AUTOMATION OF HKBK COLLEGE OF ENGINEERING LIBRARY & INFORMATION CENTRE: A CASE STUDY

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ABSTRACT

This paper is a case study of automation undertaken at HKBK College of Engineering (HKBKCE) Library and Information Centre. Administration and maintenance in a library can be made more efficient and effective with the use of computers that are of immense help in doing many jobs. For instance activities like housekeeping operations such as acquisition, cataloguing, serial control and circulation section can be performed quickly with having full control on the collection. Avoiding the duplication of work saves lot of time. The automated library can provide extended services to the users of the library. The paper describes in detail the development of automation procedures and applied tools.

I. Introduction

In the present age of information, it has been increasingly felt that information needs and users must become the central focus of attention, to serve users better. Success of information service is more likely to be achieved by adjusting the services to meet the specific needs of an individual rather than trying to adapt the individual user to match with the output of the information system.

Libraries play vital role in the educational, industrial and technological progress of a country. Progress of the nation depends upon advance knowledge gained by educationists, technologists, engineers and scientists of the country. Hence the role of libraries in Universities and then educational institutions is to active a free flow of information from the point of generation to the point of utilization of information

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efficiently and effectively. The present educational policy emphasises on self-study, experiments, field study and research rather than classroom study. Therefore, library has to play vital role in the higher education to meet user requirements. Optimum use of resources is possible through networks only

II. Development

The automation of libraries and information centers in India started in middle 19th century till the concept of automation was centered on the use of computers for housekeeping operations and information services by individual libraries. There are certain factors responsible for the automation of the libraries. Information explosions, increased user's demand, labour intensive nature of work, changing concepts of documents.

Application of modern management techniques reduced response time and need for resource sharing are important elements. With the tremendous capabilities of computer, libraries started using computers for the in-house operations.

The scope of the study is the HKBKCE Library and Information Centre in all respects such as in-house operation its automation, information services etc., since the computerization started in end of year 2000 the study will bring out its strength and weakness that will help the library to improve the system to user's satisfaction. .

III. HKBK College of Engineering: a profile

HKBK CE named after the renowned 12th century Chisty Saint HAZRAT KHWAJA KHUTHBUDDIN BAKHTIAR KAKI was founded in 1997 by a group of dedicated, service-minded persons under the stewardship of Mr. C.M. Ibrahim (President The Karnataka State Muslim Federation). The mission is to provide the best possible educational experience through excellence in teaching, research, creative activities and service for the society, the state & the Country. Located at Nagawara, about 7 km from Vidhan Soudha; the HKBK CE is acclaimed as one of the best-equipped institution of its kind. All courses are provided with necessary infrastructure as per the requirements of the university. The college is affiliated to VTU and is recognized by the all India Council for Technical Education. This offers professional education in 6 branches of

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engineering viz. Computer Science Engg. Information Science Engg. Electrical & Electronics Engg. Electronics and Communication Engg. Mechanical Engg. & Medical Electronics Engg.

IV. HKBK CE Library and Information Centre: an overview

The library is the lung of every educational institute, which breathes knowledge and information into the minds of the students. The HKBK CE has well-equipped Library and Information Centre with an elaborate collection of books, e-books, CD-ROMs journals, project reports, audio-visual materials and other resources to serve its users.

a). Collection development

The HKBK CE's Library and Information Centre came into existence in the year 1997. The main Library is equipped with a good number of national and international books, journals in the field of Engineering, Humanities, Physics, Chemistry, Mathematics, English, Management, Research Methodology, Aeronautical and General reading, etc. and also with the modern and latest technology to cope up with latest development to provide quality and quick services to its users.

The main objectives of the Library is to support staff and students of Engineering, Research & Developmental Activities and Management with the View to provide up-to-date knowledge.

b). Statistics for the year 2002-2003

Books	16,308
Journals (Indian / Foreign)	102
Bound Volumes	1941
Inplant Training / Project Reports	3167
AV-Materials	28
CD-Roms	640

Floppies	227
Charts	13
Transparencies	254

c). Library Staff: HKBK CE Library and Information Centre has good team of qualified Professional, Semi-Professional and Non-Professional Staff.

d). Library Services: HKBK CE Library and Information Centre is providing the following services to its users.

1. Circulation
2. Reference Service
3. Referral Service
4. Current Awareness Service
5. Selective Dissemination Service
6. Reprographic Service
7. E-Reprographic Service
8. Home Reference Service
9. Audio-Visual service
10. News Paper Clipping Service
11. OPAC (Online Public Access Catalogue)
12. Interlibrary Loan

V. Automation of HKBK CE Library and Information Centre

The term "Automation" describes the way in which a machine is programmed to do a job that a person might normally do. Automation is often used to assist with jobs, which must be repeated over and over again.

"Library Automation" is a process of using computer- based system to do house - Keeping operations. Such as acquisition, circulation, classification, cataloguing, stock-verification, etc. HKBK CE is one of the Best institutes of its kind in Bangalore North Zone to have a computerized Library Services. Computerization started since 2000 and built a complete database of over 17,000 books, 1000 Current and Back Volumes of

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journals and reports. Further we have Online Services provided to our users through our INTER LIBRARY LAN SYSTEM consisting of 7 terminals connected to, the library and information center Server storing our database. The ONLINE PUBLIC ACCESS CATALOG (OPAC) is used to carry out online searches of library database by Author, Title; Keywords and Accession Numbers, which enables users to provide good reference service to staff and students.

The project was implemented at the HKBK CE LIBRARY AND INFORMATION CENTRE, Nagawara Bangalore. It deals with the automation of the entire library system thereby reducing paperwork and increasing efficiency. The functioning of the existing system was studied and following details were determined.

V.I. Initial stage foxpro2.6

a). Book search

In the Initial Stage, there exists a computerized as well as manual search for books. The computerized searching can be done title-wise or author-wise. The user has to first logon to a terminal connected to the network. The interface is not a true graphical interface and is not very user friendly. The manual searching is done with the help of cards. A card represents each book in the library; which contains the title, author, subject and its location. All these cards are kept' in the library so that the member can go through the list of titles that are available in the library.

b). Circulation of books

The process of issue and return of books is manual. Each book has a card associated with it. When the book is issued, the member's roll-no is entered on the card along with the date of issue. The date of return is also entered along with the issue date. The library card of the student is then kept along with the book-card at the issue counter. When the member returns the book the date is compared along with the actual date the book was to be returned and fine if any is calculated. The library card is returned to the member who can issue another book.

c). Fine calculation

The fine calculation is manual. When a book is returned the date is compared with the return date on the book-card. If the book is returned late then a fine of Rs.1 per day is charged. If the late period increases beyond seven days, then a fine of Re.2 per day is charged. The maximum fine that can be charged is Rs.100.

d). Entry of new books

The process of entry of new books is computerized. It is done using Microsoft FoxPro. The book details are entered in a form and then stored in the database. If many copies of the same book are purchased, each copy has to be entered separately. This process is time consuming and tedious.

e). Drawbacks of the existing system

The existing system has many drawbacks, which can be listed as

1. The process of issue and return of books is manual and time consuming.
2. The fine calculation is manual and hence prone to mistakes.
3. The interface for searching of books is not user friendly.
4. The book search facility is slow and does not always give correct results.
5. The entry of new books is time consuming and tedious.
6. There is no provision for the members to recommend any books.
7. There is no provision for the members to reserve books.

V.II. Second stage Ms-Oracle / Java Servlet

a). General overview

Before embarking on the project, various Softwares had been installed in the library and worked almost two year to know the advantages and disadvantages of existing technologies, programming languages, platforms and Software were studied in order to be able to select which were the most appropriate choices for the proposed system. This was done by reading books on each subject, surfing the internet for information and seeking the expert opinion of experienced people in the IT industry and also get the feed

back from the same professionals.

c). Technologies selected

The application for the entire library system is to be implemented over a client server setup having, one server and six clients. The server and clients are to be implemented on Pentium IV machines running Windows NT ™ Server, Servlet Based.

1. Either Windows NT Server or Linux Operating System
2. Java Web Server.
3. Java Servlets

d). Client-Server model

The server model is suitable for systems that are smaller in size and less resource hungry on the server side. This system is suitable especially within an organization. Multiple clients can submit requests for service or for some processing to the server. The server executes the requests or performs the processing and then passes the results back to the respective client. Here, the request submission processing returning of results takes place transparent to the user sitting at the client terminal.

Since all applications are run on the server, there is a good amount of security and protection to the application programs from any possible attempt to tamper with the system from the client side. There are several advantages of implementing the system using the Server model.

o   The system will be fully functional as soon as the server is setup and connected.
o   No additional client side installation, of software is required except for the basic operating system. By just typing the URL of the site the application will be available to him/her.
o   The system will be platform independent on the client side i.e. the system will be accessible to all users, irrespective of the operating systems they are using.
o   The system has a good amount of security that is inherent in the client server model, also additional security can easily be provided.
o   The system can be easily extended to the Internet to make it available to remote users, and with minimum additional setup.

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e). Server system setup

The server setup will consist of Windows NT along with the accompanying Web Server i.e. the Java Servlet. To handle the data required being stored on the system Ms-Oracle has been chosen as the Database Management System. To perform the entire HTML embedded scripting operations Java web server has been chosen for scripting operation and the generation of pages. In addition Java Servlet was also used for some additional features.

f). MS-Windows NT™

The main factor in favor of Ms-Windows NT is that available in the system and is freely downloadable from the Internet. If one is looking for a free or inexpensive database management system, several are available from which to choose: Ms-VB.Net, Ms-Power Builder, Ms-Oracle (9i, 8i), Ms-SQL, etc. But MS-Oracle, one of the most popular databases, has many advantages. Ms- Oracle scores over other databases as described below:

- ✓ Speed
- ✓ Ease of us
- ✓ Cos
- ✓ Query language support
- ✓ Capability
- ✓ Connectivity and security
- ✓ Portability
- ✓ Open distribution
- ✓ Easy connectivity with Java Servlet

g). Java Servlet

Many web sites contain static, content, such as academic papers or articles. These sites' pages are documents consisting of simple text, images, and hyperlinks to other documents. For this type of web site, simple client-side technologies generally suffice. HTML and Cascading Style Sheets (CSS) provide the means to structure and present page content, and Active Server Pages allows one to spice it up a bit if desired.

Increasingly, however, the Internet and intranets are being used for applications, most of which incorporate databases. These sites and applications are dynamic, because their content will vary according to the data involved and the actions of the user. This is where *Java Servlet* comes in. By running *Java Servlet* programs on the server you can create very powerful applications that interact with a database and generate content dynamically. The main difference between *Java Servlet* pages and HTML pages is how the web server deals with them.

h). Client system setup

The system will be designed to be platform independent for users of the system. However within the library Windows NT would be installed on all client machines. Here Windows NT provides some basic security and also a windows based browser-supporting scripting. Internet Explorer would be most suitable. It is a *multi-user, multitasking,* and *multithreading* operating system.

VI. Library management system: an analysis

a). Requirement specification

The main requirements of the new proposed system are:

- ❑ The main requirement is an efficient search facility for. The books, journals and project reports. The search facility should be. Fast, user friendly and accurate.
- ❑ Another important requirement is to automate the process of issue return of books. The current system follows the manual method of issue & return of books. The new system should increase the efficiency & reduce the paperwork involved in the circulation of books. .
- ❑ The calculation of fine on overdue books should be calculated automatically at the time of returning the books. Manual error in calculating the fine should be eliminated.
- ❑ The new system should provide members a facility for recommending the books that they would like the library to keep.
- ❑ The system should allow easy updating of the database when new books, journals, or project reports are being entered or existing ones are modified.

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b). Analysis

On analysis of the system, the entire project can be considered to be made of the following modules:

1. **Login:** This page offers separate login to each User to have their own Username and Password for their login, which ensures the security of the system. After login, the user can access to the Main Page of the Library System.

2. **Main Page:** Provides brief information about the College and library and information center. It shows

All the Modules of the Library Software, New Arrivals to the Library, Most Searched for easy retrieval of required information, which saves search time.

3. **OPAC Search Module:** This option can be used by the general user (student) to Search for Materials and their status. Digital Library searches can be done by exclusively choosing Digital Library in the "Category" combo box and pressing "Search" button. The individual record / document can be directly accessed by

double clicking that record from the Grid display. Virtual Library search can be done by exclusively choosing Virtual Library in the "Category" combo box and pressing "Search" button. The individual Website / document can be directly accessed by double clicking that record from the Grid display. This opens up the web browser and directly connects to the required web address if the Internet connection is on. The status of the items being searched for can be known by the color of the row representing the book in the Grid. While RED color indicates that it is a Reference book or that book has been identified as missing or withdrawn effectively meaning that it cannot be issued, GREEN color represents that the book can be issued because it is on shelf. Yellow color represents that either the book is in circulation or it still in circulation and also reserved by other members. Members can reserve these books.
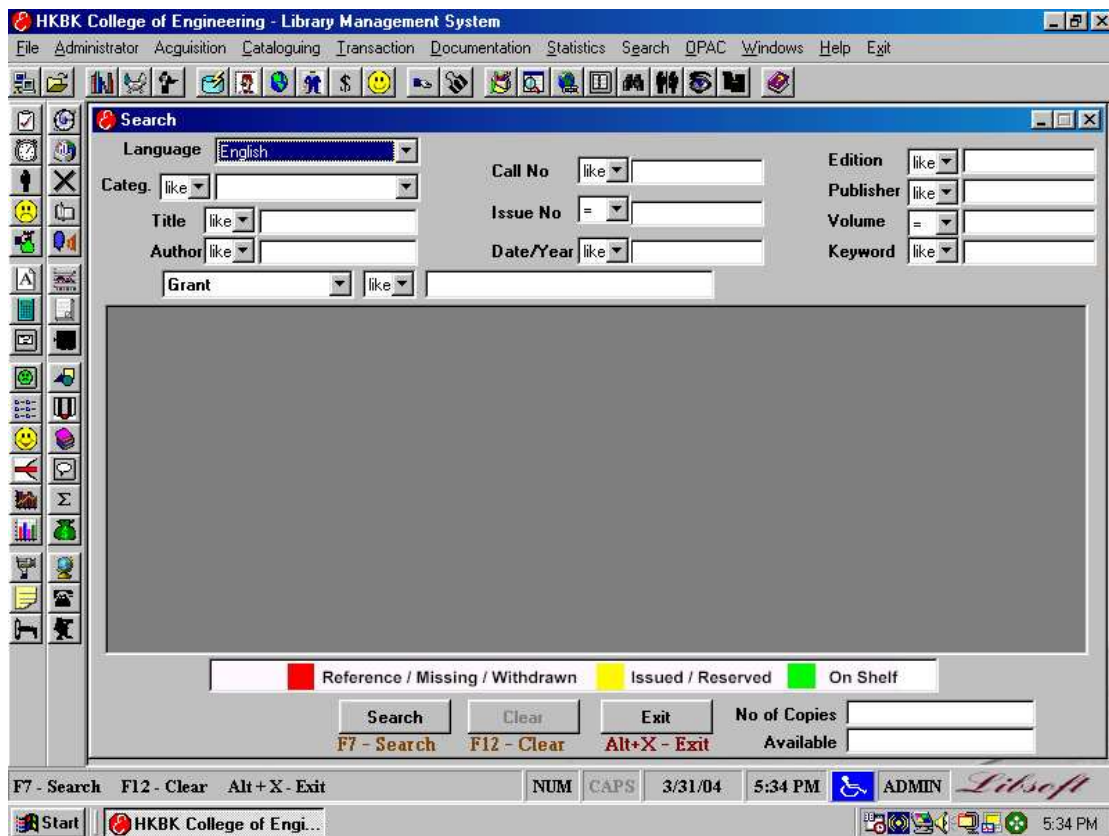
4. **Circulation of Books:** In this module implements the issue-return-renewed of materials against the member and details of the materials that are in circulation can be seen. It has got search button, which searches for the title and author combination that, is displayed in the circulation form. When search button is

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pressed, OPAC material search form opens and the search operation starts with this title and author combination see if any other book in this combination is available or not. After searching the status of that category (book) can be recognized by the color. The Red Color represents that the book may be for Reference of Withdrawn or Missing. The Yellow Color represents that it is issued or reserved. And if it is Green then it is ON Shelf. This will help in locating an alternative book if the requested book is not available for issue. At the time of issue, this module stores the member number of the member issuing the book, the accession number of the book being issued, and the date of issue.

The return date is calculated accordingly and all these details are stored in a separate database. At the time of return of books, the database is referenced to retrieve the details of the books issued by the member. The current date is matched with the actual return date of the book being returned and the fine, if any, is calculated. Once the book is returned, the corresponding entry is deleted from the issue database. Thus the process of issue and return of books is automated.

5. **Entry/Modification of Books, Journals, Reports and Members:** This module deals with the entry of new books, journals, reports, and members and accordingly updates all the concerned databases. During the entry of books, this module first checks the existing book database to see if a copy of the book is already exists. If yes, then the book is assigned the same book ID and the other details are then entered accordingly and the database is updated. If no other copy of the book exists, then the book is first assigned a unique bookid and then the other details of the book are entered and the database is updated. A similar procedure is followed while entering details of members, journals, and project reports. During modification of existing books, the module first searches for the books in the database and retrieves its details. It then allows the librarian to make the required modifications and finally updates the database. Similar procedure is used to update details of journals, project reports and members.

6. **Recommendation:** This module allows members to recommend the books they would like the library to keep. This module mainly consists of a form to be filled up by the members. The member enters the name, author and other details (optional) of the book, along with his member number. All these details are then stored in a recommendations database. The lists of books that are recommended are made periodically by referencing this database, and are sent for approval by the concerned authorities. The approved books are then purchased and kept in the library.

7. **Reservation:** This module allows members to reserve books the need in advance. This module works in association with the issue. return module. If all copies of a particular book are issued and a member requires that book, he can reserve the book. The member number, the bookid, and the time of reservation are entered in a database called the reservation database. When any book is returned, the reservation database is checked to see if the book has been reserved. If yes, then the book is marked and is not available for issue to any other member, except to the member who reserved it. When the member who

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had reserved the book, issues it, the corresponding entry is deleted from the reservation database. Each reservation is valid only for a certain time period from the time the book is returned, after which, the reservation stands cancelled and the book can be issued by any members.

b). Recommended Hardware Component

Server:

1. Intel Pentium IV @ 2.6 GHz Processor (Original)
2. Asus P4 BGL-MX/533 Motherboard with Lancard
3. 80 GB HD (Seagate)
4. 256 MB DDR RAM
5. 15" Color Monitor (Samtron)
6. 1.44MB Floppy Disk
7. Keyboard (Logitech)
8. Scroll Mouse (Logitech M-MM43)
9. ATX Cabinet with Dual fan
10. 52X CD Writer (Sony)
11. CD-ROM (Sony)
12. 440w Speaker (Mercury)

Client Nodes:

1. Intel Pentium IV @ 2.6 GHz Processor (Original)
2. Asus P4 BGL-MX/533 Motherboard with Lancard
3. 80 GB HD (Seagate)
4. 256 MB DDR RAM
5. 15" Color Monitor (Samtron)
6. Keyboard (Logitech)
7. Scroll Mouse (Logitech M-MM43)
8. ATX Cabinet with Dual fan
9. 52X CD Writer (Sony)
10. CD-ROM (Sony)
11. 440w Speaker (Mercury)

Scanners:

1. Two Barcode Scanner: QS 2500 (PSC-USA, ½ Feet 6" to 9")
2. One Document Scanner: HP Scan Jet 3570c

Printers:

1. Two Printers: DeskJet 810c

Lamination Machine:

2. Document Laminator: IDL12 working width 12 inches

Other essential accessories:

3. Polyester I.D Card Pouches: AMC 125 Micron (100X68MM)
4. Inkjet Photo Papers: Novajet Gloss PaperWR (130gsm)
5. Colored & Black Inkjet cartridges
6. UPS : 5kva capacity

VII. Observations and conclusions

The HKBK CE's library and information center is having LIBSOFT latest version Library Management Software developed by THE ENVIRON SOFTWARE (P) LTD that is Bangalore based company. Here are some observations and silent features are findings:

> ➤ Absolutely user-friendly software that requires minimum training.
> ➤ Simplified package, which requires minimum user interaction.
> ➤ Multi user package with database loaded in the server. The individual nodes across different departments can share the data from the server.
> ➤ Interactive features for data handling i.e. Storing, Backup etc.
> ➤ *Create/Modify / Delete* different users (password protected), with restrictions set by the administrator at the time of creation.
> ➤ Generates Purchase Orders on vendors that can be sent through email. The system keeps track of the items arrived as against the items ordered.
> ➤ Multiple Material (Books, Journals etc.) and Media (CD, Audio / Video cassette,

Microfilm, Maps etc.) cataloguing, all in one place.

➢ Cataloguing of Digital Library material! Documents, Virtual Library addresses

➢ Expenditure monitoring through budget control for user defined grants.

➢ Circulation with barcode interface wherein the user needs very few interaction with the system.

➢ Excellent multiple reservation facility to reserve the book which has been issued.

➢ Enhanced but Simplified Search facility to locate books, members, purchase orders and vendors quickly. Transactions of members can also be searched. Unique Titles list based on Title, Author and Volume combination for user defined search criteria can be generated.

➢ Enhanced documentation facility for preparing detailed reports the way the user prefers.

➢ Graphical representation of expenditure, books in demand, new arrivals, material distribution, member transaction details, stock status etc.

➢ ID Card for members with Barcode.

➢ Automatic Barcode generation for Accession numbers for items (Books, journals etc.)

➢ Allows users to search for material by creating a user exclusively for users and giving access only to OPAC search. This allows the users to get the information about the availability of books from anywhere inside the campus.

➢ Digital Library search, which allows members to access any kind of digital material across the network.

➢ Virtual Library search allows members to directly access Web addresses already catalogued, through Internet.

a). Maintenance of hardware and software

Hardware Maintenance: The common problems like PC's hanging, printer out of order, electricity failure 'Occurring frequently -are observed.

Software Maintenance: Library has installed Libsoft Library Management Software far management of library database. Right from the installation library is facing maintenance problem. Data entry errors, indexing, missing records, editing of data, etc. Are major problems. The software peoples and Librarian maintain database

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administration. There should be good co-ordination between these two persons.

b). Training the staff

Trained IT staff became the necessity of present IT revolutionized scenario. Staff should be computer literate. All the professional staff must be trained and provide learning environment. Unfortunately such free and healthy environment not found in the library. Deputing staff for training programs, seminar and conferences enhance the knowledge, but these activities are becoming very rare due to the lack of interest from the staff and financial hurdles.

c). Library and information services

The Main Library is providing various services to its users. Also happing to provide better and qualitative services when the Intranet is implemented within the Campus in a short period.

d). Automation of house-keeping operations

Earlier the project was planned to make Circulation and Search modules with the expandability options. Now the Software have provision to the Librarian has create or delete other existing modules, etc. Bar coding has been done far all the Library materials: books, journals, bound volumes, projects, etc. bar coding has been done not only for the books but also library user ID Cards.

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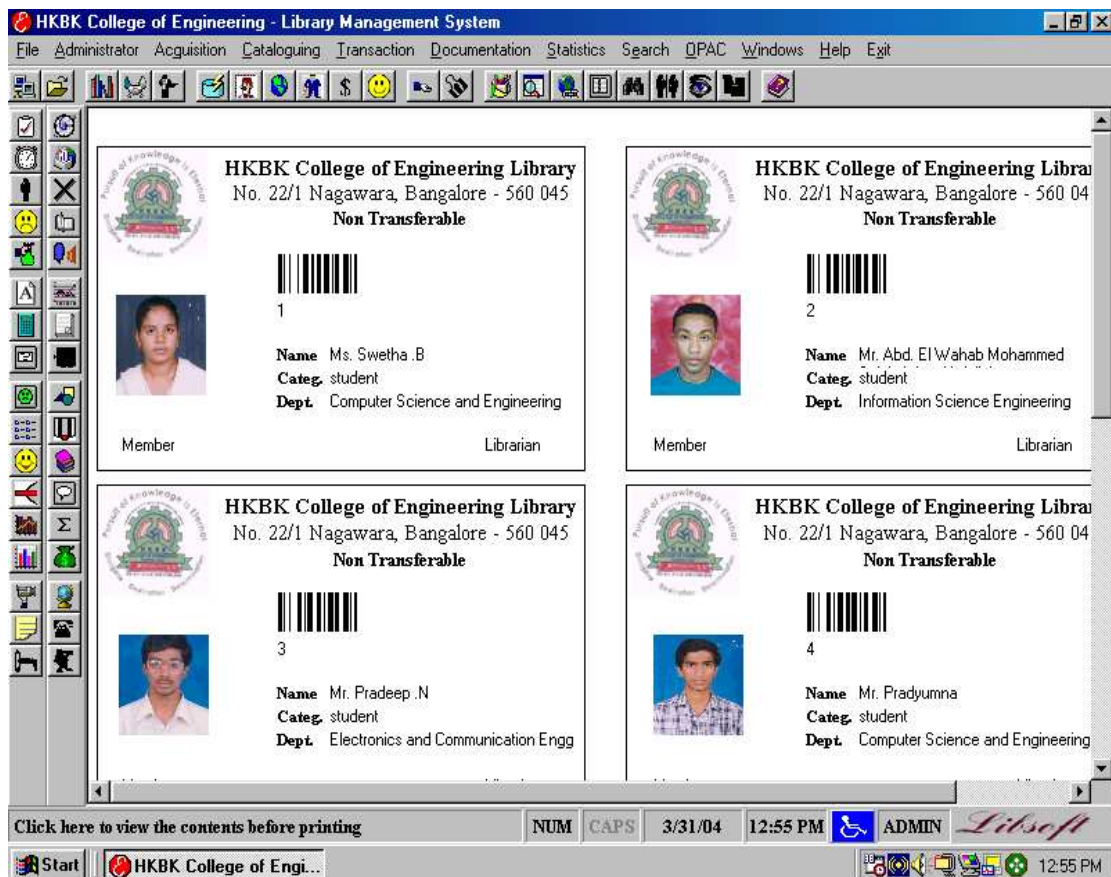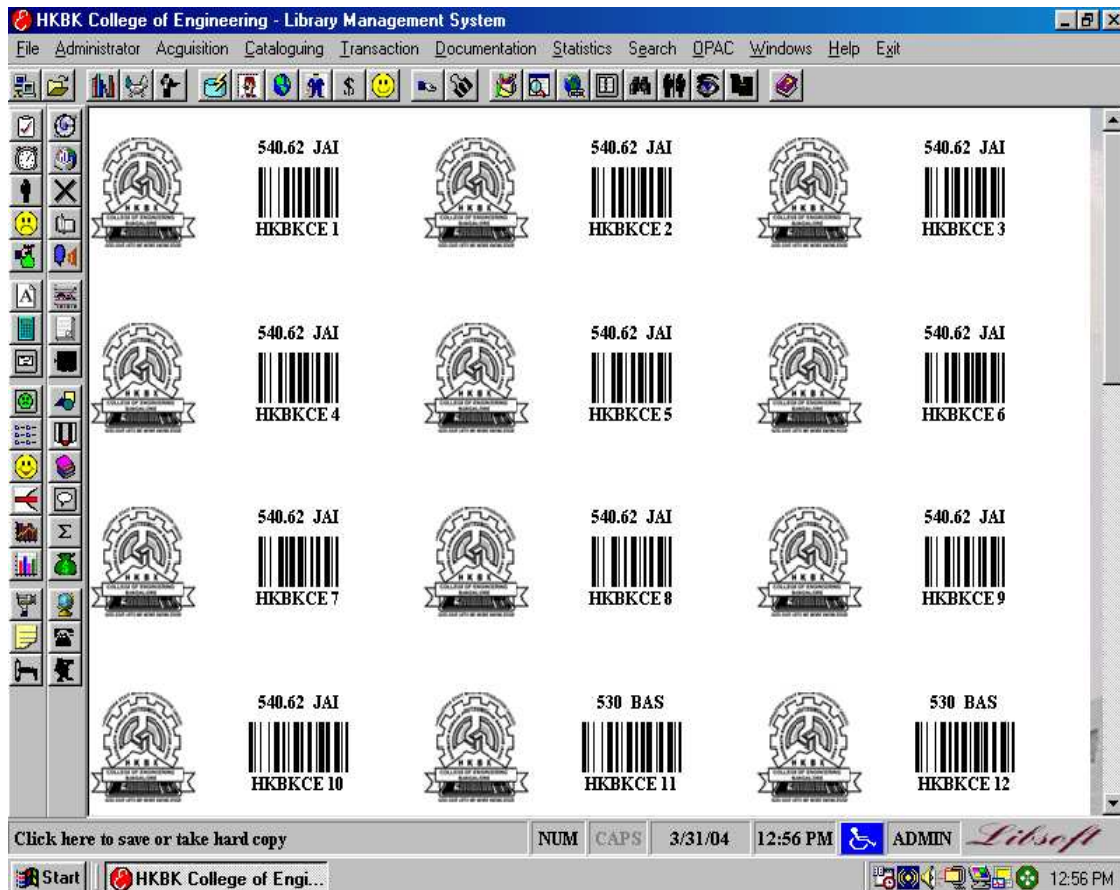
e). Enhancements possible

Like all other systems, the Library Automation system has same aspects that can be improved upon. These are as fallows:

- Students can be emailed when their reserved books are available.
- Reminders can also be mailed to students when the books issued to them are overdue.
- Pages from Internet sites, articles from the latest journals that can be scanned can be stored in database, where the students can reference them easily in digital Library.
- Books can be stored online in order to provide students access to them, even without issuing them.

VIII. Conclusion

The library is the lung of every educational institute, which breathes knowledge and information into the minds of the students, The HKBK College of Engineering has a well-equipped Main Library with an elaborate collection of books, journals, project reports, AV- materials and other resources to serve its users.

HKBK College of Engineering is one of the first institutes of its kind in North zone of Bangalore to have a computerized Library. Online Services provided to our users through our Inter Library LAN System in which users can access the library database from the Online Public Access Catalog (OPAC) and also helps to library staff to provide good reference service to staff and students.

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