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Dr. Nihar K. Patra

Manipur University, patranihar@gmail.com

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Disruptive Innovative Library Services @ international Nalanda University: Present and Future Roadmaps

By

Dr. Nihar K. Patra

**University Librarian, Manipur University, Imphal, India
Ex-University Librarian, Nalanda University, Rajgir, India**

ABSTRACT

This paper discusses on innovative technologies that have implemented at international Nalanda University, Rajgir, Bihar, India and also planning to implement some other advanced tools and technologies in future. The Nalanda University is avant-garde International University, a truly “sui generis” supported by 17 partner countries of East Asia Summit. The Government of India designates it as an “Institution of National Importance” under Ministry of External Affairs. The Nalanda University envisions its library to be the central fulcrum of its master plan, both in terms of its design and bearing. This paper explains in details about the services which are categorized into five different areas such as (1) Infrastructure (2) Collection Development (3) Emerging Tools and Technologies (4) Research Support Service (5) Other Social Responsible Activities. Under the “*Infrastructure*” this paper enumerates in details about the good ambience for best study environment for the users to attract towards the library; illustrates various types of resources, setting up a Common Archival Resource Centre (CARC) and Digitization of Nalanda’s Discovery under “*Collection Development*”; and also explains various types of “*Emerging Tools and Technologies*” to reach out the to the users such as Integrated Library Management System (ILMS), Customized Online Public Access Catalogue (OPAC), Web-scale Discovery Service (WSDS), Library Portal, Remote Access and Single Sign-on, Institutional Repository, Radio Frequency Identification (RFID), A to Z Link and Open URL Link Resolver, Cloud Computing, Electronic Resource Management System (ERMS), Course Reserve, M Library, Content Management System (CMS), Google’s Custom Search Engine (GCS), Artificial Intelligence (AI), Virtual Reality (VR) & Augmented Reality (AR), Gesture-based Computing, Crowdsourcing, QR Code, Internet of Thing (IoT), Popular Aisles, Library Utensils, 3D Printer, Library Wearable, Learning Management Systems, Web 2.0, and MakerSpace. This paper also

explains in details on Information and Reference Services, Reference Management Tool, Citation database, Thesis and Dissertation, Scholarly Archive, Anti-plagiarism Tool, Academic Writing, Personalized Research ID, Data and Visualization Service, Copyright and IPR issues, Information Alerts on Core and Allied Subjects under “*Research Support Service*”. It also elucidates in details about “*Other Social Responsibilities Activities*” such as Mobile Library Service, Workshops for local communities, Libraries in Jails, Competitive Examinations Centre

Keywords: Nalanda University, Emerging Tools & Technologies, Library and Information Services, Innovative Services

1. INTRODUCTION

The name Nalanda (synthesis of NA+Alam+Da meaning giver of inexhaustible knowledge or Vidya-Dana) – the very word invokes an awe-inspiring story of knowledge generation and dissemination, unlike any known before, in history. An ancient seat of learning, Nalanda lasted continually for almost 800 years from approximately 425 CE to 1197 CE (Thakur, 1995). It is an icon for cross-cultural interaction and intra-regional connectivity around the globe. Located in Bihar, India, near the site where the Buddha attained enlightenment, the centre of learning at Nalanda was a major hub for educational and intellectual exchange and the creation and dissemination of knowledge among Asian societies – a flourishing university (called this centre of learning “Nalanda University” and described it as the world’s first education institution of higher learning) with over 2000 teachers and 10,000 students. The library is a potent instrument of any educational institution and the Nalanda University carries the rich legacy of having the best library in the world in its glory days. After Hiuen Tsang, the two Korean monks Tche-Hong and Hoiye, and another Chinese monk named Ke-ye came to Nalanda monastery to study by utilising its unique libraries, which were rich containers of the Buddhist texts. The library was situated in a special area known by the poetical name of Dharmaganja (Mart of Religion). It comprised three huge buildings called Ratnasagara (Ocean of Jewels), Ratnadadhi (Sea of Jewel) and Ratnaranjaka (Jewel-adorned), of which Ratnasagara was a nine-storied building, was one of the world’s oldest skyscrapers and was specialised in the collection of rare sacred works. In the account of Hiuen Tsang, we find that the manuscripts were arranged on stone shelves dug out

on the walls. Usually, the teachers, who used to teach a particular subject, was the chief of that particular subjects' collection in the library and guided his students suitably. The devout copying of sacred works was part of the study at Nalanda. The endowments, which were presented to Nalanda by the king of Java and Sumatra, Balaputradeva, included provisions for the copying of manuscripts. I-Tsing mentions that after the expiry of Buddhist scholar at Nalanda, his collection of the manuscript was added to the library and other properties including non-Buddhist works were disposed of. As a result, the library of Nalanda ultimately became a grand storehouse of priceless manuscripts (Kumar, 2011). Mukherjee (1966) describe that the library at Nalanda had a rich stock of manuscripts (over 9 millions) on philosophy and religion and contained text relating to grammar, logic, literature, the Vedas, the Vedanta, and the Samkhya philosophy, the Dharmasastras, the Puranas, Astronomy, Astrology and Medicine (as cited in Bhatt, 2009). The Nalanda University and its library was flourishing, but a great fire wiped out the library of over 9 million manuscripts at the beginning of the 12th Century, the Muslim invader Bakhtiyar Khalji sacked the university (“Ancient universities in India”, n.d.) and it is reported to have burned for three months. Like all universities, the imagined Nalanda Library University had to have had a library in Figure - 1 (Asher, 2015).



(Figure – 1. Great Monument. The stupa base in the foreground is imagined by some to be the location of Nalanda Library)

Eight hundred years after the destruction of ancient Nalanda University, the former president of India, Dr. APJ Abdul Kalam, while addressing the Bihar State Legislative Assembly in March 2006, mooted the idea of reviving Nalanda University. Dr. Kalam said it should be a university that will revive the glory of ancient learning and should combine traditional thought with modern

scientific learning. The state government of Bihar consulted the Government of India and moved to identify a suitable location for the campus of the new university and acquired 450 acres of land in Rajgir. The Government of India, set out to find the best minds it could put together to deliberate on the form and structure of new University and the international co-operation and partnership which would govern the establishment of the University, and finally, the Nalanda mentor group was formed to oversee this project in June 2007. Subsequently, the Government of India decided to share this proposal with the leaders of the East Asia Summit (EAS). The proposal was first shared with the members of the EAS at the Cebu Summit in the Philippines in January 2007. The Members States welcomed the regional initiative for the revival of Nalanda University. At the fourth Summit held in October 2009, at Hua Hin, Thailand, members supported the establishment of the Nalanda University and encouraged regional networking and collaboration between the University and existence centres of excellence in East Asia. The University regards East Asian countries as partners and sees their role as central to once again forming links between nations separated by geography but linked to one another for centuries. These links were obscured somewhat due to historical reasons like colonialism but there has in the last few years been a rediscovery by Asians of their past links. The rediscovery of inter-Asian linkages, in recent times has led to much more inter-Asian interaction, and this rediscovery is also proving to be inspirational. The Nalanda University is envisaged to be an icon of the new Asian “renaissance” – a place that will be the centre of this inter-civilizational dialogue. The Nalanda University Bill was drawn up and passed by both Houses of Indian Parliament in August 2010. Subsequently, the Act was notified and the Nalanda University formally came into being on 25 November 2010 and its academic operations commenced in 2014.

Nalanda is perhaps the only University with the mandate to promote peace and harmony through knowledge. With a distinctive empirical and experiential model of learning, Nalanda is inspired by the academic excellence and global vision of its historic predecessor and aspires to meet and set global standards of academic excellence and research and enable capacity building in all areas of higher learning in the members' countries. With the support of the Members States of the East Asian and the Intergovernmental Memorandums of Understanding signed by 17 countries, this International University is poised to emerge as a shining example of Asian collaboration.

Further, (Singh, 2018) affirms that with an objective of reinvigorating India's historical linkages with Asia and East Asian countries the University invades to reinvent the University knowledge systems to suit the needs and demands of 21st Century. The University is in the process of establishing itself in ensuring a "Man-Making" education (Swami Vivekananda) while focusing on the emerging domains of knowledge. The University campus will be the first of its kind with a net zero environmental impact. This would mean that the University will be completely self-sustainable from sending out zero Waste into the environment. The University structure is designed and inspired by ancient archaeological and astronomical practices. For instance, the incorporation of the Kalachakra concept to mediate a smooth operation and a successful expansion of the University. It is an attempt to tie up the historical legacy inherited by the University with one of the most urgent contemporary issues that needs to be addressed – environmental sustainability (Professor Sunaina Singh: An Institutional Architect, 2019).

To meet the mission and vision, the Nalanda University envisions its library to be the central fulcrum of its master plan, both in terms of its design and bearing. The new library was established in 2014 and started functioning in a big hall. The library aims to become an apex resource centre with state-of-the-art resources (print and digital) and services. It will be a constant companion in the academic journey of the entire community of the university and contribute to the quest for the creation of new bodies of knowledge. The university library is committed to excellence in services and supporting intellectual inquiry, research and lifelong learning needs of the university community. Its vision is to provide seamless access to information through innovative services that drive intellectual exchange and foster interdisciplinary cross-campus research. It is also committed to build an intellectual centre ensuring access to quality resources in a variety of easily accessible formats for the overall growth of students and teachers. The image of the upcoming new library of Nalanda University is given in Figure 2.

Figure – 2



2. INNOVATIVE LIBRARY SERVICES: PRESENT AND FUTURE

In a short span of time, the Nalanda University Library is providing innovative services to its users using the latest tools and technologies, and planning to introduce other high ended tools/technologies in future. Broadly, the services are categories into five different areas such as (1) Infrastructure (2) Collection Development (3) Emerging Tools and Technologies (4) Research Support Service (5) Other Social Responsible Activities.

2.1 Infrastructure

It is important to have a good ambience for best study environment for the users to attract towards the library. The upcoming library building will build-up with aesthetic designs which signifies the receptacle knowledge as the heart of the University. It is ideal climatically since it is one large solid volume with an indirect source of light. A solid external shell also means better insulation with controlled light. The Stupa (Library) is broken into smaller segments, allowing different scales of spaces, different alignment with the sun and moon, all of which will help in the dramatic quality of light inside. The total build-up area for the Phase – 1 of Nalanda Library is approx 14703 Sqm and is designed to accommodate 1000 people at any given point of the day. The various sections of the library will be created, i.e. Lecture room, Group discussion, MakerSpace, SnackBar, Audio/Visual Room, Rare collections, Reading/Carrels, VIP Room, Exhibition, Special reference room, Reprographics, etc.

2.2 Collection Development

The breadth and depth of the library's collections (print and e-resources), and the services that underpin them are crucial aspects of the university's teaching, research, and engagement with the wider community. Therefore, the Nalanda University library will build a rich collection of both print and e-resources and will deliver access to the world's scholarly information.

2.2.1. Print and E-resources

The library generate new knowledge, information resources and data will be collected, curated, and to create the platform, systems, and network to disseminate it with a national and global community. The library shall have various types of resources such as book, journals, e-books, e-journals, online database, primary sources (newspapers, diaries, speeches, letters, photographs, census records and government documents, physical objects, etc), thesis & dissertations, patents & standards, maps & atlas, video & audio, rare books, reports etc to meet the information needs of the university community. The library's collection development is a continuous process. Contemporary and relevant resources are the part of collection development of the Nalanda University Library. Currently, library is in building up the print collection and has good numbers of e-resources like's e-books, online databases, e-journals, etc.

2.2.2. Setting up a Common Archival Resource Centre (CARC)

As the university aims to further recover centuries-old cultural and civilisations heritage, thereby supporting new modes of scholarship and intellectual inquiry, Nalanda will be a locus of histories related to ancient cultural and religious linkages as well as human values and ethics. The Ministry of External Affairs supports the possibility of establishing a "Common Archival Resource Centre" at Nalanda University. This resource centre will aim to enable and empower the inter Asian interactions through its rich knowledge repositories. The university will provide a platform for cross-culture and transnational sharing of knowledge amongst the scholars coming from ASEAN countries, thus helping to strengthen ties with the Asian community (Singh, 2017). To preserve information/documents on history, culture, religion, environment of ASEAN and South East Asian countries, the library plays a vital role in this. The Physical form as well as electronic version of various type of resources such as book, journals, e-books, e-journals, online

database, primary sources (newspapers, diaries, speeches, letters, photographs, census records and government documents, physical objects etc), thesis & dissertations, atlas, video & audio of eminent person, rare books, original manuscripts, reports will be archived and made accessible. A portal will develop and implement crowdsourcing technology so that resources of associated countries will be linked together and information can be obtained, added, edited from a large number of likeminded people. These resources will classify and index according to the country-wise and resource's type.

2.2.3. Digitisation of Nalanda's Discovery

The library also develops an open digital archive of Nalanda's rare collections such as manuscripts, scriptures, commentaries of great thinkers and philosophers, and work of theology, etc, to resurrect Nalanda her ancient glory. The rare collection at Nalanda University will lay the groundwork for the creation of a digital collection of key manuscripts from Bihar, India. In turn, this effort will benefit national and international research, while promoting area study in Bihar on a global scale. At the same time, the digital archive system at Nalanda will evolve as a digital library, focusing first on Bihar and later on the entire Indian subcontinent.

2.3 Emerging Tools and Technologies: Reaching Out to Users

There are various tools and technologies that can increase the library service to reach out the users.

2.3.1. Integrated Library Management System (ILMS): Since there are number of open source ILMS such as Koha, NewGenLib, Evergreen available in today's market to automate the workflow operation of the all sub-systems of a library system integrating traditional as well as contemporary services, considering features and technologies deployed in Koha, the library has implemented it.

2.3.2. Customized Online Public Access Catalogue (OPAC): The library has a customized OPAC implemented through Koha looking at users needs. At present, the resources

integrated with OPAC are books, journals, e-books, e-journals, educational CD-DVDs, maps and can be searched through advanced search.

2.3.3. Web-scale Discovery Service (WSDS): Library has implemented Summon Discovery service, an online search tool that provides a unified index of multitude e-resources using the single search box. The single search box has also integrated into OPAC and library portal. This service saves the user's research time to retrieve their required information from various sources and formats. Other discovery service tools are also available such as EBSCO Discovery Service, VuFind, Primo Central, Worldcat Discovery Service, etc. and the library can choose as per their requirement.

2.3.4. Library Portal: The library has developed a library portal for one-stop-shop access wide range of information such as resources (p & e), services, rules and regulations, news, events and indexes. It is recommended that library portal should be clean, sleek, easy to navigate, user-friendly, text colour in library portal should be attuned with old aged group for their vision and should not use library science jargon which will be difficult to understand the users.

2.3.5. Remote Access and Single Sign-on: Library has implemented remote access to e-resources through RemoteXS. Users can access and download the full-text e-resources (such as e-journals, e-books and all other e-contents) outside the campus. The remote access is a one-time access authentication and authorisation service. Based on the need of the library they can also opt for other remote access tools such as EzProxy, VPN, Shibboleth, OpenAthens, etc.

2.3.6. Institutional Repository: To archive intellectual scholarly output created at Nalanda University, the library is working with the open source digital library software, i.e. DSpace. It manages and disseminates the university community's intellectual work, and for this purpose, there are the number of open source and proprietary softwares available such as E-print, Fedora, and Greenstone. The following contents are the part of this archive of Nalanda University.

- Faculty Publication
- Course Materials
- Projects, thesis, articles and case studies of students/faculty
- Lectures delivered by eminent visitors at Nalanda University

- News items and Photo albums related to Nalanda University

2.3.7. Radio Frequency Identification (RFID): The implementation of the RFID system is in the pipeline. It is a form of automatic identification and data capture technology. It stores and retrieves data from computer chips using radio frequency transmission. This technology can be used in the library for self issue/return, automatic inventory control, shelf rectification etc. It can facilitate the tracking of books within the library. It provides improved security in libraries. There are various manufacturers of RFID system such as Bibliotheca, FE Technologies, Nedap, Tagsys, Rapid Radio, and the library can choose based on their budget and functions.

2.3.8. A to Z Link and Open URL Link Resolver: The library has complete list of e-resources accessible to its users through Serial Solution's A to Z list and enables the user to access full-text resources through Open URL link resolver, i.e., 360 link. This technology can also implement through other product such as SFX, OCLC Link resolver, EBSCO Link resolver, etc.

2.3.9. Cloud Computing: These days cloud computing is an emerging area in the library to provide better services to its users where information can be made available from anywhere, anytime and from any device through internet. The library is providing some of the services through cloud-based such as remote access, discovery service, anti-plagiarism tool. Further, the library is planning to have cloud base technology for other services through the university server space, to be procured soon.

2.3.10. Electronic Resource Management System (ERMS): For systematic management and optimal utilisation of e-resources, it is important to use ERMS in any library. There are number of ERMS software are available such as Alma, CORAL, Innovative ERM, TDNet ERM Solution. The library is planning to implement open source ERMS, i.e. CORAL.

2.3.11. Course Reserve: From the very beginning the library is proving course reserve service to the students by collecting the materials, both from print and e-resources, as per the request of the course instructor. The students search by instructor name, course name, department by login into their user ID in digital library software i.e. DSpace.

2.3.12. M Library: These days almost everyone has a mobile. Therefore, it is an essential role for the library professional to provide library contents through the mobile device,

called M library. The Nalanda University's library portals, OPAC, Discovery service, Remote access are very much compatible with the mobile device, and in the process to implement issue/return/renewal notice and reference service via SMS and voice call.

2.3.13. Content Management System (CMS): The system used to organise and facilitate collaborative content creation is called (CMS). There is various softwares available to develop a dynamic library portal such as Joomla, Drupal, Wordpress, LibGuideIt to manage its contents; however, the Nalanda University library has used Wordpress for the same.

2.3.14. Google's Custom Search Engine (GCS): It allows anyone to create their search engine by him/her. Search engines can be created to search for information on particular topics chosen by the creator which helps to eliminate any unwanted websites or information. Creators can also attach their custom search engine to any blog or webpage. Search is based on Google's core search technology, and users get high quality, relevant results.

Apart from these technologies and services, the libraries can also think of for the following emerging technologies:

2.3.15. Artificial Intelligence (AI): AI is the simulation of human intelligence processes by machines, especially computer systems. These processes include learning (the acquisition of information and rules for using the information), reasoning (using rules to reach approximate or definite conclusions) and self-correction. Particular applications of AI include expert systems, speech recognition and machine vision (Burns, and Laskowski, n.d.). Recently, "Plutchik" has developed – a voice-enabled, embodied artificial intelligence (AI) chatbot that can perform highly technical medical search in and across the NCBI suite of databases. This project aims to create an "empathetic" embodied AI chatbot to search, retrieve, analyse, and communicate Medical information and to interact with health care providers in natural language and "voice" using 3D facial expressions and gesture (Bohle, 2018). This technology in the library context can be called as Virtual Reference Librarians (Chatbots).

2.3.16. Virtual Reality (VR) and Augmented Reality (AR): In the words of (Oyelude, 2017), VR is the computer-generated simulation of a three-dimensional (3D) image or environment that can be interacted with in a seemingly real or physical way by a person using special electronic equipment, such as a helmet with a screen inside or gloves fitted with sensors and AR is the use of technology to overlay digital information on an image of something. It

superimposes a computer-generated image on a user's view of the real world, providing a composite view. Both technologies aim to make the user feel a sense of being there experiencing what is being viewed in real time. Further as described by the University of Indiana University, Bloomington's Blogspot VR "involves using 3D graphics and advanced interactions to immerse a real-world user in a simulated environment", and UWS defined at their website that AR stands for extended reality and actually, in technical terms, means a combination of virtual and real reality (UWS, 2018). Looking at the implication of VR & AR technologies, (Oyelude, 2018) described that the Teachers can take their students on a VR and AR tour with Google Cardboard and Aurasma. VR apps can be used with laptops, iPads and other mobile devices or electronic whiteboards. Libraries can use these too in serving their clientele. Some examples of these apps (free) are as 360 Cities (www.360cities.net/) – this takes the user to any place in the world with a 360-degree view; _ AugThat (<http://augthat.com/>) – this features a large content-based VR library, and Look at the ISTE Librarians Network Webinar. The other device for creating VR & AR is, HTC Vive, TechViz , Lumberyard, Google Tilt Brush,

2.3.17. Gesture-based Computing: Interfaces where the human body interacts with digital resources without using common input devices, such as a keyboard, mouse, game controller, or voice-entry mechanism. This interface can provide expanded or easier access to users with disabilities. This technology could give people with visual or other impairments much greater freedom in accessing in library's computers. The gesture recognition interfaces are currently being developed(or improved) for reading facial expressions, sign language, head and body motion and eye movement (Babbar, 2014).

Figure: 3



(Source:

<https://www.newscientist.com/article/mg20727735-400-gesture-based-computing-takes-a-serious-turn/>)

2.3.18. Crowdsourcing: Library can use this technology for improving their quality of data, information and resource by involving a high level of the public where they can add comments, tags, and review. This result strengthens the quality of information with a rich and diversified collection and also encourages a sense of public ownership and responsibility towards cultural heritages, and undiscovered information. The library can use Web 2.0 and Zooniverse for this purpose.

2.3.19. QR Code: QR (Quick Response) code is a matrix barcode readable by smartphone and mobile phones with cameras, sometimes referred to as 2d codes, 2d barcodes or mobile codes. These codes can be linked to songs, video, websites or other information. Libraries can use this code in stacks or magazine/journal area to point out online electronic holdings of print materials or subject guides. There are some good software to generate QR code are Visualead, QR-Code Monkey, QR-Code Generator, QFuse, and Unitag QR.

2.3.20. Internet of Thing (IoT): According to Techopedia “IoT” is a computing concept that describes a future where everyday physical objects will be connected to the Internet and be able to identify themselves to other devices. It tracks the room usage and program attendance to monitor humidity levels for special collections. The Hillsboro Public Library in Oregon has introduced the Book-O-Mat, a self-service kiosk located in Hillsboro’s central plaza and stocked with new and popular books and movies. Located in a high pedestrian traffic area, the Book-o-Mat is monitored from the main library a few miles away to track usage, alert the library when restocking is needed, and identify popular selections for informed collection development. It gives statistics on usage of library resources, a map indicating areas of library most used.

2.3.21. Popular Aisles: The library can use the pressure pads under the floor to count the users and to know which part of the library is most effectively used. This helps the librarian for collection development and the possible area where improved signage might be required.

2.3.22. Library Utensils: The library can facilitate this utensil to its users in the reading room for translating words in the print book and make digital highlights.

Figure: 4



(Source: <https://exploreworldlibrary2016.blogspot.com/2016/06/library-utensils.html>)

2.3.23. 3D Printer: 3D printer can be facilitated to the library users for making three dimensional solid objects from a digital file. In this printing process, an object is created by laying down successive layers of material until the object is created.

2.3.24. Library Wearable: The library can use the wearable “library card” as depicted in Figure – 5. The wrist band could hold the patron information and scan the band at various stations which allow the patron access to the library, computers, self-issue/return, and access resources.

Figure: 5



2.3.25. Learning Management Systems: The library can also help the organisation by implementing learning management tools such as Moodle, MyClasses, Torch LMS, Easy Campus for helping the learning process like administration, documentation, tracking, reporting and delivery of electronic educational technology (also called e-learning) education courses or training programs.

2.3.26. Web 2.0: Although this technology is already widely spread with the library profession, it is essential to notify here to update with relevancy and updated tools. It is the second generation of tools and services available on the internet, which enabled the expansion of the forms of direct participation of networked actors, including the creation and

sharing of information and online content. The library can use this tool for storing and disseminate their information through technology. The tools for this technology are messaging services (e-mail), blogs, forums, wikis (Wikipedia), social networks (Facebook, Twitter, LinkedIn and others), search engines (Bing, Google, Yahoo!) and systems connection, production, publishing and interaction with photos, sounds, music, videos (podcast, videocast, Flickr, YouTube, Skype, Windows Live Messenger, Google Voice, etc.), RSS Feed.

2.3.27. MakerSpace: Makerspaces in libraries are devoted to creative idea development and production, to support for people to access material not normally available in their homes, and to opportunities to join others in creating and making things; thus also to the provision of social spaces for practical and creative activities. They are presented as spaces that focus on hands-on involvement combined with play and especially fun. The library makerspace thus extends makerspaces to knowledge spaces (Fourie, and Meyer, 2015). Library offer resources to create makerspace such as woodworking, laser cutting, computer programming, robotics, 3D printing, self-publishing, welding and collaborative work spaces.

2.4 Research Support Service

The Nalanda University library supports every stage of research lifecycle of the researcher to meet the research excellence of the university by implementing various tools and technologies.

2.4.1. Information and Reference Services: The Nalanda University library offers this service in person or by e-mail in finding the information or sources available in the Library or elsewhere as per the demand of scholars and academics to support their work. It is recommended that the reference librarian or subject librarian can perform well to do this job.

2.4.2. Reference Management Tool: The reference or citation management or bibliographic management software is a software that helps scholars and authors for recording and utilising their bibliographic and citations which enables them to be the efficient and reliable process for producing research papers. The Nalanda University Library is using “Refwork” for this purpose. However, other softwares are also available, such as Zotero; Mendeley; Endnote

2.4.3. Citation database: The research use the citation database for evaluating the publications, count the citations and can easily know the number of eminent researchers are working-in. Scopus, Web of Science InCites are used mainly for the citation databases.

2.4.4. Thesis and Dissertation: The Nalanda University library also supports the researcher by acquiring database such as ProQuest Thesis and Dissertation, ShodhGanga, NDLTD wherein million of full-text thesis and dissertation are available.

2.4.5. Scholarly Archive: The scholarly archive databases such as Google Scholar, SSRN (formerly Social Science Research Network), RePEc (Research Papers in Economics) are linked into the library's portal so that researcher can view and browser the papers in which millions of papers are archived.

2.4.6. Anti-plagiarism Tool: The Nalanda University is using Turnitin – an anti-plagiarism tool for the researcher to improve writing and prevent plagiarism. Turnitin's formative feedback and originality checking services promote critical thinking, ensure academic integrity, and help students become better writers.

2.4.7. Academic Writing: The library has license version of the “Grammarly”, an online proofreading tool, checks the text for grammar, punctuation and style, and features a contextual spelling checker.

2.4.8. Personalized Research ID: The function of the library is to aware their users to know about the personalized research ID such as ORCID (Open Researcher & Contributor ID), Scopus Author ID, and Thomson Reuters/Web of Science research ID to create the unique identifier which helps the researchers to manage their publication lists, track their citation, identify potential collaborators and avoid author misidentification.

2.4.9. Data and Visualization Service: With the concurrent growth and availability of digital data there is an increasing demand for the skills to make sense of this varied and complex resource. From supporting researchers' data needs across the research lifecycle to preparing students for an increasingly data-focused job market, libraries are in a position to provide specialised services and resources to develop and support critical data science and data visualisation skills (Gurley, 2019). The software used for this service is OpenRefine and Tableau Public

2.4.10. Copyright and IPR issues: The essential role of the library is to create awareness about the copyright and IPR issues to their authors and creators. SHERPA – the publisher copyright policies and self archiving is a very handy and useful for the researchers.

2.4.11. Information Alerts on Core and Allied Subjects: To update the researcher about new researches, innovations and technologies being used in their core and allied subject, news alerts service should be introduced in the library. The electronic version of the e-news alert would be cost-effective, easily searchable and accessible, interactive etc. Each news should be covered with informatics abstract and linked with full text.

2.5 Other Social Responsibility Activities

The library should take initiative the social responsibility activities or library outreach programme for the benefit of local communities, as described below, but not limited to.

2.5.1. Mobile Library Service: The Nalanda University library processes to submit a proposal for rendering quality education through mobile library service to the rural villages in Nalanda district. Though there are several factors for improving the quality of education, however, one factor is to provide through a healthy reading habit which can transform a person and access books and reading material relevant to the target group can transform a community. The Nalanda University's mobile and outreach library service shall attempt to enhance literacy and overcome the lack of access to the reading facilities, latest news, happenings around the world, information regarding government policies and programmes and children's reading habit, health, career guidance, nutrition, etc in the rural villages of Nalanda district. For this service, a modern vehicle shall be designed and facilitated with TV, PC, Internet provision, Scanner, Photocopier, CD/DVDs reader, e-book reader, multimedia station, etc for carrying reading and learning materials.

2.5.2. Workshop: The library shall conduct workshops in local schools to awareness in students for e-resources, open source information, etc.; open access information for local communities, and for local library professionals on open source library automation & digitisations software.

2.5.3. Libraries in Jails: The planning of the library is to initiate this project to set up the library in the jails of Bihar state of India to educate the jailed persons. This service will help the prisoner to become good citizens of the nation.

2.5.4. Competitive Examinations Centre: It is also proposed that a section for the preparation of the competitive examination like UPSC, Ph.D., NET, etc. to create for the Nalanda University's students as well as for genuine students of the local areas. In this section/centre, competitive examination related books and periodicals shall be kept for all category of students.

3. CONCLUSION

Now the Nalanda University Library is in its infant stage. It is an opportunity for us to participate in the revival and development of the library from scratch, implementing the latest tools and technologies. To meet the vision and mission of the University, the library will facilitate conducive and user friendly access to current, global, and contemporary information by identifying, acquiring, organizing, and disseminating information in various formats (print & electronic) to serve the information needs of the academic fraternity of University to meet their teaching, research, consulting, training, and learning needs. This Library would be an exemplary knowledge repository providing high quality service-oriented in East Asia counties keeping cross-cultural interaction and intra-regional connectivity around the globe. This paper would be a handy tool to implement the latest tools and technologies in other academic libraries.

Disclaimer: The technologies described above are of personal views/opinions of the author.

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