

Full Length Research Paper

Users' perceptions of technology use for theft detection and library management in private universities in Abuja

Yusufu SA*, Babalola GA, Udoudoh SJ, Yusuf MA and Obaje AM

Department of Library and Information Technology, Federal University of Technology, Minna, Niger State, Nigeria.

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This study investigates users' perceptions of the use of technology for theft detection and library management in private universities in Abuja. As Radio Frequency Identification (RFID) continues to revolutionize library operations through improved security, cataloguing, and user services, the competence of librarians in utilizing these systems has become increasingly critical to their successful implementation. Using a survey research design, data were collected from 260 respondents, including librarians and postgraduate students at Nile University of Nigeria and the African University of Science and Technology. Descriptive statistics were employed to analyze responses. The findings revealed a moderately satisfactory Competence Performance Index (CPI) of 3.52, suggesting that librarians possess foundational skills in using RFID but need continuous training to fully optimize the system. Tag authentication was identified as the most valued RFID feature, highlighting its significance in resource protection and access control. The study acknowledges the positive impact of RFID on reducing staff workload and automating processes, while stressing the need for continuous investment in advanced RFID infrastructure and staff development to ensure efficient and effective theft detection in private university libraries in Abuja. The study concludes that enhancing librarian competence through targeted professional development is essential for maximizing RFID's potential in academic libraries. It recommends regular system evaluations, user education, and infrastructural improvements to reinforce the evolving role of LIS professionals as technologically adept facilitators of modern library services.

Key words: Librarians' competence, users' perceptions, theft detection, library management.

INTRODUCTION

Library management can be described as some basic library activities ranging from reference services, circulation operations, cataloguing and classification, selective dissemination of information, current awareness services and serial management. These services are carefully planned and executed to provide qualitative service to the library users and their host community.

(Erwina and Kern, 2024).

Library theft can be described as the crime of stealing books, Digital Video Displays (DVDs) as well as other media from the library. This menace is typically prevented by installing electronic article surveillance alarm systems by installing electronic article surveillance alarm systems at the entrance and exits of the library.

*Corresponding author. E-mail: shehuamanyiyusufu@gmail.com. Tel: +2347040576869.



Figure 1. Schematic diagram of RFID Technology adaptation across the industrial sector.
Source: Adapted from Radio Frequency Identification (RFID) Research Centre, Abuja (2017).

Theft detection using Radio Frequency Identification (RFID) technology in the management of libraries connotes the use of the RFID Electronic Article Surveillance (EAS) gate as the theft-detecting part of a typical RFID library management system (LMS). The alarm is triggered and the gate light flashes when a user attempts to pass through with an un-borrowed library material (Yusufu, 2015). The RFID system raises an alert when users try to remove books from the library without passing through the circulation desk for proper check-in and check-out- in order words, without the proper charging and discharging of such information materials (Saka and Aliyu, 2017).

RFID Technology is a technology that uses radio waves, tags, antennae and readers to track and detect objects in real-time within a geographical location of such items. RFID technology is used to protect collections against theft. The titles and bibliographic information of library collections are entered into the RFID system. Also, the circulation of books has been made easier since the introduction of RFID systems (Saka and Aliyu, 2017). RFID Technology Basics include: non-line of sight

Automatic Identification and Data Capture (AIDC) technology for identification can be used to identify and capture objects such as images, videos and sound. Basic system components of RFID technology include: tags, readers and middleware (Figures 1 and 2). Tags consist of a microchip attached to an antenna and are placed in the object to be located. However, there are various types of tags namely: passive and active tags. The reader communicates with the tags through radio waves, using platforms such as Staff work stations, handheld readers, self-charging stations, and long-range exit reader systems. Middleware converts the data captured by the reader into a format that is perceivable by the application software.

Librarians' competence is a critical factor in delivering effective library services, particularly in the digital era where advanced technologies, such as RFID, are increasingly being adopted. Competence encompasses a combination of knowledge, skills, and attitudes required to perform tasks effectively. In the context of library management, it involves technical expertise, information literacy, technological adaptability, and effective communi-

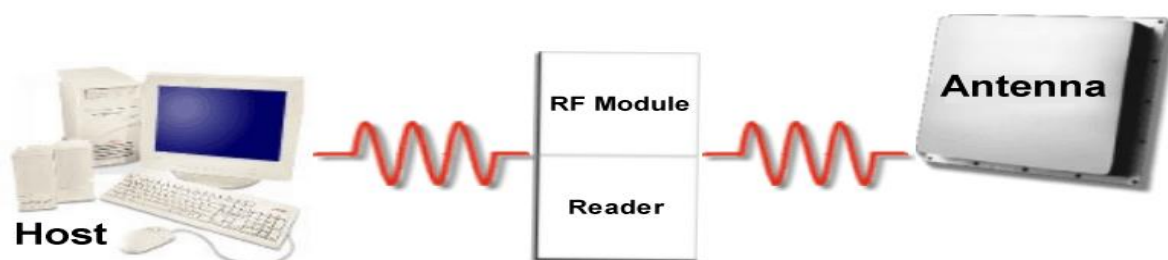


Figure 2. Basic system components of RFID technology.

cation skills (Umunnakwe et al., 2021).

Librarians are expected to stay current with emerging technologies and integrate them seamlessly into library operations. Their ability to use technology such as RFID for theft detection, inventory management, and enhancing user experience reflects their level of competence. According to Aina and Ogundele (2020), librarians who possess a high level of technological proficiency are better equipped to meet the dynamic needs of library patrons and ensure the optimal functionality of library systems.

However, challenges such as inadequate training opportunities, limited institutional support, and rapid technological advancements can hinder the development of competence among librarians. Adebayo (2019) emphasized the need for continuous professional development (CPD) programs to bridge skill gaps and foster technological readiness in library professionals. Furthermore, the perceptions of library users regarding librarians' competence play a pivotal role in shaping the effectiveness of library services, as users are more likely to trust and utilize services provided by competent professionals (Okoroafor, 2022). Developing and maintaining the competence of librarians is essential to ensure their relevance in the evolving landscape of library services and to meet the expectations of users in modern academic and research environments.

Users' perceptions play a significant role in evaluating the effectiveness of library services, including the competence of librarians and the adoption of technological innovations. Perception refers to how individuals interpret and form opinions about the quality and reliability of the services they receive. In the context of libraries, these perceptions are influenced by factors such as the accessibility of services, the responsiveness of library staff, and the ability of librarians to effectively utilize modern technologies like RFID systems (Aina and Oladele, 2020).

The way users perceive librarians' competence can directly impact their level of trust in the library's operations and their willingness to engage with available resources. When librarians demonstrate proficiency in technology use, provide timely assistance, and ensure efficient

resource management, users are more likely to view the library as a reliable and professional resource centre (Chukwuemeka, 2023). Conversely, negative perceptions—arising from delayed responses, technical inefficiencies, or limited staff knowledge—may lead to dissatisfaction and reduced library usage.

In academic libraries, particularly in private universities, users' expectations are typically high due to the competitive environment. The integration of advanced technologies like RFID in such institutions further amplifies the need for librarians to exhibit technological competence. According to Adedoyin and Olufemi (2022), when users perceive that librarians are proficient in utilizing RFID for theft detection, cataloguing, and inventory control, they are more inclined to value the library's role in supporting their academic and research endeavours.

Moreover, users' perceptions can serve as valuable feedback for identifying areas where librarians require additional training or institutional support. Understanding these perceptions helps improve the quality of library services, enhance user satisfaction and foster a positive institutional reputation (Umunnakwe et al., 2021).

The integration of RFID technology in library operations offers numerous benefits, including improved theft detection, streamlined inventory management, and enhanced user experience. However, the success of RFID implementation in libraries depends significantly on the competence of librarians to utilize this technology effectively. In private universities within the Abuja metropolis, the perceptions of users regarding the competence of librarians in managing RFID technology remain largely unexplored.

Limited competence or inadequate user confidence in the skills of librarians can hinder the full utilization of RFID systems, potentially compromising the efficiency of library management and the satisfaction of library patrons.

Understanding users' perceptions is critical to identifying gaps in librarian training and addressing challenges that may affect the adoption and optimal use of RFID technology in these academic institutions (Okoroafor and Chukwuemeka, 2023; Johnson and Ogunleye, 2021).

This study aims to bridge the knowledge gap by assessing users' perceptions of librarians' competence in utilizing RFID technology, to inform strategies for capacity building and enhance library services in private universities in Abuja. It also aims to find out users' perceptions on the competence of librarians on RFID technology usage for theft detection and library management in private universities in Abuja metropolis.

The study will be of significance to librarians, university libraries, patrons, government, stakeholders in the education sector and users of RFID technology in other sectors. It will create a platform for the reduction of book theft in library organisations through the deployment of a surveillance alarm system capable of notifying librarians in real time about theft or smuggling of any library material, especially when tagged with an RFID microchip. Furthermore, it will serve as a valuable addition to existing literature on the use and effect of RFID technologies in theft detection for library management in Abuja, Nigeria.

Although there are four private universities in Abuja, namely the African University of Science and Technology (AUST), Abuja, Baze University, Abuja, Nile University of Nigeria (NUN) Abuja and Veritas University, Abuja, only AUST and NUN have RFID technology facilities in their libraries. Consequently, this study is confined to them.

In a study carried out by Okoroafor (2022) on users' perspectives towards the RFID technology System in the Allama Iqbal Information Resource Centre shows that the statistics of 100 registered users of the Allama Iqbal Information Resource Centre, University of Kashmir was undertaken. The results revealed that the students were satisfied with the RFID system especially self-service stations and access control system.

Vasistha (2024) also found out that students are always cautious when making inquiries from the librarians, and some of the students complained about being afraid of coming close to a particular librarian. Srujana et al. (2024) advised that reference librarians should acknowledge beginners' anxieties, and position themselves as approachable allies, available at any time to provide information that supports students in their chosen fields of study.

Suda and Rani (2023) observed that RFID technology should be channelled to go with the requirements and organization of the library and its users; for instance, Hong Kong University library has installed Easy Check units, Easy Return units, and Easy Detect units to serve library patron better. This is to ensure better-reworked copy and continuous refining of the process.

Madhusudhan (2020) posited that the risk of not getting it right can be abridged by beginning with a small RFID plan in the library to enhance qualitative service delivery. For instance, in Delhi, the application of RFID technology is still dawdling and a small number of libraries have accepted the technology. From the data gathering and

assessments, various libraries are either in the procedure of execution or preparing to implement RFID technology.

Repanovici and Cristea (2022) stated that at the University of Transylvania, RFID technology is incorporated with the Koha open-source system to attain a cost-effective solution with big capability. Reasons for beginning with a small RFID plan are that it provides improved dexterity and can be effortlessly customized to have room for changes. The successes of minor RFID plans, in turn, pave the way for the application of RFID technology in bigger projects.

According to Arya (2010), in libraries, eminence is observed in terms of timely service, appropriate collection building, user-oriented services and use of Networked information services. The acceptance of information communication technologies in libraries, in particular, is concerned with effective and efficient services. It is found that total quality management in libraries will bring awareness of quality among the library staff, if not, a programme for skill development and competency building has to be planned to bring the required quality service to the libraries. He further affirmed that quality awareness or quality consciousness can be judged by the library users, administrators, and management. Greene et al. (2020) discuss the RFID usage competencies of librarians, noting that library personnel have actively participated in strategic planning processes where tactics were reviewed and redefined, the mission, goals and vision of the institution were revised, and significant development initiatives-such as an enhanced focus on customer service and broader expansion efforts-were implemented. One feature of the learning enterprise that is flawless to the librarians and library officers is the standard for all personnel to be more proactive in continuous professional development through learning and in improving the enterprise through creativity and innovation. The personnel are required to get more involved in the activities of the enterprise if the place of work has to compete favourably with similar enterprises outside. The personnel could wait anymore for others to advise them on the way forward. They had to make themselves relevant to the enterprise by acquiring new skills to complement their job schedule.

The varying opportunities for library personnel and the requirement to think out of the box from some task-related skills to more technology-related thinking led information professionals to comprehend that they are required to reflect in terms of contracting different breeds of personnel: personnel who are flexible and change-oriented. To support managers, in comprehending what types of personnel were required and to support the person to appreciate the varying prospects, the libraries boarded on a procedure to ascertain essential competencies for all personnel. Through the use of competencies, the libraries would have a shared linguistic and a shared thought of expectations for personnel and

supervisors and would be able to retort to modifications in the setting by backing up novel proficiencies of personnel and department.

It is recurrently stated throughout that the developments in computer and communication technologies have fundamentally changed the library milieu. Hence quality management is gradually becoming a part of academic libraries and it is reflected in their services which change from in-house static individual service to network-based, multi-dimensional services. This is attributed to the growth of educational and library networks in India (Indian Academic Libraries, 2020). According to Verma (2024), in trying to incorporate RFID technology with current library systems, it is significant that the library relates it to the suitable components. Using this approach guarantees that incorporation is profitable and well-organized. Utilising the proper assets (that is, existing hardware and software) can minimize expenses and strength when incorporating RFID with the present systems, such as adding RFID technology with mobile devices in libraries to accomplish the library's day-to-day procedures. An essential factor for executing RFID is its ability to incorporate with prevailing technology and applications. Successful performance of RFID depends on proficient performance (that is, it is faster when equated to barcode technology), compatibility, and proper integration. A proper amalgamation between RFID technology and the present Information Technology frame will then lead to data reliability and system amenability.

Huang (2021), in his publication, reported that there are moves to change the professional terminology from librarian to knowledge management and so on. The profession is under revolution due to the impacted changes and it has been happening for the last two to three decades. However, the strong impact of Information and Communication technology and its merging with Library and Information Science has transformed it into an almost distinctive subject of practice. These changes in the context have brought the rebirth of organizational approaches and the roles and functions of professionals persistently require to be advanced with their professional knowledge and to acquire innovative skills. This is happening in all types of organizations and libraries. Knowledge and competencies are amassed with hanging professional profile in terms of its components, the collection, the tools and modus operandi handled and the innovative services accessible by implementing the technological advances. For instance, a modest change from a manual system to a computerised library system requires several skills and competencies to work in the new environment.

RFID technology is comparatively novel technology and library personnel may not have either previous awareness of it or the essential expertise related to its usage. Bansode and Desale (2022) posited that the non-existence of any technological experts in the library is a challenge when

executing RFID technology. Cunningham (2020) is of the view that the absence of training and expertise affects the use of RFID technology. This situation causes teething troubles on a day-to-day basis. To overcome this problem, the delivery of training and education to develop library personnel's skills in using RFID technology is indispensable. Finally, Boss (2020) noted that as work in this area progresses with the adoption of advances in library computerization, such as barcodes and RFID technology, there is a clear need for continual renewal of knowledge and skills. Boss (2020) further stated that building competencies among librarians in the present context is a never-ending process. In this regard, the competencies and skills required for library professionals should include the following:

a) Personal competencies

1. Corporate mindset
2. Communication skills
3. Logical and analytical skills
4. Presentation skill
5. Negotiation
6. Human resource management

b) Professional and/or technical competencies

1. Computer literacy
2. Internet literacy
3. Networking knowledge
4. Information search and retrieval competency
5. Developments in ITES
6. Operational knowledge of equipment and tools in use (Boss, 2020).

RESEARCH METHODOLOGY

This study adopted the survey research design. This research design was found suitable for this study because it enabled the researcher to cover wider responses within a short period. Survey research design is often used because of the low cost and easy accessibility to information. This is supported by Oyedum et al. (2015) who asserted that a survey is used to appraise a situation with the intent of correcting inadequacies as well as initiating development.

The population of this study is 260, comprising all the librarians and the registered post-graduate students in the two private universities. Therefore, the population of this study is made up of 5 librarians and 100 postgraduate students from the African University of Science and Technology (AUST), Abuja, 5 librarians and 150 postgraduate students from Nigerian Turkish Nile University (NTNU), bringing the total population of the study to 260 respondents.

The questionnaire was the research instrument used for data collection for this study. The research instrument was subjected to validation and correction by the researcher's supervisors as well as experts in evaluation and measurement. The reliability of the instrument was carried out by conducting a pilot study within two weeks and the copies of the questionnaires retrieved were analyzed using Cronbach Alpha. The result of the analysis showed a high-reliability coefficient of $\alpha = 0.73$. This result clearly shows that the instrument is reliable in carrying out the study.

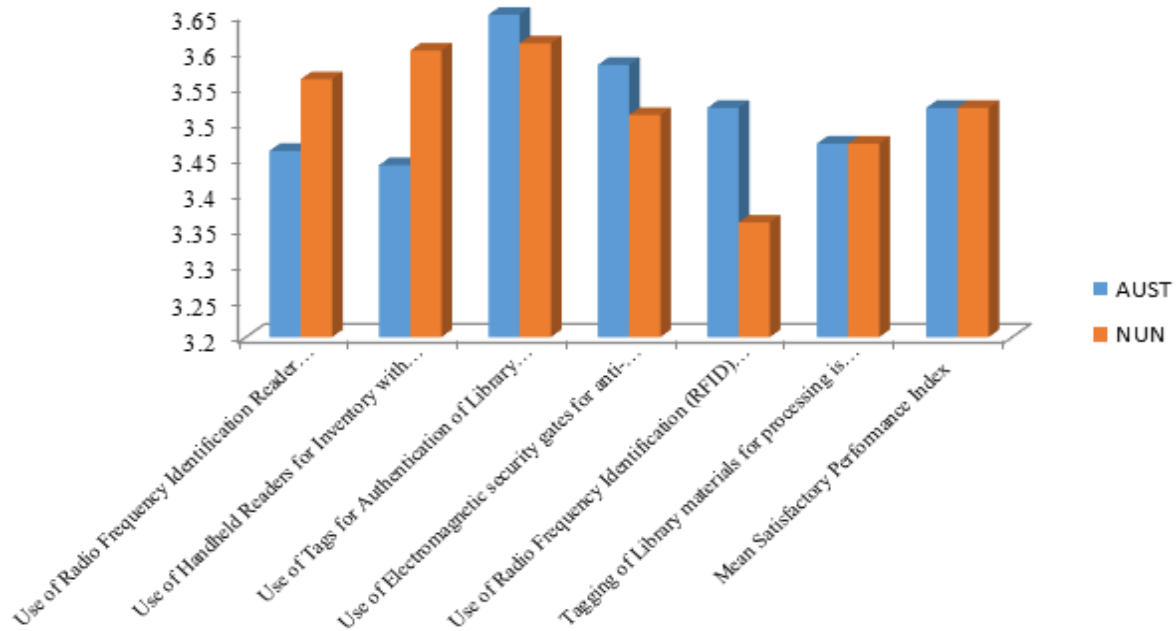


Figure 3. The level of satisfaction across all the RFID technologies.

Table 1. Users' perception of librarian's competence in the Use of RFID in selected universities.

Level of competence	Rating of competence				CPI	Rank
	HC	AC	LC	NC		
The use of a RFID is satisfactory	2.38	1.00	0.13	0.01	3.52	3 rd
The use of handheld readers for inventory concerning shelving is satisfactory	2.36	1.00	0.14	0.00	3.50	4 th
The use of tags for the authentication of library resources is satisfactory	2.63	0.94	0.05	0.00	3.62	1 st
Use of electromagnetic security gates for anti-theft detection is satisfactory	2.39	1.05	0.09	0.01	3.54	2 nd
The use of RFID labels for the printing of Tags is satisfactory	1.95	1.36	0.00	0.00	3.31	6 th
Tagging of Library materials for processing is satisfactory	2.10	1.31	0.05	0.01	3.47	5 th
Mean Competence Performance Index					3.49	

Two statistical methods were used to analyze the data for this study. They are descriptive and Inferential statistical methods. Responses from research questions were analyzed by simple descriptive statistics using statistical tools such as tables, frequency counts, mean and standard deviation.

RESULTS AND DISCUSSION

The response rate of the copies of the questionnaires administered to the two selected private universities (2) libraries in Abuja Nigeria has been previously reported (Yusufu et al., 2025). A total number of 250 copies of the questionnaire designed for the study were administered to

users of the libraries (postgraduate students) whereby 234 were retrieved and found usable. This represents 144 (96%) users for NUN and 90(90%) users for AUST. The total response rate of the library users is 94%, showing a high response rate from the library users in the two institutions.

As shown in Figure 3, the level of satisfaction differs across all the RFID technologies employed, but the mean SPI is the same. The composite analysis of the perception of the library users in both universities about the level of satisfaction with the deployment of RFID Technology for library management in Abuja indicated that the mean CPI is 3.49. Table 1 shows the composite analysis of the

Satisfaction Perception Index of the Library users.

The analysis in Table 1 indicated that the Mean Competence Index ranges between 3.62 Moderately Satisfactory and 3.31 Undesirable competence level. It shows that four (4) variables (RFID Technology) usage contributed positively to the level of competence by the library users while two (2) variables did not contribute to the mean level of competence (undesirable competence condition). Therefore, the usage of these RFID technologies is met with a different level of satisfaction by the library users. The result of the level of competence in the use of the RFID technology by librarians as opined by the library users in the selected Universities in Abuja indicated that the Mean Competence Performance Index (CPI) was 3.52, which is moderately satisfactory. This is moderately satisfactory because the mean of 3.52 is the common satisfactory level for the two universities and it ranked 3rd in the overall analysis for both universities on the competence performance index (CPI). The result shows further that the use of Tag Authentication is the most favoured of the RFID tools employed in the libraries. The implication of this is that library users are satisfied with the employment of RFID technology in library management but think that more has to be done to achieve excellent utilization of RFID technology in library management. Therefore, the management of the library and the university need to invest in additional technology for the smooth running of the automated library. The use of RFID technology has reduced staff employed in the selected libraries in the following ways: librarians are relieved of daily routines, self-service has reduced the circulation tasks of librarians, job responsibilities have also been reduced, it has also reduced their man hours to a great extent because sorting of the returned materials has reduced drastically, cataloguing has become more efficient and finally, tracking misplaced books has also reduced. The level of satisfaction with user perception substantiated the findings of Okoroafor (2022) who opined that the students (users) are satisfied with RFID technology systems especially self-service stations as well as access control systems. One can conclude based on this that RFID technology works more effectively and efficiently in libraries.

The study concludes that while the competence level of librarians in using RFID technology in the selected universities in Abuja is moderately satisfactory, there is room for improvement to achieve higher efficiency and user satisfaction. The most favoured tool, Tag authentication, underscores the utility of RFID in library management. The technology has significantly streamlined operations, reduced staff workload, and improved cataloguing and book tracking processes. These findings affirm that RFID technology is an asset in modern library management, though its potential has yet to be fully realized. Finally, the study found that librarians' compe-

tence in using RFID technology in selected Abuja universities was moderately satisfactory, with a Mean Competence Performance Index (CPI) of 3.52. Tag Authentication was the most favoured RFID tool, and while users expressed satisfaction with the system, they recommended further improvements for optimal utilization. RFID technology has reduced staff workload, improved cataloguing efficiency, and streamlined tasks like sorting and tracking misplaced books.

From the findings of the study, it is recommended that universities should organise regular training programs to enhance librarians' RFID skills and confidence, while allocating resources to upgrade and expand RFID tools for effective automation. Institutions such as Nile University of Nigeria (NUN) and the African University of Science and Technology (AUST) should conduct workshops and tutorials to educate library users on RFID-enabled self-service systems. University libraries should also establish mechanisms for regular evaluation of librarian competencies and RFID effectiveness, collaborate with other institutions that have successfully implemented RFID technology to adopt best practices and prioritize routine maintenance and updates to ensure uninterrupted and efficient operations.

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