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The Status of Implementation of Radio Frequency Identification (RFID) Technology and Its Awareness among Library Users and Professionals: A Study of Central Library of Jadavpur University, Kolkata

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The Status of Implementation of Radio Frequency Identification (RFID) Technology and Its Awareness among Library Users and Professionals: A Study of Central Library of Jadavpur University, Kolkata

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Abstracts

The main aim of this study is to determine the status of implementing the Radio Frequency Identification (RFID) technology in the central library of Jadavpur University, Kolkata; the other purpose is to increase awareness of RFID technology among library professionals and users of the library. RFID technology occurs in many areas of society, such as healthcare, marketing, libraries, etc. For this study, the users and library professionals of Jadavpur University have been selected. This study adopted the descriptive analytical research method, and quantitative and qualitative data were collected to achieve its objectives. The survey method has been used with the help of two sets of questionnaires. The first stage evolved by making a questionnaire to conduct research or gather information from users and library professionals. The second stage included the data tabulated in an Excel sheet and presented for analysis in tabular, bar, and graph formats. The study explained the outline of the RFID technology implementation status, the amount of work done in the library, and the gaps; it also explained the awareness of RFID technology among library professionals and Users and the user satisfaction level towards the library services.

Keywords: RFID Technology; Library Services; Central Library; Jadavpur University Library; University Students; RFID Awareness; Library Automation.

1. Introduction

Information-based Technology has rapidly evolved as an important instrument in the world of Knowledge. The library is one of the centres that are very important for managing information and knowledge. The resource centre facilitates the availability of accurate and authentic information. According to S. R. Ranganathan in "Five Laws of Library Science," the fifth law says, 'Library is a growing organism,' which means the library system is a continuously evolving system developed every moment. Its evaluation has increased with the advent of new

technologies day by day. The new technologies have opened the windows for integration to sustain the knowledge system and certain issues like hiring more and more skilled staff and their patrons, along with user awareness, which is equally important for its success. RFID technology is the latest and most influential technology for libraries in this digital world that is facilitating knowledge in recent days in many libraries in India. Now, the question arises: How is RFID technology implemented in the central libraries in India? What is the awareness of RFID technology among library professionals and users? Today, technology has taken all the focus of the world's population. People can't even imagine their life without technology. RFID is a technology that uses radio waves to scan and identify separate and distinct items. It is one of the AIDC (Automatic Identification and Data Capture) technology. There are many others, like barcodes, magnetic ink, optical character recognition, voice recognition, etc. RFID technology is the most recent technology adopted by the library. RFID Technology is the technology that helps library professionals and patrons of the library do their work promptly.

1.1   About Jadavpur University

Jadavpur University is one of the top academic institutions in the State of West Bengal. For many years, this university has maintained its status. After the independence government of West Bengal passed the necessary legislation to establish Jadavpur University on December 24, 1955, Jadavpur University (JD) was ranked fourth among universities by NIRF (the National Institutional Ranking Framework) in 2022, ranking 11th among engineering institutes in India, 12th overall. It has come to be known for its commitment to advanced study and research. The institution offers a variety of interdisciplinary, engineering, scientific, and arts courses.

1.2   An Account of the Central Library of Jadavpur University

The University takes great pride in its library system, which includes the Central Library, the Salt Lake Campus Library, 36 Departmental Libraries under the Faculty of Arts, Science, Engineering and Technology, and about 23 Libraries attached to the Schools and Centres for Studies under the Faculty of Interdisciplinary Studies Law and Management. All clients of the university library and researchers from other universities must use the central library of Jadavpur University, which is a very important resource.

2. Scope of the Study

The scope of this study is limited to the users and library professionals of Jadavpur University, located in Jadavpur, Kolkata, West Bengal, India. have been selected. The most current technology that libraries have implemented is RFID. These days, this is the most popular topic of discussion in libraries. This technology occurs in many areas of society, such as healthcare, marketing, etc.

3. Review of Literature

Xu, Liu and Wang (2022) this study presents an HF RFID system that can automatically scan shelves using robotics and RFID technology. The mobile robot will take the place of the library staff, and RFID will be utilised to find the tagged books on the shelves. Krishnan (2021) studied mainly the security system of libraries and how it works. Anandhi and Sarangapani (2021) explored the usage and implementation of RFID technology in Arignar Anna Central Library. Sammi and Singh (2020) discussed the growth of using RFID technology in various fields, for example, defence, medicine, transport, commerce, food quality etc. Nagalakshmi (2017)

studied the rapid growth and development of RFID technology in academic libraries. She also talked about the various applications of the RFID technology in the libraries. Pal and Sharma (2017) discussed the history of RFID technology and all the new automatic identification technology in the library. Rajeswari (2017) described RFID as an electronic device that holds the data. Jain & Krishna (2014) discussed how RFID technology speeds up library service and helps library professionals provide services promptly to their patrons. Baidwan, Adarsh, and Harvindar (2011) discussed the limitations and challenging parts of using RFID technology in the library in their study. Kaur et al. (2011) gave an overview of RFID in detail in the paper, i.e., the RFID technology's principles, components, advantages, and limitations. In their article, Ahuja and Potti (2010) described the application and use of RFID technology in today's life.

4. Research Methodology

This study followed the mixed method of research to achieve its goal. Data for this study was collected using two sets of questionnaires, which were used as a tool to help the survey. The first stage was making a questionnaire on the issue to conduct research or gather information from users and library professionals. The second stage was data tabulated in a Microsoft Excel sheet and presented for analysis in tabular, bar, and graph formats. Out of 53 questionnaires, 50 responses were received, and the response rate of 94.33% is considered adequate for the study.

5. Objectives

  i. To know the status of the implementation of the RFID technology in the study area;
 ii. To learn about the library services available to the patrons in the study area;
iii. To find out the awareness about RFID technology among library professionals and users in the study area;
 iv. To determine the user's satisfaction level with the library services.

6. Data Analysis

A survey was conducted using a structured questionnaire, and information was collected from the responders personally by the researcher. One questionnaire was prepared for library professionals to collect information about the status of RFID installation, and another one was for Library users to collect information on how much they know about their library. So, this part of the study is divided into two sections: the library professional's perspective and the library users' perspective.
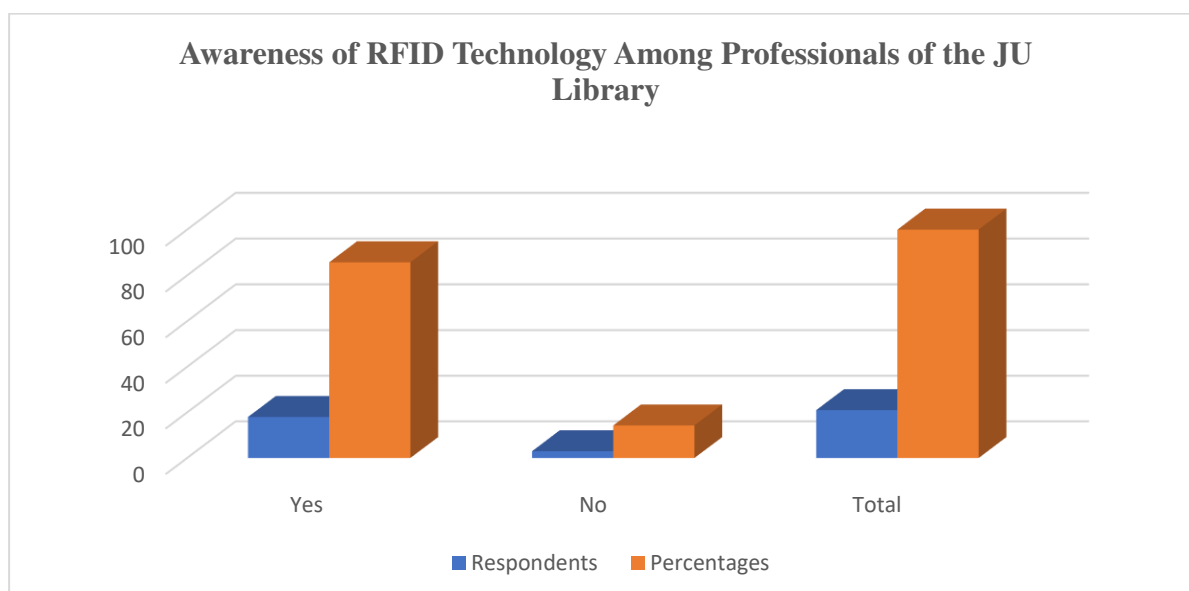
6.1 Library Professional's Perspective

Table 1: Services provided by the library

S. No.	Services name	Availability in the library	
		Yes	No
1	Circulation Service	✓	
2	Reference Service	✓	
3	Online reservation of book	✓	
4	Recommendation of library materials	✓	

5	Current Awareness Service	✓	
6	Photocopying/ Printing Service	✓	
7	Inter-library loan service		✓
8	Selective Dissemination of Information	✓	
9	Orientation of Information Sessions		✓
10	Audio-visual service	✓	
11	Multi-media section		✓

The above table shows that all library services are there in the library, and they provide all services to their patrons. The library provides a Circulation service for issuing and returning books in the circulation corner mainly because it does not have a fully installed RFID system. They provide reference services, online reservation services, library materials recommendations, CAS (Current Awareness Service), photocopying or reprographic services, SDI, and audio-visual services. At the same time, they don't provide inter-library loan services and also do not organise orientation programs for the users, etc.

Figure 1: Awareness of RFID technology among library professionals

The above figure-1 shows the awareness of RFID technology among library professionals; out of the total distributed questionnaires, 85.70% of library professionals are well aware of the concept of RFID technology, and only 14.30% need to be made aware of the concept of RFID technology. Though all the professionals know the term RFID, all need to become better familiar with the technology.

Table 2: RFID technology installation status in the library

S. No.	RFID Components	Status of the work		
		Working	Not Yet	Almost Done

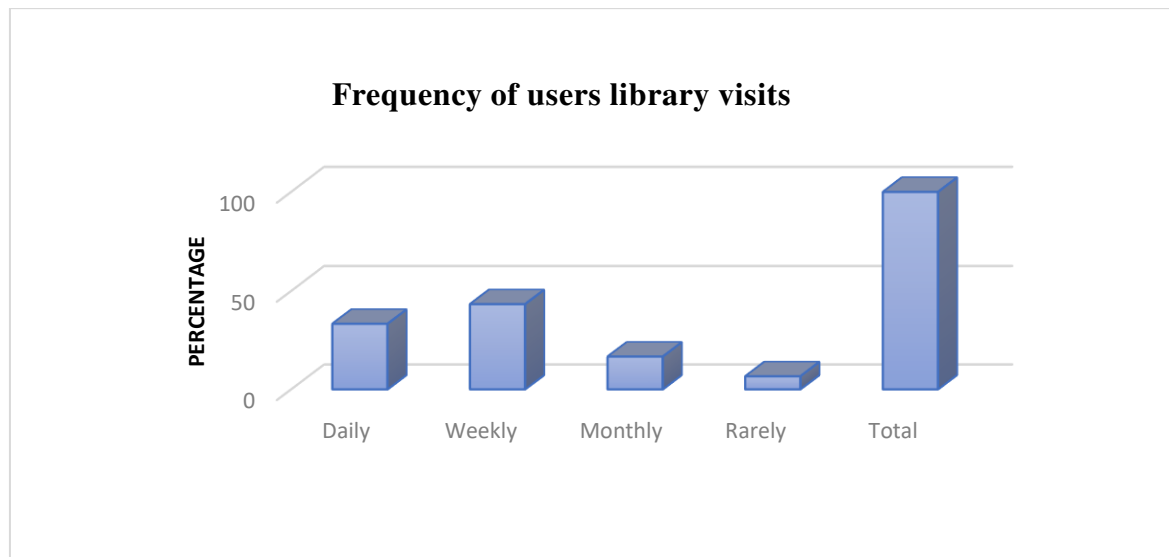|				
1	Intellectual security door	✓		
2	Self-borrowing machine		✓	
3	Self-returning machine		✓	
4	RFID materials tagging			✓
5	Borrow card			✓
6	Databases		✓	
7	Mobile inventory platform		✓	

From Table 2, one can understand the status of the RFID implementation in the library. The intellectual security door, one of the components of RFID installation completed and started working; some components, like RFID materials tagging and borrow cards, are almost done but not working yet; other components here, like self-borrowing and returning machine, databases, mobile inventory platform, are neither completed nor active yet.

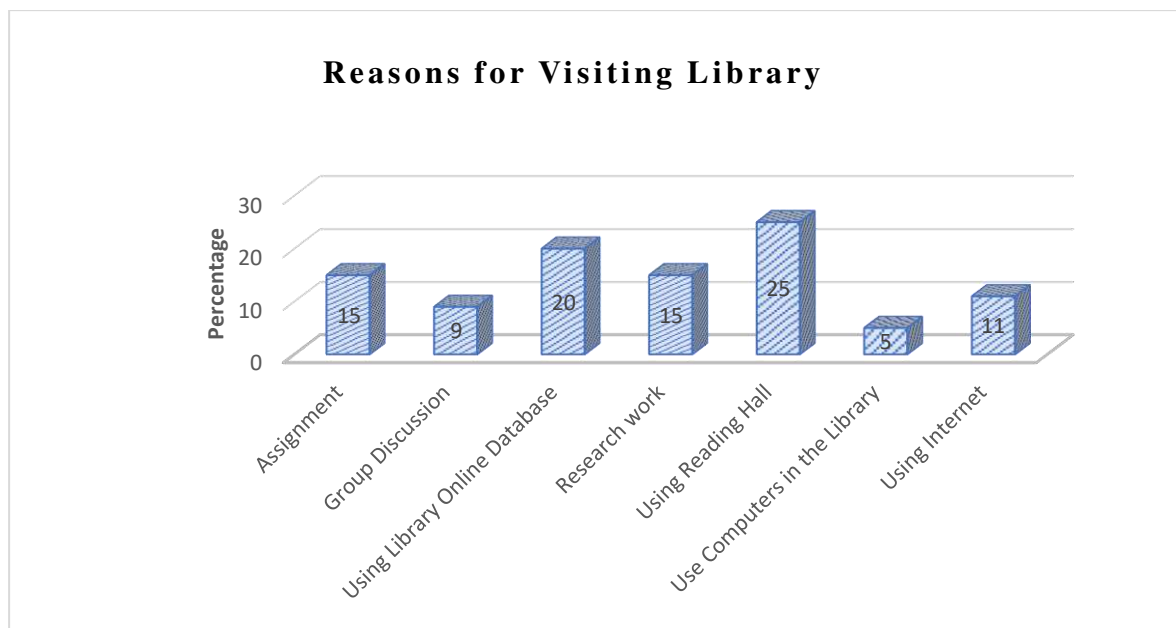### 6.2 Library Users' Perspective

Table 3: User Category

S. No.	Category	No. of questionnaires distributed	Received	Percentage
1	UG	14	14	28
2	PG	26	24	48
3	M.Phil./Ph.D.	13	12	24
4	**Total**	53	50	100

Table 3 shows the category-wise distribution of respondents. For this study, 53 questionnaires were distributed among the users while only 50 were received back. It shows that 28% of the respondents are undergraduate students from different fields, 48% are postgraduate students, and 24% are M.Phil./Ph.D. scholars.
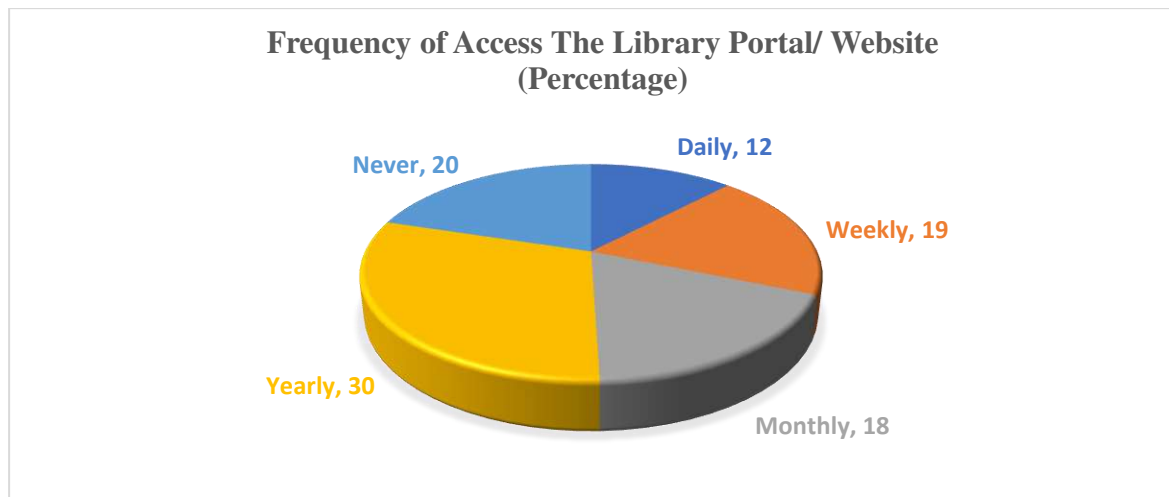
Figure 2: Frequency of library visit

Figure 2 shows the frequency of library visits by the users. This clearly shows that most of the users visit the library weekly, which is 43.33% of the total number. 33.33% of users are visited daily, 16.66% are visited every month, and only 6.66% are visited rarely.
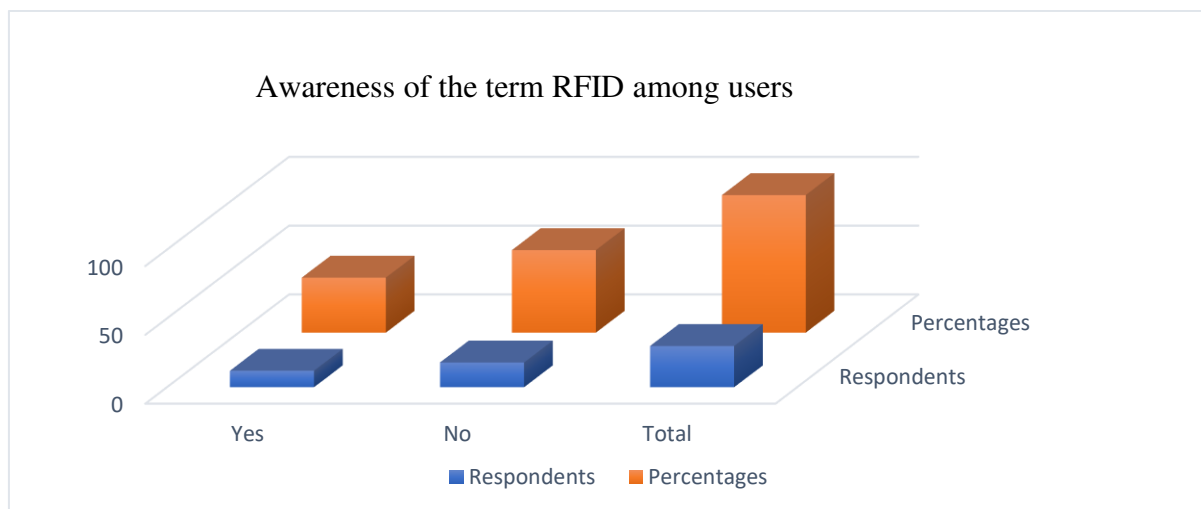

Figure 3: Reasons for Visiting the Library

Figure 3 talks about the reasons behind the library visiting users. The maximum number of users visit the library to use the library reading hall, i.e., 25% of users, 20% of users visit the library to use the library online database, 15% of users come to the library for their research work, and also 15% pupils come for making their assignment, and 11% come for using the Internet for their study, 9% of them come to the library for group discussion, and only 5% users visit the library for using the computer system.
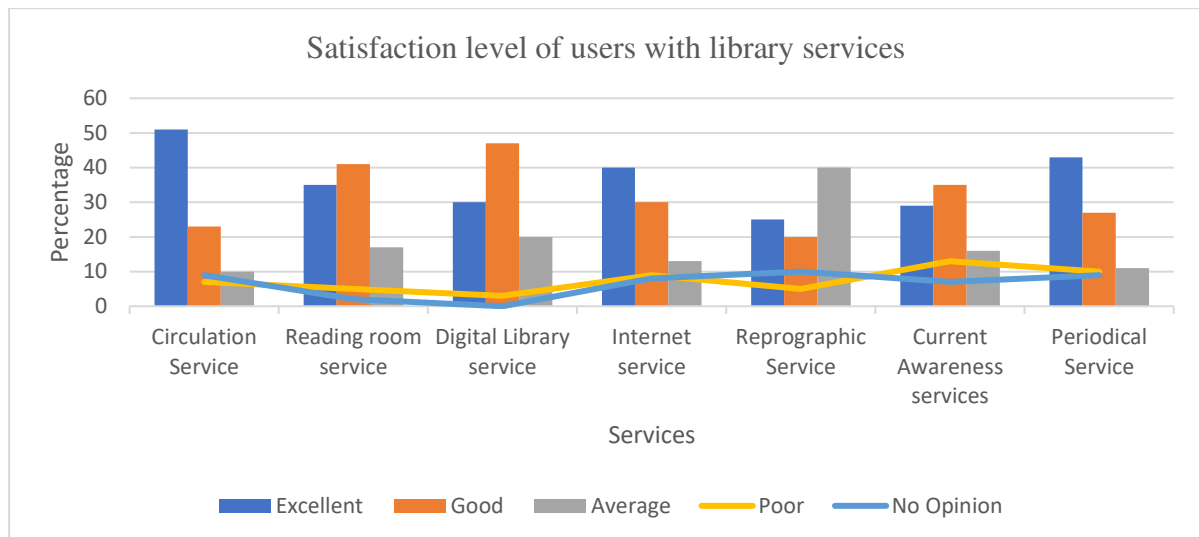
Figure 4: Library website access frequency

Above figure-4 indicates the Frequency of accessing the library portal or website. It clearly shows that only 12% of the users visit the library portal daily, 19% of the users access the websites weekly, 18% of users visit the site monthly, 30% or a maximum of users visit the library website once a year or yearly, and 20% of the pupils never use or visit the library website.

Figure 5: Awareness of the term RFID among users

Figure 5 shows the awareness of the term RFID among library users. Among the total respondents, 40% are aware of the word RFID, and the other 60% are not aware of the term RFID. However, they know that there is an intelligent security door at the library gate, which they use almost daily. However, due to a lack of knowledge of RFID, they don't know the gate is associated with the RFID technology.

Figure 6: Satisfaction level of the users with library services

Figure 6 shows the user's satisfaction level with the library services. Most of the users responded that they were satisfied with the circulation and periodical services. They are, on average, satisfied with the reading room and digital library services and partially satisfied with the current awareness services. They are not very satisfied with the reprographic services. This service needs to be improved by the library.

7. Results and Discussions

i. The University's central library offers its users nearly all of the services that libraries typically offer. Due to the lack of a fully installed RFID system, the library offers a circulation service for borrowing and returning books in the traditional circulation area. They offer user orientation programs, interlibrary loan services, online reservation services, recommendations of library resources, CAS (Current Awareness Service), photocopying and reprographic services, SDI, and audio-visual services, but not interlibrary loan services.

ii. The report displays the library's current state of RFID adoption. The RFID installation's intellectual security door is one of the parts that has been finished and put into operation; other parts, including RFID materials tagging and borrowing cards, are almost finished but not yet operational; and still, other parts, including self-borrowing and returning devices, databases, and mobile inventory platforms, are neither finished nor operational yet.

iii. According to the study, 23.33% of respondents of the library users are MPhil/Ph.D. scholars, 46.66% are postgraduate students, and 30% are undergraduate students from various fields.

iv. Most of the patrons, 43% visited the library every week, followed by 33% daily, 17% every month, and 7% rarely or just once every six months.

v. Among all respondents, 40% are aware of the phrase RFID, while the remaining 60% are not.

vi.   They are aware of the intelligent security door in the library gate, which they use almost daily. Still, they need to become more familiar with RFID technology because they are unaware that the gate is connected to RFID.

vii. The paper also shows the user's satisfaction with library services. Where most of the users responded that they were satisfied with the circulation and periodical services, they were averagely satisfied with the reading room and digital library services and partially satisfied with the current awareness services. They are not very satisfied with the reprographic services. This service needs to be improved by the library.

8. Conclusions

The study concludes that RFID technology implementation is significant in today's information world. In addition to being new, RFID technology is also a better technology for securing libraries. RFID serves as a security tool. RFID technology helps in material tracking, increases accuracy, and reduces theft. This study shows the implementation status of RFID technology in the Central Library of Jadavpur University. The study found that most library professionals are aware of RFID technology, while a few are not. On the other hand, a few of the users/patrons are not aware of the technology, while some of them are aware of it.

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