidelines informed by research to ensure ethical use of student data.

The Internet of Things: Library leaders are discussing how libraries can benefit from IoT-enabled environmental monitoring capabilities of networked devices to optimize energy use and track objects like A/V resources and books.

6. THE CHALLENGES ASSOCIATED WITH THE TRENDS AND TECHNOLOGIES

Challenges to Technology Adoption

The significant challenges impeding technology adoption in academic libraries, which include:

(Solvable; understand how to solve):

Accessibility of Library Services and Resources: To meet the charge of antidiscrimination legislation and institutional policies, librarians are challenged to implement technologies and learning resources that may not be created with diverse needs in mind. The incorporation of universal design principles in library programming can improve the user experience for all patrons, states the report.

Improving digital literacy: According to the report, digital literacy transcends gaining isolated technological skills to “generate a deeper understanding of the digital environment, enabling intuitive adaptation to new contexts, co-creation of content with others, and an awareness of both the freedom and risks that digital interactions entail. Libraries are positioned to lead efforts to develop students’ digital citizenship, ensuring mastery of responsible and appropriate technology use, including online identity, communication etiquette, and rights and responsibilities.”

(Difficult; understand issue but solutions are elusive):

Adapting Organizational Designs to the Future of Work: Technology, shifting information demands, and the evolving roles of librarians are forcing them to rethink the traditional functional hierarchy. Libraries

must adopt more flexible, team-based matrix-like structures to remain innovative and responsive to campus and patron needs.

Maintaining Ongoing Integration, Interoperability, and Collaborative Projects: For a growing number of academic and research libraries seeking to improve the research ecosystem, satisfy requirements of funding agencies, and alleviate administrative burdens on researchers, interoperability has become a key priority.

(Wicked; complex even to define, much less address):

Economic and Political Pressures: Academic and Research libraries are increasingly prioritizing technologies and digital resources that reduce the expenses associated with delivering services. “Complicating this challenge is the notion that technology adoption can trigger a variety of costs,” notes the report. “The adoption and creation of open educational resources (OER) are viewed as a potential solution for reducing costs.”

Embracing the Need for Radical Change: As information is now increasingly stored in the cloud rather than in a tangible format, libraries are rethinking acquisition strategies and how physical library space can best be used.

7. FINDINGS

Some of the most noteworthy findings are:

- (a) Total eighteen emerging trends in higher education have been identified by the NMC Horizon Report 2017(library edition).
- (b) Out of those eighteen, six trends have direct or indirect influence on academic and research libraries.

CONCLUSION

The paper reviews expected emerging trends, technologies development and challenges in academic and research libraries predicted by the NMC Horizon Report 2017. This review will be useful to the academic library practitioners in understanding the emerging technological trends. It will also help them to assess their current position and plan their future works. It shall be valuable to the library practitioners in designing and implementing befitting technology literacy programmes for faculties and students in colleges and universities, and will also be useful to the library and information science educators in revising their curricula to cope up with the emerging technological trends in academic and research libraries. Libraries as usual are serving the changed needs of the higher

education students and teachers and they are simultaneously preparing themselves to serve any further changes in the higher education. Incidentally, three of the top ten trends identified by the ACRL Research Planning and Review Committee match with the trends predicted here. These three trends are ‘communicating (library’s) value, (library’s role in) scholarly communication and data curation. They match respectively with predictions about ‘data driven approach’, ‘Students as producers of information’ and ‘self-quantification’. This matching of the NMC Horizon Report’s predictions with the trends identified by a library association confirms that libraries are prepared to respond positively to any emerging technological trends in higher education. Extended skills to adopt educational/information technology and increasing use of technology are the strengths of present academic and research libraries. Certain topics such as research data management and embracing the need for radical change reappear, regular education leaders and technologists. Every trend, challenge, and technology development evolves over time, with fresh perspectives and new dimensions revealed every year. For example, scholarly records are not what they are today they were yesterday. Progress in open access and new research formats have expanded the spectrum of possibilities for how information is stored, accessed, and communicated. Because the expert panel votes on topics they believe are poised for the deepest impact some received many votes, but not enough to be featured among the 18 here.

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ROLE OF LIBRARY PROFESSIONALS IN THE AGE OF WEB TECHNOLOGY

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ABSTRACT

This paper describes how advancement in web technology has dramatically changed the role of library professionals. With the changing era of web and information, libraries are changing in parallel. The paper is focused towards step by step development of web technology as well as changes adopted by library professionals to cope up with the user demands in the world of information age. It covers the skills required, challenges faced by library professionals along with the benefits and limitations of web technology in library. In nut shell the paper is describing the journey of traditional library to modern library and how the library professionals are playing a major role in this shifting of libraries towards web based libraries.

Keywords: *Webtechnology; Webservices; Web Resources*

1. INTRODUCTION

Earlier the information was delivered on papyrus/clay tablets followed by wood blocks, paper and now in electronic format. The journey of information resources causes a direct impact on the library and library profession too. Traditional libraries were limited within a building and librarians carried out all the tasks in libraries only. But in late twentieth century this picture has rapidly changed. With the advancement in internet and ICT technologies, there was a noticeable increase in information and the resources of information started increasing day by day resulting in information explosion. Web and internet become the solution of most of queries and users start getting their answers from sources like Google, yahoo, Wikipedia etc. from various websites. Such a change led to change in library scenario. Librarians know very well how to adopt change with the changing information age. With the development of web library also progressed. The various print sources got digitized over time and provided online. Library installed various softwares, e-resources, and databases etc. which are provided 24×7 to its users. Librarians also changed their traditional library services into

modern web-based library services for the convenience of users. Library profession is all about providing adequate, authentic and reliable information to user in least time for betterment of user's knowledge that results in development of society. With this thought library professionals are changing themselves. Now library professionals are getting advanced in ICT, acquiring new skills, changing the library services, management and structure as well. Librarians are advancing themselves with advancement in web technology and user needs. Despite of so many challenges faced by the library profession, the professionals of library are very dedicated and focused towards meeting user needs in best way possible.

2.0 WHAT IS WEB TECHNOLOGY?

Like humans, computers also need to communicate for the transfer of data, storage and interpretation of files, presentation of information etc. The method by which computers communicate with each other through the use of markup languages and multimedia packages, known as web technology. Web technology is a general term that refers to many languages and multimedia packages which are used in conjunction with one another for production of active and powerful web sites. Web technology is used for putting various technologies on web in an organized structure so as to make them accessible to its users. These technologies include Client server technologies, Web browser document markup languages (HTML, XML, RDF, etc.), and Web interface. A technology is limited to itself and other such technology is also required for the formation of a websites and web based resources so web technologies are interdependent on each other. [1]. In the past few decades, web technology has undergone a dramatic transition, from a few marked up web pages to the ability to do very specific work on a network without interruption. There has been a visible transition of web technology from Web 1.0 to Web 2.0 followed by Web 3.0 and still developing.

2.1 TYPES OF WEB

- **Web 0.0 –Developing the Internet**

Before 1999, internet was not so popular among world and it was the developing period of internet.

- **Web 1.0 -“Read Only Web”**

Internet before 1999 was “Read-Only” web i.e. internet user’s role was limited to reading the information which was presented to him. For example, static websites those were present in web 1.0 era. There was no active communication or information flow from user to the producer of the information. But it was the reason of the birth of “information age”

- **Web 2.0 -“The Writing and Participating Web”**

The lack of active interaction of users with the web results in development of Web 2.0. The year 1999 was marked as the beginning of a “Read-Write-Publish era “. Now a non-technical user can actively interact & contribute to the web using different platforms. This interaction and contribution has dramatically changed the web scenario. This era has provided power to user with new concepts like Blogs, Social-Media & Video-Streaming.

- **Web 3.0 -“The Semantic Executing Web”**

Web 3.0.has no rigid definition and it is known as the version of new ageweb that can lead to interaction of web and user just like interaction between two persons. Web 3.0 can be compared to an artificial intelligence assistant that can understands user commands and personalizes everything accordingly. There was an interactive platform in Web 2.0 but it lacks intelligence as keyword based search often leads to overload in information. Following are the new features that are introduced in web 3.0:

- Tailor made search
- Personalized search
- Evolution of 3D web
- Deductive reasoning

- **Web 4.0 -“Mobile Web”**

Web 4.0 is new alternate version of Web 3.0 in which web technology is required to adapt to its mobile surroundings. Web 4.0 is concerned with connecting all devices in the real and virtual world in real-time.

- **Web 5.0- “Emotional Web”**

Web 5.0 is still in developing phase and its characteristics are yet to be revealed. The main objective of web 5.0 is to make its user personal assistant which is capable to interact or communicate with user. This is like “symbiotic web” which will be very powerful and

full of excitement. It will be read-write-execution-concurrency web. The web 5.0 will become a habit of most of people as it will help them to get accordingly to their emotional needs by mapping them.

- So we can say that web technology is something that is having advancements in its features day by day and it will definitely going to assist in accomplishment of information requirement of users [2],[3].

3.0 WEB TECHNOLOGY IN FIELD OF LIBRARY SCIENCE

Change in web technology correspondingly changing the scenario of libraries now days. With the advancement of Web 1.0 to Web 2.0 then to Web 3.0, libraries also changed as Library 1.0 to Library 2.0 followed by Library 3.0 respectively. This change in libraries will also be continued in future with Web 4.0 and Web 5.0.

As library services and functions are totally focused towards its user's needs so library professionals are keen towards adopting themselves with changing users need and the way they retrieve the information. These help librarians to fulfill the gap between the users and library by using current technology advancements.

3.1 Factors that Led to Adopt Web Technology in Library

Today is the age of information. Information has become most powerful tool in socio-economic development of society but as the information is growing rapidly which led to "information explosion". Also users are heading towards internet and most of them are unable to retrieve authentic sources of information.

Following factors lead to adoption of web technology:

- Information explosion, exponential growth and usage of web resources
- Explosive growth and usage of web resources
- Changing demand of users with increasing information
- Change in digital environment
- ICT Revolution
- Expensive print resources
- Instability in library budgets

- Interactive virtual learning environment
- Open source movement [4]

4.0 RESOURCES OF WEB BASED LIBRARY SERVICES

With the advent of internet and advancements in ICT, users are able to get information without going to library. But web is full of various websites which are not surely authentic and reliable. In such a scenario its duty of librarian to get acquainted with the changing user demands and providing them authentic sources of information which not surely authentic and reliable. There are various web resources that are present in library to help users to get the required information. These are:

1. OPAC
2. Gateways: Internet Public Library (IPL), Bulletin Board for Libraries (BUBL), National Information Services and Systems (NISS)
3. Portals/Subject Portals: Yahoo!, MSN and AOL. Vertical Net.
4. Electronic Books, Journals
5. Online databases: ACM Digital, EBSCO databases, Elsevier's, Science Direct, Emerald full text, Springer Verlage link
6. Subject directories
7. Search engines [5]

5.0 CHANGING ROLE OF LIBRARIANS

Increased information resources, technological advancements and web progress led the change in users need and demand and services provided by library also got affected over time. Library profession is keen to serve their users with best services possible so they are also adopting change and implementing new technologies in the libraries.

5.1 Skills required by Librarians in Age of Web Technology

Due to dramatic shift of traditional libraries into web based libraries, librarians are facing so many challenges and to overcome them it is required that they must acquire some skills in order to deal with the change in information resources and user demands. So, to provide web based resources and services to user, following skills are required by new age library professionals:

Information Needs: To develop ability to understand and fulfill user needs as the needs of user keep on changing.

Conversation of traditional services into web based: Due to advancement in information resources and communication technology it is necessary for library professionals to provide traditional library resources in effective way by taking assistance of new technologies. For this it is required to have knowledge of web technology and ability of designing websites, managing in house database, etc.

Building print and non- print collection: It is important for library professionals to build up a collection of print as well as electronic resources so as to meet demands of user in required way. A library having both type of collection have tendency to fulfill user demands in more efficient way.

Self-Evaluation of service: Self-evaluation of library professionals helps them to analyze the weak points of services provided by library and hence they can improve and modify library services accordingly. This also increases the effectiveness and efficiency of services provided and help to achieve greater user satisfaction from library.

Comparison of technologies: It's always a good idea to compare two or more different technologies on basis of their price, efficiency, relativity etc. as it will help to acquire best resource in library so library professionals must have the knowledge of different softwares, technologies available in market.

Attracting users towards library: By adopting various techniques, library professionals have to attract users towards libraries. They can organize workshops, orientation programs, book exhibition, quiz or competition etc.

Managerial skills: Library professionals have ability to manage the library in changing era of information age. There are so many changes that are required to be adopted by library, so library professionals must have skills to manage and acquire those changes in library and they must know how to implement these changes properly. They must have skills to manage staff, collection and users accordingly with web technology.

ICT Skills: Library professionals must have various ICT skills for the proper functioning of library services and for better management of resources. [6]

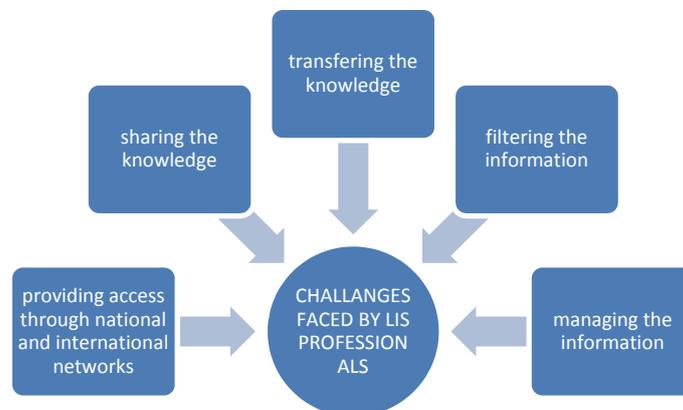
5.2 Librarians Now are Adopting Following Changes

- Acquiring new technological skills
- Anticipating changing expectations of users

- Acquiring other skills like management, teaching, leadership, interpersonal skills, etc.
- Implementing web based services in library
- Adapting new electronic information environment
- Improving information organizing skills
- Management of digital information system
- Acquiring knowledge of networking programming languages, Digital library software, Web Site Development, SQL, Video Conferencing, etc.

5.3 Challenges Faced by Librarians in Adopting Web Technology

- Sharing of existing knowledge
- Transferring the information library as an knowledge management center
- Library as access providers
- Filtering the information for users
- Protection of digital intellectual property
- Design of technical architecture of digital library



6.0 NEW WEB BASED LIBRARY SERVICES

Web based services are established due to the following reasons:

- Ensuring the needs of users and the accessible information sources are suitably matched at all times.

- Delivering those information sources to the user in a timely and appropriate fashion.
- Ensuring the information provided is high quality, accurate and appropriate.
- Assisting the user in interpreting the materials, if necessary.
- Promoting user awareness of new services and information sources as they develop.
- Providing users with individualized guidance and support as they build their information search and application skills

Web based library services include following:

Virtual Library Tours

Websites of libraries provides virtual library guide to the physical facilities including collections, services and infrastructure available in the library to its users by using new technologies such as QuickTime movies etc. and are beginning to replace image maps on main campus Web sites.

Ask-A-Librarian

Ask-A-Librarian services are Internet-based question and answer service that connects users with individuals who possess specialized subject knowledge and skill in conducting precision searches.

Real Time Services

Libraries are attempting to provide more and more now is live reference which is real-time, interactive reference services in which the users can talk to a real, live reference librarian at any time, from anywhere in the world using chat technologies, email, etc. The librarian can perform Internet searches and push websites onto the user's browser, and can receive immediate feedback from the users as to know whether their question have been answered to satisfaction or not.

Bulletin Boards

A bulletin board is an electronic communications forum that hosts posted messages and articles connected to a common subject or theme or interest. Several libraries are using bulletin boards for their web-based library services. The bulletin board system is also used as an interactive interface to invite suggestions on activities and services of a library. It can also be used as an interface to distribute library services.

Web-based User Education

Web guides and teaching tools are found everywhere on the Web because they are easily updated, accessed, and printed on demand. The web-based user education provides a high degree of interactivity and flexibility to the users. The library web sites can use web-based user education for imparting training to users in teaching the basic library skills along with glossary of library terms.

Web Forms

Library web sites have some web forms for suggestions and comments on the Library Services. Different types of Web Forms are available on web that may be an Indent form for acquiring some publications, interlibrary loan request form for document delivery, Ask-a-Librarian, etc. [5] [6]

7.0 BENIFITS OF WEB TECHNOLOGY IN LIBRARY

Web based library services require same qualities and efforts that are required for providing reference service in traditional libraries i.e. accuracy, promptness, courtesy and understanding user needs of information.

Following are the benefits of web technology in library:

- Digitization of libraries
- Cost saving
- Save the time of user and library staff
- Accessible 24/7 and have remote access to user
- Electronic library services
- Physical space of library is no bar
- Stock verification, weeding of books, loss of books ,etc. like problems are decreased
- Reduce manpower
- Special equipment required (hardware, software, printers, etc)
- Access is currently unreliable (URL problems, internet connection problems etc.)
- Use is limited by copyright laws and licensing agreements
- Archiving is “up in the air”
- Allows for multiple users with simultaneous access

Limitations

- Costs of software ,web resources subscription rates are very high
- Manpower acquainted with technological skills are not easily available
- Electronic media is not considered as safe in terms of authentic publisher, distributor, content etc.
- There is always risk of security (passwords, user id etc.)
- There is problem in creation and publication of data
- There are so many passwords that are required to be remembered
- Scope of archives available is limited
- Difficulties arise in downloading (limited pages can be downloaded etc.)
- To access required resources proper ICT knowledge is required

8.0 FUTURE PERSPECTIVE OF WEB LIBRARIES

Information technologies rapidly changing as time is passing. New technologies of ICT and internet are dramatically changing the perspective towards information retrieval and hence challenging the library professionals. There are so, many challenges faced by traditional librarians to get equipped themselves with new skills to serve extremely demanding users. Also everything is available to users so also it's difficult to attract users towards library; but as libraries are growing institutes so librarians with their efforts and dedication are continually adapting themselves towards the changing web technology and filling the thrust of user expectations in the age of information explosion. The libraries in which librarians are anticipating and embracing the change constructively, creatively and skillfully will most likely to be survive, develop and prosper. In 21st century librarians are getting acquired with modern technological and web skills and this will continue in future also.

CONCLUSION

Due to information explosion and advancements in web technology, internet and ICT it is very challenging for librarians to survive in the technological and information age as users are highly advanced and demanding. But with the dedication of librarians towards library profession it became possible for them to adapt themselves with advancing web technology and library also grow as library 1.0 , library 2.0 , library 3.0 and will continue to develop in future also. Despite of so

many challenges, librarians are continually serving their users by acquiring new web resources and web based library services. They are adopting new skills and competencies for survival and growth of library profession. Now library professionals are having multi skills, multi-tasking abilities and they are also competent in their specialized area of work.

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DIGITAL LIBRARIES AND THEIR FUTURE

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ABSTRACT

The paper describes the digital libraries, their objectives, services & functions. The requirements of digital library have been discussed besides this, the advantages and disadvantages of digital library and their future vision have been detailed.

Keywords: Digital Libraries; E-Library

INTRODUCTION

A Digital Library is a collection of Documents organized in electronic form, available on the internet or on CD –ROM disks. A user may be able to access magazines articles, books, images, and sound files etc. The terms Electronic Library, Digital Library, E-Library, and Virtual Library have been used interchangeably.

- (a) **Traditional library:** The collection of traditional libraries is mainly concentrated in print media, manuscripts, etc., and they are not very organized. The document is rapidly deteriorating. It is not easy to locate information and it is not easy to reach users. Similarly, traditional libraries are limited to physical Material.
- (b) **Automated library:** A library with machine-readable catalog, computerized acquisition, circulation and OPAC are called as automated library. The holdings of this type of libraries are same as that of traditional libraries.
- (c) **Electronics library:** When automated libraries goes for LAN (Local Area Networking) and CD-ROM networking and start procuring E- journals and other similar kind of publications then it is known as electronic library. The resources of the electronic libraries are in both print and electronic form. The electronic medias are used for storage retrieval and delivery of information.
- (d) **Digital library:** In Digital Library the information is stored in digital formats and accessible over a network
- (e) **Hybrid library:** It is designed to bring together a variety of technologies from different sources within a work library and to

explore integrated systems and services in an electronic and printed environment. This reflects the transitional state of the library, which today cannot be fully printed or fully digital.

Definition: Terence R. Smith(1997) defined it as:” Digital Library is a controlled Collection of Information bearing objects that are in Digital form and that may be organized, accessed , evaluated and used by means of heterogeneous & extensible set of distributed services that are supported by Digital Technology,(7)

According to **Dr. A.P.J Abdul Kalam** the former president of India – “Digital Library is where the past meets the present& creates the future.” (8)

The term digital library was first used in 1994,in the projects funded by US Government called “ Digital Library Projects, Phase 1”Arms (2000) defined digital Library as:” managed Collection of Information, with associated services, where the information is stored in Digital formats and accessible over a network”.(7)

Wikipedia defines Digital Library is a Library in which Collection are Stored in Digital Formats (As opposed to print, microforms, or other media) &a accessible via Computer. The Digital Content may be stored locally, or accessed remotely via computer networks. A digital library is a type of information System. (6)

Objectives of Digital Libraries

Capture, store, and organize information in digital stored format for better transmission through network devices.

- (a) To Provide lifelong learning opportunities to the user.
- (b) To introduce, distribute and offer retrospectiveservices.
- (c) To obtain financial and effective publication of information
- (d) To avoid routing and unnecessary operation.
- (e) To provide rational ideas of all information in any format.
- (f) To maintain detailed, digitized databases.
- (g) To improve the cost effectiveness of library activities. (6)

Requirement for digital libraries

World Wide Web& Internet provide technical environment for the development and operation of Digital Library. Internet Information, and TCP / IP tools and skills to publish information on its related protocols to

access the internet and the web. Requirement for Digital library are as under:

- (a) **Audio visual:** Color T.V., V.C.R., D.V.D., Sound box, Telephone etc.
- (b) **Computer:** Server, P.C. with multimedia, U.P.S. Etc
- (c) **Network:** LAN, MAN, WAN, Internet etc.
- (d) **Printer:** Laser printer, Dot matrix, Barcode printer, Digital graphic printer etc
- (e) **Scanner:** H.P. Scan jet, flatbed, Sheet feeder, Drum scanner, Slide scanner, Microfilming Scanner, Digital camera, Barcode scanner etc
- (f) **Storage devices:** Optical storage device, CD-ROM, Jukebox etc.
- (g) **Software:** Any suitable software, which is interconnected and suitable for LAN and WAN connection. (3)

Resources of Digital Libraries

The resources of a digital library are those, which the computer can store, organized, transmit and display without any intervening conversion process. It includes both print and electronic or digital material. (3)

On- line Resources:

- (a) Local database of traditional books in machine-readable form.
- (b) E-book, electronic tax, map, image, sound, video, and multimedia etc.
- (c) E-journal
- (d) LAN, MAN, WAN for web browsing, e- mail etc.

Well trained manpower for online help

Off line resources:

- (a) CD-ROM, Jukebox etc.
- (b) Audio visual aid etc.

Why www is not a Digital Library

Digital Library is to use www, but this is not a digital library.

Digital Library is organized & managed but World Wide Web is Unorganized & Unmanaged.

Much of the web Contains ephemeral information: advertisement, personal web pages Announcements etc.

Most of the information from the fine text reported, the advertisement, a personal page.

Most search engines are required to be victimized, and for the right with their own not being caught fast, and for the most part are targeted at the digital library custom set.(7)

Traditional library vs. Digital Library

- (a) Tradition library focus on Physical material
- (b) The purpose of OPAC is to indicate the physical location of the documents.
- (c) Tracking a physical object has both observable& restrained implications
- (d) The digital library provides multiple accesses and multiple audio and electronic transmissions.
- (e) Digital Library have some complications like intellectual property right, term & conditions etc.
- (f) Traditional Library Offers Additional Social and Educational Benefits

Digital Library vs. Traditional Information Retrieval system

- (a) Information retrieval system can be considered the precursors to digital libraries
- (b) The original unit of the Information Retrieval System is a document that focuses on
- (c) Text retrieval.
- (d) Information retrieval is based on exact combination: Boolean, string etc
- (e) The digital library is based on pattern search and incorrect matching.(7)

Functions of digital library

The role of a Digital Library is essentially to collect, manage, maintain and make reachable digital objects. The following are some of the functions of digital library

- (a) to provide user-friendly interface.
- (b) to avail network facilities.
- (c) to support library functions.
- (d) to enhance research and restoration in the use of data.

- (e) to improve the library operations.
- (f) to protect owners of information.
- (g) to preserve unique collection through digitization. (2)

Advantages of the digital Library

A digital library is not limited to any particular situation, it is a building, as it has been said, and the entire world should be distributed to the country. Users can get their information on their computer screen using the Internet. In fact, it is a system that provides access to a network of management multimedia hardware. The sound of the library or the digital printed word is not a graphical display of a different method. The document library will pay for its use by not having a new developer problem in the user.

- (a) **No physical boundary:** The user of a digital library need not to go to the library physically, people from all over the world could gain access to the same information, as long as an Internet connection is available.
- (b) **24*7 availability:** Digital libraries can be accessed at any time, 24 hours a day and 365 days of the year.
- (c) **Multiple accesses:** The same resources can be used at the same time by a number of users.
- (d) **Structured approach:** Digital library provides access to much richer content in a more structured manner i.e. one can easily move from the catalog to the particular book then to a particular chapter and so on.
- (e) **Information retrieval:** The user is able to use any search term word or phrase, Title Name, subject to search the entire collection. Digital library will provide very user friendly interfaces, giving click able access to its resources.
- (f) **Preservation and conservation:** An exact copy of the original can be made any number of times without any degradation in quality.
- (g) **Space:** Whereas traditional libraries are limited by storage space, digital libraries have the potential to store much more information, simply because digital information requires very little physical space to contain them. When the library had no space for extension digitization is the only solution.

- (h) **Networking:** A particular digital library can provide the link to any other resources of other digital library very easily thus a seamlessly integrated resource sharing can be achieved.
- (i) **Cost:** The cost of maintaining a digital library is much lower than that of a traditional library. A traditional library must spend large sums of money paying for staff, book maintains, rent, and additional books. Digital libraries do away with these fees. (2)

Disadvantages of Digital Libraries

The computer viruses, lack of standardization for digitized information, quick degrading properties of digitized material, different display standard of digital product and its associated problem, health hazard nature of the radiation from monitor etc. makes digital libraries at times handicap.

- (a) **Copyright:** Access to the information in Digital libraries is generally less controlled than it is in physical collections (Written & Bainbridge, 2003), though copyright is a major issue for printed resources.
- (b) **Speed of access:** As more and more computer are connected to the Internet its speed of access reasonably decreasing. If new technology will not evolve to solve the problem then in near future Internet will be full of error messages.
- (c) **(c)Initial cost is high:** The infrastructure cost of digital library i.e. the cost of hardware, software; leasing communication circuit is generally very high.
- (d) **Band width:** Digital library will need high band width for transfer of multimedia resources but the band width is decreasing day by day due to its over utilization.
- (e) **Efficiency:** With the much larger volume of digital information, finding the right material for a specific task becomes increasingly difficult.
- (f) **Environment:** Digital libraries cannot reproduce the environment of a traditional library. Many people also find reading printed material to be easier than reading material on a computer screen.
- (g) **Preservation:** Due to technological developments, a digital library can rapidly become out-of-date and its data may become inaccessible.
- (h) **Illegal & harmful materials:** Web information is a big portion of any digital library & some material in the web is illegal & harmful

& clearly inappropriate for public presentation. Violence & pornography are two major issues in this aspect; it is difficult for our academic libraries to prevent those materials. (2)

Libraries of the Future (Digital Library)

Digital libraries have the potential to be far more flexible than conventional ones. Of course, they are portable: they will be with you whenever you want them to be: in your home, on a plane, at the beach, in a Indian village, or on the street. They will be extensive, giving access to your personal topic collection, your town's public library, and your university library. Furthermore, they will ultimately be seamlessly integrated with national and international sources of information—interlibrary loan at your fingertips. In 1931, shortly before Wells penned his vision, Ranganathan wrote his "five laws of library science" "one of which is that a library is a growing organism. The ultimate digital library will continually be revised and extended by original thinkers around the world.

But wait, there's more. The flexibility of digital libraries will extend well beyond matters of physical convenience. Future digital libraries will surround you with information in ways that we can yet only dimly perceive. When Karl Marx wrote *Das Kapital*, he worked in the reading room of the British Museum Library and wrote using pen and paper. In contrast, future revolutionaries not only will use a laptop but also will work "inside" their digital libraries in a stronger and more visceral sense. (4)

Vision of the digital library of the future is that it will be a personalized, comfortable space in which to work. Think of it as more like a kitchen than a library—a kitchen for knowledge preparation.

In future, the libraries become multimedia center of information resources, leaving behind their dull & drab image of repositories of old dusty books material like micro-films audio, video cassettes. Various electronic products for use both off line & online representing the special type of materials need special equipments of different makes for their effective use.

The Libraries are never ending institutions; Digitization is the must now days for the libraries to sustain. Digitization makes the library automation itself. No more than one or two staff required if the libraries are Digitized .It is easy to maintain & keep record easily in near future it may happen that even robots may serve the Digitized Libraries. There

may be problems & solution too for storage of Digitized materials like CD ROMS/Backup/Pan Drive /Hard Discs etc.

The Digitization along with the intelligence / cyber security. With the advancement of technology, hacker has been very active & can hack the computer & Networking. Very Important data loss can be possible to protect the data; cyber security must be given first priority. There are many Instances that the defense data has been leaked in spite of Cyber security.

Soul/fox-pro software is used to catalogue the library books. Digitization required special storage condition of the software materials. Softcopies are stored in computer are retrieved as many time we wish we can create manifold copies of the stored soft material. It has to be assured how to use copyright protection in the digitization. It help the author of the book /book chapter. Digitization helps us to maintain a very vast quality of books in a very small chip/pen Drive/soft copies. Now a Days author chooses to write e-books/E-materials like e- magazine, e- journal, e-Newsletter etc.

Necessities for the libraries are good quality computer, storage of software, and copyright Protection of the published material. Air conditioners for the cooling of the environment in which the software are used. Cyber, security is must & first priority. Whether small or big may be library the cyber security ensures safety of the data. Larger capacity serves hard Disc/CD's /DVD /Pen Drive / Floppy Desk /camera audio video etc. Internet connection /wi- fi area with 24 hours, electricity supply a& large capacity generators.

Digitization must be compulsory .without digitization one cannot maintain the library. Whether e-classes are there or e-learning. Library Digitization can help any student of any discipline within its area. Knowledge is the master key to success. Knowledge without books is not possible & library is not possible without books. The world is not possible without digitization. Where the Library is there the knowledge is. There is inseparable relation of library and the knowledge is.(5)

CONCLUSION

Digital libraries cannot completely change the physical presence of documents, but of course, to meet the current demand, must be presented to satisfy the digital user's digitalization so that at least the libraries become hybrids. . The initial cost of digitalization is very high, but the experience indicates that once the digitization begins, the cost of

managing this archive will be lower than any traditional library. Day-by-day, the cost of digitalization decreases, online publication increases, users' needs develop for a different environment. Choosing the time for all the information and library professionals who have adopted to meet the challenge

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RADIO FREQUENCY IDENTIFICATION TECHNOLOGY WITH SPECIAL REFERENCE TO CSKHP KRISHI VISHVAVIDYALAYA, UNIVERSITY LIBRARY, PALAMPUR

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ABSTRACT

Nowadays the libraries offer a wide range of digital services to their readers. In the digital era RFID technology is much more needed for library. It is the technology being implemented in library for book identification, check out and checking of books, sorting and conveying of library books and theft detection. Integration of RFID with KOHA software, installation of self check station and book drop station, Kisoks and security gates for anti theft system has been installed in CSK HPKV Library. RFID digital library cards have been issued to the users i.e. teachers, students, researchers. RFID has enabled the users to manage their own transaction easily and quick and efficient circulation operation. It has helped eliminating waiting lines and reduced the staff stress. This paper highlights the RFID activities in CSK HPKV Library

INTRODUCTION

Radio Frequency Identification (RFID) is a technology which is gaining immense popularity to library management solutions. It is the state of the art technology being used in Modern day Libraries. RFID tagging of all library material i.e. books, cassettes, CDs etc. has several advantages like:

- Quick and efficient circulation operations
- Enhanced security library items
- Seamless inventory management
- Emerging technology experience for library staff and users
- It is a new generation of Auto Identification and Data collection technology which helps to automate business process and allows identification of large number of tagged objects like books, using radio waves.

RFID based library management system would allow fast transaction flow for library and will prove immediate and long term benefits to library in traceable and security.

RFID for Libraries

- Reduce the staff stress and increase management efficiency.
- Can prevent theft of library materials
- Fastest, easiest, most efficient way to track, locate and manage library materials
- Efficient book circulation and management
- Library inventory tracking in minutes instead of hours
- Multiple books can be read simultaneously
- Faster issue/return process

Self-service issue return KISOK

- Enables users to manage their own transaction easily and efficiently
- It simplifies the check-out, check-in and renewal process
- Helps eliminate waiting lines
- Ensure patron privacy and increase patron satisfaction

RFID Book Drop Station

The Book Drop Station can be placed at any convenient location to enable patrons to return their items any time even after the library is closed. The loans are instantaneously cancelled, patrons may immediately borrow again.

RFID Security Gate

- Protect the unauthorized movement of books from library.
- Most modern detection algorithm that constantly detects any unauthorized item removal
- Covers approximately 1 meter wide pathway with no orientation limits.
- Variable gate width of upto 1.80m (2x90 cm)
- Visual audible alarms at unauthorized item being taken out
- Anti collision features.

Tagging station

- Used for encoding of books details in the RFID tags, pasted on books. For tagging station we use high qualities RFID readers.

RFID Tags

RFID tags are thin paper labels stickers. It contains memory space where details of the books get encoded at the time of tagging of books.

RFID Member Cards

RFID members cards are card embedded with chips where details of the member get encoded in it and it can be printed on it.

RFID Card Printers

This printer is used for printing library member's cards, i.e. RFID Cards.

Anti Theft Stickers

Anti theft stickers for covering tags that are posted on books, this sticker contains logo of institute.

Web-Base Application Software

Web base application comes with following features:

- Tagging reports
- Card activation report
- Assign permission modules
- Books lost card modules
- Create new user modules
- Books issued and return reports.
- Daily/weekly/monthly/yearly reports
- Configuration facility for installing new RFID systems
- Tracking details of books and member cards

Benefits of RFID for Library Management

Libraries

- Stock management
- Improved patron services
- Flexibility and modularity

Library Staff

- Less time needed for circulation/operations

- Efficient inventory management
- Reducing repetitive stress injury (RSI)

HON'BLE VICE CHANCELLOR INAUGURATING RFID



RFID SELF CHECK STATION



RFID SELF BOOK DROP STATION



RFID SECURITY SENSOR GATE



STUDENTS BROWSING REFERENCE RESOURCES



CONCLUSION

Current library management System is operated manually; most libraries are staff intensive, large amount of routine procedures, difficult for searching a specific book, card based issue of books and traditional process for circulation. RFID technology is taking off in libraries at an increasingly rapid pace. This technology will dramatically improve its efficiency, security and accuracy.

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DIGITAL KNOWLEDGE INITIATIVES IN HYDERABAD, KARNATAKA: INFRASTRUCTURE, AUTOMATION, E-CONTENT AND ACCESS

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ABSTRACT

There have been tremendous changes in the information industry and digital initiatives have been the order of the day irrespective of sectors. This is an attempt to highlight the significant developments and digital initiatives being carried out in Hyderabad Karnataka region. Authors highlight various smart village projects and government initiatives by Government of India in building and empowering rural masses with information. A case study of Information technology infrastructure, status of library automation in the college libraries and development of Hyderabad Karnataka Information Library Network (HKLIBNET) of this region, Digital Knowledge Project in terms of its relevance of digitizing the regional language content i.e. Kannada language ebooks for the rural masses in Karnataka and discusses the modalities of network architecture, digital literacy campaign and accessibility. Further the impact of ICT on university libraries with the challenges of infrastructure and implementation of projects.

Keywords: *Digital Libraries, Knowledge Connect, Hyderabad Karnataka, Embedded Technology, Hyderabad Karnataka Information Library Network.*

1.1 INTRODUCTION

“Village knowledge centres would act as frontline delivery system. I visualize establishment of village knowledge centers in these panchayats empowering with knowledge and information to the targeted population

of farmers, fishermen, craftsmen, traders, entrepreneurs, unemployed youth and the students."

– Late Dr. APJ Abdul Kalam, Former President of India

Education is visualized as an evolutionary force so that each individual is enabled to evolve from purely material consciousness towards superior planes of intellectual and spiritual consciousness. Education is also perceived as a bridge between the past, present, and the future and as a means by which the best of the heritage is transmitted to the new generations for its further progression (Joshi 1998). The objective of Indian higher education is not only to promote equality and social justice, but also to provide the right kind of work ethos, professional expertise and leadership in all walks of life to foster among teachers and students and, through them, society in general--integral development of values inherent in physical, emotional, rational, aesthetic, ethical and spiritual education (Joshi, 2002). To achieve this, a well established library is essential for any academic and research institution to support teaching, learning, and research. Thus, Library and Information Services in the academic and research institutes occupy central role in enhancing the quality of learning, teaching and research activities.

Today Veterinary Council of India or Medical Council of India or AICTE or the National Accreditation and Assessment Council (NAAC) strive for quality and excellence in higher education and advocates for enhancing the role of Library and Information Services in improving academic environment. It has designed several quality indicators for libraries which emphasize more on IT based collections, facilities, services, digital libraries, library automation and IT based services. Information and communication technology, networked systems, and World Wide Web have driven rapid changes in academic libraries, in which almost every aspect of library work has been dramatically impacted by the Web which enabled greatly enhanced remote access to collections and services.

Information and Communication technology has made a greater impact on libraries to stay in tune with current developments and meet the challenges of librarianship to serve the users. Karan Singh and Nikandia (2017) focused on the prospective of mobile devices in Library and Information centers. Implementation of mobile Technology has change the way of people to access and communicate information. Khuntia, Mishra and Ramesh (2016) reiterated that Smart is a network enabling free access to all libraries those are digital in electronic society.

Smart libraries is a behavior change initiative for cyber safety and wellbeing designed to equip libraries and connect library users with the skills they need for smart, safe and responsible use of technology. Smart helps libraries providing a good environments where people can experience feelings of safety, become part of actual and virtual communities and acquire the much needed skills. We think community-based action such as smart libraries will truly drive e-safety as a cultural norm in communities through worldwide.

Digital divide has been the biggest road block in providing level playing field amongst the urban and rural population. In today's world digital or internet is information or knowledge. And thus eradication of knowledge divide becomes one of the primary necessities for the population in the rural area. Digital India initiatives by Government of India, the study signifies the role of libraries as an extremely important element of the foundation of a knowledge economy and recognized to have a social function in making knowledge publicly available to all. To keep pace with time, digital initiatives in all the sectors and particularly in the knowledge sector occupies significance and hence the study.

1.2 HYDERABAD KARNATAKA REGION AND LIBRARIES: HISTORICAL PERSPECTIVES

Hyderabad-Karnataka is a region located in north- east Karnataka, India. It is the Kannada speaking part of the Hyderabad State that was ruled by the Nizams of Hyderabad until 1948. After merging with the Indian union, the region was part of Hyderabad State until 1956. The Hyderabad- Karnataka region comprises Bidar, Yadgir, Raichur, Koppal, Ballary and Kalaburagi that are in the present state of Karnataka. The Hyderabad-Karnataka region is the second largest arid region in India. Hyderabad province and its citizens became independent on 17 September 1948. The districts of Hyderabad Karnataka covers six districts – Bellary, Bidar, Kalaburagi (Gulbarga), Koppal, Raichur and Yadgir occupy the last positions in gender development as in the case of Human Development. (Dr.Nanjundappa's Report, Submitted by admin on Tue, 2010-09-14 15:56) and to overcome this disparity, the Hyderabad Karnataka region has received special status of under Article 371(J) of the Indian Constitution.

The vernacular press and national schools played a very important role in bringing awareness on Library movements among the people of Hyderabad Karnataka. The library movement in Hyderabad Karnataka was closely associated with national movement. In 1889 the Imam-UI-

Mulk Library was started at Gulbarga in the Middle School. This was the first Library of the Gulbarga region. In 1898 under the auspices of the Sharana Basveshwar Samsthan, a big Library was started and playwright Garuda Sadashiva Rao was appointed as the manger. In 1918 Dodappa App started the Sharana Basveshwar Kannada Library. The main aim of this was to take an active part in the national movement and create national awareness among the people. In 1930 the founder of N.V.School Vittalarao Devalganwakar established National Library Association, and in 1931 Bartha Library established at Osmania Middle School Chincholli. With the Influence of Pandit Taranath Jagganath Rao Fadnavis, R.G.Joshi and others established Bharth and Jayalaxhmi Libraries in Raichur. Jaganath Desai established Dasappa Library at Kanakagiri of Ganagavathi Taluk. In 1932 advocate Uday Banu and Gopal Dev Shasthri established Araya Samaj Library at Basavakalayana. Shirur Virabadrappa opened Vishwanath Library at Adur in 1932. In the same year Basaweshwar Libraries were established at Itagi, Yalburga and Rajuri. Kannada Sahitya Sangha library started at Gulbarga. In 1933 R.V.Beedappa and Hakikath opened Association Library at Chitaguppa. Maratha Sahithya Mandala Library, Irfan Darga Library, and Hindusthani church Library were also established in this region (Hugar, 2015).

1.3 DIGITAL INDIA AND SMART VILLAGES – INITIATIVES IN INDIA

As a progressive nation with diverse parameters, the Government of India has rightly recognized the potential of digital revolution in bringing up the socio, economic development and equality. The ambitious program of ‘Digital India’ is precisely based out of this ideology of the Government. According to a 2015 report by Deloitte and others, “Digital India: Unleashing Prosperity,” usage of mobile devices and other available technologies can serve as complementary channels for delivery of public services and can have positive outcomes on the quality of life of the users. The Prime Minister Narendra Modi’s vision of Digital India is to ensure that “every Indian is digitally empowered and every information is digitally available” to reach the unreached connecting villages and to every nook and corner of the country.

To make “Digital India” project a very successful movement in real sense, would need penetration of digital at the grass root level and at

village level addressing different areas of development as aptly put below in the “Dream Statement of Digital India”:

- High-speed **Digital Highways** unite the Nation
- 1.2 billion **Connected Indians drive Innovation**
- **Knowledge** is strength – and **empowers the People**
- **Access to Information** knows **no barriers**
- **Government** is Open - and **Governance** Transparent
- Technology ensures the **Citizen-Government Interface** is **Incorruptible**
- **Government Services** are easily and efficiently available to citizens on **Mobile devices**
- Government proactively engages with the people through **Social Media**
- **Quality Education** reaches the **most inaccessible corners driven by Digital Learning**
- **Quality Healthcare** percolates right up to the remotest regions powered by e-Healthcare
- **Farmers** are empowered with **Real-time Information** to be connected with Global Markets
- Mobile enabled Emergency Services ensure **Personal Security**
- Cyber Security becomes an integral part of our **National Security**
- Mobile and e-Banking ensures **Financial Inclusion**
- **e-Commerce** drives Entrepreneurship
- the World looks to India for the **next Big Idea**
- the Netizen is an Empowered Citizen

1.4 IT INFRASTRUCTURE IN LIBRARIES OF HYDERABAD KARNATAKA

For any college library, to modernize its activities and services including automation and technology enabled services, Information Technology Infrastructure is essential and effort made to assess the existing Information Technology Infrastructure available in the college libraries of Hyderabad Karnataka region.

Table 1 Type of Colleges Vs Number of Computers available for In-House Activities

		Number of Computers available for In-House Activities							Total
TYPE OF COLLEGE		1	2	3	4	5	6	11	
Government College	Frequency	23	0	0	0	0	18	0	41
	Percentage	56.1%	.0%	.0%	.0%	.0%	43.9%	.0%	100.0%
Private Aided College	Frequency	16	10	15	4	16	0	6	67
	Percentage	23.9%	14.9%	22.4%	6.0%	23.9%	.0%	9.0%	100.0%
Total	Frequency	39	10	15	4	16	18	6	108
	Percentage	36.1%	9.3%	13.9%	3.7%	14.8%	16.7%	5.6%	100.0%

Chi-Square value - 67.934

Significance 0.00

Computer is a basic infrastructure essential for college libraries, but as per the results it is found that, only one computer is available in 36.1% of the colleges libraries of Hyderabad Karnataka region. Two computers are available in 9.3% of colleges, 5 computers are available in 14.8% of college libraries. This gives the impression that there is a need for more number of computers in the college libraries to automate its in-house activities and services. Compared to government college libraries, number of computers available in private aided college libraries is better. Results of Chi-Square test find that there is an association between type of Colleges and Number of Computers available in the library for In-House activities as the computed Pearson Chi-Square value (67.934) is higher than the table value (Table 1).

Status of Library automation in Government Colleges and Private Aided degree Colleges available in the six districts of Hyderabad Karnataka region is shown in Table 2.

Table 2 Library Automation

		Automated		Total
TYPE OF COLLEGE		Yes	No	
Government College	Frequency	15	26	41
	Percentage	36.6%	63.4%	100.0%
Private Aided College	Frequency	61	6	67
	Percentage	91.0%	9.0%	100.0%
Total	Frequency	76	32	108
	Percentage	70.4%	29.6%	100.0%

Pearson Chi-Square value - 36.180

Significance 0.00

Majority of the college libraries have carried out library automation in their respective college libraries (70.4%). When compared to government

college libraries, 91% of Private Aided College libraries have automated against Government College libraries (36.6%). It may be noted that the libraries which have indicated no automation (29.6%) but they have created their database mainly MS-Excel and looking for proper automation, which indicates library automation in most of the college libraries. In order to determine extent of association between two variables, results of Chi-Square test find that there is an association between type of Colleges and library automation as the computed Pearson Chi-Square value (36.180) is higher than the table value. Further, application of Kendall's tau-b (0.579) indicates that there is a relatively high Correlation between type of Colleges and status of library automation.

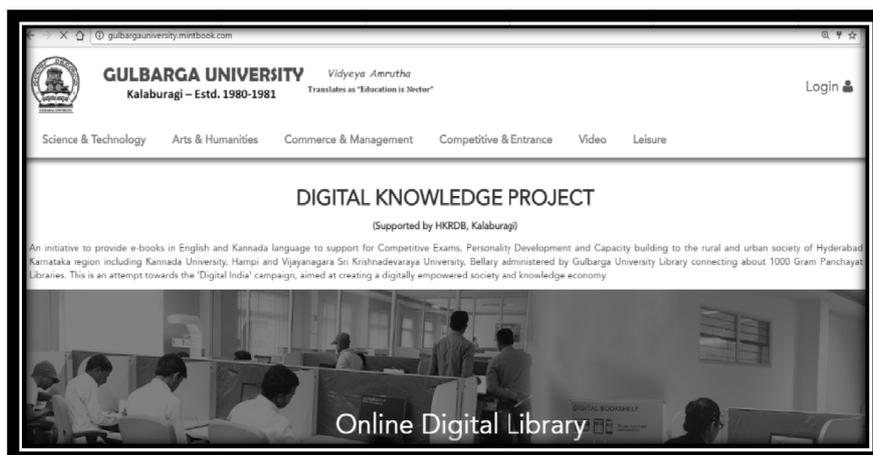
Table 3 Library software used

TYPE OF COLLEGE		Library software							Total
		Self – In Process	E-Lib	Easy Lib	Library Manager	e-Granthalaya	New-genlib	soul	
Government College	Frequency	26	1	1	2	8	3	0	41
	Percentage	63.4%	2.4%	2.4%	4.9%	19.5%	7.3%	.0%	100.0%
Private Aided College	Frequency	6	51	0	0	0	4	6	67
	Percentage	9.0%	76.1%	.0%	.0%	.0%	6.0%	9.0%	100.0%
Total	Frequency	32	52	1	2	8	7	6	108
	Percentage	29.6%	48.1%	.9%	1.9%	7.4%	6.5%	5.6%	100.0%

There are 108 colleges in which 41 are government and 67 are private aided colleges and out of these 108 college libraries in Hyderabad Karnataka region, nearly half of the college libraries in the Hyderabad Karnataka region use E-Lib developed by Argees, Hubli & Bangalore for their automation activities in the library. The features and services of this software has been found to be good as informed by librarians is the main reason for its popularity especially in this region. However other softwares - e-Granthalaya is adopted in 8 college libraries, newgenlib in 7 seven college libraries and SOUL software developed by INFLIBNET Centre in six libraries. As reported in table 11, nearly thirty percent of college libraries though they are skilled and interested but lack of support, they said that they have created their database in MS-Excel and few in MS-ACCESS databases. When compared to government colleges, it is found that among 52 college libraries using E-Lib software, 51 college libraries of Private aided colleges has this E-Lib software and only 1 government college library use E-Lib software, as it is commercial (Table 3).

1.5. DIGITAL KNOWLEDGE PROJECT – CONNECTING 1000 GRAM PANCHAYAT LIBRARIANS

‘Digital Knowledge Gram Panchayat Project’ is an initiative to provide e-books and educational videos mainly in Regional (Kannada) language to support students and youth from rural areas and villages in North Karnataka (Hyderabad Karnataka Region – considered to be a backward region in the State of Karnataka) for Competitive Exams, Personality Development and Capacity building. This project is supported by Hyderabad Karnataka Development Board (HKRDB), Government of Karnataka in collaboration with Gulbarga University. Under this project, digital library and e-learning solution customized to each of the 1000 identified gram panchayats libraries (in six districts of Gulbarga, Raichur, Bidar, Koppal, Bellary and Yadgir) and provided accessibility to 1200+ e-books and video content comprising of 800 plus in Kannada language and 400+ in English language. The digital content covers academic subjects (Political Science, Economics, Law, Ambedkar studies, Sociology, etc), English language books, Computer science literacy, Personality development, Folk literature, Kannada classics, Mathematics, Employment related exam preparation within Government like Railways, Banking, PDO, Teachers recruitment. UGC-NET, JRF, CSIR-NET, SET, Civil Services, etc and competitive exam preparations for higher studies like Engineering, Medical, Chartered Accountancy, Science research, Post graduation admission, study abroad, etc.



URL: <http://gulbargauniversity.mintbook.com/>

- **Implementation approach**

Each of the identified Gram Panchayats is enabled with digital libraries and these Gram Panchayats also act as eStudy Centres that provides reading materials and video lessons for higher education, skill development and employability. Content loaded in the digital libraries would comprise of Academic text and reference books, Literature and Classics, Science and General Knowledge, Employment Examinations, Entrance examinations (Higher studies) – CET / IIT-JEE / SAT, Language development – English learning, Personality development – soft skills, Capacity building, Vocational training videos , Research journals, Kannada language literatures and classics, etc. Digital libraries are implemented in 2 tiered approaches - Master Digital Library (MDL) and Sub Digital Library (SDL). Gulbarga University digital library will be the Master Digital Library which will have all controls on the users, content and sub digital libraries. All other digital libraries under this contract shall be sub digital library and will mirror Gulbarga digital library content. Each of the sub digital libraries is enabled with a desktop digital library platform that connects to the centralized eBooks storage server.

Members / users in each of the Sub digital libraries will automatically connect to the Digital library through the enabled IP of respective digital library locations. With respect to Universities digital libraries, remote access abilities can be enabled by the Super Admin.

- **Digital Library Awareness Campaign**

An awareness and training Program for 1000 Gram Panchayat (GP) Librarians of Hyderabad Karnataka region was carried out from 28th March to April 6, 2016 at Gulbarga University, Kalaburagi under the Digital Knowledge Project supported by HKRDB, Kalaburagi to provide access to around 1200 e-books mainly in Kannada language to support for Competitive Exams, Personality Development, subject based books and Capacity building to the rural and urban society of Hyderabad Karnataka region. The workshop on digital library was a big learning experience for many of the rural librarians. This also put them in the limelight and showcasing their contribution in nation building.



- **Social impact and outcome**

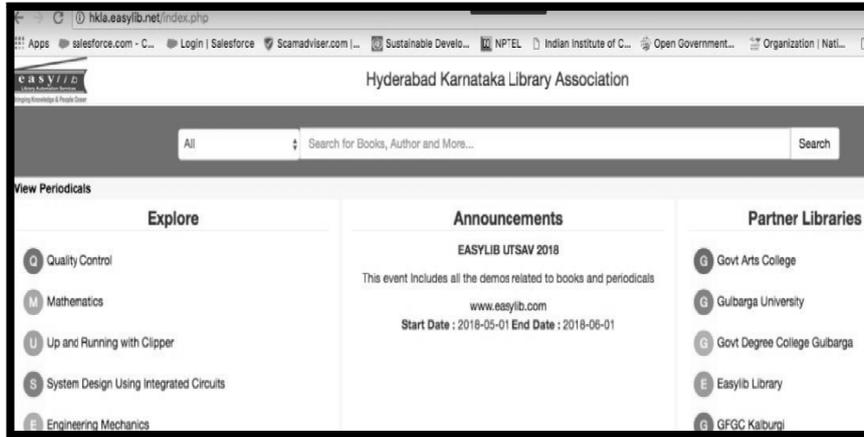
Much of the value created by digital literacy based on local content through empowering technologies likely to flow to rural population, including those in the poorer segments. This would create a sort of ‘consumer surplus’ in number of ways, including time savings, low costs, and greater convenience and even improved health. A McKinsey report estimated that empowering technologies including digital literacy can help some 400 million poor rural Indians in general and 24 million students in particular, who will gain 4 to 8 years of additional education by 2025.

- Current critical challenge to have local digital content to avoid the trap of low digital literacy despite the substantial advancement in technology sphere would have been addressed. The existing digital and knowledge divide amongst urban and rural is bridged
- Actively supports Digital Literacy Mission of GOI and provides a smarter adoption mechanism.
- Developing a reading habit that changes the world-view-awareness about the location of the self and the community in the interconnected world
- Self-reliance and mutual respect
- Ability to articulate choices and decision making including amicable conflict resolution

- Awareness about rights and responsibilities that bring accountability
- Capability to use technology appropriately and adapt in the present world
- Takes literacy to the next level-beyond to read and write, allows the users to engage digitally in acquiring knowledge and use internet services for their occupation
- Provides a level playing field for the rural students and job aspirants
- Improves their personality and self confidence
- Better performance in exams (students), better job opportunities (unemployed), better price and market (Cultivators and artisans), better knowledge (all), better awareness (Women empowerment and Adult education), better usage of internet (Utility services), better utilization of developmental schemes (all) and better digital literacy.
- Brings urban amenities to the rural areas – Learning, Library, Exam prep, Employment, Cyber café, e-Commerce and e-Market place, Entrepreneurship, Women empowerment, Adult literacy and many more.

1.6 HYDERABAD KARNATAKA INFORMATION LIBRARY NETWORK

Library Associations especially in Hyderabad Karnataka region has been playing a significant role in the promotion of librarianship as a profession vital to an informed and knowledgeable society since 1980's. Hyderabad Karnataka Librarians Association' [Reg. No. 565/2011-12] owing to the demand from library professionals to enhance the scope of coverage of library professionals serving in different sectors and keeping in view of the special status received under Article 371(J) of the Indian Constitution to this Hyderabad Karnataka region covering six districts – Bellary, Bidar, Kalaburagi (Gulbarga), Koppal, Raichur and Yadgir. (source: <http://www.hkla.in/>) 'Journal of Information Management and Educational Technology' is a peer reviewed open access online journal published thrice a year by the association (source: <http://hkla.in/jimet/index.php/jimet/index>) and is actively conducting workshops, academic and social programs for the benefit of the society.



This is an initiative in pipeline to establish networking of colleges and universities in Hyderabad Karnataka region sharing their catalogue and making access to all the libraries catalogue at one central location with a facility to search all the college libraries connected under one network.

1.7 TECHNOLOGICAL INFLUENCE ON UNIVERSITY LIBRARIES



Source: Virtual Learning Resource Centre & Digital Library @ www.guglibrary.net

Gulbarga University Library, a knowledge Center for accessibility developed on modern lines is a prominent Learning Resource Center supporting to the academic and research pursuits. A state-of-the-art Virtual Learning Resource Center and Digital Library (VLRC & DL), excellent ICT facilities has been established with 100 computer

workstations with one GBPS leased line connectivity under NMEICT Project and Wi-fi (Wireless Fidelity) access provides access to 15,000 plus e-Journals and databases under E-ShodhSindhu consortia and other e-resources (www.guglibrary.net). Further RFID technology has been implemented in central University of Karnataka, Kalaburagi (<http://cuklibrary.ac.in/index.html>). Besides, Institutional repository, ERP system, Remote access etc., are the technology base services extended to the users in addition to the user sensitization programmes extended to state level of Karnataka including Government and Private aided colleges in Karnataka state.

1.8 CONCLUSION

Digital literacy and awareness amongst the rural librarian is critical not only in their dissemination of knowledge but also in engaging with the population and creating a snow ball effect in propagating the ease of use and effectiveness of such initiatives. Digital Libraries project also focuses on expansion and development of educational facilities and brings a focus of knowledge sharing at the regional level. Such knowledge and literacy would help benefit livelihood and standard of living of population at large and thereby build of libraries.

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APPLICATION OF CLOUD TECHNOLOGY IN DIGITAL LIBRARY

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ABSTRACT

Libraries may before long be fabricating and dealing with their own particular server farms. This model would give libraries a chance to keep up more control over the applications and information stores that contain delicate, private data about benefactors. Provisioning and support of framework for Online computerized library exhibit a few difficulties. In this paper we talk about issues looked with advanced library and improvement endeavors to conquer that issue. Framework virtualization and distributed computing are especially alluring decisions which is tested by both development in the extent of the listed record accumulation, new highlights and most conspicuously use. With the reason for applying Distributed computing to college library, the paper portrays the present status of client benefit models in college libraries. At that point it proposed to enhance current client benefit demonstrate with Distributed computing. This paper investigates a portion of the security issues encompassing information area, portability and accessibility.

Keywords: Proficiency, Consents, SAAS, PAAS, IAAS, Administration Models, BBS.

INTRODUCTION

Distributed computing is a totally new IT innovation and it is known as the third insurgency after PC and Web in IT. To be more particular, Distributed computing is the change of Appropriated Figuring, Parallel Registering, Lattice Processing and Conveyed Databases. What's more, the essential guideline of Distributed computing is making undertakings dispersed in vast quantities of disseminated PCs however not in nearby PCs or remote servers. As it were, by gathering vast amounts of data and assets put away in PCs, cell phones and other hardware, Distributed computing can coordinate them and put them on the general population cloud servers for serving clients. Advanced library is an improvement

arranged equipment and programming reconciliation stage, through to specialized and the item mix, every sort of bearer digitization, carries on the compelling store and the association, gives the system a viable administration. After Advanced library innovation promotion, gave the high review data benefit however at the same time likewise to uncover a wide range of question constantly, on the grounds that the zones of various the current monetary condition restrain introduced the improvement not adjusted wonder, the local assets imparted to trouble, frame every one data secluded island or the assets are excess, make the assets the waste, fulfilled the aggregated and with trouble, the distributed computing perhaps gives a decent arrangement step by step for this sort of marvel.

ISSUES OF ADVANCED LIBRARY

Advanced library for our examination gives an advantageous, alongside the expanding learning levels; the prerequisite of computerized library is additionally developing step by step, but since of uneven financial improvement in various districts makes the advanced library's assets be moderately short, to college advanced library for instance. Different schools and colleges while are raising the particular showing level endlessly, have built up an advanced library to buy its own particular database assets, but since of the showing center And financial conditions, library assets between college's has the distinctions, in the mean time looked from the entire that the Computerized library has certain blemish. Information assets between different colleges are generally autonomous, building repetitive ventures probability was high, has made the labor, the monetary asset and the assets waste, or a few schools and colleges to utilize just piece of database assets, insufficient utilization of assets, and can't play assets most extreme usage. Computerized library delegate one sort of new framework and the earth, through the distributed computing, it might utilize assets more powerful, and can fathom the deformities of advanced library. decrease costs. Stage as an administration (PAAS), characterized by the type of administrations gave to the designer's application advancement and organization stage, so they can utilize this stage to create, convey and oversee SAAS applications.

DISTRIBUTED COMPUTING ACKNOWLEDGMENT

In view of distributed computing in the cost figuring, execution, group participation and the benefits of the geographic area, on the grounds that at the same time the diverse application method has utilized the

distinctive commonly free stage, every application methodology finishes on claim server. Utilizing distributed computing can share the server in numerous application methodology, understands the asset sharing, subsequently additionally diminished server's amount, accomplishes the impact of decreasing the cost, in this manner uses distributed computing in the Advanced library, will give our work, the life and the investigation definitely acquires a more prominent productivity.

CONSENTS ACKNOWLEDGMENT

Cloud administrator ought to is created by college delegate, government agent and specialist co-op delegate, its duty ought to be the administration day by day activity, gives the high review benefit and the high security, the plan understanding, the planned all quarters' advantage and carries on endorse on the unlawful client and the opposite task.

INVESTIGATION OF CURRENT CLIENT ADMINISTRATION DISPLAY IN LIBRARY

Library, as a most critical scholastic and logical research base, charges for giving data administrations to its clients. Before, most libraries demanded that their administration depends without anyone else library assets. So, custodians hardly thought about clients' requests. Be that as it may, today, present day libraries have changed this perspective. What's more, bookkeepers for the most part need to gather as more data as they can do it as per clients' prerequisites. At that point they will investigate the data and deal with them. At long last, they will give them to clients in some specific specialized techniques. Be that as it may, benefits in present day libraries will progressively center around clients' requesting in future. What's more, a definitive objective of present day library is to offer suitable, exhaustive and multilevel administrations for its clients. At current client benefit models are for the most part WWW benefit display, FTP benefit model, BBS and Email benefit demonstrate, and so forth.

WWW Administration Model: WWW (Internet) depends on customer Server demonstrate. It displays a wide range of data perusing frameworks with the bases of HTML dialect and HTTP convention. The particular division is: WWW Servers are accountable for connecting pages by hypertext connections and WWW customers are in charge of showing data and sending solicitations to servers. Also, the most noteworthy component of WWW benefit is its high level of incorporation. As such, it can associate a wide range of data and administrations consistently and furnish clients with distinctive graphical UI at long last. All in all, WWW

gives new methods for hunting and sharing data down individuals around the globe. In the meantime, it step by step turns into the best methods for dynamic media intuitive for individuals.

FTP Administration Show: FTP (Document Exchange Convention) is a generally utilized correspondence convention. What's more, it is included different tenets that help record exchange on the Web. In that capacity principles can allow online clients duplicate documents starting with one host then onto the next, it conveys extraordinary accommodation and advantages to clients. Similarly as other Web administrations, FTP are additionally in light of customer Server demonstrate. In the meantime, it's anything but difficult to figure out how to utilize FTP benefit. In the first place, you just need to begin the FTP customer program to interface with remote host, at that point you should issue document exchange summon to remote host and after remote host got the order, it will give react and actualize the right

BBS and Email Administration Demonstrate: BBS (Release Board Administration) is a sort of electronic data benefit framework on the Web. It is much the same as an open clear board on the Web; all clients can compose their contemplations or discharge data on this board. Furthermore, Email is simply one more sort of data benefit on the Web. In a word, Email gives a snappy, straightforward and conservative method for correspondence for the Web clients in the entire world. Through BBS framework, library clients can ask and counsel administrators whenever. Generally, they can get their reaction in a brief timeframe. Mean while, bookkeepers can speak with more clients at once through BBS. Additionally, college libraries can open addresses, discharge declarations and give online help to clients by BBS framework. Furthermore, through Email framework, clients can acquire their required data and information assets all the more rapidly and financially as they don't have to visit libraries actually. In the new data condition, different IT advances refreshed opportune.

CONCLUSION

We realize that library isn't just an information sea; its definitive point is to give palatable administrations to every one of the general populations. So, in the new time, library ought to enhance itself continually by embracing numerous new IT advances. Furthermore, in this paper, we endeavored to enhance current client benefit display in college library by utilizing Distributed computing. In spite of the fact that investigation of Distributed computing is still in the underlying stage currently, impacts

brought by Distributed computing are self-evident. With the acquaintance of Distributed computing with college library, administrations of libraries will have another jump sooner rather than later. Administrations gave by libraries will turn out to be more client driven, more expert and more powerful, and so forth. Furthermore, we as a whole trust that libraries will make more learning benefits for our nation with the assistance of Distributed computing. Cloud condition is a very created arrange condition; it appears to the clients of astounding administration and high security. The Distributed computing strategies and techniques connected to computerized libraries, not exclusively can enhance the use rate of assets to address the awkwardness being developed between districts, yet in addition can make more broad utilization of distributed computing to our work life.

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SOCIAL MEDIA FOR EFFECTIVE LIBRARY SERVICES

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ABSTRACT

The present era is the age of information science and technology. Social media is a most powerful tool for connecting people to share photo, videos and ideas. In this paper we are discussing about social media works in libraries, library social media, advances of social media and challenges of social media.

Keywords: *Web 2.0, Social Media, Advances of social media, Challenges of social media.*

INTRODUCTION

The application of ICT technologies has broadened the walls of the libraries. The term Web 2.0 refers to the development of online/Web based services that encourage collaboration, Communication and Information Sharing.¹ Social media has become a part of many people's everyday lives. Social media is merely a tool for connecting with people. To share what we know or have in mind by bringing it to library users.

Social media are computer mediated tools that allows people to create share and exchange information ideas and picture/videos in virtual and networks. Social media as defined as "a group of Internet based applications that build on the ideological and technological foundations of Web 2.0 and that allow the creation and exchange of user generated content."² Social media is the collective of online communications channels dedicated to community based input, interaction content sharing and collaboration, website and applications dedicated to forums, micro blogging, social networking, social duration, and wikis are among the different types of social media.

DEFINITION

According to Wikipedia "Media for social interaction, using highly accessible and scalable communication techniques. Social media use of

web based and mobile based technology to turn communication into interactive dialogue”.

Web 2.0

Web 2.0 has been described in different ways. Some people argue that social software include the tools that allow people to connect more easily to each other online, such as wireless internet access and mobile devices. A narrower definition may only include software that let people have a two way conversation, excluding technologies such as podcasting and screen casting.

The phase web 2.0 was reputedly coined in 2004 by O'Reilly Media, although it described technologies that had been developed earlier in the 1990s. Social software is not really as such, but internet services that could ultimately replace desktop software. It is about using the internet as a platform to run software and services rather than a desktop PC, so most software tools are hosted remotely and can be accessed from anywhere with an internet connection.

How Social Media Works in Libraries

There are three main areas for implementation of social media in libraries. They are:

1. ***Social media for communication of information:*** Communication of information is an important area for implementation social media in libraries. The main objective here is to create and maintain a constant line or network of communication for effective interaction with patrons, staff and faculty in an online collaborative environment. (Facebook, MySpace, Twitter, LinkedIn etc.)
2. ***Social media for dissemination of information:*** Information dissemination being the most important function of a library can make use of the image and video hosting, uploading, downloading and sharing videos, educational resources such as videos, audio, documents, photos, slide sharing, hosting slide services. (Flickr, YouTube, Teacher Tube, Slide share etc.)
3. ***Social media for organisation of knowledge:*** Due to information explosion it is hard to keep up with all the information in today's era. Information today needs to be filtered and users today are only after information that is relevant. Some social media tools used for storing, sharing and discovering web bookmarks, book review services, tracking books with access to the Library of Congress,

Amazon sites for easy access and tracking. (Del.icio.us, aNobii, Library Things, lib.rario.us etc.)

Social Media in Libraries

The prime reason behind the existence of a library is information dissemination. It is the responsibility of a library to bring the right information to users at the right time. Now by right time it is definitely meant that it be provided as soon as possible. That is where social media fits in into the realm of library services. Social media creates a constant medium of communication between the library and its users. By applying social networking as a medium of providing its services a library moves one step further into the realm of information and communication technology. It allows users to share ideas, activities, events and interests within the individual networks.

Social Networking: It is the way the 21st century communicates now. The term social networking refers to a process of relationship building among a group of people who have a common interest (What is Social Networking, 2010).

Advances of using Social Media in Libraries

1. **Low cost maintenance:** Use of social media for a library incurs very low expenses.
2. **Direct and fast service:** Though social media a library can provide its services and disseminate news quickly, delivering information directly to library users.
3. **Regular Interaction:** Social media it is possible for regular interactions with library users.
4. **Regular Feedback:** Social media make it possible to gather regular feedbacks from library users to enhance its services.
5. **Usage of Library Contents:** The promotion of library holdings and services through social media can help increase the usage of library contents.
6. **Enhances communication:** it enhances communication both within libraries and other departments.
7. **Sharing Platform:** Social media provide a wide platform for sharing the library resources to a wide range of users living thousands of miles away.

Challenges of using social media in libraries

There are advantages of social media in library however it does not come without challenges. Challenges are an important part of development and following are some of those challenges that needed to be overcome if implementing social media as part of library development is to be made a reality.

1. **Time taking process:** it is a time taking process and requires considerable amount of effort and patience from library staff.
2. **Training:** small training is required for maintaining a social media profile for a library. A regular social media user can easily handle it without much effort.
3. **Two way participation:** For active social media profile participation from both side the library staff and user is necessary and so both ends require a level of interest in social media and networking.
4. **User friendly:** The social media whether it is a blog or a website should not have a complicated design and usability. It should be user friendly so that patrons may take maximum benefits out of such applications.
5. **Copyright issues:** There are always copyright issues while using social media. So it always helps to be aware of the Intellectual Property Rights and the contents uploaded online to not face any issues regarding copyright.
6. **Other Challenges:** Other challenges like internet connectivity, technology infrastructure. Government restrictions, funds are also affected the social services.

CONCLUSION

The use of social media in Library as an effective communication tools to interact with faculty staff and students in new ways. The libraries can be used for spread different activities, services that they offer and the marketing of new library products, initiatives, new addition to library collections, links to articles, videos, community information, feedback, respond to people, talk to people, give instructions. Other than marketing, the simple act of having conversations and creating relationships with patrons is immediately useful. Through conversations on social media, libraries can identifying their users want and needs are and can ultimately understand their users better.

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SOCIAL MEDIA: RELEVANCE IN LIBRARIES AND APPLICATIONS

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ABSTRACT

This article explains how to use some of the most important social media platforms in the library. Libraries, regardless of the location or language of the family for us, geographically, are linked to national brands, although their use of platforms is very different. Although the platform is how to use it and what each library is equipped with different materials, it is not surprising, but the general effect is that Patchy uses the platform, some libraries will include all the platforms, while others will concentrate less. An important message that can be connected to people who use high quality images for websites.

Keywords: *Social Networking; Library Services*

INTRODUCTION

A library network is broadly described as a group of libraries society together with some accord of accepting to help each other with a new to gratifying the information needs of their clientele or users example in flibnet. Social connections have become very imperative and have enhanced the library profession vastly in India. Social networking refers to a process of relationship building among a group with a common interest. Social Media emerged in India principally for the purpose of socializing. The Facebook initially was used only for social discussions, however over time, particularly by the turn of the 21st century the grouping of individuals into specific groups emerged. Professional groups started to spring up and within time the library profession had its own group with the sole purpose of sharing ideas and crowd first-hand information regarding the profession, without a doubt, as an increasing economy, the use of these media often met with challenges which are briefly discussed in this paper and strategies for the enrichment of library services through these media have been proffered.(13)

What is social media?

Different authors and organizations have defined social media differently.

Research Information Network (RIN) uses the term social media to refer to internet services where the users of the services generate the online content. In its Social Media Guidelines for Staff, the European Commission describes social media as “online technologies and practices that are used to share content, opinions and information, promote discussion and build relationships.” (10)

Henderson and Bowley define social media as “collaborative online applications and technologies that enable participation, connectivity, user-generated content, sharing of information, and collaboration amongst a community of users.”

Kim describes social media as “the phenomenon of Community-led information exchange, i.e. users generating and consuming other user-generated content. It is enabling sharing of ideas, co-operating, collaborating, meeting new like-minded people, keeping in touch, strengthening relationships and reaching out to potential customers: both in a personal and professional context.” (10)

Social networks are a form of internet based communications. The social media platform allows users to chat, share information and create web content."The media enables LIS professionals to provide prompt responses to users. The channels give the open walls to advertise all library services to users. Moreover, they can strengthen the services and images of the library. By obtaining feedback, LIS professionals can provide and adjust information and services for users effectively".(4)

Why to use social media in libraries

Social media has the potential to facilitate a closer relationship between libraries and users. Social media can be a powerful tool for disseminating information and a way to promote library activities, resources and services, while stakeholders can have two types of conversation. The core of the work of librarians is the sharing information so this would suggest librarians are in a unique position to implement and exploit social media to their improvement.

Social media can be used in various communication methods, which are usually summed up as broadcast messages in response to questions, and then in the form of a conversation between the Institute and the users. Social media can give competitive advantage at the time of the high technical value of their proposal. Social media give librarians a way to

reach out to their users who may not have considered the library as a resource for their information needs.(1)

(a) Cost and ease of use

Open and start system is easy and free. The users make use of the tool in the life of a society, and professional, too, for a long time, and by the correspond to the expectations of the many users of social networks in the workflow. Setting up accounts and getting started is easy and free. Patrons use the same tools in their social and work life so social media fit in with the workflow and expectations of many users. However, judging what success looks like in social media is notoriously difficult as unlike in conventional direct marketing where there are recognised response rates. It is much harder to measure something intangible like social media. Although there are the easy measures such as the number of Twitter followers, Facebook likes and comments, measuring 'engagement' or customer satisfaction is much more problematic. Further a myth has arisen that suggests that social media is completely 'free' when very real costs, particularly staff time, are attached. Good social media engagement requires considerable staff time and management commitment to ensure the reputation of the library is enhanced in the eyes of users. (1)

(b) Communication with patrons

Social media provides an accessible way for users and potential users to interact with potentially young, younger generation or "digital origin" who enter the world of work while increasing information sharing culture. It is an imagination that young people are people of social technique, yet they are very active and do a special work / study in the field of work to see a clear distribution of work / study and entertainment and libraries.(1) Current two-way communication between the library and the user may be useful in answering collection requests.

(c) Marketing and promotion

Social media resources are used primarily for many organizations in their marketing and promotional activities. For libraries it allows them to communicate to promote collections, exhibitions, ideas, etc. However, it should be kept in mind that social media tools can provide, the library still needs to offer content to promote and it takes time and money. Social media can only promote what is feed into it. (1)

(d) A way to improve customer service

By emphasizing this on social media for marketing and broadcasting one can overlook the participatory nature of social media. Social media is often seen as a marketing tool and promotion but they also offer the chance to improve customer service issues and complaints. Social media allow an organization to monitor what's being said about them and respond to positive (and particularly negative) feedback quickly.(1) There are now numerous platforms which offer these services although libraries need to consider who is responsible for this activity and how much time to devote to this as this hidden cost and rise. This participatory communication method allows users to connect with knowledge curators and trust to be built between the two parties.

What are the benefits of using social media?

Billions of people around the world use social media to share information and make connections. On the individual level, social media allows people to communicate with friends and family, learn new things, develop their interests, and be entertained. On a professional level, one can use social media to broaden the knowledge in a particular field and build professional network by connecting with other professionals in the industry. At the Library Level, social media allows to have a conversation with Users, gain users feedback, and elevate the scope.

What are the challenges that social media presents in the library?

- Time (Lack of time to use social media)
- Too many social media tools to learn
- Balance between pleasure and information (Being light- hearted)
- Keeping up with trends of social media
- A fast ship, it is necessary to provide the answer,
- Social networking sites and the transition to a new social trends
- Reiterate messages without bombarding students
- Coordinating staff efforts within the library
- Quality control
- Responding to negative feedback
- Tension between the administration and the University Library
- Inadequate funding for libraries
- Inadequate training opportunities for library staff

- Slow speed of Internet
- Electricity failure (13)

What social media sites does the universities use?

While there are many types of social media sites available for use, many universities have their presence in the sites, these are Facebook, Foursquare, Ning, LinkedIn, Instagram, Tumblr, Twitter, Youtube, Second Life, Flickr, Blog, RSS, Wikipedia, PBWiki, Footnote, Slide share. These types of university social service centers are called University Communications and Marketing. Prominent examples of social media tools include the following:

- (a) **Facebook** is a social networking site that allows to network with people, friends, businesses and organizations worldwide. Departments looking to build overall brand awareness should consider using Facebook. Facebook is librarian friendly. Group communication among patrons can be possible in web 2.0
- (b) **Foursquare** is a location-based social networking site available to users with GPS-enabled mobile devices. Departments who host several events should consider using Foursquare to encourage students to check into those events and venues.
- (c) **Ning**: Librarian can use this tool to get connected with students, library associations, and more. One can also use it to share information with many people at a time (9).
- (d) **LinkedIn**: This social networking site for professionals is a great way to get library patrons connected with the people that can help them find information. Whether that's you, faculty, authors, historians, or other sources, they can find them in your Linked in network.
- (e) **Instagram** is a social networking site that allows users to share pictures and short videos using their mobile device.
- (f) **Tumblr** is a blogging site that allows users to post text, images, videos, links, quotes and audio.(9)
- (g) **Twitter** is a micro-blogging site that allows people to post updates in 140 characters or less. Departments looking to engage their audience at a high frequency and have the resources to respond promptly should consider using Twitter.
- (h) **YouTube** is the world's largest video sharing site. Departments with a videographer or high volume of videos should consider

creating a YouTube channel to publish their videos. Library video and e-learning tutorials, events and others video library services can be effectively promote and webcast through YouTube.

- (i) **Second Life:** On Second Life, one can create a virtual library with streamed media, discussions, classes, and more. (9).
- (j) **Flickr:** This image distribution tool is a great way to share new image collections. Library can share photo collection of workshops; conference and different programme that are organised with in the campus. One can create image sets with metadata, as well as take advantage of the many plugins available for Flickr users. Flickr users can also help gather missing information about images.
- (k) **Blog:** By creating a blog, one can disseminate information to lots of people at one time. Whether one is updating students on new collections, or just conversing with library staff, blogs are a powerful tool, especially when combined with RSS. A user can have up to 100 blogs per account(5).
- (l) **RSS (Rich Site Summary; originally RDF Site Summary; often called Really Simple Syndication)** is a type of web feed which allows users to access updates to online content in a standardized, computer-readable format. These feeds can, for example, allow a user to keep track of many different websites in a single news aggregator. The news aggregator will automatically check the RSS feed for new content, allowing the content to be automatically passed from website to website or from website to user. This passing of content is called web syndication. Websites usually use RSS feeds to publish frequently updated information, such as blog entries, news headlines, audio, video. An RSS document (called "feed", "web feed", or "channel") includes full or summarized text, and metadata, like publishing date and author's name. A standard XML file format ensures compatibility with many different machines/programs.

RSS feeds also benefit users who want to receive timely updates from favorite websites or to aggregate data from many sites. Subscribing to a website RSS removes the need for the user to manually check the website for new content. Instead, their browser constantly monitors the site and informs the user of any updates. The browser can also be commanded to automatically download the new data for the user's feed data is presented to users using

software called a news aggregator. This aggregator can be built into a website, installed on a desktop computer, or installed on a mobile device. Users subscribe to feeds either by entering a feed's URI into the reader or by clicking on the browser's feed icon. The RSS reader checks the user's feeds regularly for new information and can automatically download it, if that function is enabled. The reader also provides a user interface.(7).

- (a) **Wikipedia:** Wikipedia is an online encyclopedia updated by users. One can use this tool to share knowledge by editing, or simply point library patrons in the right direction. One can also host library websites on wiki software like PBWiki (9).
- (b) **PBwiki:** PBwiki is the world's largest provider of hosted business and educational wikis. It encourages collaboration from students, a way to showcase work, and offers a central gathering point for information. PBwiki offers controlled access, so one can give some editing privileges, while others can only read (9).
- (c) **Footnote:** On Footnote, one can get access to original historical documents, and can update them with content and insights. One can even find personal anecdotes and experiences that one won't find in reference books.
- (d) **SlideShare:** Encourage faculty, staff, and students to share their slideshow presentations for the greater community to access on SlideShare. It's a great way to disseminate information among research community to the field of research and development (R&D) activities.

Social Media's Place in Libraries in future

In general terms, there is agreement that it is difficult to predict how social media and its use will evolve, so the priority for most of the librarians contacted is to remain experimental and flexible. There is little doubt that use of social media is well on its way to becoming an integral part of how people communicate with each other in the 21st century. A more integrated future is imagined, with library services and collections becoming more deeply embedded with external sites. Some librarians see their role becoming one of helping users find paths through complex content, and directing them towards making useful connections as efficiently as possible- potentially by merging smart applications and human crowd sourcing, with the smart component drawing on the human element by using social source to retrieve information that is

personalized and relevant to a specific user. Not surprisingly, social media would become more important to the library in future.(12)

Role of information professionals on using Social Media

Libraries play important role in providing information for research and access to knowledge. In order to stay relevant in the social networked environment and meet the growing needs of their users, librarian should perform the following roles for catering the needs of users: (12)

- As an information broker, librarian should identify, retrieve, organize, repackage and provides electronic access to digital information resources by various means.
- ICT has posed a great challenge for proper access of e-information; librarian should work as technology application leader. The librarian should evaluate systems time to time that would facilitate e- access.
- Accessing timely and easy retrieval of information are major issues in libraries. Librarian as a information facilitator should make information access easier by providing easy network access, adopting suitable software.
- Librarian should trains clients on internet use i.e. tools search engines, e-journals, e-databases, using of information portal, online tutorials etc to user can be used for accessing potential information from various web resources.
- Keeping in view the importance of social media for marketing library among internet users, internet service must be provided in all types of libraries in order to utilize social media tools.

CONCLUSION

In general libraries have adopted a multichannel approach to social media and are using the familiar household brands used in our personal and professional lives. There are differences across the libraries and the libraries are using social media for many purposes, from marketing and promotion, opening up the resources of the library, and a customer service function by responding to queries and questions. It is impossible to know what social media success looks like for libraries without undertaking in-depth research but librarians are trusted information professionals are well placed to harness the opportunities available in the world of social media.

RECOMMENDATIONS

- All libraries should develop their web site.
- Libraries should create their social media marketing plan and social media services.
- In competitive environment libraries should employ social media to communicate the library mission.
- It is recommended that libraries should provide their patrons with tools for accessing social media by developing social media page on library web site.
- Facebook is much popular among teens; it is recommended that libraries should develop their Facebook page on their web sites. It would keep the library fresh in teen's minds.
- Librarians must be educated and trained in using social media tools for marketing library resources and services.
- Library associations, alumni and LIS schools should play their role in popularizing the use of social media among LIS professionals.
- Library schools in their syllabus should emphasize on the practical aspects of marketing and using social media for this purpose.
- Future research should be conducted to investigate the use of different social media among students and general public.
- Libraries not only should examine how social software can improve services to their patrons, but they should also consider how these tools can improve internal communication and collaborations(14)

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LIBRARY AND INFORMATION NETWORKS IN INDIA: AN OVERVIEW

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ABSTRACT

Networking of libraries is an important measure to share resources which was proposed by Dr. S.R. Ranganathan as Library Cooperation. This paper attempts to profile some of the leading Library Networks in India viz., NICNET, INDONET, BONET, MYLIBNET, CALIBNET, DELNET, INFLIBNET, etc.

Keywords: *Library Networks, India, NICNET, INDONET, BONET, MYLIBNET, CALIBNET, DELNET, INFLIBNET.*

INTRODUCTION

The explosion in the amount of literature that is available, increases among the number of users and their different needs, and the application of electronic media are forcing libraries to construct and participate in networks. Magnetic tapes, floppy disks, and CD-ROMs provide enough data storage capacity. Retrieval through telecommunications networks and access to international databases are available for searching for information on various subjects. With the advent of networks, remote transmission of texts and graphics, video clips and animated clips are also possible.

A library network is broadly described as a group of libraries coming together with some agreement of understanding to help each other with a view to satisfying the information needs of their clientele. UNISIST II working document defines Information Network as a set of inter-related information systems associated with communication facilities, which are cooperating through more or less formal agreements in order to implement information handling operations to offer better services to the users. The National Commission on Libraries & Information Science in its National Programme Document (1975) defines a network as two or

more libraries engaged in a common pattern of information exchange, through communications for some functional purpose.

OBJECTIVES

- To promote and support adoption of standards in library operations.
- To create databases for projects, specialists and institutions to provide online information services
- To improve the efficiency of housekeeping operations
- To coordinate with other regional, national & international network for exchange of information and documents
- To generate new services and to improve the efficiency of existing ones

Network Development in India

There are numerous factors that are responsible for the development of library and information networks in India. They are based on the report of the working group of the planning commission on modernization of library services and informatics for the seventh five-year plan, 1985-90. The National Policy on Library & Information systems document (1986) accepted by the ministry of HRD, Government of India also played a crucial role. The report on national policy on university libraries prepared by the Association of Indian Universities (1987) and the UGC report on information systems for science and technology under the Department of Science & Industrial Research (DSIR) Government of India has been vigorously promoting an integrated approach to library automation and networking

Limitations in Network Development

A network may fail in the early stages if there is not proper planning or if adequate funds are not available. Moreover, a common memorandum of agreement signed by the participating libraries at the institutional level is essential for the success of a network venture. On a more practical level, catalog data must be in a standard, machine readable form for it to be shared and exchanged. And, finally, a continuous flow of external assistance is crucial for the network's survival.

Types of Networks:

Presently, there are three types of computer networks:

- LAN
- MAN
- WAN

Local Area Network (LAN)

A LAN is a number of related computers and electronic devices that share information over a transmission media.

A typical use of LAN is to tie together personal computers in an office so that they can all use a single printer and a file server. The LAN can be within a building or a campus wide network.

Metropolitan Area Network (MAN)

Attempts are being made to develop this type of network in metropolitan areas such Delhi, Calcutta, Bangalore, Madras, etc.

Wide Area Network (WAN)

A large-scale network, involving offices in different cities and countries is referred to as WAN, which is specially designed to interconnect data transmission devices over wide geographical areas.

Categories of Network

Library networks have been divided into two categories: general network and specialized network. The latter can further be divided into metropolitan network and countrywide network.

General Networks in India

NICNET

Title: National Information Center Network

Sponsor: Planning Commission, Govt. of India.

Membership: Four national and regional nodes, 32 state and union territory nodes; seventy cities and towns

Services: Bulk file transfer; teleconferencing; full text and bibliographic retrieval services

Application: ICMRNIC Center; MEDLARS in India; Chemical Abstracts database

INDONET

Title: INDONET data Network

Sponsor: CMC Ltd (1986) = Informatics India Ltd (1989)

Membership: Commercial computer network

Services: Database services such as DIALOG, COMPUSERVE; IP; SHARP

Applications: ACME; file transfer; international gateway

I - NET (VIKRAM)

Title: I - NET

Sponsor: Dept. of Telecommunications, Govt. of India

Connectivity: Packet switched public data network covering nine cities

Services: Information exchange through e-mail / FTP; Bibliographic databases

Specialized Networks

Metropolitan Networks

CALIBNET

Title: Calcutta Libraries Network

Sponsor: NISSAT - Govt. of India

Applications: Cataloging; serials control; acquisitions; circulation

Services: CAS; SDI; union catalog; partial database; editing and retrieval of records; global information; search; full-text document delivery; library automation; CALIBNET INFO Services

BONET

Title: Bombay Library Network

Sponsor: NISSAT & NCST (1994)

Objective: To promote cooperation among libraries in Bombay

Services: online catalog; online document delivery; IRS; interlibrary loan; dissemination of information

DELNET

Title: Developing Library Network

Sponsor: NISSAT & NIC (1988)

Objective: To promote resource sharing; develop a network of libraries; collect, store, disseminate information

Members: 165 Institutions, 600 Libraries, 15 States in India, 5 from outside India

Services: resource sharing; free Software; ICE online facility; books database; thesis database; Indian specialists; database

ADINET

Title: Ahmedabad Library Network

Sponsor: NISSAT, DSIR (1994) & INFLIBNET

Objective: To bring cooperation among its regional libraries; to develop databases; to integrate scientific and technical information systems

Members: nine libraries

Services: library automation; library holdings; database in progress

MYLIBNET

Title: Mysore Library Network

Sponsor: NISSAT (1994)

Objective: Developing software tools; conducting seminar; workshops/training programs; conduct surveys

Host Site: CFTRI, Mysore

Members: 116 Institutions

Services: MYLIB Database; E-journals; food patents; CFTRI Library Bulletin; public services.

Countrywide Area Network

DESINET

Title: Defence Science Information Network

Sponsor: DESIDOC, Delhi

Activity: Focus on scientific, research and defense communities

ERNET

Title: Educational and Research Network

Sponsor: Dept. of Electronics, Govt. of India; UNESCO (Financial assistance from UNDP)

Members: eight institutions (5 IITs, IISc., National Centre for Software Technology - Bombay, CCI wing of Dept. of Electronics)

Services: Communication services such as e-mail, file transfer, remote log on, database access, bulletin board etc.,

SIRNET

Title: Scientific and Industrial Research Network

Sponsor: CSIR (Commissioned Agency- NCST, Bombay)

Members: 40 labs and R&D Institutions

Applications: scientific communication; leather technology; natural products; food technology; medicinal Plants

VIDYANET

Title: VIDYANET (Dedicated Communication Computer Net)

Sponsor: TATA Institute of Fundamental Research, Bombay

Objectives: To provide rapid means of communications by linking computers at various institutions in India to similar networks outside the country; to stimulate corporate research, the day-to-day exchange of research information and the execution of joint projects and publications

Services: File transfer facility; sharing of computer resources and access to remote applications, databases, libraries, etc.

BTISNET

Title: BTISNET (Specialized Information Network)

Sponsor: Dept. of Biotechnology, Govt. of India.

Connectivity: 10 Specialized Information Centres in genetic engineering, plant tissue culture; photosynthesis and plant molecular biology; cell transformation ; bio-process engineering.

Services: Data processing using applications software; online communication access; facsimile facility

INFLIBNET

Title: Information Library Network

Sponsor: UGC (1991)

Connectivity: computer communication network of universities and R&D; libraries and bibliographic information centers throughout the country

Members: 200 Universities; 400 College libraries; 200 R&D libraries

Services: catalog service; database Services; document supply services; e-mail; BBS; audio and video conferencing, etc.

BALNET:

Title: Bangalore Library Network

Sponsor: JRD; Tata Memorial Library (1995)

Members: 100 Libraries

MALIBNET:

Title: Madras Library Network

Sponsor: INSDOC & NISSAT (1993)

Members: 15 Libraries

Activity: Two important databases, a directory database of current serials in Madras and a contents database covering articles published in 300 journals available in Madras libraries.

CONCLUSION

During the recent period quite a large number of libraries and information centers are forming networks. The advent of computer networking as an accepted part of the library and information infrastructure has had a very significant impact on the way in which library and information systems are perceived. India is thus on the threshold to a new era of computer communication networks both for general purposes and for library and information purposes.

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ROLE OF ICT IN LIBRARY MANAGEMENT

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ABSTRACT

The libraries are the hub of knowledge. They provide information to the users in the form of stored information. The stored information is translated in the form of books, Journals, Manuscripts, Thesis, Technical articles etc. Traditionally library was operated manually which was a cumbersome process. But, nowadays use of information technology in this field have widen the use and knowledge of the users. Digitization is the one step in this regard. This paper deals with the use of Information technology and their tools in Library Management.

Keywords: *Library Management, Knowledge, ICT, Information technology, digitization.*

INTRODUCTION

The quest for knowledge by the man has led to the creation and accumulation of tremendous amount of information. The thrust for knowledge is a never ending process and it has no boundaries and limitations. This is a never a ending process and has continued since the onset of civilization to the modern age. This hard earned knowledge and information is valuable for the entire mankind and therefore need to be preserved. With the invention of papers, man became able to convey his knowledge to others by writing books and manuscripts. More than thousands of books and manuscripts have been written by the man of ancient times but many of them were destroyed or lost due to lack of preservation. With the invention of printing press knowledge became easier to preserve in the form of printed documents. This helped to generate and preserve the large number of book. The need for preservation and dissemination of information led to the establishment of more and more libraries. The library has now become an important place in the development and civilization of society. Library accounts for storage of knowledge and information that help men in their pursuit of excellence and in generation of new school of thought making innovative discoveries and general contribution to adding to world information and knowledge. Experts opine that accumulated knowledge leads to new

innovative ideas that are passed down for the benefits of generation. Library assumes a significant importance in modern education system. It acts as a reservoir of knowledge and plays a crucial role in dissemination of various kinds of information to the students and society. It plays a vital role and leads to the knowledge explosion. In order to meet the growing need of users the library system has been greatly improved and upgraded to meet the challenges. With the advent of new technologies in the field of computer and telecommunication revolutionary changes have taken place in this field of library and information.

The shape of traditional libraries containing a large number of printed documents is in the process of being transformed to paperless libraries containing a large number of digitized documents. It is expected that the library is must continuously improved themselves with up to date computer technology for knowledge transmission and network (Lancaster and Sandore.2001).Evolution in the field of information and communication technology (ICT) has helped in quick and efficient transmission of information form the knowledge centers to various stakeholders. Libraries are now widely applying ICT component and transforming from manually operated to ICT enabled modern processes as an outcome ICT knowledge has changed the possibilities. Digital libraries combine technology and information resources to allow remote access, breaking down the physical barriers between resources. Although these resources will remain specialized to meet the needs of specific communities of learners, digital libraries will allow teachers and students to take advantage of wider ranges of materials and communicate with people outside the formal learning environment. This will allow more integration of the different types of learning, as depicted in Figure 2. Although not all students or teachers in formal learning settings will use information resources beyond their circumscribed curriculum and not all professionals will want to interact even occasionally with novices, digital libraries will allow learners of all types to share resources, time and energy, and expertise to their mutual benefits.

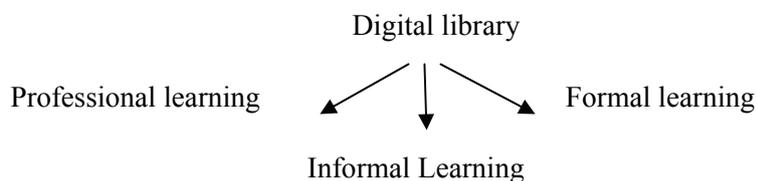


Fig. 1

ICT techniques used by libraries in India: Librarian have the responsibility to provide right information and to make accessible to the right person at the right time which should be the main motive for the modern library(Ranganathan 1960).The world wide web has emerged as effective sources for various types of library users. The internet has become more favored for selective dissemination of information for its various function like web portal, social networking sites.ICT are the software and operating equipment that authorize society to fabricate, accumulate, communicate, and amalgamate information in multimedia format and for different purposes.

Impact of ICT in information centres: Automation of library made possible the construction of knowledge in electronic format. This technology made electronic approaches and file transfer possible, thus ICT increases the level of digital learning. Library will be first net worked the core collections will be stocked and finally made accessible to the worldwide people. Circulation of Effective ICT techniques will save time for users and library staff. With the help of OPAC users can search information from anywhere. Users can easily reserve library resources through app like IOS, Android and others. Some automations software provides images of the resources through multimedia application. RFID (Radio Frequency Identification) can help to protect the resources from theft (Mahapatra,2006). Automation also enables users to use self circulation systems. Various online ICT tools can be used for library operations like OCLC world cat, classification web, Web Dewey, the catalogue calculator and other.

Access to the Web based resources:

E-Journals: Libraries have been expected to easily cope with the dual issues of ever increasing prices of the journal and space requirements for back issues. Libraries are required to maintain back issues of the journals, usually in bound form. E-Journal provide the librarians to maintain back issue of the journals, usually in bound for. E. journal provide the librarians a remedy to these issues without remarkably changing the service levels. E-Journals provide the librarians a remedy to these issues without remarkably changing the service levels. E journals can approached via the internet from any web enabled personal computers.

E. Book: The E-Book has been elucidated as a text corresponding to a book that is I electronic form to be unveiled on a computer screen .E-book can be read just like a paper book, using dedicated E-Book readers like kindle, Kobo touch, or others or GemStar or other reader software on a computer screen after downloading it (Buddhi,2004).

Electronic Theses and Dissertations (ETD): These produced at universities are effective sources of knowledge for further research. A large number of universities have transformed these dissertations collections into electronic libraries and have made them available on the internet for global access.

Digital Library Archives: Libraries have been repositories of local information and owned publications like manuscripts rare books, maps, photographs and painting. Archives are also part of library system, particularly in research and development organizations. In other instances like university libraries, college libraries and academic libraries, their publication such as thesis, research reports constitute the cognitive strength of the organizations (Webber 1999).

Some Emerging ICT Technologies for library Service: Now every library is undergoing transformations from paper to digital. It is essentials for librarian in india to take part in this changing scenario. ICT has provided libraries with new technologies to india to take part in this changing scenario provided. ICT has provided libraries with new technologies to advance their resources and services (Manir, 2011). The following ICT technologies have been used by many of the research and development libraries in India:

- Disseminate library services.
- Cellular Technology.
- IOS technology
- Smart card technology
- Talking computer library-Robot
- Social Networking
- CDROM searching
- Database Searching Services
- Audio visual Services
- Internet Access
- E-Query Services
- Barcode technology
- E List etc.
- RFID
- CCTV
- Biometrics

Impact of ICT on librarians: Presently ICT has impact on different levels of librarians. Improvement in ICT and the extensive use of ICT result in electronic information sources and digital media collections and archives becoming the supreme form of knowledge storage and retrieval (Shongwe,2012). ICT also sustain and make new roles for librarian .ICT with its significant knowledge sources and easy approach, ensure the benefits that users will demand. It is a effective source of information centers.

CONCLUSIONS

The ICT infrastructure in Indian libraries is good, and most of the libraries (large government libraries and special libraries) have already implemented many recent ICT technologies in their libraries. Libraries help in sharpen the ICT education and make faster the accessment of books journals and other reading materials to the users. Different web based tools futher enhancing the speed of searchin material and educations to the users.

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IDENTIFICATION OF LIBRARY LOCATION THROUGH ARCGIS SOFTWARE: GEOGRAPHICAL INFORMATION SYSTEM

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ABSTRACT

Maps produced from Geographical Information System data can be used to depict relationships and significant hotspots within a community. This article illustrates the application of Geographical Information System to locate library, college and hospital of College of Veterinary Science, Proddatur, Andhra Pradesh through simple steps, showing the usefulness of GIS in mapping social needs and its partners.

Keywords: *Geographical Information System, GIS, Library, Location Map, ARCGIS Software.*

INTRODUCTION

A Geographic Information System (GIS) is a configuration for collecting, handling, and evaluating data. Rooted in the science of geography, GIS integrates many types of data. It analyzes spatial location and organizes layers of information into visualizations using maps and 3D scenes (Preda et al 2007)¹. With this exceptional competence, GIS reveals profound insights into data, patterns, relationships, and situations to mention a few thus helping users make smarter decisions. Innovation through GIS started in the 1960s as computers and initial notions of quantitative and computational geography emerged (Jessica 2014)². Roger Tomlinson's initiated hard work to educate, recommend, and build up the Canada Geographic Information System resulted in the first computerized GIS in the world in 1963, he also gave GIS its name (UCGIS 2014)³. The Northwestern University (1964), Howard Fisher create the leading PC mapping software programs known as SYMAP (Nick Chrisman 2004)⁴. Jack Dangermond (1969) and his spouse Laura established Environmental Systems Research Institute, Inc. (Esri). (Charlie Taylor 2017)⁵. Geographical Information System give society

the ability to create their own digital map layers to help solve crucial world problems (Howell, Donna 2009)⁶. Additionally, Pidwirny, M. 2006⁷ avowed that Geographical Information System have as well develop into a resources for data sharing and association, inspiring a vision that is now rapidly becoming a reality a continuous, overlapping, and interoperable GIS database of the world, about virtually all subjects. Today, hundreds of thousands of organizations are sharing their work and creating billions of maps every day to tell stories and reveal patterns, trends, and relationships about everything. This paper attempts to locate CVSC Proddatur library, college and Veterinary hospital through GIS technology.

Applications of Geographical Information System

GIS technology applies geographic science with tools for understanding and collaboration. It helps people reach a common goal and to gain actionable intelligence from all types of data (Jeff Simley 2018)⁸. Figure 1 provides various applications of GIS.

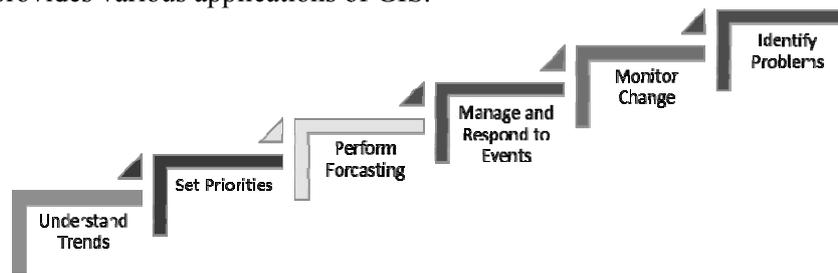


Fig. 1 Applications of Geographical Information System

The improvement of Geographical Information System, the opportunity of amalgamate spatial and alphanumeric data, has made it widely applicable to a variety of fields (Trubint etal 2006)⁹.

- Location analysis
- Route and timetable scheduling
- Demand for various services
- Marketing analyses
- Urban construction planning
- Cost analyses
- Cadastral data
- Resource allocation

Review of Literature

Vidicek et al (2010)¹⁰ had emphasized that GIS information system enables storing and analyzing data, but it differs from other information systems as the data are linked to location. This enables presentation of data in map form. Therefore, the application of GIS is possible also in the field of library services, either for analysis of current services or for planning current or future services. By applying GIS, demographical data can be added to geographical data, which can result in better analysis or planning. GIS had been used by Higgs et al (2013)¹¹ to investigate library service areas, to aid initial location decisions, and to model the implications of the opening and closure of library services. Floating Catchment Area (FCA) approaches, were used to research variations in accessibility to public library facilities using bespoke application tools developed within a commercial GIS package.

Objective

- To locate College Library, College Main Building and Veterinary Hospital of College of Veterinary Science, Sri Venkateswara Veterinary University, Proddatur using Geographical Information System Technology.

Limitation

- Time factor being a significant hindrance to consider merely 3 locations to position using the Geographical Information System software.

Research Methodology

Geographical Information System atlas is interactive, taking place the computer display, map users preserve scan a Geographical Information System map in any direction, zoom in or out, and change the nature of the information contained in the map. In order to visualize the demographics of CVSC PDTR, the computer program ArcView GIS (Geographic Information Systems) was used to create maps for specified areas. (<https://www.arcgis.com/home/index.html>). Open Map Viewer, used to position the library location. Keywords "India", "Andhra Pradesh" "Kadapa", "PDTR" and "CVSC" were entered in search box. The map is automatically zoomed to the closest match, and a pop-up appeared at the location.

Mapping and Discussions

Mapping is a dominant utility of Geographic Information System, which provides a visual interpretation of data. GIS store data in database and

then represent it visually in a mapped format. Figure 2 and 3 (screenshots) features the location of India in world map and Kadapa district in Andhra Pradesh state respectively. ArcGIS ropes safe navigation system and make available exact topographic and hydrographic data (Esri 2017)¹². Screen shot (Figure 4) shows location of Proddatur in Kadapa district while screen shot in Figure 5 provides route map for CVSC Proddatur. Geographical Information System has many uses and advantages in the field of facility management. It can be exploiting by skill supervisor for space supervision, visualization and preparation, tragedy and disaster planning and response. It can be used throughout the life cycle of a facility from deciding where to build to space planning. Figure 6 denotes location of College of Veterinary Science, Proddatur, College main building (🏠), College Library (📖), and Veterinary Hospital (🏥).



Fig. 2 Screenshot locating India in World map



Fig. 3 Screenshot positioning Kadapa district of Andhra Pradesh



Fig. 4 Screenshot locating Proddatur in Kadapa district



Fig. 5 Screenshot providing route map to C.V.Sc Proddatur.

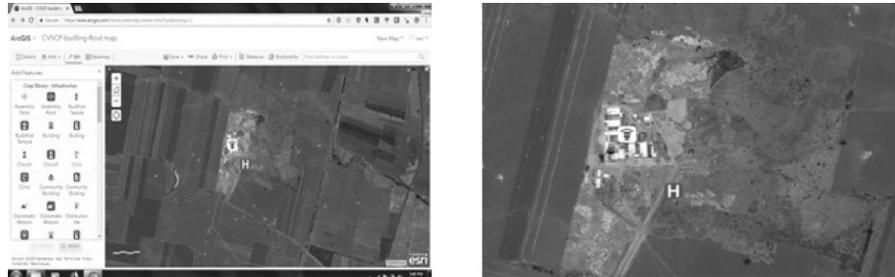


Fig. 6 C.V.Sc Location of Library(📖), Hospital(🏥) and Main Building (🏠)

CONCLUSIONS

Amid its drive to network and cloud computing, and amalgamation with real-time information via the web, Geographical Information System has become a platform relevant to almost every human endeavor, a vital system of the universe. As our world faces problems from expanding population, loss of nature, and pollution, Geographical Information System would play an increasingly important role in how the issues are understood and provide a resources for communicating solutions with the general speech of mapping. (Jack Dangermond CEO, Esri)¹³. Geographical Information Systems store data in databases and then signify it visually in a mapped format. Geographical Information System facilitates us to better recognize our globe so we can meet global challenges. Nowadays Geographical Information System technology is progress speedily, provided that a lot of new potential and innovations in planning.

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LIBRARY SECURITY SYSTEMS: RFID, ELECTRONIC SURVEILLANCE, EMSS

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ABSTRACT

RFID systems are used for identification and tracking of equipment, staff and users. There has been little public comment or analysis of these systems with regard to privacy as their implementation has been driven by security issues. The systems that gather this information include video, smart card and more recently RFID systems. This paper focuses on the increasing use of electronic surveillance systems in library and the apparent lack of awareness of the implications of these systems for privacy of the individual.

Keywords: *RFID, Library Security System, Electronic Surveillance System.*

INTRODUCTION

RFID is a combination of radio-frequency-based technology and microchip technology and the information contained on microchips in the tags affixed to library materials is read using radio frequency technology. This technology is slowly merging the Library Automation Activities and services as an urge on the part of Library managers to improve the effectiveness to the library keeping in mind of the user's consciousness towards information access and use.

The impact of information technology on libraries has been profound. It is, after all, technology for processing and transmitting information, so libraries could hardly stand aside from it. RFID is one of the significant technologies of the new millennium that had invaded the libraries. RFID-based systems move beyond security to become tracking systems that combine security with more efficient tracking of materials throughout the library, including easier and faster charge and discharge, inventory and materials handling.

Concept of RFID

The concept of RFID systems originated in the 1940s as a mean of distinguishing friendly aircraft from enemy aircraft in WWII. Large powered RFID tags, or transponders, were placed on friendly aircraft in Order to be correctly identified by radar signals. This IFF (Identify: Friend or Foe) system was the first use of RFID and its concepts continue to be used in present day aviation traffic control. The invention of microchip and subsequent technological advances led to the design and use of passive RFID tags. This was primarily used to track objects in industrial environments where barcodes. Today the RFID technology has become integral part of many businesses industries, software companies and information industries in the world.

Components of RFID Systems

RFID system has three components:

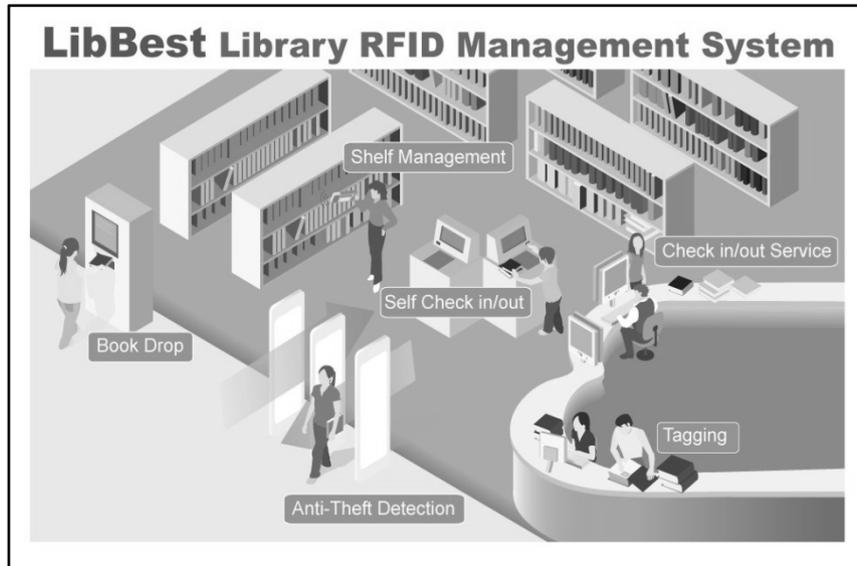
RFID Tags: The tags are electronically programmed with unique information. The tag is paper thin, flexible and approximately 2"x2" in size which allows it to be placed inconspicuously on the inside cover of each book in a library's collection. It consists of an etched antenna and tiny chip which stores vital bibliographic data including unique ID number to identify each item. This contrasts with a barcode label, which does not store any information, but merely points to a databases.

Readers or Sensors: These components are available in various shapes and sizes to suit respective applications within the library, and are often integrated into one enclosure for that specific purpose, i.e. user self-check-out Machines and inventory readers: The reader powers the antenna to generate an RF Field. When a tag passes through this RF field, the information stored on chip is decoded by the reader, and sent to the computer system or Central Server which in turn, communication to the Library Information Systems.

Server/Docking Station

The server is the heart of some comprehensive RFID systems. IT is the communication gateway among the various components. It receives the information from one or more of the readers and exchanges information with the circulation database.

RFID system chart



(Courtesy: www.libbest.com)

Benefits of RFID Systems

1. Fastest, easiest, most efficient way to track, locate and manage library materials.
2. Self Check Station - Perform patron self-check-out and check-in process.
3. RFID security and the tracking of materials throughout the library that overcomes the problem of theft in the library.
4. Anti-theft Detection Gate - Detect the RFID Tag on Book and, System alarm when the book is not issue to the user.
5. Stock management
6. Opreations such as managing material on the shelves, identifying missing and miss shelved items and taking stocks regularly will be feasible Improved User Services.
7. Library item identification and security is combined into a single tag, therebyeliminating the need to attach an additional security strip.
8. User will spend less time waiting in check-out lines by using Self-Check-in –Check-out systems.

Disadvantages of RFID in Libraries

1. The major Disadvantage of RFID technology is its high cost.

2. Removal of Tags.
3. It is possible to deceive an RFID system by wrapping the protected material in two to three layers of ordinary household foil to block the radio signal.
4. The performance of the exit sensors is problematic. The performance of exist sensors is better when the antennae on the tags are larger fear to invade.

Electronic surveillance: The term “electronic surveillance” covers an array of capabilities and practices. To better understand what is meant by electronic surveillance, it is useful to break it down into parts. Surveillance has previously been defined on the basis of covert/overt distinctions, or determined according to the level of contact with the target, whether remote or direct. These distinctions might, arguably, create a false dichotomy, particularly in the context of modern surveillance technologies, where overt/covert lines are not as easy to draw. Thus, a framework based on function is perhaps more useful. The table below provides some examples. Although this too is flawed in that modern surveillance technologies will often have multiple capabilities.

Audio surveillance Visual surveillance tracking surveillance Data surveillance Phone-tapping. Hidden video surveillance devices.

Radio frequency identification devices (RFID). Keystroke monitoring. Thermal imaging/forward looking infrared. Biometric information technology (retina scans at airports etc).

CCTV is not a new form of surveillance. However, the latest form of CCTV is digital rather than analogue and can be linked to other systems such as the as access control systems (Aldridge, 2005). The placement of CCTV is important and will normally include all areas within the Library where risk is high, Nurseries, ATM machines, cashiers, pharmacies, Malls and public car parks.

Importance of CCTV

The use of CCTV is necessary in the following activities: In chemical process industries, where the processes take place under dangerous conditions, CCTV should be installed to supervise and control accidents and disasters. Coalmines are one of the important places where CCTV is essential. The use of CCTV in places like Banks, Airports, Railway stations, city centres and other busy locations will not only provide security. In educational institutions, instead of inspecting the various departments and sections periodically, video surveillance and remote monitoring can be used for an effective management. Library security is a

continuous process including several factors, which should follow a logical progression. Maximum traditional libraries have a security team headed by library security officer (LSO) who should meet regularly to discuss and deal with such matters as a security responsibility (Ramamurthy, 2001). CCTV can be used in libraries to monitor the student activities and their behaviour in the library. The common mischievous activities in the libraries like tearing of the pages from the books, hiding the books, sitting in corners and gossiping and book theft can be reduced to a great extent.

CONCLUSION

RFID technology is not only emerging but also more effective, convenient and cost efficient technology in library security. This technology has slowly begun to replace the traditional bar-code on library items. The RFID tag can contain identifying information such as a book's title or material type, without having to be pointed to a separate. The information is read by an RFID reader, which replaces the standard barcode reader commonly found at a library's circulation desk. The RFID tag found on library materials. It may replace or be added to the barcode, offering a different means of inventory management by the staff and self-service by the borrowed. It can also act as a security device, taking the place of the traditional electromagnetic security strip. And not only the books, but also the membership cards could be fitted with an RFID tag. The cost of the technology is main constraint. Library is the heart of any academic institution asset provides its users with literature and information in the form of books, journals and other electronic media. While providing such facilities, libraries are also facing the problems of document theft and mutilation. To overcome the security problem, many university libraries in the country have installed the CCTV cameras for user level security. There are various types of cameras available in the market such as- Coax cable based CCTV camera, UTP cable based CCTV cameras, IP based CCTV cameras, etc.

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DIGITAL LIBRARIES AND THEIR FUTURE

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ABSTRACT

With the rapid growth in information it is difficult to retrieve the right information at the right time. Digital Library is a major solution for getting abundant information in a second to fulfill the need of users of nation of the world. Digital library is portable, largely accessible and integrated with national and international sources of information. May digital libraries costly but it provide quick, accurate information, which is more beneficial for Professors Scientist and Students. This paper attempts to discuss about the features, characteristics and future of digital libraries.

Keywords: *Digital Library, Future Libraries, Digitization, e-Resources.*

INTRODUCTION

In digital libraries services are fully automated and all resources are in digital form. It enables users to interact effectively with information distributed across a network. Digital library are a set of electronic resources and associated technical capabilities for creating, Searching and using information. It includes data and metadata (It is an essential Phenomenon for electronic cataloguing, federated searching and URLs.) that is information about information and data about data .It is a computerized network system where all the information is stored in electronic format. It can be transmitted through network the larger no. user. Digital libraries are electronic libraries in which large number of geographically distributed users can access the contacts of large depositories of electronic object. Electronic object includes images video films, music's book, journals manuscripts. They include hypertext, hypermedia and Multimedia composition.

Digital resources may be multimedia types both Prints and electronic. The Size and scope can be maintained by Individual and organization. CERA, AGORA, OARE are the ex. Lib. Networking. KrishiPrabha, Krishikosh are the Institutional Repositories .which all are maintained by ICAR. We Central library of Birsra Agriculture university Follows it very sincerely.

According to the Digital Library Federation defines a digital Libraryas

Organization that Provide the resources, including the specialized staff, to select, Structure, offer intellectual access to interpret, distribute,preserve the integrity of and ensure the persistence over time of collection of digital works. So that they are readily and economically available for use by a defined community or a set of communities.

Need for Digital Library

In 1990 Alvin Toffler estimated in the Book “Power Shift” that is one year the united states run our 1.3 trillion documents. No of document may have risen to four trillion. 50,000 periodicals in science and technology are another estimate. It is impossible to acquire every publisher’s document under one roof and thus involved the concept of resources sharing and Networking. Since information can be digitized. And library change their holding to electronic form and put them on the network. Abundant information requires a large amount of storage space. So digital library is a suitable solution for that movement.

Features of Digital Libraries

Digital libraries as a means of easily and rapidly accessing books, archives and images of various types are now widely recognized by commercial interests and public bodies alike.

- **No physical boundary.** The user of a digital library need not to go to the library physically; people from all over the world can gain access to the same information, as long as an Internet connection is available.
- **Round the clock availability.** Digital libraries are that people can gain access 24/7 to the information.
- **Information retrieval.** The user is able to use any search term (word, phrase, title, name, subject) to search the entire collection. Digital libraries can provide very user-friendly interfaces, giving click able access to its resources.
- **Preservation and conservation.** Digitization is not a long-term preservation solution for physical collections, but does succeed in providing access copies for materials that would otherwise fall to degradation from repeated use. Digitized collections and born-digital objects pose many preservation and conservation concerns that analog materials do not. Please see the following "Problems" section of this page for examples.

- **Space.** Whereas traditional libraries are limited by storage space, digital libraries have the potential to store much more information; simply because digital information requires very little physical space to contain them and media storage technologies are more affordable than ever before.
- **Added value.** Certain characteristics of objects, primarily the quality of images, may be improved. Digitization can enhance legibility and remove visible flaws such as stains and discoloration.
- **Easily accessible.**

Characteristic of Digital Library

Mainly Three Characteristic of Digital library:

1. It is open source soft making large collection in a short time.
2. Usage of Communication networks to access and obtain informally.
3. Copying online/offline printing form master file.
4. It Provide rare and expensive material.
5. It is a collection of information objects and assists users by satisfying their needs and requirements.

Digital Information Resources

The resource of a Digital library are those, which the computer can store, organized, transmit and display and display without any intervene. It Include both Print and electronic or digital materials. Digital sources may be multimedia types like digital audio, video, full text information, e-book, electronic tax, map image etc.

There are two types of digital E-resources

1. On line Resources :- local database-journal, E- book, multimedia, LAN,WAN, MAN ETC
2. Off line resources: - C.D Rom, Audio- visual Aid etc.

Uses of Digital Resources access to information is instant, downloading information very easily. Large volumes of data can be stores in it and made assessable to the users. Presentation of information through digital resources can be done within a reasonable time with speed. It can become available to anywhere in the world at minimum cost.

Metadata

It is another issue central to the development of digital libraries. Metadata is the data that describes the content and attributes of any particular item in a digital library. It is a concept familiar to librarians because it is one of the primary things that librarians do¾ they create cataloguing records that describe documents. Metadata is important in digital libraries because it is the key to resource discovery and use of any document. Anyone who has used Alta Vista, Excite, or any of the other search engines on the Internet knows that simple full-text searches don't scale in a large network. One can get thousands of hits, but most of them will be irrelevant. While there are formal library standards for metadata, namely AACR, such records are very time-consuming to create and require specially trained personnel. Human cataloguing, though superior, is just too labor extensive for the already large and rapidly expanding information environment. Thus, simpler schemes for metadata are being proposed as solutions.

Advantage and Disadvantage of Digital Library

Digital library is quick accurate easy to locate by searching and browsing Mechanism. It also potential to store much more information at a time simply because digital information requires very little Physical space. Cost of Maintaining digital library is low. It reduces these points, like staff, book maintain, additional book etc. Use new innovation like Blog, WiKi, opac, catalogue, information retrieval etc. Digital library give one touch answer to their viewers.

Disadvantage of digital library is Computer Viruses, lack of standardization for copy right, speed of access, initial cost is high, efficiency environment and preservation. The infrastructure cost of digital library that is, the cost of Hardwar, software, leasing, communication circuit is very high. Many people like to read print material than screen material. Copyright has been called the single most vexing barrier to digital library development.

Major obstacle for Digitalization

It is very expensive. Funding is required to –

Purchase the high quality digitalization equipments to facilitate the digitalization of traditional holding.

To train both staff and user on the use of modern technology

Purchase of other machines such as server, workstation etc .

For the subscription of online and offline information resources.

Purchase of appropriate software and its maintenance.

Role of Librarian in the Digital Environment

Job of digital library are quite similar to Traditional library .He is responsible for accurate cataloging AND CLSSIFICATION AND ALSO ENSURE ABOUT THE INFORMATION SHARED WITH THE PUBLIC OVER THE WEB IS PROPERLY LICENSED. The Librarian monitor collection budgets expenditure and responsible for maintain relationships with other vender.

The digital library Research and Development department at the university of California, Berkeley suggest A Librarian have following require

1. Must thrive with ongoing change.
2. Be a constant self-educator.
3. Remain open to varying degrees of experimentation
4. Take risks
5. Learn from experience
6. Have a sense of optimism of potential in technology.

Digital Preservation

Another important issue is preservation keeping digital information available in perpetuity. In the preservation of digital materials, the real issue is technical obsolescence. Technical obsolescence in the digital age is like the deterioration of paper in the paper age. Libraries in the pre-digital era had to worry about climate control and the de-acidification of books, but the preservation of digital information will mean constantly coming up with new technical solutions. Digital preservation is a process by which data is preserved in digital form in order to ensure usability, durability and intellectual integrity of the information contained therein. Fresco (1999) defines as “the storage, maintenance and access to digital objects over long term “that is ensuring intellectual content, which is already in digital Form, remains accessible to the future generations. The data formats are –office document, E-book, database, email, website, images, etc. It involves reproducing a work in any form. The Future of research and scholarship depends on ability to preserve digital resources into the future.

There is some objective for digital preservation.

1. Digital preservation should be authentic, accurate, and complete.
2. Save the space and time
3. Makes information service Longer.
4. Maintain historical value of information.
5. It preserves technical data.

Research and Scholarship depends on the ability to preserve digital recourse into the future.

CONCLUSION

Digital libraries are not replacing the physical existence of document completely but no doubt to meet the present demand. Digitalization must be Introduce the local user so at least the Libraries become Hybrid nature. Day by day the cost of digitalization is decreasing but the online publication is increasing. And the need of user is shifting towards a different environment. Due to the need, and verasality of user library will go to be digitalized.

The central and State Governments and funding agencies like, UGC, CSIR, ICAR, ICMR, NASSDOC and DST should provide Budgetary Provisions to the Libraries for digitalization in a phased manner to ensure sustainable growth of digital libraries in India.

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LIBRARY NETWORKING AND LIS PROFESSIONALS IN MODERN ERA

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ABSTRACT

Modern era is known as ICT (Information Communication Technology) era. In modern society information is the basic need for every human activity. The information is as important for the society as the food, air and water are important for living in the society. Information in itself has no value, but its value lies in its communication and use. A networking play an important role for providing continuous and variety of digital services through library websites to door for 24X7 in their users, it is must for library information service professionals that they should keep abreast themselves with latest information and also network equipped with technology used for digital environments. The digital resources provide tremendous scope for libraries in India to provide access to worldwide information with the help of internet, the information flow are fast as well as the qualities of information are standardized globally. After adopting the technology there is no geographic bar for distribution of digital information in world over. With the use of internet and intranet the library professionals are substantially contributing social, cultural and economic development of any developing country.

Keywords: Digital information, Skill development, Library Networking, Digital Library, Agricultural Library.

INTRODUCTION

During the last century the main role of the librarians was to preserve the holdings of the library and make them available to their users. In the present era advancement of ICT has influenced & controlled each and every field of the society and the libraries and library professional are also not exceptional. Various conventional tools are available in the libraries and information centers for providing access to the holding of libraries. By using these available tools libraries have been striving hard to provide quick access to the existing resources in the libraries as well as

in information centers. The use of conventional tools has widened the gap between what is available and what is being communicated. With the help of new technologies quick receiving of information and its distributions to the users with the quality of research has become easier.

Now the digital techniques and processes of digital information management shall have to be re-oriented to enable an information seeker to access the resources more quickly, accurately, conveniently and comprehensively. ICT technologies have joined hands in locating, organizing, storing, retrieving and disseminating of information to meet out their clients i.e. library users. The information output is being generated in increasing rates and the demand of the information is also increasing speedily in the present day to day context. The libraries are now becoming an inseparable and integral part of an information based society. Due to the increasing awareness among the users, new resources availability and advancement in information communication technology, the libraries are changing its traditional concept rapidly. In the digital era the libraries and information centers are becoming a global information hub. The roles of library professional are also highly significant. Their contribution in making the information available and accessible to the users is being recognized and appreciated. The users also have every opportunity to retrieve and access their required information for all disciplines from all over the world with the help of computers & its mouse on a single click. Even any users can enter the library 24X7 days round of the year sitting anywhere in the world and too can access remotely. In such manner the library not confined to a geographical boundary and is going to be wall-less or geographical borderless.

Computer Network

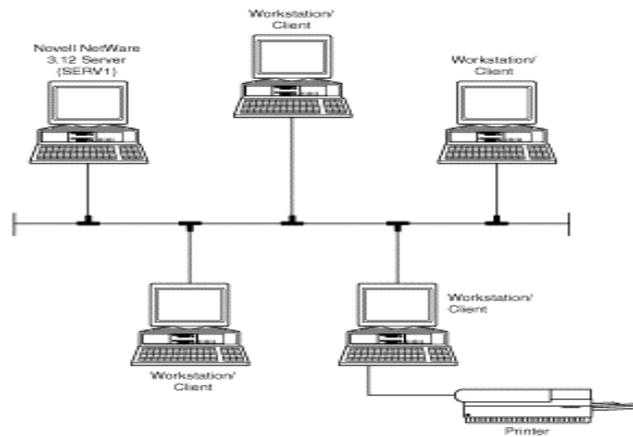
- A computer network is a group of PCs connected together for the purpose of sharing various computer software and hardware resources.
- Network PCs are defined as either servers or clients, depending on the function they perform on the network.
- PCs that provide services to other PCs on the network are known as *servers*.
- PCs that use the services provided by the file servers are known as *clients*.

Network Categories

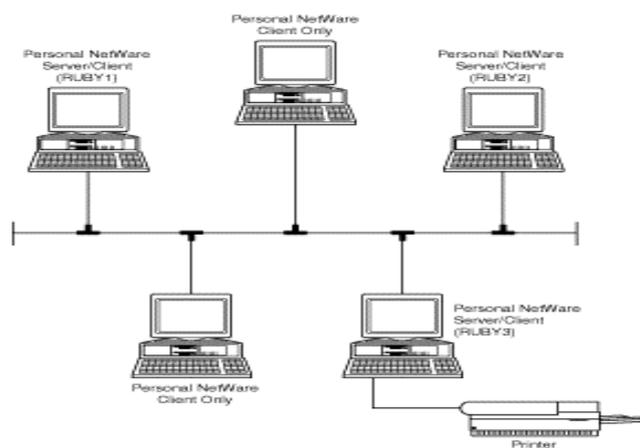
- Server based
- Peer-to-peer

Server Based Network

- In a server based network, there are computers set up to be primary providers of services such as file service or mail service.
- The computers providing the service are called servers and the computers that request and use the service are called client computers.
- This technology referred as Client-Server Technology



Peer-to-Peer Network: In a peer-to-peer network, various computers on the network can act both as clients and servers. Many Microsoft Windows based computers will allow file and print sharing. These computers can act both as a client and a server and are also referred to as peers. Today's networks are a combination of Client-server and Peer-to-Peer technology.



Type of Networks

- LANs
- CANs
- MANs
- WANs

Local Area Networks (LANs)

- A network is any collection of independent computers that communicate with one another over a shared network medium.
- LANs are networks usually confined to a geographic area, such as a single building or a college campus.
- Campus Area Networks are a collection of LANs, which typically spans several buildings.
- Networks under campus of a college, institute or university comes under this category.

Metropolitan Area Networks (MANs)

- Metropolitan Area Networks are a collection of CANs, which typically spans a city or state. Example: Network of all the branches of a school in a city. Each branch could have a CAN, each having several LANs.

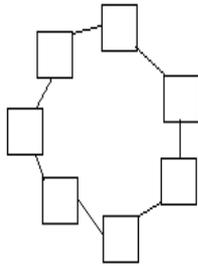
Wide Area Networks (WANs)

- Wide Area Networks are a collection of MANs
- It spans a country or a continent or even the entire world.
- Wide area networking combines multiple LANs that are geographically separate.
- Internet is wide area network
- It is accomplished by connecting the different LANs using services such as dedicated leased phone lines, dial-up phone lines (both synchronous and asynchronous), satellite links etc,

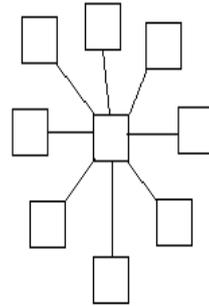
Network Topologies

- **Bus:** Both ends of the network must be terminated with a terminator. A barrel connector can be used to extend it.
- **Star:** All devices revolve around a central hub, which is what controls the network communications, and can communicate with other hubs. Range limits are about 100 meters from the hub.

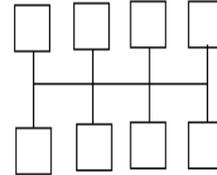
- **Ring:** Devices are connected from one to another, as in a ring. A data token is used to grant permission for each computer to communicate.



Ring



Star



Bus

Network Media

- **Coax:** Two conductors share the same axis. Commonly used for thick Ethernet, thin Ethernet, cable TV and ARCnet, coaxial cabling that uses BNC connectors; heavy shielding protects data, but expensive and hard to make connectors. Bandwidth between 2.5 Mbps and 10 Mbps.
- **Fiber optic:** (IEEE 802.8) Cable in which the center core, a glass cladding composed of varying layers of reflective glass, refracts light back into the core. Max length is 25 kilometers, speed is up to 2Gbps but very expensive. Best used for a backbone due to cost.
- **UTP:** Unshielded Twisted Pair; uses RJ-45, RJ-11, RS-232, and RS-449 connectors. Max length is 100 meters, speed is up to 100Mbps. Cheap, easy to install, length becomes a problem. Most sensitive to electromagnetic interference. Can be CAT 2, 3, 4 or 5 quality grades.
- **STP:** Shielded Twisted Pair. One or more twisted pairs of wire in foil or wire woven-copper shielding. Uses RJ-45, RJ-11, RS-232, and RS-449 connectors, max length is 100 meters, speed is up to 500Mbps, though no common networks exceed 155 Mbps in 100 meter runs.. Not as inexpensive as UTP, easy to install, length becomes a problem. Can be CAT 2, 3, 4 or 5 quality grades.

- **Switches:** Switches are the most recent, most sophisticated and most expensive of inter-networking devices. Switches provide the same kind of address-intelligence (filtering and forwarding) that routers provide. Among the greatest strengths of a switch is its ability to support connections across multiple LANs as well as supporting simultaneous transmissions.

Other Network Media

- **Hub:** A hub is the point of central connection for all of the LAN's shared devices. A typical hub has multiple ports to which a LAN's devices connect.
- **Routers:** These are the devices are used to route the network from one LAN to another LAN in a very big network.
- **Bridges:** Bridges are simpler and less expensive than routers, but offer similar inter-network capability.
- **NIC (Network Interface Card):** Circuit card that fits inside the computer and connects with wiring to the network. Software drivers on the computer allow communication through the NIC.

Applications of Computer Network

- File Transfer
- Remote Login
- Resource Sharing
- File Sharing
- Electronic Mail
- Information Search and Retrieval
- Group Discussion
- Electronic Library

Networks connecting Educational and Research Institutions all over the country

Education and Research Network (ERNET): The ERNET was indicated in 1986, by the Department of Education (DOE), Govt. of India with the financial help from UNDP (United Nations Development Programme) to provide academic and research institutions with electronic mail facilities. It is currently used by DSIR Labs, research centre and academic institutions. The web address is www.ernet.in.

Scientific and Industrial Research Network (SIRNET): The SIRNET was established in 1989, by INSDOC. Now the rename of INSDOC is NISCARE. The network was interconnected all the CSIR laboratories and other Research and Development institutions in India. With the aim is to sharing available resources among national laboratories of CSIR. Its ultimate aim is to provide connection with the entire scientific community of the nation and international to achieve efficient scientific communication.

Open Education Network (OPNET): In Indian many of institutions are entering into the field of education and they are offering professional and technological courses by using communication technologies. They are using television, computer communication, email and network to reach the students. IGNOU, which is an apex body for open and distance education, is engaged in the task of developing a network of open universities in India called OPNET. This is a one of the network of intellectual and academic resource organized under the aegis of the Distance Education Council (DEC). It is independent arm of IGNOU and distance education in India. The OPNET has an umbrella network with the every partner university for delivery of their own courses.

NETWORKS CONNECTING THE LIBRARIES IN THE COUNTRY

Information and Library Network (INFLIBNET): University Grants Commission establish a national computer – communication network in 1993 to provide the link all the libraries and information centre in universities, colleges, deemed universities, UGC Information Centres, institutions of national importance, Research and Development institutions, etc. INFLIBNET is the brain child of UGC. The National Centre of INFLIBNET is located in Gujarat University Campus at Ahmadabad. INFLIBNET is a major national effort to improve information transfer and access, as a support to scholarship, learning, research and academic pursuits.

CALIBNET: CALIBNET was established in 1993 at Calcutta. It is a metropolitan network linking 38 libraries in Calcutta metropolitan area. E-Mail, file transfer, remote log-on and database and documents access are in the applications package within individual libraries, the functions to be automated are cataloguing, serials control, acquisition and fund accounting, circulation and local user services. The networking provides for global user”, services of current awareness, SDI, Union catalogues, partial databases, and access to national and international networks.

DELNET: DELNET was started at the India international centre library in January 1988 and was registered as a society in 1992. It links with 42 libraries in the metropolitan area of Delhi. The applications package is available in CALIBNET the same is available with DELNET. It was initially supported by the National Information System for Science and Technology (NISSAT) department of scientific and industrial research, Government of India. It was subsequently supported by the national Information Centre, Department of Information Technology, Ministry of Communication and Information technology, Government of India and the ministry of culture, Government of India.

MYLIBNET: MYLIBNET is the first library network established in a small city in 1995. The MYLIBNET was launched in association with Mysore city library consortium (MCLC). There are 16 institutional members. The holding list of Mysore city libraries has been computerised and software has been developed to enable users to access the catalogue and information on-line. MYLIBNET provides e-mail facilities to its members and new facility created on-line updating of databases by the participating libraries through web.

Bombay Library Network (BONET): BONET was setup at the National Centre for Software Technology (NCST), Bombay with the network sponsored by NISSAT in 1992. The aim of BONET is to build a low cost library information system which can possibly be used as a model for future expansion of this service even outside Bombay. BONET also benefits significantly from the experience gained, and facilities created, by the Education and Research Networking (ERNET). BONET is aimed at promoting cooperation between libraries in Bombay. BONET is focus on inter-library activities, rather than on computerizing individual libraries, which is no doubt computerize their own operations and are likely to share their experiences with each other and also offers training related to library computerization and networking.

NETWORKS CONNECTING THE AGRICULTURE LIBRARIES IN THE COUNTRY

Consortium for e-Resources in Agriculture (CeRA): Consortium for e-Resources in Agriculture (CeRA) is a network of e-Consortium of Agricultural Libraries under the Indian Council of Agricultural Research for National Agricultural Research and Education System (NARES) Libraries. It is the network for e-Resources for National Agricultural Research and Education System, established in the year of 2007, It is facilitating 24x7 online accesses of a most important journals in

agricultural and allied sciences to all researchers, teachers and students, policy planners, administrators and extension specialists in NARS through IP authentication. About 152 Consortium members consist of ICAR institutes/NRCs/ Directorate/Project Directorates/National Bureau etc. and State Agricultural Universities (SAUs). CeRA is now the most sought after online platform by scientists/ teachers in NARS for literature search for their professional pursuit. After the completion of NAIP project, CeRA has been transferred to ICAR–DKMA who has been taking care since 2014.

e-Granth: e-Granth is a Agri-Info-Network. It is a digital information sources in the area of agriculture sector and used by research, education or extension for quick access to required information. The e-Granth is one such attempt initiated under National Agricultural Innovation Project (NAIP) of the Indian Council of Agricultural Research (ICAR). Indian National Agricultural Research System (NARS) is a huge repository of knowledge and information regarding agricultural and allied sciences. Digital movement has been taken by ICAR for holding of various libraries in the NARS. In order to standardize the catalogue of participating libraries, a union catalogue named ‘AgriCat’ has been created. Necessary efforts were taken to strengthen the digital library initiatives, to implement advance Library Management Software, to comply open international standards for easy data portability and data sharing. The KOHA, an open source software has been identified for implementation in the NARS libraries with expert support, intensive trainings.

CONCLUSION

The modern era librarian will become the guardian of online digital information and will be the network managers of the online digital information vehicle to preserve democratic access to information. The libraries are becoming available through networking to the users community at their doorstep in 24x7, due to all the modern library resources and their services are on the network mode (internet) and ready to use for their clients every time. The network technological application in a library will only be fully successful when the competence of the ICT application is achieved by the library professional. The LIS professionals have to know about the skills and technologies for network resources and to face different kinds of challenges in using ICT in their libraries. There are the maximum needs of network application of library, consortiums of e-resources in various special libraries and due to ultimate uses of e-

resources & to provide maximum uses of resources to the societies for enhancement of skills, various programmes are needed for the library staff. The library professionals should be provided an opportunity to be trained in network aspects so the library professionals may also have the positive attitude to work for the benefit of institutions and achieving its goals. The evaluation, acquisition, organization, sharing and distribution of information in all formats, including books, periodicals, online services such internal works product document and database resources are an integral parts of library. Therefore adequate knowledge of IT and its application in libraries with a positive attitude can make the real difference between the real and desired situation. Hence all the library professionals should become an IT skilled person.

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UNDERSTANDING THE IMPORTANCE OF LIBRARY AUTOMATION AND E-LIBRARY

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ABSTRACT

Library automation, stated in single term, is the application of computers and utilization of computer based product and services in the performance of different library operations and functions in provision of various services and production of output products. There is a great impact of computers and information technology and its applications on the libraries due to which a process of great change is taking place in libraries. Modern technology's tending to alter radically the nature of our society and affect the prevailing economic, political and social value and libraries are also in the process. This paper attempts to document the importance of library automation and e-Library.

Keywords: *Library Automation, e-Library.*

INTRODUCTION

Library automation implies a high degree of mechanization of various routine and repetitive tasks to be performed by human beings. With the advent of automation, the human intervention is reduced to a great extent. The appearance of computer has greatly increased the library automation. In addition to computer advancement, telecommunication and audio-visual technologies gave way to new possibilities in information handling in India; the use of computers is limited to only some specialized libraries unlike the case of developed countries. Library automation includes use of computers and other semi-automatic devices like punched card to reprography.

The word "Automation" has been derived from Greek Word "automose" means something, which has power of spontaneous motion or self-movement. The term "automation" was first introduced by D.S.Harder in 1936, who was then with General Motor Company in the U.S. He used the term automation handling of parts between progressive production processes.

Automation is technology of automatic working in which the handling methods, the process and design of professional material are integrated, thus the effort to achieve an automatic and self-regulating chain of process.

Objectives of Library Automation

- (i) To maintain bibliography records of all the materials, in a computerized form.
- (ii) To provide bibliographical details through a single enumerative access points of holding of a library.
- (iii) To reduce the repetition in the technical processes of housekeeping operations.
- (iv) To provide access to information at a faster rate.
- (v) To share the resources through library networking.
- (vi) To implement new IT process to provide high quality information.

Basic Requirements for Library Automation

- (i) Adequate collection
- (ii) Financial assistance
- (iii) Hardware
- (iv) Software
- (v) Trained Staff
- (vi) User training
- (vii) Maintenance and development

eLibrary

"An informal definition of a digital library is a managed collection of information, with associated services, where the information is stored in digital formats and accessible over a network. A crucial part of this definition is that the information is managed. A stream of data sent to earth from a satellite is not a library. The same data, when organized systematically, becomes a digital library collection. Most people would not consider a database containing financial records of one company to be a digital library, but would accept a collection of such information from many companies as part of a library. Digital libraries contain diverse information for use by many different users. Digital libraries range in size from tiny to huge. They can use any type of computing equipment and any suitable software. The unifying theme is that information is organized on computers and available over a network, with procedures to select the

material in the collections, to organize it, to make it available to users, and to archive it."

There are many definitions of a "digital library." Terms such as "electronic library" and "virtual library" are often used synonymously. The elements that have been identified as common to these definitions are:

- The digital library is not a single entity;
- The digital library requires technology to link the resources of many;
- The linkages between the many digital libraries and information services are transparent to the end users;
- Universal access to digital libraries and information services is a goal;
- Digital library collections are not limited to document surrogates: they extend to digital artifacts that cannot be represented or distributed in printed formats.

eLibrary provides a database of documents that have been issued by or submitted to the Federal Energy Regulatory Commission (FERC). Members of the public and FERC personnel can access this database; however, only FERC personnel can access certain documents that are designated as non-public. Specifically, eLibrary gives you access, through the FERC Web site, to over two million documents with over 10 million pages that have been archived over more than 20 years. As a web-based system, eLibrary enables you to search the database, view several categories of documents, view scanned images of documents that you select, and have the documents printed, downloaded to your desktop, or saved on a CD.

The e Library includes:

- Electronic versions of documents issued by FERC from 1989 to present
- Documents received and issued by FERC
- A description/index of documents from 1981 to present
- Microfilm of documents for 1981 to 1995
- Images of paper documents for the period 1995 to present
- Native files electronically submitted from November 2000 to present

The images and native files are available for viewing on a desktop PC. You may request through the FERC Web site older documents that are available only on microfilm and aperture cards.

The eLibrary is the result of a combination and enhancement of the data and capabilities of several earlier systems. The system:

- Adds enhanced and more powerful searches for documents.
- Provides a seamless interface to electronic filings.
- Improves the ability to view large format maps.
- Enables users to select from several formats for downloading documents.
- Provides users with the ability to search the text of newly scanned documents that have been converted to PDF.
- Enables users to request that documents be printed or downloaded to a CD.

CONCLUSION

Library automation is now not a big thing as many open source library automation packages are available on the Internet. Any library whether it is a big or small in size may make use of the Open source software like KOHA ILMS and automate their services as automated library services will attract users to the library besides make the routine works of the librarians easy.

WEB-BASED LEARNING PLATFORM: MOOCS

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ABSTRACT

MOOC is a revolutionary step in the field of web learning. Massive Open Online Courses (MOOCs) are self-expressing that the courses are provided via internet for infinite learners and it is open to all. This study is an attempt to define MOOCs, how India is stepping up in this field by launching SWAYAM. The study reveals how libraries and library professionals are changing to themselves with the scenario, how they can do better for MOOCs in LIS field.

Keywords: MOOCS; Web-based Learning, Online Courses, Information Technology, Swayam

INTRODUCTION

Today, we are living in technological era. Technology as well as Information technology is growing very rapidly. Web based learning is a part of this technological era. Due to information explosion, librarians are forced to learn and apply new and updated technology in the field of LIS. Librarians should be updated regarding new developments in this field. So, web based learning is the necessity of today's IT society. Web based learning is an effective and easy way to learn for working professionals. E-learning, online learning, computer based learning etc. are the synonymous of web based learning.

There are a number of online sources available in the field of LIS. Today, web based learning is playing pivotal role to enhance the quality of education. Web based learning is an effective tool for distance education and open universities. Web based learning provides Massive Open Online Courses (MOOCs), which provide good opportunities to educate anyone. There is no age limit, no geographical boundaries and no fee or almost free to take up MOOCs. MOOC is defined as a free and open course by organizations, governments, welfare trusts, industry experts and some of the leading universities of the world.

MASSIVE OPEN ONLINE COURSES (MOOCS)

Earlier, MOOC was introduced in 2006 and became popular in 2012. It is the collaborated initiative of MIT and Harvard University. Main motive of MOOCs is to provide online courses to the infinite learners through internet. MOOCs are nonprofit making and meant to free of cost delivering. It provides the facilities to those who want to study through world's famous institute without getting enrolled as regular student.

MOOCs courses are introduced for infinite numbers of students that anyone can access anywhere via internet, these courses are open to all without any age and minimum qualification requirements, and provide a complete course experience online for free. There are a number of MOOC platforms, which provide the opportunity to learn online. Some of the main MOOC platforms are given below:

edX

edX introduced by Harvard University and MIT in 2012. It is an online learning platform and MOOC provider. It has partnership with world's best universities/ institutions and provides best quality courses. It has 130+ partners, 1900+ courses and more than 14 million students worldwide, representing almost every country. The main motive of edX is:

- to educate everyone, anywhere
- to enhance the learning and teaching skills
- to enhance their service providing skills etc.

Udacity

Stanford University launched a course 'Introduction to Artificial Intelligence' as a free online course to everyone. Now, it is well known as Udacity. It is started by two professionals Sebastian Thrun and Peter Norving in June, 2011. It is an online learning platform which is designed for those who wants to grab knowledge and enhance their skills. Motive of Udacity is to give first class higher study options that are flexible, accessible and economical. Udacity has 160000+ learners, 190+ member countries and more than 33 courses. It is a big platform to educate people for their desired courses.

Coursera

Coursera is a well-known online learning hub, which is profit based. It is introduced by Andrew Ng and Daphne Koller. It is launched in April, 2012 from Stanford University

Coursera educates its learners by following steps:

- Video lectures
- Assignments that are peer reviewed/ projects
- Forum for discussion/ group discussion for doubt clearance
- Quizzes
- Electronic certificate distribution after completing the course

It has 2000+ courses, 149 partner universities, 180+ specializations and 25 million learners.

MOOCS IN INDIA

SWAYAM

“Education perhaps has no boundaries” keeping this in mind, Ministry of Human Resource Development (MHRD), Government of India and All India Council for Technical Education (AICTE) in alliance with Microsoft have initiated a step towards the active learning for aspiring minds who are eager to grab knowledge by introducing an idea of ‘MOOC’- Massive Open Online Courses in India, which is named as “SWAYAM - Study Webs of Active-learning for Young Aspiring Minds.” It is self-defining “We can study all on our own.”

SWAYAM is successfully designed for three policies of education:

1. Access
2. Equity
3. Quality

It is operated in four quadrants:

1. Video lecture
2. Online material which can be downloaded and further be printed as per convenience.
3. Online tests and quizzes to assess themselves and
4. Doubt clearance discussion forum

It is operated by seven national coordinators:-

1. NPTEL- Engineering Education
2. UGC- Post Graduation Education
3. CEC- Under Graduation Education
4. NCERT and
5. NIOS- School Education

6. IGNOU- Out of the School Students and

7. IIBM- Management Studies

MOOCs, Libraries and Library professionals

In the present scenario, the role of library professionals is changing with the technological developments. Library professionals are information providers either it is traditional or digital. Library professionals can add value to their services by assisting MOOCs. Libraries and library professionals can assist MOOCs as well as learners in various ways, such as:

- To help to develop MOOCs for LIS subject
- To conduct lectures in the field of LIS through the MOOC platforms
- To collect the material for MOOC platforms
- To assist in resolving copyright and faire use related issues
- To build MOOCs collection by their research articles
- To provide a particular place for MOOC related activities
- To preserve MOOCs data in libraries for future
- To facilitate their patrons and fulfill their information needs by creating their own MOOC platform

MOOCs are really playing a major role in the field of LIS by providing web learning facilities so that LIS professionals can enhance their skills. The impact of all these developments can be seen in various subjects including LIS. This information technological era expects that librarians should be multi skilled in respect of information and information communication technology. Here, MOOCs play a major role to deliver LIS education and training.

CONCLUSION

In many developing countries of the world where quality education is still a hope to come true, initiatives like this will surely prove to be beneficial for students and professors of such countries. With the flow of time, the developing world is going to be surrounded by such initiatives which will knock the door of new opportunities for keen learners but might also bring a pool of difficulties for schools as they may face a lack of interest in enrollment in physical courses. Students are going to be attracted towards new online courses rather than traditional offline courses. This can be converted into an opportunity by converting the classroom setup

into a flipped classroom which will improve the enrollment scenario and also bring innovative ideas in the classrooms.

The benefits may add up to another level by attracting those who want knowledge over degree. This can also be used by roping in retired professionals/librarians who can share their experiences and knowledge treasure to those who just want to gain knowledge and are not running after a formal degree. MOOC enables a retired teacher to share their knowledge within their comfort zones i.e. their homes, allowing them to earn extra income as well. But this system can definitely solve the problem of availability of good teachers for particular subjects by providing the experts for the same.

Although MOOC is destined to be successful but at current scenario it is a bit difficult to examine its impact on traditional learning system. However, there are certain points that are boon to every learner through this initiative:

- Tuition fees equivalent to zero.
- Association with library schools at national and international levels
- Processes that helps a school and a teacher to build and raise their profile.
- Availability of plethora of courses that one can opt from different schools and universities

Helping schools to set up digital platform to enable online courses.

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OPEN SOURCE SOFTWARE: ITS USEFULNESS FOR LIBRARIES

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ABSTRACT

Library has been playing an import role for the development of any country in term of education and research. Due to growth of knowledge in this era of science and technology, the expenditure of the library is also growing day by day. Keeping in view of same, the libraries are moving toward open source software. The open source software is users' friendly software and source code of same are available for free of cost. Users may modify the software according to their need and ability to run, copy, distribute, study, change, share for improving purpose, but not for commercial purpose. Open source software provides greater control over their working. As library professionals are aware of the advantages of open source software and they should involve in their development and customization. They should have basic knowledge about the selection, installation and maintenance of the open source software to be implemented in the libraries. This paper highlights major open source library software, their advantage and constraints.

Keywords: *Open Source Library Software, Open Source Movement, Library technology, Information Technology, Library Management Software, and Digital Library Software.*

INTRODUCTION

In this modern era, the growth of Information and Communication Technology (ICT) has speedily changed the growth of literature or information and now these are almost more than double. In the era of ICT, computerization and mechanization have brought the complete change towards development in the world. Library has been a very important place of knowledge resources generation, preservation and distribution. Automation of library resources has also brought over all revolution in the field of libraries and information services and has made its access easy to the end users. The impact of automation can be

observed in the libraries, information centre, and higher educational organization. In the era of ICT, quick access to right information has become absolutely important. It is very important in this era to adopt 'the right information in right time'. Automation of library system deals with the computerization of resources in such a way that the information can be made available on just a single click and makes them available globally. Automation of library is useful for web design, content management, operating systems, and communications. It is also useful to improve the management of physical and financial resources of the libraries.

Types of software

The library and information services deal with the non-numeric data processing, text retrieval, manipulation of strings of characters. In the present era for the special purpose, there are many software available in the market and even than various open source software are available for these special purposes.

There are various types of library software and their features are – General software for data entry, validation, sorting, merging of files and editing of data etc. Word processing software to manage text manipulation and processing like text-storage, search, recall, modify, alignment of margins, addition and deletion of string etc. Database management systems (DBMS) are for creation and management of databases, file management systems, relational database management systems (RDBMS), network and hierarchical DBMS. Text-retrieval packages for storage and retrieval of non-numeric record. Software can also be use for searching online retrieval system and CD-ROM databases for library. They also provide private or personal file facility and permit editing of search files on micros. Library automation software can be grouped into three broad categories-

Commercial Software: The commercial software is developed by the firms for their profit. The firms develop software according to the requirement of the market. In this software the monopoly of the firms is always dominated and they charge from market as software cost. If the user of the software requires some modification and customization, the firms charge heavily for the customization.

Free Software: The Free Software Foundation (FSF), started in 1985, introduce the word 'free' to mean without any cost. The software is free of cost but the source code not available with the user and the source code available only for developer of the software. This is the basic difference

of free software and open source software. The user cannot modify the software.

Open Source Software (OSS)

Open source software (OSS) is freely available software and does not require a license fee. The source code of the software is available to public for use and modifications as per their requirement but not for commercial use. There are open source software applications for a variety of different uses such as office automation, library automation, web design, content management, operating systems, and communications. The open source software are not required any type of license. As copyright material, software is almost always licensed. The license indicates how the software may be used. OSS is unique in that as it is always released under a license that has been certified to meet the criteria of the Open Source Definition. Open source software criteria include the following right to:

- Redistribute the software without restriction;
- Access the source code;
- Modify the source code; and
- Distribute the modified version of the software.

In contrast, creators of proprietary software usually do not make their source code available to others to modify. When considering the advantages of open source software one should consider the open source product itself. Open source products vary in quality. Open source software does not come with phone support or personalized e-mail support. However, there are commercial service providers who will provide support. If one needs a lot of support, consider whether the overall costs of using an open source product will be higher than that of a proprietary product.

History to Started Open Source Software

With the development of science and technology the open source software came in to existence in the 1970s with the open mind people creativity. The open mind technocrats thought and broke the monopoly of commercial software developer. The proprietary commercial software did not allow users to redistribute it, modify it, or access its source code possession itself not distributed to their users. But some of the technocrats were against to the right to use of the software for individual. They were open minded societies and not accepted restriction for the use of software and the nature of proprietary.

The development of open source software was a reaction to the fact that changes or improvements could not be made to commercial (proprietary) software by other developers or users. This was the monopoly of the software developer companies; the user could not customize or modify this type of the software. The open source movement started with Richard Stallman's general public license model (in the 1980s), which holds that software should be freely modifiable, with the condition that if you make improvements to the software, you must put the improvements back in the open source community. The rationale for the open source movement is that a larger group of programmers not concerned with proprietary ownership will produce a better product.

Advantages of Open Source Software

Lower Costs: It is free of cost. There is no cost involvement for implementation of open source software. Open source software usually does not require a licensing fee and its lower cost is generally one of the key reasons why small businesses choose to adopt this software. Make sure that one consider the total costs of ownership when considering open source software.

Flexibility: The flexibility of the open source software. The source code or a programmer can take a standard software package and modify it to better suit business needs. One can usually hire a programmer to add a particular function to open source software.

Reliability and Quality: When looking at improved quality, one has to compare the products themselves. It is impossible to say that open source software is better than proprietary software in terms of reliability and quality – both have a range of products. However, mature open source software is generally viewed to be of good quality and reliability. If one's business is not familiar with open source software, one may only want to review some of the more mature products (e.g. Linux, Apache and Sendmail).

Reduces "Vendor Lock-in": If one is using proprietary software one may be restricted for using certain vendors. Switching vendors in this case usually involves significant costs. Keep in mind though that choosing an OSS product may not make one totally independent of vendors. For some OSS products there may be a limited number of vendors that can provide one with services, upgrades or security patches.

Availability of External Support: External technical support is available for many of the open source software packages. Some vendors offer

support contracts and there are service providers that install, configure and maintain an OSS system. Many open source products also have active online community support that may be able to answer the questions through online blogs.

Open Source Software

Open source software is the software whose source code is available for modification or enhancement by anyone. Open source software may be free, a developer or distributor may charge for services, including special programming, installation, training, and technical support.

Library Automation Open Source Software-

- ABCD
- Evergreen
- OpenBiblio
- Emilda
- Avanti
- phpMyLibrary
- NewGenLib
- Koha etc.

ABCD: The name itself already expresses the ambition of the software suite to provide not only automation functions for traditional libraries but also other information providers such as documentation centers. It is developed by BIREME (WHO, Brazil) in collaboration with the Flemish Interuniversity Council, Belgium, using UNESCO's ISIS database technology. The ABCD is a library automation open source software and its full name is "Automation of liBRaries and Centres of Documentation". This software provides flexibility and versatility. It has an excellent indexing and retrieval features based on UNESCO's ISIS technology, a web OPAC, a library Portal with integrated meta-search and content management system to manage online as well as offline digital resources, physical documents and media. It offers a solution to library automation with ISBD as well as local formats. It caters to almost all present needs of modern libraries of any sizes.

Evergreen: It is the consortia of public libraries, individual libraries, moving towards academic libraries started in 2004. The Evergreen Project was initiated by the Georgia Public Library System in 2006 to serve their need for a scalable catalog shared



by (as of now) more than 275 public libraries in the state of Georgia. Equinox is the company that promotes, develops and supports Evergreen. Evergreen ILS is another option when researching open source ILS options. Developed by Equinox Software, Evergreen is a robust, enterprise level ILS solution developed to be capable of supporting the workload of large libraries in a fault-tolerant system. It too is standards compliant and uses the OPAC interface, and offers many features including flexible administration, work-flow customization, adaptable programming interfaces, and because its open source, cannot be locked away and can benefit from any community contributions.

OpenBiblio: OpenBiblio is an easy to use, open source, automated library software written in PHP. This software has facilities of OPAC, circulation, cataloging, and other administrative work. OpenBiblio is well documented, easy to install with minimal expertise and designed with common library feature.

Emilda: Emilda is a complete Integrated Library System that features amongst others an OPAC, circulation and administration functions, Z39.50 capabilities and 100% MARC compatibility. Emilda LA ILS MARC21 support, integrates and controls access to third-party databases and Web-based resources.

Avanti: Avanti Micro LCS Software is developed by Avanti Library Systems in Java language. This is a small, simple, and easy to install and use open source software. It is a platform independent, and can run on any system that supports a Java runtime environment. This software is useful for small libraries; it has a powerful and very flexible architecture that allows it to be adapted for use in libraries of any type. This software incorporates standards such as MARC and Z39.50 as modules and interfaces

PhpMyLibrary: PhpMyLibrary is a PHP/My SQL web-based library automation application meant for smaller libraries. The software has the facilities of cataloguing, circulation, and OPAC module. The software also has an import export feature. It strictly follows the USMARC standard for adding materials. This software is compatible with the content management system and has as facility of online reservation system for library and also supports import from ISIS database with an ISIS2MARC program.

NewGenLib: NewGenLib (New Generation Library) is an Integrated Library Automation and Networking Solution Developed by Verus Solutions Pvt



Ltd and The Kesavan Institute of Information and Knowledge Management, India. In March 2005, NewGenLib version 1.0 was released and versions 2.0 and 2.1 have come up later. On 9th January 2008, NewGenlib was declared Open Source Software under GNU General Public License (GPL) License by Versus Solutions. Currently NewGenlib 3.0.3 U2 is the latest version running. Presently about 2,500 libraries and information centres are using NewGenlib across the world.

Koha: Open Source Integrated Library System

Koha is the software which can run across the platforms and also has proved as the most popular worldwide accepted integrated library system with powerful data entry and retrieval features, i.e. acquisition, cataloguing, circulation, and serial etc. Experiences of adopting these applications in the library management system have been discussed in the article. Koha is an open source integrated library system (ILS), used world-wide by Libraries. Koha is web-based ILS, with a SQL database (MySQL) backend with cataloguing data stored in MARC and accessible via Z39.50 or SRU. The user interface is very configurable and adaptable and has been translated into many languages. Koha has most of the features that would be expected in an ILS, including:



- Simple, clear interface for librarians and members (patrons)
- Various Web 2.0 facilities like tagging, comment, Social sharing and Union catalog facility
- Customizable search
- Circulation and borrower management
- Full acquisitions system including budgets and pricing information (including supplier and currency conversion)
- Simple acquisitions system for the smaller library
- Ability to cope with any number of branches, patrons, patron categories, item categories, items, currencies and other data
- Serials system for magazines or newspapers
- Reporting
- Reading lists for members

Koha is a full featured Integrated Library System (ILS). As there is no cost for the license, one has the freedom to modify the product to adapt it as per one's needs, etc. It was developed initially in New Zealand by Katipo Communications with Horowhenua Library Trust. It is

currently maintained by a dedicated team of software providers and library technology staff from around the globe.

Digital Library Open Source Software: This is a library software for creating and developing a digital library for e-Resources

Greenstone Digital Library Software:

Greenstone digital library software is an open ended software for creating/developing a digital library of the information contributed by all participating libraries. The collections under this software can be effectively searched in full-text and browsing facilities can be done based on metadata. It is very easy to use. The data can be easily maintained and the same can be rebuilt and augmented automatically. “plugins” facility in the software can accommodate various types of document and metadata. It provides the facility to the libraries to create their own library and maintain the same easily.



DSpace: Dspace is digitization software for creating digital institutional repository. The research and intellectual output of the faculty of institution is captured, stored, indexed, preserved, and made available to the users in digital formats. This software manages the digital material in shape of digital files which are indexed in a manner that the same can be search using metadata. Massachusetts Institute of Technology (MIT) Libraries and Hewlett-Packard (HP) has designed and developed DSpace. It is an open source software which can be used by institutions and other organization for submission, management, and access of digital content.



EPrints: Eprints is also an open source software used for creating open access repositories of digital content with Open Archives Initiative Protocol. University of Southampton School of Electronics and Computer Science has developed EPrints software under GPL license. This software has many features similar to Document Management systems. It is commonly used for creating institutional repositories for various publications..



Fedora: Fedora is an open source software used for creating and delivering the digital content. It follows a digital object model supporting to multiple views of each digital object along with their relationships. It manages the digital contents created locally and has the reference of remote contents also by tagging the same. Fedora manages task and decisions surrounding the ingestion, cataloguing, storage, retrieval and

distribution of digital contents. These digital contents are kept in repository and supported by many management functions. These functions are available as web services. But the same can be managed by some sort of access control policies. On account of these useful functions Fedora is considered an attractive solution for library collection management, digital repositories, institutional repositories etc.



Web Publishing Open Source Software:

Wordpress: Wordpress was started in 2003 as a free, open-source solution blogging. Today, WordPress is built on PHP and MySQL. About 31% of all sites across the web prefer it and it is considered as a perfect alternative to building a web site. It is free to use and one can easily download and install the same. At present it has a large community of users and programmers who help in using the interface and content management system. The text and photos can easily be uploaded on the web site.



Drupal: Drupal is also another open source web publishing software which is available to be used by an individual or a community of users for publishing, managing and organizing a variety of content on the website. A large number of individuals and organizations have been using Drupal to deal with different web sites, including Community web portals, Discussion sites, corporate web sites, Intranet applications, Personal web sites or blogs, E-commerce applications, Resource directories, Social Networking sites.



CONCLUSION

In the era of ICT there is a tremendous growth of literature in every field of societies. Purchase of publications of all available knowledge on various subjects has become costly a affair for the library. Libraries with small budgets always consider automation of housekeeping operations but financial of high cost of commercial software comes a barrier in this regard. However, open source software is an effective tool to cut the automate library operational cost without undertaking reduce financial burden. Libraries are taking up open source software as a substitute the commercial software and way to reduce the costs of expensive commercial products. "The benefits of Open Source Software

can potentially reduce costs; give users more control and increase software performance” (Courant and Griffiths, 2006). In India automation and networking of library are still in their formative stages.

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PARTICIPATORY MANAGEMENT: A NEW PARADIGM IN ACADEMIC LIBRARIES

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“A successful manager is not measured by what he/she does but by what he/she can inspire others to do.”

ABSTRACT

Increasing demand for knowledge workers reflects the changing skills requirement in every walk of life. Quality decisions require useful suggestions that can only come from employees with necessary skills, knowledge and abilities. Participatory management presumes that employees have a potential role in all levels of decision making within an organization. This paper addresses the following posers – (i) What are the characteristics of participatory management? (ii) How can participatory management be effectively implemented in academic information services?; (iii) Examines the theory of participatory management as an alternative form of administration; (iv) which facilitate the settlement of problems and conflicts created in libraries because of non-involvement of staff in decision making.

Keywords: *Autonomy, Authoritarian management, Hierarchical administration, Management Information System, Participatory Management, Team work.*

INTRODUCTION

It is human tendency to believe that we as individuals are much more capable of handling things on our own. In fact, to finish any task, we invariably need the help and assistance of other people. Effective and efficient team work goes beyond individual accomplishments. In any workplace, there are several tasks that require people with diverse skills and different perspectives to come together ensuring successful completion of work. Effective team work is imperative for proper completion of result-oriented tasks (Deccan Herald, Aug 2011).

Traditionally organizations are run by authoritarian managers with decisions made at the top and the subordinates to follow directions. With

technological advances competition for the world's limited resources has intensified. The search for a more effective, dynamic and competitive management system has led to the concept of Participatory Management.

WHAT IS PARTICIPATORY MANAGEMENT?

The concept of participatory management can be traced back to the 18th century social philosophers and political thinkers, especially Rousseau. Although most management theories began with the abstract models of social and organizational psychologists and scholars from related fields, participatory management was one of the first that focused primarily on the needs of the individual.

In its current form participatory management was conceptualized by the Prussian social psychologist Kurt Levin. Through his writings he showed that the problems have social consequences that include people's feelings, perceptions of reality, sense of self-worth, motivation and commitment (Rees Jr. 2009).

To understand the nature of participatory management, it is necessary to compare it with the authoritarian management. In the latter, managers think and employees do. Under the former, people in different positions think at the same time about the same things, but not in the same way. The performances focus on user community, on adding value and the ability to replenish (McLagan and Nal, 1991).

As organizations grow in size and complexity, the need for cooperation increases proportionately, since it is difficult for managers to take the best decisions when they are not fully aware of the various factors and the views of others (Cabral-----). Effective and efficient team work goes beyond individual accomplishments. There are several tasks that require people with diverse skills and different perceptions to come together ensuring successful completion of work.

EMPOWERING THE STAKE HOLDERS

Researches have revealed that participatory management positively impact job satisfaction, better decision making and greater efficiency, employee satisfaction, morale and self esteem (Shaghorl et al, 2011).

Participatory management is based on the assumption that empowering people throughout the enterprise will result in a more responsive, more flexible and ultimately more successful enterprise. Empowerment involves leadership actions such as coaching, negotiating,

sharing and facilitating (Oosthuizen and du Toit, 1999). Empowering occurs when the employees are entrusted with certain responsibilities, who then experience a sense of belongingness. Workers feel more responsible and show more initiative in their work and enjoy the work (Wellins,1991).

TEAM WORK AS CATALYST

Empowerment and participation make employees feel significant, committed to learning, team spirited and excited about their work (Oosthuizen and du Toit,1999). A team's out put is good only if there is good coordination among its members. Every person has a unique talent that suits a particular job profile. To achieve better results the important factor is 'putting the right people to the right jobs' (Deccan Herald , Aug 2011).

As a result of global recession and its fall outs, working as a team is more relevant in the present age. People recognize that 'none of us is as good as all of us'. This encourages better communication as workers mutually discuss work problems and give quality suggestions.

IMPACT OF ICT AND QUALITY DECISIONS

Organizations are facing unprecedented challenges. With the rapid development of electronic information and communication media, distributed work has become much easier, faster and more efficient (Hertel et al, 2005). This has resulted in creation of products, organizations and activities that are not static in nature but changed dynamically. They offer information products and services tailored to the needs of specific users and user communities (Smith,1993).

The increasing demand for knowledge workers reflects the changing skills requirements in every walk of life. Learning is not just about what happens in training courses and programmes but something that happens continuously. More focus is put on outcome measures and learning effectiveness rather than on input measures such as course attendance, hours of training and satisfaction with training programmes (Cheese et al, 2008) Quality decisions require useful suggestions that can only come from employees with the necessary skills, knowledge and abilities. Organizations have begun to realize and acknowledge this strategic importance of human capital (Deccan Herald, Aug 2011)

LIBRARIES ADOPTED HIERARCHIAL SYSTEM

Libraries have adopted bureaucratic style of management which means that decisions are handed down vertically, without prior consultation of staff at the lower level(Cabral-----) Bureaucracies are structured in the form of a pyramid with several levels in which each employee has clearly defined functions, rights and duties and is accountable to an immediate superior. Authority flows from top to bottom. Bureaucracy requires compliance with the organization's rules and regulations.

The bureaucratic model has imposed serious constraints on the libraries and librarians. They are merely expected to carry out orders and report to their superiors whereas librarians should enjoy a considerable degree of autonomy in taking decisions regarding library's policies, objectives, priorities etc. (Cabral----). The libraries, especially in the universities are quite hierarchical in their management structure. The movement against top-down hierarchies in general took place in 1960s. This ushered in a number of management revisions, including participatory management and even student evaluation of teaching faculty.

IMPACT OF ICT ON LIBRARY MANAGEMENT

Increase in production of reading materials and ever growing importance given to information services has a high impact on existing libraries. They have grown in size and diversified functions. Technology has introduced sweeping changes in how libraries work which has required a reallocation of resources to deal with these developments (Reese Jr, 2009).

Library decision making as a process has not been given due consideration in terms of modern administrative theory. As a result, the authoritarian system of administration is adopted widely in libraries as being the most appropriate to their purposes and functions (Marchant, 1971). It is vital for librarians to be involved in assessing the services rendered and suggesting the setting up and maintenance of services for the library users.

Attempts to introduce participatory management in organizations where bureaucratic set up is firmly established will have to face a series of hurdles. Inviting workers' views on improvement of existing environment as well as innovative ideas to be introduced helped the librarians to retain and maintain workers' interest in the organization. However, librarians should remember that majority of their

subordinates will not trust innovations as they take it as an infringement of their authority. They will resent any programme that appears to transfer the responsibility that should belong to them.

AUTONOMY IN LIBRARY MANAGEMENT

The unwillingness of the librarian to share authority with his assistants, the disinterest of the power that be act as stumbling blocks. It is commonsense that individuals will take greater pride and pleasure in their work if they are allowed participatory freedom in decision making which affects their work (Virmani, 1988). The study of Oosthuizen and du Toit (1999) on the application of participative management in academic information services provides an excellent discussion of the rationale propelling attempts to establish participatory management models. They note that the participatory management's unique feature is that it presumes employees have a potential role in all levels of decision making within an organization. Participatory management is more than a willingness to share. A high level of trust among all stakeholders is necessary before successful implementation is possible. Librarians should enjoy a considerable degree of autonomy in taking decisions regarding library's policies, objectives, priorities etc. At present they are expected to carry out orders and report to their superiors.

NEED FOR MANAGEMENT INFORMATION SYSTEM

There are librarians, especially younger generation, who are increasingly keen in participative management. They opine that the contact and interaction with experienced librarians will help their professional growth and the development of their decision making capacities. The areas they have identified are planning, coordination, job organization, budget preparation, drafting of reports, preparation of projects, public relations, assessing the services rendered and suggesting innovative services.

The world has entered a new technological age dominated by computers and communication systems. The change is both rapid and revolutionary. The future will bring even more rapid and more radical changes to gathering, processing and dispensing information in libraries now known as Knowledge Centers.

Libraries are information systems in the process of entering high-tech information age.

Libraries need management information systems. Without them, libraries have little feedback on how well they are achieving their goals.

Machines should be used to facilitate human creativity and data analysis abilities rather than stifles them.

NEED FOR COORDINATION WITH LIBRARY STAFF

There needs to be a greater interaction between the librarian, his colleagues and his superiors. Here, librarian must function as a “ linking pin”. Participatory management requires certain amount of training to equip the staff for group work. Many librarians are not enthusiastic about the training programmes believing that it is a waste of time when there are already others more qualified to make better and rapid decisions.

Many librarians are unaware of the coming changes in ICT and do not have the required skill to address the requirements.

Just repeating the ‘mantra’ of team work does not work. Today’s librarians have the responsibility to catalyze creativity and innovation. A proper environment has to be creative to make the members give their best whole heartedly. This can be achieved by maintaining a high level of motivation within the work force.

One possible obstacle to change might be the conformist spirit of some librarians who have reconciled themselves to routine jobs. What is needed is that librarians who enjoy sufficient freedom of action and are willing to collaborate should work together and exchange ideas and experience with a view to recommending appropriate solutions to the problems in the area and improving the services provided for library users.

Such a change can be achieved by the adoption of a decentralized organizational structure whereby the staff can play a greater role in decision making. Librarians ‘first concern must be to improve communications since information must be available for effective solutions to the prevailing problems.

There is need for significant organizational change in the libraries. Now a days, librarians are pressing for changes under demanding greater autonomy and participation in decision making and more freedom of action (Cabral....).

ADVANTAGES OF PARTICIPATORY MANAGEMENT

- Decisions are more readily accepted as they are worked out by the group itself with a common objective in view.

- Group members can air their views, stimulating creative original ideas.
- Conflict is seen as a productive force. It identifies issues, creates incentives to exploration and provide a route to possible solutions.
- Suggestions and criticisms help correct errors. Mediocre ideas can be avoided.
- Collective sharing of rewards, cooperation replaces competition.
- Provides opportunities for professional growth, empowers individuals with capacity building.

CONCLUSION

Continued developmental research work in digital technology and ICT has opened up flood gates of innovations. Almost all records – business, personal, official, research data – are now created and stored digitally. This shift from physical materials to digital holdings has slowly infiltrated libraries across the world.

Participatory management has the virtue of forcing decision making down to the level where the most relevant information can be found and where the effect of decision will have the greatest effect (Steuart and Moran, 1998). Participatory management should rather be implemented on a gradual basis over an extended period of time, particularly if it represents a significant change in the prevailing practices. It is human nature to resist change if it is not thoroughly explained and meaningful results are not achieved within a reasonable period of time (Maisela, 1995).

The diverse workforce in modern enterprises offer opportunities for collaborative ventures that bring together people with different attributes skills and expectations. Empowerment and participation make employees feel significant, committed to learning, team spirited and excited about their work.

Integration of learning and knowledge management helps organization to cope with the potential loss of critical knowledge and experience as the work force ages. This cannot be done in a class room-like structure. It is necessary that an environment which encourages and rewards knowledge sharing is built (Cheese et al, 2008). Schools of Librarianship should produce librarians with a capacity for decision making, criticism and democratic approach to management and planning operations.

Today participatory management method have been developed, tested and their viability established. Information technology will change the way organizations are managed, the way they are structured and the way jobs are designed. The compulsions of the present day competitive world have made workers' involvement more relevant than ever before.

Librarians are at the heart of the information technology revolution. They are experiencing an environment of rapid and radical technological changes. Several librarians believe that participatory management is expensive to introduce in libraries because it requires a certain amount of training to equip the staff for group work. Higher ups are not enthusiastic about the idea of participation, believing that much time is wasted in training the inexperienced when there are already others more qualified to make better and more rapid decisions (Smith, 1969).

What is needed is that librarians who enjoy sufficient freedom of action and are willing to collaborate should work together and exchange ideas and experiences with a view to recommending appropriate solutions to the problems in the area and improving the services provided for library users. One must remember that no matter how inspiring the leaders are, they are only as effective as their team.

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IMPORTANCE OF LIBRARY IN EDUCATIONAL INSTITUTES

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ABSTRACT

Library is known as the heart of university. A well stocked and managed library is one of the prerequisite to ensure quality education and research. That is why the National Institutional Ranking Framework (NIRF) of Government of India gives equal importance for libraries and laboratories while allotting marks and recognised the library as one of the important indicator while ranking the universities. International level rankings are also giving significant weightage while ranking of universities. This paper discusses the importance of library in educational institutes.

Keywords: *Library, Educational Institutes, University.*

INTRODUCTION

Libraries are really reservoir of knowledge, ideas, vision and great thoughts. The accumulation and transfer of ideas, thoughts, concepts, philosophies for innovation of technologies are emanated through reservoir of knowledge that is Library. In libraries ideas are synthesized and kept in the form of stone inscriptions, bhojpatra, palm leaves, paper books, magazines and right now in the shape of CD, and hard disc of computer. Thereafter, it is uploaded to the internet for access to global people for enhancement of knowledge, for the purpose of mankind as well as social engineering. What technology we are using today or enjoying the benefits of these inventions are based on accumulated manuscript in the library. Library is the seed of knowledge and librarians are gardener through their efforts human civilization have occurred.

Human civilization is totally based on technology and know-how; we utilize energy at the base of technological innovation. During Paleolithic period, hammer like instruments made from stones were utilized for killing the animals for their food and defense. Peoples at that time were

of little knowledge to harvest the energy, that's why they were unable to harvest the energy in tune with present world.

In nutshell without Library, human was just like wild animals of forest. As library has given us an opportunity to gain knowledge and use it for mankind. University of Alexandria, Rome and Constantinople have given opportunity to make rise Egypt, Greece and Roman empire. Ancient India were well known as a wisdom society, because great library of Nalanda, Vikramshila and Takshshila were there to imbue the people from rich repositories of knowledge. The People of India were highly respected and well known to world due to scholar monk, who made India as a golden bird. Later on invaders destroyed, dismantled and burnt the Nalanda library, led to devastation of total rich technological culture of our Country. India fell into the deep sea of darkness and became slave of west and Britishers.

From this 'knowledge and wisdom model of universe' it is absolutely clear that without library existence of modern society is totally impossible. Libraries are an important cornerstones of a healthy community that give people an opportunity to find jobs, explore medical research, experiences new ideas, get lost in wonderful stories, while at the same time providing a sense of place for gathering knowhow. It reflects the diversity and character, and the needs and expectations of our community. Library is often the only readily available source of comprehensive information needed for business decisions, use library resources to make wise use to our community's economic and intellectual benefits, improve job skills, break cycle of poverty and overall welfare of mankind. It is a unique and valuable resource and is a lifeline to the world for all the information.

A library is a building homologue to a repository, which contain Books, Research papers, Thesis, Journals, Magazines, Periodicals, Newspapers, Digital resources etc. In short, it's a store house of knowledge. The first library was recovered from Sumerian civilization of 2600 BC. Be it's a Rome, Alexandria or Constantinople, which were the advanced ancient human civilization had their own libraries. Even Indus Valley Civilization had its own libraries having manuscript, written over miniature plates, copper vessels, pots and other items. So, library has its importance back in history, in present and in future. A library has a paramount place in a college, as a body is nothing without a soul, an educational institute has no existence without a library.

A college being an institute of education, the library plays a very vital role in upbringing its quality of education. A professor can teach to

his/her full efficiency, but within a time limit of 1 or 2 hours which limits the student to reach the depth of the topic. Here, a library provides the student and faculties a full excess to unlimited excess of the knowledge at any time to the depth of any topic with no time limit. Having excess to the new researches, developments, recent advances, inventions, discoveries *etc.* It upgrades the quality of education, which keeps the students and faculties up to date in this fast-growing world.

A library cannot be seen merely a building, it's a multi-dimensional platform that has multifaceted sides. It's effect over social environment of college can't be neglected. Apart from knowledge flow, it has also a soul quality of bringing the economic and social status at the equal level on the same table under the same roof. Whether a rich or poor, socially forward or backward, a library debarred all these discriminations at its door by giving equal excess to everyone to the knowledge.

Library plays a hidden role in personality development at neurological level. A body works according to the status of a brain. A well fruitful brain gives a better result in its work. The cognitive behavior, aptitude, rational thinking, analyzing power, practical behaviorism, wisdom, better understanding and a broad vision is developed when one who uses the library in productive way. Reading regularly balances the neurotransmitters that are responsible for the dynamics of comprehensive abilities that helps in developing these qualities.

A library provides a soulful ambience to the students, who find it difficult in studying in their places. This ambience also provides a place of interaction with the new people which gives an opportunity of exchange of new ideas and concepts.

Library also has a digital section that is comprise of computers, internet, digital resources, printing sections. These section offers students and faculties to access the outer world in context of interaction to the other institutes repositories. It helps students to learn and develop their multimedia skills, making their projects, researches and lot more.

Libraries offer a wide variety of choice. People who cannot subscribe magazines and newspapers can go to library and satisfy their urge for reading. Libraries are of great value to the aspirants of competitive examination. Since they require reading many books, journals and magazines, but cannot afford them. Libraries offer them all these things at one place. Even good books that costs Rupees 5,000 to Rupees 10,000 or even more which can't be affordable are available to the students and

faculties at no cost. Hence, a library plays a character of soul which cultivates and comprehend the knowledge to the entire college.

Librarian is the interface between reams of data and the untrained, but motivated user” and it is here where the importance of library rests, in what I call “sense making” — whether that be the “Seth Godin librarian”, or even the library architecture, which may act as an extension to what the librarian, patrons and fostered information yield.

Library is a dynamic center for idea interaction: As books evolve into and from the digital world, they are becoming ever more ubiquitous, where more users are able to grasp more information more quickly. With all of this information that is “everywhere”, there will, I believe, be greater need for “sense making” abilities that is, the ability to decipher, translate and teach information. It becomes about bringing information forward to make it relevant, understandable and usable. As such, the importance of library to you as an architect remains in your ability to design a space that is socially, intellectually and emotionally conducive to “sense making” for the public.

In a great library architecture, ideas may prosper while those that come into contact with them learn, carry them in their minds as memories and behaviors, and share or teach them to the rest of their community. The library is important because it affects cultures, it affects innovation and it affects individuals. Because of all this, library architecture has the responsibility to enhance these effects by providing a knowledge center that is inspirational and conducive to good communication and teaching interactions. Libraries are, in a certain sense, a microcosm of our world, where ideas propagate and cultures surround them, while at the same time libraries are also an extension of each individual that seeks knowledge, whether for amusement, practical need, inspiration or even to help them teach others.

A library can be considered a store house of knowledge. In dictionaries the word “library” has been defined as “a building or room containing a collection of books”. A library renders a great service to the society. There are a large number of Public Libraries maintained by the local authorities throughout the island. In view of the above facts it is apparent that a library is a very important place in the society. It is a gateway to knowledge and culture, libraries play a fundamental role in society. The resources and services they offer create opportunities for learning, support literacy and education, and help shape the new ideas and perspectives that are central to a creative and innovative society. They also help ensure an authentic record of knowledge created and

accumulated by past generations. In a world without libraries, it would be difficult to advance research and human knowledge or preserve the world's cumulative knowledge and heritage for future generations.

Libraries are keenly aware of the need to maintain the balance between protecting the rights of authors and safeguarding the wider public interest. They play an essential role in enabling the delivery of library services to the public and in achieving the copyright system's goals of encouraging creativity and learning. Libraries represent different things to different people – from a place where mothers can take toddlers to read their first stories and students can study, to a service allowing anyone to borrow a book, access the Internet or do research. Quite simply, libraries offer a means by which we can gain access to knowledge.

Supporting Education

Libraries are synonymous with education and offer countless learning opportunities that can fuel economic, social and cultural development. In addition to lending books, libraries are also involved in copying materials for research or private study purposes. The exceptions and limitations that are an integral part of many national copyright systems play a critically important role in enabling libraries to deliver such services. For example, they allow libraries to make copies on behalf of students and others for research or study purposes, of works that might not otherwise be directly accessible to them. Libraries also make interlibrary loans possible, providing local access to materials that normally reside in a library hundred, or even thousands, of miles away.

Preserving Cultural Heritage

Recognizing the cultural importance of sharing, Mahatma Gandhi said that, "no culture can live, if it attempts to be exclusive". The stimulus to share and reuse information and knowledge comes in many guises. Perhaps the most deep-rooted of our human instincts is the desire to preserve our culture for future generations. This is one of the most important functions of libraries.

Today, many works are only "born digital", such as websites or electronic journals, and are unavailable in print format. Without the legal means to preserve and replace works in a variety of media and formats including format shifting and migrating electronic content from obsolete storage formats many of these works will inevitably be lost to future generations of historians.

The Root Challenges

The challenges facing libraries are linked in large part to the fact that, while international copyright agreements guarantee exclusive rights for authors and other right holders. The interpretation of the exceptions and limitations that entities such as libraries depend on in order to provide their services is left to national parliaments. In sum, exceptions and limitations are national and optional, whereas the rights accruing to right holders are international and guaranteed.

In 2008, WIPO commissioned a study on Copyright Limitations and Exceptions for Libraries and Archives. The study found that statutes relating to library exceptions differ greatly from one country to another. Even where library exceptions to copyright laws do exist, however, they generally date from the pre-Internet age and now need to be updated and adapted to the digital environment. They also point to the need for a common approach to ensuring equitable access to knowledge, and to provide libraries with the legal means to preserve the unique cultural, artistic and scientific heritage of each country.

The Opportunities of Mass Digitization

The Internet has created tremendous opportunities in terms of accessing knowledge. Making the collections of the world's great libraries available to the public through large-scale digitization, however, has yet to be realized. While it is difficult to foresee the full implications of such an undertaking, the benefits promise to be widespread and powerful. One particularly moving example of the benefits of mass digitization comes from my own library, **the BASU Library**. A number of years ago, a digitized series of 20th century recordings from Uganda were put online. an art form that had all but disappeared. Today's citizens want access to information online, while libraries have some funds to digitize collections and put them on the web, the many challenges of clearing intellectual property (IP) rights in in-copyright materials (combined with the fact that copyright can reach back as far as the 1870s) means that libraries often prefer to digitize out of copyright material. This has led to what is referred to in the European Union as the "black hole of the 20th century."

Libraries have no desire to undermine vibrant markets, but evidence suggests that there is little market activity for many older in-copyright works. While large libraries, and indeed Google, have digitized parts of their out-of-copyright collections, legally digitizing copyright-protected materials on a large scale remains a pressing issue. Since 2005, the European Commission has sought ways to address these legal

complexities. While the 2012 Orphan Works Directive appears to be useful for the digitization of niche collections, it is still unclear when Commission activities will translate into effective legislation that will support the mass digitization of 20th century in-copyright works collections, of course, that are largely preserved in national libraries and museums at the expense of the tax payer.

Contract Law vs Copyright law

Despite its many benefits, the digital age has, unfortunately, caused an erosion of copyright law in that the act of using purchased digital content is no longer regulated by copyright law, but by contract law. Whereas national copyright laws strive to promote creativity by balancing the needs of creators with those of users, this is not expressly the case with contract law. Copyright laws are designed to foster innovation. They protect the investment of creators in the production of their work, while guaranteeing that others may use that work in support of innovation, competition and learning. Evidence suggests however that private systems of law, such as contract law, do not create this innovative synergy between creators and users but reflect instead a more static, one-sided relationship between content distributors and customers.

Despite this fundamental shift, policymakers globally have been slow to recognize that copyright law is increasingly peripheral to regulating access to copyrighted works. From the perspective of libraries, the issues are stark. Billions of euros are spent annually on purchasing electronic materials, but the uses that can be made of this purchased content are diminishing. Moreover, libraries are facing a situation equivalent to one in which, in the analogue world, every book on a shelf comes with a different contract allowing different things. How can access to knowledge be lawfully or practically managed in such a case?

CONCLUSION

Libraries play a key role in fostering literacy and learning, in creating the building blocks of development, and in safeguarding the world's cultural and scientific heritage. We need to act swiftly to ensure libraries can continue to deliver their services effectively, for the public good in all countries. Without a good library and information centre, it is highly impossible to ensure quality education and research.

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PUBLICATION PRODUCTIVITY OF SCIENTISTS OF ICAR- INDIAN INSTITUTE OF OILSEEDS RESEARCH: A SCIENTOMETRICS STUDY

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ABSTRACT

This paper presents a scientometric study of publication productivity of scientists of DOR for the period 1983 to 2006. The study analyses distribution of contributions, channels of communications, subject distributions, authorship pattern of contributors, growth of collaboration coefficient, prolific contributor, Tables of top 10 prolific contributors and top 10 journals have been prepared calculating first author analysis and dominance factor & journals preferred. The total 1204 papers have been contributed by the scientists, out of which 382 (31.73%) papers are published in conference proceedings and 432 (29.07%) in journals. 350 (29.07%) in signal authorship and 854 (70.93%) are found joint authored papers with collaboration coefficient 0.80.

1. INTRODUCTION

The (DOR) Oilseeds Research Institutions are national organizations under the aegis of the Crop Science Division of Indian Council of Agricultural Research, Deptt. of Agricultural Research Extension (DARE), Ministry of Agriculture and Cooperation, New Delhi. These Institutions have the responsibility to plan, coordinate and execute the research programmes to augment the production and productivity technology of oilseeds.

The oilseed research in India received a fillip with the establishment of All India Coordinated Research Project on Oilseeds (AICOPRO) in April 1967 based on the recommendations of a sub- committee appointed by the Government of India. It was the most significant event in the history of oilseeds research in India. In the beginning it had one project coordinator to coordinate and monitor the research programmes of groundnut, rapeseed –

mustard, sesame, linseed and castor operating at 32 research centers. Later on in 1972, safflower, sunflower, and niger were brought under the umbrella of the AICORPO and the number of research centers increased to 40. Realizing the need for national research institute in oilseeds, the AICORPO was elevated to the status of Directorate of Oilseeds Research on August 1, 1977 with a Project Director as its administrative head and seven Project Coordinators at different research centers for groundnut at Akola, rapeseed – mustard at Hisar sesame and niger at Jabalpur, sunflower at Bangalore, safflower at Sholapur, linseed at Kanpur and castor at Hyderabad. Besides DOR and the seven Project Coordinating Units, there were in all 62 operating centres during the V plan (1974-79), which increased to 98 operating centers in 16 states by the end of VI plan (1980-85). The DOR was also provided with responsibilities of National Communication and Training Centre on Oilseeds (NCTCO) during the VI Plan. Later the two crops *viz groundnut and rapeseed- mustard* were delinked from the DOR with the establishment of National Research Centers for Groundnut and Rapeseed-Mustard at Junagadh, (Gujarat) and Bharatpur, (Rajasthan) in the years 1979 and 1993 respectively, based on the recommendation of the Task Force. The AICORPO programme was confined to 61 centers in the VIII plan (1992-97). During IX plan (1997-2002), AICRP on Sesame, Niger and Linseed were also separated from the DOR as per recommendation of H.K. Jain Committee. At present, only Sunflower, Safflower and Castor crops are under the administrative control of DOR. Later on during February, 2015 DOR has been upgraded as Indian Institute of Oilseeds Research.

2. OBJECTIVES

The objectives of the present study are to quantify documents to find out the publication productivity behavior of scientists of Directorate of Oilseeds Research (DOR), Hyderabad (Telengana). It studies Distribution of contributions, Channels of communication, Subject distributions, Authorship pattern of contributors, Growth of collaboration coefficient, Prolific contributors, First author analysis and dominance factor, Journals preferred & bradford Law and Expenditure based analysis

3. METHODOLOGY

The statistical population consists of contributions of scientists made in various communication channels over the years of their services in the institute under study. For this purpose annual reports have been procured. Which publishes list of the publications of scientists as an official policy. The

scientists do report to the office for their own goodwill and insist inclusion of their works. After that lists prepared on it was sent to the institutes and scientists to check any mistake or omission. Beside, librarians of the institutes were also consulted before finalizing the list. A final list of publications has been prepared digitally. Index of publications is available separately in print & electronic form. The scope of the study is to find out publication activities in sunflower, safflower and castor crop only. Various statically methods have been applied to find out results.

4. SELECTION OF SOURCE DOCUMENTS

The first and foremost task is to select the source documents from which data is to be drawn. For this purpose annual reports and newsletters of the institute established under Indian Council of Agricultural Research since its establishment to the year 1977 have been selected as the source of documents.

The data has also been collected from annual reports, newsletters and websites of institutions under study. Personal contacts have made to update the data verification.

Data pertaining to a list of contribution of DOR/sunflower, safflower and castor scientists have been prepared with the help of annual reports. The study is based on production of research papers/ articles by the scientists of rapeseed –mustard research institutes, since its inception. Each entry consists of information about authors, title, name of the communication channels, year and pages. In the other words an index has been prepared created in standard format on the computer.

5. COLLECTION OF DATA

It is complete analysis of data from date of inception of the institute the year till 2011. The annual report for the year 1983 is yet to be published. In total 1204 research papers and articles have been reported. The period of 23 years has been divided in 4 blocks of five years each (1982-86, 1987-91, 1992-96, 1997-2001 and 2002-2006) to find out changing trend over each block period of time.

6. ANALYSIS

In this part analysis for DOR has been made from the data calculated. During 1977-1982 the DOR was only a coordinating centre for all 9 oil crops. Their was no research project undertaken by the directorate so no papers were published. Annual reports were also brought out since the year 1983, so their is no data for available the period 1977-82.

Table 1 DOR: Year Wise Distribution of Contributors and Communication Channels Used

Sl. No.	Year	Journals		Conferences/Symposiums/Seminars		In House publications	Newsletters		Books		Popular Articles	Others	Total	% Percentage
		Indian	Inter-national	Indian	International		Indian	Intl	Chapters	Edited				
	1983	1	--	--	--	--	--	--	--	--	1	-	2	0.17
	1984	1	--	--	--	--	--	--	1	--	--	-	2	0.17
	1985	4	--	--	--	--	--	--	1	--	2	-	7	0.58
	1986	1	--	--	--	--	--	--	--	--	--	-	1	0.08
	1987	2	--	--	--	--	--	--	--	--	1	-	3	0.25
	1988	--	--	--	--	--	--	--	4	--	1	-	5	0.42
	1989	4	--	--	--	--	--	--	--	--	--	-	4	0.34
	1990	10	--	--	--	--	-	-	1	--	1	-	12	1.00
	1991	8	--	--	--	--	1	--	--	--	1	-	10	0.84
	1992	8	2	--	--	--	--	--	--	--	--	-	10	0.84
	1993	6	6	3	6	1	1	1	-	-	1	-	25	2.08
	1994	4	4	13	4	2	1	2	4	1	-	-	35	2.91
	1995	12	-	10	-	-	-	1	6	-	1	-	30	2.49
	1996	16	6	10	6	6	-	2	3	-	5	-	54	4.49
	1997	8	7	9	7	3	-	2	25	-	9	-	70	5.82
	1998	9	11	19	11	3	-	2	4	-	6	-	65	5.40
	1999	19	7	9	7	-	1	5	4	2	6	-	60	4.98
	2000	29	5	42	5	2	-	2	4	1	13	25	127	10.55
	2001	16	5	25	5	-	1	2	3	1	19	-	77	6.40

Contd...

Sl. No.	Year	Journals		Conferences/Symposiums/Seminars		In House publications	Newsletters		Books		Popular Articles	Others	Total	% Perstage
		Indian	Inter-national	Indian	International		Indian	Intl	Chapters	Edited				
	2002	22	5	52	5	9	1	5	21	1	24	1	146	12.13
	2003	57	5	34	5	7	1	-	12	3	33	3	160	13.29
	2004	40	2	28	3	-	-	-	6	-	21	-	100	8.31
	2005	61	3	30	1	7	-	1	4	7	8	1	124	10.30
	2006	22	4	33	-	-	-	-	5	-	10	1	75	6.23
	Total	360	72	317	65	40	7	25	108	16	163	31	1204	100
	%	29.90	5.98	26.33	5.40	3.32	0.58	2.08	8.97	1.33	13.54	2.57	100	--

Note : Data not available during 1977 to 1982

6.1 Distribution of Contributions

The table 1 shows that during twenty four years (from 1983 to 2006), 1204 papers have been contributed by the scientists. It is observed that highest number of papers 160 (13.29%) have been contributed in the year 2003. In the year 1983, only 2 papers (0.17 %) have been contributed. On an average 50.17 papers have been contributed every year by the scientists of this institute.

6.2 Channels of Communication

The scientists have used various communication channels to publish their works. Table 1 also shows year wise distribution of contributions in various communication channels. In the beginning there was very little publication activity. In the first seven years (1983-89) there were only 13, contributions in journals & 11 contributions in book chapters & popular articles. There was no publication at international level. The highest 432 (35.88%) papers have been contributed in various journals out of which 360 (29.90%) are in Indian journals and 72 (5.98%) are in foreign journals. There are 382 (31.73%) contributions in conferences, symposiums & seminars out of which only 65 (5.40%) are in international conference. Thus study reveals that conferences are preferred than journals as communication channel. The contributions at international level, both in conferences. & journals are less. On the other hand only 163 (13.54%) papers have been published in popular media like newspapers & magazines followed by 116 (10.30%) contributions as a chapter in a book. In-house publications received only 40 (3.32%) papers. In newsletters only 32 (2.66%) papers have been contributed. Other forms such as websites, monographs souvenir etc. have been used only for 31 (2.57%) papers.

Table 2 shows five yearly distributions of contributions in various communication channels. The growth of publication in Vth block has doubled then IVth block. The contributions in journals have doubled, but it has declined for contributions at international level.

Table 2 DOR : Five Yearly Distribution of Contributions

Sr. No.	Name	1982-86	1987-91	1992-96	1997-01	2002-06	Total	%
		Block I	Block II	Block III	Block IV	Block V		
1.	Indian Journals	7	24	46	81	202	360	29.90
2.	Foreign Journals	-	-	18	35	19	72	5.98
3.	National Conferences / Seminars/ Symposiums	-	-	36	104	177	317	26.33
4.	International/Conferences / Seminars Symposiums	-	-	16	35	14	65	5.40
5.	In house publications	-	-	9	8	23	40	3.32
6.	Newsletters		1	8	14	9	32	2.66
7.	Book Chapter	2	5	13	40	48	108	8.97
8.	Edited Books	-	-	1	4	11	16	1.33
9.	Popular Articles	3	4	7	53	96	163	13.54
10.	Others	-	-	-	25	6	31	2.57
11.	Total	12	34	154	399	605	1204	100
12.	%	1.00	2.82	12.79	33.14	50.25	100	--

6.3 Subject Distribution

Table 3 shows subject analysis of contributions. The scientists of the institute have worked on various aspects of castor, safflower and sunflower crops. Agronomy tops the list with 183 (15.20%) papers followed by Entomology with 165 (13.70%) papers, Plant Breeding with 120 (9.97%) papers, Plant Pathology and Soil Science each with 115 (9.55%) papers and Genetics /Cytogenetics with 71 (5.90%) papers. Thus the table shows that its scientists have worked in most major areas of research. 122 (10.14) Out of 163 contribution are popular articles 36 papers (3.00%) are miscellaneous.

Table 3 DOR: Subject Analysis of Contributions

Sr. No.	Subject	1982-86	1987-91	1992-96	1997-01	2002-06	Total	%	Rank
1.	Agricultural Economics	-	-	3	5	13	21	1.74	11
2.	Agricultural Extension	4	5	6	20	16	51	4.24	8
3.	Agronomy	2	4	25	58	94	183	15.20	1
4.	Biochemistry	-	3	14	17	14	48	3.99	9
5.	Biotechnology	-	-	2	3	2	7	0.58	12
6.	Entomology	-	6	13	65	81	165	13.70	2
7.	General	1	3	10	22	50	86	7.14	-
8.	Genetics/Cytogenetics	-	2	11	26	32	71	5.90	5
9.	Germplasm	-	-	11	20	32	63	5.23	6
10.	Library & Information	-	-	1	2	-	3	0.25	13
11.	Microbiology	-	-	-	11	10	21	1.74	12
12.	Plant Breeding	2	4	15	34	65	120	9.97	3
13.	Plant Pathology	3	7	14	36	55	115	9.55	4
14.	Plant Physiology	-	-	5	19	29	53	4.40	7
15.	Seed Science/ Production	-	-	9	15	22	46	3.82	110
16.	Soil Science	-	-	7	41	67	115	9.55	4
17.	Miscellaneous	-	-	8	5	23	36	3.00	--
18	Total	12	34	154	399	605	1204	100	
	%	1.00	2.82	12.79	33.14	50.25	100	--	

6.4 Authorship Pattern

Table 4 studies authorship pattern of contributions. Most of the papers have been published by three or less authors. But there are as many as four to seven or even more authors in some papers. The table shows 364 (30.23%) papers with two authors and 253 (21.01%) papers with three authors. There are 136 (11.30%) papers with four authors, 67(5.56%) papers with five authors, 23 (1.91%) papers with six authors and 11(0.92%) papers with seven and more authors. It shows that there is multiple authorship trends among scientists of DOR. Only 350 (29.07%) papers are single author papers.

The table 4 also shows degree of collaboration during various blocks of period. The table reveals that percentage of multi authored papers increased gradually from Ist time blocks to another. Contrary percentage of single authored papers declines from 41.66% to 29.42% from Ist to last block. Contributions by 5 or more authors are still negligible.

$$Q = \frac{Nm}{Nm + NS}$$

Where,

C= degree of collaboration in a discipline.

Nm= number of multi authored research paper in the discipline published during a year, (Including double authored).

Ns = number of single authored research papers in the discipline pulished in the same year.

Table 4 DOR: Authorship Pattern of Contributions (All publication)

Sr. No.	Authors	Number of Communications					Total	Author ship
		Time Block I	Time Block II	Time Block III	Time Block IV	Time Block V		
		1982-86	1987-91	1992-96	1997-01	2002-06		
1.	Single/One	5 (41.66)	17 (50.00)	47(30.52)	103 (25.82)	178 (29.42)	350(29.07)	350
2.	Two	3 (25.00)	10 (29.41)	45(29.22)	13 6(34.00)	170 (28.10)	364(30.23)	728

Contd...

Sr. No.	Authors	Number of Communications					Total	Author ship
		Time Block I	Time Block II	Time Block III	Time Block IV	Time Block V		
		1982-86	1987-91	1992-96	1997-01	2002-06		
4.	Four	2 (16.67)	-	17(11.04)	39(9.77)	78 (12.89)	136(11.30)	544
5.	Five	-	1(2.94)	7(4.54)	20(5.01)	39(6.45)	67(5.56)	335
6.	Six	-	-	2(1.30)	12(3.01)	9(1.49)	23(1.91)	138
7.	Seven	-	-	-	3(0.75)	3(0.49)	6(0.50)	42
8.	Seven +	-	-	-	3 (8) (0.75)	1 (9) 1(15) (0.33)	5(0.42)	48
9.	Total	12 (100)	34 (100)	154 (100)	399 (100)	605 (100)	1204 (100)	2944
10.	%	1.00	2.82	12.79	33.14	50.25	100	--
11.	DC (Q)	0.583	0.500	0.695	0.742	0.706	0.709	0.881
	CI	2.856	2.529	2.925	3.020	3.101	3.037	-

6.5 Growth of Collaboration Coefficient

Table 5 shows year wise values of degree of collaboration. Only 350 papers (29.07%) have been contributed as single author. All other 854 papers (70.93%) have been contributed by two or more authors. The table reveals that collaboration coefficient has upward trend from with an average of 0.709 with an exception in the year's 1983, 1986 & 1989, where number of contributions is very little but all paper and multi authored papers.

Table 5 DOR: Year Wise Growth of Collaboration Co-efficient

Sl. No.	Year	Single Author Paper	Multi Authored Papers	Total	Cumulative	Collaboration Coefficient
1.	1983	-	2	2	2	1.000
2.	1984	1	1	2	4	0.500
3.	1985	3	4	7	11	0.571
4.	1986	-	1	1	12	1.000
5.	1987	1	2	3	15	0.667
6.	1988	3	2	5	20	0.400

Contd...

Sl. No.	Year	Single Author Paper	Multi Authored Papers	Total	Cumulative	Collaboration Coefficient
7.	1989	-	4	4	24	1.000
8.	1990	7	5	12	36	0.417
9.	1991	7	3	10	46	0.300
10.	1992	2	8	10	56	0.800
11.	1993	6	19	25	81	0.760
12.	1994	13	22	35	116	0.629
13.	1995	8	22	30	146	0.733
14.	1996	18	36	54	200	0.667
15.	1997	20	50	70	270	0.714
16.	1998	25	40	65	335	0.615
17.	1999	15	45	60	395	0.750
18.	2000	23	104	127	522	0.819
19.	2001	20	57	77	599	0.740
20.	2002	34	112	146	745	0.767
21.	2003	45	115	160	905	0.719
22.	2004	31	69	100	1005	0.690
23.	2005	51	73	124	1129	0.589
24.	2006	17	58	75	1204	0.773
	Total	350	854	1204	--	0.709
	%	29.07	70.93	100	--	--

6.6 Prolific Contributors

An attempt has been made to rank the authors by number of contributions & also scores obtained by equal weightage methods. Table 6 is in rank order according to total number of papers contributed by first 10 authors. In total there are 614 authors contributing 1204 papers of various authorships. An analysis of top ten contribution have been given here. D.M. Hegde has contributed 150 papers & ranks first, he scored 84.73 points. G. Nagraj follows with 98 papers scoring 65.28 points. B.N. Reddy, with 90 papers scored 52.21 and ranks third. C.V. Raghavaiah with 89 papers scoring 48.53 points ranks fourth. At the end M. Padmaiah with 86 papers scoring 44.70 points ranks tenth.

There are 45 authors only with more than 10 papers. Similarly there are 60 authors with 5-9 papers. 508 authors have contributed less than 5 papers. They are not listed in the table. The original ranks of many authors have changed after scores by equal weightage scoring method. These are shown in this table, e.g. 10th ranked Padmaiah 1st rank become V by scoring methods while 9th ranked Mulidharu went down to 13th in

this methods. Table also calculates collaborations coefficient of each author which is very high in most cases.

Table 6 DOR: Contributions of top ten authors with Authorship Patterns and Scores

Ranked	Ranked author	Authorship									
		Single	Two	Three	Four	Five	Six+	Total	Score	Ranks	Coeff.
1.	Hegde, DM	49	40	26	19	12	4	150	84.73	1	0.673
2.	Nagraj, G	45	27	16	2	5	3	98	65.28	2	0.541
3.	Reddy, BN	8	30	26	11	14	1	90	37.13	6	0.911
4.	Raghavaiah, CV	30	20	11	14	7	7	89	48.53	3	0.663
5.	Sujatha, M	15	45	15	9	--	2	86	44.70	4	0.825
6.	Ranganatha, ARG	8	22	31	9	5	4	79	32.48	9	0.899
7.	Sudhakara Babu, SN	6	39	14	8	7	2	76	33.52	7	0.921
8.	Basappa, H	20	26	8	11	6	-	71	39.59	5	0.859
9.	Murlidharudu, Y	5	23	15	7	7	8	65	24.60	13	0.923
10.	Padmaiah, M	21	13	9	6	5	6	60	32.97	8	0.650

6.7 First Author and Dominance Factor

In the table 7 dominance factors of 105 highly productive authors with five or more contributions have been calculated. The table in this paper periods data for first 10 authors The DF of ranges below 0.200- 0.641. It means these top ten contributors are not always dominant & have not published articles as first author in much of their contributors.

The Dominance factor formula has been developed by Prof. Sudhir Kumar . D.F. is proportion of number of multiauthored papers of an author as first authors (Nmf) in total number of multi authored papers of the author (Nm)which is

$$DF = \frac{Nmf}{Nmt}$$

Table 7 DOR: Dominance factor of top ten authors

Sl. No.	Name	Total Papers	Single Authored	Joint Authors	First Author	4 -2	Dominance Factor 5÷3
	Hegde, DM	150	49	101	105	056	0.554
	Nagraj, G	98	45	53	65	020	0.377
	Reddy, BN	90	8	52	46	038	0.463
	Raghavaiah, CV	89	30	59	57	027	0.457
	Sujatha, M	86	15	71	45	030	0.633
	Ranganatha, ARG	79	8	71	27	019	0.267
	Sudhakara Babu, SN	76	6	70	20	014	0.200
	Basappa, H	71	20	61	57	037	0.606
	Murlidharudu, Y	65	5	60	29	024	0.400
	Padmaiah, M	60	21	39	46	025	0.641

8.8 Journals Preferred

Table 8 lists journals used to communicate research findings by the scientists of DOR. The scientists have used 91 journals for the 432 contributions made in journals 45 journals received only one contribution each. 52% articles have been published only in 4 journals. Rest 48% articles have been published by 87 journals. The table provides list of 10 top journals which have received 279 articles which is 64.6% of total contributions made in journals. Journal of Oil Seeds Research ranks first in the list with 154 (35.65%) papers. It is followed by Helia with 26 (6.02%) papers.

1/3rd articles have been covered by 1 journal only, 2/3 articles by 13 journals and all articles 91 journals.

Table 8 DOR: List of top ten journals as communication channel

Sl. No.	Publication Titles	1982-86	1987-91	1992-96	1997-01	2002-06	Total	%
1.	Journal of Oilseeds Research	4	11	17	37	85	154	35.65
2.	Helia	-	-	3	7	16	26	6.02

Contd...

Sl. No.	Publication Titles	1982-86	1987-91	1992-96	1997-01	2002-06	Total	%
3.	Indian Journal of Agricultural Sc.	1	-	3	8	13	25	5.79
4.	Journal of Oil Technologists Association India	-	4	8	6	1	19	4.39
5.	Indian Journal of Plant Protection	-	-	1	1	14	16	3.70
6.	Indian Journal of Dryland Agriculture Res. & Development	-	-	-	8	4	12	2.78
7.	Indian Jr. of Plant Genetics Resources	-	-	3	5	1	9	2.08
8.	Annals of Agricultural Research	-	-	3	1	2	6	1.39
9.	Fertilizer News	-	-	-	3	3	6	1.39
10.	Journal of Research ANGRAU	-	-	-	-	6	6	1.39
11.	Total	5	15	38	76	145	279	

CONCLUSION

Institute of Oils Seeds is a major research institute under ICAR. The study reveals continuous growth of publication activity of the scientists. The study also reveals increasing trend of number of authorship. It is an era of collaborated research. The studies of top ten authors have helped in finding high profile contributors. The scientists have contributed papers in few selected journals.

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MAPPING OF “JOURNAL OF THE INDIAN SOCIETY OF SOIL SCIENCE”

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ABSTRACT

This paper attempts to highlights the quantitative assessment of status of the Journal by way of amazing the various feature of journal “Journal of the Indian Society of Soil Science.” During 2013 to 2017 total 211 articles published in journal.

Keywords: *Agriculture, Soil Science; Indian Society of Soil Science.*

1. INTRODUCTION

Mapping is an important research topic in the field of Scientometrics / Bibliometrics. It attempts to find representations of intellectual connections within the dynamically changing system of scientific knowledge. In other words, science mapping aims at displaying the structural and dynamic aspects of scientific research. The general workflow in a science mapping analysis has different steps: data retrieval, processing, network extraction, normalization, mapping, analysis and visualization, Cobo and others (2011). The “Journal of the Indian Society of Soil Science” is an Indian peer reviewed journal published quarterly that aims to provide a national communication medium for all those working in the agricultural field whether from scientists, researchers and students. First issue of the Journal of the Indian Society of Soil Science was published in **1953** since then this journal has been published uninterrupted. Never so far, even a single issue has either been missed or two issues combined as one. The Golden volume of the Journal (**Vol.50**) has been published.

2. OBJECTIVE OF THE STUDY

The main objective of the study is to analyze the contents of journal of “Journal of the Indian Society of Soil Science” and make the quantitative assessment of status of the Journal by way of analyzing the following features of Journal-

- To find out year- wise growth of publications,

- To find out the authorship and collaboration pattern in the publication,
- To find out the Degree of Collaboration of articles,
- To find out the most productive authors in the field.

3. SCOPE AND LIMITATION OF THE STUDY

Scope of the study is restricted to the “Journal of the Indian Society of Soil Science” published during 2013 to 2017. The papers presented in the journal are analyzed using content analysis technique.

The present study is limited to the total numbers of 211 papers published during 2013 to 2017.

4. ANALYSIS OF “JOURNAL OF THE INDIAN SOCIETY OF SOIL SCIENCE”

Analysis and finding of the study are outlined below

4.1 The year –wise distribution of articles

Table 1 Year-wise distribution of articles

S.No.	Year	Vol. No. & issue No.	No. of Articles	Percentage	Cumulative (%)
01	2013	61;4	35	16.58	16.58
02	2014	62;4	40	18.95	35.93
03	2015	63;4	50	23.69	59.22
04	2016	64;4	43	20.39	79.61
05	2017	65;5	43	20.39	100
5Years	5Volume	20Issues	211		

The year –wise distribution of 211 articles published from 2013-to 2017 in volumes containing 20 issues of journal is presented in table 1. It is seen that the number of articles published is highest in the year 2015 with 50 articles.

4.2 Year –wise distribution of Single vs. multi author’s

Year-wise distribution of single vs. multi author’s citation pattern of journal and the degree of collaboration is shown in Table 2.

Table 2 Year –wise distribution of single vs. multi author’s

S.No.	No. of Author	No. of Articles	Percentage	Cumulative (%)
01	One Author	08	3.79	3.79
02	Two Author	36	17.07	20.82
03	Three Author	55	26.07	46.89
04	Four Author	48	22.75	69.24
05	More than four authors	65	30.80	100
Total		211		

Authorship study reveals that multiple authorship pattern the highest position, followed by single author respectively. The multiples authorship articles which secure the highest positions account for 65 (30.80%) articles and two authorship contributions take the credit of having 36(17.07%) articles. Three author articles account for 55(26.07%) and four author articles account for 48(22.75%).One author articles account for 8(3.79%).

4.3 Degree of Collaboration

Degree of Collaboration as seen in journals articles is shown in Table 3.

Table 4 Degree of Collaboration as seen in journals articles

Year	Single Author	Percentage	Multi author Percentage	Total No.	Degree of Collaboration
2013	2	25	33 16.25	35	0.94
2014	1	12.5	39 19.21	40	0.97
2015	2	25	48 23.64	50	0.96
2016	2	25	43 21.18	45	0.95
2017	1	12.5	40 19.70	41	0.97
	8	100	203 100	211	0.95(Mean)

In the study of the degree of collaboration during the Overall 5 Years (2013-2017). When we calculate the year-wise degree of collaboration the results arise different.

The Table 4 represents the year –wise number of multi authored articles and their degree of the collaboration .In the study, the degree of collaboration of all years is almost same of the mean value as 0.95

4.4 Most Productive Author

An author is defined both as “the person who originates or gives existence to anything” and as “one who sets forth written statements” in the Oxford English Dictionary (Fowler 1988).

Table 5 Most productive author

S.No.	Name of the Author	No. of Publication	Rank
1	Gouranga Kar	06	1
2	Y.P.Singh	05	2
3	Y.V.Singh	04	3
4	K.Prabhavati	03	4
5	P.Patil	03	4
6	Rameshwar Singh	02	5
7	Muneshwar Singh	02	5
8	Sumanta Chatterjee	02	5
9	B.C.Verma	02	5
10	A.N.Deshpande	02	5
11	Abir Dey	02	5
12	Nirmalendu Basak	02	5
13	S.K.Singh	02	5
14	Authors publishing single paper	725	6
Total		762	

It can be observed from Table No.4.4 that, the most productive authors are **Gouranga Kar** who had the highest number (6) of the publication. One author with 5 publications, One Author with 4 publications. Two Authors with 3 publications, Eight Authors with 2 publications, and 762 Authors with single publication.

CONCLUSIONS

- The number of articles published is highest in the year 2015 with 50 articles.
- The multi authorship articles which secure the highest position account for 65 (30.80%) articles.

- The degree of collaboration of all years is almost same of the mean value as 0.95. The analysis shows that in the 5 years of period, the Multi author articles are highest and predominant on single authored.
- The most prolific author is Gouranga Kar who had the highest number (6) of the publication.

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USAGE OF CeRA CONSORTIUM AMONG THE USERS OF CHAUDHARY CHARAN SINGH HARYANA AGRICULTURAL UNIVERSITY (CCSHAU) LIBRARY, HISAR: A CASE STUDY

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ABSTARCT

The present study attempts to highlight the present status use of library consortia and its service among the users of Chaudhary Charan Singh Haryana Agricultural University Hisar. Information or data collected through questionnaire method. A total of 200 questionnaires were distributed among the random sample. Lastly, on the basis of the analysis and interpretation of data, the paper provides some important finding regarding the use and awareness of CeRA consortium and its benefits and services.

Keywords: *CeRA; Library Consortia; Consortia-Cera*

INTRODUCTION

Information explosion, evolution of multi disciplinary subject areas and ever increasing cost of library resources have changed the way of developing library collection. Libraries today are facing unprecedented challenges not only to provide customer responsive services, but to do so in the face of constant change. Modern libraries are facing such circumstances where it is not just enough to what you own in your library, but equally important is, what your library is able to provide access to. Acquiring all the materials and providing access to all the information as to meet the needs of the users is a great challenge. To meet the demand of the users at less cost, libraries are collaborating with each other. The cooperation among the libraries to get access of maximum required has given the birth of consortia

WHAT IS CONSORTIUM?

According to online free dictionary (2013) an association or a combination, as of business, financial institution, or investors, for the

purpose of engaging in a, joint venture. Or a cooperative arrangement among group of institution: a library consortium.

A consortium can be defined as a strategic alliance of institutes having common interests. The main aim of a consortium is to achieve what members of the group can achieve individually at a relatively low cost **(Rangandham et al, 2013)**.

LIBRARY CONSORTIA

Library consortia will become even more important in the future by assisting libraries in implementing and managing the process of change. The most successful consortia in the next century will help libraries predict their emerging needs and help them work through the process of change to develop strong programs and services in a way that fosters experimentation, risk-taking and creativity (Hirshon, 1999)

Co-operation, Inter Library Loan and Resources Sharing among libraries play significant role in providing effective services by reducing costs. All types of libraries are not capable of acquiring every publication and providing it to the users on demand. Recent developments in ICT have led to change in way of library cooperation. Now it is called library consortium. A lot of efforts have been taken in past few years to overcome the financial problems through consortia. Library consortium is a group of two or more libraries which have agreed to co-operate with one another in order to fulfill certain similar needs, usually resource sharing. It usually, refers to co-operation, co-ordination and collaboration between and amongst, libraries for the purpose of sharing information” **(Bajpai, et.al, 2009)**.

OBJECTIVES OF THE STUDY

1. To identify the awareness regarding CeRA consortium;
2. To measure the frequency of use CeRA consortium;
3. To find out the purpose of use consortium;
4. To identify the place of accessing the consortium;
5. To identify the problems faced by the students;
6. To ascertain the need for training in accessing CeRA consortia.

RESEARCH METHOD FOLLOWED IN CASE STUDY

Research is an intellectual act that begins with the asking of question and progress through the critical examination of evidence that is both relevant and reliable. At present the study is intended to collect and analyses the response of certain sample of a population, the survey method was considered appropriate and used for the study.

DATA COLLECTION

The user's questionnaire (Appendix: I) was also administered personally by visiting the Chaudhary Charan Singh Haryana Agricultural University, Hisar. The direct method of data collection was used with a view to maximize response and avoid ambiguity, if any at the time of filling in the questionnaire.

TOOL USED

In order to achieve the desired objective one questionnaire was prepared to know the use of CeRA Consortium by the users of Chaudhary Charan Singh Haryana Agricultural University, Hisar. As the nature of the study required collection of data from a large population spread over the Chaudhary Charan Singh Haryana Agricultural University, Hisar, it was decided to use questionnaire for data collection purpose.

STATEMENT OF THE PROBLEM

Haryana Agricultural University, Hisar offers UG and PG level courses in various disciplines. Besides teaching schedule, a reasonable well-equipped library is also maintained to support teaching learning process and research activities. The presents study is conducted to understand the usage of CeRA Consortium in different discipline of Agriculture University, Hisar.

DATA ANALYSIS AND INTERPRETATION

This chapter contains analysis of data collected through the questionnaires from the Undergraduate students of Haryana Agricultural University, Hisar. Response of the study is analyzed with reference to these categories. Fig. No.1 shows the response of the users of different subjects.

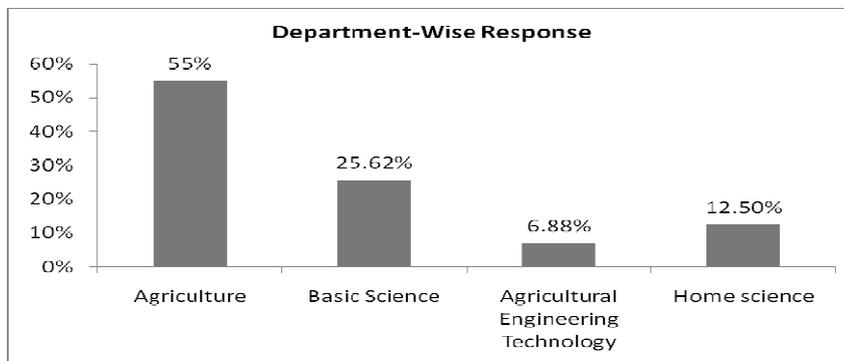


Fig. 1

The above Figure No. 1 shows the department wise response of the users. The highest response with 55% was received from the department of Agriculture followed by 25.62% of Basic Sciences. Only 12.5% response of Home Science and 6.88% of Agricultural Engineering & Technology were received

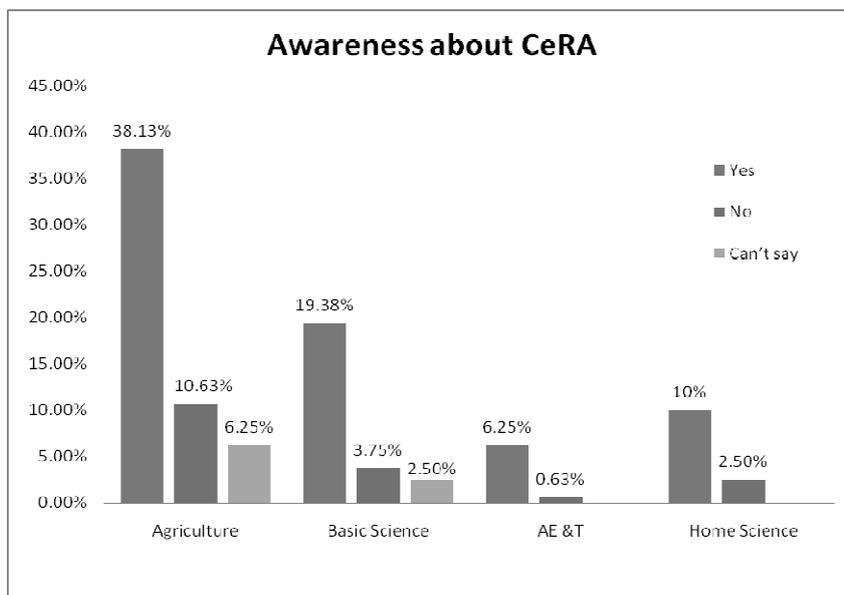


Fig. 2

Above figure reveals about the awareness about the CeRA consortium used by the respondents of HAU, Hisar. The majority of the respondents i.e. 38.13% of Agriculture and 19.38% of Basic Science were aware

about CeRA consortium. Only 2.5% respondents Home Science and 0.63% respondents of Agriculture Engineering & Technology do not know how to use the use CeRA consortium.

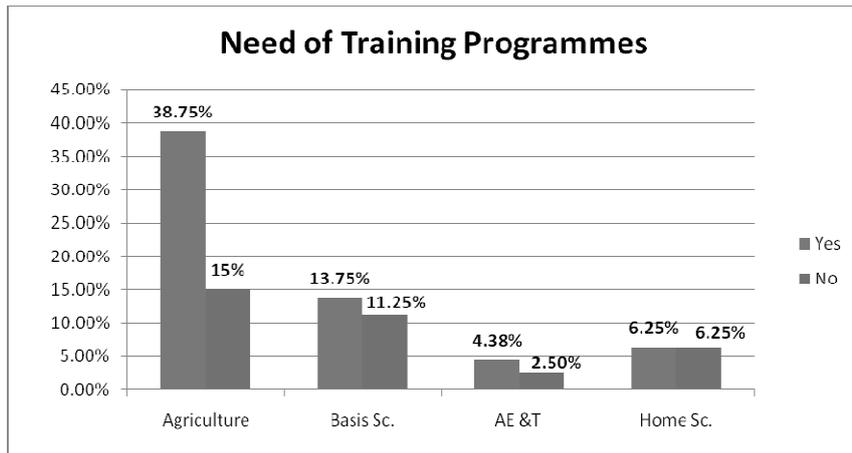


Fig. 3

The above figure 3 reveals about the need of training programmes while using of CeRA consortium for the respondents. 40.62% respondents of Agriculture and 13.75% of Basic Science opined that they need of training programmes in using of CeRA consortium. Only 6.25% respondents of Home Science and 2.5% of Agricultural Engineering & Technology opined that they need no training programmes in using of CeRA consortium.

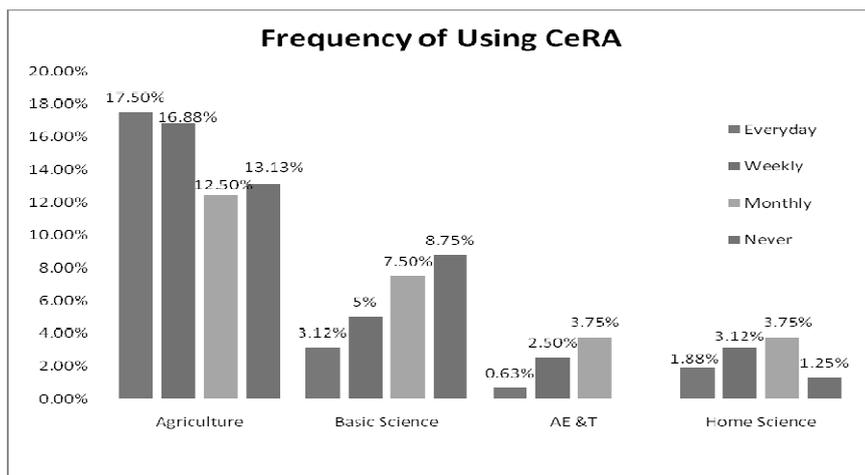


Fig. 4

The above Figure 4 shows the frequency of use the CeRA consortium by the respondents of HAU, Hisar. Maximum of the respondents of agriculture with 17.5% use CeRA everyday and 16.88% on weekly basis. CeRA consortium was used on everyday basis by the least of the respondents of all the departments.

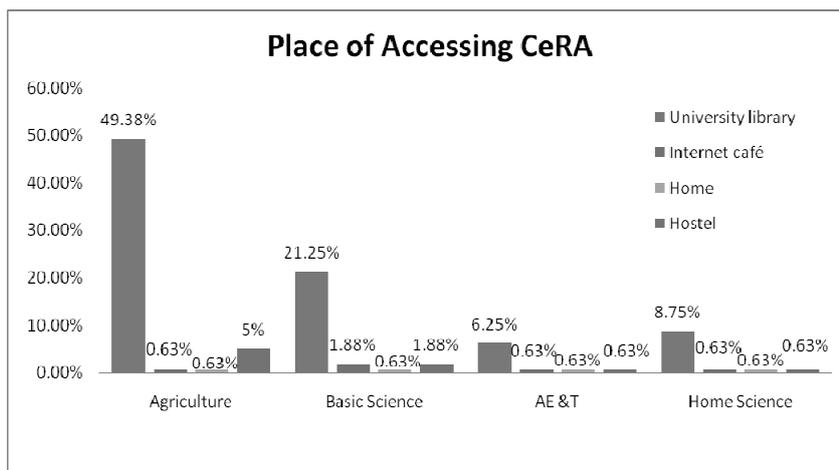


Fig. 5

The above Fig. No. 5 deals with the place of accessing CeRA consortium by the respondents. The highest number of the respondents i.e. 49.38% of Agriculture and 21.25% of the Basic Science accessing CeRA at university library. Only 0.63% of the respondents of all the Departments access the CeRa consortium at hostel.

MAJOR FINDINGS

Majority of the users of Agriculture i.e. 29.38% and 27.5% were aware about Internet/web-based Resources and 27.5% e-journals, respectively. The respondents i.e. 38.13% of Agriculture and 19.38% of Basic Science were aware about CeRa consortium. 20.63% of Agriculture respondents using the CeRA consortium for the purpose of updating knowledge and for the research work. The majority of respondents with 20.63% and 12.5% of Agriculture and Basic Science faced problem of low speed of Internet.

CONCLUSION

CeRA is a much helpful in fulfilling users information needs. Almost users aware about how to use CeRA consortium. But due to slow speed

of internet they cannot use e-resource properly through CeRA consortia. Its necessary for the university to upgrade the bandwidth of the internet as well as strengthen the hardware and network infrastructure.

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APPENDIX I

PART-1

General Information

- 1.1 Name: Mr./ Ms./ Mrs.....
- 1.2 (Gender) Male Female
- 1.3 Age (in years) >20-25 26-30
31-35 <36
- 1.4 Your Department

PART - 2

Usage of CeRA Consortium

- 2.1 How often do you visit the library?
- Daily Weekly
- Monthly Never
- 2.2 How often do use the internet?
- Daily Rarely
- Once a fortnight Once a month
- 2.3 Are you familiar about using IT tools?
- Familiar Moderately familiar
- Not familiar
- 2.4 Most preferred format to download (Multiple Ans. Permitted)
- Word.Doc PDF HTML

2.5 Which Search engine do you use frequently?Google.com Yahoo.com Excite.com Altavista.com **2.6 Awareness of various types of Electronic Resources (Multiple Ans. Permitted)**E - Journals E – Books E – Thesis OPAC Internet / Web-based Resources **2.7 Use of digital information resources**Internet Based Resources CD ROM Databases Online Journals E- Books **2.8 Are you aware about using CeRA?**Yes No Can't say **2.9 Frequency of Access and Use of CeRA Resources?**Every Day Weekly Monthly Never **2.10 Where are you accessing CeRA?**University Library Internet Café Home Hostel **2.11 What is your adequacy of CeRA?**Adequate Sometime Adequate Mostly Adequate Never Adequate

2.12 Which Agricultural CD-ROM/Online Databases preferred more for Research/ Assignment Works (Multiple Ans. Permitted)

- CABI Abstracts AGRIS
- AGRICOLA FSTA
- Biological Abstracts Indian Science Abstract

2.13 Methods of learning access and use of CeRA you have preferred? (Multiple Ans. Permitted)

- Through University/Library Website
- Through faculty members
- Through colleagues
- Through friends
- Through computer staff

2.14 What are your purposes of using CeRA? (Multiple Ans. Permitted)

- For updating knowledge
- For Writing paper and presenting paper
- For doing research work
- For Writing assignment

2.15 Use of Publishers when you using CeRA? (Multiple Ans. Permitted)

- American Society of Agronomy Annual Reviews Inc.
- CSIRO Publishing Elsevier Science
- Indian Journals.com John Wiley and Sons,
- Inc.

OxfordUniversity Press Springer –Verlag

Taylor and Francis Ltd. Any other please
specify.....

**2.16 Satisfaction with the Infrastructure to Support
Accessing Electronic Resources in the
Institute/Library**

Highly Satisfied Satisfied

Sometime Satisfied Never Satisfied

2.17 Usefulness of e-Journals in CeRA?

Highly useful Useful

Less useful Not useful

2.18 Article Receipt over Document Delivery System?

Almost Rarely

Sometime Never

2.19 Rating of CeRA for academic purpose:

Excellent Very good

Good Unsatisfactory

2.20 Do you need training programme?

Yes No

**2.21 Which Problems do you face in accessing and using
CeRA? (Multiple Ans. Permitted)**

Useful essential resources not available

Library staff is unwilling for service

- Low speed of internet
- Lack of time
- Abstracting and statistics not available
- Lack of knowledge in using the CeRA
- Slow response of requested articles
- Difficulty in Finding Relevant Information
- Lack of Computers

**2.22 Suggestions to improve the use of CeRA?
(Multiple Ans. Permitted)**

- More number of computer in latest configuration
- Faster internet access
- E-resources downloading and printing facilities
- Efficient and effective campus network
- Wireless network facilities in the campus
- Increase time period for internet use
- Frequent training facilities for end user

2.23 Please give any comments, if you have:

.....

.....

.....

(Signature)

**COMPARATIVE STUDY OF THE USE OF CeRA
(CONSORTIUM FOR e-RESOURCES IN
AGRICULTURE) BY THE POST-GRADUATE
STUDENTS OF CSKHP KRISHI
VISHVAVIDYALAYA , PALAMPUR AND
DR. YS PARMAR UNIVERSITY OF
HORTICULTURE AND FORESTRY, SOLAN**

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ABSTRACT

Consortium for e-Resources in Agriculture (CeRA) provides access to about 3,900 + scholarly journals in the field of Agriculture and allied subjects including almost 78 journals in Horticulture science and 42 Journals in Forestry Science. This article compare the assessing the utilization of CeRA by Post-Graduate students of of CSKHP Krishi Vishvavidyalaya , Palampur and Dr YS Parmar University of Horticulture and Forestry, Solan The data was collected via questionnaire from both the university. The factors assessed are user awareness of CeRA, purpose of use, sources of information about consortium, search strategies used to access articles, users' opinion about usefulness of consortium, and problems faced by them in using CeRA.

Keywords: *CeRA, consortium, e-resources, resources sharing*

INTRODUCTION

With the advances in information and communication technologies the libraries are now changing to digital libraries. It has changed the nature of delivery of library resources and services. The information communication technology led initiatives in the format electronic

resources, portal/gateway and global digital library. Today all type of libraries are providing printed, electronic as well as other internet resources like a e-books and e-journals for fulfilling the academic and research requirements as the library users. In the modern libraries, resources are becoming more and more important. The published materials are also available in electronic forms. With the explosion of knowledge, multidisciplinary research, escalation of cost of foreign journals and financial crunch lead libraries to opt for resource sharing. The universities and institutions have started utilizing the resources amongst themselves via resource sharing over the network available under various criteria.

DEFINITION OF CONSORTIA

A **consortium** is an association of two or more individuals, companies, organizations or governments (or any combination of these entities) with the objective of participating in a common activity or pooling their resources for achieving a common goal. *Consortium* is a Latin word, meaning "partnership", "association" or "society" and derives from *consors* 'partner', itself from *con-* 'together' and *sors* 'fate', meaning *owner of means* or *comrade*.

Library Consortia

In the 21st Century there is much more need for library consortia. Library consortia consist of number of libraries preferably by some common features by subject institutional affiliation, unit of libraries with common interest and objectives for certain jobs collectively. The consortia for library can be considered in 2030 as major step towards library cooperation in sharing electronic resources. Some important library consortia are :

- CeRA
- Sodhganga and Sodhgangotri a repository of Indian electronic theses and dissertation and repository of research in progress.
- E-Granth – Agricat-Krishi Kosh

CeRA (Consortium for e-Resources in Agriculture)

An agriculture library is the special library to renders service to scientists, teachers and farmers in agriculture. Agriculture libraries have been procuring journals and literature in aid of science and technology. An advancement of web technology and rapid growth of internet facilities, almost all reputed journals are available on-line and can easily be

accessed over the network. This advancement of ICT and easy accessibility has made the libraries to opt for consortium of e-journals to get maximum use of journals to large numbers user with maximum budget. Since Indian Council of Agriculture Research (ICAR) is having net work connectivity across institutes and state agriculture universities, it has taken a major initiative through World Bank funded project NAIP (National Agricultural innovation Project) to form an e-journal consortia named as CERA (Consortium for e-resources for agriculture) under the consortia for all the state Agriculture Research Institute (IARI) Delhi in November 2007. Duration of Project is five years, from 2007-8 to 2011-12. It facilitate the accessibility of scientific journals to all researches/teachers in the National Agriculture research system by providing access to information especially through on line journals.

OBJECTIVES OF THE STUDY

The survey was conducted with the following objectives in mind:

1. To compare the students awareness and utilization of CeRA at CSKHPKV, Palampur and
2. YSPUHF, Solan
3. To compare the students reasons for using the consortium CSKHPKV, Palampur and
4. YSPUHF, Solan
5. To compare the various search strategies used by students of CSKHPKV, Palampur and
6. YSPUHF, Solan and access articles from CeRA.
7. To compare the students opinion about the usefulness of the consortium.
8. To compare the problems faced by students in accessing CeRA.

SCOPE AND LIMITATION

The study is based on the user behaviour and the pattern of the utilization of information resources(CeRA) by the PG, Ph.D students of College of Home Science, College of Agriculture, College of Basic Science and College of Animal Science of CSKHPKV, Palampur and PG, PhD and MBA students of college of Horticulture and College of Forestry of DYPUHF, Solan. The scope of the study is limited to the digital resources mainly available through CeRA

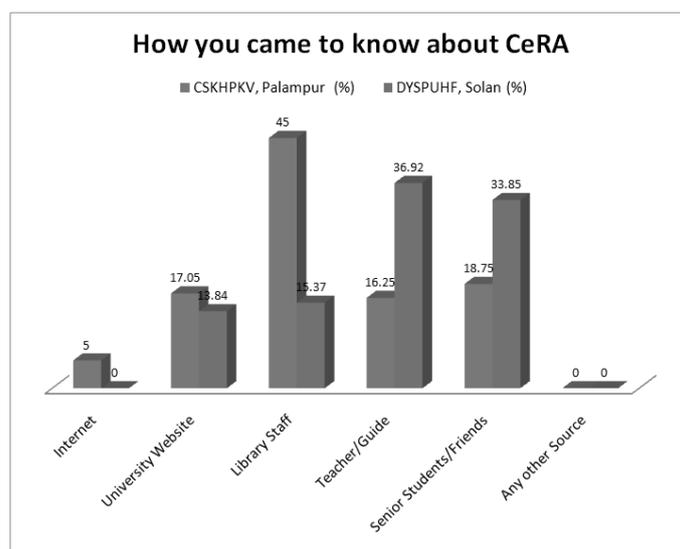
METHODOLOGY ADOPTED

The present paper is based on the questionnaire which was prepared and distributed both the universities among the PG, Ph.D and MBA students of UHF Sola and The PG, Ph.D students of CSKHPKV, Palampur. The 80 copies of the questionnaire were distributed randomly among the students at CSKHPKV, Palampur and 65 copies of the questionnaire were personally distributed to the sample population at YSPUHF, Solan. The completed questionnaires were personally collected from the students. The complete and relevant questionnaire were tabulated and analyzed for the result and discussion.

DATA ANALYSIS

Table 1 How you came to know about CeRA

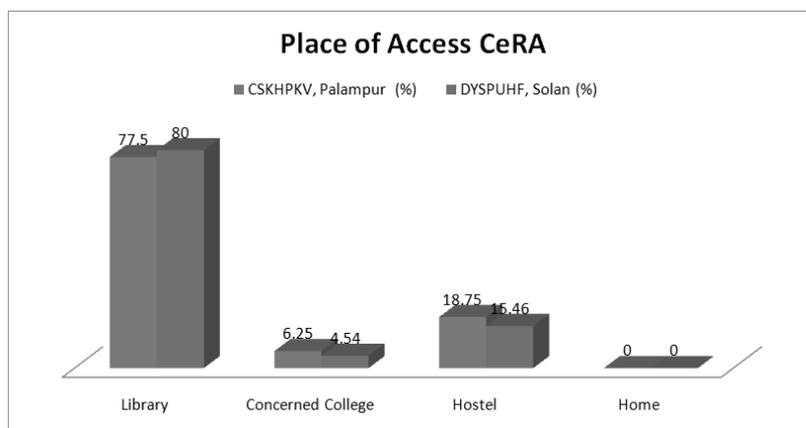
S.No.	Source	CSKHPKV, Palampur (%)	DYSPUHF, Solan (%)
1	Internet	5.00	0.00
2	University Website	17.05	13.84
3	Library Staff	45.00	15.37
4	Teacher/Guide	16.25	36.92
5	Senior Students/Friends	18.75	33.85
6	Any other Source	0.00	0.00



Inference: Table shows that maximum 45% students of CSKHPKV, Palampur came to know about CeRa from library staff where as maximum DYSPUHF 36.92% students came to know about CeRA through their Teacher/Guide.

Table 2 Place of Access CeRA

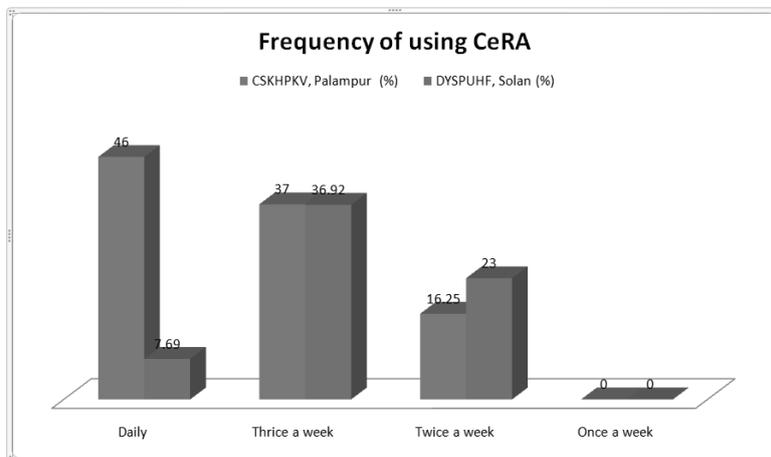
S.No.	Assessing Point	CSKHPKV, Palampur (%)	DYSPUHF, Solan (%)
1	Library	77.50	80.00
2	Concerned College	6.25	4.54
3	Hostel	18.75	15.46
4	Home	0.00	0.00



Inference: Bothe the university maximum students access the CeRA at library. CSKHPKV, Palampur 77.5% students and DYSPUHF, Solan 80%. students

Table 3 Frequency of using CeRA

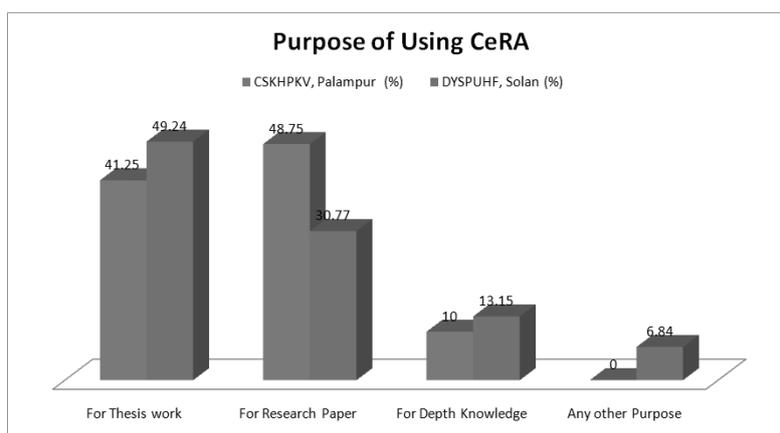
S.No.	Frequency	CSKHPKV, Palampur (%)	DYSPUHF, Solan (%)
1	Daily	46.00	7.69
2	Thrice a week	37.00	36.92
3	Twice a week	16.25	23.00
4	Once a week	0.00	0.00



Inference: Table shows that 46% students of CSKHPKV, Palampur Students access CeRA daily where as DYSPUHF, Solan only 7.69% students access CeRA daily. The use of CeRA thrice a week is almost same.

Table 4 Purpose of Using CeRA

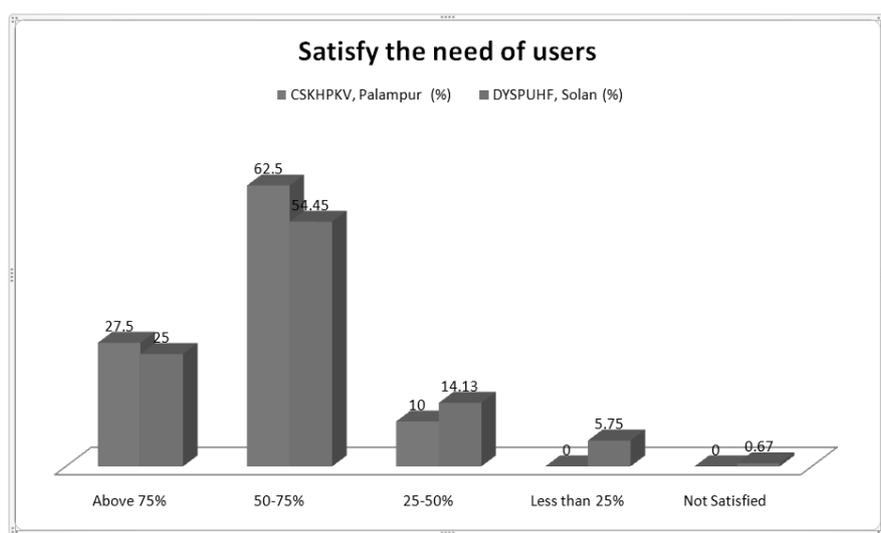
S.No.	Purpose	CSKHPKV, Palampur (%)	DYSPUHF, Solan (%)
1	For Thesis work	41.25	49.24
2	For Research Paper	48.75	30.77
3	For Depth Knowledge	10.00	13.15
4	Any other Purpose	0.00	6.84



Inference: Table reveals that both the university students mostly use CeRA for their thesis work and for research paper work.

Table 5 Satisfy the need of users

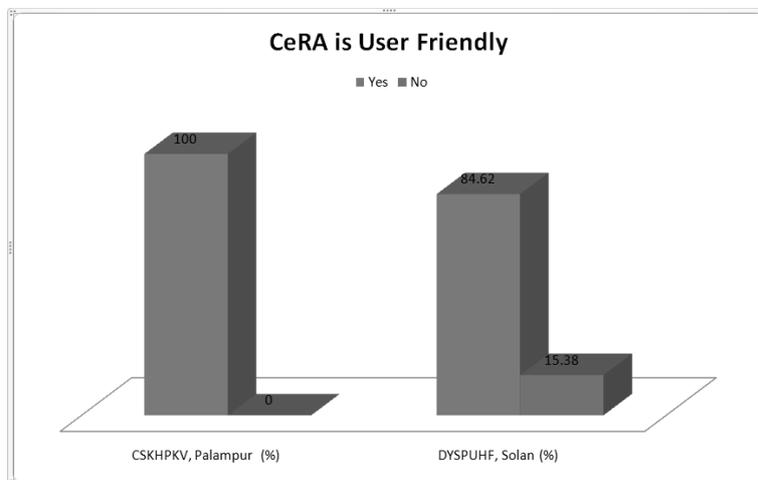
S.No.	Satisfaction level	CSKHPKV, Palampur (%)	DYSPUHF, Solan (%)
1	Above 75%	27.50	25.00
2	50-75%	62.5	54.45
3	25-50%	10.00	14.13
4	Less than 25%	0.00	5.75
5	Not Satisfied	0.00	0.67



Inference: Table shows that CeRA satisfy the information need of both the universities students is almost same.

Table 6 CeRA is User Friendly

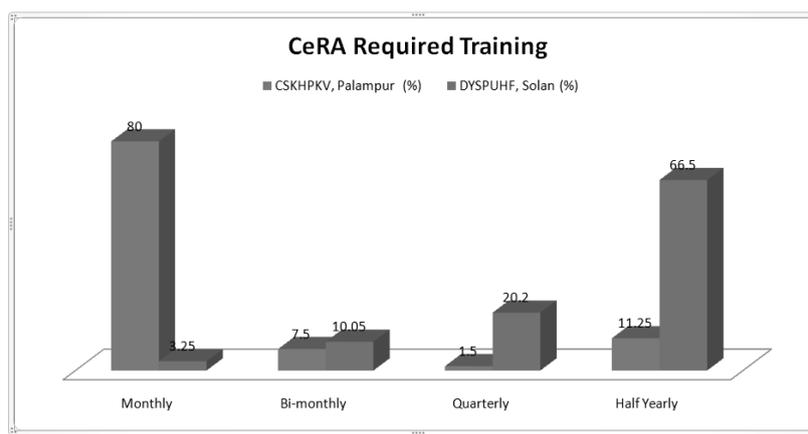
S.No.	User Friendly	CSKHPKV, Palampur (%)	DYSPUHF, Solan (%)
1	Yes	100	84.62
2	No	0.00	15.38



Inference: Students of both the university feels the CeRA is user friendly.

Table 7 CeRA Required Training

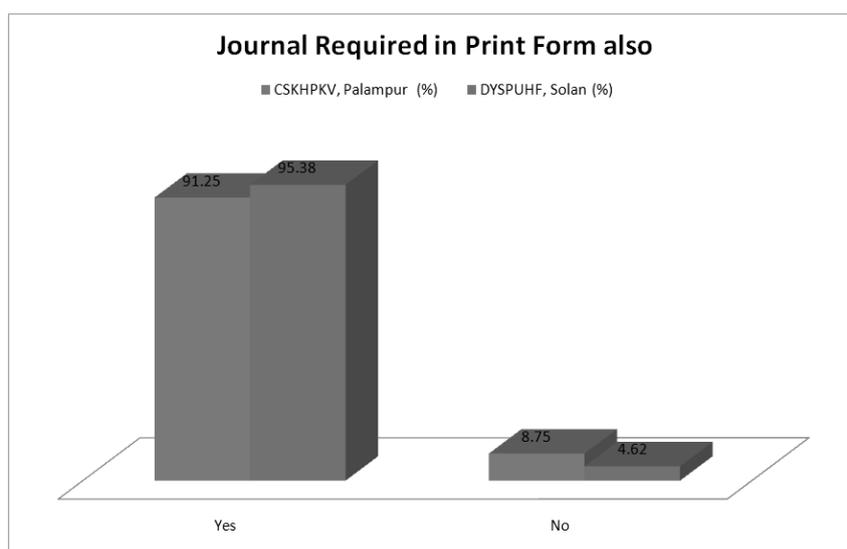
S.No.	Required Training	CSKHPKV, Palampur (%)	DYSPUHF, Solan (%)
1	Monthly	80.00	3.25
2	Bi-monthly	7.50	10.05
3	Quarterly	1.50	20.20
4	Half Yearly	11.25	66.50



Inference: Table shows that the 80% students of CSKHPKV, Palampur students require training on CeRA every month where as maximum 66.5% students of DYSPUHF, Solan need training on CeRA half yearly.

Table 8 Journal covered under CeRA required in print form also

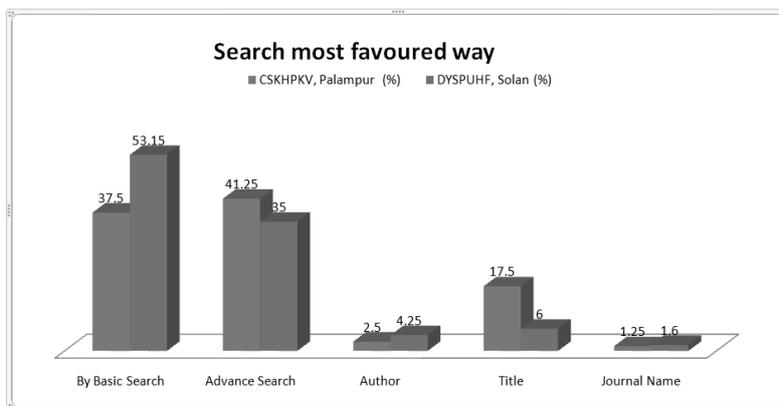
S.No.		CSKHPKV, Palampur (%)	DYSPUHF, Solan (%)
1	Yes	91.25	95.38
2	No	08.75	4.62



Inference: Table indicates that almost all the students of both universities need the print format of the journals also.

Table 9 Search your information in most favored way in CeRA

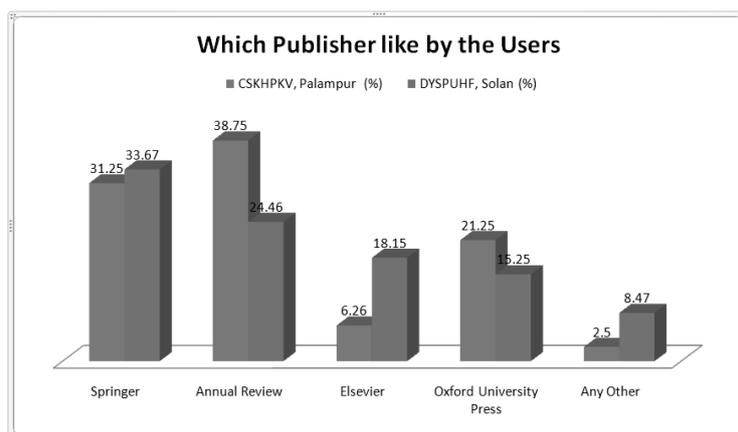
S.No.		CSKHPKV, Palampur (%)	DYSPUHF, Solan (%)
1	By Basic Search	37.5	53.15
2	Advance Search	41.25	35.00
3	Author	2.5	4.25
4	Title	17.5	6.00
5	Journal Name	1.25	1.60



Inference: Table shows that maximum 41.25% students of CSKHPKV, Palampur use advance search where as maximum 53.15% students of DYSPUHF, Solan use basic search of getting the information from CeRA.

Table 10 Which Publisher liked by the Users

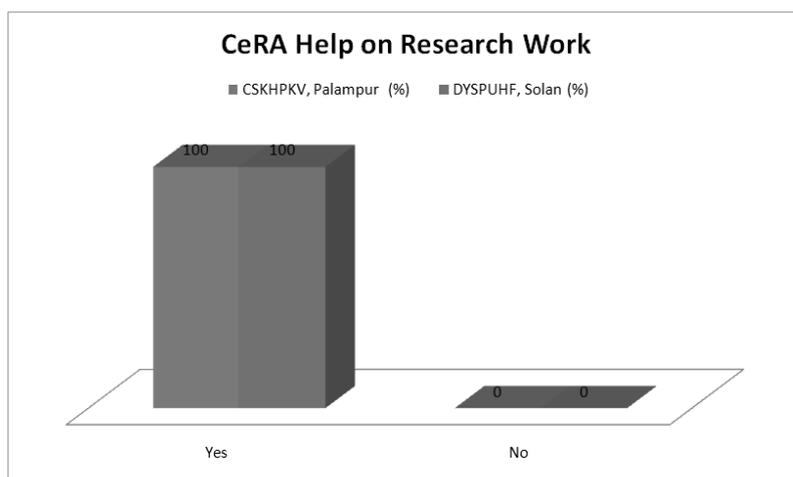
S.No.	Publisher	CSKHPKV, Palampur (%)	DYSPUHF, Solan (%)
1	Springer	31.25	33.67
2	Annual Review	38.75	24.46
3	Elsevier	6.26	18.15
4	Oxford University Press	21.25	15.25
5	Any Other	2.50	8.47



Inference: Table shows that Annual Review is the most favorite publisher for CSKHPKV, Palampur and Springer is the favorite publisher for DYSPUHF, Solan.

Table 11 CeRA Help on Research Work

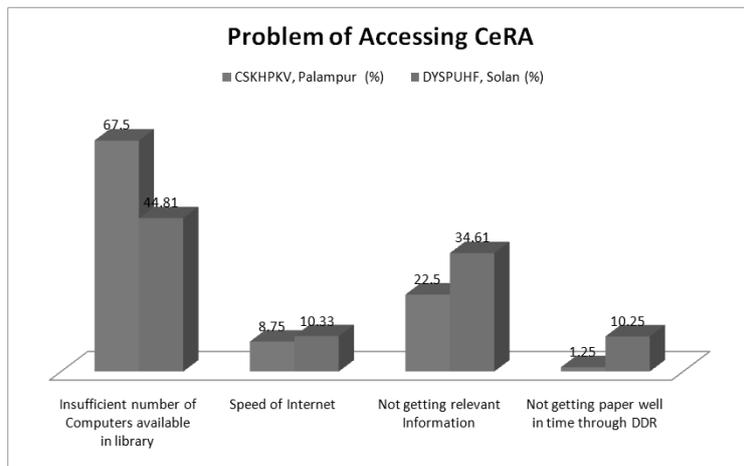
S.No.		CSKHPKV, Palampur (%)	DYSPUHF, Solan (%)
1	Yes	100.00	100.00
2	No	0.00	0.00



Inference: Table shows that both the universities 100% students say that CeRA help on their research work.

Table 12 Problem of Accessing CeRA

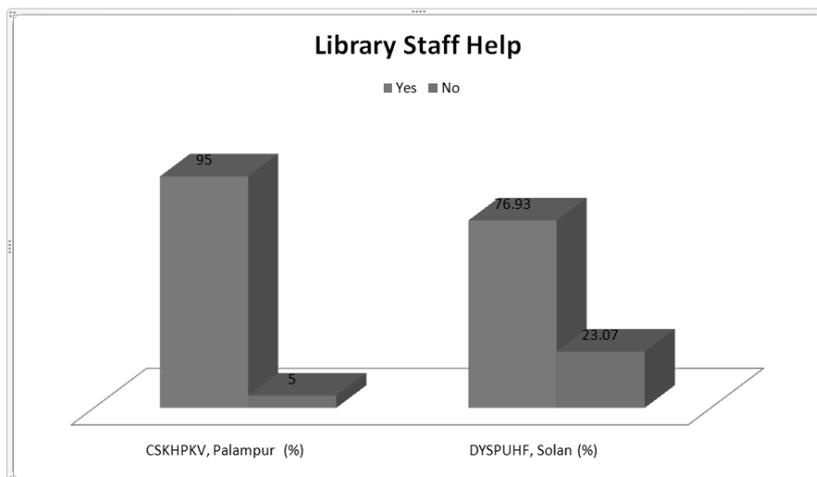
S.No.	Problem	CSKHPKV, Palampur (%)	DYSPUHF, Solan (%)
1	Insufficient number of Computers available in library	67.50	44.81
2	Speed of Internet	8.75	10.33
3	Not getting relevant Information	22.50	34.61
4	Not getting paper well in time through DDR	1.25	10.25



Inference: Table reveals that maximum students of both the university indicated that the main problem of accessing CeRA is insufficient number of computers in the library.

Table 13 Library Staff help to get information from CeRA

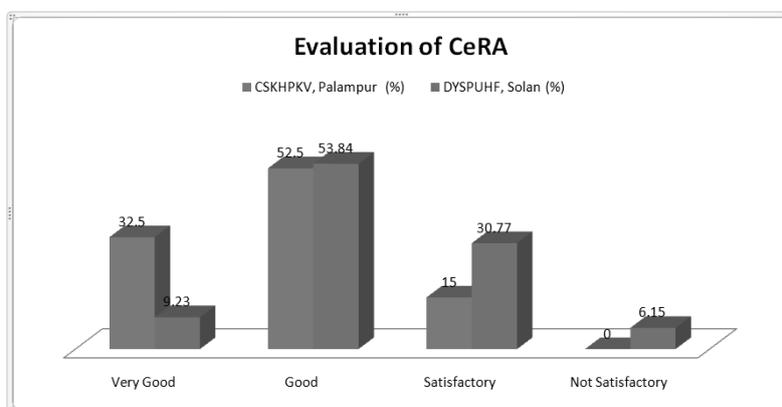
S.No.	Library Staff help	CSKHPKV, Palampur (%)	DYSPUHF, Solan (%)
1	Yes	95.00	76.93
2	No	5.00	23.07



Inference: Maximum students of both the university says that the library staff help the students for getting the information from the CeRA.

Table 14 Evaluation of CeRA

S.No.		CSKHPKV, Palampur (%)	DYSPUHF, Solan (%)
1	Very Good	32.50	9.23
2	Good	52.50	53.84
3	Satisfactory	15.00	30.77
4	Not Satisfactory	0.00	6.15



Inference: Students of both the universities, evaluated CeRA as good.

RESULTS AND FINDINGS

- The mostly students of CSKHPKV, Palampur came to know about CeRA from library staff where as DYSPUHF, Solan students came to know from their Teacher/Guide.
- Library is most favourable place for accessing CeRA for both the universities students.
- The most of the students of CSKHPKV, Palampur access CeRA daily where as most of the students DYSPUHF, Solan access CeRA thrice a week.
- Most of the students of both the university access CeRA for their thesis work and for research paper work.
- CeRA satisfy 50-75% of information need for both the universities students.

- Students of both the university feels that CeRA is user friendly.
- Mostly students of CSKHPKV, Palampur students require training on CeRA every month where as maximum most of students of DYSPUHF, Solan need training on CeRA half yearly.
- Indicate that almost all the students of both universities need the print format of the journals also.
- Almost all the students of both universities need the e-journals as well as print format of the journals also.
- Maximum students of CSKHPKV, Palampur use advance search where as maximum students of DYSPUHF, Solan use basic search of getting the information from CeRA.
- Annual Review is the most favorite publisher for CSKHPKV, Palampur and Springer is the favorite publisher for DYSPUHF, Solan.
- Both the universities students say that CeRA help on their research work.
- Students of both the university indicated that the main problem of accessing CeRA is insufficient number of computers in the library.
- Students of both the university says that the library staf help the students for getting the information from the CeRA.
- Students of both the universities evaluated CeRA as good.

CONCLUSION

CeRA is marvellous effort on the part of Indian Council of Agricultural Research (ICAR) to provide a single window access to e-journals to the scientists, teachers, researchers, and students of institutions and State Agricultural Universities all over India. This has enabled the libraries of these institutions to facilitate access to scholarly information to their users without any local financial obligation. At this institutional level, it is imperative to organize orientation and awareness programs to let users practice with CeRA and to teach them about the various features of the consortium. The CSKHPKV, Palampur thrust area is Agriculture Science, Animal Science, Home Science and Basic Science where as the thrust area of DYSPUHF, Solan is Horticulture and Forestry. Consortium for e-Resources in Agriculture (CeRA) provides access to about 3,900 scholarly journals including almost only 78 journals in Horticulture science and 42 Journals in Forestry Science other journals are Agriculture and allied subjects. This is the region of some difference of uses of CeRA by the students of both the universities.

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INFORMATION LITERACY: FROM LAB TO LAND

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ABSTRACT

Literacy is always treated as vital element for both generation and dissemination of knowledge. Unless a person is literary competent to understand the value of information or knowledge we cannot derived our desired benefit whatever knowledge or information we generate. Knowledge is always treated as driving force for agricultural development, the attention of society towards information and knowledge is raising and people's demand for information and knowledge are increasing step by step. The major objective of the institutions dealing with higher education in Agriculture is to impart teaching and research so that the farmers and allied sector can improve their farming condition by increasing productivity. Apart from research and Teaching the agricultural universities undertake another important activity of extension so that outcome of higher education extended to the people beyond university boundary. The process of transfer of technology must carry out in such effective manners so that the technology developed in laboratory can be delivered to the farmer's working in the field at the time when they need it. Traditionally agricultural projects and researchers had paid too little attention to agricultural information. Agricultural information system should be the basic component of extension institutions' task and must be incorporated into their long and short term plans. Only effective information literacy among farmers can help to adopt new farming methods and successfully integrates with their existing system. . Effective dissemination of agricultural information to the farming community is very much essential for increase in agricultural production. A well plan information literacy programme can make information reach to unreached. This paper attempts to assess the importance of information literacy among farming community in context of strengthening agricultural productivity.

I. INTRODUCTION

One of top priority agenda of present government is double the agricultural production by 2022. Immediately just after independence we have to face a major crisis as India was not self-sufficient in food sector and adequate measures was taken to strive for food sufficiency in food production. As a result we have witnessed a major historical event by achieving breakthrough in not only in green revolution but also white revolution in field of livestock and to day India ranked as highest milk producer in the globe. Agriculture has been always priority area of all the government which has come into power from time to time. Effective dissemination of agricultural information to the farming community is very much essential for increase in agricultural production to ensure the food security of millions of needy people of our country. Food security is possible when there is adequate domestic agricultural production; otherwise we have to depend on import which will adversely affect our economy. One of the government most populist benevolent scheme food security bills 2013 is trying to cover eighty one core people under the scheme. Agricultural production plays a vital role in our country's economy where almost 65% people engaged in agricultural sector. The agricultural sector contributes 18.2 (year 2011-12) percent to GDP of our country. Present scenario reveals that GDP from Agriculture in India averaged 4052.74 INR Billion from 2011 until 2018 reaching an all-time high of 5666.82 INR billion in the fourth quarter of 2017 and record low 2690.74 INR in third quarter of 2011. Innovation is always recognized as key to success for increase of agricultural production since the people started cultivation. Adoption and integration of innovation is an essential prerequisite for any social development and agriculture is not exception to it. The success of green revolution has made tremendous effect over all scenario of agricultural sector of our country. The country which once import huge amount of food grain from outside is now not only self sufficient on essential food grain but also in a position to export. These changes are occurred due to various factor in which proper dissemination of agricultural information through various channel have been playing very important and pivotal role. In this process the role of extension and communication is not only important, it is also indispensable. Research output should not remain within the wall of the laboratories; instead it should reach the beneficiaries who need them without any barriers. Therefore dissemination of information is as important as its generation. In view of above, movement of lab to land is catching up fast in India and ICAR and other agriculture related organization are giving due importance and priority in carrying out the technologies to the farmland

to increase the agricultural production in both quality and quantity. The technology developed in laboratory much reach to the farmer's working in the field. Only effective information literacy among farmers can help to adopt new farming methods and successfully integrates with their existing system.

II. INFORMATION LITERACY

The phrase information literacy first appeared in print in a 1974 report by Paul G. Zurkowski (1974). It was written on behalf of the National Commission on Libraries and Information Science. He used the phrase to describe the "techniques and skills" known by the information literate for utilizing the wide range of information tools as well as primary sources in moulding information solutions to their problems

According to McTavish (2009), in order to increase and maximize people's contributions to a healthy, democratic and pluralistic society and maintain a prosperous and sustainable economy, governments and industries around the world are challenging education systems to focus people's attention on literacy.

The stakeholders involved in generation and dissemination of agricultural information must underscore the importance of high information quality. Farmers must be trained to distinguish between fact and opinion. They must be encouraged to use cue words such as "I think" and "I feel" to help distinguish between factual information and opinions. Information related skills that are complex or difficult to comprehend must be broken down into smaller parts. Another approach would be to train farmers in familiar contexts. Extension personnel should encourage farmers to examine "causes" of behaviours, actions and events. Research shows that people evaluate more effectively if causes are revealed, where available. Such initiatives would aid educators' help people become more Information Literate. As a society, we must critically evaluate information to establish a public demand for high information quality.

Because information literacy skills are vital to future success:

- Information literacy skills must be taught in the context of the overall process.
- Instruction in information literacy skills must be integrated into the curriculum and reinforced both within and outside of the educational setting.

Information literacy is about people's ability to operate electively in an information society. This involves critical thinking, an awareness of personal and professional ethics, information evaluation, conceptualising information needs, organising information, interacting with information professionals and making effective use of information in problem-solving, decision-making and research. It is these information based processes which are crucial to the character of learning organisations and which need to be supported by the organisations technology infrastructure. To date, using the phenomenographic research approach has made available descriptions of seven qualitatively deferent ways in which information literacy is experienced. The experiences are closely related to information based workplace processes and suggest a range of implications for professional education and development. (C.S. Bruce, 1999)

III. AGRICULTURAL INFORMATION

The information is a powerful tool in addressing other agricultural needs and if it is used appropriately it can change a nations economy (Tshbalala,200). The agricultural information is the data for decision-making and a resource that must be acquired and used in order to make an informed decision. Umali (1994) classified agricultural information into two broad groups: pure agricultural information and agricultural information inherently tied to new physical inventions. Pure agricultural information refers to any information which can be used without the acquisition of a technology. It includes all types of self-standing advice on practices such as production techniques, farm management, marketing and processing and community development. On the other hand agricultural inventions or technologies are those that come in the form of agricultural inputs, management technologies facilitating farm management, and marketing and processing equipment.

IV. THE CONCEPT OF INFORMATION FLOW

The concept of knowledge-sharing is defined as the transfer of useful know-how or information. People have investigated multiple types of flows (e.g. the material flow, the energy flow, the message flow, control flow, etc.) and the rules they follow in respective domains.

The knowledge flow (sometimes called information flow) is the flow of knowledge through an organization. It is decomposed into automatic knowledge flow from one knowledge repository to another. The knowledge flow looks like what is best known as workflow. The main

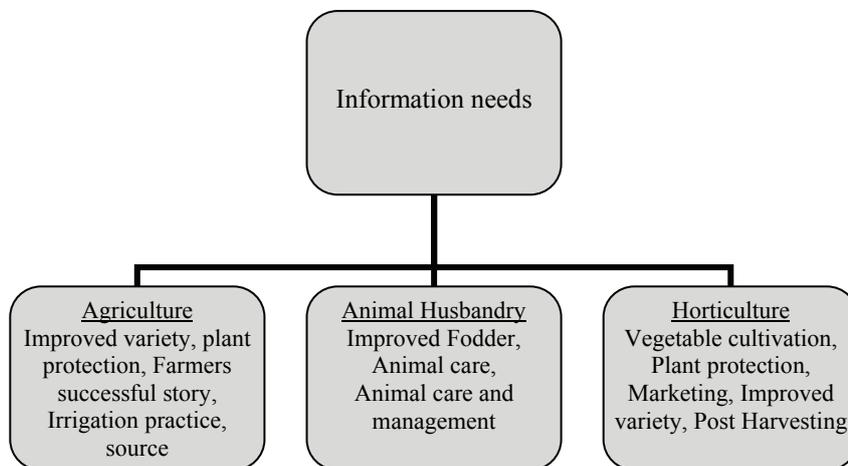
difference is that workflow is task-driven although knowledge flow is content-driven. In fact, a workflow is a coordination and control diagram and knowledge flow is a communication diagram. However, coordination requires information exchange and thus most of the workflow models contain the knowledge flow. The reverse does not generally hold. The spread of new information (also called innovative ideas) in society follows a four-step process:

- The awareness stage
- The interest stage
- The examination and testing stage
- The adoption/rejection stage.

Self-confidence is important if individuals are to successfully adopt a new behaviour or implement a new practice. If self-confidence is lacking, it is hard to adopt a new idea/practice. Successful role models set a good example. People not only learn through their own experience, but also by imitating the behaviour of other individuals who have succeeded in doing something new. The process of adopting new ideas can be speeded up through the participation of members of the community. They will then know what to adopt. It will be easier to decide. They will feel free to express their knowledge and information needs, and other needs they have, to build capacity to deal with the expected social changes. Wider participation by members of the community may also help in identifying other structural limits that prevent the adoption of new practices. For example, the shortage of: land, financial resources, transport, and marketing information. The community can then address these problems in order to support the adoption of new ideas and practices.

V. INFORMATION NEEDS: A FARMERS PERSPECTIVE

The agricultural land of India spread over in to a vast area that too belongs to different geographical back ground. As a result farming situation also varies from one area to another. Nevertheless, some generalization can still show the major areas in which farmer would need information. Incidentally, the farmer's perception about their information needs is mostly technology oriented. Investigation conducted in this regards identified some vital information which farmers list to priority are given below:



VI. AGRICULTURAL EXTENSION AND INFORMATION LITERACY

Traditionally agricultural projects and researchers had paid too little attention to agricultural information. The information has been identified as one of the resources required for the improvement of agricultural production. It is defined as the data for decision-making. It is said to be a resource that must be acquired and used in order to make an informed decision. Those who possess appropriate and timely information will make a more rational decision than those without. Agricultural scientist and Extension personnel can play a vital role in spreading agriculture related information among farming community through various effective information literacy programme such as by organizing Krishanmela, Live demonstration, TV and Radio programme, writing agriculture related topic in newspaper etc..

Agricultural information system should be the basic component of extension institutions' task and must be incorporated into their long and short term plans. Having adequate well-presented information will improve the efficiency of rural development projects and programs. It will improve the implementation of rural projects and programs through improving capacity of managers to devote due consideration to the principles of rural development programs: accessibility, independence, sustainability, participation, effectiveness and vision. Information literacy programme can be very useful methods to educate farming community about latest development in agriculture research. Extension personnel from agricultural department must make effective use of Information

Literacy programme in collaboration with local village headman, school teachers and other educated people to make farmer aware of not only the what happening in agriculture sector but also other developmental programme. While doing so identifying and documenting and incorporating Indigenous Knowledge is essential to achieve sustainable agricultural development. In this regards information literacy programme should be based on two way communication system:

- Agricultural scientist /Extension personnel → Farmers.
- Farmers → Agricultural scientist/ Extension personnel

Under this system there is direct interaction between the farmers and extension personnel. Farmers get the information on latest development and on the other hand agricultural scientist/ extension personnel get the feedbacks from farmers about their sort comings, Indigenous farming knowledge etc.. Indigenous knowledge system provides a frame of reference for strengthening agricultural extension programme and this led to reorganization of intervention made by extension personnel. The participatory technologies that are developed through indigenous knowledge integration will:

- Provide diversified technological options, which enable farmers to choose using their own decision-making system.
- Originate from the farmers own knowledge
- Use diversified source in active participation of research minded farmers (Rajaskharan, 1993)

Information literacy programme can be sound base for Extension strategy which will focus on improving current benchmark of indigenous knowledge practices. The strategy should also concentrate on facilitate skill to build capacity of producers of innovations to formulate question, which they used to engage specialists or utilize information systems.

VII. FARM INFORMATION SYSTEM OF JORHAT DISTRICT, ASSAM: A PILOT STUDY

A pilot study was conducted with an aims to cover agricultural information, its dissemination and usages by the farming community with special reference to Jorhat district of Assam. The study also covered the role of the different stakeholders like Agricultural Scientist, Agricultural Development Officer, Village level Extension worker, Voluntary Organization etc, in disseminating required information to the farmers. The study also tried to cover different information channel used by the farmers in their own situation. The study also tried to identify the

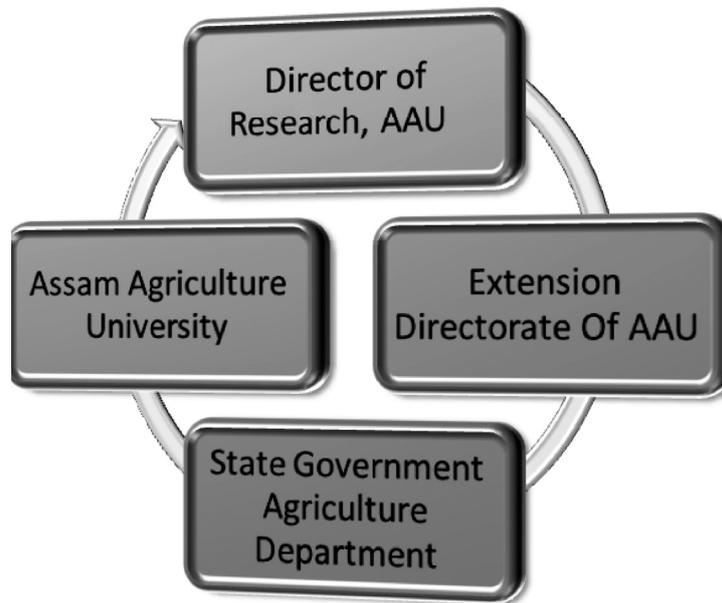
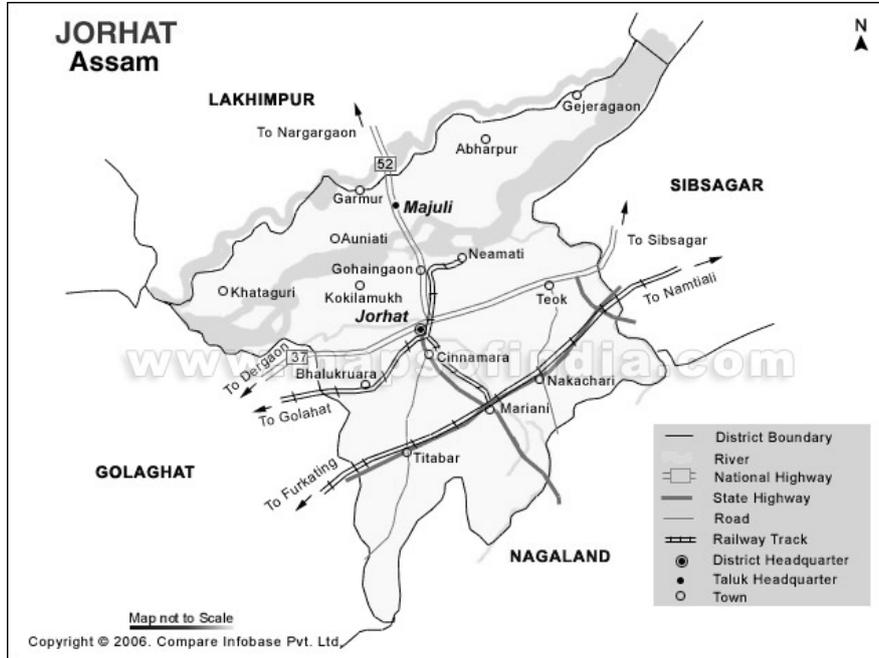
problems faced by the farmers while accessing required information. A eight village under Jorhat district two each within the jurisdiction of four different development blocks were chosen for investigation. All together two hundred and eighty samples were taken on each and alternative house basis. An attempt has been made to understand the flow of agricultural information and the channel used to disseminate the same. The study also tries to find out various drawbacks and also determine the communication barrier in dissemination and access of agricultural information by the farmers. Approach has been made to District Agriculture Department, government of Assam and Directorate of extension, Assam Agricultural University to understand the existing information system under which they disseminate agricultural information to farmer and vice-versa. With consultation of extension specialist from above department certain information circle and channels were identified which later on instrumental for planning of data collection programme.

VIII. AREA OF THE STUDY

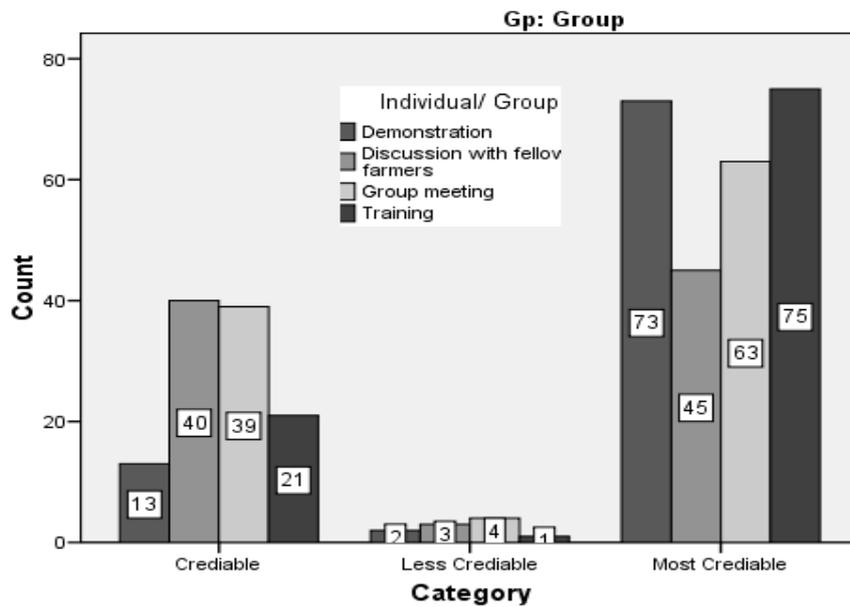
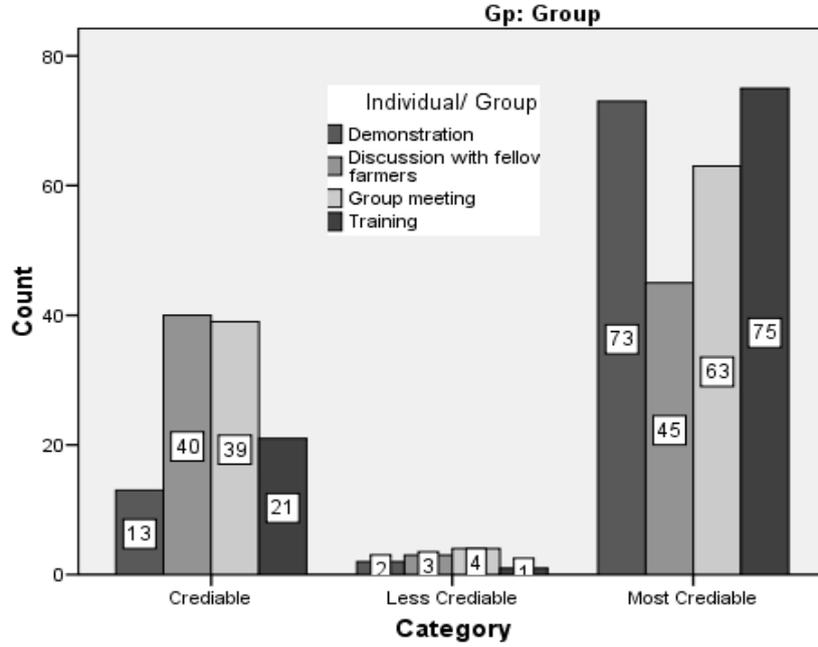
The investigation was conducted in the Jorhat district of Assam which also presenter's native district. The main reason for selection of the site because investigator himself is well aware of socio cultural and local language of the district which is very essential in establishing proper rapport with the respondents and also deriving accurate, authentic and reliable information.

The Jorhat was declared as district in 1919. At present, the district spreading over 2859 sq. km with population of 8.7 lakhs out of which 7.3 lakhs lived in rural area and 1.3 lakhs depends on agriculture (1991 census). The agricultural labour population of the district is nearly sixteen thousand. There are three subdivisions and eight Development Blocks in Jorhat district. Out of eight above development block following four development blocks according to different geographical location have been selected for study:

- Majuli Development Bock
- North West Development Block (Dhekorgarh)
- Central Jorhat Development Block (Shipahikhula)
- Titabor Development Block

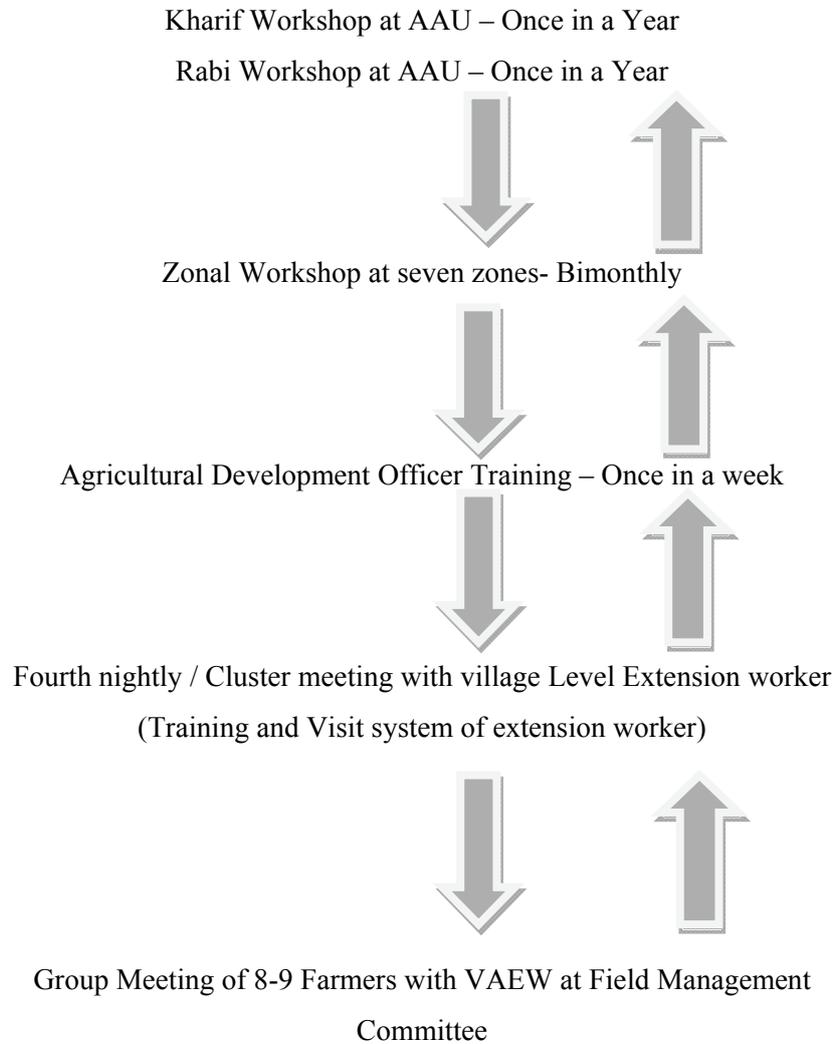


Agricultural Information Circle In Jorhat District



Information Requirements from Various Sources

Agricultural Information Flow from Lab to land and vice-versa



VIII.I Preliminary results of pilot study highlights following major findings:

Percentage of land less farmer in the Jorhat district is negligible and they follow both Scientific and traditional farming. The majority of them undertake farming as single occupation and 57% farmers represents middle age group of 26 - 45 years.

There is no illiterate farmers and majority of them can at least read and write. Hence Information disseminated to them in simple written medium is easily acceptable to them.

Majority of the farmers covered under the study are belongs to lower income group as per capita standard of our country and believed that farming can be a good source of livelihood. As such more information on agriculture income generation should be made available to the farmers.

Apart from rice majority of them also cultivates vegetable and cereals hence adequate number of information on composite farming should be generated.

The Investigation reveals that in spite of patronage of scientific farming at government and institutional level large number of farmers still holds faith on traditional Farming. Hence more information on sustainable agriculture should be included while packaging agricultural information.

As regards scientific farming majority of the farmers' access agricultural related information from Co-farmers, extension worker at block level, Krishi Vigyan Kendra and Agricultural Scientist. Therefore coordination between these agencies is very important.

The majority of farmers interviewed read news paper and also listen to radio and view television for day to day information including agricultural information. More farm news should be added in news bulletins.

Majority of the farmers believed that information accessed from family members, neighbours, local Traders and agricultural scientist are most reliable. These areas should be identified as potential source of agricultural information and input should be given to these areas through local extension personnel.

Progressive Farmers are considered as most reliable source of information. Demonstration and Training also helps farmers to take appropriate decision. Hence up to date list of progressive farmers kept for ready reference and they should be invited to all event on agricultural Interaction meet of the farmers.

Memorizing is most common form of methods for storage of agricultural information among farmers. They share view with family members. Awareness programme on different methods of information storage should be organized among farmers.

For crop variety majority of farmers rely on Assam agricultural University. The university should improve its information system so that accurate information disseminated to the farming communities.

The findings of the pilot study reveals that most of the farmers cultivate on their own farmland and accessed agriculture related information from family members, neighbours, local traders and agriculture scientist which they find more reliable. Here role of extension personnel from agriculture department is not prominent. On the other hand, getting touch with agricultural scientist on frequent interval is not easy. The extension professional should act as mediator between the farmers and agricultural scientist. The investigation also reveals that majority of the farmers can at least read and write. Hence to make the agricultural Information system more effective in Jorhat District of Assam a sound Information literacy programme will be ideal for proper use of agricultural information so that farm information can be disseminated to remote corner of the district. Keeping in view of the same a model based on research process (Oberg, 1999) for agricultural information literacy programme is suggested below to strengthening agricultural information system in Jorhat District of Assam.

FOCUS ON INFORMATION NEED: A PROCESS APPROACH

STAGES	SKILLS
Planning	<ul style="list-style-type: none"> • Establish Topic • Identify Information Sources • Identify Audience and Presentation Format • Establish Evaluation Criteria • Review Process
Information Retrieval	<ul style="list-style-type: none"> • Locate Resources • Collect Resources • Review Process
Information Processing	<ul style="list-style-type: none"> • Choose Relevant Information • Evaluate Information • Organize and Record Information • Make Connections and Inferences • Create Product • Revise and Edit • Review Process
Information Sharing	<ul style="list-style-type: none"> • Present Findings • Demonstrate Appropriate Audience Behaviour+ • Review Process
Evaluation	<ul style="list-style-type: none"> • Evaluate Product • Evaluate Research Procedures and Skills • Review Process

Stage 1: Planning

In the Planning stage, farmers are given the opportunity to get an image of the whole process. Involvement of farmers in the planning stage is crucial. Even with the illiterate farmers, the extension personnel can help them to identify what they know and what they want to know about the topic, generate ideas about potential information sources, and discuss potential audiences and evaluation criteria for their work. Topic selection is an important task for farmers in this stage. To satisfy his information need, the farmers should have fair knowledge about the topic he wants to explore. Having a good understanding of the topic will allow the farmers to design the search quarry. Extension personnel generally will have planned the assignment after getting feedback from farmers. They should be looking for topics that farmers will find personally complex. Careful and thoughtful work is needed here to ensure that topics and research questions require high level thinking skills and that they will encourage the farmers and engage their interest and curiosity. The farmers feel more positive towards investigative activities when they are involved in topics of their choice.

Stage 2: Information Retrieval

In the Information Retrieval stage, farmers obtain the sources of information needed. If farmers are inexperienced or if information on the topic is very hard to access, a stations approach, organizing the materials by format or media, is often effective. Knowledge of information tools and systems and of search strategies (source and pathfinder approaches) is critical if the farmers are finding their sources independently. The Farmers may experience information overload during this stage and find it difficult to pick up right information. The extension personnel should be alert to the feelings and help the farmers to identify the appropriate information that fulfil his or her information needs. The extension personnel should also help farmers to identify useful strategies such as omission or filtering (ignoring or selecting certain categories of information), generalizing or twigging (broadening or narrowing the topic), or asking for help. Group activities related to getting a large picture of the topic and its sub-categories, such as concept-mapping, or deciding what kinds of information might be appropriate for the topic are helpful strategies for the information retrieval stage, especially when information overload is a problem.

Stage 3: Information Processing

In the Information Processing stage, the farmers select and synthesize information pertinent to their information needs. This is really a two-

phase stage. After selecting and recording/ memorizing pertinent information, the farmers create a system by organizing and synthesizing their information in a unique and personal way. Here is where the time invested in planning pays off; farmers who do not have a clear understanding of their topic (a topic focus) cannot select pertinent information.

In the first phase, recording information, farmers need to be helped to take notes in some format. The extension personnel should help them how to keep record of required information. It is an established fact that the memorizing is a traditional method for storage of information adopted by farmers. As majority of the farmers literate the extension personnel should convince the farmer to keep the information in recorded form. Memorizing should be discarded as new information is added very frequently. The format should be provided for inexperienced farmers. This should be a search for pertinent information, for information that will answer their questions or fit into their subtopics, not writing down everything they can find. This is often where electronic resources or the photocopy machine can actually be a detriment to the process.

In the second phase, creating information, farmers organize and synthesize their information. Interaction between farmer and extension personnel before writing also can help farmers express their ideas in their own words.

Stage 4: Information Sharing

In the Information Sharing stage, the farmers present the information findings in a way that is meaningful for future guidance. There is also opportunity for the farmers to consider the role of the co farmers in enhancing the sharing experience. The co farmers preferably in a wider range should have been identified in the Planning stage so that the shaping of the sharing mode is possible. For illiterate or inexperienced farmers, small group sharing is often more successful and more time efficient than sharing with the wider range of farmers.

Stage 5: Evaluation

In the Evaluation stage, the emphasis is on involving the farmers in the assessment of the effectiveness of the information in ultimate agricultural productivity. The emphasis may at times be on assessing the farmers' understanding of the process or of the content. Evaluation need not be summative. While assessing the process the evaluator may take the feedback form farmers asking him or her to prepare a written or oral

summary of what they have learned about the process, or what content they have learned through the process.

CONCLUSION

Development and literacy are two important factors for prosperity. Many benevolent schemes whether at government level or non government level could not succeeded due to lack of awareness of ultimate beneficiaries. Information can play a vital role in removing the barriers in this regards. More you are literate; you are one step ahead to your information need. Information literacy can be a very useful tools for awareness campaigning. Agriculture has been always priority area of all the government. Effective dissemination of agricultural information to the farming community is very much essential for increase in agricultural production. A well plan information literacy programme can make information reach to unreached.

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USE OF ELECTRONIC INFORMATION SOURCES BY THE RESEARCH SCHOLARS OF INDIRA GANDHI AGRICULTURAL UNIVERSITY, RAIPUR: A STUDY

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ABSTRACT

The study was undertaken to determine the availability and utilization of electronic information resources by research scholars of Indira Gandhi Agricultural University (IGKV) in Raipur, Chhattisgarh. A questionnaire was designed to collect the data. The population of this study was 61 scientifically distributed among the research scholars in Indira Gandhi Agricultural University (IGKV) in Raipur, Chhattisgarh. Survey method was used for the study. The copies of the questionnaire that were returned were analyzed using the Statistical Package for the Social Sciences (SPSS). The study also recorded that a high percentage of the respondents use electronic databases frequently and the utilisation of electronic databases was for research work, to update knowledge in their field of interest and current awareness. The findings are documented in this paper.

Keywords: *Use of electronic resources, Agriculture information, IGKV, User study.*

INTRODUCTION

Libraries have always adopted new technologies to assist in their objective of providing clients with effective and efficient services, as well as timely access to needed information. Implementation of Information and Communication Technologies (ICTs) has changed the way people access and communicate information. Agriculture is the set of activities that transform the environment for the production of animals and plants for human use. Agriculture is the cultivation of animals, plants, fungi, and other life forms for food, fibers, biofuel, medicinal and other products used to sustain and enhance human life. Agriculture concerns techniques, including the application of agronomic research. Agriculture was the key development in the rise of sedentary human civilisation, whereby farming

of domesticated species created food surpluses that nurtured the development of civilisation.

But irrespective of the categories, they are seen as phases of decision making that farmers' are required to face during the cropping season. Nevertheless, studies on farmers' information needs have taken various patterns such as gender, farmer group (e.g. youth) and development area; like men and women farmers' information needs revolve around the resolution of problems such as income generation, best farming practices, methods of fertilizer application, agricultural inputs, market prices, transportation, food processing and preservation and new agricultural technologies (Okwu & Umoru, 2009; Zaid & Popoola, 2010; Saleh & Lasisi, 2011).

Nowadays, libraries are functioning in a user centered, technology based atmosphere, providing individualized value added services. The Internet and networking of libraries and information centres have facilitated information access 24x7 at one's fingertips. Library and Information Science (LIS) professionals are no more merely caretakers of books. They do the challenging, non-commercial business of satisfying information needs of users. Therefore, today's LIS professionals look forward to assume new earnings of communication for outreaching the users to take information at their ease. (Dr. K. Kumar)

Aim and Objectives of the Study

The aim of the study was to determine the availability and utilisation of electronic information database by agricultural Research scholar by Agricultural in Indira Gandhi Agricultural University (IGKV) in Raipur, Chhattisgarh. The study was specifically designed to:

1. Identify the types of electronic information databases available in agriculture-based faculties of the university libraries in Indira Gandhi Agricultural University (IGKV) in Raipur, Chhattisgarh.
2. Find out how often agricultural Research scholar use electronic information databases in Agricultural in Indira Gandhi Agricultural University (IGKV) in Raipur, Chhattisgarh.
3. Ascertain the level of user satisfaction in the use of available electronic databases resources in the Indira Gandhi Agricultural University (IGKV) in Raipur, Chhattisgarh.
4. Determine the inhibiting factors to effective provision of electronic information database by the faculties in the universities in

Research scholar by Agricultural in Indira Gandhi Agricultural University (IGKV) in Raipur, Chhattisgarh.

It is clear from the Table 1 that the highest percentage of the respondents who used to library daily 25 (49.58%) while the lowest percentage of the respondents who used to Occasionally came in library 5(8.19%) and the respondents who used to Once in a week 13(21.31%), Two Three Times in a week used to library 11(18.03%).

Table 1 Frequency of visit to the library

S. No	Frequency No of respondent Percentage	Percentage
1	Daily	25 (49.58%)
2	Once in a week	13(21.31%)
3	Two Three Times in a week	11(18.03%)
4	Once in a month	7(11.47%)
5	Occasionally	5(8.19%)

Table-2 Frequency of Use of Electronic Information in the Agriculture Universities From the analysis of data presented in the Figure 1 In this table saw the Research Scholar use of his article through key word. The uses sequence is given 29 (47.5 %) First, 21 (34.4 %) Second, 9 (14.8 %) Third, 1 (1.6 %) Fourth, 1 (1.6 %) Six times uses key ward by agriculture research scholar.

Table 2 Frequency of use to the search ward.

Rank	Frequency	Percent
1	29	47.5
2	21	34.4
3	9	14.8
4	1	1.6
6	1	1.6
Total	61	100.0

Table-3 Frequency of Use of Electronic Information in the Agriculture Universities From the analysis of data presented in the Figure 1 In this table saw the Research Scholar use of his article through Subject. The uses sequence is given 1 (1.6%) First, 15 (24.6 %) Second, 32 (52.5 %) Third, 1 (1.6 %) Fourth, 13 (21.3 %) Six times uses Subject by agriculture research scholar.

Subject (Table-3)

Rank	Frequency	Percent
1	1	1.6
2	15	24.6
3	32	52.5
4	13	21.3
Total	61	100.0

Table 4 Frequency of Use of Electronic Information in the Agriculture Universities From the analysis of data presented in the Figure 1 In this table saw the Research Scholar use of his article through Title. The uses sequence is given 30 (49.2%) First, 19 (31.1 %) Second, 32 (52.5 %) Third, 7 (11.5 %) Fourth, 3 (4.9%) Five times uses Title by agriculture research scholar.

Title (Table-4)

Rank	Frequency	Percent
1	30	49.2
2	19	31.1
3	7	11.5
4	3	4.9
5	2	3.3
Total	61	100.0

Table 5 Frequency of use to the search Author.

Table 5 Frequency of Use of Electronic Information in the Agriculture Universities From the analysis of data presented in the Figure 1 In this table saw the Research Scholar use of his article through Author. The uses sequence is given 30 (49.2%) First, 19 (31.1 %) Second, 32 (52.5 %) Third, 7 (11.5 %) Fourth, 3 (4.9%) Five times uses Author by agriculture research scholar.

Author (Table-5)

Rank	Frequency	Percent
1	1	1.6
2	6	9.8
3	12	19.7
4	35	57.4
5	5	8.2
6	2	3.3
Total	61	100.0

Table 6 Frequency of use to the search Publisher.

Table 6 Frequency of Use of Electronic Information in the Agriculture Universities From the analysis of data presented in the Figure 1 In this table saw the Research Scholar use of his article through Publisher. The uses sequence is given 1 (1.6%) Third, 7 (11.5 %) Fourth, 34 (55.7 %) Five, 19 (31.1 %) six times uses Publisher by agriculture research scholar.

Publisher (Table-6)

Rank	Frequency	Percent
3	1	1.6
4	7	11.5
5	34	55.7
6	19	31.1
Total	61	100.0

Table 7 Frequency of use to the search Abstract.

Table 7 Frequency of Use of Electronic Information in the Agriculture Universities From the analysis of data presented in the Figure 1 In this table saw the Research Scholar use of his article through Abstract. The uses sequence is given 2 (3.3%) Fourth, 19 (31.1 %) Five, 40 (65.6 %) six times uses Abstract by agriculture research scholar.

Abstract (Table-7)

Rank	Frequency	Percent
4	2	3.3
5	19	31.1
6	40	65.6
Total	61	100.0

Table 8 Frequency of use to the search Alta vista

Table 8 Frequency of Use of Electronic Information in the Agriculture Universities From the analysis of data presented in the Figure 1 In this table saw the Research Scholar use of his article through Alta Vista . The uses sequence is given 40 (65.6%) First, 10 (16.4 %) Second, 11(18.0 %) Third, times uses Alta Vista by agriculture research scholar.

Alta_Vista (Table-8)

Rank	Frequency	Percent
1	40	65.6
2	10	16.4
3	11	18.0
Total	61	100.0

Table 9 Frequency of use to the search Google.

Table 9 Frequency of Use of Electronic Information in the Agriculture Universities From the analysis of data presented in the Figure 1 In this table saw the Research Scholar use of his article through Google. The uses sequence is given 9(14.8%) First, 11(18.0%) Second, 8(13.1%) Third, 5(8.2%) Fourth, 12(19.7%) Five times Google by agriculture research scholar.

Google (Table-9)

Rank	Frequency	Percent
1	9	14.8
2	11	18.0
3	8	13.1
4	5	8.2
5	12	19.7
6	16	26.2
Total	61	100.0

Table 10 Frequency of use to the search MSN.

Table 10 Frequency of Use of Electronic Information in the Agriculture Universities From the analysis of data presented in the Figure 1 In this table saw the Research Scholar use of his article through MSN. The uses sequence is given 3 (4.9%) First, 11(18.0%) Second, 11(18.0 %) Third, 11(18.0 %) Fourth, 18 (29.5%) Five, 16 (26.2%) and 2(3.3%) six times MSN by agriculture research scholar.

MSN (Table-10)

Rank	Frequency	Percent
1	3	4.9
2	11	18.0
3	11	18.0
4	18	29.5
5	16	26.2
6	2	3.3
Total	61	100.0

Table 11 Frequency of use to the search Rediff.

Table 11 Frequency of Use of Electronic Information in the Agriculture Universities From the analysis of data presented in the Figure 1 In this table saw the Research Scholar use of his article through Rediff. The uses sequence is given 1(1.6%) Second, 1(1.6%) Third, 12(19.7%) Fourth, 20(32.8%) Five, 25(40.0%) Six, and 2(3.3%) seven time’s Rediff by agriculture research scholar.

Rediff (Table-11)

Rank	Frequency	Percent
2	1	1.6
3	1	1.6
4	12	19.7
5	20	32.8
6	25	41.0
7	2	3.3
Total	61	100.0

Table 12 Frequency of use to the search web Crawler.

Table 12 Frequency of Use of Electronic Information in the Agriculture Universities From the analysis of data presented in the Figure 1 In this table saw the Research Scholar use of his article through Web Crawler. The uses sequence is given 9 (14.8%) First, 22 (36.1%) Second, 22 (36.1%) Third, 8 (13.1%) Six time’s Web Crawler by agriculture research scholar.

Web Crawler (Table-12)

Rank	Frequency	Percent
1	9	14.8
2	22	36.1
3	22	36.1
6	8	13.1
Total	61	100.0

Table 13 Frequency of use to the search yahoo.

Table 13 Frequency of Use of Electronic Information in the Agriculture Universities From the analysis of data presented in the Figure 1 In this table saw the Research Scholar use of his article through Yahoo. The uses

sequence is given 2 (3.3 %) Five, 59 (96.7 %) seven, time's Yahoo by agriculture research scholar.

Yahoo (Table-13)

Rank	Frequency	Percent
5	2	3.3
7	59	96.7
Total	61	100.0

Table 14 Satisfaction

Table-14 User satisfaction is one of the most important aspects for the good library so it is important to know the adequacy of the available information resources and to find out to the extent the user feel about the collection.

Table 14

S No.	Satisfaction	%
1	Satisfied	31
2	Very Satisfied	22
3	can't say	8
4	Dissatisfied	0
5	Very Dissatisfied	0

CONCLUSION

There is a growing influence of Electronic technology in Libraries, especially as network access becomes more affordable and reliable, and Electronic applications have seen a in stream acceptance in teaching, learning, and research. This trend will likely continue, and one way libraries can respond to this emerging trend is to make the library's website easily accessible via web-enabled mobile devices. Libraries should make conscious choices about what they want to offer in this arena and act accordingly and only time will tell if a completely mobile-accessible library, in terms of its services and collections, will become common place.

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LIBRARY SERVICES IN THE INTERNET ERA

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ABSTRACT

The study presents the needs of library services in the Internet era the innovation of information communication technology have influenced libraries to serve better. The Information and Communication Technology (ICT) has transformed the library services all around the world, now days most of the information recorded in electronic format. Internet technology is playing a vital role to improve the performance of libraries & digitization of the libraries facilitates easy & immediate access to information. A library service in Internet Technology environment has availed the libraries to keep pace with the latest development .This has additionally facilitated precision, flexibility and reliability in the library and information centre. Library services reduce the perpetual work and preserve them and brings precision and speed & keeps material safe.

Keywords: *Library services, Internet, library networking, user awareness, electronic library, library management.*

INTRODUCTION

Libraries are moving rapidly towards the electronic method of storage and retrieval. In the recent years, Internet has been the major force, which has led to the electronic versions of library amassments. Due to following reasons IT application plays a vital role. Following are the reasons for why IT applications need in today's scenario:

- **Increase in Resource sharing:** Due to revolution of information it is difficult to acquire all the materials needed by the clientele. In fact partnership and cooperation in local, national and international have become enviable for all libraries. In achieving cooperation is through the establishment of consortium.
- **Importance of library networking:** Presently all Govt. public libraries working under Directorate of Libraries are having more or less same collection of copyright books. These books are old and rare which are not easily available elsewhere and difficult to find if needed. Also data of books available in all libraries is not available

at one point. Communication between libraries is also very rare. Hence, chances of duplication of books are more. Due to these barriers, libraries are lacking in giving services to its readers.

- **Internet Access:** Internet is not only a medium for digital communication but also the world's largest repository of information. However, under developed internet infrastructure in a country like India, poses a serious challenge to growth of ICT enabled services. Large segment of user groups may still be deprived of personal access to internet facility. Libraries, therefore, provide free or controlled access to internet and email. Depending upon the availability users can be given time slots for use of internet facility. Usually a few internet enabled terminals are provided in the library that can be used by the visitors for internet access and email etc.
- **Transformation of printed materials (TD):** Dissertations and theses produced at universities are important sources of information and knowledge for further research. A large number of universities have converted their theses and dissertation collection into digital libraries and have made it available on Internet for global access. A number of universities have also implemented Electronic Theses and Dissertation programmes, where researchers submit theses in electronic format
- **Digitized information:** Digital information is a type of information stored using a series of ones and zeros, according to TechTerms.com. It is the most commonly used method of storing and reading data, as it can be copied, edited and moved without losing any quality.
- **User awareness:** As information systems become increasingly distributed (through mobile computing, desktop computing, etc), users is increasingly placed in a position where they must handle information security matters that they did not handle in days gone past. These new distributed systems force users to play security roles that they had not previously had to play.
- **The electronic library:** Physical site and/or website that provide 24-hour online access to digitized audio, video, and written material.

Functions of Library Management System

Manage Book and Member Record

- Easily manage Member and book detail with the help of Barcode.

Acquisitions

- With library Management software, Acquisitions function as generate Purchase order, Cancel Purchase Order , Reminder Purchase order, Receive Purchase Order, Invoice and instantly available in the Reports . Data can be search by feeding Purchase Order no, Invoice No , Supplier name .

Circulation

- Library Management Software enables the complete management of multiple Item issues and return of books using Manual or Barcode Scanner.

Barcode

- Use of Bar Codes for Library Management eases the everyday tasks of big Libraries, where the No. transactions exceeds several thousands in number. Moreover, the software can work even without Bar Codes seamlessly. The Bar-Code generation and printing process is a Built-In feature of this Software.

OPAC

- Library management software admin/Member can easily search book author, Title, Accession No, Publication, and Language also admin can filter data by category wise.

Alert through Email

- Admin can send mail to members, vendors, or any other people from the software.

Multiple Library Setup

- Library management software can setup at different locations.

Export All Report into Excel, Word

- Admin can take all the details which are displayed in the reports into excel and word file.
- Handles donated items, free items and keep track of donors
- Some library items are free or some person donates the item. So Library management software keeps track of those items.

Provide Multi User environment

- Library management software gives facility of multi user environment. Multiple users can login at the same time in the Library management software.

Maintain Any Media

- You can define a number of things that one wants to keep track of.
- One can maintain different kinds of media like Book, CD, File Documents, Video Cassette, and Audio Cassette.
- One can maintain media with its own specifications rather than common.
- You define the specification you want for that media, for book (pages, ISDN number, type, volume).

Powerful Search Engine

- Library Software includes searches for words, phrases and more within single sentences in a book, or your entire library.
- Includes (+, " ",-) operators.
- 'Powerful reference searching' you can find resources about any given media anywhere in your library.
- Find media by any keyword typed in text box or by selecting the name of media author, publisher or subject also find different combinations of author, publisher, subject and sub subject.

Custom Field Indices

- Library Software provides sorted data on required fields by clicking on the column header. i.e. if clicked on publisher the data will be sorted on publisher.
- One each master form.

Lock System

- Lock the subject or group of the member, so that media can't be issued which falls under these criteria. One can in this way restrict the issuing of the media.

Circulation

- Easy operation of circulation by entering the code of media, get all the information related to the media and the number. (name, group, media type)

Auto Filter & Auto Search

- On each master form, Library Software will search on the field where your cursor is and what you type is taken as a search value.

Customize

- User can customize the system to feel easier for data entry.
- While adding records user can keep form in 'add' mode. Define Holidays.
- Set the criteria of issuing the book if member is requested for media or not.

Reports

- Member wise report.
- Media wise report.
- Time duration and media name for which user want the report.
- More specific report.

Creating a Technology Plan

- Our technology plan supports the mission of the library to: Provide accessible and innovative services in response to community needs, while helping to accomplish its vision of: High-speed internet service, new technology and education to integrate technology into daily life.
- Identification of basic functions of the library
- The basic functions of any library are: ordering and acquisitions, cataloguing, circulation control, serials control, management information and community information control. A library manager must always look for ways in which these functions can be integrated in order to reduce duplication of effort. Much of the software available in the market provides this integration in the sense that the software is provided in a series of modules covering specific functions which together form a complete system from acquisitions to online catalogue. 'Modules can be bought as required and or as funding permits. Each module will work with all others, allowing records to be transferred from one to the other. The main objective is to indicate the factors which must be taken into consideration while studying automation of routines and to examine how some of the software performs with this type of activity.

Planning for library automation

- Planning for an automated system, no matter how big or small, should be part of an overall long-range plan for the library. Automation should always be used as a means to achieve overall

better patron service. Careful planning for technology will assure that your automation project is "sustainable", i.e. enhances the organization's ability to meet its service mission without disrupting the organizational stability of the institution.

- ✓ **Identify key issues influencing the library**
- ✓ **Define the ultimate outcomes**
- ✓ **Assessment of existing technology and services, user needs**
- ✓ **Establish priority**
- ✓ **Develop missions, goals and objectives**
- ✓ **Financial and implementation considerations**

CONCLUSION

The digital library movement in India is rapidly increasing and the traditional libraries are now on their way to digitization with the internet technology application in the library sector, data of all libraries will be handled with facileness, precision, great speed, high rate and more preponderant quality. It will preserve cost, time and labour of library staff and will avoid duplication of work. All libraries will be connected through networking, hence amassment will be shared. It will additionally avail to adopt the felicitous strategies for ameliorating accumulation building. Union catalogue and cooperative bibliographic accommodations will be introduced. However Internet Technology application/automation and networking is must require for any kind of libraries & information center.

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HUMAN RESOURCE DEVELOPMENT IN INDIAN LIBRARIES AND INFORMATION CENTRES

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ABSTRACT

Human Resource Development (HRD) is a process by which employees in an organisation are helped in a continuous way to: (1) Acquire or sharpen capabilities required to perform various functions with their present and future expected roles; (2) Develop their general capabilities as individuals and discover and exploit their own inner potentials for their own and / or organisational development purposes; and (3) Develop an organisational culture in which supervisor-subordinate relationships, team work, and collaboration among sub-units are strong and contribute to the professional well being, motivation, and pride of employees. This paper attempts to discuss some aspects of HRD that might help in Library and Information Centres to contribute substantially their share to supporting all aspects of socio-economic activities of the country.

Keywords: *Human Resource Development, Library Management, Information Centres.*

1. INTRODUCTION

Of all the resources available to any developmental process, human resources are the most vital and valuable ones that enable utilization of all the other resources effectively. It is a comparatively recent perception of management specialists to view human resource management as acquiring greater attention than looking at it merely as control and deployment functions of personnel. In recent decade, the facets of Human Resource Development (HRD) are studied at depth and new and innovative methods and techniques to utilize optimally human capital in all organizations are being developed to ensure success in any productive activity.

Human beings constitute the most important and valuable resource of an organisation, based on the brief that employees commitment to work in an organization is a fundamental prerequisite to organizational success. Such commitment can be ensured only if actions towards personnel are undertaken with the highest degree of integrity and respect. This

presupposes a continuing healthy relationship between employees and employers. Consequently human resource management places an emphasis on strategic thinking towards employees, personnel planning, extensive personnel and organisational development and such others. In this article attempts to study the vital and valuable role of human beings in organizations with a brief perspectives to grasp the essentials of its importance.

2. HUMAN RESOURCES DEVELOPMENT

Human Resources Development (HRD) is the process of helping employees in an organization to acquire competencies. This help is given to employees in a planned and continuous way to:

- Acquire and sharpen capabilities required to perform various tasks associated with their present and expected future roles;
- Develop their general capabilities and discover and exploit their inner potential for their own and/or organizational developmental purposes;
- Develop an organizational culture in which supervisor-subordinate relationships, team work, and collaboration among sub-units are strong and contributes to the professional well-being, and pride of employees; and
- Facilitate up skilling and improved abilities by the introduction of mechanisms (instruments or sub-systems) such as training, performance appraisal, organizational development (OD), feedback, counselling, career development, potential development, job rotation, incentives, awards and rewards.

3. NEED FOR AND PURPOSE OF HRD

Personnel constitute the most important and vital key to the effective functioning of an organization. Their knowledge and skills have to be constantly upgraded to handle new tasks to achieve organizational success. Not only employees competencies and abilities have to be enhanced but their motivation, dedicated involvement, sense of personal participation and above all full commitment to organizational goals, objectives and targets are absolutely essential. The purpose of involving employees with increased knowledge and skills is obviously to achieve the organization's goals and targets successfully. The twin factors that will ensure success to any organization in enhancing their goodwill and

reputation in the field are customer satisfaction and quality of products and services that an organization offers.

Therefore, HRD is necessary for any type of organization for:

- Survival and stability;
- Growth and development;
- Change and diversification;
- Retuning activities to become more effective;
- Providing highest quality in products and services;
- Playing a leadership role in the field; and
- Obtain goodwill and reputation through customer satisfaction.

4. HRD MECHANISMS, INSTRUMENTS AND SYSTEMS

Human resource is the most important factor for an organization using diversity of resources to achieve the targets successfully. There must be, therefore, well thought out means, mechanisms, instruments and systems for human resources development. The following schematic diagram sums up the HRD linkages with the means and mechanisms:

HRD Mechanisms Sub-systems Instruments	HRD Processes HRD Climate Variables	HRD Outcome Variables	Organizational Effectiveness Dimensions
*HRD Department	*Role Clarity persons	*More Competent	*High Productivity
*Performance Appraisal	*Planning of Development of every Employee	*Better Developed Roles	*Growth and Diversification
*Review discussion, Feedback Counselling Sessions	*Awareness of Competencies Required for Job Performance	*Higher Work Commitment and Job Involvement	*Cost Reduction
*Role analysis Exercises	*Proactive Orientation	*More Problem Solving	*More Profits
*Potential Development Exercises	*More Trust	*Better Utilization of Human Resources	
*Training Policies	*Collaboration and Team Work	*Higher Job Satisfaction and Work Motivation	*Better Image
*Communication Policies	*Authenticity	*Better Generation of Internal Resources	

Contd...

HRD Mechanisms Sub-systems Instruments	HRD Processes HRD Climate Variables	HRD Outcome Variables	Organizational Effectiveness Dimensions
*Job Rotation	*Openness	*Better Organizational Health	
*OD Exercises	*Risk taking	*More Team Work Synergy and Respect for each other	
*Rewards	*Value generation		
*Job Enrichments	*Clarification of norms and Standards		
*Other Mechanisms	*Increased Communication *More Objective Rewards *Generation of Objective Data on Employment		

Table 1 List of HRD Mechanism

Other factors	
Personnel policies Top management styles Investments of HRD Top management commitment History Previous culture Line manager's interest, etc.	Environment Technology Resource availability History Nature of Business, etc.

The above schematic table illustrates list of HRD mechanisms, process variables, process outcomes and dimensions of organizational effectiveness. It is to be noted, as shown in the tables, that the organizational effectiveness depends on a number of other variables like environment, technology, competitors, top management styles and commitment, line manager's deep involvement, etc.

Other things being equal, organizations that have a well defined HRD programme, competent, satisfied, committed and dynamic personnel would indeed do better than those organizations that do not have proper HRD programmes and the right type of personnel.

5. HRD AS A PROCESS

HRD is a continuous process and not merely a set of mechanisms, instruments, techniques. The mechanisms and techniques such as training, performance appraisal, counselling, interventions on organization development, etc. are meant to initiate, facilitate and promote the process. However these mechanisms, instruments and techniques need to be constantly reviewed for their effectiveness. Organization can facilitate this process of development by planning for it, by allocating organizational resources and exemplify HRD philosophy that values human beings and consciously promotes their development. The premises to this thinking are based on three basic concepts of HRD.

1. Persons working in an organization are regarded as valuable resources implying that there is a need to invest time and effort in their development;
2. They are human resource with all the special characteristics and hence cannot be treated in the way other resources are handled; This focuses on the need to humanize organizational life and introduce human values in the organization;
3. Human, resource handling does not merely focus on employees as individuals, but also on other human units and processes in the organization.

This human approach to HRD, therefore, deals with six concepts which should determine HRD process in relation to HRD systems and activities. These concepts are:

- Individual employee: Self-management, Competence building, Advancement;
- Role: Optimum stress, Linkage, Autonomy;
- Dyad (consisting of the individual and the boss): Trust, Mutuality, Communication;
- Team; Cohesion, Resource utilization;
- Inter team: Identity, Collaboration;
- Organization: Growth, Impact, Self-renewal.

These concepts are superimposed on HRD systems namely Appraisal, Career, Training, Work, Culture, Self-renewal systems. Let us study these concepts and systems very briefly.

Individual Employee--HRD hinges on individual development, so that jointly they would contribute maximal to the organization growth and

development. Three aspects concern the individual development viz. Self-management, competence building and advancement.

Role--Role is the positions an employee occupies as defined by expectations of different significant persons (who have face-to-face relationship with role occupants) have with the person. It is not, however, synonymous with position in an organization. In fact individual roles have to be examined independently.

Three aspects are concerned with roles of employee's viz. optimum stress, linkages and autonomy. Optimum stress refers to tuning a person to raise his contribution to an optimum level. Linkages provide for intra and inter relations between individuals and teams within the section and outside. Autonomy permits an individual to display initiative in dealing with a new situation and solving problems.

Dyad--The dyadic (an employee and the supervisor) are the basic building blocks of an organizational structure. This bond of relationship should be strong enough to deliver the maximum to the organization. Trust, mutuality, communication are three aspects that guide this bond of relationship.

Team--It is only team work that ensures success to an organization. Cohesion, resource utilization is the necessary ingredients that should build up team work.

Inter Team--Cooperation among the different teams i.e., between teams in a section, between teams of different sections, sectional teams with higher level divisions and departments, is essential for achieving corporate objectives and goals.

Organization--An Organization needs to be dynamic and should respond to changes in environments, advances in technology, diversifications of products and services. Growth, impact and self-renewal are three aspects that deserve attention.

Appraisal System--Appraisal systems concern three main aspects - performance, potential and performance coaching. It is said that performance appraisal is practised widely in assessing individual and team performances, the other two seldom get full attention.

Training System--This is a widely used system in most organizations to build staff skills. However attention needs to be given to the different

types of training required, in-house training or training by professional bodies or institutions, evaluation of trained employees and utilization of the training gone through, etc.

Work Systems--This aspect relates to work related issues and should be examined at every level- managerial and operational. Task analysis, quality of work life (work place democracy, autonomous work groups, participating management, etc.), productivity and quality of products and services are some more important aspects that deserve considerable attention.

Cultural System--For the development of organizational culture, an appropriate organizational climate is necessary. Communication within the organization that includes top-down, bottom-up, horizontal, circular, and external communication ensures smoothness in employee and employer relationship.

Another aspect is the reward, incentive schemes, both for individuals and teams that will generate greater involvement of employees in work and promote quality. The award, reward and incentive scheme should be judiciously implemented lest it will produce the opposite results.

Self-renewal System--A healthy organization is highly conducive to success and growth. Activities, methods and techniques will have to be reviewed constantly to improve the impact and effectiveness of the organization. This is done through organization development which is concerned with development of competency through effective teams to diagnose the problems and initiate process of collaborative work to deal with them. Process competency is improved, aiming at maintaining profiles of organizational health, monitoring organizational health, assisting 'sick' units, helping interested units and departments in self-renewal, conflict management, creation of strong teams, etc.

Organizational learning which is learning through involvement and experience in the organization and effectively utilizing such improved capabilities.

Another important aspect is research orientation in HRD. Collecting data on different issues, analysis of such data, interpretation, evaluation and application of results constitute the aspects of work of research.

These two sets of parameters constitute a matrix that brings out the relationship between them. The table given below sums up this relationship.

Table 2 HRD Matrix

HRD			Systems			
Concept	Appraisal	Career	Training	Work	Cultural	Self-renewal
Person	*Performance	*Development Planning	*Identity Training Needs	*Role Efficiency	*Rewards Acculturation	*Involvement
	*Potential					
Role	*Develop Critical Attributes	*Job Rotation	*Task Analysis	*Job Enrichment	*Stress Management	
Dyad	*Performance Review & Coaching	*Mentoring	*Training in Performance		*Communication	
	*Feed-back on HRD					
Team	*Appraise Team Work		*Identification of Training Needs	*Autonomous Work Groups		*Team Building
	*Counsel Teams		*Developing Curriculum			
	*Team Appraisal					
	*Team Counselling					
Inter Team	*Common Procedures of Appraisal			*Productivity	*Communication	
	*Parity of Appraisal			*Quality of Work		*Collaboration
Organization	*Linkage of Appraisal with Goals & Values	*Succession Planning		Quality of Work Life	*Climate Rituals Celebrations	*HRD Res
						*Organizational Learning

While the top management is responsible for a well defined programme, evolving strategies, setting appropriate goals and targets, it is the line managers who have to implement programmes to give the organization the aimed success. Much of the above discussions that have been on HRD pertain to the implementation process by line managers.

6. PERSONNEL / HRD IN INDIAN LIBRARIES AND INFORMATION CENTRES

Personnel/Human Resources Development, as has been discussed above, does not seem to be operative in any library and information centre in India. Personnel aspects are handled, by and large, by parent organizations to which the Library/Information Centre is attached. The administrative departments deal with personnel, mostly in relation to salary and allowances, discipline and control, training and deputation to conferences, performance appraisal in a limited way, and a few others. Many of these developmental Processes are confined only to certain levels and do not percolate to lower levels. No personnel/HRD department, exclusively to take care of all personnel problems appears to be in existence in any library/Information Centre.

As libraries and information centres are growing, particularly with reference to collection and services, and sophistication in terms of computerization and networking, it is necessary to give full attention to personnel development. Some of the aspects, among others that might help Library/Information Centres to contribute substantially their share in supporting efforts towards socio-economic activities, may include

- Personnel planning
- Orientation, introduction to Library/I Centre's goals, objectives, targets & activities
- Productivity, customer satisfaction
- Quality of products and services
- Acquisition of new knowledge and skills
- Task analysis for proper deployment of personnel
- Performance reviews and appraisal
- Motivational aspects
- Developmental supervision
- Counselling and monitoring

Professional education and training institutions also should share responsibilities to induct research in HRD; initiate efforts for plans and programmes to study the diversified requirements of personnel in libraries and information centres. Studies are necessary to assess the manpower needs for the present and future activities and regulate the supply of the different categories of personnel required. Quality and value added information systems and services and achievement of excellence

are to inculcate into the profession through appropriated motivation programmes by professionals associations and societies.

7. CONCLUSION

Giving an overview of personnel / Human Resource Development. In this article presents the following aspects: (i) Human Resource Development in organisations at the macro and micro levels. The macro level expounds strategic planning and forecasting of manpower; and (ii) the macro deals with the implementation of plans and policies, procedure and rules laid down by the macro planning. The top management is involved in the former and the line managers operate at the executive levels; (iii) It is the personnel that are responsible for all the actions and activities of management evolved and executed in an organisation, hence the most important aspect in HRD.

HRD is essential for an organisation to achieve success. It comprises a number of methods and techniques and organised through various means, mechanisms, instruments and systems; Gaining knowledge, acquiring new and innovative skills, competency building of employees at all levels of works, are basic function of Human resource management. Alongside these competence, dedicated involvement, motivation, commitment are other aspects that require attention in HRD in an org All the strategies, methods and techniques supported by mechanisms, instruments and systems are applicable to managing human resource in libraries. Some of the aspects of Human Resources Development in libraries and information centres are described in this article.

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UTILIZATION OF CONSORTIUM FOR e-RESOURCES IN AGRICULTURE (CeRA) BY THE SCIENTISTS OF NATIONAL RICE RESEARCH INSTITUTE (NRRI): A CASE STUDY

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ABSTRACT

This study assesses the attitudes towards e-journals available through CeRA and tries to analysis the current level of usages of these e publications by the Scientists and research scholars of NRRI, Cuttack. The paper attempt to highlight the role of ICAR to facilate the access to the select the scientific literature to the academic and research society in the NARS. The article explores that the usages of e journals has increased as compare to print journals as the majority of the users have started accessing these e journals in electronic form. Users are accessing these e journals at their concern departments more as compare to the library.

Keywords: CeRA, Information Seeking Behaviour, User Study, NRRI, ICAR.

INTRODUCTION

JOURNALS are the core information resources in any discipline. These carriers of nascent information are usually highly priced as compared to other documents. The emergence and applications of Information and Communication Technologies (ICTs) have transformed the publishing and dissemination of information. This has brought a swing in practice of ownership to access to information. Under the influence of ICTs, most of the journal publishers have opted for either only online or online in addition to print versions of their journals. The advantages of e-journals over print counterparts have made these widely popular. The interdisciplinary nature of research, blurring boundaries among subjects, rapid growth in research and developments and ease of publishing, have

resulted in proliferation of journals in all disciplines, state that 'Number of journals and their costs have increased by three-fold every 15 years, and 226 per cent during the last 20 years in terms of dollars, which may be further compounded by currency conversion, whereas the increase in library budget was only 110 per cent during the same period . The number of journals and their prices are multiplying, but at the same time, budgets of libraries are shrinking. The library have made it difficult for subscribe to all journals relevant for meeting information needs of respective users. To overcome these problems, libraries joined hands to provide information to users in a cost-effective way; and as an outcome, various consortia of e-journals emerged. The e-journals consortium refers to the co-operative acquisition of access rights for ejournals and databases. Though the library co-operation exists since recognition of libraries as information and knowledge facilitators, the consortium approach has given it a new impetus. 'This new era of resource sharing has performed like a magic bullet to break the jinx of various constraints in accessing information beyond the financial purview of libraries at the individual level.

Major Library Consortium in India

The growing number of e-journals, their rising prices, increasing number of educational institutions and the problem of financial crunches has led to the evolution of various consortia for e-journals in India. Usually, consortia are intended for meeting information needs of stakeholders in a homogenous group of institutions. The UGC-INFONET Digital Library Consortium, Indian Digital Library in Engineering Science and Technology, National Knowledge Resource Consortium, Consortium for e-Resources in Agriculture, Forum for Resource Sharing in Astronomy and Astrophysics, and Health Science Library and Information Network are the popular consortia. The consortium approach began in India in 1982 with emergence of the Forum for Resource Sharing in Astronomy and Astrophysics (FORSA). This programme was initiated for sharing resources available in astronomy libraries in the nation. In 2004, its membership was extended to physics and mathematics libraries having common interests to carry forward the aims and activities of FORSA. The UGC-INFONET Digital Library Consortium was launched in December 2003. It facilitates current as well as archival access to more than 7,500 core and peer reviewed electronic journals and 10 bibliographic databases from world famous publishers, scholarly societies and aggregators. This

consortium has been implemented in a phased manner. In the first phase, access to e resources was offered to 50 universities having internet connectivity under the UGC-INFONET networking program. The consortium access has been extended to 209 universities which are under the purview of UGC. The consortium provides access to e-resources in almost all disciplines including arts, humanities, social sciences, physical sciences, chemical sciences, life sciences, computer sciences, management, mathematics and statistics. The Indian Digital Library in Engineering Science and Technology (INDEST) set up by the Ministry of Human Resource Development, Government of India, facilitates access to e-resources to all the Indian Institutes of Technology (IITs), Indian Institute of Science (IISc) and other institutions including NITs, ISM, IIMs, NITTTRs, etc. Its head quarter is located at IIT Delhi. The consortium facilitates differential access to e-resources to member institutions depending on the nature of their research activity and education. The Knowledge Resource Consortium (NKRC) was established in 2009. It is a network of libraries of 39 National laboratories of CSIR. The Health Science Library and information network (HELINET) was launched during 2003.

ICAR Knowledge Initiatives: CeRA

Consortium for e resources in Agriculture (popularly known as CeRA) is an e consortium of Agricultural Libraries under ICAR for National Agricultural Research and Education System (NARES) Libraries. It was established in November 2007, the Consortium for e Resources in Agriculture is the first of its kind for facilitating 24*7 online access of selected journals in agriculture and allied sciences to all researchers, teachers, students, policy planners, administrators and extension specialists in NARS through IP authentication. The 152 Consortium members consist of ICAR institutes/NRCs/Directorate/ project Directorates/ National Bureau and state agricultural universities. CeRA is now sought after online platform by scientists/teachers in NARS for literature search for their professional pursuit. CeRA acts like a catalyst to enhance agricultural research, education and extension activities of NARS institutions in achieving excellence and setting high standards in output and service to the society. After the completion of NAIP project, CeRA is entrusted to ICA DKMA from July 2004 onwards.

Objectives of CeRA

- To upscale the existing R and D information resource base ICAR institution/ State agricultural universities comparable to the world leading institution.
- To subscribe online journals / e Resources and create e access culture among scientists/faculty in ICAR institutions/Agricultural Universities.

Facilities provided by CeRA

- Access of journals/e resources through IP authentication
- Document Delivery Request System (DDR)
- Access through Remote access facility (Ez-Proxy)

OBJECTIVES OF STUDY

The purpose of the study was to explore the awareness and usage of consortia-based information and knowledge resources by the Scientists, Research Scholars and doctoral students of NRRI, Cuttack. The main objectives were to:

- Evaluate the pattern of access and use digital resources.
- Find out the purposes for which the digital resources were used.
- Assess the impact of consortia-based delivery of digital resources.
- Know the consortium growth in India.
- Know the usages of CeRA in our Institute.
- To analyze the institute research publication growth from 2014 to till date.
- Evaluating the quality and quantity of publications.

METHODOLOGY

The preliminary study concentrates on the CeRA data usage report for 5 years from 09.022014 to 09.08. 2018 . The usages data was collected from JCCC@CeRA institute admin login. The five year CeRA usages were analyzing by general service usages, Journal wise usages and publisher wise usages.

ANALYSIS AND DISCUSSION

Table 1 Service Usage Report for the Date Range: 09/02/2014 and 08/08/2018

Sl. No.	Group Name	Service	Hits
1.	Successful Logins	Successful IP / Login BASED	5218
2.	Basic Search	Home page	4545
		Results Page	4265
		View All	3532
		View Full text	478
3.	Advance Search	Home page	255
		Results Page	219
		View All	132
		View Full text	59
4.	List of services	View Full text	6448
		Home page	4910
		Results Page	2
		View All	21
		View Full text	270
5.	Print Article	Result Page	121
6.	Download Article	View all	54

During the last five years total number of successful login is 5268. It has been observed that the users of NRRI prefer for Basic Search instead of advance search. During 2014 number of login was 1619 and basic search is high 1456 no. as compared to other years.

Table 2 5 most access Journals from 2014 to 2018

1.	Indian Journal of Agronomy	422	4.36%
2.	Soil and Tillage Research	281	2.90%
3.	Field Crop Research	264	2.73%
4.	Indian Journal of Agricultural Science	245	2.53%
5.	Oryza-An International Journal on Rice	226	2.33%

NRRI scientists accessed total number of 813 journals during 2014 to 2018. Out of 813 journals Indian Journal of Agronomy is the highest number of use journals (4.36%) followed by Soil and Tillage Research (2.90%), Field Crop Research (2.73%), Indian Journal of Agricultural Sciences (2.53%), Oryza- an international journal on Rice (2.33%)

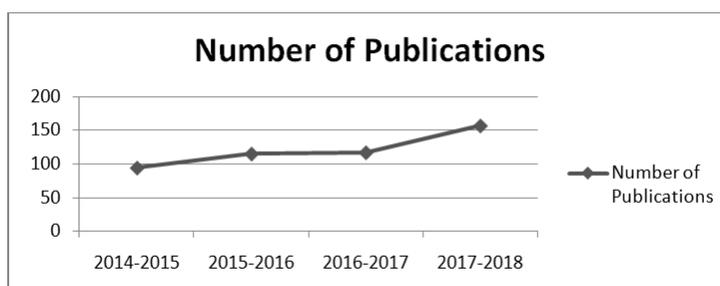
Table 3 5 most widely use Publishers from 2014 to 2018

1.	Elsevier Science	4926	17.68%
2.	Springer Nature	3135	11.25%
3.	Taylor and Francis	1306	4.68%
4.	Indian Society of Agronomy	1194	4.28%
5.	John Wiley and Sons	1036	3.71%

During 2014 to 2018 NRRI scientists were using more number of Elsevier Science publishers Journal (17.68%). In 2015 highest number of Elsevier Publishers journals was accessed at NRRI (2115 times). Springer Nature Publishers Journals were more used in 2016 (948 times) as compared to other four years. Taylor and Francis publishers journals were more use in 2015 (448 times), Indian Society of Agronomy Publishers journals were more use in 2017 (475 times). It shows that users of NRRI were more use in Elsevier Science Publishers Journals.

Evaluating the Quality of Publications by NRRI Users

The quality of publications in an institute under NARS is measured using the NAAS ID (which is the rating of journals in agricultural Sciences, developed by leading experts and fellows of NAAS and is available in NAAS (<http://www.naasindia.org/documents/jrnlist.pdf>). Here at NRRI the number of research papers publication (not include papers present in the workshop/seminar/symposia, book chapter, Training manuals and Research bulletin) are gradually increased in 2014-2015 number of publication was 94, 2015-2016 it was 115, 2016-2017 number publications was 117. In 2017-2018 the number of publication was increased by 157.



The number of publications and average NAAS rating are calculated and it has been observed that there is an increase in quality publications at NRRI, Cuttack. The scientists were like to publish their research papers on high rating NAAS ID journals.

CONCLUSIONS

CeRA is an e-journal consortium facilitating 24* 7 online access of selected agricultural journals to all researchers in NAAS through IP authentication. Starting with the concept of the consortium, we have highlight the important Consortia in the country and their salient features. Specific details of the CeRA have been presented, especially the usages of CeRA at NRRI, Cuttack and try to find out the the quality and quantity of research publications the NRRI scientists were published. The increase in quality and quantity of research papers is not accessible due to CeRA alone and other factors would have contributed to it. This is because of the fact that all publishers/ journals in agricultural sciences are not available in CeRA platform. Nevertheless, CeRA plays a key role in research and development activities in NRRI, Cuttack.

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CHANGING TRENDS IN INFORMATION LITERACY: AN OVERVIEW

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ABSTRACT

Information literacy plays a pivotal role in the development of society. It is a process where people know that what is the information and how they get reliable, authentic information. This paper aims to attempt find the concept of information literacy (IL). The paper shows initially the general idea about information, information literacy with relation to library and information science. This paper highlights the emerging trends and developments of information literacy in the library profession in the present day.

Keywords: *Information, Information Literacy, Technology.*

1. INTRODUCTION

Information literacy is a key component of, and contributor to, lifelong learning. Information literacy is a set of abilities requiring individuals to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information. Information literacy is increasingly important in the contemporary environment of rapid technological changes and proliferating information resources.

Information Literacy skills are essential to fully participate in, and contribute to, the world we live in. Teachers and school librarians, at all grade levels, should develop collaborative working relationships to develop Information Literacy curriculum and to teach Information Literacy skills to all students; and school administrators should actively encourage and support their efforts. Information Literacy is the defining paradigm of modern education. Librarianship in the present digital age is not restrained to the documents rather; the profession has now amalgamated to multifarious subfields. Advancement of technologies and its application in library services, multifarious, multidimensional needs of the users due to inter-disciplinary research are some of the factors which are responsible for the librarian to accept and adapt to the changing situations causing thereby, change in library profession. (Mishra & Mishra, 2010)

CONCEPT OF INFORMATION LITERACY

The concept of information literacy is generally attributed to Paul Zurkowski in 1974. Indeed, since 1974 Information Literacy has been an area of increasing interest to librarians and information professionals and there is a huge amount of literature on this topic (Babu,2008). Information literacy is the understanding information, access and evaluate the different types of information systems and sources in the modern age and fluent in the technology. To be information literate, one should be able to efficiently and effectively locate and use information needed for problem-solving and decision-making. Information literacy is a means of empowerment in today's information-rich environment.

WHAT IS IL?

Information Literacy is set of abilities requiring individuals to “recognize when information is needed and have the ability to locate, evaluate and use effectively the needed information. Legal information literacy as the set of abilities to recognized a legal information need, identify likely information sources and use them to retrieve relevant information , assess the quality of the information and its applicability to a specific situation and analyze, understand and use the information to make good decisions.

According to Chan, an information skilled student must be able to:

1. Recognize a need for information.
2. Know how to accurately identify and define the information need.
3. Know how to locate information effectively.
4. Know how to organize, analyze, interpret and evaluate information.
5. Incorporate selected information in to his/her knowledge base and
6. Use information effectively to accomplish a specific purpose.

DEFINITION

ALA has defined IL in the following words, “Information literacy is the ability to recognize when information is needed and locate, evaluate and use effectively the needed information.” According to Chartered Institute of Library and Information Professionals (CILIP), “IL knows when and why you need information, where to find it, and how to evaluate, use and communicate it in an ethical manner.” “Information literacy is a set of abilities requiring individuals to recognize when information is needed and have the ability to locate, evaluate and use effectively the needed information”.

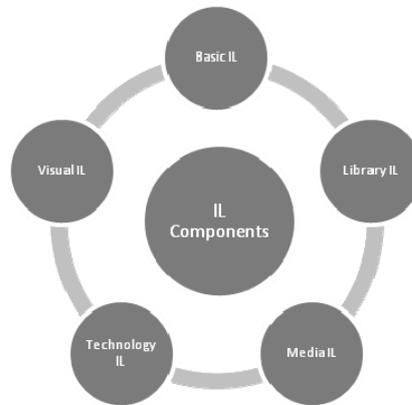
NEEDS OF THE INFORMATION LITERACY

1. To expand information literacy Skills in users.
2. To become independent novic.
3. To make laymen people part of the IT revolution.
4. IT has taken a new shape that's why there is need to promote information literacy.
5. To help librarians to develop, and assess information literacy programme.

FIVE COMPONENTS OF INFORMATION LITERACY

There are mainly five components of information literacy which are according to the nature of IL; it shows the broader aspects of information literacy. (Ferguson). The components are as follows:

1. *Basic Literacy*: Includes Reading, Writing, Speaking, Counting, Calculating and Perception and Drawing.
2. *Library Literacy*: The library is the place where information is stored, catalogued, indexed, and available. This type of literacy includes types of materials, indexing, cataloguing, research process etc.
3. *Media Literacy*: Media Literacy includes an understanding of the many different types of media and the purposes for which they can be used.
4. *Technology Literacy*: Every student should have frequent opportunities to use technological tools to create their own information artifacts — in print, on the screen, and online also.
5. *Visual Literacy*: Visual Literacy is the link between Media Literacy and Technology Literacy. Media images and sound are end products created using the tools of digital technology.



INFORMATION LITERACY IN LIBRARY: To cater the need of library users, it is imperative for a librarian to have an Information literate. An Information literate Librarian can understand the need of users' pattern.

1. General Users
2. Specific context users

To categorize the users in above two categories Librarian should use following methods for garner the requisite insights.

- (i) Library orientation programme
- (ii) Provide services on the basis of Reference interview
- (iii) Access e-database training

It is important to classify the users based on their need for information. This helps a librarian to understand the need of a specific set of user groups and serve them appropriately. It will not only help the users to avail the maximum benefit of resources but will also help librarian to manage the information and users properly.

The librarians should also have regular interactions with the user and find ways and means to serve the user better.

ROLE OF LIBRARIANS

In the past of the graduates entering into the library and information profession, few would say immediately that they were drawn to librarianship to teach. Yet teaching is something that many librarians routinely undertake, through a variety of means. As computers became widespread throughout organisations, increasingly librarians have needed to teach using computers. This started out as teaching users skills such as searching the online library catalogue, however, it very soon extended to teaching end users to search online databases, formulate Internet search strategies and use a variety of subject specific databases and electronic resources,

However, the role of librarians as educators, teaching information literacy skills, either face to face or via the web, or a virtual learning environment has witnessed an enormous growth in the last ten years. It is imperative that library schools provide their graduates with the appropriate skills to carry out this type of work.

Another important issue is the need to embed information literacy skills into the curriculum as early as possible. The lack of professional

librarians in many primary and secondary schools is a key problem. One way of tackling this is for teachers to recognise the important role of the librarians.

AVAILABILITY OF INFORMATION LITERACY

In this era of information explosion, it is very difficult for a user to get the relevant information from the ocean of information. Today everybody more or less has been depended on the facilities available in the different search engines (yahoo, google, altavista...etc) of the world of internet.

Even though it is not easy to turn out the proper source from where the users can achieve the particular data which he/she intended to get but library can guide him/her.

CONCLUSION

Information literacy is the necessity of the information age. It is an understanding to find way through many sources of information without becoming overwhelmed and overloaded. Information skills further helps to acquire, manage and utilize the information for the benefit of the individuals and the society. In this paper, as we are looking forward in the age of information and technology, where everybody need to be perfect in his/her work.

Librarians need to work with new group of professionals, they need to develop new skills, in particular teaching skills, which enable them to deliver these programmes where appropriate, using technology, E learning is offering exciting and new possibilities which the library profession need to reach out and seize. At present, every user wants his/her required information quickly without wastage of time, and for it Information Technology is a boon for LIS professionals because of its time saving feature. All of us ought to be well informed about science and technology to participate in decisions about its role in our societies in regard to library and information science. Hence, without information literacy, it is difficult to understand and retrieve the information from different sources. The librarians, library professionals and information professionals wanted to train the student through the information literacy program.

There is a need for the management to publicize and promote the use of information literacy in libraries to a greater extent.

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INFORMATION SEEKING BEHAVIOUR PATTERN AMONG THE AGRICULTURAL STUDENTS OF INDIRA GANDHI AGRICULTURAL UNIVERSITY, RAIPUR

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ABSTRACT

Information is an essence of research. Agricultural University Libraries play an important role in providing information to the users. The users seek for information in different patterns. In the present study, the authors have made an attempt to know the information seeking patterns of the Under Graduate Students, Post Graduate Students and Ph.D. Scholars in Agriculture of various Agricultural College Libraries of Indira Gandhi Agricultural University (IGKV) in Raipur, Chhattisgarh. The questionnaire method was adopted to collect data. About 100% responses have been received. The study identified various modes of literature search, purpose of visit, type of information gathered, frequency of library visit and time spent in the library. The result shows that there is significant difference among the users of different colleges of IGKV in the preference of various channels of Agricultural information, modes of literature search, purpose of visit to the library and time spent in the library.

Keywords: *Agricultural University Libraries, Information Seeking Behaviour, Library Users.*

1. INTRODUCTION

Students of Agriculture student in Chhattisgarh gather information to obtain higher level of knowledge in the field for preparing academic course assignments and project papers using a variety of information sources and services. Toward improving knowledge about Agriculture student in Chhattisgarh, the basic academic facilities for information-seeking process are necessary. Libraries play an important role in students' information seeking behaviour, which is considered a multifarious, dynamic, social human behaviour that needs a picture as rich as possible to truly understand the phenomenon. Information is

regarded as one of the vital resources in agriculture. The existing information environment is ironic, branded by a propagation of information sources and providers, an array of methods for retrieving information, and a redundancy of content from multiple sources. In this "Information Age" many information users tend to experience a sense of information inadequacy and anxiety. The role of information has been acknowledged as an important aspect in the academic and research activities. However, it is believed that a better understanding of the information needs and the information seeking behaviours of students is fundamental for their achievement. The process of seeking and searching for information also has received considerable attention from researchers, resulting in several models, many of which are centered on information seeking and searching in academic or professional settings. Though the models delineate the processes, they have not shed much light upon how users recognize what or how much information is enough to accomplish their objectives.

2. HISTORY OF CHHATTISGARH

Chhattisgarh is a state in Central India. It is the 10th largest state in India, with an area of 135,190 km² (52,200 sq mi). Chhattisgarh is the 16th most-populated state of the nation. It is an important electricity and steel-producing state of India. Chhattisgarh accounts for 15% of the total steel produced in the country. The state was formed on 1 November 2000 by partitioning 16 Chhattisgarhi-speaking south-eastern districts of Madhya Pradesh. Raipur was made its capital city. Chhattisgarh borders the states of Madhya Pradesh in the northwest, Andhra Pradesh in the south, Odessa in the east, Jharkhand in the northeast and Uttar Pradesh in the north. Currently the state comprises 27 districts. The name Chhattisgarh is not ancient and has come into popular usage in the last few centuries. In ancient times the region was called Dashing Kosala.

3. HISTORY OF IGKV

The university was established on **20 January 1987** in Raipur by the State Legislature (Act No. 20 of 1987) to provide a new dimension to the agriculture development of region of Chhattisgarh erstwhile state Madhya Pradesh, which is known as the "Rice Bowl". Dedicated to perpetuate the memory of Indira Gandhi, the late Rajiv Gandhi, the main aims of the

university are to provide education in agriculture and allied science, to further research particularly in agriculture and allied sciences; undertake field extension programmes for proper transfer of technology and such other purposes related to the aforesaid with the objective of improving the socio-economic level of rural people.

The University Library "Nehru Library" is on main campus. The total holdings in the library are approximately 60,000 books along with theses and periodicals. The library provides documentation service, photocopying service etc. In addition, each college and research station has its own separate library. All constituent colleges have hostels with about 475 seats for men. The colleges have facilities for games and sports. The Health Centre provides free medical facilities for students and staff. Scholarships and Fellowships Merit Scholarship and Merit cum means scholarship of Rs 1500 to 1800 for 5 to 7% students of undergraduate and postgraduate classes. Partial and full free ships are awarded to a fraction of students.

4. OBJECTIVES OF THE STUDY

The study examined the information seeking behaviour of agriculture student of the Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh. Precisely, the focus was on obtaining information on the nature of academic information needed by the students, the sources consulted and the general pattern of information gathering system by the students.

More specifically, the objectives of the study were:

1. To study the information needs and seeking behavior of agriculture student of the Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh.
2. To identify the types and range of information resources used currently by Agriculture student and determine the level of their use.
3. To investigate the availability of information resources that affects the information seeking patterns and communication process of agriculture student.
4. To determine whether or not different kinds of information need leads to different information seeking behavior and communication channels.

5. To identify the information searching methods adopted while searching for Information in the library.
6. To suggest measures for enhancing the use of information sources, and Seeking a synthesis of theoretical elements from information science.

5. METHODS

The questionnaire method has been employed to collect data for the present study and to select the sample population. Random sampling method has been used. According the questionnaire was distributed among 250 Agriculture user of Indira Gandhi Agriculture University and all 250 member have responded the questionnaire.

6. HYPOTHESES

1. All UG & PG Agriculture Students are used to internet.
2. All UG & PG Agriculture Students are used to Agriculture library.
3. Post Graduate Students is mostly preferred to use of e-recourses.

7. ANALYSIS OF DATA

Describes the use of internet by UG& PG Students. It is evident that all UG& PG Students are using the Internet. It also indicates that the information available on the internet has proved to be a great asset for many of the respondents. Total 250 Students given the questionnaires, all questionnaires taken by the agriculture students.

It was found that regularity plays a key role in updating of knowledge of human beings. In the present study, of the total respondents, about 48.40% visited the library daily; 09.20% visited alternate days; 14.40% visited twice in a week; 18.40% visited once in a week and 09.60% visited the library occasionally.

Table 1 Frequency of Library Visit by the Respondents

S.No	Category	Frequency	Percentage
1	Daily	121	48.40%
2	Alternative days	23	9.20%
3	Weekly one time	46	18.40%
4	Weekly two time	36	14.40%
5	Occasionally	24	9.60%
	Total	450	100

Table 2 Duration the use of the library of user surveyed

S.No	Duration the use of the Library	Responds	Percentage
1	30-45 minutes	139	55.60%
2	45-60 minutes	65	26.00%
3	1-1.5 hr	22	08.80%
4	1.5-2.00 hr	24	09.60%
	Total	250	100%

Maximum numbers of users 55.60% are spending in the library within 30-45minuts and26.00%users are spending within 45-60 minutes. Whereas only 8.80% are spend in the library withing1-1.5hours. While 9.60% are spend in the library within 1.5-2.00 hours respectively.

Table 3 Usage of Library Resources by the Respondents

S.No	Library Resources	Respondents	Percentage
1	Text Book	144	57.60%
2	Reference Book	44	17.60%
3	Journal Book	11	04.40%
4	Journals	29	11.60%
5	News Paper	09	03.60%
6	Internet	13	05.20%

It is clear from the Table 3 that the highest percentage of the respondents who used to read text books was about 57.60% while the lowest percentage of the respondents who used to read News paper 17.60 %. The highest percentage of the respondents who used to refer reference books was about 03.60% while the lowest percentage of the respondents who used to refer about journal book 30. %.

Table 4 Readers comment on necessary of internet and Xerox facility in the library

Internet and Xerox facility	Respondents	Percentage
Very necessary	210	84.00%
Necessary	40	16.00%
Not necessary	0	00.00%
Total No of Users	250	100%

It is clearly state that the maximum numbers of users 84.00% have openly expressed that the very necessary of internet and Xerox facility in

the every library for the information explosions age and 16.00% user have said only the necessary of internet and Xerox facility in the library.

CONCLUSION

The study on “Information Seeking Behaviour Pattern among the Students and Faculty in Indira Gandhi Agriculture University” is very helpful in documenting Information Literacy and Library Information Services. The respondents in this study area have varied levels of knowledge on information services. The study also quantified the respondent’s time allocation to visit library. Majority of the respondents have utilized the library only to read text books. The research helped to find out the association between different levels of respondents and opinion about the reference services. Based on the use pattern of the university libraries, care has been taken to attract the users to visit library more frequently and spend their valuable time in the library to exploit the agricultural university library information Resources, facilities and services to meet their user’s needs.

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