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Users perspective towards the RFID System in the Allama Iqbal Library

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Abstract
The present study analyses the user satisfaction towards the Radio Frequency Identification (RFID) system in the Allama Iqbal Library (central library), University of Kashmir. A survey of the 100 registered users of the Allama Iqbal Library was undertaken. The results revealed that the students are satisfied with the RFID system especially self-service stations and access control system. The time taken to complete a single transaction at self-service station is considerably reduced. The results further reveal that less number of self-service stations and system failures at times is great concerns to the library users.

Keywords: Radio Frequency Identification, Library Circulation, RFID Application- Libraries

1. Introduction

Radio Frequency Identification (RFID) is widely used around the globe for item tracking and access control applications. RFID has established itself in a wide range of markets and continues to do so as the technology becomes more affordable (Tech-Logic Corporation, 2011). The use of RFID technology in libraries is growing (Singh & Mahajan, 2014) and increasing number of libraries are taking advantages of the RFID technology (Smartrac-group, 2012). The major applications of RFID implementation in libraries include information management, circulation, inventory and theft control (Yu, 2007).

1.1 Components of RFID

An RFID "system" for libraries is comprised of three components:

(1). An RFID tag consisting of a chip and antenna
(2). An RFID reader connected to the library information system to read/write information from and to the RFID tag.
(3). An RFID antenna connected to the reader that emits power and data from and to the RFID tag.

The combination of the RFID reader and antenna is a RFID station. The communication between the RFID tag and the RFID stations is wireless, so it's possible to read or write data in the RFID tag from a distance and to perform multiple reads or writes simultaneously, such as in a stack of books at checkout (Tech-Logic Corporation, 2011).

The information contained on microchips in the tags affixed to library materials is read using radio frequency technology regardless of item orientation or alignment (i.e., the technology does not require line-of-sight or a fixed plane to read tags as do traditional theft detection systems) and distance from the item is not a critical factor except in the case of extra-wide exit gates. The corridors at the building exit(s) can be as wide as four feet because the tags can be read at a distance of up to two feet by each of two parallel exit sensors. The devices used for circulation and inventorying are usually called "readers" while the ones used at building exits are usually called "sensors." (Boss, 2004).

Just as the structure of memory cards or smart cards depend on the mode of memory and structure, RFID can be divided into four major types (Yu, 2007):

(1) Read only – can only read data, used to record object's identification number;
(2) Read/write – similar to memory cards, chips built-in EEPROM or write-once, read-many (WORM) in RFID can be erasable and programmable;
(3) Built-in process chip – similar to smart cards, chips in RFID include operation system (OS) and programming, for high security use; and
(4) Built-in sensor – products such as temperature and pressure sensors.

1.2 How RFID system works in a library

The RFID technology works through flexible, paper-thin RFID tags, which can be placed inside the cover of each and every document. The tags are available in a variety of shapes and sizes. Libraries make use of a bibliographic database to track circulation information about items in a collection. Check-out occurs at either a circulation desk or a special "self-check" machine that allows patrons to check out their own books. In both cases, the RFID tag is read and the association between ID number and book looked up in the bibliographic database, and the status of the book is changed to "checked out" in the bibliographic database. Later, when the book is checked in, the tag is read again and the bibliographic database updated (Molnar, 2004). As the user takes the document outside the library, the antenna placed at the exit gate automatically reads the information contained on the RFID tag to verify whether the document is properly issued or not. In case, it is not issued to the user as per library norms or it is being stolen from the library, the antenna senses it and sounds an alarm. Thus, it results in successful theft reduction of documents. The RFID technology is not only being used for circulation purpose in the libraries, it is also used for stock taking purpose (Vasishta, 2009).

2. Objectives of the study

The present study aims to identify the users' perspective towards the Radio Frequency Identification (RFID) system in the Allama Iqbal Library (central library), University of Kashmir, Jammu and Kashmir.

3. Methodology

The survey method was applied to conduct study and questionnaire was used as a data collection tool. The data was collected using a structured questionnaire from 100 registered users (selected randomly) of the Allama Iqbal Library, University of Kashmir. The questionnaire was distributed among different categories of users based on sex, age and programme. In case the questionnaire was not received even after several reminders, a new student was randomly selected to achieve 100% response rate.

4. Findings and Discussion

4.1. Diversity of Users

The users consisted of various categories based on sex, age and programme. Among gender, 64% consisted of male and 36% from female population. Age classification shows that 67% falls between the age-group of 20-25 whereas 23% between the age-group of 25-30 and 10% above 30 years respectively. Programme wise statistics show that 73% were post- graduate students and 27% scholars conducting research in different areas of various disciplines. (Table 1)

Table 1: Diversity of Library Users

	Variables	Number
Gender	Male	64
	Female	36
Total		**100**
Age	20-25	67
	25-30	23
	Above 30	10
Total		**100**
Programme	Post-Graduate Student	73
	Research Scholar	27
Total		**100**

4.2. Frequency of Library Visit

It is revealed from the data that majority of the users (94%) are frequent users of the library in which 28% users visit more than once in a week, 32% once in a week and 34% once in every two weeks. (Table 2)

Table 2: Frequency of Library Visit

Frequency	Number	Percentage
More than once in a week	28	28
Once a week	32	32
Once every two weeks	34	34
Once a month	04	04
Other	02	02

4.3. Awareness of RFID System

The majority of the users 87% were familiar with the RFID system of the library whereas 10% were aware to some extent and 03% weren't aware at all and take help of others in using the system. (Table 3)

Table 3: Awareness of the RFID System

Awareness	Number	Percentage
Fully Aware	87	87
Aware to some extent	10	10
Not Aware	03	03

4.4. Training to use Self-Service stations effectively

The operation of RFID system is easy as majority of the users (86%) are of the opinion that they just need training once to operate the RFID system whereas 04% and 10% demands that raining should be provided six monthly and yearly respectively. (Table 4)

Table 4: Training to use Self-Service stations effectively

Training Required	Number	Percentage
Only once	86	86
After every six months	04	04
At least once in a year	10	10

4.5. Purpose of using Self-Service station

Majority of the users use self–service stations for check-in (87%) and check-out (98%) purposes whereas only 36% use it for checking account status. (Table 5)

Table 5: Purpose of using Self-Service station

	Number	Percentage
Check-in	87	87
Check-out	98	98
Check Account Status	36	36

4.6. Response Time of Self-service stations

Majority of the users 73% are satisfied with the speed of the self-service stations whereas 8% blames that these are slow. To get a book or multiple issued or returned at a self-service station, it takes 6-8 seconds on an average. In order to increase the user account security, Allama Iqbal Library has introduced a 4 digit pin to access a user account which has enhanced the time by 3-4 seconds. Thus it takes 10-12 seconds to issue or return book/s at a self-service station. On the other hand, it takes 35-45 seconds to issue or return a single bar-coded book at the circulation counter. (Table 6)

Table 6: Response Time of Self-service stations

Response Time	Number	Percentage
Fast	73	73
Average	19	19
Slow	08	08

4.7. No. of Self-Service Stations

Majority of the users (69%) complain about the inadequate number of self-service stations whereas only 27% feel that the self-service stations are in good number. (Table 7)

Table 7: No. of Self-Service Stations

Self-stations	Number	Percentage
Adequate	27	27
Inadequate	69	69
Can't Say	04	04

4.8. *Self-service stations ensures User Privacy*

Only 61% of the users feel that self-service stations ensure user privacy whereas 39% disagree with the statement. The reason for disagreement is probably the less number of self-service stations in the library where chances of crowd during peak hours is unavoidable. (Table 8)

Table 8: Self-Service stations ensures User Privacy

Ensures Privacy	Number	Percentage
Yes	61	61
No	39	39
Don't Know	00	00

4.9. Self-Service stations encourages Independence

94% of the users agree that self-service stations encourage independence in issue and return of book/s from the library. Users are not dependent on library staff and the working hours of the

library for the same. Users can issue or return book/s even after the circulation counter is closed. This allows library to remain open for longer time without any need of additional staff. (Table 9)

Table 9: Self-Service stations encourages Independence

Encourages Independence	Number	Percentage
Yes	94	87%
No	04	04%
Don't Know	02	02%

4.10. Access Control

In order to prevent un-authorized access into the library, Allama Iqbal Library has installed an automatic Flap-barrier system at the entrance of the library. Only those possessing RFID smart card are able to activate the flaps to enter into the library. 82% of the users are satisfied with the access control system and 12% aren't satisfied at all. (Table 10)

Table 10: Satisfaction level of access control

Access Control	Number	Percentage
Satisfied	82	82
Not satisfied	12	12
Can't say	06	06

4.11. Over-all satisfaction towards RFID system

The data depicted that 76% of the users are satisfied with the RFID system whereas 15% aren't satisfied and 9% have reservations to provide opinion.

Table 11: Over-all satisfaction towards RFID system

Satisfaction	Number	Percentage
Satisfied	76	76
Not satisfied	15	15
Can't say	09	09

5. Findings and Conclusion

The results reveal that majority of the users (94%) visit libraries within 15 days to issue or borrow books and other documents. It may be due to the fact that the users can borrow books from libraries upto 15 days only at first instance. Further, majority of the users (87%) are familiar with the RFID system, feel that the operation of RFID system is easy (86%) and use self–service stations for check-in (87%) and check-out (98%) purposes. Furthermore, majority of the users 73% are satisfied with the speed of the self-service stations but complaint about the inadequate number of self-service stations (69%). In addition, 94% of the users agree that self-service stations encourage independence in library circulation, 61% feel that self-service stations ensure privacy and 76% are satisfied with the overall functioning of the RFID system. From the above findings, it is concluded that RFID technology have multiple benefits for libraries and libraries need to apply this technology in their operations for improving the quality and speed of their services and serve their users in a better way.

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