6.1 Introduction:
Feasibility study is very important aspect for any proposed model. It gives us direction to implement or not to implement the further proposed project. This chapter deals with the feasibility study of the proposed model with relevant theoretical and statistical data. This study is carried out with the help of literature, primary data, current market prices and logical thoughts. In this chapter the term “feasibility” has discussed with relevant statistical data to complete the determined objectives to this chapter.

6.2 Objectives of the Feasibility Study:
Jennifer Campbell (2007) has elaborated some of the objectives of the feasibility study, which are as follows,

- To explain present situation of the automation.
- To find out if a system development project can be done is possible.
- To find out whether the final product will benefit end user.
- To suggest the possible alternative solutions.

Even though, feasibility study does not directly help to solve the problems, its purpose is to determine the direction towards implementation of the project for problem solving. Feasibility study in the present work deals with areas like operational feasibility, technical feasibility, economic feasibility and time-line feasibility. Due to various factors, the researcher has come across some of the constraints while developing the prototype model which are like,

1. It is bit difficult to determine the price of any specific hardware and software as there are various products available in the market.
2. It is also observed that the quality of the products both software and the hardware differ from brand to brand.
3. The prices or costs involved in this study are based on the current market prices that are already paid by some of the libraries that are part of this study.
4. Libraries are the service providing organizations and in such cases, it is very difficult to find out some of the tangible and in-tangible benefits of the system. While conducting this feasibility study, the researcher has looked into following aspects.

- Current scenario of the library automation in Sinhgad Institutes.
- Deficiencies of existing systems.
- Goals to be achieve from new System.

In addition to this, the researcher has observed some limitations, while going towards feasibility study which are as follows,

6.3 Limitations of Feasibility Study:

1. This feasibility study is limited only Commercial library management software and Open source software.

2. In this feasibility study, there are some intangible / hidden costs related to internet connections either wired or Wi-Fi, UPS, Electricity Generators, remunerations to IT expert or system administrators, etc. Some of these costs are difficult to calculate as these are purchased or used for common use of whole institute.

3. Software license agreements (yearly/ permanent) have purchased commonly for all the computers used in whole organization either on individual machines or by campus agreements. So it is impossible to determine the pricing at an individual machine level.

6.4 Types of Feasibility:

There are four types of feasibilities expressed by Jennifer Campbell (2007) which are discussed in this chapter with relevant data. The economic feasibility, technical feasibility, operational feasibility and scheduled feasibility are the major types of feasibility.
1. **Economic Feasibility:**
   In this type of feasibility, the cost of hardware, software and overall budget is evaluated to run the new system. Tangible and intangible benefits are also considered in the evaluation.

2. **Technical Feasibility:**
   In this type of feasibility, the present hardware and software compatibility with the new one is checked out to run the new system.

3. **Operational Feasibility:**
   In this type of feasibility, the issues like, operational scope for the fast acceptability of the alternative solution, human issues, social issues, internal issues (organizational conflicts) and legal issues are to be checked out.

4. **Schedules Feasibility:**
   In this type of feasibility, the skills required for properly applying the new technology with training in minimum time and the time duration can be checked out to implement or overrun the new project within minimum time.

6.5 **Study of Present System in Sinhgad Institutes:**
   In the present study, Researcher has collected some relevant data with the help of questionnaire, observation and discussions, and found that there is a scope to improve the library services with latest technology at a minimum cost. During the study, it is observed that forty-three libraries are automated. At the same time there are five libraries that are yet to be automated, due to high capital cost of LMS. (Ref. Table No. 5.22, 5.23, 5.25, 5.26). Most of the libraries of the Sinhgad Institutes are having good Internet connectivity (Ref. Table No. 5.22). It is also observed that, one library is using in-house software for LIS operations, while remaining all other libraries are using commercial library management software, like, AutoLib, EasyLib, LibSuite, Libex.Net and SLIM21 by spending huge amount on library automation. (Ref. Table No. 5.25, 5.26). Now a day’s, library management system is supposed to follow all the database management systems standards and practices like MARC21 for the record structure and the Z39.50
protocol for the online OPACs. On the contrary, in the present structure it is observed that most of the software does not follow the database standards and systems. (Ref. Table No. 5.33)

As on today, all the libraries that are automated are using commercial operating system Windows from Microsoft and are also using antivirus software. This has incurred a huge amounts on purchase of the licenses and the Annual Maintenance Contracts (AMC) for renewal of license agreements, etc. (Ref. Table No.5.28, 5.27, 5.26). As some of the library management systems do not provide support to Web-based services, the users have to completely depend on the services that are available only through library premises. (Ref. Table No. 5.19)

6.5.1 Pitfalls of Existing System:
During this study, it is observed that most of the libraries are unwilling to pay for getting the updates and upgradations of the systems as this is a taxing amount for the libraries. Even, most of the libraries are not happy with the updates or upgrades that are given after the payments. Some of the general as well as specific problems related to LMS are mentioned in following points.

- In most of the LMS software there is a vendor lock that becomes a hurdle for data export. (Ref. Table No.5.46, 5.47)
- Similarly due to the software vendor locks, sometimes some vendors claim data propriety on the data of the individual libraries: (Ref. Table No. 5.46)
- Use of commercial backend software for the database management creates problem after certain number of users and the records.
- As the base prices of most of the LMS software are very high, the working capital cost too goes very high.
- In most of the cases, it is observed that the libraries do not get advanced services as per promises from the vendors. (Ref. Table No. 5.44, 5.14)
- As mentioned earlier, there are lack of International Standards in the System (Ref. Table No. 5.33)
- In most of the commercial software there is a lack of online / troubleshooting help messages. (Ref. Table No. 5.47)
• It is observed that most of the vendors charge separately and exorbitantly for add-on services or features like the web 2.0 services.
• Some of the vendors also ask for extra charges for services like copy cataloguing or even there are charges for the libraries where from the copy cataloguing services will be opted by the libraries.
• Discussion Forums and e-Mail or online supports are not provided by many of the vendors (Ref. Table No. 5.44)

6.5.2 General Expectations from New System:
After understanding the existing LMS problems, researcher has developed a tentative structure for centralized library management system that may be an alternative solution to the existing system. Researcher has tried to find out following aspects with LMS to achieve the goals from new system.

• LMS suitable for centralized or multi locational library system.
• Zero capital cost of the LMS.
• No updating charges.
• No AMC required for the system.
• Minimum cost for supporting hardware and software.
• Maximum web-based advanced services.
• Unlimited entries for backend database.
• Maximum international supporting standards.
• Technological driven support.

6.6 Feasibility Study: Towards Development of Prototype Model:
In this study, the researcher has checked out the aspects related to economic feasibility, technical feasibility, operational feasibility and scheduled feasibility with relevant data which is discussed below.

6.6.1 Economic Feasibility Study:
The economic feasibility is related to prices of required material to run the system; these prices are relevant to suitable hardware and required software cost. Researcher has been studied the economic feasibility of commercial library
management system and Open source library management system, which has been studied in terms of hardware cost and software cost.

1. Using Commercial LMS:
To create centralized library system, using existing or any commercial library management software for the Sinhgad institute libraries is not feasible, because, at first stage, it is necessary to connect all the libraries into the network and the existing LMS are creating following hurdles to run the system,

- Variaty of Library Management Softwares (LMS): In the Sinhgad Institute libraries, variety of commercial softwares are being used and brand wise these software architecture is different.
- LMS, not able to communicate each other: Due to variety of features, technology and architecture, these softwares not interlinked and hence cannot communicate with each other.
- No data exchange: Each and every commercial library software is using different data structures and not compatible to data exchange to new system.
- Lack of database standard support: These systems do not support any database international standards like, Z39.50 or MARC21etc.
- Different features of various LMS: Different software developer has different features and there is no consistency.
- At present, institutes have to contact commercial software vendor from time to time for any updates.

Solution:
- To overcome all the above problems, one needs to use the centralized library management system that needs a single (Uniform) LMS license, and would not create any hurdle for connecting each other. The following table indicates estimated capital cost for library automation using commercial LMS in ideal situation. The chart is created on the basis of approx. market prices.
Table No. 6.1: Estimated cost of required hardware for library automation using commercial (In an ideal situation) software

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Required Hardware Particulars</th>
<th>Qty.</th>
<th>Average Approx. Cost</th>
<th>Total Approx. Cost</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Server Machines</td>
<td>48</td>
<td>50,000</td>
<td>24,00,000</td>
<td>One per library</td>
</tr>
<tr>
<td>2</td>
<td>Client Machines</td>
<td>192</td>
<td>22,500</td>
<td>43,20,000</td>
<td>Three to five per library</td>
</tr>
<tr>
<td>3</td>
<td>Barcode Printer</td>
<td>48</td>
<td>9,750</td>
<td>4,68,000</td>
<td>One per library</td>
</tr>
<tr>
<td>4</td>
<td>Barcode Reader</td>
<td>96</td>
<td>3,500</td>
<td>3,36,000</td>
<td>Two per library</td>
</tr>
<tr>
<td>5</td>
<td>Laser Printer</td>
<td>48</td>
<td>6,500</td>
<td>3,12,000</td>
<td>One per library</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>78,36,000</strong></td>
<td></td>
</tr>
</tbody>
</table>

Explanation: In the existing situation, Sinhgad Institute higher education libraries are having 132 computer terminals along with eight separate servers in 48 libraries for library house-keeping operations. In an ideal situation, they required one separate server for each library i.e. 48 server machines required to run the system. The approx. market price of one server with minimum configuration is Rs. 50,000/- then the integrated cost of 48 servers will be Rs. 24,00,000/-. In ideal situation, if planed properly, each library will need at least 4 client machines, then integrated amount for 192 client machines will be Rs. 43,20,000/-. In all the libraries, barcode printer is necessary equipment for printing barcode labels. So as per the requirement, if the approx. cost of barcode printer is Rs. 9,750/- then integrated cost for 48 barcode printers will be Rs. 4,68,000/- If the average cost of laser printer is Rs. 6500/- then integrated amount of 48 laser printers will be Rs. 3,12,000/-. Barcode reader is also necessary equipment to read the printed barcodes. All the commercial library management systems will require barcode readers for barcode reading. If one or two barcode readers are supplied to respective libraries as per their need, then integrated cost for 96 barcode readers will be Rs. 3,36,000/-. So the expenditure for the various hardware will be Rs. 78,36,000/-. 
Table No.6.2: Estimated cost of required software for library automation using commercial (In an ideal situation) software

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Required Software Support</th>
<th>Qty.</th>
<th>Average Approx. Cost</th>
<th>Total Approx. Cost</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Capital cost of the LMS</td>
<td>48</td>
<td>1,00,000</td>
<td>48,00,000</td>
<td>Applicable as per brand</td>
</tr>
<tr>
<td>2</td>
<td>AMC charges per year (LMS)</td>
<td>48</td>
<td>10,000</td>
<td>4,80,000</td>
<td>Applicable as per brand</td>
</tr>
<tr>
<td>3</td>
<td>Updating charges (LMS)</td>
<td>48</td>
<td>0</td>
<td>0</td>
<td>Charges included : AMC</td>
</tr>
<tr>
<td>4</td>
<td>Operating system (server)</td>
<td>1</td>
<td>10,000</td>
<td>4,80,000</td>
<td>License copy</td>
</tr>
<tr>
<td>5</td>
<td>Operating system (client)</td>
<td>192</td>
<td>1,931</td>
<td>3,70,752</td>
<td>Yearly charges</td>
</tr>
<tr>
<td>6</td>
<td>Antivirus software (server)</td>
<td>48</td>
<td>273</td>
<td>13,104</td>
<td>Yearly charges</td>
</tr>
<tr>
<td>7</td>
<td>Antivirus software (client)</td>
<td>192</td>
<td>273</td>
<td>52,416</td>
<td>Yearly charges</td>
</tr>
<tr>
<td>8</td>
<td>Training cost</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>From vendor</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td>61,96,272</td>
<td></td>
</tr>
</tbody>
</table>

**Explanation:** The above table shows estimated cost of required software when commercial LMS are in use for library automation. This chart is created on the basis of existing situation, market prices and for ideal situation. From the primary data it is clear that, all the libraries are using commercial library management systems and not able to support centralized library system, but in ideal situation there is required uniform (Single) LMS with separate license’s copy. There are total 48 libraries and they required 48 LMS license copies for library automation, but todays approx. market price of the LMS is Rs. 1,00,000/- then integrated amount for 48 licenses will be Rs. 48,00,000/-. The commercial library management system is required to pay Annual Maintenance Charges (AMC) for each license copy and this amount will be Rs. 4,80,000/- per year. This AMC charges usually includes updating charges and training cost. All the libraries are using commercial operating system on their computers and the average cost of operating system is Rs. 1931/- per year for renewal agreements to operating system, so integrated amount for 192 client machines will be Rs. 3,70,752/- per year. If we think about operating systems for server machines, generally organizations / institutes purchases permanent license copy for server machine. In current situation, the approx. market cost of the permanent license copy
of operating system software is Rs. 10,000/- then integrated cost of 48 licenses will be Rs. 4,80,000/-. The average cost of antivirus is Rs. 273/- per computer per year (it may differ from company to company), so the integrated cost for antivirus will be Rs. 65,760/- for client (192) and Server (48) machines. So the expenditure for the software will be Rs. 61,96,272/- and the integrated expenditure on hardware and software for library automation using commercial LMS will be Rs. 1,40,32,272/-.  

2. **Economic Feasibility Study: Using OSS (Koha):**

**Table No. 6.3: Estimated capital cost of hardware for CLM using OSS**

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Required Hardware Particulars</th>
<th>Qty.</th>
<th>Average Approx. Cost</th>
<th>Total Approx. Cost</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Server Machine</td>
<td>1</td>
<td>2,00,000</td>
<td>2,00,000</td>
<td>Central Server</td>
</tr>
<tr>
<td>2</td>
<td>Client Machines</td>
<td>192</td>
<td>22,500</td>
<td>43,20,000</td>
<td>Three to five per library</td>
</tr>
<tr>
<td>3</td>
<td>Barcode Printer</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Not required</td>
</tr>
<tr>
<td>4</td>
<td>Barcode Reader</td>
<td>192</td>
<td>3,500</td>
<td>6,72,000</td>
<td>Two per library</td>
</tr>
<tr>
<td>5</td>
<td>Laser Printer</td>
<td>48</td>
<td>6,500</td>
<td>3,12,000</td>
<td>One per library</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>55,04,000</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Explanation:** Above table indicates the estimated capital cost of library automation in terms of hardware for using open source software. This chart is created on the basis of ideal situation, current market prices and for ideal circumstances. The dedicated server is required to run centralized library management system with open source software. Being the centralized server for all libraries, a huge load is expected on the single server. Hence a server with high configurations is considered for this project. Hence the cost of a single server is approx. Rs. 2,00,000/- rather than that of Rs. 50,000/-. In ideal situation, if we provides three to five client machines for each library as per their necessity, then integrated amount for 192 client machines will be Rs. 43,20,000/-. Barcode printer is necessary equipment for printing barcode labels. Most of the libraries require barcode printers and most of the open source library management softwares support laser printer to draw the barcode labels. At present situation if the average cost of laser printer is Rs. 6500/- per unit then integrated cost for 48 laser printers will be Rs. 3,12,000/-. Barcode is also necessary equipment to read the printed barcodes, all the Open Source Software (OSS) library management
systems require barcode gun for barcode reading, if one or two barcode guns supplied to respective libraries as per their need, then integrated cost for 96 barcode guns will be Rs. 3,36,000/- So the expenditure for the various hardware’s will be Rs. 55,04,000/-.

**Table No. 6.4:** Estimated cost of software for Centralized Library Management (CLM) using OSS

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Required Software Support</th>
<th>Qty.</th>
<th>Average Approx. Cost</th>
<th>Total Approx. Cost</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Capital cost of the LMS</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>Not required</td>
</tr>
<tr>
<td>2</td>
<td>AMC charges per year (LMS)</td>
<td>48</td>
<td>0</td>
<td>0</td>
<td>Not required</td>
</tr>
<tr>
<td>3</td>
<td>LMS updating charges</td>
<td>48</td>
<td>0</td>
<td>0</td>
<td>Not required</td>
</tr>
<tr>
<td>4</td>
<td>Operating system (Server)</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>Linux (OSS)</td>
</tr>
<tr>
<td>5</td>
<td>Operating system (Client)</td>
<td>192</td>
<td>0</td>
<td>0</td>
<td>Not required</td>
</tr>
<tr>
<td>6</td>
<td>Antivirus software (Server)</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>Not necessary</td>
</tr>
<tr>
<td>7</td>
<td>Antivirus software (Client)</td>
<td>193</td>
<td>0</td>
<td>0</td>
<td>Not necessary</td>
</tr>
<tr>
<td>8</td>
<td>Training cost (Once)</td>
<td>1</td>
<td>30,000</td>
<td>30,000</td>
<td>Yearly</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>30,000</strong></td>
</tr>
</tbody>
</table>

**Explanation:** Above table shows estimated cost of software for centralized library system using open source software. The chart is created on the basis of ideal situation and current market prices. Most of the Open source softwares are ‘free to download’ from the internet, so it does not require any capital cost for software. Also it does not require AMC charges and updating charges. Apart from the LMS software, other requisite and supporting software for backend and other purposes are available / downloadable free of cost. This system runs on Linux operating system which is again available in open source from the internet. Since the LMS runs on Linux, it does not require any antivirus. As these are newly and upcoming technologies, the library professionals may require one training to train the staff. The average training cost will be Rs. 30,000/- per year, so the expenditure for the software related aspects will be
only Rs. 30,000/- and the integrated expenditure on hardware and software will be Rs. 55, 34,000/- in terms of open source software.

In addition to this, OSS has a facility to connect our library database to cloud server. If user library / libraries wish to use this this facility, there are paid as well as free options are available. SMS facility is also one of the most important facilities of this model. If users wants to use this facility there are paid option are also available from various service providers like, idea, Airtel, Vodafone, etc. From the above data, researcher has stated the following table of observation related to economic feasibility study.

**Table No. 6.5:** Integrated financial estimation of hardware & softwares for centralized library system (CLM)

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Particulars</th>
<th>Commercial LMS</th>
<th>OSS LMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hardware cost</td>
<td>78,36,000</td>
<td>55,04,000</td>
</tr>
<tr>
<td>2</td>
<td>Software cost</td>
<td>61,96,272</td>
<td>30,000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>1,40,32,272</strong></td>
<td><strong>55,34,000</strong></td>
</tr>
</tbody>
</table>

**Findings:** Above table shows the cost difference of working capital models using commercial LMS and open source LMS for 48 libraries. Working capital cost for commercial software option is approx. Rs. 14,032,272/- and if we are using OSS LMS, like Koha then the approx. working capital cost may be Rs. 55,34,000/-. Difference between approx. working capital cost using commercial library management software model vs. open source library management software model will be Rs. 84,98,272/-. From the above table it is clear that, the open source software is very cost effective solution instead of commercial library management system.

**6.6.2 Technical Feasibility Study:**

In this type of feasibility, researcher has checked out whether present hardware and softwares are compatible with the new system for overrun the project.
Findings:

- All the library computer terminals have sufficient configuration (hardware & software) to adopt new software along with present configuration, (Ref. Table No. 5.16, 5.17) but still there is opportunity to add/ increase computer terminals for each library as per their need.
- All the campuses are having Wi-Fi facility to access the Internet, so it is helpful to provide web based services.
- All the campuses having UPS as well as electricity generation facility, so there is no disturbance for power cut. (Ref. Table No. 5.48)
- Most of the libraries having barcode printers and Laser printers (Ref. Table No. 5.30)

6.6.3 Operational Feasibility Study:

In this type of feasibility, researcher has checked the issues like, operational scope for the fast acceptability of the alternative solution, human resources issues, social issues, internal issues (organizational conflicts) and legal issues, etc.

Findings:

- There are 100% computer literate library personnel to understand the new system. (Ref. Table No. 5.4)
- The 100% library staff is aware about open source software. (Ref. Table No. 5.50, 5.51)
- 52.08% library staff wanted to switch their libraries towards OSS (Open Source Software). (Ref. Table No. 5.50)
- In commercial LMS, the maintenance is taken care by the vendor where as in OSS, it will be the responsibility of every individual library. This can be achieved either by the library staff or the system administrator. If not both, then the same can be outsourced.

6.6.4 Scheduled Feasibility Study:

In this type of feasibility, researcher has to check the time duration to implement the new project with minimum time along with the skills required for properly applying the new technology with training in minimum time.
Findings:

- All the libraries are keeping backup of their data in various ways. (Ref. Table No. 5.34) It is possible to convert their data in excel and MARC21 format and upload to new system.

- If all the library staff supports for this project with relevant data, within two to three month duration, it is possible to start new system.

6.7 Transitions from Commercial LMS to OSS:

Following table shows some of the institutes, where existing commercial library management systems are switched to OSS. Researcher has visited some of them and discussed their experience and views. After hearing the experiences and views about OSS, researcher has stated the following major findings, which are given below,

1) Users are able to download, install and use open source software.
2) They have successfully reduced the capital cost of LMS.
3) They are able to reduce AMC charges, commercial operating system cost and antivirus cost.
4) In the lack of IT expertise, there are many professional organizations and individuals who are ready to give technical support.
5) Able to reduce hardware components.
6) They are able to enhance library services after the replacement of commercial library management system. The major services are expressed in chapter number eight.

Table No. 6.6: Transitions from Commercial LMS to OSS

<table>
<thead>
<tr>
<th>Sr.</th>
<th>Name of the Library / Institute</th>
<th>Switched to OSS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mahatma Gandhi University, Kerla</td>
<td>Koha</td>
</tr>
<tr>
<td>2</td>
<td>Symbiosis International University, Pune</td>
<td>Koha</td>
</tr>
<tr>
<td>3</td>
<td>Bharti Vidyapeeth’s, Dr. Patangrao Kadam Mahavidlaya, Sangli (Maharashtra)</td>
<td>e-Granthalaya</td>
</tr>
<tr>
<td>4</td>
<td>Gulbarga University, Gulbarga (Karnataka)</td>
<td>Koha</td>
</tr>
</tbody>
</table>
Explanations: From the existing software study, reviews of different types of literature about OSS, feasibility study of different types of library automation and transition study of the OSS, researcher has determined to use Koha OSS (Open Source Software) for developing a prototype model, which is further discussed in next chapter.

6.8 Conclusion:

- The model being considered operationally, technically, economically as well as legally feasible in the Sinhgad Institute libraries.
- Open source software ‘Koha’ is the alternative solution to the commercial as well as in-house library software.
- Though, there is some cost consumption to implement the open source software, the outcome result is in the form of services. So the benefits derived from the software cannot be calculated in statistical format. Some benefits are tangible and some are intangible.
- All this information gives a green signal to the problem solving solution and one can proceed with the project.

References:

2. Ibid.