

Development of E-Services for Promoting Education and Research Through Digital Library Initiatives

Dr. Harish Chandra
Librarian
Indian Institute of Technology Madras
Chennai-600 036
e-mail: hchandra@iitm.ac.in
URL: <http://www.harishchandra.net>

Abstract

This paper has been prepared keeping in view the need of the professional colleagues who need to implement the digital library in their respective environments. The paper discusses the general background of digital library, various motivating factors for planning, developing and managing digital libraries. It further highlights various e-services provided to support education, learning, research, consultancy and continuing engineering education at the Central Library of IIT Madras.

1. Background

We are observing that computer and communication technologies have drastically and directly affected the human activities including library and information science practices. Currently, the concept of librarianship and its practices have also considerably changed. Presently libraries are deeply engaged to modernize their operations and activities to provide fast, integrated, interactive and comprehensive services to their stakeholders. In the same direction with IT thrust, the concept of digital library has emerged globally. Various universities and institutions of higher learning have initiated to have digital libraries in their respective environments. The concept of digital library is getting fast momentum in India too. Some of the successful digital libraries of international importance are listed below

- ACM Digital Library (<http://portal.acm.org/dl.cfm>)
- Edinburgh Engineering Virtual Library
(http://www.unl.edu:2020/alpha/Edinburgh_Engineering_Virtual_Library.html)
- The New Zealand Digital Library (<http://www.sadl.uleth.ca/nz/cgi-bin/library>)
- Library of Congress (<http://www.loc.gov/>)

- Columbia University Digital Library (<http://www.dlib.org/dlib/march96/klavans/03klavans.html>)
- Alexandria Digital Library (<http://alexandria.sdc.ucsb.edu/>)
- British Library Digital Library Program (<http://www.bl.uk/>)
- Digital Library of MIT Theses (<http://theses.mit.edu/>)
- The Berkeley Digital Library Sun SITE (<http://sunsite.berkeley.edu/>)
- California Digital Library (<http://www.cdlib.org/>)
- Networked Digital Library of Theses and Dissertation (<http://www.ndltd.org/>)
- Stanford Digital Library (<http://www-diglib.stanford.edu/>)
- National Science Digital Library (<http://nsdl.org/>)
- Digital Library for Earth System Education (<http://www.dlese.org/dds/index.jsp>)
- Digital Library of Georgia (<http://dlg.galileo.usg.edu/>)
- Glasgow Digital Library (<http://gdl.cdlibr.strath.ac.uk/>)
- British Columbia International Digital Library (<http://bcdlib.tc.ca/>)
- The Perseus Digital Library (<http://www.perseus.tufts.edu/>)
- International Children Digital Library (<http://www.icdlbooks.org/>)
- Maryland Digital Library (<http://md-diglib.org/>)
- Oxford Digital Library (<http://www.odl.ox.ac.uk/>)

2. Digital Library?

Digital Libraries are organizations that provide the resources, including the specialized staff to select, structure, offer intellectual access to, interpret, distribute, preserve the integrity of and ensure the persistence over time of collections of digital works so that they are readily and economically available for use by a defined community or set of communities – **DLF**

3. Why we need Digital Libraries?

Due to the above-mentioned challenges, most of the countries have already realized the importance of digital libraries. Accordingly, efforts are on to create more and more digital libraries. Some of the factors for building digital libraries are listed below:

- Digital Libraries are the large repository of electronic information
- Effective tool for bridging the information gap
- Provide interactive access to the collections
- Instant access to multimedia based information
- Distributed knowledge environment
- Fully automated indexing & intelligent retrieval
- Digital reading and referencing of materials
- Effective image search
- Reduced space and high update rate
- Users are more eager to do R&D remotely

- Immutability of the text
- Service at door step at 7X24 hrs
- Reduced manpower
- Effective searching & retrieval
- Increased speed of access
- Promote paperless office environment
- Promotes e-learning
- Ensures increased productivity
- On-line user education
- Instant downloading of information
- Multiple access to resources
- Distributed learning environment
- Storage of large volume of data
- Access @anytime @anyplace by anyone
- Reduced bureaucracy
- Faster addition & gap reduction
- Connects users with authors instantly

4. Information Technology Infrastructure

IIT Madras has provided the following IT infrastructure to provide world-class e-library and information support services for achieving academic excellence.

- Wireless Networking and Digital Knowledge Center with over 100 systems
- Internet Connectivity (10 MBPS to be upgraded to 32 MBPS soon)
- Sun fire™ 15K File Server, Web Servers, Workstations and Thin Clients
- Scanners-Handheld and Flatbed
- Portable Data Capture Unit and Electronic Display System
- Laser and Thermal Laser Printers
- CD-Writers and CD-Level Printer
- Laptop, LCD, OPACs
- CD-ROM Databases, E-Journals, Standards Databases
- VTLS-Virtua Library Management Software with Digital Library Interface
- On-line Full text as well as Bibliographical Databases
- E-Books, e-Reference Sources, Media Resources
- Networking with Fiber Optic Cables and 50 KVA UPS

5. Digital Information Resources

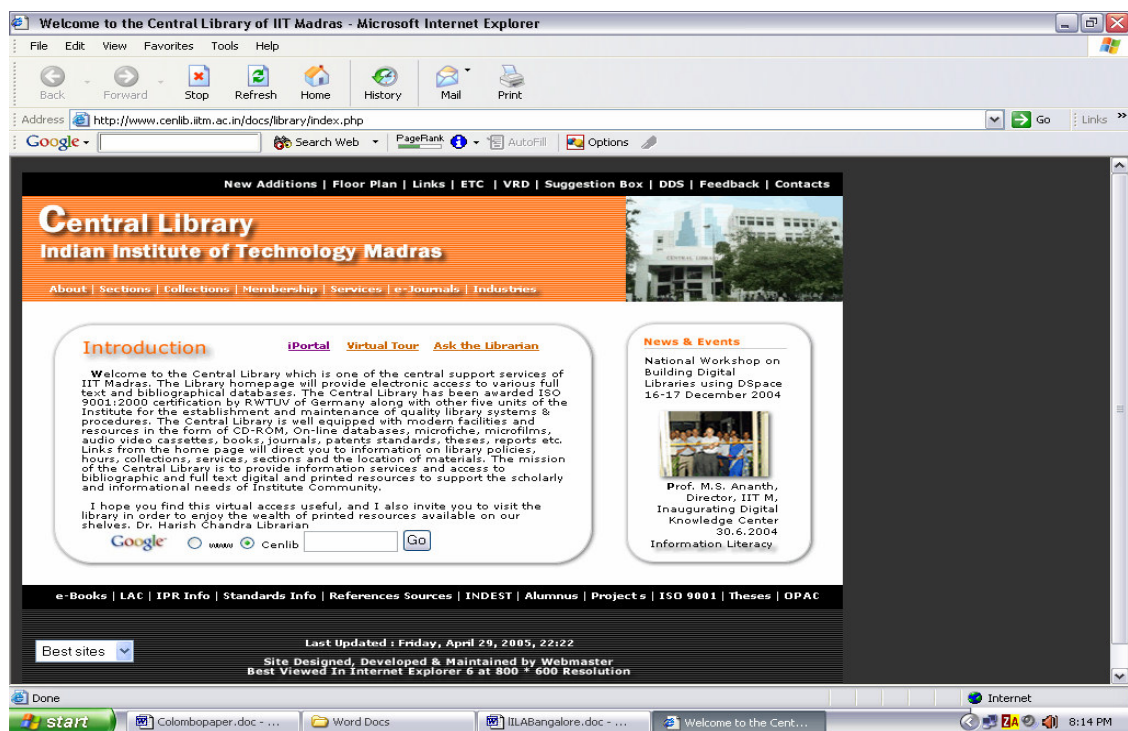
Realizing the importance of digital information resources for the benefits of users, IIT Madras, has encouraged the Central Library to develop digital information resources with the help of INDEST Consortia, IIT Funds, and funds from IC&SR as well as using open source collections. Accordingly, the following digital information resources are

available under Intranet and Internet environment due to the major advantages over printed journals as listed below:

- Speed and Easy Search
- Multidimensional Interaction
- Dynamic Links
- Multimedia Effects
- Downloads
- Cost Effective
- Flexibility and Manipulation of Text

6. Development of e- Services

With the help of the above IT Infrastructure, and e-resources, the Central Library is considerably comfortable to build digital library to serve users effectively and efficiently. For this purpose, we have created a comprehensive and interactive library website which has also been linked with Institute website <http://www.iitm.ac.in>. With the help of this comprehensive website, we are able to provide various e-services to our users community. The screenshot of the Central Library website is given below:



Based on the library website, we are able to promote research, education and consultancy at our institute effectively and efficiently. Selected e-services provided are listed below:

6.1. Digital Reference Services

Wasik, J. M. (1999) states that digital reference and ask services are Internet-based question-and-answer services that connect users with experts in a variety of subject areas. Keeping this fact in view as well as the importance of digital reference service, we have created a **Virtual Reference Desk (VRD)** and given the hyperlink on the main web page of the Central Library with the following objectives:

- To extend library and information services at the doorstep to remote users
- To provide reference service to the industries under IAS Scheme
- To have continuous interaction with users in virtual environment

VRD service has been provided to assist the users at their desktops and doorsteps. The users for asking brief and relevant reference queries in virtual mode use this service. VRD service is very popular. The Screenshot of VRD is given below:



6.2. Ask the Librarian

It has been observed in traditional library system that users are generally unheard due to the administrative set up as well as the over involvement of librarians in various types of administrative, technical and other routine types of activities. In this matter, digital libraries have great potential to help the users. Due to this fact, the Central Library has created a separate web page for providing an opportunity to the users to contact the librarian for raising queries about the services, facilities, policy issues, problems faced inside the library, inconveniences in the use of e-resources, suggesting the new ways to improve the library services and collections through the highly specialized service called **Ask the Librarian**. The librarian responds to the questions received from users on priority. The service is very popular among the students, faculty, alumni, library professionals & industries. The screen shot of the Ask the Librarian is given below:

Ask the Librarian - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home History Mail Print

Address <http://www.cenlib.iitm.ac.in/docs/library/index.php?page=asklibrarian> Go Links

Google Search Web PageRank AutoFill Options

New Additions | Floor Plan | Links | ETC | VRD | Suggestion Box | DDS | Feedback | Contacts

Central Library

Indian Institute of Technology Madras

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Ask the Librarian

Hello there, I am [Dr. Harish Chandra](#), the Librarian of IIT Madras available by e-mail all the days to help you by providing desired information and answer your questions if you are our library member and also interested in our services. Delay is regretted if I am on leave.

Please enter your name, email address, phone number, department/hostel.

Name

Email Address

Telephone Number

Department/Hostel

Status
← Select Here →

Others:

Done

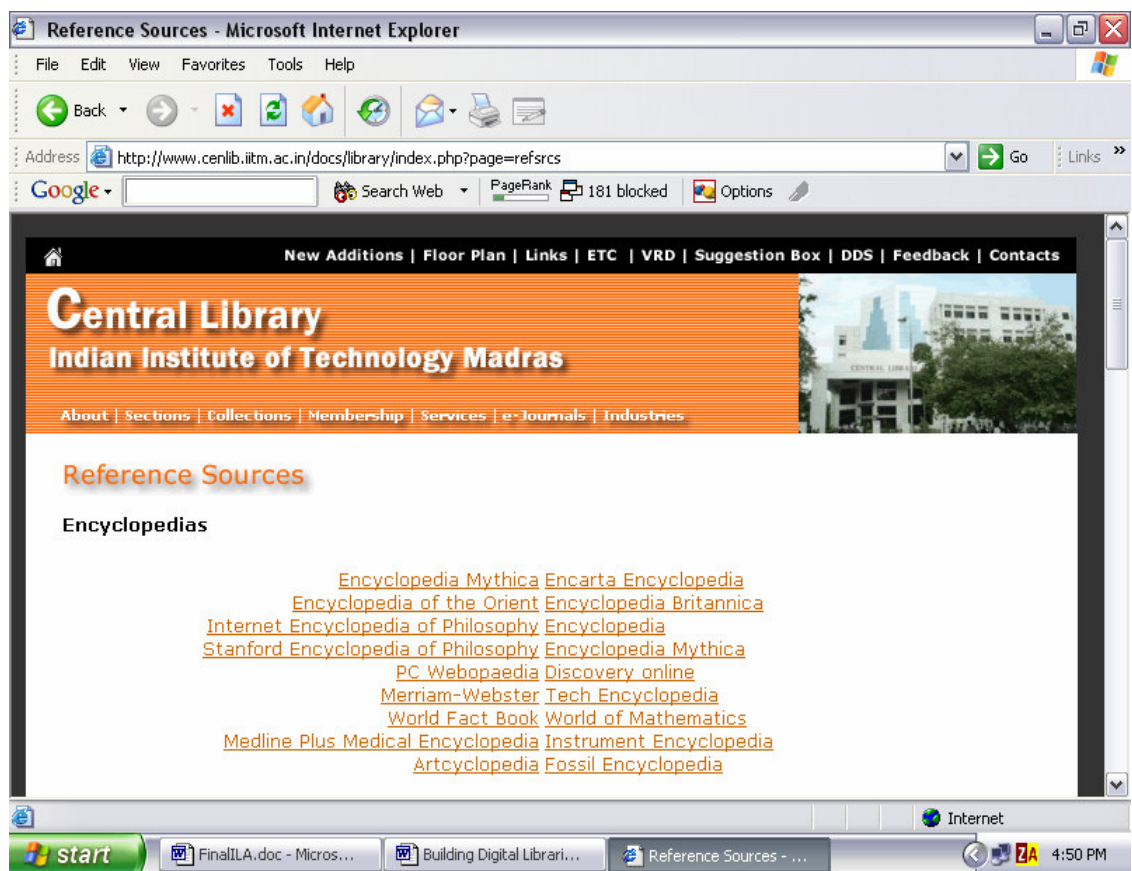
start Colomobpaper.doc - ... Word Docs IILABangalore.doc - ... Ask the Librarian - Mi... Internet 8:46 PM

6.3. E-Reference Sources

Over the past many years, the Central Library has developed and identified various e-reference sources to provide digital reference services to users. In this direction large number of e-reference sources has been identified keeping in view the interest and thrust areas of our Institute. These resources have been categorized as follow:

- Encyclopedias
- News Papers
- Atlases
- Translation
- Citation Guides
- Grants
- Dictionaries
- Associations

Still, we are deeply engaged to add and update more e-reference sources. The screenshot of **Reference Sources Page** is given below:



6.4. On-line Document Delivery Service

It has been experienced that users are generally asked about the availability of specific paper appeared in the scholarly journals subscribed by our Central Library. Realizing the need as well as importance of document delivery service, we have initiated to provide on-line DDS. Under this, users can submit their requirements through online submission for the research papers, which are not available in our library. The users also get instant acknowledgement of their requests submitted to the Central Library. This service is very popular among faculty, staff and research scholars of IIT Madras. In addition to this, we also participate in JCCC service of INDEST. For this purpose, we have designed special purpose web form for the users and a visible hyperlink in the main web page has been provided. The screenshot of the same is given below:

The screenshot shows a Microsoft Internet Explorer browser window displaying the Central Library Indian Institute of Technology Madras Document Delivery Service (DDS) web page. The browser's address bar shows the URL: <http://www.cenlib.iitm.ac.in/docs/library/index.php?page=dds>. The page features a navigation bar with links: New Additions | Floor Plan | Links | ETC | VRD | Suggestion Box | DDS | Feedback | Contacts. The main header includes the Central Library logo and a photograph of the library building. Below the header, a section titled "Document Delivery Service" explains the facility and provides contact information for Mr. P. Natarajan, Assistant Librarian. A form for submitting requests is located at the bottom of the page, with fields for Document Type, Author/Editor, Title, and Name of Journal.

Document Delivery Service - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Reload Print Mail Print Mail Print Mail

Address <http://www.cenlib.iitm.ac.in/docs/library/index.php?page=dds> Go Links

Google Search Web PageRank 181 blocked Options

New Additions | Floor Plan | Links | ETC | VRD | Suggestion Box | DDS | Feedback | Contacts

Central Library
Indian Institute of Technology Madras

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Document Delivery Service

Users can use this facility for getting papers from other libraries, which are not available in the Central Library of our Institute. You may also contact Mr. P. Natarajan, Assistant Librarian at Level I or contact at libdds@iitm.ac.in Other organisations can also use this form for getting photocopy of the paper for academic use only not for further sale!

Document Type <-- Select here -->

Author/Editor

Title

Name of Journal

start FinalILA.doc - Mic... Inbox - Outlook E... Building Digital Lib... Document Deliver... 7:13 PM

6.5. Virtual Tour

One of the major services, which librarians need to consider that the digital libraries need to provide a comprehensive picture tour with appropriate texts describing the particular service, activity, facility or product in the form of virtual tour of the concerned library. I have observed that this service helps the user to know more about the facilities and services provided to the users internal and external. This will help the user to decide to visit the library. Keeping this fact in view, the Central Library of our Institute has initiated to provide this facility by creating a separate web link, which gives the complete picture of the Central Library. This facility is also very useful to give a brief presentation to the distinguished visitors who need a quick tour of the library. This service is very popular among our new students and alumnus working all over the world to know about the developments taking place in the library. A screen shot of the Virtual Tour web page is given below:



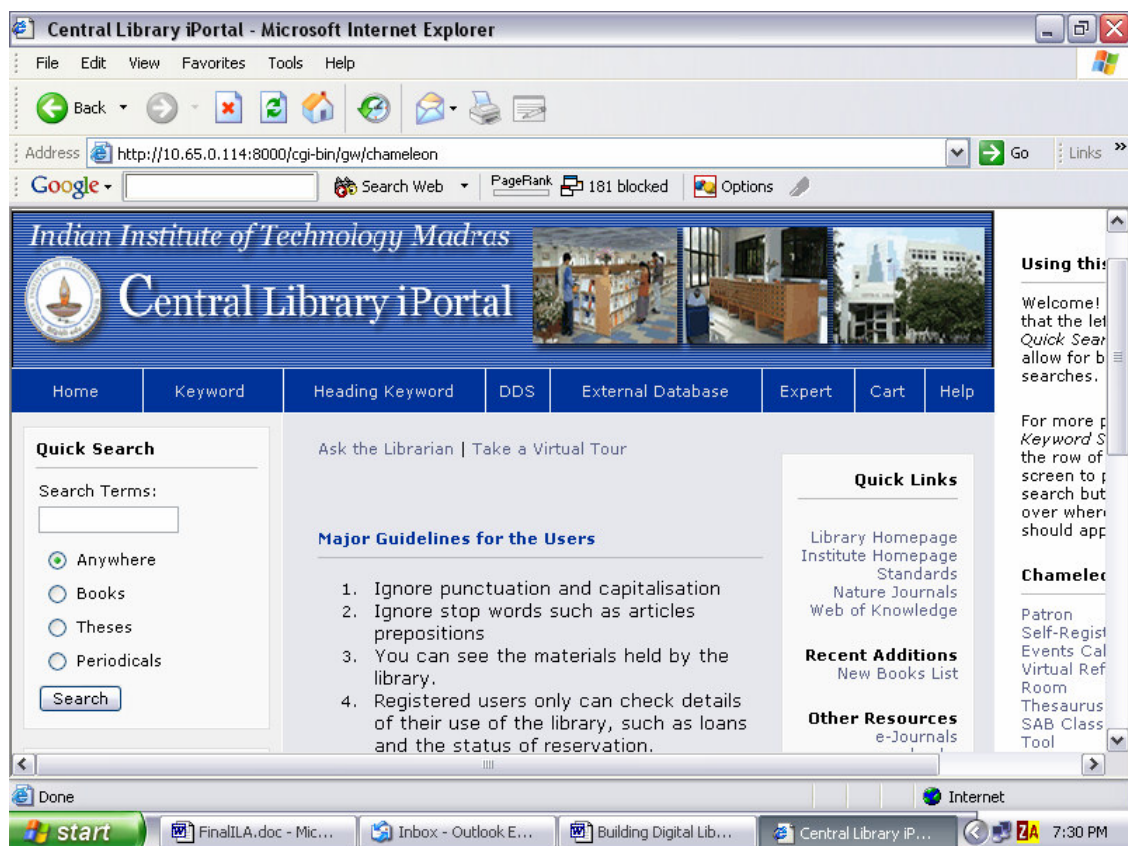
6.6. New Additions

It is a universal fact that users need to have current awareness service from libraries irrespective of traditional or digital. Therefore, it is necessary to the librarians to consider providing CAS to its users without any further delay even in digital library environment. The advantage of digital environment is that this service become more personalized as there is possibility to provide this service to the users through his personal e-mail ID which is not possible under traditional library system unless or until we have good resources and postal system. The digital libraries have great potential to provide the access to new resources added to the library through using New Additions available through Digital Library without wasting resources on postal system and saving total time of users and library system. Realizing the importance of this service, the Central Library of IIT Madras has provided New Additions service through digital library initiatives. Therefore a separate web blink has been created in the Central Library website and all users get information about the new additions added to the Central Library. A screen shot of the web page is given below:



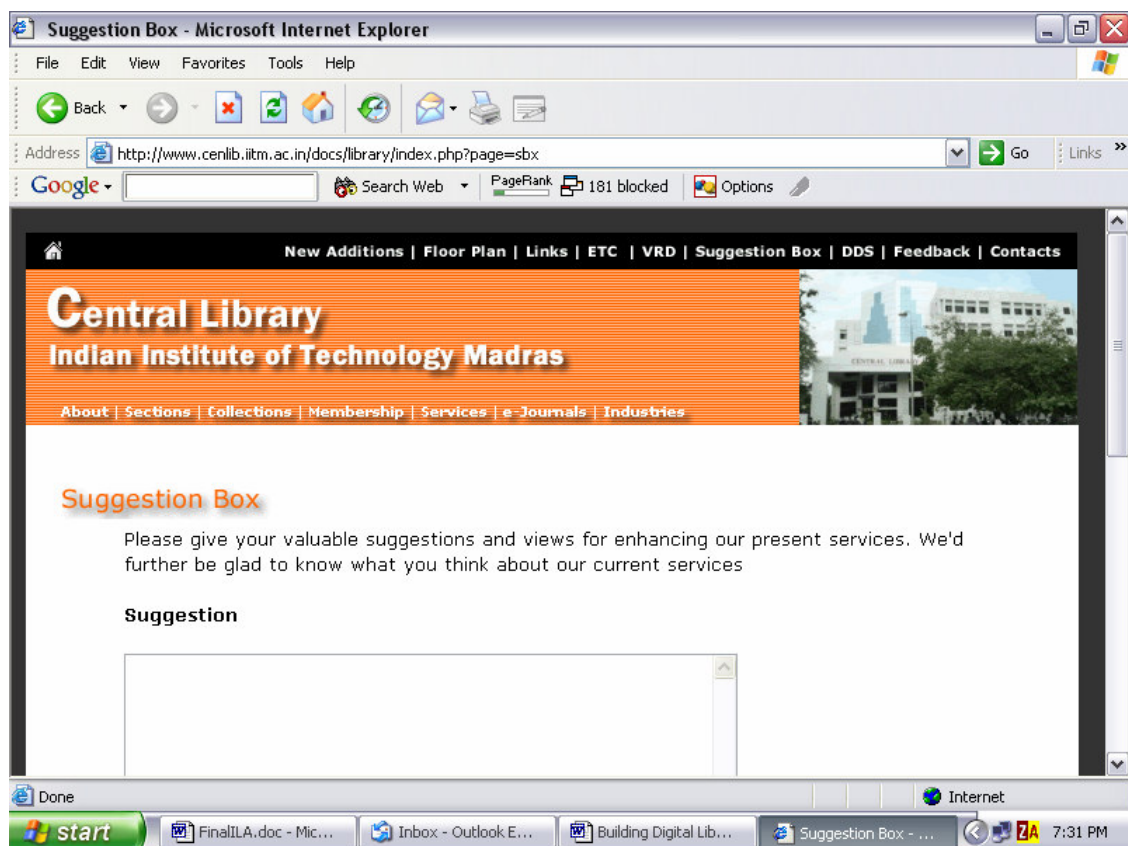
6.7. iPortal

To maximize and popularize an effective and efficient use of e-resources, the Central Library has created a very comprehensive and interactive website with various related hyperlinks with the objective to provide continuous and uninterrupted services to the faculty, students, staff and industries. Very recently we have implemented VTLS-Virtua international library management software with digital library interface. Recently, iPortal has been made operational under Intranet environment for the campus users. The efforts are being made to provide iPortal facility under Internet environment for remote users also to provide value added library and information support services. On interacting with various users of different Departments/ Centers/ Units /Sections/ Laboratories on campus, it was found that iPortal is a very effective and efficient user interface facilitating the use of e-resources. It is therefore necessary to librarians to consider providing gateway as a strong user interface through good portal facilities in their digital libraries. The screenshot of iPortal of IIT Madras is given below



6.8. Digital Suggestions Box

It has been observed that users always intend to give suggestions or their experience about the library services with the objective to see some improve in the facilities and services. But they hesitate to express in direct terms and need the facility to convey to the top management of the organization or the head of the library. Digital libraries can provide such service to end users, In this direction, Central Library being the first library in India to implement ISO-9001 standards in the establishment and the maintenance of quality library systems, procedures, services and products, need to implement digital library initiatives through providing Digital Suggestion Box services which can be utilized by any user under Internet environment. I have noted over 7 years; we have received various important suggestions in the building library services more competent and dynamic. The users can give their suggestions through the suggestion box provided through the Central Library website. The screen shot of the same is given below:



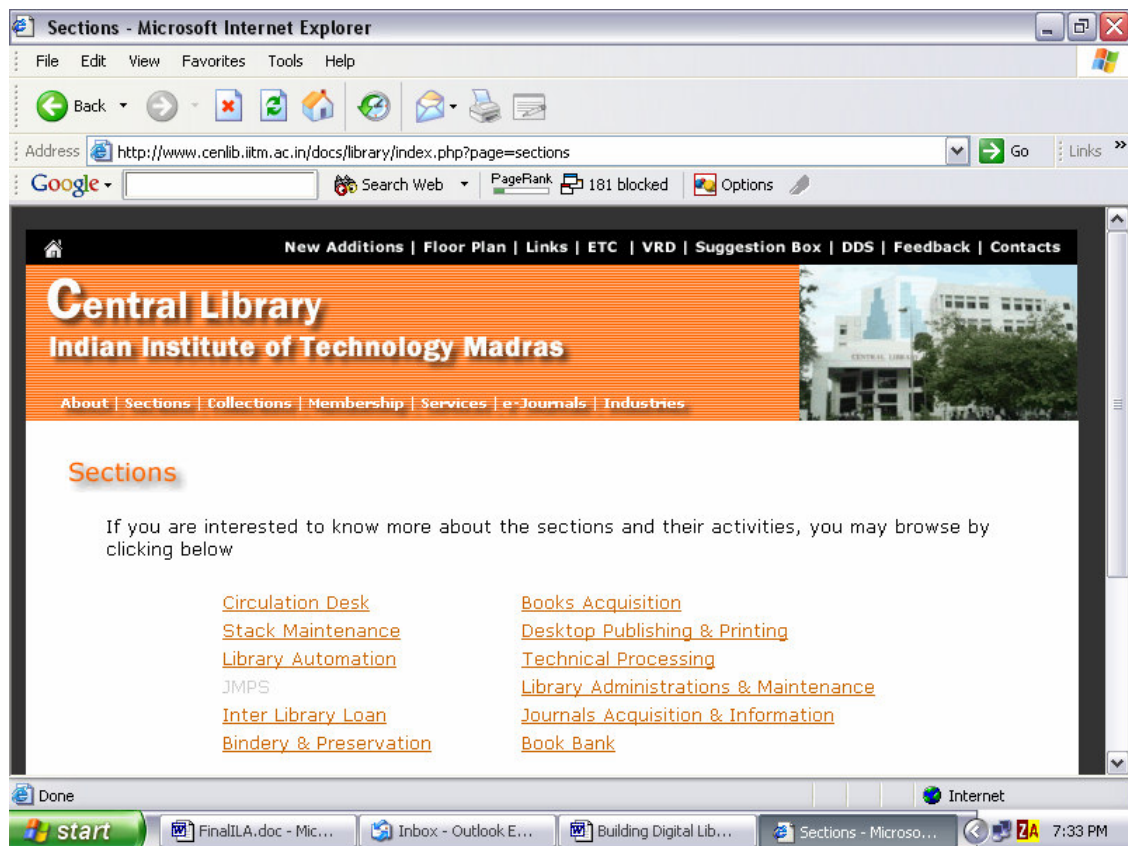
6.9. Theses Service

It is very important to institutions of higher learning to consider to initiate to provide access to the contents generated by the faculty and students to the external world with the objective to get feedback about the quality and also to inform the potential users that some work has already been done. This will help the nation to avoid duplication in R&D work. Therefore, digital library should be exploited to keep informed about the contents generated. In this direction, we have provided a hyperlink to the theses, which provides bibliographical details about the theses under different departments to external users. Further to this, we have plan to implement the e-commerce facilitating downloading of full text of the thesis. The screen shot of theses web page is given as under:



6. 10 Library Sections

Providing information about the activities and services of various Sections of a library to the users community is very useful and also ensures a great help to external as well as internal users of an organization. In this direction, Digital Libraries have great potential to help the librarians and users community to provide the best solutions. On conducting literature review, I found that all highly developed digital libraries of developed world have this feature under different headings like About Us, Library Services, At a Glance, FAQs etc. Following this trend and future information needs of our users, the Central Library of IIT Madras has also initiated to provide the information about the following Sections through the Central Library website under Sections and users can get more information after further clicking the link about the particular Section. The screenshot of the web page of the Sections of the Central Library is given below:



7. Major Issues

We have implemented various e- services in our Institute. Some of the major issues are listed below for the discussion to the conference participants:

- Rapid Technology Advancement
- Development of Infrastructure
- Selection of Hardware and Software
- Choice of Databases
- Usage Tracking
- Acquisition and Development of e-Contents
- Access and Delivery Mechanism
- Digital Asset Management
- HRD Planning
- Digital Rights Management
- Metadata Development
- Image Retrieval

8. Role of Librarians in Digital Library Development

It is also necessary that the librarians and the staff should come ahead to understand and upgrade their existing knowledge level about the various tools and techniques of modern information handling and support their management to implement digital library initiatives. In this regard, there is need to be self-directed, self motivated and receptive to meet the challenges faced in digital era. In this context, it is appropriate to mention about the **Stephen Pinfield who has highlighted the role of librarians in his paper entitled “managing electronic library services: current issues in UK higher education institutions”** available on <http://www.ariadne.ac.uk/issue29/pinfield/> ⁴

- Multi-Media User – comfortable with a wide range of formats
- Intermediary – with a good knowledge of sources and user requirements
- Enabler – proactively connecting users with information they require
- Metadata Producer – creating records of information sources in a variety of schemas
- Communicator – formally and informally connected with users
- Team Player – working with colleagues in library, IT services and academics
- Trainer / Educator – taking on a formal role to teach information skills
- Evaluator -for resources on behalf of users
- Negotiator – dealing with publishers and suppliers
- Project Manager – leading on development projects to enhance the services
- Innovator – looking at improved ways to deliver the services
- Fund-Raiser – working for greater income for the institution

9. Conclusion

It can be concluded that there is dire need to build digital libraries in every organization and providing essential and identified e-services through digital libraries. I am confirmed to state that by doing this, we will be doing a great service to the users community and our respective organizations.

10. List of References

1. Digital Library Federation A Working Definition of Digital Library available on <http://www.diglib.org/about/dldefinition.htm>
2. Stephen Pinfield, “managing electronic library services: current issues in UK higher education institutions” available on <http://www.ariadne.ac.uk/issue29/pinfield/>
3. Wasik, J. M. (1999) Building and Maintaining Digital Reference Services, ERIC Digest, March, 1999
4. <http://www.cenlib.iitm.ac.in>