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How to Design the Academic Library Smart?

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Abstract

This paper gives a brief discussion on how to build up the academic library smart. Smart library more personalized services to better satisfy the requirements of users. This paper discusses how to construct the college library services smart. This paper shows the the importance of smart library and the integral approach to design the smart libraries. This also analyzes the best practices that are required to be adopted to make the college library smart. A smart library is a library which is designed to provide advanced and special services to the users making use of electronic and communication technology. The technology enables remote access of library using RFID supported automatic controlling gates, self-service kiosks, public access computers, scanners. This allows us to notably increase the library visiting hours, so more community people can utilise the library holdings from time to time that is suitable for them. To access a smart library, one has to scan his/her library card at the gate and enter the password. He/she will then be allowed to open the gate and access to resources of the library. Some basic features of smart library have been enumerated in this paper. This article highlights the best practices need to be adopted to design the college library smart and the best practices suggested by the NAAC. In a very nutshell, the present article describes the application of smart technologies along with the smart campus library system.

INTRODUCTION

With the rapid increase of big data, innumerable data resources generate. Smart library more personalized services to better satisfy the requirements of users. This paper discusses how to construct the college library services smart. This paper shows

the holistic approach to build up smart libraries. This also analyzes the best practices that are required to be adopted to make the college library smart. A smart library is a library which is designed to provide advanced and special services to the users making use of electronic and communication technology. The technology enables remote access of library using RFID supported automatic controlling gates, self-service kiosks, public access computers, scanners. This allows us to notably increase the library visiting hours, so more community people can utilise the library holdings from time to time that is suitable for them. To access a smart library, one has to scan his/her library card at the gate and enter the password. He/she will then be allowed to open the gate and access to resources of the library. Some basic features of smart library have been enumerated in this paper. This article highlights the best practices need to be adopted to design the academic library smart and the best practices suggested by the NAAC.

Concept of Smart Library

Li and Dong describes smart library as "the smartness of the library building, through the integration of library building equipment, computer networks, communications technology and sensor monitoring." According to Baryshev & Babina, a smart library is "to satisfy" information requests of a user, using modern information technology. It is possible to study information need of a user via instruments of information technology. In 2020, Shah & Bano defines smart library as "a library provided services, which are interactive, innovative, informative, actual, changing and international". A smart library is a library which is designed to provide advanced and special services to the users making use of electronic and communication technology. The technology enables remote access of library using RFID supported automatic controlling gates, self-service kiosks, public access computers, scanners. This allows us to notably increase the library visiting hours, so more community people can utilise the library holdings from time to time that is suitable for them. To access a smart library, one has to scan his/her library card at the gate and enter the password. He/she will then be allowed to open the gate and access to resources of the library.

Features of Smart Library

Basic Features of Smart Library**:**

Tech-savvy with Application Interface (AI) and Internet of Things (IoT) supported service provider to smart users;

Serves all library services quicker, better and smartly to its target users through IT enhanced digital environment in different software systems using internet and intranet;

Generates new knowlege in smart user-friendly platform;

Enables interaction with the end user using smart interface;

Provides smart services with personalised information services using mobile applications, e-mails etc.

Detects gaps in policy making and operations by supporting a well-designed action plan that links to best practice approaches to access resources;

Offers technological innovation as smart services with the help of AI, semantic web, mobile and web access, Cloud technology, RFID system, NLP, voice and image recognition, virtual reality for rendering new experinces about the civilization and cultural legacy etc.

Importance of Smart Library

The role of librarians and libraries is changing because of the changing demands of its users. Nowadays, users expect much more from the libraries particularly from the academic libraries. The indispensable thing which a smart library demands is smart librarian. Usually a smart librarian provides service to user focused and user-friendly. Three things that are essential for performing the role of Smart Library: i) Smart Library staff, ii) Smart Library patrons and iii) Smart Library services. The benefits of Smart Library are mentioned below:

(i) A smart library is quite advanced from the usual conventional workings;

(ii) The advanced library system works with the newly evolved technology.;

(iii) Promotes the use of the library and motivates users to access more to it;

(iv) Provides wide range of opportunities for searching and presents specific information to virtual users as per their needs;

(v) Smart Library enables remote control of the library building including self-service kiosk, RFID supported automatic controlling gates, public access computers;

(vi) Smart Library serves the community people of the society through the record of human thinkings, beliefs, notions and interpretations by making them available to all;

(vii) SL system extends the library hours and

(viii) This makes the users able to use library resources and services conforming to their ease and thus it supports to build a user-friendly environment.

An Integral Approach to Design a Smart Library

The smart library functions on two modes. The one is the recognizing the needs of users with the help of sophisticated tools and techniques, and catering smart services for users; and the other one to provide services through cloud deployment (cloud hosting service), data mining, and other technologies by analysing the users' information needs. Depending on these intellectual elements, the smart library can be determined as an integral approach to disseminate customized and multi-faceted library services to meet diversified information needs integrating especially sensory simulation/interaction technology (embedded cognizance technology) with updated knowledge of librarians and training of library users empowering itself to acquire an auto-operable expertise. Libraries can upgrade their services via community participation, and they need librarians to cope with various library modifications.

Librarians Need To Be Smart

Smart librarians require new skills and need to keep themselves informed about the latest news or developments.

- Smart librarian needs to be a change agent;
- Smart librarians should have acceptance to new ideas and their personal interest and friendly approach to user queries and satisfaction;
- ICT enhanced environment demands that smart librarians must have managerial skills, technical skills, IT skills;
- They should be an effective information professional;
- They should have skills of accepting challenges of today and tomorrow;
- A smart librarian should act as an information officer and knowledge manager;
- A smart librarian should work as a cybrarian who maintains a cybrary where he works with digital resources online.

Best Practices Need To Be Adopted To Design the College Library Smart

What is best practice?

Best practice is a procedure for best results. It can be explained as a "well-defined procedure that is known to produce near-optimum results." According to the Oxford dictionary best practice implies a "way of doing something that is the usual or expected way in a particular organization or situation: common/ current/ standard practice". National Assessment and Accreditation Council (NAAC) defined best practices as "quality enhancing academic/ administrative/ infrastructural strategies adopted by highly accredited institutions of higher learning in the present instance"

Categories of best practice in libraries

The categories of best practices can be presented as:

(i) Management of Libraries and Information Centres

(ii) Storage and Services

(iii) Implication of newly evolved Information Technology in Libraries for the purpose of conservation, restoration, preservation to ensure ease and rapid access

(iv) Community involvement and user participation i.e. library extension services (external membership; learn and earn scheme such as Internships i.e new books processing, stock verification etc.; career guidance notifications, newspaper clippings; document delivery service; reprography; library help desk & feedback register)

The best practices suggested by the NAAC

(i) Library induction for new users

(ii) Library user education through information literacy, teaching methods (using A-V Materials and Computer assisted learning), contents, evaluation studies

(iii) Information Support Services

(iv) Course module (Lecture module, tutorial and training module) on LIS

(v) User survey

(vi) Library book-use statistics

(vii) Best library user award

(viii) Suggestion Box for timely user feedback

(ix) Computerization of library with standard format

(x) Internet browsing facilities to different user communities

(xi) Displaying newspaper clippings periodiaclly

(xii) Displaying new arrivals and circulating a list of those to academic departments

(xiii) Inclusion of sufficient information about the library in the college prospectus and website

(xiv) Organising book exhibitions and book talks

General best practices in library

(i) Library advisory committee meeting at a regular interval;

(ii) Notifications regarding library general rules;

(iii) Technical processing of books (database entry, barcode & spine label pasting, classification & cataloguing etc.)

(iv) Providing syllabus, previous years' question paper files, projects etc.

(v) Binding of books and volumes of journals

Application of Smart Technologies

The cutting edge technology is the basic foundation of smart library and can range from artificial intelligence, cloud deployment, Internet of Things (IoT), enhanced ICT environment, augmented reality, wearable technology, smart bookmarking apps, RFID support system, electronic resource management, overhead document scanner, robots in libraries. The technology enables smooth control of library routine activities and easy access of its resources including self-service kiosks, automatic doors, lighting, and user-interactive terminals. This allows us to prolong library visiting hours so as to more users can utilise the library resources at times that are convenient for them. One of the important advantages of making a library smart is to reduce maintenance overhead cost and save time. Apart this, use of newly emerged technologies enables paperless use and encourages to create productivity.

There are some applications of recent technologies for smart libraries which are mentioned below:

- Integrated Library Software (ILS): Koha, Evergreen, NewGenLib , OpenBiblio, WEBOPAC
- D-Space, Greenstone, Drupal, Joomla, Wordpress
- Cloud computing, Application Programming Interface, E-Granthalaya 4.0, Greenstone, RFID
- Bibliographic reference tools: mendeley, EndNote, Reference Manager, Zetero
- Artificial Intelligence
- Information retrieval through AI
- Expert System
- Use of broadband internet connectivity

Smart Library Services

- E- Document Delivery Services (E-DDS), institutional portals
- Institutional Digital Repositories (IDR) and aggregator services
- RSS (Really Simple Syndication) for web feed formats allows one to receive updates from web sites, library databases and other online resources all in one location.
- Open Access Publishing
- Metadata Standard and Interoperability (Dublin Core Metadata Initiative)
- Resource Discovery (smarter interactions and communications between different IoT artifacts) which enables libraries to explore seamlessly across a wide range of information content.
- Streaming Media Services (subscription based third party streaming services)
- Dataset linking and information mashups (remixing of data from different sources to create new hybrid services such as combination, visualization and aggregation with the help of API)
- Ask a librarian/Virtual Reference Service/(virtual worlds, internet messaging, e-mails, web forms etc. and video podcasting (podcasting with a video element like static or motion graphic images)
- Library Web Home Page (promotional tool for advertising electronic web resources and in-house library services i.e. newsletter services)
- E-SDI & Bulletin Board Service

Intelligent Information Service System

An Intelligent information service system can be a smart library information service if it stores a smart treasure house of books that blends the operations of the existing information system with the knowledge based smart library system in terms of producing ingenious or cutting edge human resources. An intelligent information system can collect and examine data and share with other systems even with an innovative modern platform. As a consequence of Artificial Neural Network (such as expert system, natural language processing, semantic web, deep learning and information retrieval and other related techniques) the system accumulates and interprets data while arriving at the previous findings data, connectivity and protection issues. Below is a proposed model of intelligent information service system that provides services through collective intelligence (a group of combined skills or expertise to perform a wide variety of tasks):

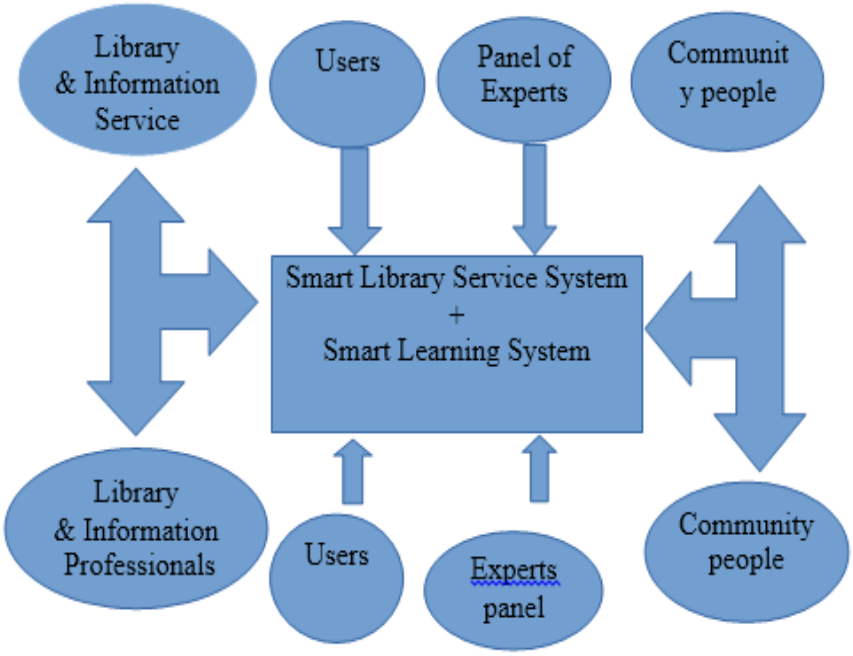

Figure.1

11 Smart campus library system

Smart campus library uses numerous devices such as tablets, laptops, phone, etc. and connected sensors and object which are generally designed to perform simple tasks and their components are relatively limited (Ikrissi and Mari, 2020). A smart campus is equipped with intelligent behaviour (digital/computer technology) and a user-friendly integrated ambiance of teaching learning system in an institution. The linking of devices enabled by sophisticated technologies and application programming interfaces (API) has a number of benefits in the entire campus. The academic libraries or documentation/information centres those implemented to adopt digital infrastructure and disseminates services to its users' community are becoming a smart campus, for example, Central Libraries of Indian Statistical Institute and Indian Institute of Technology. These include not only software-based systems but also technology enhanced environment such as digitalization of contents, internet of things (IoT is a self-configuring collective network between connected devices), cloud computing, context-aware computing/application (a computing approach where situational and environmental information about users, things and places and it enables to anticipate needs of users), technology enabled study room, radio frequency identification (RFID), WiFi connections, and augmented reality (merging of a view of the real world environment upon a digital image), modern book management system and a collective intelligence.

API Integration in Library

API is an application programming interface in which the term 'application' refers to any programme or software with a distinct task. Interface can be thought of as a two way communication between applications. API is a software intermediary that allows to talk one application to another application. The interface to an apps and websites is one type of API. Modern library discovery services are API compatible like VuFind, the popular discovery interfaces. The discovery services allow library users to search all components of its resources, with the conventional use of the online catalogue and in addition articles represented in its subscriptions to e-resources and to other collection items. Discovery service that delivers extra search capability through a web based interface. Some are discovery services are EBSCO Discovery Service from EBSCO Publishing, WorldCat Local from OCLC, Primo Central from Ex Libris, Summon from Serials Solutions. The APIs are provided as Web services and it has been desgined with a view to create library interface environments, such as VuFind, and content management systems, such as Drupal.

CONCLUSION

The implementation of smart library is not so easy. There are some big issues in relation to the development of a smart library such as immense cost of implementation, high maintenance cost, lack of tech-savvy librarians and information professionals, insufficient fund and inadequate digital infrastructure. It may be concluded that we should strive hard to build up a library smart to provide best services at the least cost within the existing infrastructures.

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