Introduction of four factors for smooth running of the Next Generation Libraries in Sri Lanka: A concept paper

Abstract

In this concept paper, new factors to the field of Library and Information Sciences are introduced. These factors are named as the Four Factors for smooth running of the next generation libraries in Sri Lanka. Main purpose of introducing these factors is to facilitate the smooth running of libraries especially in Sri Lanka and generally all over the world. This paper points out four factors that should be considered by librarians in Sri Lanka and other parts of the world along with the conversion of traditional libraries to the next generation libraries. Mainly, these factors can be used by any large scale to small scale libraries to make their day to day life easier and more secure. Next generation of the libraries will have to depend on the sophisticated IT tools and equipment as the world is moving to the digital era fast. As such, to be par with the world changes libraries should be digitized as much as possible to cater for the modern user needs. The four factors introduced by here are mostly related to use of modern electronic equipment and Information Technology within the library premises. The four factors are as follows.

1. CCTV SYSTEM
2. BACKUP WARRANTY
3. RFID TAGS
4. CENTRALIZED UPS SYSTEM

Key words

Four Factors, Generation, Libraries, Sri Lanka

Introduction

At present it can be observed that most of the libraries in Sri Lanka other than the University Libraries are in a conversion stage from the traditional libraries to the next generation libraries. In this conversion stage, libraries tend to purchase more and more online library resources along with traditional printed resources. Also libraries try to keep open till late night as far as they can. Further, with the modernization of the libraries, there is a tendency to purchase more sophisticated and advance library management systems and IT equipment to provide an efficient and productive service to library users. With these changes Information Technology has to play a major roll for the smooth running of the Next Generation Sri

Lankan Libraries. This concept paper will introduce IT related four factors that will help the smooth running of the next generation libraries in Sri Lanka. Librarians are invited to consider these four factors to improve the smooth running of their libraries.

1.CCTV Camera System

a. Introduction

Closed Circuit Television (CCTV) is a system in which a video programme is transmitted within a closed space. All the elements of the system (cameras, display monitors, recording devices) are directly connected. This is different from broadcast television where any receiver that is correctly tuned can pick up and display or store the signals that are transmitted through the open space ("What is CCTV?,"2018).

The most common use of CCTV is seen in security camera systems. They are found for years in areas like large retail shops, banks, and government institutions. Thanks to reduced costs in the manufacture of cameras and video recording equipment, camera systems are becoming more and more commonplace in smaller businesses, and even private homes and small libraries.

By introducing CCTV camera systems to libraries, an additional security and safeguard to library users as well as library resources could be provided. By using a good CCTV system librarians can reduce the cost of having many security guards to different sections of libraries. Also theft of and damages to library materials can be significantly reduced due to a CCTV system. Further, the library can provide additional security to user's vehicles and their belongings at the library premises and it will help to get more user attraction to libraries.

The cost of the CCTV system can be reduced more by appropriately arranging the library furniture and resources within the library.

b. Basic equipment needed and the approximate cost

i. CCTV Cameras

There are several types of Security cameras with unique features. Mainly, five types of commonly use cameras are available. They are Dome Camera, Bullet Camera, C-mount camera, Day / Night Camera and PTZ Camera.

The dome camera is the one most commonly used for indoor security and surveillance. The shape of the camera makes it difficult for onlookers to tell which

way the camera is facing, which is a strong piece of design, deterring criminals by creating an air of uncertainty. Bullet cameras are long and cylindrical in shape, and are ideal for outdoor use. Their strengths lie specifically in applications which require long distance viewing. Installed within protective casings, the cameras are protected against dust, dirt and other natural elements. These cameras can easily be mounted with a mounting bracket, and come fitted with either fixed or varifocal lenses depending on the requirements of its intended application. C-mount cameras come with detachable lenses and allow for simple lens changes to fit different applications. Though standard CCTV cameras with normal lenses can only cover distances of 35 - 40 feet, C-mount cameras can cover distances beyond 40 feet thanks to the possibility to use special lenses with these cameras. Day / Night Cameras are capable of operating in both normal and poorly lit environments. Further, these cameras benefit from not requiring inbuilt infrared illuminators as they can capture clear video images in the dark thanks to their extra sensitive imaging chips. For this reason, these cameras are ideal for outdoor surveillance applications in which IR cameras are unable to function optimally. PTZ – Pan/tilt/zoom – cameras allow the camera to be moved left or right (panning), up and down (tilting) and even allow the lens to be zoomed closer or farther. These cameras are used in situations where a live guard or surveillance specialist is there operating the security systems.

When selecting the CCTV cameras there are four main things that should have to be considered apart from the warranty period. First thing is the coverage area. Most of the cheap cameras have a small coverage area. Then, to cover a specific location it should have to use many cameras but some expensive cameras can cover up to the 360 degree. Therefore, it is profitable to use a single wide coverage camera than using many narrow coverage cameras. The second thing is the light sensitivity. The light sensitivity of a camera is measured in Lux and this is the standard specification (property) that defines how well a camera can see in poor lighting conditions. In order to capture good quality images in low light or dark conditions, a day and night camera that takes advantage of near-infrared light is required. Third factor is the higher resolution and the HD video. Megapixel IP cameras can capture High Definition Video (HD Video) and provide greater detail improving identification. A 2 megapixel camera is an excellent choice for

capturing vehicle number plates and can cover a 24 foot wide point of entry or exit. As such, looking for the number of megapixel of the camera is very essential. Forth factor to be considered is the lens of the CCTV camera. The lens is what gathers the light for the sensor. Everything the viewer sees, or that gets recorded on the DVR comes through the lens. It determines the distance at which a car's number plate can be read. Also, a face can be recognized because the lens controls the focus. Therefore, selecting the camera with the right lens as per our need is important.

Figure 1: CCTV Camera, https://www.indiamart.com/proddetail/2-0-mega-pixel-ahd-cctv-dome-camera-11498858633.html

ii. CCTV Monitors

Most television sets can function as CCTV monitors. The only difference between CCTV monitors and standard television sets is that monitors do not have tuners. Some monitors also feature built-in switchers. This means that more than one camera can be plugged into the monitor and the librarian can view the desired area through the appropriate camera by changing the channel.

Figure 2: CCTV Monitor,https://www.indiamart.com/proddetail/cctv-monitor-3987633773.html

iii. Digital CCTV Recorders

CCTV digital video recorders (DVR) are easy to use, compact, and can keep recording for days or weeks without running out of space. A digital system does not require daily attention. However, depending on the size of the hard drive, footage may be erased after a certain number of days in order to allow the system to record new data.

CCTV systems do not have to be installed by professionals, especially if the system consists of only one or two cameras. However, if the cameras are located in awkward areas or if you feel that you lack the technical expertise to set up the system yourself, you can call in an expert to install the system.

Figure 3: Digital CCTV Recorder, http://esecurecctv.com/

iv. Approximate Budget

You can install a CCTV camera system with four cameras (including night vision camera and one week recording capacity) for the cost of around Rs. 60,000 with installation charges depending on the quality of cameras and recording capacity.

v. Calling Quotation for a CCTV system

When purchasing a complex CCTV system, without having a good technical knowledge, it is really difficult to decide the number of cameras and the models of the CCTV cameras required. Therefore, it is advisable to let the vender to decide the number of cameras and the models required for a specific CCTV system. Libraries just have to indicate the locations need to be covered and the type of view (clear view, very clear view, general view) they need. Then the responsibility to cover the requested location lies with the vender. When calling quotations or bidding, libraries should use the “Two-Stage Two-Envelop” system of bidding. In the Two-Stage Two-Envelope bidding procedure, at the first stage, bidders submit two sealed envelopes simultaneously, one containing the Technical Proposal and the other

containing the Price Proposal, enclosed together in an outer single envelope. Only the Technical Proposals are opened at the date and time indicated in the Bidding Document, and the Price Proposals remain sealed and are held in custody by the Purchaser. The Technical Proposals are evaluated and if the purchaser requires amendments or changes to the Technical Proposals, such amendments and changes are discussed with the bidders. The bidders are allowed to revise or adjust their Technical Proposals to meet the requirements of the purchaser. The objective of the exercise is to ensure that all Technical Proposals conform to the same acceptable technical standard and meet the technical solution required by the purchaser. Bids of bidders who are unable or unwilling to bring their Technical Proposals to conform to the acceptable technical standard will be rejected as deficient bids with technical evaluation committee approval. Following Technical Evaluation Committee approval of the evaluation of Technical Proposals, bidders are invited, at the second stage, to submit Modified Bid Proposals consisting of Revised Technical Proposals and Supplementary Price Proposals based on the technical standard agreed. The original Price Proposals and the Modified Bid Proposals are opened at a date and time indicated by the Purchaser. In setting the date the Purchaser will allow sufficient time for the bidders to incorporate the changes in the Revised Technical Proposals that are needed to meet the agreed technical standard and to prepare the Supplementary Price Proposals that reflect these changes. Then, the Price Proposals, Supplementary Price Proposals, and Revised Technical Proposals are evaluated. Following Technical Evaluation Committee's approval, the contract is awarded to the bidder whose bid is determined to be the lowest evaluated substantially responsive bid.

2. Backup Warranty within the Warranty Period

Most of the Sri Lankan libraries are managed with limited funds. As such, they can only purchase limited number of IT equipment. As the big libraries do it is not possible for the small libraries to purchase backup equipment for the each and every equipment. For an example a big library can purchase two multimedia projectors so that if one projector goes out of order the other could be used till the first is repaired to continue the library activities. But small or medium scale libraries cannot do like that because most of the IT equipment is very expensive. In the real situation, when a photocopier or any other equipment is out of order, the venders who supplied that will take it to repair and take

more than one or two months to repair and deliver it back. Till that the library has to manage their functions without the proper equipment. This is a big problem each and every library facing. Therefore, as the **Second Factor**, it is emphasized to have backup warranty when purchasing equipment. When you call quotations to purchase the equipment you should include a term asking backup equipment within 48 hours within the warranty period. As the Assistant Librarian (systems) of the University of Colombo, the researcher knows practically that including this requirement while calling quotations is very beneficial for the library. This action has worked nicely for the Main Library, University of Colombo. After having the backup warranty, as a library staff member, there is no need to worry about the repairing activities of the equipment because when the company removes the equipment to repair within the backup warranty period they supply a temporary machine to use within 48 hours. Thus the normal activities of the library will not be affected due to the malfunction of certain equipment. To provide this facility, the venders will charge little more price than the normal price. But most of the big companies will not charge at least a cent to provide backup warranties.

3. Introducing RFID Tags

a. Introduction

A Radio Frequency Identification Tag (RFID tag) is an electronic tag that exchanges data with a RFID reader through radio waves. Most RFID tags are made up of at least two main parts. The first is an antenna, which receives/sends radio frequency (RF) waves. The second is an integrated circuit (IC), which is used for processing and storing data, as well as modulating and demodulating the radio waves received/sent by the antenna. (Radio Frequency Identification Tag, 2018)

By introducing RFID tags to libraries, librarians can solve many issues they face now. However, to get the benefit of the RFID tags it is a prerequisite to have a Library Management Software (Open source one or a commercial version). In a middle scale library, stock verification takes quite a big time period. Therefore when stock verification of Lending section is conducted, closing down that section for a long period is a huge problem. But to conduct a stock verification while counting books, closing down that section is essential. However, if RFID tags are fixed inside books and if the library can purchase a RFID Stock Counting Hand Held Device, it is possible to complete the stock verification very quickly. Library staff members just have to take the hand held devise through the book racks. Then it will automatically count and enter the

data into the computer that is linked to the hand held devise with the help of the Library Management system installed. This hand held scanner is capable of scanning more than 1000 books per minute. By using RFID gate with the RFID tags the security of the books and library resources can be increased. If someone tries to steal a book and takes it through a gate, the gate synchronizes with the RFID tag and tends to make a beep. Therefor to increase the security level of the library resources, it can use RFID tags.

If the library is a big one and have sufficient funds it is possible to go for full automation of the books issuing and returning process by introducing Library kiosks and Drop Boxes with the RFID tags. This will cost little bit of money but by introducing this facility you can provide an amazing service to the library users. These kiosks can self-issue books and can return books at any time through the Drop Boxes although the library is closed. This will help increase the user satisfaction drastically.

b. Basic Equipment needed and the Approximate Cost

i. RFID Tag

One tag will cost around Rs.90. This is a small tag with the size of 50*50 mm with a memory of 0.5k - 2.5k bit. This can be fixed on any flat surface like the back cover of a book with the operating temperature of 18 °C to 26 °C / 64.4 °F to 78.8 °F. Also a RFID tag has a life span of 10 to 15 years.

Figure 4: RFID Tags,https://www.makeuseof.com/tag/technology-explained-how-do-rfid-

ii. RFID Hand Held Scanner

This device can perform a complete instantaneous search of all on-shelf items quickly and efficiently by simply reading the RFID tagged items. Following a search, data can be uploaded to the Library Management System or analyzed manually. In addition, by downloading search list information, RFID Hand Held Scanner can be used to find specific items on a shelf, or to assist with shelf-tidying functions. This will cost around Rs.750000.

Figure 5: RFID Hand Held Scanner. http://www.celect.in/Products/RFID-Readers/

iii. Self-Check Machine

This machine helps the users to self-checkout the library materials available at the library. Also library can publish their new events and notices on the Kiosk screen. This is expensive library equipment that will support Library Automation. This will cost around Rs.2.2 million.

Figure 6: self-check. http://bibliotheca.ru/ru/our-products-ru/self-service-

iv. Drop box

This equipment helps the library users to return their books at any time (24*7*365). This will make the users activities easier. After returning the book this machine automatically issues a printed receipt indicating the returned books and the time and date of the return had taken place. This will cost about Rs.1.7million.

Figure 7: Drop Box. http://cdsol.com.my/cdsol/index.php/bibliotheca-

v. RFID Security Gate

RFID Detection Gate System is able to detect the items that have not been properly checked-out. The audible and visible alarms are automatically triggered when improperly checked-out materials are passed through the gate system. This will increase the protection of the Library resources. This will cost around Rs.2.5 million.

Figure 8: RFID security Gate, http://www.cosmotron.cz/products/rfid/security-gates

With the above mentioned equipment the library can use equipment called RFID Work Station if required. This helps to lock and unlock the RFID tags pasted in the books. If someone tries to take out a book without unlocking the RFID tag security gate will make a noise plus some lightning. As such, RFID tags are very important to the next generation Libraries in Sri Lanka.

4. Centralized UPS System

Along with the transformation to the digital era libraries tend to have more electronic equipment. For an example, the main library of the University of Colombo consists of more than 125 computers. Therefore, to use a separate UPS for each computer, the library has to purchase and maintain more than 150 UPS. Likewise each and every library needs to have a large number of UPS systems for the protection of the computers and the electronic equipment it uses. However, maintaining such a large number of UPSs is a very difficult and

time consuming task. As a solution for this, libraries can use Centralized UPS systems. Then libraries can use one single high performing UPS system for all the electronic equipment. Accordingly, libraries have to look after only one UPS system instead of many UPS systems. However, to use centralized UPS systems, it is a pre-requirement to have a separate single power (electric) line to connect the centralized UPS system to all the electronic equipment. Therefore, when a new library is constructed the librarians should advice the architects, engineers and contactors to install a separate power line to connect all the electronic equipment to the centralized UPS. If the library is operated in an old building that does not have a separate power line for this purpose then the librarian can advise the maintenance officer/division to construct a separate power line. In some instances constructing a single line for the entire building may not be possible due to various constrains. In such cases it is advisable to have at least a separate line for each section or each floor. According to the power consumption of a single computer a suitable centralized UPS system can be used. For an example power consumption of a modern i7 branded computer with a LED monitor is around 0.45 KVA (Kilo Watt Ampere). As such, if there are 20 computers it is required to have a centralized UPS of 0.45KVA * 20 (i.e. 9 KVA). But when purchasing a centralized UPS it is required to consider about the power factor of the UPS. There are UPSs with different power factors according to their brands and the sizes. Examples for power factors are 0.9, 0.8, 0.7, etc. If the power factor of a 9KVAcentralized UPS System is 0.9 then it can supply only a total power of 9KAV * 0.9 = 8.1KVA. Therefore if a 9KAV centralized UPS System is purchased by thinking that it is sufficient to provide power for 20 computers, it may not be able to operate all the 20 computers due to the power factor of the UPS system. Therefore it is required to consider about power factor of UPSs when purchasing a Centralized UPS system. According to the (L.Chinthana, Telephone Conversation, February 27, 2018) prices for UPS systems with different capacities from Riello Brand Italy are given below.

1. 200KAV (Three Phase In Three Phase Out) - Rs.8 Million
2. 160KAV (Three Phase In Three Phase Out) - Rs.6.5 Million
3. 125KAV (Three Phase In Three Phase Out) - Rs.4.2 Million
4. 100KAV (Three Phase In Three Phase Out) – Rs.3.5 Million
5. 80KAV (Three Phase In Three Phase Out) - Rs.3.2 Million
6. 60KAV (Three Phase In Three Phase Out) - Rs.2.8 Million
7. 40KAV (Three Phase In Three Phase Out) -Rs.1.8 Million

8. 20KAV (Three Phase In Three Phase Out) - Rs.0.9 Million
9. 20KAV (Three Phase In Single Phase Out) - Rs.0.75 Million
10. 15KAV (Three Phase In Three Phase Out) - Rs.0.85 Million
11. 10KAV (Three Phase In Three Phase Out) – Rs.0.75 Million
12. 10KAV (Three Phase In Single Phase Out) – Rs.0.35 Million
13. 6KAV (Three Phase In Single Phase Out) – Rs.0.24 Million

By applying above 4 factors, next generation of Sri Lankan libraries can perform smoothly and efficiently. As such, it is highly recommended to follow these four factors in different scales according to the sizes and the financial capabilities of libraries.

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