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UNVEILING SECURITY LAYERS - INFORMATION SECURITY ISSUES IN SELECT ENGINEERING COLLEGE LIBRARIES OF TELANGANA STATE

M. DeepthiReddy
Research Scholar,
Department of Library and Information Science,
Osmania University, Hyderabad

Dr. J.Vivekavardhan
Asst.Professor (Senior Grade)
Head of the Department and Chairman BoS,
Department of Library and Information Science,
Osmania University, Hyderabad

Abstract:

The paperexplores different types of security layers, information security issuesin libraries. The paper discusses on different types of Information security threats like unauthorised access, data privacy, Phishing Attacks, Network security issues, malware attacks etc..that are encountered by the selected engineering college libraries in the state of Telangana.The data collected from 330 respondents from select engineering college libraries. The study highlight the critical need for strategic information security practices tailored to the unique environment of libraries.The Prominent security measures adopted by the libraries was Radio Frequency Identification (RFID) 212 (64.24%), Bio-Metric 71 (21.32%), Bio-Metric Face Recognition 34 (10.30%), CCTV 13 (3.94%) to identify the library users.The other Prominent Information Security problems encountered by the libraries was Data Privacy 114 (34.55%), Un Authorised Access 103 (31.21%), Network Security Issues 85 (26%), Phishing Attacks 88 (27%), Access Control 105 (32%) problems faced by the users in the libraries. There is a need for regular update of security protocol and continuous training programs for all the stakeholders like library users, staff members to create awareness and strategic management to safeguard information security in the libraries.

Keywords: Information Security, Digital Assets Security, Identity Access, Password Security, Data security, Security issues in library.

Introduction:

Information Security protects the information by reducing information risks. It provides a safe and secure environment for library staff and its patrons, for good usage of library resources and safeguarding the library material. Information security is one of the major challenges being faced by the Library professionals. There is a paradigm shift of traditional libraries into the Digital Libraries. Library resources and library patrons are increasing enormously this causes an increase in the vulnerabilities of theft and other critical information security related issues.

The threats to formation cause damages it affect the integrity of data, confidentiality and non-trust on the information system.There is a need to know in advance about threats, its sources and its effect on the information system. It is very much essential to know how to keep the information system more safe and secure to protect it.Cyber-threats such as data breaches, hacking, and phishing attacks pose risks to the integrity and confidentiality of information, potentially compromising user privacy and trust.Libraries face unique challenges in implementing the effective security policies due to limited budgets, lack of specialized work force and open access services. Striking a balance between facilitating easy access to information for users while at the same time protecting their privacy and data integrity is a major challenge for libraries.

Review of Related Literature:

Chanlang Ki Bareh,(2023) study examines the Digital Personal Data Protection Act, 2023 within the library context. DPDP Act was enacted on August 11, 2023. Study outlines eleven privacy principles including data collection, processing, retention, sharing, consent, children's data, security, user rights, accountability, reporting and compensation as guidelines for libraries and e-vendors to protect user privacy. It also suggests measures such as implementing clear privacy policies, reducing web tracking, using privacy-enhancing technologies, and de-identifying patron data to address online privacy gaps in libraries, thereby supporting the preservation of user privacy rights. **DhairyaAgarwal, Souvik Roy, Sandhya Elizabeth Anto, (2020)**Security mechanism which has become an important part in today's society to protect the information.Mobile plays a crucial role to control the equipment and security system.**Analytics India Magazine. (2020, March 05).**Cyber security and information security, one deals with the defending of data in cyberspace, while the other one deals with the security of data in general.**IfeomaAjie (2019),** cyber threats have plagued academic libraries making it necessary for the emergence of cyber security. **Nicholas-Rocca, S. T (2019)** in his article "Information security in libraries: examining the effect of knowledge transfer" Study suggests that knowledge transfer does have a positive effect on library employee information security and risk management practices.**Vikas, S &Madhusudhan.M(2018),**The study revealed that university libraries lagging physical security measures, librarians to improve their information security measures and also open the floodgates for improvements of information security.**Bhavsar, S., &Bhavsar, S. (2017)** Libraries need to invest in various measures required to curb cybercrimes and how they perform their respective cost-benefit analysis of such investments..**BijayanandaPradhan and RatnapriyaBhoi (2015)**study examines security issues in libraries include mutilation of books, theft of library materials, mis-shelvig of books intentionally, use of other patron's library cards, duplicating ownership stamps, etc..**Lincoln, A. J., and C. Z. Lincoln.**(2014) study reveals that recruit library staff for effective security, train the staff time to time, retaining the security staff is very essential to safeguard library resources. There is a need to purchase multiple copies of books which is high in demand, photocopying service in library, punishment for library crimes recommended.

Objectives of the Study:

- To examine the current information security issues in selected engineering college libraries of Telangana State.
- To identify the various information security methods used in selected engineering college libraries.
- To determine the different types of information security issues in selected engineering college libraries.
- To assess the training needs of library personnel in information security management in selected engineering college libraries.
- To provide recommendations for improving the implementation of information security in selected engineering college libraries.

Methodology:

Survey method and personal interview is employed to collect the responses regarding the information security in the select libraries. To achieve the research objectives, a sample of 10 engineering college libraries in the state of Telangana was selected. The sample size for the study includes 250 student respondents, 50 faculty respondents and 30 library administrators. Results and findings of the study were drawn based on the responses from the total of 330 respondents.

Limitations:

The present study is confined to selected 10 engineering colleges libraries of Telangana state. The observations and findings are drawn based on limited sample only. The results and findings can't be generalized to all other engineering college libraries in the state of Telangana.

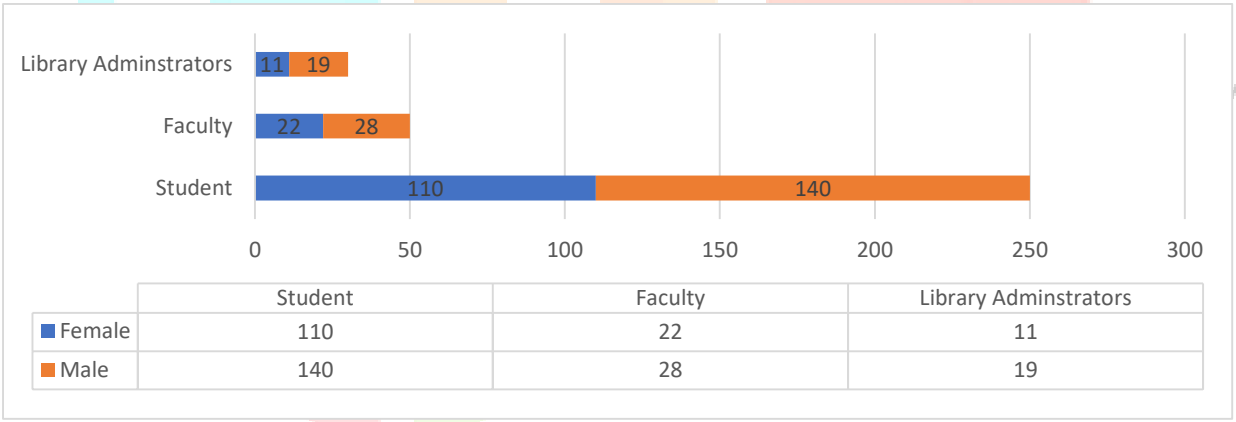
Results & Discussion:

The Gender-wise distribution of respondents shows that 110 students, 22 faculty and 11 library administrators were females while 140 students, 28 faculty and 19 Library administrators were male.

Table No. 1 Distribution of respondents based on Gender & Occupation

Gender	Occupation of Respondents			Total
	Student	Faculty	Library Administrators	
Female	110	22	11	143
Male	140	28	19	187
Total	250	50	30	330

Figure: 1 Distribution of respondents based on Gender & Occupation



The average age of student respondents is 21 years. For faculty respondents, it is 47 years and for library administrators it is 45 years. The majority of faculty respondents have post-graduate degree as their education qualification, followed by a small percentage of respondents who holds PhD as education qualification. All library administrators have MLISC as their basic educational qualification and considerable number of respondents also have PhD as additional qualification. The average work experience of faculty respondents was 10.5 years, and for library administrators, it was 9.45 years.

The majority of libraries, i.e., 6 out of 10, are located within the main college building, while the remaining libraries offer services from independent buildings on the campus. A very small number of libraries in the current survey have implemented a single entry and exit for the users in their respective libraries to ensure better monitoring and control of library operations. Radio Frequency Identification- (RFID), Bio Metric, Biometric Face Recognition and CCTV are the prominent security measures adopted by the libraries for user identity.

Table: User Identity measures followed across the libraries

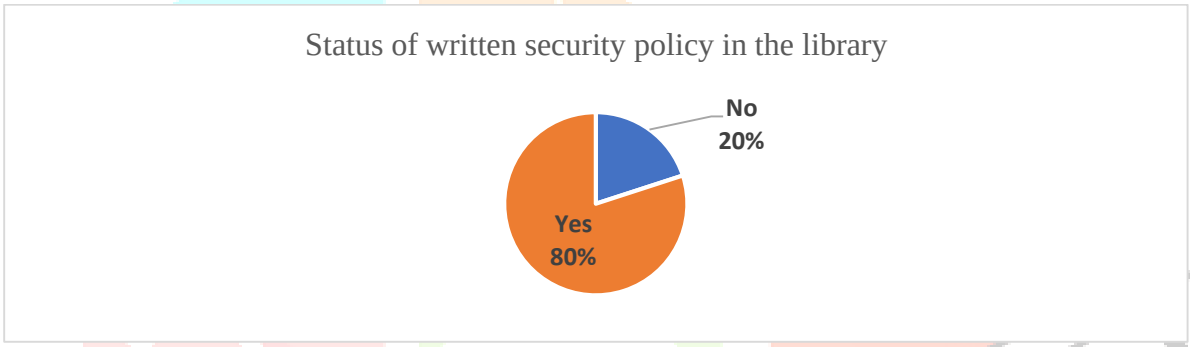
Security Method	No. of Respondents	Percentage
Radio Frequency Identification	212	64.24
Bio Metric	71	21.52
Biometric Face Recognition	34	10.30
CCTV	13	3.94
Total	330	100

A written security policy for a library is an essential document that outlines the procedures and guidelines for maintaining a secure environment. It serves multiple purposes: it protects the library's physical and digital assets, ensures the safety of both patrons, staff, maintains the confidentiality of user data. In the present study a Large majority of participated libraries i.e. 8 out of 10 libraries possess a well-structured written security policy.

Table- Responses on Status of written security policy for the library

Response	No. of Respondents	Percentage
No	2	20
Yes	8	80
Total	10	100

Figure: Responses on Status of written security policy in the library



Chi-squire test: Respondent type Vs. Status of written security policies in Library

Respondent Type	Chi-Squire Value	Table Value	DF	Significance
Vs. Need for Training	3.3107	5.991	2	In-Significant

Calculated Chi-Squire value respondent type Vs. Libraries having written information security policy is 3.3107 is less than the table value 5.991 at 2 degrees of freedom. Hence majority of selected libraries in the present study is following the standard written information security policy.5 libraries out of 10 selected libraries conduct regular security audit. Regarding the frequency of security audits, libraries typically conduct a security audit at least once every three months.

Library automation enhance efficiency of library services, improves accuracy, speed up checkouts, enables easy inventory management, and provides better access to digital resources.. 80% libraries i.e. 8 libraries out of 10 libraries are fully automated and remaining 2 libraries are partially automated.

Table- Responses on Information security issues in libraries

Information Security Issues	Response		Total
	No	**Yes**	
Data Privacy	216	114	330
Unauthorized Access	227	103	330
Network Security	245	85	330
Phishing Attacks	242	88	330
Physical Security of Devices	263	67	330
Access Control	225	105	330
Digital Resource Management	286	44	330
User Education	197	133	330
Insider Threats	269	61	330
Backup and Recovery	226	104	330

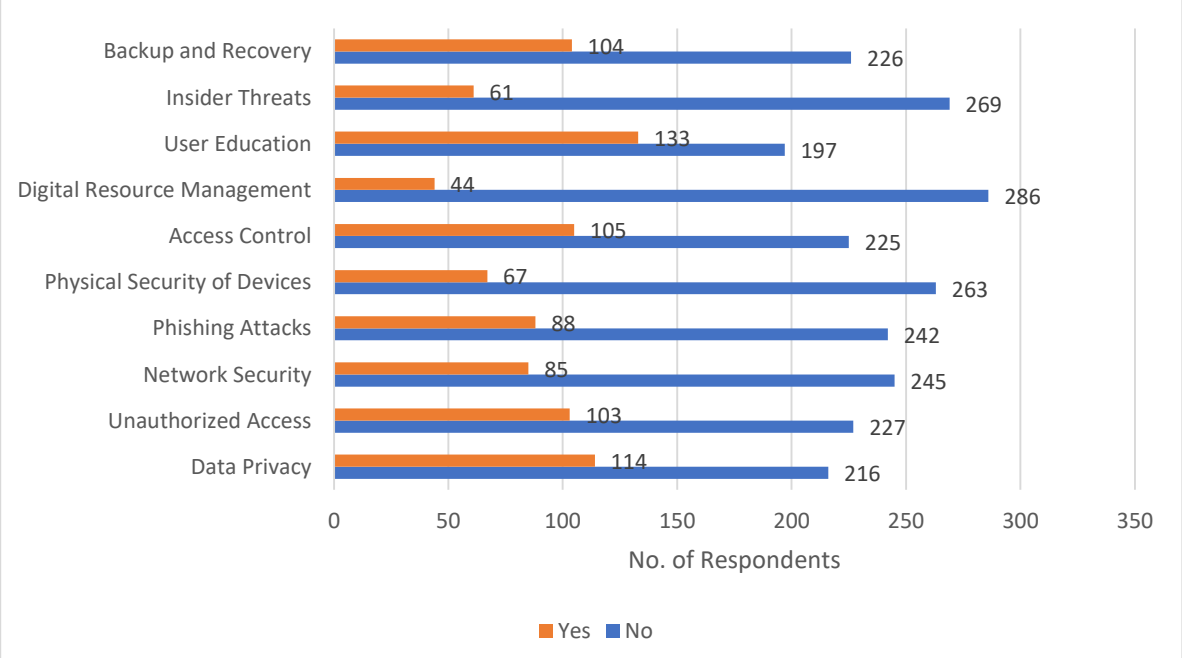
Responses regarding data privacy as an information security issue faced by the library indicate that out of 330 total respondents, 114 (34.55%) reported that their respective libraries experience data privacy issues. Concerning unauthorized access by users to libraries or library resources, approximately 68.79% of respondents (227 out of 330) stated that their libraries do not face issues related to unauthorized access. However, a significant minority of 31.21% (103 respondents) confirmed that their libraries do encounter issues with unauthorized access.

About 26% (85) of respondents said they do face network security issues in their respective libraries and 27% (88) of respondents said they do encounter Phishing Attacks in their respective libraries. The vulnerabilities to Physical Security of Devices a few respondents i.e. 67 respondents out of 330 total respondents said their libraries do have information security issues pertains to Physical Security Devices. 32% (105) said their libraries have information security issues pertain to access control.

Information security issues like Digital Resource Management a large majority of respondents i.e. 86.67% (286) said their libraries don't have Digital Resource Management issue in their libraries. About 40.30% (133) respondents out of total 330 respondents said that user awareness/user education on how to be resilient with various vulnerabilities is the information security issues. Only 18.48% (61) said their libraries do face insider threats.

Responses on Backup and Recovery a considerable number of respondents i.e. 31.52% (104) respondents said their libraries do face Backup and Recovery problem in their libraries.

Figure- Information security issues in libraries



Chi-squire Test: Respondent Type Vs. Information Security issues in libraries

Respondent Type	Chi-Squire Value	Table Value	DF	Significance
Vs. Data Privacy	93.2009	5.991	2	Significant
Vs. Unauthorized Access	89.8713	5.991	2	Significant
Vs. Network Security	58.6695	5.991	2	Significant
Vs. Phishing Attacks	21.6909	5.991	2	Significant
Vs. Physical Security of Devices	9.3339	5.991	2	Significant
Vs. Access Control	22.2375	5.991	2	Significant
Vs. Digital Resource Management	35.4000	5.991	2	Significant
Vs. User Education	14.1271	5.991	2	Significant
Vs. Insider Threats	25.5746	5.991	2	Significant
Vs. Backup and Recovery	17.7063	5.991	2	Significant

Calculated chi-squire value for information security problems like Data Privacy (93.2009), Unauthorized Access (89.8713), Network Security (58.6695), Phishing Attacks (21.6909), Physical Security of Devices (9.3339), Access Control (22.2375), Digital Resource Management (35.4000), User Education (14.1271), Insider Threats (25.5746) and Backup and Recovery (17.7063) is more than the table value (5.991) at 2 degree of freedom. Hence there are information security issues in engineering college libraries of Telangana state.

Table: Responses on Need for training on information security policies of libraries

Responses	No. of Respondents	Percentage
No	213	64.53
Yes	117	35.45
Total	330	100

Based on the responses on need for training on the information security policies shows that a moderate number of respondents i.e. 117 (35.45%) respondents out of 330 total respondents said they need training on information security policies. To provide smooth and secure environment for the users, all libraries need to conduct the regular training programs to the users.

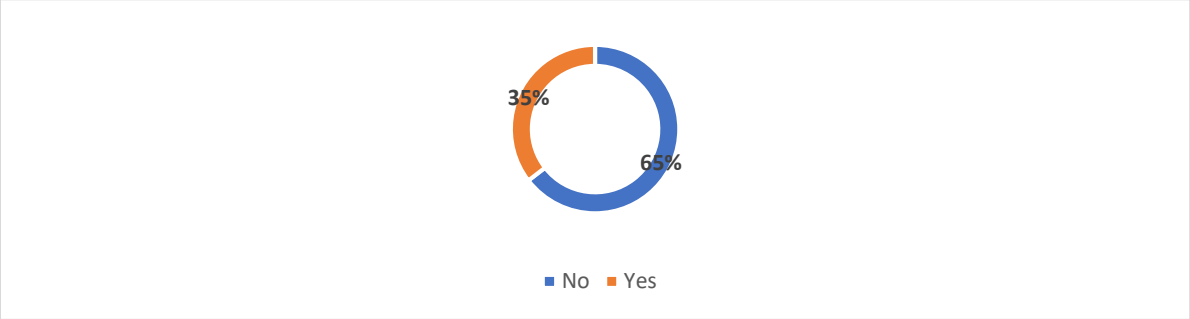


Figure: Responses on Need for training on information security policies of libraries

Chi-squire Test: Respondent Type Vs. Need for training on information security policies and procedures

Respondent Type	Chi-Squire Value	Table Value	DF	Significance
Vs. Need for Training	13.7109	5.991	2	Significant

Calculated Chi-squire value for Respondent Type Vs Need for training on information security policies and procedures is 13.7109 which much more than the table value (5.991) at 2 degrees of freedom. Hence there is a significant demand from the library users for training on information security policies and procedures of library.

Findings of the study:

- Use identification methods like RFID 212 (64.24%, Biometric 71 (21.52%), Biometric Face Recognition 34 (10.30%), and CCTV 13 (3.94%) is followed in the selected libraries.
- 8 out of 10 libraries adopted awell-structured written security policy in the ibraries.
- About 26% (85) of respondents said they do face network security issues in their respective libraries.
- 80% libraries i.e. 8 libraries out of 10 libraries are fully automated and remaining 2 libraries are partially automated.
- 27% (88) of respondents said they do encounter Phishing Attacks in their respective libraries.
- 31.52% (104) respondents said their libraries do face Backup and Recovery problem in their libraries
- 117 (35.45%) respondents out of 330 total respondents said they need training on information security policies.

Conclusion:

Technology is essential part of today's generation. The technology we use in libraries is extremely secure and safe. Libraries are not merely centres of knowledge but also custodians of sensitive information and digital resources. As libraries continue to expand their digital offerings and integration of technology driven solution to enhance the library services to the users, the potential for security breaches increases. Therefore it is imperative that libraries adopt a proactiveapproach to information security, ensuring continuous staff training on the latest security practices and threats. Collaboration with IT experts and adherence to international information security standards can help libraries safeguard against potential cyber threats. This study also highlights the importance of fostering a culture of security awareness among all stakeholders, including library staff, patrons, and administration. Libraries can not only protect their resources but also maintain the trust of the communities they serve. Continuous vigilance and adaptation to the evolving cyber security landscape will be the key to overcoming challenges faced by libraries in the realm of information security.

References:

1. Analytics India Magazine. (2020, March 05). Cybersecurity: Difference between cybersecurity & information security. Retrieved April 15, 2024, from Analytics India Mag website: https://analyticsindiamag.com/difference-between-cybersecurity-information-security/
2. Bhavsar, S., &Bhavsar, S. (2017). Cybercrimes and measures to prevent in libraries. Knowledge Librarian, 3(5), 38-47. Retrieved August 2, 2022, from http://www.klibjlis.com/4.5.7.pdf
3. BijayanandaPradhan and RatnapriyaBhoi (2015), Security & Conservation ofLibraries, , International Journal of Library and Information Science Studies, Vol 5(4), pp 72-82.
4. Chanlang Ki Bareh, Reviewing the Privacy Implications of India's Digital Personal Data Protection Act (2023) from Library Contexts, DESIDOC Journal of Library & Information Technology · January 2024, https://www.researchgate.net/publication/377768426
5. Charles Rodrigues and Angel Freddy Godoy Viera, (2018), Criteria for adoption of e-books in libraries in the context of the paradigm of cloud computing, Information Discovery and Delivery V.46,I. 3 (2018) Pp.161–172.
6. DhairyaAgarwal, Souvik Roy, Sandhya Elizabeth Anto, (2020), Automated Security Systems, International Journal of Electrical Engineering & Technology (IJEET) , Volume 11, Issue 2, March-April 2020, pp. 121-128.
7. Emil Hudomalj, Avgust, Jank, (2005), Authentication and Authorization Infrastructure for the Mobility of Users of Academic Libraries An overview of developments, Program: Electronic library and Information Systems, Vol.40, No.1, PP.63-73
8. Emmanuel, V., &Anele, E. (2018). Influence of information and communication technologies (ICT) on some library services in libraries of Federal Uniersities in South-South Nigeria. International Journal of Applied Technologies in LIbrray and Information Management, 4(2), 9-16.

9. IfeomaAjie (2019), A Review of Trends and Issues of Cyber Security in Academic Libraries, Library Phylosophy Practice (e Journal).2523
10. Lincoln, A. J., and C. Z. Lincoln. "Library and Security: An International Perspective," Library and Archival Security 8, no. 1/2 (1986): 1–154
11. Nicholas-Rocca, S. T. (n.d.). Informatiom security in libraries: examining the effect of knowledge transfer. Retrieved on 05-4-2024 fromhttps://ejournals.bc.edu/index.php/ital/article/download/10973/9495/
12. Sattarova, Feruza Y and Kim, Tao-hoon. (2017). IT Security Review: Privacy, Protection, Access Control,Assurance and System Security. International Journal of Multimedia and Ubiquitous Engineering, 2(2), pp. 17-32.
13. Shabana, T. S., Saleem, A., &Sadik, B. M. (2013). Impact of library automation in the development era. IOSR Journal of Humanities and Social Science, 17(5), 20-26. Retrieved August 2, 2023, fromhttps://www.researchgate.net/publication/324829280_Impact_of_Library_Automation_in_the_Development_Era
14. Solms, R. v., &Niekerk, J. V. (2013). From information security to cyber security. Computers & Security, 38, 97-102. Retrieved November 14, 2021, from https://profsandhu.com/cs6393_s19/Solms-Niekerk-2013.pdf
15. Solms S.H. Von, Eloff Mm (2000), Information Security Management: A Hierarchical Framework for Various Approaches, Computers & Security, 19(3), 243-256.
16. Vikas, S &Madhusudhan.M(2018), Information security measures of libraries of central universities of Delhi: A Study, DESIDOC Journal of Library & Information Technology, 38(2);102-109.