INFORMATION SECURITY GOVERNANCE ASSESSMENT TOOLS FOR HIGHER EDUCATION WITH SPECIAL REFERENCE TO ENGINEERING COLLEGES – A STUDY

SYNOPSIS SUBMITTED TO
MADURAI KAMARAJ UNIVERSITY
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
DOCTOR OF PHILOSOPHY IN
LIBRARY AND INFORMATION SCIENCE

By

Mr. M. BHARATHIDASAN

Registration No: P4571

(Part-Time)

Research Supervisor

Dr. K.CHINNASAMY, M.Sc., M.L.I.Sc., M.Phil., PGDCA., Ph.D.,

Professor, Head and Chairperson,
Department of Library and Information Science,
School of Information Technology,
Madurai Kamaraj University,
Madurai – 625 021.

MADURAI KAMARAJ UNIVERSITY

(University with Potential for Excellence)

MADURAI – 625 021

November 2019

INTRODUCTION

The proliferation of the Internet and other computer technologies has been highly beneficial to the libraries. Investment in everything through online databases and computing equipment to personnel and training is significant. Libraries should have policies, protection measurements and trained staff in order to safeguard their investment in computer and computer-related technologies, personnel and services. This thesis will address the topic of information security, making concrete recommendations for safeguarding information and information access tools. Instead of giving detailed instructions for security techniques, the emphasis is done for setting the agenda for the role of security in library environments. Historically, formal training for librarians' use of information technology was in the relatively narrow specializations of library automation and online searching. Library automation training is for library staff that would manage, evaluate, and sometimes design and implement technology system in the libraries. The OPAC (Online Public Access Catalog) was a centralized system based in the library or a regional office for circulation and holding information as well as other types of data (Serials Control, Acquisitions, Cataloging, etc.). Library automation training seldom mentions any type of security for protection of data, privacy or equipment.

SCOPE OF THE STUDY

The Higher education engineering institute libraries face a number of security challenges with their collections (both print and non-print). Library collections constitute the bedrock of services provided to the community and serve as important assets to the library. And securing and protecting the collections can help the libraries to provide an effective service in response to the information needs of the students and staff community. Collection security implies the need for libraries to provide, maintain and secure its collection to ensure longetivity, accessibility and effective provision of services to users.

Though the scope is large, information security has not made much headway in our country. Various factors would be responsible for this scenario. Analazation of these factors by focusing library security as well as higher education engineering institute library professional would throw light on further improvement regarding the effectiveness of library security. This study examines the case study on library security

and collection security to identify factors to be considered to develop a collection security management assessment instrument for higher education engineering institute libraries. The proposed "house" model consists of five factors; collection security governance, operations and processes, librarian issues, physical and technical issues and the security culture in higher education engineering institute libraries and all these have been focused in the present study. The study has been undertaken to explore the library security in higher education engineering institute libraries. The scope of the study is to include higher education engineering institute librarian in the state of Tamilnadu, India.

OBJECTIVES OF THE STUDY

- To Study the available security policies for information security governance assessment tools in engineering institute libraries.
- To analyze the library safety measures of security arrangement in the library.
- To identify quality aspect of information security systems in the library.
- To identify the organizational aspect of information security technological and features in the library.
- To measure the overall satisfaction regarding information security system to be adopted in the library.

HYPOTHESES

1. There is no significant relationship between the college living area and the security policies in the library.
2. There is no significant difference between the gender and the library safety of Security arrangement.
3. There is no significant relationship between designation and the quality aspect of information security systems.
4. There is no significant relationship between age and the organizational aspect of information security technological and features.
5. There is no significant relationship between the socio factors and their overall reading satisfaction about information security systems.

RESPONDENTS OF THE STUDY

Tamilnadu is home to some of the most reputed engineering institutes at the higher educational level in India. Higher Education Engineering Institute librarian groups were chosen as the respondents for their search study. The first and major groups of respondents who used information security systems were implemented at the higher education engineering institution libraries. There are totally 198 respondents selected for the study.

DATA COLLECTION

The study depends on primary and secondary data. The primary data have been collected through well-structured questionnaire from the higher education institution engineering college faculty members. The secondary data from various sources like research articles, books, thesis and dissertation have been used for the purpose of preparing review of literature. The researcher designed the questionnaire after having a thorough discussion with subject experts and colleagues.

METHODOLOGY

The Higher Education engineering Institute library facility members were chosen as respondents for the study. Among so many reputed institutions in Tamil Nadu, the researcher has selected 75 institutions for his study. He has distributed questionnaires among these selected higher education institutions' library faculty members randomly. Nearly 200 questionnaires were issued. Out of these, 200 (100%) questionnaire were collected and 02 questionnaires were rejected. For the researcher convenient, 198 respondents have been selected for analysis purpose. The random sampling technique was adapted to select the respondents.

LIMITATIONS OF THE STUDY

The respondents were selected by random sampling procedure by looking into the availability of the library faculty's member in engineering college in the Tamilnadu region. The ex post facto analytical design used in this study was also inevitable due to inherent peculiarities of the research problem. To some extent, natural biases of the respondents might have cropped in, though utmost care was taken to eliminate such extraneous factors. The Study includes information security governance assessment

tools in engineering college library and they are selected from NAAC Accredited higher education engineering institute in Tamilnadu region.

ANALYSIS OF DATA

- The data were analyzed quantitatively and qualitatively and interpreted in relation to the objectives stated in this study.
- The data were collected from the respondents. The response obtained from the questionnaire was totally converted into percentage. Based on this, findings were deducted and recommendations are suggested.
- The collected data from the respondents were analyzed by using Statistical Package for Social Sciences (SPSS), The established null hypotheses were tested for its significance at 0.05 levels
- The following statistical tools have been used to check any significant association between attribute collated data.
    - Simple percentage score,
    - ANOVAs test
    - Chi-square Test
    - Co-efficient of Correlation
    - Ranking
    - Graphs

SUMMARY OF FINDINGS

The categories of gender among the respondents are covered under the study. It is inferred that male library professionals are greater in number than that of female library professionals. Majority of the respondents for the percent survey belong to the age group of 31 to 40 Years. It is also found that most of the respondents are research scholars. It is clearly understood from the data that majority of the respondents are Assistant librarians. It is understood that the respondents of urban background are greater in number than that of the respondents of rural background.

LIVING PLACE WISE LIBRARY SECURITY POLICY INFORMATION

Out of eight hypotheses in the section “Living place wise library security policy information” five hypotheses are accepted and three are rejected.

The co-efficient correlation test result for living place wise library security policy information of ensuring safety information is insignificant. So, there is a relationship between living place and library security policy information which ensures safety of the library.

The co-efficient correlation test result for living place wise library security policy information for advising library staff for the sake of library property is insignificant. So, there is a relationship between living place and library security policy information which ensures safety of the library.

The co-efficient correlation test result for living place wise library security policy information of outlining all the suspicious characters is insignificant. So, there is a relationship between living place and library security policy information which outlines all the suspicious characters.

The co-efficient correlation test result for living place wise library security policy information of correct procedure for reporting all incidents is significant. So, there is no relationship between living place and library security policy information with correct procedure for reporting all incidents.

LEVEL OF INFORMATION ABOUT GENDER WISE AND LIBRARY SAFETY OF PHYSICAL SECURITY ARRANGEMENT

Out of ten hypotheses in the section "Level of information about gender wise and library safety of physical security arrangement" nine are accepted and one is rejected.

It clearly indicates the gender wise opinion and the aid of physical security arrangement to stabilize the temperature and humidity in the library. Since the χ^2 calculated values 2.94968 is less than χ^2 table values at one percentage of degree of freedom at the level 0.05, the hypothesis is accepted. Hence, the level of opinion for the aid of physical security arrangement about stabilizing the temperature and humidity with the gender wise respondents does hold well.

It clearly indicates the gender wise opinion and the aid of physical security arrangement regarding Earthquake Early Warning System in the library. Since the χ^2 calculated values 2.94968 is less than χ^2 table values at one percentage of degree of freedom at the level 0.05, the hypothesis is accepted. Hence, the level of opinion for

the aid of physical security arrangement about Earthquake Early Warning System with the gender wise respondent does hold well.

It clearly indicates the gender wise opinion and the aid of physical security arrangement regarding Flood Detector, an Early Warning System in the library. Since the χ^2 calculated values 0.16290is less than χ^2 table values at one percentage of degree of freedom at the level 0.05, the hypothesis is accepted. Hence, the level of opinion for the aid of physical security arrangement about Flood Detector, an Early Warning System with the gender wise respondents does hold well.

LEVEL OF INFORMATION ABOUT GENDER WISE AND LIBRARY SECURITY ARRANGEMENT

Out of seven hypotheses in the section "Living of information about gender wise and library security arrangement" all are accepted.

It clearly indicates the gender wise opinion and the purpose of security arrangement regarding it becomes easier in the library. Since the χ^2 calculated values 0.52210 is less than χ^2 table values at one percentage of degree of freedom at the level 0.05, the hypothesis is accepted. Hence, the level of opinion for the purpose of security arrangement about it becomes easier with the gender wise respondents does hold well.

It clearly indicates the gender wise and the opinion the purpose of security arrangement regarding Stacks are in Full View for Staff in the library. Since the χ^2 calculated values 1.65918 is less than χ^2 table values at one percentage of degree of freedom at the level 0.05, the hypothesis is accepted. Hence, the level of opinion for the purpose of security arrangement about it Stacks are in Full View for Staff with the gender wise respondents does hold well.

It clearly indicates the gender wise opinion and the purpose of security arrangement regarding Users are closely monitored by Staff in the library. Since the χ^2 calculated values 0.97826 is less than χ^2 table values at one percentage of degree of freedom at the level 0.05, the hypothesis is accepted. Hence, the levels of opinion for the purpose of security arrangement about Users are closely monitored by Staff with the gender wise respondent does hold well.

It clearly indicates the gender wise opinion for the purpose of security arrangement regarding Library Rules and Regulations with Impunity in the library. Since the χ^2 calculated values 1.08499 is less than χ^2 table values at one percentage of degree of freedom at the level 0.05, the hypothesis is accepted. Hence, the level of opinion and the purpose of security arrangement about Library Rules and Regulations with Impunity with the gender wise respondents does hold well.

GENDER WISE ANALYSIS OF THE ELECTRONIC SECURITY SYSTEM

Information about the various electronic security systems for higher education library by the respondents are as follows:

- To support RFID in higher education libraries and the score obtained -1 as result and secured the First rank.
- To support Biometrics in higher education libraries and the score obtained -3 as result and secured the Second rank.
- To support Smart Cards in higher education libraries and the score obtained -5 as result and secured the third rank.
- To support Fire Alarms in higher education libraries and the score obtained -10 as result and secured the Fourth rank.
- To support Barcode and Motion / Sensor Detectors in higher education libraries and the score obtained -15 as result and secured the Fifth rank.
- To support Close Circuit Television **(**CCTV) in higher education libraries and the score obtained -17 as result and secured the Sixth rank.

GENDER WISE QUALITATIVE ASPECT OF INFORMATION SECURITY SYSTEMS

- Out of ten hypotheses in the section "Gender wise Qualitative aspect of information security" eight are accepted and two are rejected.
- It clearly indicates the gender wise level of satisfaction for information security system regarding Library Management Software in the library. Since the χ^2 calculated values 2.9098 is less than χ^2 table values at four percentage of degree of freedom at the level 0.05, the hypothesis is accepted. Hence, the level of satisfaction for information security system regarding

Library Management Software with the gender wise respondents does hold well.

- It clearly indicates the gender wise level of satisfaction for information security system regarding Anti-Spyware Software in the library. Since the χ^2 calculated values 3.1899 is less than χ^2 table values at four percentage of degree of freedom at the level 0.05, the hypothesis is accepted. Hence, the level of satisfaction for information security system regarding Anti-Spyware Software with the gender wise respondents does hold well.
- It clearly indicates the gender wise level of satisfaction for information security system regarding Cleanup Software for Erasing Files or Settings in the library. Since the χ^2 calculated values 0.5582 is less than χ^2 table values at four percentage of degree of freedom at the level 0.05, the hypothesis is accepted. Hence, the level of satisfaction for information security system regarding Cleanup Software for Erasing Files or Settings with the gender wise respondents does hold well.

AGE WISE ORGANISATION INFORMATIONSECURITY SYSTEMS

- Out of twelve hypotheses in the section "Age wise organisation information security systems" eight are accepted and four are rejected.
- The ANOVAs shows the opinion of each group for the age wise analysis of the opinion for organization information security systems about security policy and it is found to be statistically significant as the calculated F value .21 is less than the table value 3.84. Thus, the hypothesis framed is accepted.
- The ANOVAs shows the opinion of each group for the age wise analysis of the opinion for organization information security systems about Classification of Data for Sensitive Information and it is found to be statistically significant as the calculated F value 1.244 is less than the table value 3.84. Thus, the hypothesis framed is accepted.
- The ANOVAs shows the opinion of each group for the age wise analysis of the opinion for organization information security systems about Identifying Management Policies for the User and it is found to be statistically significant as the calculated F value 8.624 is greater than the table value 3.84. Thus, the hypothesis framed is rejected.

AGE WISE TECHNOLOGICAL INFORMATION SECURITY

- Out of fourteen hypotheses in the section "Age wise Technological information security systems" twelve are accepted, and two are rejected.
- The ANOVA shows the opinion of each group for the age wise analysis of the opinion for Technological Information Security about Authentication of software and it is found to be statistically significant as the calculated F value 1.028 is less than the table value 3.84. Thus, the hypothesis framed is accepted.
- The ANOVA shows the opinion of each group for the age wise analysis of the opinion for Technological Information Security about Authorization for Software and it is found to be statistically significant as the calculated F value 10.836 is greater than the table value 3.84. Thus, the hypothesis framed is rejected.
- The ANOVA shows the opinion of each group for the age wise analysis of the opinion for Technological Information Security about Privacy for Software and it is found to be statistically significant as the calculated F value 10.836 is greater than the table value 3.84. Thus, the hypothesis framed is rejected.

OVERALL SATISFACTION LEVEL OF INFORMATION SECURITY

Out of fourteen hypotheses in this section "Overall Satisfaction Level of Information Security" all are accepted.

There is a chi-square test for information security purpose about the gender wise level of satisfaction. The calculated value 0.7049 is less than the table value 0.05 at the degrees of freedom level three. Hence, the hypothesis is accepted.

There is a chi-square test for information security purpose about the age wise level of satisfaction. The calculated value 9.9296 is less than the table value 0.05 at the degrees of freedom level six. Hence, the hypothesis is accepted.

There is a chi-square test for information security purpose about the designation wise level of satisfaction. The calculated value 4.8659 is less than the table value 0.05 at the degrees of freedom level six. Hence, the hypothesis is accepted.

There is a chi-square test for information security purpose about educational qualification wise level of satisfaction. The calculated value 0.6690 is less than the table value 0.05 at the degrees of freedom level three. Hence, the hypothesis is accepted.

There is a chi-square test for information security purpose about the place of living wise level of satisfaction. The calculated value 2.7659 is less than the table value 0.05 at the degrees of freedom level three. Hence, the hypothesis is accepted.

FURTHER SUGGESTIONS AND RECOMMENDATION

The study proposes the following suggestions and recommendation for effective implementation of information security measures in the libraries:

1. As far as Organizational security is concerned, engineering institution lacks in most of the features such as LIS security policy, classification of data, retention, destruction policies for sensitive information, written policy regarding data security and software security, procedure for reviewing security policy, contingency disaster plan/ risk management policy.
2. Physical security aspects like Air conditioning is important to stabilize the temperature and humidity, earthquake early warning system, flood detector an early warning system, smoke detector, fire extinguishers, etc.
3. The library security personnel should be placed in strategic position in the library so that strict compliance to the library rules and regulations would be ensured among the library users.
4. Gender security personnel should be employed to ensure that a thorough search takes place for both male and female students at the exit point of the library.
5. Electronic security system should be deployed to the library as the major system of securing the library collection and should be closely monitored by the security staff in order to minimize the menace of book theft and mutilation.
6. The library should provide stable and uninterrupted power supply in order to maintain the electronic security network and other ICT equipment.
7. Insurance should be made whether adequate fund is allocated to libraries for purchase, development and maintenance of information security systems and devices.
8. Organize user education programme and in-service training for the staff on how to use information security system and devices to secure resources.

9. Organize seminars, workshops, conferences etc. for the board members, directors, administrator and management of libraries and information Centre's in order to create awareness among library authorities about the advantage and benefits of using ICT facilities and information security systems.
10. Use of firewall for mobile devices that connect to the library's LAN is very essential for readers.
11. Network security equipment such as: Locked cable trays, Security cables, metal cages/ anchoring devices are essential equipment and they should be used in engineering institution Libraries for better security purpose.
12. System recovery to rebuild and repair the library computer systems are the integral part of any network security.
13. Employing competent and experienced in-house computer engineers who can handle the repairs of information security systems and devices in case of software failure or hardware breakdown.
14. Providing available power generating plant i.e. generators that can supply electricity in case of power failure.

CONCLUSION

Information security includes personnel security, privacy, policy and computer security. Specific personnel must be assigned security-related tasks in order for any security system to be effective. Due to the continuing emergence of new security exploits, tools and techniques – coupled with the constant parade of software and hardware upgrades likely in most of the library environments and ongoing diligence is required to keep informed about security developments. It is concluded that libraries should take security issues seriously in order to ensure that their resources and user privacy are secured. An adequate level of information security, different standards and benchmarks must be used. The usefulness of information security systems and devices in the library cannot be over emphasized due to the following benefits: maximum security for library building and resources, prevention of theft in the library, flexibility, remote monitoring etc. However, the utilization of information security system and devices require budgetary management support, staff support, software development and hardware upgrade for the attainment of the set goals and thereby appealing to the library management to release funds that is required to accomplish this task.

BRIEF RESUME OF THE SUCCEEDING CHAPTERS

The ***first chapter*** entitled 'Introduction' deals with the information security Governance Assessment Tools study which is related to this research.

The ***second chapter*** entitled 'Review of Literature' deals with the previous study which is related to this research.

The ***third chapter*** 'Methodology' deals with the Objectives, Hypothesis, Method used for the study, Scope, Limitations, Population for the study, Sample for the study, Tools used, Description of the tool, Statistical techniques used for the research.

The ***fourth chapter*** deals with the "Analysis and Interpretation" and gives a detailed analysis of the data collected and the application of the statistical analysis.

The ***fifth chapter*** deals with the "Findings, Suggestions and Conclusion".