Library Resources Security- Analysis with Proposed Design

Bhawna Talwar

CT Institute of Higher Studies,
Shahpur, Jalandhar

Abstract - Libraries are great asset which need to be secure by every aspect. As library collections are broad and varied, so the access to these collections must be free from security threats and vulnerability. The libraries are filled with difficulties of managing resources and challenges to acquire essential skills. The foremost challenge is the issue of security of library resources. This paper analyzes library resources security issues with solution. Indeed this study provides the guidelines or steps in proposed design which is coupling of most preferred security tools & techniques to increase security of library resources.

KEYWORDS: Firewall, Closed Circuit Television (CCTV), Radio Frequency Identification (RFID), Electro-Magnetic Surveillance System (ESS), Charge Coupled Devices (CCD), Complementary Metal–Oxide–Semiconductor (CMOS)

I.   INTRODUCTION

Libraries play an important role in transmission of information and knowledge in higher educational institutions. They help in teaching, learning and research functions of their respective institutions. Libraries are expected to acquire, preserve and disseminate information resources that would satisfy the needs of present and future users. Most of the users of Library are students, scholars, visitors and teachers. Users can get information through various sources of library either electronically or manually. Libraries have a great content on their websites, such as tutorials on how to conduct searches, list of case titles in specific disciplines, electronic text books and specialized data bases more than pub med and Google scholar. Security of Library resources refers to the method developed to protect varied Library resources against un-authorized access, disasters as well as protect from thieves or intruders.

II.   TYPES OF LIBRARY INFORMATION SOURCES

Information can come from anywhere described in Figure 1. Many valuable resources are available at the library e-books, Books, Magazines, Movies, Newspaper, Journals, Database, Internet, and Reference.
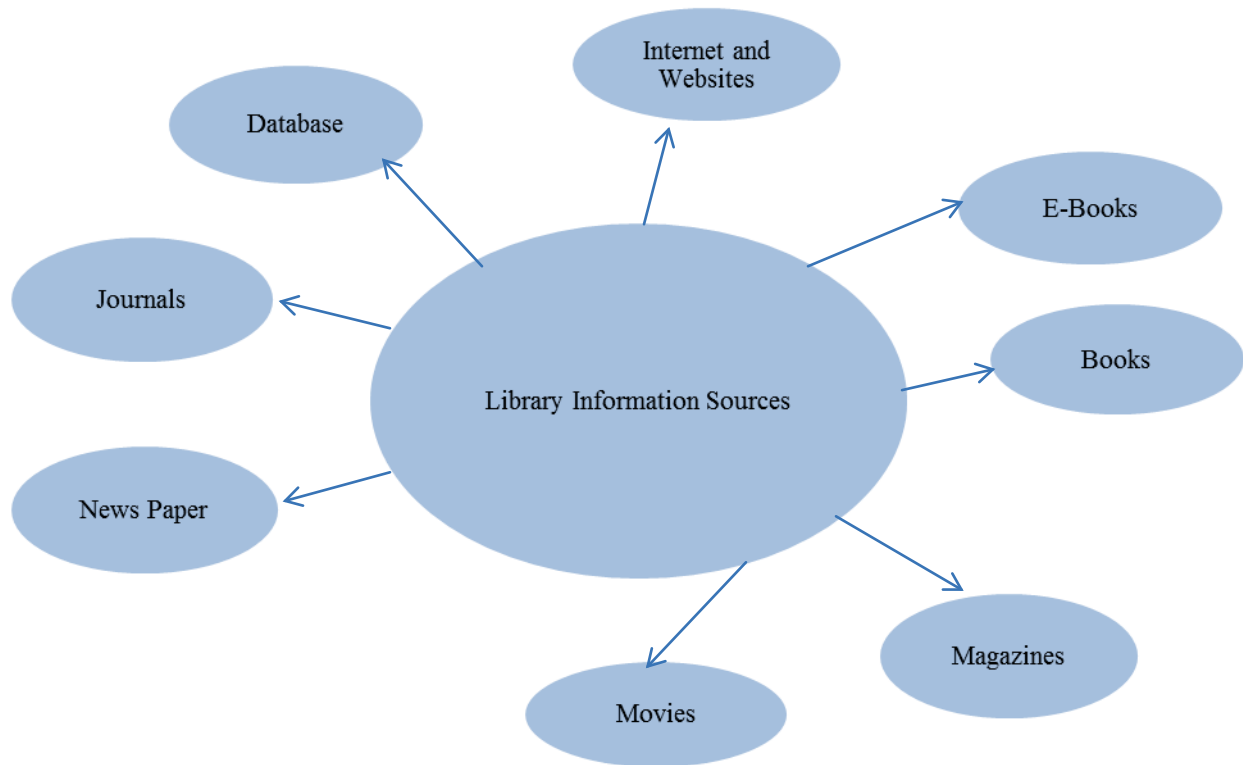
Figure 1 Library Information Sources

- **Books: -** Libraries carry many categories of books such as fictions are reference science, Management. Some libraries carry special collection of rare books, manuscripts and maps.
- **E-Books: -** Information can be acquired through E-Books which can be read on electronic media.
- **Magazines: -** A magazine is a collection of articles and images about different topics of different interest. One can find update information in magazines.
- **Movies: -** Library may carry an assortment of DVDs for Entertainment and education. We can acquire documentary and informative films like Crouching Tiger, Hidden Dragon from library.
- **News-Papers: -** Through newspapers we can acquire current information about local national and International events.
- **Journals: -** A journal is a collection of articles written by professionals or scholars in an academic or professional field. Articles in journals cover various fields of research.
- **Database: -** Data base is a set of information that contains citations of articles in newspapers and magazines. Some data bases include graphics or images such as photo, painting or maps.
- **Internet and Websites: -** Through internet and websites we can acquire information in few seconds. The information in websites includes sounds, Images and videos.

III. WAYS TO FIND DIFFERENT TYPES OF LIBRARY RESOURCES

Resource	Location in Library	Ways to Find Items
Newspaper	• Current – Leisure issue corner • Back - Serials Issues collection	• Print/ E-versions through library catalogue • E-Versions through library website • Homepage -> E-Resources -> ->Database -> Subject list -> News
Journals / Magazines	• Current Issue on magazine racks • Back – Serials Issues collection	• E-Versions through library website Homepage -> E-Resources ->Database -> ->Subject list -> News • Home page -> E-resource -> E-Journal
Books	• Various Collections	• Library catalogue Home page -> E-resource -> E-Bucks
Dissertation / Theses	• In reference / research Collections	• Library Catalogue

Table 1 Ways to Find Library Resources

IV. WHY WE NEED SECURITY FOR LIBRARY RESOURCES?

The library's collection has been changed with time. As most of the Libraries (Public, academic, corporate and special libraries) are connected to the Internet, so because of intrusion or tampering, electronic resources are difficult to protect. Also the loss of materials when taken into consideration, costs more on places new order. So to avoid inconvenience for searching lost item, we must first know the security issue and then its measure to improve security of Library resource management [9].

V.   LIBRARY SECURITY ISSUES

There are many library security issues which incurred in libraries and are of great concern. Collection security breaches considered by Ugah [8] are difficult obstacles for information access and use. Results of such acts are serious problems which causes user dissatisfaction. The major security issues in libraries to include: theft and mutilation; damages and disaster; vandalism; delinquent borrowers; and purposefully displacing arrangement of materials described in Figure 2.
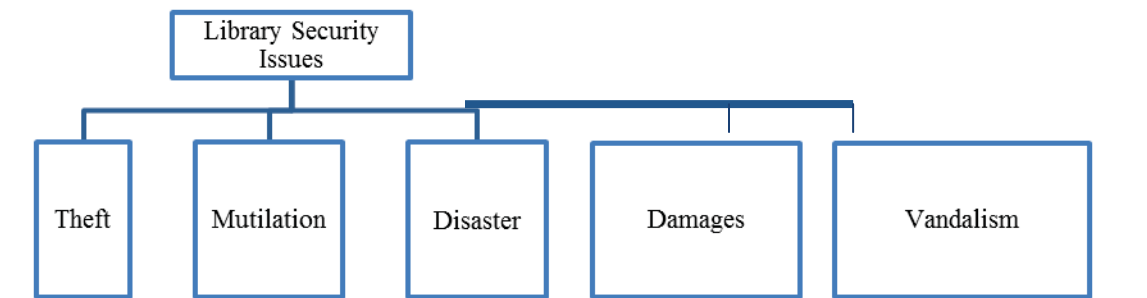

Figure 2 Library Security issues

- **Theft: -**   Theft is major concern security issue for library resources because of weak security framework. According to Lorenzen [5], the hardest threat is theft, done by library staff, as they take materials from

library by breaking security system of library. Theft not only done by library staff, but mostly by the visitors in the library who intentionally or for their need steal the library resources.

- **Mutilation: -** The damage or harm done with library resources is called mutilation. The study conducted by Bello [1] on theft and mutilation reveals that there is lack of security in university libraries. Lorenzen has described many forms of mutilation which ranges from underline text, tearing or removing pages, highlight the content. This mutilation happens only because of lack of security policies implementation in libraries.
- **Disaster: -** Aziagba and Edet have classified disaster as natural and man-made. Natural disaster such as earthquake, storm, flood etc is not controllable. But by using security measures we can have a way to overcome on these disasters if happens.
- **Damages: - Destroying**, cutting or tearing of pages of book or of any library material is term as damage of library resources. Irrespective of these damages, natural damage such as fire and water destroys library materials. Hence preservation of library materials from these damages is essential.
- **Vandalism:-** It is deliberately act of changing the content of documents or break the integrity rules and this issue occurs because of shortage of recommended textbooks, restrictions in use of some materials, high cost of photocopying etc.

VI. SECURITY MEASURES FOR LIBRARY ISSUES

Now a day the knowledge and technology have been advanced which has some vital issues that resulted to increase the security of library resources. Hence various security measures [3] have been adopted so far to safeguard these library resources and are described below.

- **Biometrics: -** It is an identification system which authenticates the person via biometric characteristics such as touching biometric system by fingers of authenticated user (who has access to library resources). According to pathrose, rathore and dixit [6] physiological or behavioral characteristics, the person is recognized and this integrity is checked by the automated method which is called as biometrics.
- **Backups: -** [2] To make duplicate copies of file or database for the accidental loss. Hence print or non-print media can be recovered from alternate storage area.
- **Antivirus Software: -** This software is very helpful to detect and used to remove virus from infected files and make these infected files free from virus. It helps to protect computer from malicious attacks created by download files from internet, email etc.
- **Firewall: -** It is just like proxy server which forwards the request of authenticated user to network servers. It act as wall between private network and other networks and also examines each network packet that is whether it should be forward to destination or not.
- **Burglar Alarm: -** RF signal via control unit having sensors indicate opening of door/window to safeguard specific losses.
- **Radio Frequency Identification (RFID): -** It is hybrid technique [4] which combines microchip technology with radio frequency based technology. The gate sensor read information on tag of material taken by reader while passing gate. This information is passed to server which checks the database and activates alarm, if material is not properly issued. There are three different types of RFID tags: passive, active, or semi-passive. Passive tag requires no power source such as battery but active and semi-passive requires small battery.
- **Closed Circuit Television (CCTV): -** It has set of monitors connected to video cameras which transmit signals. Monitors are visualized by chief of library who controls system through computer.
- **Electro-Magnetic Surveillance System (ESS): -** It is used to monitor theft and vandalism. It uses tattle-tape made of magnetic material. This magnetic material strip is inserted in books or library material and is impossible to remove. So, if an unauthorized issue has been occurred without desensitize it, an alarm will be start. Therefore the returned books are desensitized by staff of library. The sensitization and desensitization of tattle tape ensures security of library material from theft.
- **Video Cameras: -** Video cameras include imaging technologies that is Charge Coupled Devices (CCD), Complementary Metal–Oxide–Semiconductor (CMOS), tube and film. To detect electrons CCD uses light sensitive material on silicon chip. CMOS are better than CCD for its low power consumption. Fluorescent screen is used in tube camera to form the image. Photosensitive film has image which is then developed to be played.

- **Lockers Protection: -** Locks on books almiras should be open only when user authentication has been checked and verified.
- **Discourage Mutilation: -** Open and closed stacks in library used by readers should be observed by library staff to discourage mutilation or vandalism of library staff.
- **Auditing of Library:** - To get the overall view of conditions of collection via the auditing of library by team of staff members of college.

VII. ANALYSIS OF LIBRARY SECURITY ISSUES

The analysis has been described in the form of table 2 which will help the researcher to get optimum security measure for its corresponding security issue.

Sr. No.	Security Breaches or Issues	Best Optimum Security Measures
1.	Book Theft	Marks of ownership (Permanent Ink Stamp), Electronic Security and detection System such as RFID, CCTV
2.	Tearing Pages & Torn Book Spine	Electromagnetic Surveillance System (ESS)
3.	Using Someone Else ID to Borrow	Biometrics Identifiers
4.	Purposely Mis-Shelving	Video Cameras
5.	Virus in Library Computer	Antivirus Software
6.	Disasters	Fire, Burglar and Water alarms, Automatic Water Sprinkler System

Table 2 Analyses of Security Issues and its Measures

VIII.   PROPOSED DESIGN TO INCREASE LIBRARY SECURITY

The problem of library security is still unresolved even after introducing technology [7 and 10] based security solutions. So to increase security some steps can be adopted which are analyzed from research done on various libraries.

Step1 Self Check System on Entrance

1.1 What you have (ID card or Badge)

1.2 What you know (Password or Pin, Usually with card reader)

1.3 Who you are (Biometrics identifiers, usually with a Pin)

Step 2 Security Tool for Library

2.1 Video Cameras, CCTV should be used inside Library.
2.2 At Exit gate RFID technique can be used.

Step 3 E-Resources Security

3.1 Password on library software or database should be applied in computerized library.
3.2 Antivirus Software (such as AVG, Norton, Trend Micro) should be installed in computers used for Library.
3.3 Select Antivirus Software (on basis of speed removing).
3.4 Regularly update the antivirus software.
3.5 Install firewall (only for large area network like for university library).

Step 4 Mirroring of Library resources

4.1 Store backup of data on different storage media (CD, DVD, HD).
4.2 Store extra copies of print material on safe storage area (adjacent with library).

IX. CONCLUSION

The role of security in Library resources is very significant. This study analysis provides knowledge to researchers about various library resources with its access location, and regarding library security issues with its measures. Hence study concludes that we can secure library and its resources by adopting the proposed design which is described with the help of various the security patterns and techniques.

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