



Readiness of Librarians towards Adoption of Radio Frequency Identification for Information Service Delivery in Kano State

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ABSTRACT

RFID is the acronym of Radio Frequency Identification a new technology introduced in areas of information industry. RFID technology is used in libraries for shelf management, anti-theft detection, accessioning, external book return etc. The main purpose of the paper was to investigate the awareness, perception and readiness of librarians working in university libraries in Kano state towards RFID. The study employed an exploratory survey design. The target population for the study consists of all librarians working in three university libraries in Kano State. A total of one hundred and nineteen (119) questionnaires were distributed, out of which 94 copies of completed questionnaire (79%) were returned and found usable. The data collected were analyzed using descriptive statistics of frequency and simple percentage scores using SPSS version 20. The findings of the revealed that majority of the respondents were aware of the existence of RFID and its usage in libraries. They also perceived the use of RFID in libraries positively. They were also ready to use it if it is installed in the libraries. Finally, the finding revealed that lack of support from the management, resistance to change, cost among others were the major factors inhibit libraries to adopt RFID. The researcher recommended that there is to pave away of training librarians on the new technologies used in libraries and the library management to put more pressure to the university management to ensure RFID and similar technologies are installed in libraries.

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INTRODUCTION

Radio Frequency Identification (RFID) is a technology used for identifying a person or object using radio waves to communicate among a system of integrated circuits, tags, readers and software to identify items. RFID refers to the technology in which the RFID tag transmits a radio frequency signal that is picked up by a reader. Radio waves transmitted from an antenna interact with an integrated circuit embedded on an RF tag, which sends radio waves back to a reader. The reader turns those waves

into digital information, allowing the item that respond to be instantly identified. RFID is widely used today in many areas such as logistics, supply chain management, Warehouse management and logistics, medical implants, road tolling, building access control, aviation security, luggage tracking at airports, libraries, etc (Singh & Mahajan, 2014).

According to Dictionary of Library and Information Science (2004), RFID technology is the use of microchips to tag library materials and the library card, enabling patrons to check out items



by walking through a self service station equipped with an antenna that emits low-frequency radio waves. When an RFID tag (transponder) passes through the electromagnetic zone, a reader (antenna + transceiver) decodes the data encoded in the tag's integrated circuit, passing it to a computer that corresponds to the library card. Line-of sight is not required for this non-contact system.

RFID system make self-checkout faster and easier for library patrons and RFID portable scanners can take inventory by just being passed slowly along the library shelves, without having to handle each item individually. Use of RFID save time and it operate more efficiently and effectively than the barcode systems. However, the cost factor is the major barrier of using such technology to the maximum. (Singh & Mahajan, 2014)

LITERATURE REVIEW

Marquardt, Taylor, Villar, and Greenberg (2010) asserted that people often have an incomplete understanding of the functionality of RFID, which can not only result in misuse, but also fear and insecurity about privacy risks. We believe that providing feedback about a tag's reading activity can help people to better understand what is going on, even if they do not know how RFID tags technically work. Chia (2001) stated that there is a need to transform the present library system influencing four building blocks, i.e., content, services, people and infrastructure. He opined that the transformation of libraries could only be possible with proper implementation of Electronic Library Management System which takes less than 15 minutes queuing to borrow material during peak periods and zero minute queuing time for book returns. He stated that with Electronic Library Management System stocktaking of books in a library which used to take two weeks earlier, now takes less than a day.

Yorkovich (2001) stated that the use of RFID in libraries saved the time of

library staff on performing routine tasks such as finding lost items, weeding the collection, properly shelving items and performing shelf reading in a fraction of time. He opined that with RFID Check System, users can check out the material themselves without the assistance from the library staff. RFID is among the most revolutionary technology to affect the way libraries manage information and with the use of this technology, a library becomes a more efficient place to retrieve information. Singh and Midha (2008) discussed the importance of using RFID in libraries and highlighted its various advantages like speedy circulation operations, self-charging/discharging, highly reliable, high-speed inventory control, automated handling of material, long life of RFID tags, etc. They also discussed the disadvantages of RFID systems like high cost, accessibility to compromise and removal of exposed tags. They pointed out some of the characteristics to be considered while evaluating RFID vendors which include security feature, reader collision, tag memory capacity, anti-collision, standards, etc. They concluded that RFID is increasing in popularity among libraries, as the early adopters of this technology have shown that it makes good economic sense for all types of libraries.

Pandey and Mahajan (2010) opined that RFID is not only emerging but also more effective, convenient and cost efficient in providing library security. It can also act as a security device, taking the place of the traditional electromagnetic security strip. The authors found that the RFID tag contains all required identifying information's without being pointed to a specific position to be read by an RFID reader. Pawar, Shegaonkar and Udane (2016) opined that the technology could lead to significant savings in labor costs, enhance customer service, lower book theft and provide a constant record update of new collections of books. It also speed up book borrowing, returning and monitoring, and



thus freed staff from doing manual work to do any other user services task.

Margam (2010) found that after the implementation of RFID in the libraries, the check-in and check-out time was reduced to less than 20 seconds per item and the use of the libraries has also increased. High cost was the most significant challenge faced after implementation of RFID technology. He highlighted the advantages of RFID technology for libraries and recommended the use of RFID technology in other libraries for faster and better services to their users. He suggested that as the RFID technology is very costly and cannot be changed frequently, thus good quality tags should be used so that there is no need to remove exposed tags frequently. He also suggested that anti-virus protection should be made with the self-service of RFID. He concluded that the future of libraries lie in RFID technology and it is expected that in the coming years, the cost will come down further and soon more libraries will adopt the technology.

Gupta and Margam (2017) stated that as inferred from the fifth law of library science that 'library is a growing organism', librarians are always found interested in adopting latest technologies to provide better and efficient services to the patrons. Indeed, RFID technology has redefined various library related services and made every patron's job easier and efficient, from the patrons to the library professionals, as compared to conventional technologies like barcode, but in developing countries the high cost of implementation and maintenance is still the major barrier in the proliferation of such auspicious technology. Pattnaik and Pattnaik (2007) opined that though few libraries are employing this technology today, but due to its customizable features and continuing improvement, the library communities are beginning to get involved in its development. They highlighted some barriers of RFID use like technological

barrier, cultural barrier, and financial barrier, lack of proper standards, blocking the RF wave, etc. and stated that these are the major concerns that need to be addressed before implementing this technology.

Makhija and Chugan (2016) stressed that RFID is one of the latest technologies being used by libraries in the management and maintenance of a library which are usually very crucial and time consuming tasks. The authors opined that RFID technology involves direct systems to detect the target and hence made detection of documents (digital or print) easier and quicker, although the cost was still a big challenge in its adoption. Madhusudhan (2010) opined that the RFID technology could be the future of services provided by libraries, but the involvement of high cost in the working and implementation has been encountered as the primary challenge in its proliferation. Nevertheless, the author forecasted a decrease in the cost of the technology with its adoption, if carried out in large numbers in libraries.

Research Questions

The study attempt to find answer to the following questions:

1. Do librarians in Kano state aware of the use of RFID for information service delivery in libraries?
2. What is the perception of librarians in Kano state on the use of RFID for information service delivery?
3. Are the librarians in Kano state ready to adopt RFID for information service delivery in libraries?
4. What are the factors affecting adoption of RFID for information service delivery in libraries in Kano state?

METHODOLOGY

This study adopts an exploratory survey design. Exploratory survey is defined as a survey used to investigate a problem which is not clearly defined in order to have a better understanding of the existing problem. According to Babbie



(2015) explains that exploratory surveys are used on concepts which are new and have not been studied exhaustively. Powell (2006), stated that, exploratory surveys can increase the researcher's familiarity with the phenomenon under study and help to clarify concepts and identify priorities for future studies.

The target population for this study consist of all librarians working in three university libraries in Kano State, i.e Bayero University, Kano Library, Yusuf Maitama Sule University Library and Kano University of Science and Technology University. There were one hundred and nineteen librarians working in these

institutions (table 1). Sample was drawn by applying census technique where all the respondents in the study population constituted the sample size. The justification of this is the small size of the population. A self-developed questionnaire was used for data collection. A total of one hundred and nineteen (119) questionnaires were distributed, out of which 94 copies of completed questionnaire (79%) were returned and found usable. The data collected were analysed using descriptive statistics of frequency and simple percentage scores. The analysis was presented in tables.

RESULTS

Table 1: Response Rate

| S/N | University Library | Questionnaire Distributed | Returned Questionnaire |
|-----|--|---------------------------|------------------------|
| 1 | Bayero University, Kano Library | 70 (59%) | 54 (45%) |
| 2 | Kano Science and Technology, University, Library | 14 (12%) | 12 (10%) |
| 3 | Yusuf Maitama Sule University, Library | 35 (29%) | 28 (24%) |
| | Total | 119 (100%) | 94 (79%) |

Source: field survey, 2019

Table 1, shows that a total of one hundred and nineteen questionnaire were distributed to the librarians working in university libraries in Kano state, majority 70 (59%) were from Bayero university, Kano, 35 (29%) from Yusuf

Maitama Sule and 14 (12%) from Kano science and technology, university. The table also depicts that 94 (79%) of the questionnaire were returned to the researchers.

Table 2: Awareness of RFID by the librarians

| SN | Statement | SA/A | % | SD/D | % |
|----|---|------|------|------|------|
| 1 | I am aware of the existing RFID | 69 | 73.4 | 25 | 26.6 |
| 2 | I am aware RFID is used for tracking documents in library | 73 | 77.7 | 21 | 22.4 |
| 3 | I am aware RFID is used for book return in library | 67 | 71.3 | 28 | 28.7 |
| 4 | I am aware RFID is used for theft detection in libraries | 65 | 69.1 | 29 | 30.8 |

Source: Generated by the Researchers using SPSS version 20

From the results in table 2, the majority of the respondents 69 (73.4%) were aware of the existence of RFID technology, 73 (77.7%) of the respondents were also aware that RFID is used for tracking documents in library, 67

(71.3%) of the respondents were also aware that RFID is used for book return in library, lastly 65 (69.1%) of the respondents indicated that were aware RFID is used for theft detection in libraries.



Table 3: Perception of librarians on RFID

| SN | Statement | SA/A | % | SD/D | % |
|----|--|------|------|------|------|
| 1 | I believe use of RFID saves time for both library staff and users | 69 | 73.4 | 25 | 26.5 |
| 2 | I believe use of RFID makes library work faster and easier | 68 | 72.3 | 26 | 27.6 |
| 3 | I believe use of RFID helps in provision of efficient and effective library services | 65 | 69.1 | 29 | 30.9 |
| 4 | I believe use of RFID speed up charging and discharging | 63 | 67 | 31 | 33 |

Source: Generated by the Researchers using SPSS version 20

Table 3 presents the results of the study about the perception of the respondents towards adoption of RFID in libraries. More than half 69 (73.4) of the respondents agreed that RFID saves time for both library staff and users. Similarly 68 (72.3%) of the respondents agreed that RFID makes library work faster and

easier. More so, 65 (69.1%) of the respondents stated that RFID helps in provision of efficient and effective library services. Finally, 63 (67%) of the respondents believed that adoption of RFID in libraries speed up charging and discharging.

Table 4: Readiness of librarians towards RFID

| S/N | Statement | SA/A | % | SD/D | % |
|-----|--|------|------|------|------|
| 1 | I can determine the location of document with RFID | 70 | 74.4 | 24 | 25.5 |
| 2 | I can charge and discharge with RFID | 65 | 69.2 | 29 | 30.8 |
| 3 | I can take statistics of documents consulted with RFID | 63 | 67 | 31 | 32.9 |
| 4 | I can put documents in their appropriate spaces on shelves with RFID | 68 | 72.3 | 26 | 27.6 |

Source: Generated by the Researchers using SPSS version 20

Table 4 shows the results of the investigation about the readiness of librarians towards adoption of RFID in libraries. It shows that 70 (74.4%) of the respondents agreed that they can use RFID to determine the location of documents in libraries. More than half of the respondents 65 (69.2%) were also ready to use RFID for charging and

discharging if it is installed in the library. Furthermore 63 (67%) of the respondents indicated that they can take statistics of the documents with RFID. Finally, 68 (72.3) of the respondents agreed that they can put documents in their appropriate positions on the shelves with RFID.

Table 5: Factors affecting adoption of RFID in libraries

| S/N | Statement | SA/A | % | SD/D | % |
|-----|--|------|------|------|------|
| 1 | Lack of support from management prevent library to adopt RFID | 70 | 74.4 | 24 | 25.6 |
| 2 | Resistance to change is a challenge to implementation of RFID | 67 | 71.3 | 27 | 28.7 |
| 3 | Cost is a factor affecting adoption of RFID | 67 | 71.3 | 27 | 28.7 |
| 4 | Lack of skills among librarians hinder libraries to adopt RFID | 56 | 59.5 | 38 | 39.4 |

Source: Generated by the Researchers using SPSS version 20



It can be seen from the table 5 that, majority 70 (74.4%) of the respondents agreed that lack of support from management was a factor that prevent library to adopt RFID. More than half 67 (71.3%) indicated that resistance to change and cost are among factors that affect adoption of RFID in libraries. Finally, 56 (59.5%) of the respondents stated that lack of skills among librarians was also a factor that prevent library to adopt RFID.

DISCUSSION

The findings of this study implies that majority of the respondents were aware about the existence of RFID technology, they were also aware of the use of RFID in libraries for tracking documents, book return and theft detection. This finding is similar to that of Kumbhar (2017) who found that the use of RFID in Indian libraries was growing and the awareness about this technology has been increase. The findings of this study revealed that most of the respondents have positive perception towards adoption of RFID technology in the library. They believed that use of RFID saves time for both library staff and users, it makes library work faster and easier, it helps in provision of efficient and effective library services and speed up charging and discharging. This finding tandem with Margam (2010) who found that implementation of RFID in the libraries, helps in saving time, the check-in and check-out time would reduce to less than 20 seconds per item and the use of the libraries has also increased.

The findings of this study shows that majority of the respondents were ready to use RFID if it is installed in the library. They were ready to use it for determining the location of documents in the library, to use it for charging and discharging for taking statistics of document consulted and for shelf reading. The study correspond with that of Kern and Nauer (2004) Lastly the findings of the study revealed that lack of

support from the management, resistance to change, cost and lack of skills among librarians were major factors that affect libraries to adopt RFID. This finding was similar to that of Bansode and Desale (2009) in their study who found lack of availability of technology experts, resistance towards change and lack of support were major factors impeding libraries to implement RFID technology. It was also tallied with Margam (2010) who found that high cost was also challenge faced libraries to implement RFID technology. Therefore, it is paramount for the management of university libraries in Kano state to convince university management to adopt RFID since the librarians were ready to accept it.

CONCLUSION

RFID technology is applied to the variety of activities in the libraries such as automated self-check in and checkout, theft detection, stock verification and it comprises many components including RFID tags, security gate, library personnel station or staff station, shelf services unit, shelf management, etc. This technology has changed the concept of the security level all over the world by using smart cards for an individual identification. The technology has saved money and fast gives return on investment. Therefore, if libraries and other information centres in Nigeria can adopt it they will provide efficient and effective services to their users.

RECOMMENDATIONS

The following recommendations were made:

1. The university libraries should develop programmes that would help in awareness about new technologies that are used in libraries to provide effective and efficient services to the users.
2. The university library should put more pressure to the university management to ensure RFID and similar technologies are adopted in libraries.



3. There is also need to train librarians about the new technologies that are available for libraries to provide services to the users. This can be achieved through attending seminar and workshops on ICT facilities.
4. There is need for an increased budgetary allocation to university libraries to enable them subscription of new technologies that allow them to provide efficient and effective services.

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