Emerging Trends And Technologies In University Libraries

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Abstract

This paper emphasises on the most recent advancements in technology and trends in university libraries. With regard to digitalisation, RFID implementation, library automation, institutional repositories, consortium-based services, virtual/digital reference services, CAS/SDI services, Web 2.0, 3.0, and 4.0-based services, usage of social media, semantics, artificial intelligence, etc., these new developments in the fields of libraries and information services are the focus of this paper.

Keywords: Web2.0,3.0,4.0, Institutional Repository, Artificial Intelligence, Library automation, Digitisation, RFID, CAS/SDI, and Social media.

1.Introduction:

Academic libraries serve the demands of research, publications, concept and knowledge preservation, as well as teaching and learning. ICT is the fusion of science, technology, and information delivery techniques. ICT encompasses a broad spectrum of technology tools and resources used in communication. They are used for handling, producing, distributing, and gathering data. It is supportive of libraries' sustained expansion and their function in the transition to knowledge-based societies.

2.What is Emerging Technologies:

Emerging technologies are those that are brand-new and cutting-edge and are either being developed right now or are expected to be developed shortly. The capacity to profoundly affect several sectors and parts of everyday life is a common trait of such technologies. University libraries often house state-of-the-art technology. These technologies are frequently still in their infancy. Though they might still need to be widely adopted, they have the power to transform many sectors and enhance our quality of life.

3.Emerging Technologies in Libraries

The newest developments in academic libraries are listed below.

• Library automation:

A complicated program or database called an integrated library system (ILS) or library management system (LMS) combines several different library functions. The particular tasks, often referred to as "modules," such acquisition, cataloguing, circulation, serials, etc.

• Library Digitalization :

Having electronic access to resources can facilitate the storing and retrieval of information. It assists libraries in cutting costs and space usage.

• Consortia based services:

Librarians should place a strong emphasis on pooling resources through consortiums and group buying, as this will help them manage budget cuts and other cost-cutting measures.

• Institutional Repository :

University libraries should develop Institutional Repositories to access digital resources.

• Digital Library Service:

The younger generation has begun to favour eBook readers over other reading devices, with the kindle, calibre, nook, iPad, Sony Reader, and Adobe digital edition being particularly well-liked.

•Instant Messaging(IM):

Libraries already make use of instant messaging (IM) to provide "real-time reference" services, which function similarly to in-person conversations between patrons and librarians.

•RSS Feeds:

On the one hand, the technology supports XML, which allows websites or e-publishers to showcase the most current updates, such as journal tables of contents or new articles.

• HTML Feeds:

HTML codes can be added to websites, and HTML feeds give consumers access to information more quickly.

• Streaming Media:

In order to play back or show multimedia material in real time, the provider sends it in batches over a computer network. Multimedia streaming is the term used to describe this.

•Podcasting:

Many libraries use podcasts as a tool for their orientation programs. Using podcasting and other consumer technologies to disseminate library services and content is a tremendous advancement for the library profession.

•Vodcasting:

Vodcasting is a method of transmitting video material, as opposed to podcasting which is used to communicate audio data. Listening to vodcasts on a personal media assistant (PMA) or laptop is similar to listening to podcasts.

• SMS Enquiry Service:

Customers can use their mobile phones to SMS the library with questions via the SMS enquiry services. When a reference staff member receives a question like this, they can quickly provide an answer or a link to a more comprehensive response.

•Blogs:

A blog gives a person or group of people the ability to publish stuff and offer discussion on it. Technologically speaking, blogs are more user-friendly, cross-platform, and available online via the Internet.

• Wikis:

A wiki is an editable database of web pages that anyone with a basic understanding of markup may add to or edit.

• RFID

RFID is used for theft detection systems and library circulation operations.

• QR Code :

Users can quickly scan a QR code to find out a library's operating hours and available resources by using apps like RedLaser or BeeTagg.

• Virtual/Digital Reference Services :

According to the definition of digital reference services, they are "the provision of reference services involving collaboration between library user and librarian, in a computer-based medium."

• Web Content Management :

A system for managing a website's content is called a content management system (CMS).

• CAS/SDI Services :

SDI is among the CAS types. The goals of both programs are to keep users informed and current in their respective fields of study.

•Web1.0, Web 2.0 , 3.0 & 4.0 based services :

The original intent of the World Wide Web was to facilitate the discovery and analysis of data. Reading, publishing, creating, and engaging with the end user are the primary tenets of Web 2.0.

The third iteration of the World Wide Web, known as Web 3.0, places a premium on reading, writing, and ownership.

Web 4.0 encompasses a wide range of technologies, such as the IoT, cloud computing, analytics, artificial intelligence, and machine learning.

• Use of Social Media:

Academic libraries can leverage social media as a powerful tool to advertise services and resources, boost user engagement, and improve overall user experiences.

• Tagging:

Usually, the product's audience or the author or developer choose the tags informally.

•Social bookmarking Services:.

Users may save and share links to websites they find interesting or useful in a social bookmarking system.

•Semantic Web:

The semantic web has the power to improve user experience for researchers, teachers, and students while revolutionising the way academic libraries store and exchange material. It can also foster cooperation and interoperability.

• Machine Learning:

It supports reference services, cataloguing and classification, information retrieval, indexing and abstracting, and collection administration in libraries.

• Cloud computing

Cloud computing has become the new buzzword in the library industry. This is a blessing in disguise since it makes it easier for libraries to run different ICT services because third-party services will take care of server management, upgrade systems, and backup data.

• Artificial Intelligence

These days, machines are more capable than humans at learning, speaking, identifying patterns, and making decisions. Asking a machine for an answer is therefore swiftly becoming a commonplace, daily action.

•Big Data analytics :

Academic libraries can employ big data analytics to monitor how often their resources—such as databases, e-books, and journals—are used. This allows them to determine which resources are most popular, when they are most utilised, and what kinds of devices are used to access them.

• Internet of Things(IOT):

Everyday devices might one day be networked and share data; this concept is referred to as the "Internet of Things" (IOT). By enhancing its services and collections, the library may provide its patrons with a better experience.

•Mobile Technology:

Numerous university libraries have created mobile applications that enable patrons to use their mobile devices to explore library catalogues, make reservations, and access digital resources.

•Block Chain Technology:

Academic libraries can make use of block chain technology, a decentralised ledger that allows for safe and transparent transactions in the absence of a central authority.

•Augmented Reality (AR):

It's an interactive technology that creates new methods for users to interact with academic library resources while improving the user experience by superimposing digital content, such films or photographs, onto the real environment.

• Facial Recognition:

Libraries can utilise facial recognition technology to identify patrons who walk in. It might replace traditional library cards and offer details about the identity, address, books checked out, and whether any are past due for the users.

• Drones:

Drones have several applications in libraries. They can be used for data collection, content creation, and delivery services for library patrons who are unable to visit the library due to distance or physical disabilities.

• Virtual reality:

Several entrepreneurs have zeroed in on two of libraries' core services—collections and places—so libraries may now deliver virtual reality to their patrons.

• Robots:

Libraries and other learning institutions may be able to assist displaced individuals in acquiring new skills or improving their existing ones. This might enable them to assume new roles and responsibilities in businesses where robots execute a significant portion of the workflow.

4. Objective / Purpose of the study:

• To learn regarding the newest developments in university libraries' technological and trend landscapes as well as those in library and information science.

•This study aims to disseminate information on new developments in the fields of libraries and information services.

5. Review of Literature:

The following is the review of literature on emerging trends and technologies in University libraries:

G.P. Patankar, A.M. Kulkarni, and M. Pandariyan (2023) If libraries want to better manage their resources and provide better services to their patrons, they must use the SMART practices outlined in the Koha ILS (Integrated Library System). Koha provides a centralised database for managing the library's holdings, which include books, periodicals, and other resources.This guarantees that materials are appropriately catalogued, categorised, and shelved while also assisting the library in keeping track of its holdings. Customers may easily search for and access library resources because to its user-friendly interface. In order to give consumers a smooth experience, the system also connects with other systems, including digital collections and online catalogues. Many of the mundane operations involved in running a library, like circulation, check-ins and check-outs, and fines, are automated using Koha.

L, Shashidhara K. (2023) IoT applications in libraries to show off their potential for use in library activities, especially in educational settings. The article warns readers about potential repercussions while discussing a number of IoT application components in libraries. The study is exploratory in character, and articles from both domestic and foreign publications were selected from a range of sources. The study includes articles that suggested or promoted the use of IoT technology in libraries. The paper provides a thorough examination of IoT technologies for use in libraries in five sections: introduction, IoT concept, IoT application in libraries, and benefits and obstacles associated with IoT adoption.

Through a rigorous evaluation of mobile applications based in libraries, **Singh, B.P. & Madhusudhan, M. (2023)** present a thorough analysis and investigation of the corpus of information. Mobile applications, websites, databases, SMS-based services, and QR codes are some of the mobile technologies that the authors of the research primarily focus on, both in terms of theory and practice. Concerning mobile apps, they also go over new developments, standards, and best practices. Librarians and information experts who

are thinking ahead of the curve are catering to library users' demands for convenient mobile access to materials by using QR code and mobile apps.

Nepali ,Somand& Tamang, Rajesh (2022) Using mobile libraries is a relatively new idea in library services. Fraternities among students and staff are excited by the development of mobile technologies. Libraries cannot offer these services without this kind of infrastructure. the comprehension of technology developments such as mobile services, gamification, augmented reality, and Internet of Things apps.

Saibakumo (2021) The sustainability and upkeep of academic libraries in contemporary society depend on the advancement and enhancement of information services. Libraries have been compelled to embrace all-encompassing, user-friendly, and tech-driven delivery methods, and the use of IoT technology is crucial for academic libraries to keep up with technological innovations. This imagined gap seems to be filled by new technologies. The survey demonstrates how well-aware, well-liked, and prepared Nigerian academic libraries are to incorporate modern technologies into their operations.

Chingath (2020) articulated the primary goals of his research, which are to show how technology may be integrated and used in libraries with ease. Contrarily, the author went on to talk about how libraries can make use of cutting-edge innovation like drones, blockchain, mobile apps, big data, and robots.

Moruf and Dangani (2020) Librarians and other information technology workers need to become experts in the technologies that may be utilised in academic institutions since digital knowledge building is an essential part of all academic courses. They talk about the new trend in library technology, especially in academic libraries, and their research looks at how their services are being affected by technological developments. They also need to review.

Acharya, Hiremath, and Lalasangi (2019) Present the advancements made by the inventive library. Then, given the advanced conditions of today, there are many changes to the library's services and data offerings, as well as to the roles and aspirations of the library professionals to satisfy the client's request for data during this period. ICT, digitalisation, and library modernisation have all had an impact on the LIS field, leading to the evolution of a new viewpoint. Digital innovation has undoubtedly found a place in every sector of the economy and every aspect of daily life.

In **2019, Shashikumara et al.** The authors make an effort to understand the new technical advancements for the benefit of libraries and librarians. Future developments in library technology will have a big impact on the political, social, educational, economic, and environmental elements of the country as well as the intellect of the populace. The main technological developments that ALA has recognised are examined in their analysis. Thanks to current technology, libraries and librarians can offer higher-quality products and services. Library staff members need to learn more about these tactics in order to introduce and accept the newest trends in libraries. Technological improvements have given libraries a wide choice of solutions because the newest technology have been implemented into library systems in the previous 10 years. Libraries have evolved significantly from traditional ones as a result of Library 1.0, Library 2.0, and Library 3.0, which included new services in addition to the old ones. The technological innovations of Library 4.0 provide a blueprint for libraries and user services in the future.

In their **2017 article, Barathi, Loganathan, and Rajan** detailed how advancements in technology have enhanced information management and library services. This research fills a gap in the literature on digital library project management by surveying the difficulties of introducing and making use of innovative library technology and programs. When it comes to managing and providing library services, both new and old technologies may be better identified, evaluated, and put to use with the help of emerging technology. In order to keep up with the ever-changing world, it is essential to regularly update library services, address managerial difficulties, and incorporate technology innovations.

In 2016, Makori and Mauti : The research included five different educational institutions, with three public and two private university libraries taking part. Despite the substantial resources allocated to Kenya's public institutions, the Commission for University Education is pushing to merge them. Webometrics ranked Kenyan public universities among the world's best in 2015, a recent online ranking of colleges and universities. The digital repositories established by university libraries have also become profitable, helping to increase the visibility of academic and research works on a worldwide scale. Academic institutions rely on libraries for a wealth of information and expertise that helps them achieve their missions.

Sinha and Chanda (2014) Implementing RFID technologies in North East India's libraries and information centres is an urgent necessity. The administration of various colleges and institutional libraries can benefit from the adoption of RFID technology. The research delves deeper into the topic of RFID technology implementation in North East India's universities and institutional libraries.

6. Findings of Review of Literature:

The status of new technologies in university libraries across the country and internationally was covered in the papers that follow.

. Integrated Library System, or ILS In 2023, libraries must employ SMART usage if they are to manage their resources efficiently and offer their clients better services. This is according to A.M. Kulkarni, G.P. Patankar, and M. Koha Pandiyan. Shashidhara K. and L. (2023) offer IoT applications in libraries to show the potential of these technologies in library operations, especially in the educational setting.

Saibakumo debuted in 2021. However, the public at large is not adopting the eighteen new technologies, and institutions such as libraries, Web OPAC, social media, and websites are not well-versed in or equipped to handle them. Integrated Library Management System, RFID, the Library Guide app, and the internet of things have all used the uniqueness and value of learning environments in a comprehensive way.

Through a systematic review, Singh, B.P., and Madhusudhan, M. (2023) provide a thorough analysis and examine the importance of the body of research on mobile app-based applications in libraries. Nepali, Rajesh, Somand Tamang. (2022)Mobile library services are a relatively new trend in library services. Faculty and student fraternities are excited about mobile technology and its development.

According to Chingath (2020), all of the technology that libraries are utilising have potential applications. Examples of these include the creation of speaking robots, flying books, and encrypted databases. The implementation of these technologies will help libraries provide better services overall. Digital content development in academic libraries will be greatly influenced by emerging library technologies such as electrical copyright management systems, classroom management, instructional system design, library automation, electronic resource management, and integrated search (Moruf and Dangani, 2020).

New technologies, such as the bleeding edge, were covered in the article by Acharya, Hiremath, and Lalasangi (2019): The field of face recognition is making great strides. upgrading media laboratories and maker spaces, Library robots, augmented reality applications, 3D printers, kinetic bikes, and library mobile apps Cloud printing, copying, scanning, e-reader applications, digital book interfaces, digital storytelling, and eBook distribution services are all part of the digital ecosystem.

In addition, the modes of technical progress that Shashikumara et al. (2019) mention include voice control, robotics, haptic technology, data everywhere, drones, blockchain, connected toys, face recognition, virtual reality, and plugged-in. have selected. In addition, how technology might affect libraries and how emerging technologies might develop in the future. Technological advances need to be updated frequently to stay competitive in the rapidly expanding industry (Barathi, Loganathan, and Rajan, 2017). By expanding swiftly and utilising contemporary technologies, a

traditional library can today be an automated, electronic, virtual, or digital library. Specifically, this transformation has completely altered the environment of academic libraries (Jan and Sheikh, 2011).Academic institutions need a solid information infrastructure so that students can use digital tools, digital warehouses, the internet of things, mobile computers, and social media sites like Facebook, YouTube, and Twitter as learning tools, information resources, and educational platforms.

In order to accommodate electronic learning, electronic resources, electronic information, and electronic archives, a digital environment that can be enhanced with the use of contemporary technological resources and infrastructure, such as social cloud computing and the internet, is required (Makori and Mauti, 2016).

Regarding national and international scenarios, Sinha and Chanda (2014) described how RFID technology is used in libraries and other commercial organisations, where it has become increasingly important. Further research is urgently needed to determine whether RFID technology can be deployed in Northeast India's libraries and information centres. It is hardly unexpected that libraries are working hard in this day and age to prove their value and provide unquestionable user service.

7. Conclusion

Users, patrons, academics, and publishers all face difficulties brought about by current events and rapidly developing technologies, in addition to those faced by library and information science professionals. Unprecedented traits and chances abound in today's contemporary world. Unexpectedly, there are a lot of possibilities available, and the best part is, most of them are free, assuming we know what we're doing. The digital age's emerging technologies provide librarians with a once-in-a-lifetime chance to boost user-centred services and facilitate collaboration between libraries and their patrons.

If libraries implement some of these trends and some of the new online technology, their standing and reputation in the community should improve. While some may be successful in attracting new patrons, others may help retain the ones they already have or elevate libraries to even higher status as academic institutions and centres of their communities' histories and cultures. With these new offers and continued enhancements, More engaging, relevant, and socially acceptable library spaces are undoubtedly on the horizon. Library science is an evolving field that will see new methods, tools, and ideas emerge.

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