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Parul Gupta Ms.

University of Delhi, parulgupta.du@gmail.com

Madhusudhan Margam Dr.

University of Delhi, madhumargam@gmail.com

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Assessment of Professionals' Outlook on the Application of Electronic Security Systems in Select University Libraries of Northern India

Parul Gupta

Research Scholar, Department of Library & Information Science, University of Delhi, Delhi – 110007, India.

Email: parulgupta.du@gmail.com

Margam Madhusudhan

Associate Professor, Department of Library & Information Science, University of Delhi, Delhi – 110007, India.

Email: mmadhusudhan@libinfosci.du.ac.in

ABSTRACT

In a digital era, library professionals are not only responsible for efficient transaction services but also act as custodian of materials in all forms. With the constraints of funding, more and more librarians are relying on different technological advances such as Electronic Security Systems (ESSs) to provide security to library materials, buildings, and premises. The present paper uses survey methodology to assess the perception of library professionals especially librarians of select libraries of Northern India on the different ESSs such as Radio Frequency Identification (RFID), Closed-circuit television (CCTV), Biometric and Burglar system, and the related applications, benefits, and problems. The work highlighted that most of the libraries are relying on technology such as RFID or Electro-Magnetic (EM) Tags and Surveillance System than Biometric and Burglar for the security of library materials. The study raises awareness of the importance of ESSs for the betterment of the libraries and emphasizes the need to implement such security systems.

Keywords

Library Security, Electronic Security Systems, Applications Of Esss, Universities, Library Professionals, Rfid, Biometrics.

Introduction

The library has always played a crucial role in satisfying the need for information ranging from an individual up to the civilizations. Past decades have shown profound changes in the responsibilities and code of conduct of library professional, owing to the involvement of latest technologies, in every aspect of life. Despite playing the role of overseer of the library materials, library professionals are also facing historical and contemporary technological challenges in protecting the library environment and rights of the patrons. For example, common security issues such as theft, mutilation, vandalism, and natural hazards have always been there for centuries (Lorenzen, 1996). Beside these previous issues, the boom in information and communication technology (ICT) has changed the overall infrastructure

of a library and its services and brought unforeseen security problems such as mutilation of radio tags and tapes. A university library invests a significant amount of money to acquire different types of information materials. The librarian needs to make a balance between the complex issue of resources, its access and security and should work to protect the same with the use of all possible security options to control the damage (Ali, 2017). Despite bringing challenges, the revolution in ICT has provided essential security tools such as electronic security systems such as RFID, Biometrics, CCTV, and other devices in securing the library and all of its concerned areas (Gupta & Madhusudhan, 2018b). Although different ESSs are expensive, the cost of the alternative (loss of collections) is equally valuable in the long run. So considering the electronic security system is the need of the time for sustaining a library.

Literature Review

Electronic Security systems have become an essential part of the modern day experience. A recent report provides information about the collection security management in libraries, wherein security policies, programs, procedures, or measures are deployed to mitigate risk and ensure access (Maidabino and Ngah, 2010). Whereas in the context of security, the most effective method to minimize related crimes such as vandalism, theft and mutilation, disruptive behavior of patron, book mis-shelves, etc. in the libraries is the use of alternative preventative measures and security devices (Gupta and Madhusudhan, 2018). Technological innovation such as RFID is considered to reduce the problems of thefts as well as maintaining the inventory of the books (Molnar and David Wagner, 2004; Yu, 2007). Recent reports from our group also emphasized the importance of RFID since it combines the features of the security of materials and efficient tracking, charging-discharging, inventory, and materials handling (M Madhusudhan & Gupta, 2014; Gupta & Madhusudhan, 2017; Gupta & Madhusudhan, 2017b).

Anunobi and Okoye in his paper stated that “academic libraries are faced with hybrid challenges of managing resources and are challenged to acquire the necessary skills (Anunobi and Okoye, 2008).” Also, one more study unveils that academic libraries have suffered adversely from security issues and other anti-social menace and that the installation of security devices would drastically improve the situation (Osayande, 2011).

A study by Trapskin revealed that “the latest technology systems like RFID, Surveillance cameras, metal detectors, door intrusion alarms, delay devices, panic alarms, heat sensors, and others, may be useful in detecting different security patterns or to ensure effective security strategies for the protection of collections” (Trapskin, 2008). Similar results obtained in another study by (Madhusudhan, 2010) opined that “the RFID technology could be the future of services provided by libraries and the adoption of the technology couldn’t be given a blind eye in an era of constrained funding because, in spite of its limitations, it has provided considerable severe advantages and benefits by curbing much time to consume, monotonous, tedious and complex problems in an efficient manner”. However, the inadequate funding of the library, poor power supply and the high cost of installing electronic surveillance affect the effectiveness of electronic monitoring in a library (Ozowa et al., 2016). Nevertheless, the use of “RFID as a tool is being used for the better governance and management of libraries which concludes that implementation of RFID technology has brought a bouquet of benefits to librarians, the staff and scientists or user of the Library” (Nisha, 2018).

Objectives of the Study

- (i) to find out the already implemented Electronic security systems in university libraries for security;
- (ii) to find out the steps/planning/procedures considered before implementing these ESSs;
- (iii) to determine the various components, uses, and applications of ESSs;
- (iv) to assess the perception/opinions of library professionals regarding ESSs including benefits and problems;

Research Methodology

The present study has taken into consideration the Universities libraries of Northern India for the related analysis. The sample of the survey contains eight librarians, each from the select libraries of New Delhi, National Capital Region, and Uttar Pradesh (Delhi/NCR/UP). A survey was conducted with the help of a structured questionnaire, to obtain information from the librarians in two sections: Part 1 contains demographic information of the university libraries such as the name of the library, number of daily users, and the total number of working staff. Whereas, Part 2 contains questions related to ESSs, types of ESSs used, steps considered before implementation, and finally information regarding available technology covering applications, components, benefits, and problems. The selected technology was analyzed on the basis of its user-friendliness with a person with disabilities (PWD) and also the opinion of the librarians regarding implemented technologies using a Likert scale. The questionnaires were circulated personally to the librarians of the ten select University of Northern India, out of which only eight filled-in questionnaires were received for analysis. Descriptive statistics for analysis of data (Frequency Distribution, Percentage, calculated, etc.) are presented in the form of tables and figures. From here on, the librarians or library professionals will be addressed as respondents.

Results and Discussion

Demographic Information

The demographic details of universities library and ownership of Electronic security system are provided in Table 1. All the eight respondents provided the name of their respective university libraries namely, Bodhisattva Dr. B. R. Ambedkar Library (BDBRAL), Gautam Buddha University, Greater Noida, (UP).; Central Library, Bennett University (CRLBU), Greater Noida, (UP); Central Library, IIT Delhi (CRLIITD), New Delhi (Delhi); Dr. O. P. Bhalla Central Library (DOPBC), Manav Rachna International University, Faridabad, (Haryana); Gyanodaya Library (GL), IIM Lucknow, Lucknow (UP); Indian Law Institute Library (ILIL), New Delhi (Delhi); Justice T. P. S. Chawla Library (JTPSCL), National Law University, Dwarka (Delhi); Madhu Limaye Library (MLL), Ram Manohar Lohiya, National Law University, Lucknow (UP).

The responses also provided the details regarding the strength of the total staff of respective libraries. The information provided a tentative idea of the technical team that handled all the major service including proper functioning of ESSs. Similarly, information regarding the daily visitors of the library helped to predict their interest in the use of the library facilities in a secure environment with the use of ESSs.

Table 1: Demographics Information		
Library Name	Total staff in the library	Daily visiting users (approx)
Bodhisattva Dr. B. R. Ambedkar Library (BDBRAL)	3	300
Central Library, Bennett University (CRLBU)	10	150
Central Library, IIT Delhi (CRLIITD)	26	200
Dr. O. P. Bhalla Central Library (DOPBC)	10	1000
Gyanodaya Library (GL)	10	200
Indian Law Institute Library (ILIL)	12	100
Justice T. P. S. Chawla Library (JTPSCL)	12	200
Madhu Limaye Library (MLL)	13	200

It is also clear from the table, CRLIITD has the maximum number (26) of staff in CRLIITD, whereas BDBRAL was found to have the least number of staff members. Also, DOPBC has the maximum number of daily visitors whereas ILIL has the lowest number of daily visitors of the respective libraries.

Electronic Security Systems (ESSs)

Types and Year of implementation of ESSs

To get information of awareness, need, importance and utility regarding the different kinds of ESSs used by various libraries, a question with multiple choices were asked to the respondents and the related data given in table 2. It is visible that all the eight libraries are using RFID technology, while six are also using the surveillance system additionally in their libraries. Moreover, Biometric and Burglar security system are used by four and one libraries, respectively.

Table 2: Types and Year of Implementation of ESSs								
Library Name	RFID/Year		Surveillance/Year		Biometric/Year		Burglar/Year	
MLL	✓	*	✓	2010	×	×	×	×
DOPBC	✓	2014	✓	2014	✓	2018	✓	2014
CRLBU	✓	2016	✓	2017	×	×	×	×
GLIIML	✓	*	✓	*	×	×	×	×
BDBRAL	✓	2010	×	×	✓	2017	×	×
ILIL	✓	2007	✓	*	✓	*	×	×
CRLIITD	✓	2010	✓	2016	×	×	×	×
JTPSCL	✓	2011	✓	2010	✓	2016	×	×

Note = Please refer Table 1 for abbreviations; '✓' = Yes; '×' = No; '*' = Data unavailable

Table 2 also showed the year of implementation of respective ESSs in a library. Among the given libraries, RFID technology was first implemented in 2007 in ILIL, whereas recently it is implemented in 2016 in CRLBU. Also, the surveillance, Biometric, and Burglar systems were first installed in 2010 (MLL & JTPSCL), 2016 (JTPSCL), and 2014 (DOPBC), respectively.

By the analysis, it can be said that the RFID and Surveillance systems are most used technology for security reasons compared to than that of Biometric and Burglar systems. The data also shows about the librarian's curiosity about the technology to secure libraries property, year by year, starting from early 2007.

Steps considered before ESSs implementation

To better understand about the stages of planning before consideration of implementation of ESSs in their libraries, respondents were given question as shown in Table 3. The analysis interprets the procedure of implementing any technology, the circumstances which come while fixing the systems also it can help to create a blueprint for the implementation of ESSs systems in their libraries. Majority of the respondents stated that they took actions such as budget of provision, application, maintenance and training to personnel, whereas site survey was given least priority while considering steps in implementing ESSs. 88% of respondents believed the type of technology selection, while 75% think about kind of document holding or test the technology as its working process.

Table 3: Steps considered before ESSs implementation		
Budget Provision	08	100
Types of documents holding	06	75.0
Process Analysis	05	62.5
Site Survey	04	50.0
Technology Selection	07	87.5
Implementation	08	100
Testing	06	75.0
Maintenance	08	100
Training to Personnel	08	100

Radio Frequency Identification (RFID) Technology

The responses of the open-ended questions related to RFID technology are given in Table 4. This information will provide a basic understanding of the implementation of the RFID system in the libraries in the future. As depicted in the table, out of eight libraries, five (MLL, DOPBC, BDBRAL, ILIL, and JTPSCL) of them have tagged all the materials of libraries (books, bounded volume, etc.) with RFID/EM tags.

When asked about the software used for an RFID system, except CRLBU, all other respondents used Libsys (integrated with ILMS) as the answer. LibSys is integrated multi-user library

management software that caters to the needs of an advanced library and information professionals.

It is also observed that, during the implementation of RFID, among the eight libraries, three (DOPBC, BDBRAL, and ILIL) were not found with RFID equipment friendly for persons with disability (PwD) This results help to know and understand the different area especially disable the friendly system in implementing in further libraries to the others.

Table 4: RFID Technology Information				
Library Name	All documents are tagged with RFID/EM	Software used for RFID	ILMS	User-friendly with PwD
MLL	✓	Libsys	✓	✓
DOPBC	✓	Libsys	✓	×
CRLBU	×	*	*	✓
GLIIML	×	Libsys	✓	✓
BDBRAL	✓	Libsys	✓	×
ILIL	✓	Libsys	✓	×
CRLIITD	×	Libsys	✓	✓
JTPSCL	✓	Libsys	✓	✓

Note = Please refer Table 1 for abbreviations; '✓' = Yes; '×' = No; '*' = Data not available

Applications of the RFID system

Responses were also analyzed of questions that allowed ascertaining the implementation of the RFID systems and recognizing different variations of an RFID system in different areas. As shown in Figure 1, it is visible that all the eight respondents were found to be using RFID for circulation, whereas only one respondent used it to maintain and control users account. The related details of the application of RFID in control of theft in the library, for both access control and acquisition, supply chain monitoring, and periodical section, etc. can be inferred from the given figure 1.

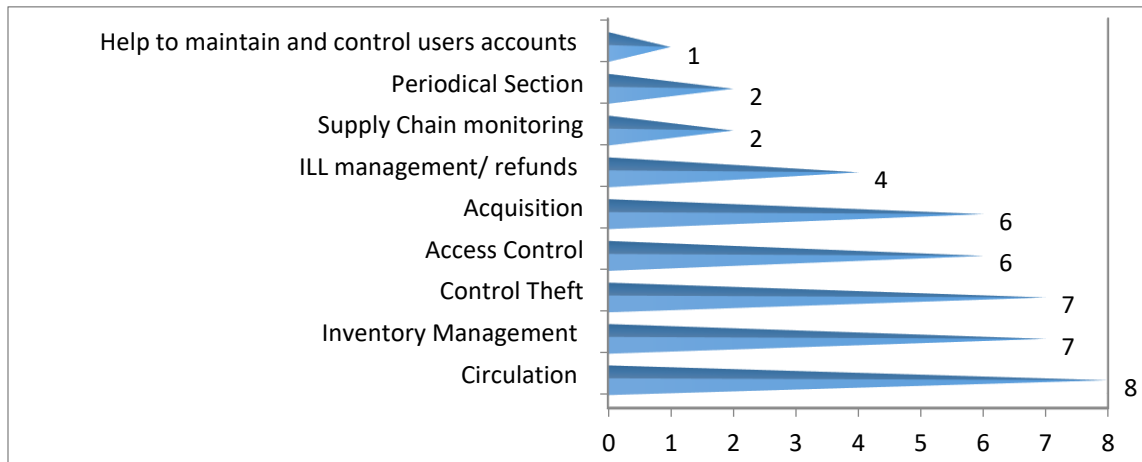


Figure 1: Application of RFID system

RFID Components

In the context of components involved in the RFID system, a multiple choice question was asked to the respondents. A blend of different RFID components such as RFID tags, RFID smart card, RFID reader, antenna, RFID hand reader, library security gate, self-check-in the station, and self-check outstation is useful in the evaluation of the RFID technology competency (M Madhusudhan & Gupta, 2014).

As inferred from the Figure 2, 100% of the respondents were using security gate, followed by the 87.5% who were using both for tags and self-check-in/out units.

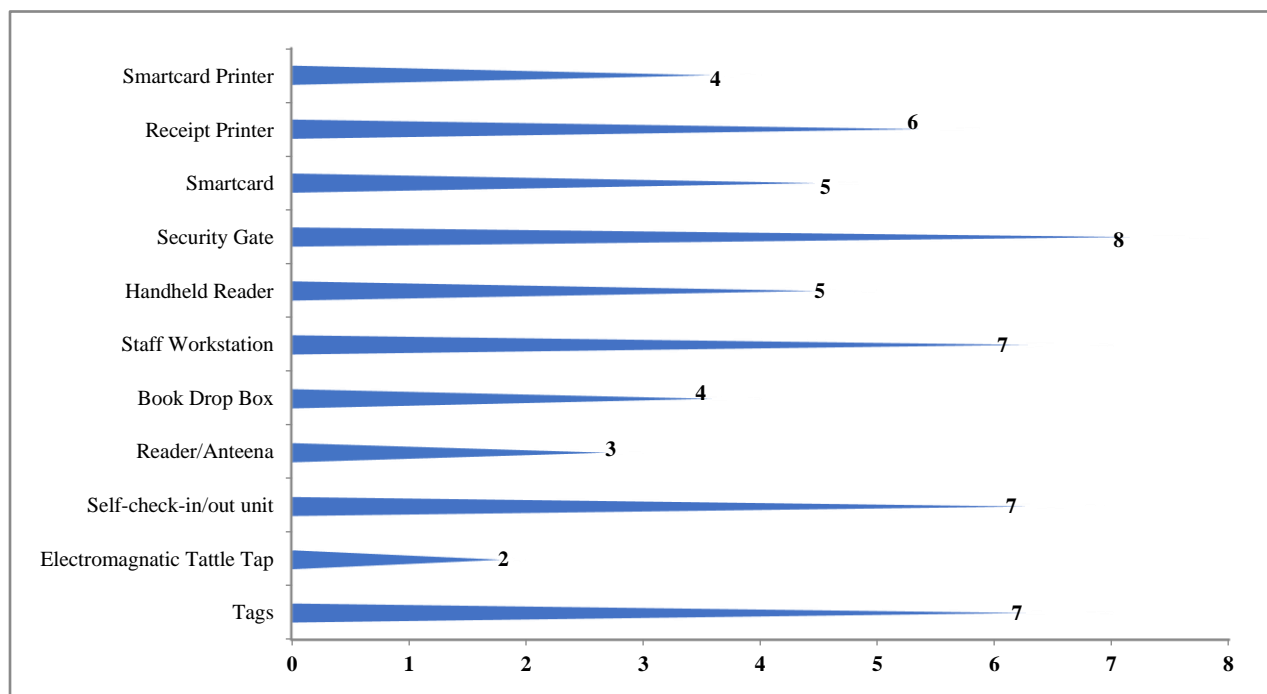


Figure 2: RFID Components

Interestingly, 75% were found using receipt printer as a component, while 62.5% were using the handheld reader. Other components such as a smartcard, book drop box, and RFID smart card printer, whereas very few respondents (37.5% and 25%) used reader/antenna and electromagnetic tattle tap. The analysis helped us to understand the usefulness of components to prevent unnecessary money waste.

RFID Benefits

There are various benefits of using the RFID system, and the most important have been enlisted and provided in Figure 3. It is also stated that “The RFID technology is primarily intended to reveal a current change in the library user service from semi-automated to fully-automated mode” (Chan & Ying, 2005). It is also opined that “It is a fast-growing technology used in libraries for enhanced circulation capabilities, better inventory control, reliability” (Ayre, 2006), and in “minimizing theft of documents and provides batch access and storage of mass” (Golding

& Tennant, 2008; Sumi & Kumar, 2007; Makhdumi & Verma, 2007). It is clear from the data given in the figure; all the libraries found the RFID system useful in the (a) security of library materials, (b) improving the efficiency of the transactions, and (c) decreasing staff workload to carry out other routine chores. It is also found that its implementation has improved time management round the clock services (75%), return on investment (ROI) (62.5%), constant updating of the database with audio/visual alerts (50%), better allocation of funds, and the easing out services for readers (12.5%).

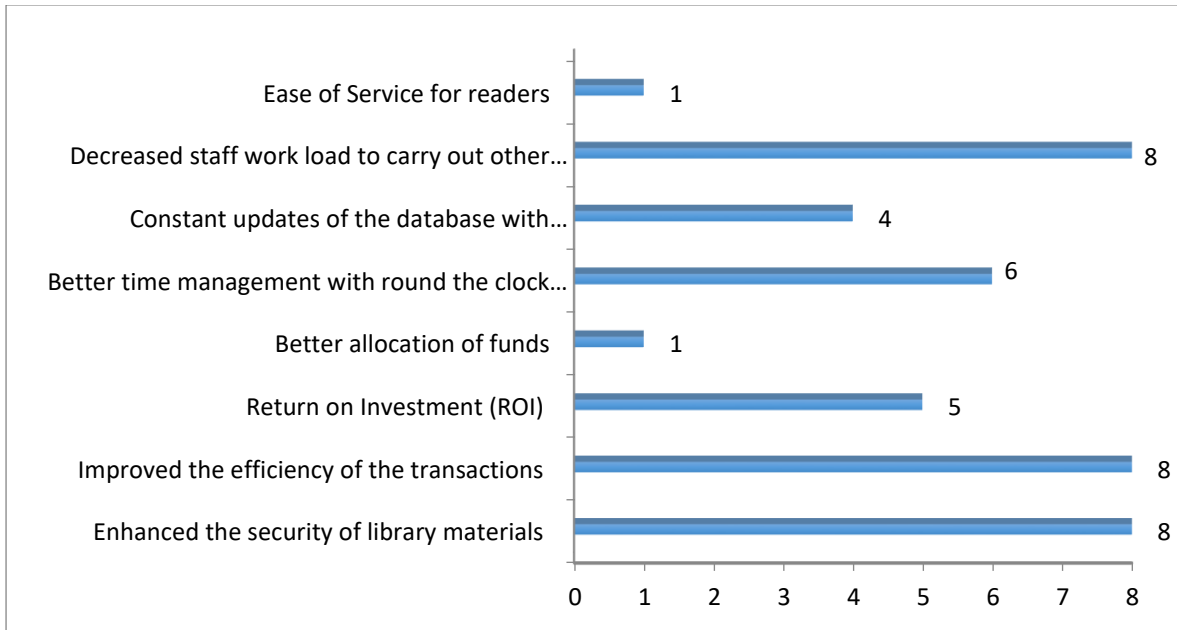


Figure 3: RFID Benefits

Problems of the RFID system

There are some problems associated with using the RFID system in libraries. The respondents were asked about the difficulties faced by them, and the related data is given in Figure 4. Out of the six choices provided in the questionnaire, the most common problem cited was the high cost of RFID component (85.7), followed by susceptibility/disruption of RFID components (42.9%), with the lack of availability of experts and regular update of software's (28.6%). Proper training of patron/staff, inability to implement in the huge collection, and compatibility of RFID with infrastructure are considered to be least problematic by the respondents (14.3). Finally, it seems that no one (0%) have problems regarding low return on investment of RFID. These results will help others in the future who are going to implement it in libraries.

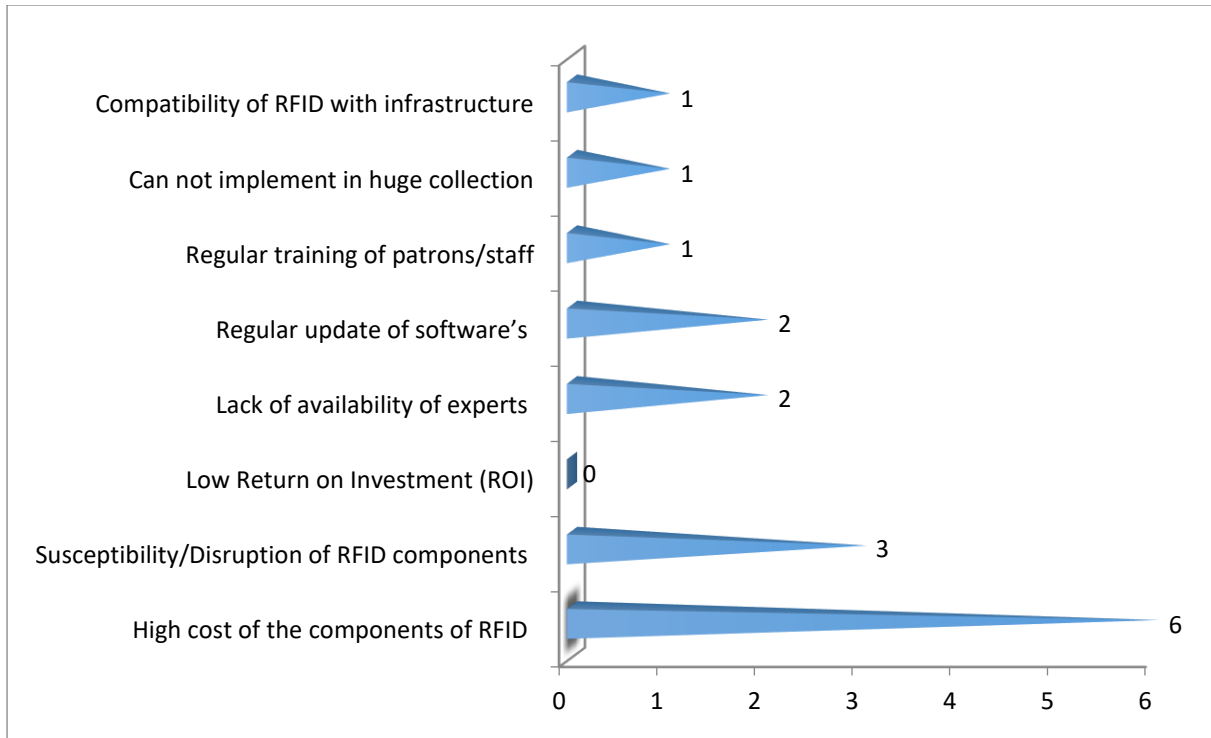


Figure 4: Problems with the RFID system

Areas secured by Surveillance System

In this context, a multiple choice question was asked to respondents about the applications of using different surveillance system in their libraries. Surveillance cameras are generally video cameras mainly CCTVs used in an area. As clearly visible from the related data compiled in Figure 5, the majority of them (87.5%) used it for securing reception, whereas only 12.5% used it to cover all the area of the library via cameras. It is also visible from the figure, 75% used it in the reading room or periodical section and circulation area, while 62.5% is used in the reference section and computer labs. More findings reveal that 50% of respondents are using it in the security control room, in the staircase, stack room, and corridors. These analyses provide an understanding of the premise to be covered of the library materials to prevent any misbehave that can happen in libraries.

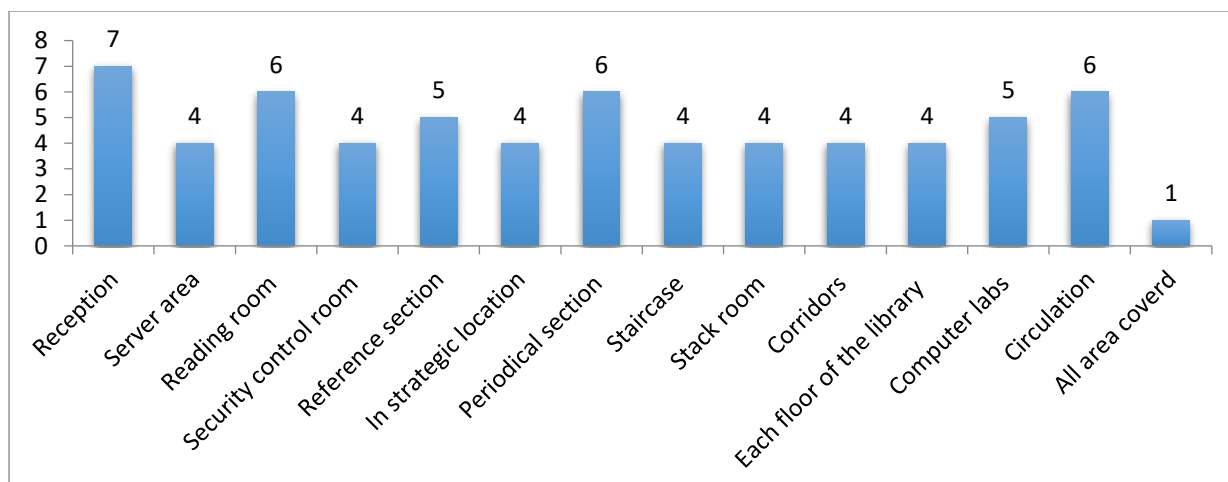


Figure 5: Areas secured by Surveillance System

Type of Surveillance System used

Responders were asked to provide the kind of surveillance system used in their libraries. The related data compiled in Table 5 shows that DOPBC and CRLIITD are using both dome and wall camera, whereas MLL are using the wireless camera. Also, CRLBU and JTPSCL are using dome camera only. Interestingly, none of the libraries is using the bullet-proof, hidden and infrared camera.

Library Name	Dome Camera	Wireless Camera	Wall Camera	Bullet-proof Camera	Hidden Camera	Infrared Camera
MLL	×	✓	×	×	×	×
DOPBC	✓	×	✓	×	×	×
CRLBU	✓	×	×	×	×	×
GLIIML	×	×	✓	×	×	×
BDBRAL	×	×	×	×	×	×
ILIL	×	×	×	×	×	×
CRLIITD	✓	×	✓	×	×	×
JTPSCL	✓	×	×	×	×	×

Note = Please refer Table 1 for abbreviations; '✓' = Yes; '×'=No; '*' = Data not available

Components of the Surveillance System

There are different components associated with surveillance systems for its proper functioning, and the related data is given in Table 6. The results depict that five (MLL, DOPBC, ILIL, CRLIITD, and JTPSCL) out of eight libraries are using all elements of a surveillance system like cameras, monitors and recording units. Camera, monitors, and recording units are using by. It is also clear that from the data of respondents of CRLBU and GLIIML that both are using camera and recording units, only.

Table 6: Surveillance System Components			
Library Name	Camera	Monitors	Recording Units
MLL	✓	✓	✓
DOPBC	✓	✓	✓
CRLBU	✓	×	✓
GLIIML	✓	×	✓
BDBRAL	×	×	×
ILIL	✓	✓	✓
CRLIITD	✓	✓	✓
JTPSCL	✓	✓	✓

Note = Please refer Table 1 for abbreviations; '✓' = Yes; '×'=Not using

Benefits of Surveillance System

After the implementation of the surveillance system in libraries, respondents find multiple benefits out of the system, and the related data is given in Figure 6. It is clear that 87.5% of respondents were agreed on improved safety and security of materials, while 75% found enhanced building security, whereas 50% respondents found improved productivity and change in the behavior of patron and staff. The suggestion received from one respondent claimed to get help in maintaining the discipline in the library.

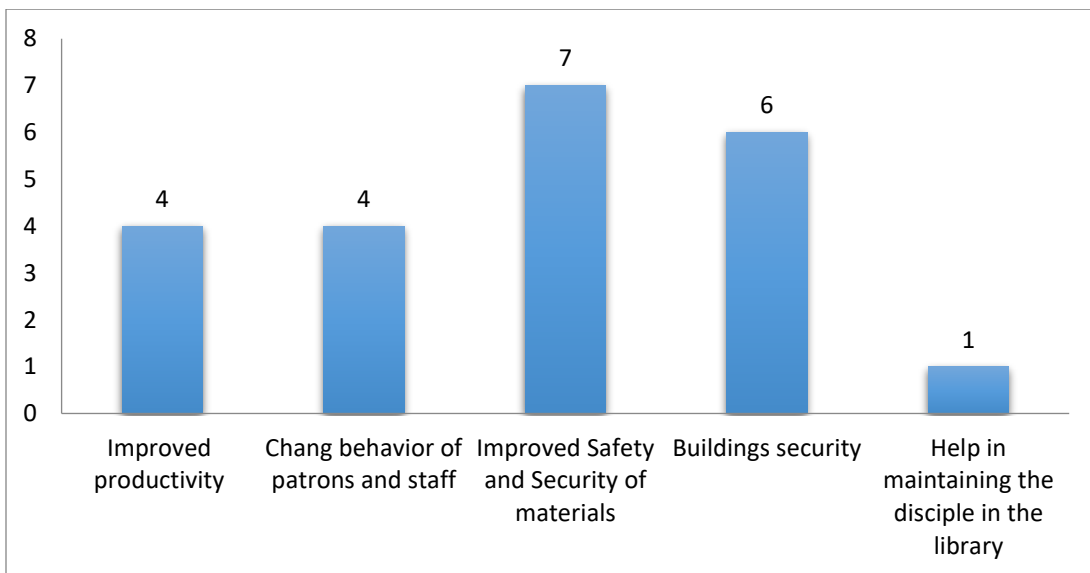


Figure 6: Benefits of the Surveillance system

Problems with Surveillance System

After the implementation of surveillance systems, respondents were enquired about the related issues, barriers, and difficulties faced after video cameras installation and the associated data is given in Figure 7. It is revealed by the analysis of the information that the system doesn't offer any more significant problems. Each of the 25% respondents said that they met faulty wiring, limited monitoring area and camera as the concerned problems, whereas 12.5% found a problem in display/monitor. None of them found a problem with wireless connectivity and hacking. With these results, it can be inferred that the surveillance system doesn't create big issues, it's easy to use and handle.

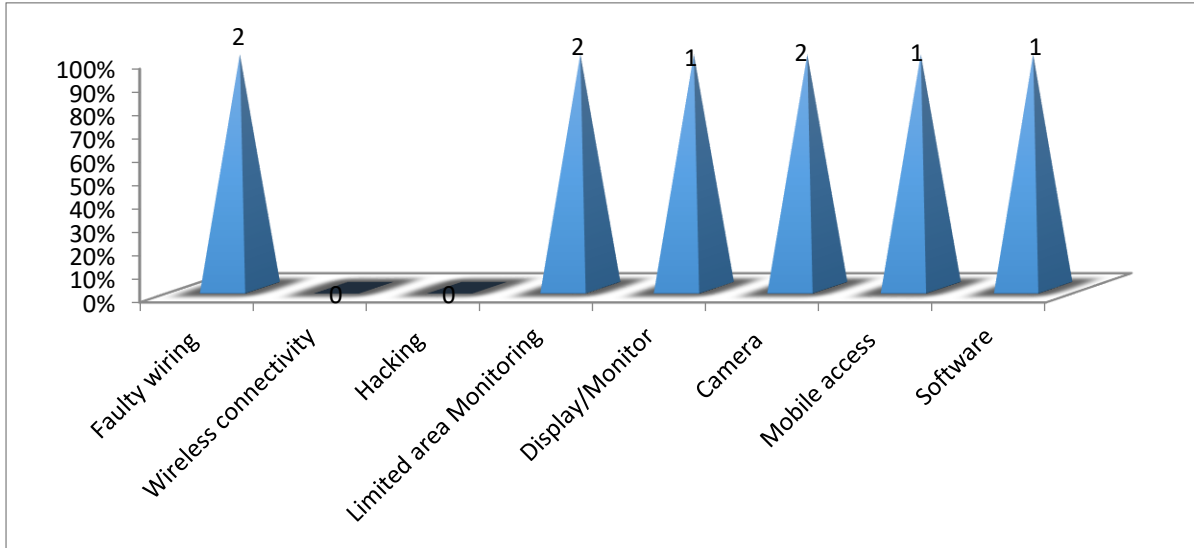


Figure 7: Problems with a Surveillance system

Biometric System

As part of the implementation of contemporary ESSs, the biometric system is gaining considerable interest in different organizations. The main reason behind the expansion of this technology is the affordability. This section provides an analysis of the various aspects of the biometric system such as the applications/area, components, benefits, and related problems. As revealed in Table 7, four out of eight libraries (DOPBC, BDBRAL, ILIL, and JTPSCL) wherein these systems are present and are using it in staff attendance system placed in a common area, including patron identification and gate in/out check using the Fingerprint module. The components of libraries the DOPBC include Database module or BDBRAL as sensor module, while JTPSCL was found using all of three parts, i.e., sensor, database, and a matching module. The main benefits of the biometric system are its enhance efficiency in the management of human resource. Interestingly, all the respondents opined about their satisfaction regarding this system and found no problem associated with it.

Library	Biometric	Application/ Area	Biometric Types	Components	Benefits	Problems
MLL	*	*	*	*	*	*
DOPBC	✓	Staff Attendance and Patron Identification	Fingerprint	Database Module	Enhance efficiency in the management of Human Resource	×
CRLBU	*	*	*	*	*	*
GLIIML	*	*	*	*	*	*
BDBRAL	✓	Staff Attendance and Gate Checking	Fingerprint	Sensor Module	Enhance efficiency in the management of Human Resource	×
ILIL	✓	Staff Attendance	Fingerprint	×	Enhance efficiency in the management of Human Resource	×
CRLIITD	*	*	*	*	*	*
JTPSCL	✓	Staff Attendance	Fingerprint	Sensor, Database and matching module	Enhance efficiency in the management of Human Resource	×

Note = Please refer Table 1 for abbreviations; '✓' = Yes; '×' = No, '*' = system not available

Burglar Security system

Considered the only presence of burglar security system in DOPBC, Table 8 presents the analysis of the system from the accepted. As revealed in the table, the main components involved in this system comprises of input, output and alarm panel. The library also enumerated the benefits and considered it in improving safety with real-time monitoring and instantly resolving conflicts or crimes. The only main problem was opined as the expensiveness of this system.

Library	Burglar	Component	Benefit	Problem
MLL	×	×	×	×
DOPBC	✓	Input, output and alarm panel	Improved safety with real-time monitoring and Instantly resolving conflicts/crimes	Expensive System
CRLBU	×	×	×	×
GLIIML	×	×	×	×
BDBRAL	×	×	×	×
ILIL	×	×	×	×
CRLIITD	×	×	×	×
JTPSCL	×	×	×	×

Note = Please refer Table 1 for abbreviations; '✓' = Yes; '×' = No

Opinion about Electronic Security Systems

To assess the viewpoint of library professionals and thus find the possibility of further improvement in the electronic security based systems, a five-point rating question was prepared to rate the services rendered by the librarians from excellent to poor (Table 9).

Table 9: Opinion about the Electronic Security Systems				
Library	RFID	Surveillance System	Biometric System	Burglar System
MLL	Excellent	Excellent	×	×
DOPBC	Excellent	Excellent	Excellent	Excellent
CRLBU	Excellent	Fair	×	×
GLIIML	Fair	Fair	×	×
BDBRAL	Good	×	Good	×
ILIL	Good	Good	Good	×
CRLIITD	Good	Average	×	×
JTPSCL	Good	Good	Good	×

Note =see table 1 for full abbreviation; ‘√’ = Yes; ‘×’=No

It was observed from the data that three libraries considered RFID system as Excellent (MLL, DOPBC, and CRLBU), while four other libraries recognized it as Good. The surveillance system implemented in the library was rated as excellent (two libraries), fair (two libraries), Good (two libraries) and average (one library). Out of the four libraries with the biometric system, three of them (BDBRAL, ILIL, and JTPSCL) is considered it as Good, while remaining one library rated it as Excellent. Old burglar alarm used by DOPBC was satisfied with its use and found it as excellent

Suggestions to Strengthen Electronic Security Systems

The respondents were asked open-ended questions to suggest ways and means for improving/strengthening the electronic-based security systems. The following were the essential suggestions collected from the respondents:

- Technology needs to be more secure and free from any typing of leaks and hacking.
- More and more security elements of a library should be made automated.
- Patrons should be made aware and educated of the technology to bring the best outcome.
- The Cost incurred with the technology are appreciably high, so should be made feasible to all institute;
- Library professional recommends facility of RFID as a security proof arrangement in a library.
- The technology like RFID/Security System should be planned and surveyed thoroughly before any implementation or use.
- The components of the technology should be explored or bought from a reputed brand to improve in the return on investments.

Conclusion

The library plays an essential role in providing access to knowledge to the citizen of any society. In digital times, the part of library professionals has gained a multitude of variations. Besides paying attention to the need of the patrons on a daily basis, one also has to be the custodian of the library intangible assets the way perceived like never before. The advent of latest technologies like RFID, Biometrics, surveillance cameras and their application in a library environment has shown results with significant efficiency. The library professional, link between a library and this technology, has played a vital role in the execution and proper management of the latest upfront. They have suggested that if done with reasonable plotting and planning, the quality of service related to the security of library can increase manifold. They also foresee the implementation of technology like RFID and Biometrics, though presently expensive to be done on a broader platform to overall increase the return on investments.

References

- Ali, M. Y. (2017). Library Book Theft and Audits in University Libraries of Pakistan. *Journal of Library Administration*, 57(1), 87–98.
- Anunobi, C. V., & Okoye, I. B. (2008). The Role of Academic Libraries in Universal Access to Print and Electronic Resources in the Developing Countries. *Library Philosophy and Practice*, 189.
- Ayre, L. B. (2006). RFID Backgrounder for Library Workers, 1–5. Retrieved from https://galecia.com/sites/default/files/included/docs/rfid_backgrounder.pdf
- Chan, P., & Ying, Z. (2005). Application of RFID Technology with the Establishment of Book Drop in Library. *Bulletin of Library and Information Science*, 55(6), 101–108.
- Golding, P., & Tennant, V. (2008). Evaluation of a radio frequency identification (RFID) library system: Preliminary results. *International Journal of Multimedia and Ubiquitous Engineering*, 3(1), 1–18.
- Gupta, P., & Madhusudhan, M. (2017a). A Review of Literature on the Recent Developments in the Application of Electronic Security System in. In *Journal of library and Information Science* (Vol. 42, pp. 136–152).
- Gupta, P., & Madhusudhan, M. (2017b). RFID technology in libraries: A review of literature of Indian perspective. In *DESIDOC Journal of Library and Information Technology* (Vol. 37, pp. 58–63).
- Gupta, P., & Madhusudhan, M. (2018a). Security of Library Materials: Challenges and the Solutions. In *Library Practices in Digital Era* (pp. 402–414).
- Gupta, P., & Madhusudhan, M. (2018b). Use of Multifaceted Electronic Security Systems in a Library Environment. In *Journal of Knowledge & Communication Management* (Vol. 7, pp. 116–130).
- Lorenzen, M. (1996). Security issues of academic libraries. In *the faculty of the College of Education, Ohio University*. ERIC: IR055938.

- Madhusudhan, M. (2010). RFID technology implementation in two libraries in New Delhi. *Program*, 44(2), 149–157. <https://doi.org/10.1108/00330331011039508>
- Madhusudhan, M., & Gupta, P. (2014). Use of RFID Technology by Students in Indian Institute of Technology , Delhi and Indian Law Institute , Delhi : A Survey. *World Digital Libraries*, 2(7), 145–156.
- Maidabino, A. A., & Awang, Z. (2010). Collection security issues in Malaysian academic libraries: An Exploratory Survey. *Library Philosophy and Practices*, 1–11.
- Makhdumi, G., & Verma, V. (2007). RFID Implementation in Libraries: A Survey of Some Select Libraries in India. In *Proceedings of the 26th IASLIC All India Conference, December 26–29, 2007, Dr Zakir Husain Library, Jamia Millia Islamia, New Delhi*. (pp. 65–74).
- Molnar, D., & David Wagner. (2004). Privacy and Security in Library RFID Issues , Practices , and Architectures. In *Proceedings of the 11th ACM conference on Computer and communications security* (pp. 210–219).
- Nisha, F. (2018). Implementation of RFID technology at defence science library, DESIDOC: A case study. *DESIDOC Journal of Library and Information Technology*, 38(1), 27–33.
- Osayande, O. (2011). Electronic Security Systems in Academic Libraries: A Case Study of Three University Libraries in South-West Nigeria. *Chinese Librarianship*, 1–10.
- Ozowa, V., Aba, J., & Aba, T. (2016). Impact of Electronic Surveillance Systems on Theft and Mutilation in Francis Suleimanu Idachaba Library, University of Agriculture Makurdi. *Library Philosophy and Practice (e-Journal)*, 1–17.
- Sumi, S., & Kumar, J. (2007). Application of RFID Technology in Libraries. In *Proceedings of the 5th International CALIBER Conference, February 8–10, 2007, Punjab University, Chandigarh* (pp. 459–467).
- Trapskin, B. (2008). A changing of the guard: Emerging trends in public library security. *Library and Archival Security*, 21(2), 69–76.
- Yu, S. (2008). Implementation of an innovative RFID application in libraries. *Library Hi Tech*, 26(3), 398–410.

About Author:

Dr M. Madhusudhan is currently working as Associate Professor in the Department of Library and Information Science, University of Delhi. He has 19 years of teaching, administration and research experience at the University level. Under his supervision 23 MPhils, 7 PhDs and 120+ project reports have been awarded. He has published one book, edited three books, 60+ research articles in peer-reviewed journals, 25 chapters in books. He is also editorial member of J LIS, IJLIS and reviewer for five international LIS journals. His areas of interest includes: Designing and evaluation of websites, evaluation of web-OPACs, ICT in libraries, social networking sites, e-resources, mobile-based library services, etc. Dr. Madhusudhan is principal corresponding author and can be contacted at mmadhusudhan@libinfosci.du.ac.in.

Ms. Parul Gupta is obtained his Master of Library and Information Science from the Agra University, Agra (India)(IGNOU), New Delhi. Master of Philosophy from the Department of Library and Information Science, University of Delhi. She presented few papers in Conference/Seminars. Her research interests are in the area of Library security systems.