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## **Library Architecture: Interior Security measures as a protective coverage for a library: a study of three university libraries**

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The Author

**K.G.D.A. KARUNANAYAKE**

**BA (Kelaniya), MLS (Colombo), MPhil (Kelaniya), Dip. Russ (Moscow)  
Sr. Asst, Librarian, University of Colombo**

### **Abstract**

*This article deals with the evaluation of security measures and implemented security strategies in the university libraries of Sri Lanka with special reference to Colombo, Kelaniya and Sri Jayawardanapura universities. Securing the materials and the building is a significant factor in an effective library service. The study found that the security problems could be a result of building construction flaws and reader behaviors. Therefore the possible security measures could be incorporated at the designing stage. It is recommended in the research that of security tightening could be adopted by better communication, transportation and good house keeping.*

### **1. Introduction**

Universities play a vital role to achieve the advancement of knowledge in the society through better library services. Conceptually Libraries are considered as hearts of universities. But lack of properly designed library buildings and appropriate reader behaviors are drawbacks in some Sri Lankan universities in achieving this goal. In an academic environments university libraries differ in their concept and design as well as in their respective responsibilities, resources and clientele. They also differ in their functions. Hence to safeguard the real concept of a library, an organized library service within a well-planned interior security arrangement is required among the above aspects.

Aspect of security in libraries could be defined as preservation control and building securities. Both aspects could be described under communication, transportation and strategies implemented against both natural and human hazards in libraries. Any kind of delinquencies or hazards could be seen in libraries as the any other institution. Libraries consist of both human resources and materials. Therefore the building should be designed to reduce any kind of hazards against its resources.

Identifying the nature of the building and their surroundings is an important factor for preparing well-secured library environment to provide a sound secured library service to their clients.

This study will focus on the inside security arrangements in libraries according to the building construction and strategies implemented by the individual university libraries to the best type of security system required, librarians should acquire sufficient knowledge in protecting inside library buildings. Library work experience supplements the professional knowledge in identifying and overcoming any practical difficulties it could be minimized by reading professional literature, observing the situations, attending courses and seminars, collecting details, selecting the most applicable solution to any existing problem, seeking advice from other sources, making visits to different library buildings and preparing solutions by following standards.

Therefore studying in library architecture is an important for all library professionals because they are faced the situation to design a new library building or have to be construct or renovate the existing one in their professional life. Protection of the building, materials as well as users is a major operational function in library services. Responsibility of protecting materials and the construction of a well-secured library building is a responsible duty of the librarian. To overcome the above problems security measures are to be identified and enforced by the libraries.

## 2. Significance of the Study

The findings of the study on the security arrangement inside a library will serve librarians as well as library personnel to get some ideas and effects when planning security controlling in libraries. Hence the study will attempt to identify the existing difficulties as well as the organizing processes. The main significance of this study is to be providing a guideline for future librarians when protective coverage is needed.

The creation of a new library building is the result of co-operation of a whole team, the librarian and the architect playing major roles. Each will contribute his own professional skill as well as that of his staff and associates. The librarian will have to play the role of a client on behalf of twenty years of future users, which is a difficult task. This study will reveal the areas to be considered when planning a library building with due consideration to existing security difficulties.

## 3. Objectives of the Study

The study attempted to identify the current problems created by security arrangements in some university libraries today and to examine the quality and the nature of the university library buildings in Sri Lanka in respect of security.

This research attempts to ascertain the factors, which are important in securing a library, mindful of the requirements of building, materials, staff, users and their levels of satisfaction and expectations. The preparation of a safer appropriate building as a responsibility of the librarian and finally pose solutions for future librarians.

#### 4. Methodology of the Study

The university libraries of Colombo, Kelaniya and Sri Jayewardenepura in Sri Lanka were selected as samples of the study because these buildings were constructed in a span of three decades in 70s 80s and 90s. The survey research method was used as the main method of gathering data pertaining to the study. In addition, literature review was used in collecting relevant information.

In assessing the user requirements and their opinions, the present users, which included the undergraduate students, were selected as the study population. The Faculty of Arts was considered to include the faculties of Humanities and Social Sciences since similar subjects are conducted under those faculties at the three universities.

##### 4.1 Study population and Sample

All first and final year on campus students in each university formed the population of the sample 1. Since there was a larger study population in sample 1, the sample size was restricted to 5 % of the total population in each sub category.

Permanent library staff members were taken as the sample 11. Stratified sampling technique was used with the aim of higher level of accuracy in sampling.

**Table 1 - Population and Sample in sample 1**

University Faculty	Colombo				Kelaniya				Jayewardenepura			
	1 <sup>st</sup> Ye ar	Sampl e	Fina l Yea r	Sampl e	1 <sup>st</sup> Yea r	Sampl e	Fina l Yea r	Sampl e	1 <sup>st</sup> Year	Sampl e	Fina l Yea r	Sampl e
Arts/ Humanities	557	28	176	8	1303	65	1182	59	505	25	549	27
Com & Mgt.	277	14	270	13	793	40	396	20	788	39	757	37
Science	**	**	**	**	621	31	348	17	194	9	200	10
Law	393	20	195	10	**	**	**	**	**	**	**	**
Medicine	**	**	**	**	**	**	**	**	159	8	148	7
Total	1227	61	641	32	2717	135	1926	96	1646	81	1654	81

\*\* - Indicate non-availability of faculties

### Sample II – by professional levels

	Uni. Colombo	Uni. Kelaniya	Uni. Jayawardanapura
Professional	8	8	9
Para Professional	24	25	25
Support/Minor	27	25	11
Total	59	59	55

Questionnaire was the main information-gathering tool.

#### 4.2 Response Rate to the questionnaire according to the universities

The response rate varied among individual Universities. Out of the total number of questionnaires received, Colombo recorded the highest 100% of responses, while it was 73.07% from university of Sri Jayawardenepura and 72.35% from the University of Kelaniya.

The distribution of respondents of five faculties in the three universities varied. The population included those within the Faculties of (Arts/Humanities/ Social Science), Commerce/Management, Science, Medicine and Law at the selected universities. This population either used the central library or the faculty libraries within the central library. These students were classified according to the faculty levels in each university.

#### 4.3 Hypotheses

Two hypotheses were taken into consideration for evaluating the strength of the responses,

There is a direct relationship in the usage of the three university libraries among the students taken sample. Here the researcher was considered following last three choices of the frequency of library visits of the respondents.

1. "If 80% of the respondents visit the library daily, 2-3 days per week or once a week, it could be considered that sample has a fair knowledge to evaluate the library security arrangements with their experience".
2. "If 80% of the above frequent library users considered the following three library facilities as important and extremely important, it also could be considered that their attitudes will be highly acceptable."
  - a. For reference
  - b. To borrow books
  - c. To read periodicals

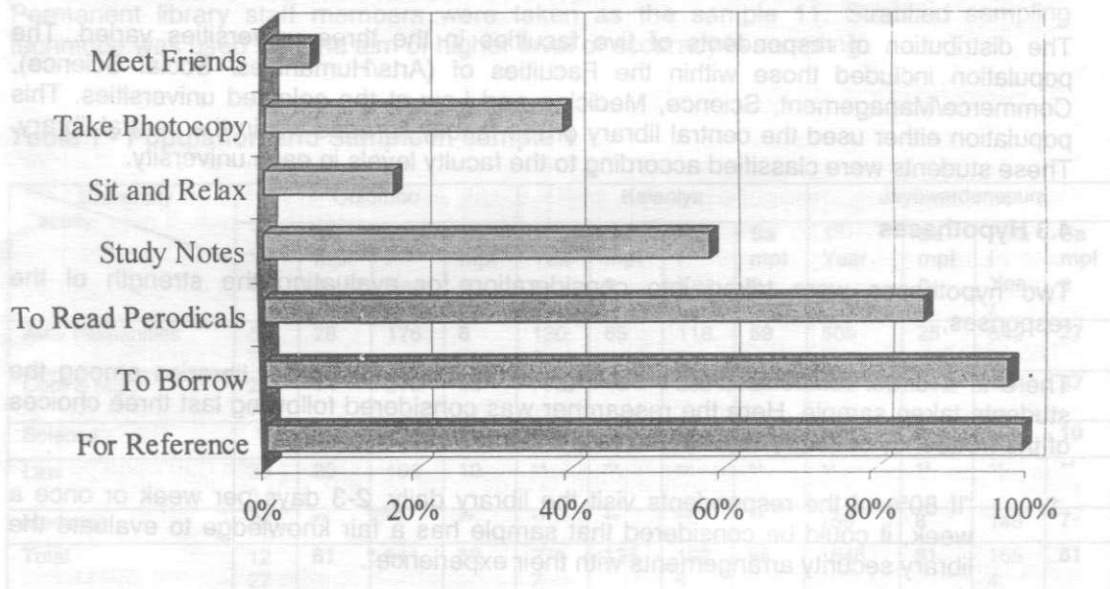
The respondents of this survey were categorized systematically to elicit the most appropriate answers for the study. The respondents in this survey were tested by two questionnaires to assure whether they were regular users.

#### 4.4 Purpose of library visits

One question was used to get the nature and extent of visits to the libraries in the three universities. The question was used as significant keys to evaluate the purposes of library visits, such as

- a. Extremely important
- b. Important
- c. Not important

The following figure represents the purpose of visits by the respondents of each university.



**Fig. 1 – Response for Visiting the Library**

Visiting the library is significant because it helps to find the behavior of the respondents. The results obtained through these questionnaires have confirmed that most of the students use library for several reasons.

The above graph indicates that most of the students visit the library mainly for three purposes Reference (98.45%), to borrow books (94.48%) and to read periodicals (85.01%)

Studying their own notes too has become a relevant factor to 58.19% of the respondents of the sample. Since they visit the library to study their own notes, they can not be considered as being aware of library purposes as required in this survey. Hence the received data could be considered as acceptable and effective in this survey. In addition to the purposes of library visits, the respondents were questioned about the frequency of their visits.

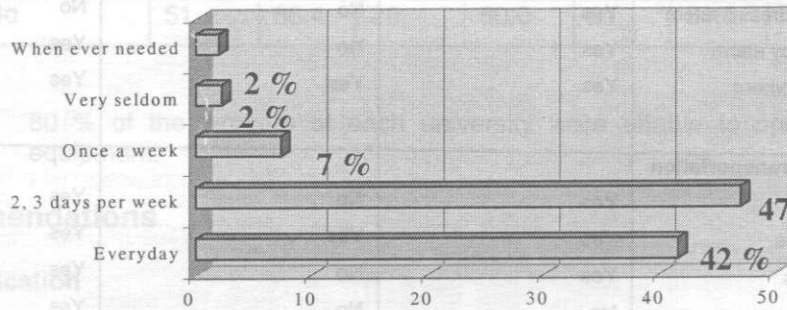


Fig. 2 – Frequency of Library visits

According to the above table, 42% of the respondents visit the library almost daily and 47% twice or thrice a week and hence at a satisfactory level.

Therefore the purposes of library visit and the frequency confirm the accuracy and the quality of the respondents as in the hypothesis.

## 5. Data analysis

Table 2 - Observed Data Regarding Library Buildings

Building	UC	UK	USJP
Location	Center close to main road	Center away from road	Center away from road
Shape	Five storied with ground floor Square shape	Single story with basement Rectangular shape	Six storied with basement Rectangular
Storage facilities			
- Separate	-	-	-
- Off centre	-	-	-
- Cooperative	-	-	-
- In house	Yes	Yes	Yes
Roofing	Slope level metal decking	Slope level asbestos roofing	Slope level asbestos roofing
Flooring	Smooth surface Rubber carpet	Hard surface Cement flooring	Hard surface Cement and Ceramic tiles
Signs Directional	No	No	No
Identification	Yes	Yes	Yes
Prohibition	Yes	Yes	Yes
Informational	No	Yes	Yes

**Table 3 - Observed Data – Regarding Security arrangements**

Security measures	UC	UK	USJP
<b>Communication</b>			
Telephone	Yes	Yes	Yes
Computer Net works	No	No	No
Public address system	Yes	No	No
Emergency alarm	Yes	No	Yes
Fire Equipment	Yes	Yes	Yes
<b>Vertical transportation</b>			
Elevators	Yes	No	Yes
Main stairs	Yes	Yes	Yes
Sub stairs	Yes	No	Yes
Ramp	No	No	Yes
Emergency Exits	Yes	Yes	Yes
<b>Entrance system</b>			
Turn style	Yes	No	Yes
Security checking	Yes	Yes	Yes
Counter checking	Yes	No	Yes
<b>Cloak room</b>	Separate	In-house	In-house

**Table 4 - Response Regarding Evidence of Library Hazards**

	UC		U K		USJP	
	Res.	%	Res.	%	Res.	%
Pets	40	43.22	60	25.97	49	30.24
Insects	22	23.65	20	8.65	16	9.87
Fungus	15	25.42	23	9.95	16	9.87
Floods	-	-	10	4.32	5	3.08
Fire	-	-	-	-	-	-
Thefts	51	86.44	69	29.87	54	33.33
Yellowing	56	85.65	45	19.48	20	12.34
Delinquenci es	60	64.51	65	28.13	42	25.92

- No evidence

Finding: Pets, Insects, Fungus reaction, Book thefts, Humidity, Yellowing, Delinquencies and Fire are making difficulties in libraries comparatively.

**Table 5 - Fire Protection**

	UC		UK		USJP	
	Res.	%	Res.	%	Res.	%
Yes	8	13.5	5	20.0	4	16.0
No	51	86.4	20	80.0	21	84.0

Finding: 80 % of the workers of each university were unable to operate fire equipment.

## 6. Recommendations

### 6.1 Communication

There should be at least single phone facility in each section of the library except in reading areas where a responsible staff member could answer immediately.

Public address equipment must be installed to communicate with users. Emergency alarm should be installed and emergency lamps should be installed in case of emergency. These are the main basic communication system available in modern libraries in security arrangements.

### 6.2 Transportation

A well-designed vertical transportation system is needed in an effective library building. Therefore elevators are an essential component in multiple storied libraries. But it should be restricted only for movement of long distances within library.

Elevators could be located in corners of the building at a shorter distance to the main entrance. Main and sub stairs are to be placed adjacent to the main entrance. If the main stair is in the middle, the sub stair should be in the corners together with other fixed services such as elevators, toilets, and emergency escape areas to make quick movement possible. Emergency exits could be guarded by electrical alarms, which operate automatically. However this could be varied according to the type of libraries.

Main and sub stairs should be convenient for use and easily found rather than elevators. Stairs should not be in circular shape like in University of Colombo because narrow edges of circular stairs cause difficulties when climbing to upper floors in peak hours. Stairs should fit with out doorways to act as emergency escapes.

Ramp facilities are to be provided for the disabled and they will facilitate the movement of book trolleys. A non-slip surface is essential on ramp with handrails for the safety of the users on crutches.



Libraries should have a wicket gate near the counter to control traffic for security reasons. Both in and out ways must be checked by security guards. Supervision only at the exits is not the safest in library protection. But it can be used as an alternative to material protection. Various methods of exit control could be used in libraries. Such as electrical alarm, robe grad and light beam systems. Turnstiles are the popular method in modern libraries in Sri Lanka.

### 6.3 Library hazards

Fire, water, theft, vandalism, mutilation of books and biological infections such as insects, mold, yellowing, foxing, fungi, acidity and brittleness are the common hazards in university libraries. Those could be minimized to a certain amount by interior arrangements and the building construction. Due to the climatic condition the high temperature and humidity damages can be coursed to the collection at a higher rate.

To avoid the dark atmosphere in stack areas, stores and reading areas must be reduced by providing natural or artificial lighting. Proper air circulation and selecting the colors for library ceilings, walls, floors and stacks areas must be selected according to the reflectance levels of colors. Natural lighting and air should be obtained through glass, sky dooms, air shafts or open inner courts to be used properly according the types and condition of the building. Stagnant air in stack areas to be removed by regular cleaning or interior arrangement. Moisture and heating make damages in libraries. Therefore the use of air- conditioning must control temperature and humidity. If it is impossible electric fans and exhaust fans could be used to prevent stagnant air in stack areas through free air circulation. Getting natural air through windows and air shafts contain dust and atmospheric pollution. Therefore air-filtering systems must be included in the air passages.

When selecting a site for the library, the above mentioned facts should be well considered. The soil should be checked and if necessary and should be treated by a professional company. Protecting the whole collection is really a difficult task due to certain environmental factors such as the location, and the site.

In designing a new library building every effort must be made to eliminate any insecurity measures. Therefore, in selecting a site for the library, care should be taken to locate it away from places such as the main roads, canteen and playgrounds, public areas as much as possible. Apart from locating the library in a quieter area, further action could be taken to minimize the amount of library hazards.

A well-planned library building is a prerequisite in a university for the sake of the building, the materials, the students, as well as the researchers and the staff. But most libraries have not paid much attention toward these aspects.

The most dangerous natural force is the fire in libraries. Therefore protection against fire should be designed in various ways. Choice of furniture, arrangement of materials, wiring used for lighting, cooling and electrical equipment, smoking habits in libraries must be considered as the sources of possible library fire when the building is planned. Good library buildings can prevent the start and the spread of fire. The following suggestions could be applied for fire protection in libraries.

Books are highly inflammable. Any possible alternatives such as firewall, fire passages, and free air supplying doors, windows, fire escapes and well designed electrical arrangements should be arranged against fire. Following basic elements of fire protection must be considered when planning a library building.

- Library staff should learn how to operate fire equipment and how to use emergency escape in sudden fire throughout the building.
- Internal arrangements must be organized against fire spreading both vertically and horizontally.
- Careful supervision of lifts, alarm, daily patrolling, checking for possible fire is to be done by the library authority.
- Highly inflammable equipment should be kept away from any possible fire areas using fire isolation areas.

Water is also a major hazard in libraries. Every precaution should be taken against insufficient drainage facilities, leaky roofs, sudden floods and heavy rains which very common in Sri Lanka. Heavy rain will increase a very humid atmosphere and it will be very sensitive to some paper qualities. Therefore water damage is to be minimized. Because proper air circulation reduces the inner wetness and spreading fungus will occur under low humidity condition.

Damages by insects and other animals are common hazards in present libraries. Good lighting, good house keeping, regular cleanliness, proper ventilation and proper temperature should be provided as precautions against insects, bookworms and silver fish as short term solutions. Animals such as cockroaches, rats, squirrels, pigeons could be considered as big enemies of libraries. Proper building construction will reduce the above hazards to a certain extent. Materials such as leather, wood, glue, and paper, which are used for books, low level of lights and inadequate air circulation are vital aspects to be taken in to account when considering protection of materials in a library.

Hazards such as theft, vandalism and mutilation, delinquencies could be completely avoided by proper building arrangements by using closed access shelves, exit control, cloakrooms and visible reading arrangements. Small grills must cover the windows so those books cannot be thrown out.

Cloakroom such as in housed, adjoined or separated could be arranged. The best arrangement is at the entrance to the library close to the entrance lobby. Arrangement of a separated cloakroom is not practicable. It should be prepared with a certain amount of space for shelving the bag drawers, racks and token numbers are needed. Cloakroom must be operated as a service of the library because it will reduce library noise, book theft and reader hazards.

Therefore the following recommendations are suggested for security measures in a library building.

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| Entrance & Exits | - Must be through Turnstile and security checking rectangular stair with hand railings<br>Main stair in the middle<br>Sub stair at the corners |
|------------------|--|

- Elevators with sub stairs at the corners
- Ramps with non-slip surfaces
- Emergency exits through sub stairs with out door access
- Emergency - Fire extinguishers with fire alarms
- Public address system
- Windows with small grills
- Doors with door closures
- Curtain or venation blinds for windows

## 7. Conclusion

Data collected for this study revealed that there are several internal and external security problems in university libraries in Sri Lanka. The materials used in external and internal construction could regulate these difficulties. Therefore considerable attention must be given at the planning stage of the building. Good communication facilities, effective vertical and horizontal transportation arrangement, precaution against the possible library hazard such as natural and human, discussion room facilities, isolated non-assailable spaces, outlets for students gatherings, more visual arrangements, can be implemented as a matter to be resolved later.

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The Internet has experienced unprecedented growth in the use of electronic communication networks and development of the Internet Domain Survey carried out by the Internet Software Consortium, there were 171,636,297 hosts on the Internet in January 2003.\*

More than 100 countries are using the Internet with a growth rate in traffic of 100 per cent per month. Most users are in developed countries. The Internet is used in the business, industry, environment, education, and government sectors. The impact of the Internet on the technical, financial, and social aspects of the world is being studied by many researchers.

A host is a computer that is connected to the Internet. It is used to store and retrieve information. The Internet Model explains the introduction and utilization of Internet. It describes the features and tools in information provision in relation to the Internet.

### 3.2 Internet Model

The Internet Model describes the direct and indirect impacts of the Internet on the information environment. It is a model that explains the introduction and utilization of the Internet. It is a model that explains the features and tools in information provision in relation to the Internet.

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