Research Article

LIS TODAY
Year 2025, Volume-11, Issue-2 (Dec)

User Satisfaction towards Implementation of Emerging Technologies in Library, University College of Science, MLSU Udaipur

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ARTICLE INFO

Keywords:RFID technology, satisfaction level, library resources, Self-Check-In/ Check-Out, Mohanlal Sukhadia University, and faculty members.

doi:10.48165/lt.2025.11.2.2

Submission date : 26.09.2025
Acceptance date : 25.11.2025
Publication date: 18.02.2026

ABSTRACT

The present study examines the user satisfaction level of RFID technology and facilities provided in the Library, University College of Science (UCoS), Mohanlal Sukhadia University, Udaipur, Rajasthan. The main objective of the study was to know the level of satisfaction with RFID-enabled library services, to examine the utilization of Self-Check-In/Check-Out by software and Check-In/ Check-Out by staff, and to assess the satisfaction of users with RFID technology.A self-designed questionnaire was used to collect data from 367 students out of 4,472 registered users. A total of 336 respondents were chosen from the University College of Science, MLSU Udaipur. The findings of the study have depicted that most of the respondents were fully satisfied with RFID technology and library services that are provided to physically impaired users. In Self-Check-In/Out, the majority of users were using Self-Check-In/Out by software.

INTRODUCTION

University libraries function to support teaching, learning, and research activities. Libraries serve as facilitators and play a significant role in the provision of information services and resources to assist their users in their studies, research, and other academic activities. They are the backbone of the research and teaching-learning process, offering a variety of extensive services and access to a wide range of information resources, both in print and electronic format, to the academic fraternity (Umasankar*et* al., 2008; Ayre, 2006). University libraries are structured to provide information on learning, teaching, and research. Information is regarded as the lifeblood of universities where learning is at its heart (Carlsson *et* al., 2004). The library is a service organization that provides access to resources, information, and required personal assistance to its users. A quality service rendered to all library users is among the core values of librarianship (Boss, 2011). The primary purpose of university libraries is to fulfill an institution's mission and goals by providing quality teaching, learning, and research services that are sufficient in depth, diversity, and currency to support the institution's curriculum (Molnar and Wagner, 2004).

User satisfaction is "a personal, emotional reaction to a library service or product" (Jose *et* al., 2005). It refers to the consumer's dissatisfaction with a discrete service encounter

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and overall service satisfaction (Kajewski, 2006). The potential users' feedback regarding the library resources, services, and facilities should be considered for providing necessary resources and amenities in the library. There are various types of library users with different types of expectations (Pandey and Mahajan, 2010). Therefore, the latest innovative technologies, online databases, and information retrieval systems for accessing resources have made libraries more complicated and challenging for library professionals and users alike *(Melanie et* al., 2006). The evaluation of libraries based on the satisfaction of library users can be identified in ways such as cost evaluation, cost-effectiveness, and cost-benefit evaluation (Roberti, 2005). The use of libraries by users and indeed their satisfaction with library services depends on the availability of suitable learning materials, infrastructure, and competent library personnel. The evaluation of library resources and services is based on users' perceptions of collection, budget, staff, resources, services, and process competence measures (Ondieki Makori, 2013).
Therefore, to review library services, user satisfaction becomes indispensable for the success of any library, which nonetheless depends upon how well a service satisfies the demands placed upon it by the users.

Mohanlal Sukhadia University, Udaipur: A Profile

Mohanlal Sukhadia University, Udaipur, is a NAAC accredited "A" grade state university established by an Act in the year 1962 to cater to the needs of higher education in Southern Rajasthan with more than 2.25 lakh students. The university is located in the Aravalli Hill Area, largely dominated by tribal populations. Endowed with rich cultural heritage, natural resources, and beautiful landscapes, Udaipur is a world-renowned tourist attraction. Realizing its role in the creation of new knowledge, the university has not only made a visible impact on national and international levels but has also attracted the interest of other institutions for collaborative research.The Library of University College of Science, one of the oldest constituted colleges of this university, has 1.75 lakh books and more than 8,000 e-resources.

Objectives Of The Study

The present study has been conducted with the following main objectives in mind:

1 To know the level of satisfaction with RFID technology library services.

2 To examine the utilization of Self-Check-In/Check-Out by software and Check-In/Check-Out by staff.

3 To assess the satisfaction of users with emerging RFID technologies implemented in the library of the University College of Science under RUSA 2.0.

Research Methodology

The descriptive survey research method has been adopted to examine the user perspectives of the Library,University College of Science, Mohanlal Sukhadia University, Udaipur, Rajasthan, India, after implementing the emerging technologies such as RFID systems, hardware, and software for physically impaired students under the RUSA 2.0 project. A well-structured self-designed questionnaire was used for data collection. The target population for the present study is 4,472, including library users (research scholars, guest faculty, undergraduate/postgraduate students only). Descriptive statistical techniques like tables of frequency and percentages were used in the analysis. Appropriate statistical software like SPSS version 21.0 and MS Excel were used for data analysis and interpretation.

Sample Size

The sample size for this present study was determined by using Yamane (1967, p. 886), which provides a simplified formula to calculate sample sizes. This formula is considered one of the best for survey-type research. The formula for calculating the sample size is:

$$n = \frac{N}{1 + N (e)^2}$$

Where n is the sample size,
N is the population size, and e is the level of precision (95% confidence level and p = .5 as assumed).
The population of the students and faculty under study was 4,472. Further, to ensure an optimal sample size, the 95% confidence level was pre-assigned, and a small sampling error (0.05) was fixed, i.e., the population distribution was 50%, and then applying the above formula:

$$n = \frac{4{,}472}{1 + 4{,}472 (0.5)^2}$$

$$n = 367.16$$

n = 367

Thus, the sample size for the present study is 367. Therefore, 367 questionnaires were distributed among the library users. Finally, 336 filled questionnaires were received back, resulting in an overall response rate of 91.55%.

Table 1:Procedure of Sample Selection

Categories	Science College Library, MLSU,Udaipur			
	Number of Respondents			
	Students	Research Scholars	Faculty Members	Total
Administered Questionnaires	277	55	35	367
Questionnaires Received	254	53	29	336
Questionnaires Analyzed	254	53	29	336

Result And Discussion

Assessment of Level of Satisfaction with RFID Technology Library Services

Libraries need to be more creative as educational establishments in order to offer better services. Libraries are starting to embrace information technology called library automation since they are no longer run in the old-fashioned way. The automated circulation service is performed using RFID technology devices. The purpose of this study was to assess user satisfaction with the use of RFID technology in library services and the effectiveness of library services in supporting currently offered educational programs. In addition to being more adaptable than traditional means and encouraging digital-based libraries, the use of RFID technology has raised the bar for circulation services and resulted in a degree of client satisfaction. In light of the explanation above, the purpose of this study is to investigate the variables that affect RFID-based system utilization and user satisfaction in libraries.

Table 2: Distribution oflevel of satisfaction with RFID Technology Library Services

RFID Technology Library Services	**Fully Satisfied** *f* (%)	**Partially Satisfied** *f* (%)	**Satisfied** *f* (%)	**Not Satisfied** *f* (%)
Library workflow	115 (34.22)	96 (28.57)	72 (21.42)	53 (15.77)
Staff productivity	121 (36.01)	89 (26.48)	63 (18.75)	63 (18.75)
User service	136 (40.47)	90 (26.78)	81 (24.10)	29 (8.63)
Book drop boxes	119 (35.41)	91 (27.08)	72 (21.42)	54 (16.07)
Quick response to users query	106 (31.54)	125 (37.20)	83 (24.70)	22 (6.54)
Services provided tophysically impaired	139 (41.36)	107 (31.84)	69 (20.53)	21 (6.25)
Fast processing of information	94 (27.97)	111 (34.03)	83 (24.70)	48 (14.28)
On-the-Spot users need assessment	106 (31.54)	115 (34.22)	71 (21.13)	44 (13.09)
Book collection management	99 (29.46)	89 (26.48)	105 (31.25)	43 (12.79)
Inventory process	133 (39.58)	91 (27.08)	87 (25.89)	25 (7.44)
Reliability	105 (31.25)	96 (28.57)	83 (24.70)	52 (15.47)
Arrangement of materials	126 (37.50)	90 (26.78)	99 (29.46)	21 (6.25)

Circulation	128	84	87	37
	(38.09)	(25.00)	(25.89)	(11.01)
RFID Gates	102	89	101	44
	(30.35)	(26.48)	(30.05)	(13.09)
Self-Check-In/Out	116	96	112	12
	(34.52)	(28.57)	(33.34)	(3.57)

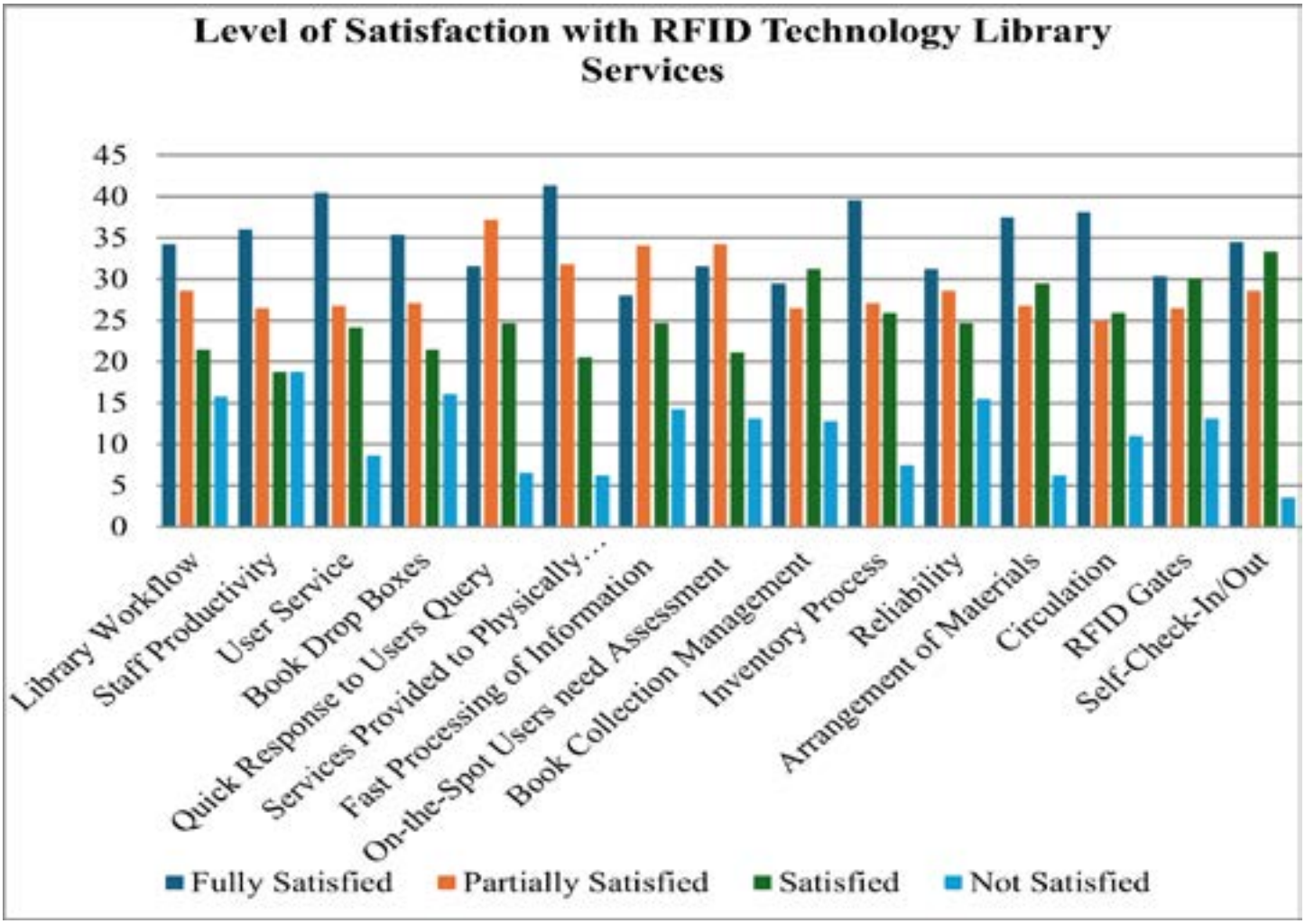

Fig.1:Distribution of Level of Satisfaction with RFID Technology Library Services

Table 2 and figure 1 reveal the level of satisfaction with the basic library services provided by the library. The 34.22 percent of respondents are fully satisfied with the library workflow, 28.57 percent are partially satisfied, 21.42 percent are satisfied, but 15.77 percent are not satisfied at all.

As far as staff productivity is concerned, 36.01 percent of respondents were fully satisfied, 26.48 percent were partially satisfied, 18.75 percent were satisfied, and the same percentage were found not satisfied.

Table 2 and figure 1 depict that 40.47 percent of respondents were fully satisfied with user services, 26.78 percent were partially satisfied, 24.10 percent were satisfied, but 8.63 percent were found not satisfied.

As far as book drop boxes are concerned, the respondents, i.e., 35.41 percent, were fully satisfied, followed by 27.08 percent who were partially satisfied, 21.42 percent who were satisfied, and 16.07 percent who were not satisfied.

Regarding Quick Response to Users' Queries, 31.54 percent of respondents were fully satisfied, 37.20 percent were partially satisfied, 24.70 percent were satisfied, and only 6.54 percent were not satisfied.

Throwing light on services provided to the physically impaired, most of the respondents, i.e., 41.36 percent, were fully satisfied, 31.84 percent were partially satisfied, and 20.53 percent were satisfied, but 6.25 percent were not satisfied.

A cursory look at Table 2 and figure 1 revealed that 27.97 percent of respondents were fully satisfied in fast processing of information, followed by 34.03 percent who were partially satisfied and 24.70 percent who were satisfied, but 14.28 percent were not satisfied.

In the case of On-the-Spot users' need assessment, 31.54 percent of respondents were fully satisfied, 34.22 percent

of respondents were partially satisfied, 21.13 percent were satisfied, and 13.09 percent were not satisfied.

It is visible from the above Table and figure that 29.46 percent of respondents were fully satisfied, 26.48 percent of respondents were partially satisfied, 31.25 percent were satisfied, and 12.79 percent of respondents were not satisfied with the book collection management.

With regard to the inventory process, 39.58 percent of respondents were fully satisfied, 27.08 percent of respondents were partially satisfied, 25.89 percent of respondents were satisfied, and 7.44 percent of respondents were not satisfied.

Regarding reliability, 31.25 percent of respondents were fully satisfied, followed by 28.57 percent of respondents who were partially satisfied, 24.70 percent who were satisfied, and 15.47 percent of respondents who were not satisfied at all.

Table 2 and figure 1 depict that for the arrangement of materials, 37.50 percent of respondents were fully satisfied, 26.78 percent of respondents were partially satisfied, 29.46 percent of respondents were satisfied, and 6.25 percent of respondents were not satisfied.

For data regarding circulation, 38.09 percent of respondents were fully satisfied, 25.00 percent of respondents were partially satisfied, 25.89 percent were satisfied, and 11.01 percent were not satisfied.

It is visible in RFID Gates that 30.35 percent of respondents were fully satisfied, followed by 26.48 percent of respondents who were partially satisfied, 30.05 percent of respondents who were satisfied, and 13.09 percent of respondents who were not satisfied at all.

Results presented in Table 2 and figure 1 highlight that for Self-Check-In/Out, 34.52 percent of respondents were fully satisfied, 28.57 percent of respondents were partially satisfied, 33.34 percent of respondents were satisfied, and 3.57 percent of respondents were not satisfied.

Assessment of respondents for Self-Check-In/ Out by software and Check-In/Out by staff

The self-check-out/in service calmed the library staff from the protracted circulation activities of books. Substantially, it saves a lot of users' time as they need not wait in long queues at the circulation desk for scheduled issues and revisit performance. In this way, it enhances user satisfaction in the circulation control of the library. Science College Library is providing the facility of self-check-out/check-in through machines.

Table 3: Distribution of respondents for Self Check-In/Out by software and CheckIn/ Out by staff

Status	Science College Library MLSU, Udaipur			
	Students (n1=254) *f* (%)	Research Scholars (n2=53) *f* (%)	Faculty Members (n3=29) *f* (%)	Total (n=336) *f* (%)
Self-Check-In/ Out by Software	213 (83.85)	44 (83.01)	23 (79.31)	280 (83.34)
Check-In/ Out by Staff	41 (16.14)	9 (16.98)	6 (20.68)	56 (16.67)

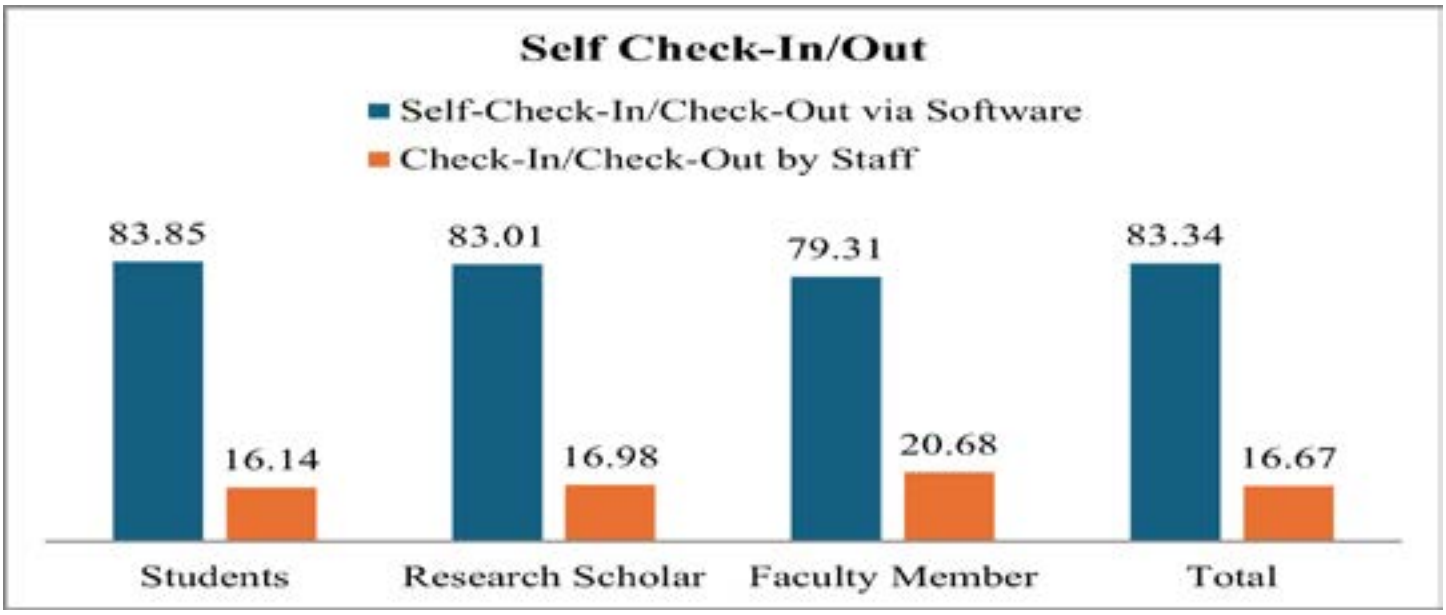

Fig.2:Distribution of respondents for Self Check-In/Out by software and Check-In/ Out by staff

The data in Table 3 and Figure 2 investigates that the majority (83.85%) of students Self Check-In/Out with the help of software, followed by (83.01%) who were research scholars and (79.31%) who were faculty members. Whereas 16.14 percent were students who Self Check-In/Out with the help of library staff, followed by 16.98 percent who were research scholars and 20.68 percent who were faculty members. Thus, the total respondents, i.e., 83.34 percent were Self Check-In/Out by software and 16.67 percent of respondents with the help of library staff.

Assessment of satisfaction of users with RFID technology

RFID has the potential to become a key technology for ubiquitous services, allowing people and things to be automatically identified by their RFID tags. But along with RFID technology are problems that must be resolved if users are to embrace it widely. For instance, the adoption of RFID technology by government organizations and retailers raises concerns about possible security risks to personal data as well as possible privacy violations. RFID tags are used by commuters worldwide to pay for public transportation and tolls electronically, eliminating the need to wait in line at a teller (Hossain and Prybutok, 2008). It is exactly said that the value and achievement of any library system are in a straight line proportional to the level of satisfaction of end users of that system.

The use of Radio Frequency Identification (RFID) technology is essential to the automation of libraries. RFID technology has completely changed how items are tracked and identified. RFID embeds chips with wireless antennae inside items to enable automated product identification. A radio frequency transmitter uses an antenna to create, modulate, amplify, and transmit radio waves in a standard RFID system. RFID tags receive and process the radio waves, then transmit a unique ID and additional information to a radio frequency receiver via radio waves. RFID tags are incorporated into the items of interest (such as books, journals, and DVDs) in a library setting, and the receiver is integrated into a number of systems, including inventory management, security, and self-checkout systems (Dwivedi *et al.* 2013). Success is measured by the high effectiveness and user satisfaction levels of RFID technology's implementation in library services.

Table 4: Distribution of satisfaction of users with RFID technology

Level of Agreement	Science College Library, MLSU, Udaipur			
	Students (n1=254) ***f*** **(%)**	**Research Scholars (n2=53)** ***f*** **(%)**	**Faculty Members (n3=29)** ***f*** **(%)**	**Total (n=336)** ***f*** **(%)**
Strongly Satisfied	83 (32.67)	16 (30.18)	09 (31.03)	108 (32.14)
Satisfied	142 (55.90)	29 (54.71)	18 (62.06)	189 (56.25)
Neither Satisfied nor Dissatisfied	16 (6.29)	07 (13.20)	02 (6.89)	25 (7.44)
Dissatisfied/ Unfamiliarity	09 (3.54)	01 (1.88)	00 (0.00)	10 (2.97)
Strongly Dissatisfied	04 (1.57)	00 (0.00)	00 (0.00)	04 (1.19)

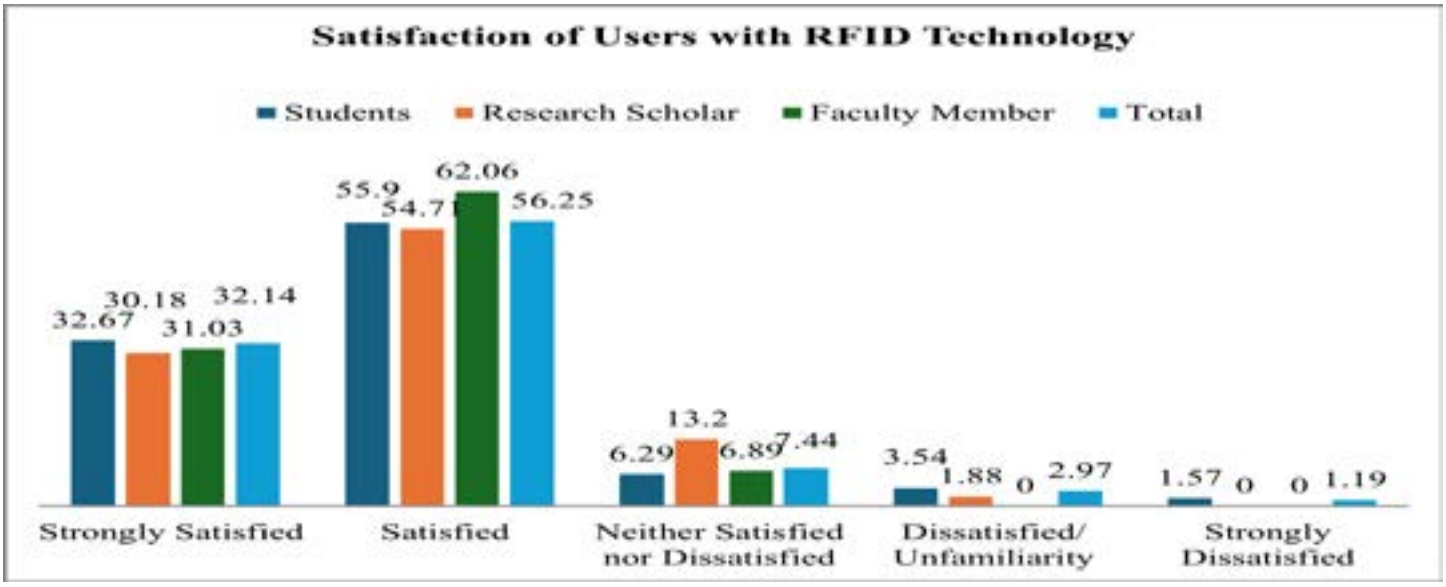

Fig.3:Distribution of Satisfaction of Users with RFID Technology

The above data reveals the satisfaction of users with RFID technology. Most of the students, i.e., 32.67 per cent, were strongly satisfied, out of which 30.18 per cent were research scholars and 31.03 per cent were faculty members. The total, i.e., 32.14 per cent, of respondents from Science College Library, MLSU, Udaipur, were strongly satisfied.

Table 4 and Figure 3 depict that 55.90 per cent of students were satisfied with RFID technology, out of which 54.71 per cent of respondents were research scholars and 62.06 per cent were faculty members. The total, i.e., 56.25 per cent, of respondents were satisfied.

Regarding neither satisfied nor dissatisfied, 6.29 per cent were students, 13.20 per cent were research scholars, and 6.89 per cent were faculty members. Furthermore, a total of 7.44 per cent of respondents were neither satisfied nor dissatisfied.

It is visible from Table 4 and Figure 3 that 3.54 per cent of students were dissatisfied or had unfamiliarity with RFID technology, out of which 1.88 per cent were research scholars. No faculty members were dissatisfied or had unfamiliarity with RFID technology. The total, 2.97 per cent, of respondents were dissatisfied/unfamiliar with RFID technology.

Table 4 and Figure 3 show that 1.57 per cent of students were strongly dissatisfied, whereas no research scholars or faculty members were strongly dissatisfied with RFID technology. Moreover, 1.19 per cent of respondents were strongly dissatisfied with RFID technology.

Conclusion

The findings of the study have depicted that most of the respondents have been found fully satisfied with the RFID technology library services provided to the physically impaired.In self-check-in/out, the majority of the students were using self-check-in/out software, and a greater percentage of respondents used the software compared to check-in/out by staff. Furthermore, the result of this study leads to the conclusion that users have good satisfaction regarding the RFID technology services. However, they are not satisfied with services such as quick response to users' queries and fast processing of information. Therefore, these services need to be taken care of for the betterment of the users. The majority of the faculty and respondents were satisfied with RFID technology.

Mohanlal Sukhadia University is investing in strengthening its library and resources, including adopting RFID technology for efficient resource utilization. The library is implementing self-check-out/check-in hardware and software for physically impaired systems, particularly for students and research scholars. The study suggests that regular monitoring and supervision of these services will increase the utility of the library. However, there are certain risks, such as ill-behaved users who return only RFID-tagged books and keep the rest illegally. Despite these challenges, most of the users are satisfied with RFID technology, stating that it has improved the circulation of library resources, reduced staff time and effort, and enhanced user satisfaction. Self-check-out and check-in machines also allow users to check account statistics and receive computerized receipts for returned books.

Acknowledgement

This study has been conducted after the implementation of the RFID system in the Library, UCoS, MLSU, Udaipur, Rajasthan. The RFID system project was sanctioned by RUSA, MHRD, Government of India. This project was given to Dr. P.S. Rajput, Author/Principal Investigator. He is grateful to Prof. Kanika Sharma, Nodal Officer, RUSA, for her guidance, unconditional support, and encouragement. The Principal Investigator is also grateful to SPD, Jaipur, for monitoring, assessment, and valuable inputs throughout the project.

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