Impact of New Technology at Dayananda Sagar College of Engineering Library

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ABSTRACT:

Now a day libraries are no ware remaining as traditional libraries, these are changing from traditional to advanced modern libraries. The revaluation of computer technology and web technology brought great change in the field of library and information science. The role of library professionals also getting change compare to olden days, in this paper we are trying how new technologies like Web 2.0/Library 2.0, RFID, Automation, Institutional Repository Wi-Fi technology, digitization and digital libraries are helping library professionals to serve the user of Dayananda Sage College of Engineering and how our users are getting benefits from these technologies.

INTRODUCTION:

Dayananda Sagar College of Engineering is one of the top Engineering College in Karnataka according to Competitive Successes Review Magazine (CSR) of Nov. 2009.This college is came in to exist in the year 1960. Now it became 31 year old institute having 14 Institutions under that Engineering is one of the big college having 18 UG programme, 10 PG programme and 3 research and development programmes across engineering. We have 8,000 students in engineering and we got independent central library with the carpet area of 4500 sqp. With 1000 seating capacity.

The library building is divided in two blocks called Block “A” and Block “B”. Block “A”

having two floors, covers Circulation Section, private study zone and news paper Section and RFID tagging station, personal study zone Printing / Photo coping section and Librarian Chamber. Block "B" having five floors covers Periodical section at ground floor Digital Library at Mezzanine floor, Reference sections in 1st 2nd, 3rd and 4th floor. This is about physical infrastructure of DSCE library. Now we can see about collection development and services part. Presently we have around 44,000 books. 87 national and international journals in hard copy, 400 e-journals. Our all library collection is fully automated with LIBSYS automation software and all the books got RFID tags, which are integrated technology with LIBSYS software. To provide better services to users we have created library website which is meets needs of users.

NEW TECHNOLOGIES USED AT DSCE LIBRARY:

I. Wi-Fi Technology (Wireless Local Area Network):

Wi-Fi (pronounced /waIfaI/) is a trademark of the Wi-Fi Alliance that may be used with certified products that belong to a class of wireless local area network (WLAN) devices based on the IEEE 802.11 standards [1].

Every day one or other new technologies are coming to market in network field and use of those technologies will be in different field some new technologies are entering in to the academic field in these Network and Internet technology is playing major role in accessing of information by staff and students of institute. Our Institute is not so far from this technology and we are the first engineering college in Karnataka to introduce Wi-Fi technology for entire campus in the year 2004 with sysco service provider. With this facility all our staff and students are abele to access all subscribed resources and other Internet resource across the campus using their own laptop. This is monitoring by the network administrator based on IP numbers assigned by them to users. Apart from this we have separate "Liege Line Network" of 8 Mbps Internet accessing through Local Area Network (LAN) for campus and separate line of 2 Mbps is allotted for Library, which helps to access Online subscribed resources and in house resources through Institutional Repository (IR) and for doing Library day today activities of automated system.

HOW DOES IT WORK [2]:

Wireless Internet Access has four components that form its structure: high-speed access, a networking gateway, a wireless network and a wireless customer. The customer connects wirelessly through the wireless network to the gateway, it then launches their Internet browser, authenticates through the gateway by entering a coupon code or purchasing time and the user has high-speed Internet.

Advantages of Wi-Fi:

1 Helps to access Internet where cable cannot be run.
2 Helps users to access Internet any corner of campus round the clock. With moveable device like Laptop, Mobile device, etc.
3 Easy to identify the problem in accessing of Internet, based on wireless device put across the campus.
4 Many compatible devices.
5 Continuous connection to a network from a variety of sites
6 No wires = lower installation costs

Disadvantages of Wi-Fi:

Wi-Fi has also some important disadvantages over a traditional wired network. As mentioned below

1 **Security**: This is the most important potential problem with a wireless network. It is important enough that it merits its own section below.
2 **Range**: The wireless signal extends several hundred feet from the base station, but this range is greatly curtailed by obstructions and interference. In an office environment, interior walls will likely limit the range to less than 100 feet, and an exterior wall may block the signal completely. In a large office, this will require multiple base stations laid out to cover the entire office.
3 **Interference**: Some electronic equipment can interfere with radio waves and disrupt your Wi-Fi network. The biggest problems come from microwaves and cell phones

II. Automation and Implementation of Radio Frequency Identification (RFID) Technology:

DSCE Library is one of the first private engineering college library to implement RFID technology with all available modules in Karnataka. Before implementing the RFID technology library is automated with Student Information System (SIS) software, with brocade technology for issue and return purpose. In the year of 2006 our management is willing to implement RFID system for library. Based on the requirement of the management library staff made a survey of Automation and RFID service provider in market and theirs service and available clients in India. Finally library staff submitted report to management saying that LIBSYS with LS-Mart RFID system is good for introduce the RFID technology to DSCE library because they are the only one company which supply software as well as RFID hardware components, based on the report management is agree to implement the RFID system. Implementing of RFID technology work began in the year of 19 Feb 2007.

1 Steps involved in implementing RFID technology:

Before starting the project we need to concentrate on the following issues.

a) **Selection of automation software:** Which automation software we need to select weather integrated software or separate one. We selected integrated automation software called LIBSYS LS-Mart system, which helps in many ways for implementing RFID.

b) **Selection of RFID hardware components:** This is very important step to begin the work because all RFID hardware components should compactable with software and is should communicate properly with software to do the issue, return, renewal and other library routine jobs without any problem. To avoid the problems we have taken software and hardware components from the same company called LIBSYS Corporation, they have taken all RFID hardware components from TAGSYS Company, which is compactable with LIBSYS software.

c) **Selection of documents for RFID tagging purpose:** We need to decide whether we have put RFID tags for all the documents or only for selected documents based on transaction, cost of the book etc. We put RFID tags to entire collection.

d) **Selection of RFID Tags:** This is also important task while purchasing the tags we should check the compatibility of the tag with RFID hardware components whether tags are communicating with reader or not whether the EAS gates are sensing gats or not all these points to be observed with these tag rang and memory capacity of the tag and ISO no of the tag also observed. We have taken RFID tags from two vendors observing all the above-mentioned points.

e) **Dividing of collection based on category:** Most of the engineering colleges are getting books from different sources like books from Social welfare office, from SC/ST cell, from management fund some time from UGC / MHRD and Gifted books, based on these category we need to categories the collection it is important task while creating databases in software. Keeping these aspects we have created 5 databases namely UG Books, PG Books, SC/ST books, Gift books and Full catalogue.

2 Components of RFID System

To implement RFID system with all modules for library the following components are very much required now we can see about these components how it will work and its usage in library.

A) RFID Tags:

The heart of the system is the RFID tags, which are electronically, programmed circuit with unique information. RFID tag is a small object such as an adhesive sticker. Tags can be pasted inside the book or directly on CD's and DVD's. Each tag will come in thin paper format these tag contains an engraved antenna and microchip with a capacity of at least 64 bits. In our library we have gone for two company tags with same standards of 64 bits.

Tags can further be classified as:

a) Passive tags

b) Active tags

a) **Passive tags:** Passive tags do not carry on board power derive it from the reader to enable reading and writing to the tag. This gives a practically unlimited life but a shorter range. They are activated only when they are read or interrogated by another device first. Data storage on a passive is fairly limited. These can be read from up to 10 meters away.

The draw back of passive tags is limited data storage capacity small out put power and short range of communication.

b) **Active tags:**

Active tags are the trace transmitters of the information. These tags can initiate communication with the antenna and provide faster and higher storage capacity. Active tags have a built in power cell. These offer a higher communication range but this life is limited to the life of the power cell. These can be read and updated from kilometers away.

The tags that are presently used in our library are 13.56 MHz (Mega Hertz) tags. Generally tags are 1024 bits memory with built- in antitheft and are ISO 15693 and ISO 18000-3 compliant. At our library we have adopted ISO 15693 tag.

B). Self Checkout Station:

This is one of the attractive and helpful module in RFID system, it helps users to Checkout books, CD's and DVD's etc, without staff assistance. This station is consisting of RFID reader. P4 Windows XP operating system installed all necessary software, with touch screen LCD monitor, High-speed thermal printer, and Smart Card reader. It is an independent station where users can check out library tagged materials. For check outing materials users need to bring Smart card and library tagged materials to this station and they need to keep both smart card and library tagged items on the reader placed in self checkout station and they need to process transaction using touch screen for Check out.

Figure.4. Self Check-Out station

C) RFID Security Gate (EAS Gate):

This is one of component in RFID system, which helps us in constantly detects non-deactivated antitheft items. A visual audible signal is triggered instantaneously when security is violated. In our Library two EAS gates are hosted. This gate will be placed at the entrance of the library where all the users are going out side.

Figure.5.

EAS Gate

D) RFID Reader:

This is one of the important components in RFID system, which helps library professionals to do tagging for books also it helps in circulation activities. Reader uses its antennas to stimulate tags, read their data and transmit it via a network to a host computer. This reader is used in these modules in Library RFID system.

a) **Staff Station:** Where book data entry and assigning value for tag work is done.

b) **Staff workstation at Circulation Section:** This is used to check-in and check out purpose at circulation.

c) **Self -Check out Station:** RFID reader used in self check-out station for issuing books without staff assistance using touch screen monitor pc at circulation.

d) Self Check-in station: RFID reader is used for check-in purpose without staff assistance.

e) Book Drop Reader: The same reader can be used in book drop for Checks in books from any corner of the campus.

In our Library we are using 4 RFID readers as staff station reader, staff work Station at circulation, Book Drop reader and Self-checkout station reader Reader.

E) Book Drop Station:

This unit will be working as book return station, placed at convenient location in the organizations premises perform easy and one –step checks-in process of multiple tagged items. It will receive books 24/7 mode, when circulation is closed and in holidays also. When books are returned through book drop users will get conformation mail saying that such and such books has been returned by particular ID with acc no and bibliographic details. IF the book has over due such kind of books fine will be adding to the respective book barrowed user count as and when the users will go to barrow another books that time system will show the due fine details. Presently we have one book drop station and we are planning to extend some more books in campus which is suitable place for users to return items 24 hours a day.

Figure.6. Book drop

5. Shelf Management Reader/Hand Held readers:

This portable device, which works with the help of portable document assistant (PDA) and RF reader antenna, which is built in Wi-Fi connectivity. It is used for identifying missed books in the stock or on the shelves and for stock verification purpose also with this device we can do 50,000 collection stock verification with in two days which helps in reducing human effort and increases the accuracy compare to human being. It will helps in shelving books on the basis if class no. This reader carries out following functions.

1. Faster inventory /Stock verification process.
2. Helps in identifying misplaced items on rack.
3. Shelving of documents on the basis of class no.
4. Higher customer satisfaction.

III. Video Surveillance in Library:

DSCE library is under video surveillance with 26 IP Based Dome Cameras, which helps us in keeping track of library user's movement in library and helps in identifying page tarring, misplacing of books, property counter surveillance etc. This will alert students in misusing of library things, the librarian can came to know whom all visited library in a day. We can store 7 days data in our Dom Camera server and it provides facility to right selected video recorded clip to CD/ DVD.

IV. Access control system:

We are using access control doors for our library to keep trace of library visitors. With the help of smart card users are allowed to enter in to the library, the same card is used for another two purpose, one is library transaction purpose and it is used in parking place also to park the vehicles, which helps us to easily identify who all are making use of library and parking every day. Management is planning to implement single card system for all-purpose where ever necessary in the campus.

V. Use of web tools and techniques in library:

Other than these we are using few more web tools and techniques in our library for better services, listed as bellow.

a). Dspace (Institutional Repository):

In our library we have institutional repository of students project reports and bibliography records, which helps users to know the previous work done in concern area and they get reports also for that work. Our repository is still under collection building process, but users are making use of this repository through internet and intranet.

b). Use of RSS Feed Technology:

RSS means Really Simply Syndication or Rich Site Summary, which is one of the easy way to deliver current information to users desktop with the help of RSS feeds. We are using RSS Feeds in our college to get latest information of IEEE journals, about library resources and activity finely we are using RSS feeds for getting latest job information from various job sites. We are using independent RSS readers for reading feeds it is very helpful in getting current information for staff and students.

c) Open Sources Gateway:

It is one of web based service created using Hyper Text Markup Language (HTML) which is very much used by our users, here users are allow to access freely available web resources like e-journals, Databases, E-Books sites, Video tutorials, Online tutorials, Dictionaries, Encyclopedias, Directories, other reference sources, and gate way to world repositories according to alphabetic order.

d) Skype / Google talk:

Skype and Google talk are the web tools, which help us to connect DSCE faculty members online, for talk and video conversation in getting online assistance regarding library resources and other information. For this we are using Web cam and Headphone.

e) Library Web site:

We have got separate library website to provide batter service through web. In our library website users can access Library working hours, Library rules and regulations, Online subscribed and freely available resources links. The web site is created using simply html and xml markup language. Through web site we have made facility to access old scanned question papers according to branch and semester wise. The same website is providing Web OPAC facility to users. Users are abele to check the library books and journals status if they want they can reserve the library books based on their register no which is used at the time of library membership registration.

f) Wikipedia:

This is one of the big and help full web tool where users can get brief information about any thing, and it provides facility to add the known information in any language using any web browser.

g) Xerox, Fax, Printer and Scanner:

These are the some new tools, which we are making use of these in every day work in library.

h) Educational movies show:

DSCE Library got separate AV auditorium for conducting video class, paper presentation,

presently we have 200 engineering educational movies which are previewing in the auditorium along with this we are previewing online NPTEL videos in auditorium. We have plane to make use of this auditorium for video conferencing purpose.

i) FTP server:

We have converted one PC as FTP server using Linux operating system, in this server we are keeping all downloaded IEEE/ IEE papers, PG student's presentations, downloaded educational videos, other useful resources and software's etc.

j) Digital Library:

We have Digital Library of 100 systems with 2 Mbps dedicated line for accessing e-journals, e-books, databases, internet search using different search engine's and some other information through internet. In case of power failure we have alternative arrangement of 20 KV UPS for digital library and Diesel Generator for whole library.

VII. Conclusion:

The modern technology are playing whittle role in all corner of society, the libraries are also making use of modern technology in all activities of library to fulfill the needs of the users. Every day one or other technology exists in marking the library professionals are trying to make use of the new technology to serve the users community, in that way library professionals are always doing experiments to implement new techniques in library we at DSCE library staff are making use of new technologies very effectively for providing better service to our user community. Still we are planning to make proper use of all web technology in our library service We hope we will do it.

Reference:

[1] http://en.wikipedia.org/wiki/Wi-Fi

[2] http://webpages.uah.edu/~iveyd/

[3] http://www.google.com

[4] DSCE Library report.