Radio Frequency Identification (RFID) Technology Devices in Library Services: Improving Education Services

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Abstract: As educational institutions, libraries must innovate to provide higher-quality services. Libraries are no longer managed in the traditional way and are beginning to use information technology known as library automation. RFID technology devices are used to carry out the automation circulation service. This study was done to measure user satisfaction with the usage of RFID technology in library services as well as the efficiency of library services in assisting existing educational services. This kind of quantitative research employs observational methods, a descriptive study design, and the distribution of research questionnaires to participants. The usage effectiveness value for the research indicated that the combination of the cadet identification card and the library membership card into a single card was deemed to be effective and efficient at 96%, which was a considerable increase. The adoption of RFID technology has increased circulation service standards, is more flexible than traditional modes, and promotes digital-based libraries, with a level of customer satisfaction with the use of RFID technology devices in circulation services of 97.2%. The high value of effectiveness and user happiness with the application of RFID technology in library services are indicators of success.

Keywords: Education Services, RFID, Library Service

A. Introduction

Education is the key to a person's success, which begins with receiving a decent and quality education. The importance of education can also bring positive attention to the nation and the country (Maulidiyah & Roesminingsih, 2020).According to Education Unit Law No. 20 of 2003, Section 1, "Education is a form of action carried out by students in a learning state in a planned and conscious manner, so that the learning process can develop individual potential to gain religious, intellectual, character, handling of people, and other abilities that are needed by people, local residents, nations, and countries."

Information technology has changed many facets of life and professions, including libraries, due to its extremely quick development. In order to transform data

into information that is quick, accurate, and carried out automatically, information technology is commonly employed in data processing. Automation of the library refers to all actions carried out there with the aid of technology. Traditional library management is no longer feasible due to the enormous demand for information sources among users. The existence of library automation undoubtedly affects how well librarians perform because previously manual work has been automated with the aid of current information technology. Because service is the foundation of running a library, the service process can also be completed swiftly, precisely, and accurately.

(Akbar et al., 2021) The library plays a crucial role in raising student learning achievement levels. It also serves as a venue for students to develop their reading interests and independent learning skills with the aim of expanding their horizons of knowledge. Finally, it aids both students and teachers in promoting the attainment of educational objectives. The development of the nation's quality in the field of education and the interests of the educational community have both been significantly impacted by the establishment of libraries. (Krismayani, 2018) Storage, instruction, research, information, and cultural recreation are the five main roles that libraries play. The foundation for carrying out daily chores is this function. It shows up as performance by librarians acting in the capacity of library managers. It is imperative to create a library that endures in the age of globalization in order to carry out the basic functions of the institution. (Kusuma, 2021) In actuality, university libraries serve more purposes than only acting as the heart of the institution. It does not beat and performs its activities independently of those of other organs. (Rizqiyani et al., 2017) The execution of national education necessitates the development of library services based on information and communication technology, so it is important to establish these services, according to Law of the Republic of Indonesia Number 43 of 2007 concerning Libraries. (Yuventia, 2015) The nation's intelligence and empowerment are increased through the use of the library as a tool for education, research, preservation, information, and enjoyment. Fostering a culture of reading through the creation and use of libraries as a source of information in the form of written works, printed works, and/or recorded works is vital to boost the intellectual life of the country. However, in practice it has fallen short of expectations, one of which is that the public, particularly policymakers, do not understand library standards.

In order for users to evaluate library performance and whether they are aware of it or not, this will directly influence the assessment of all library performance, user service is an activity that directly connects users with library employees. According (Putriaurina et al., 2021) Library services are facilities or services that library administrators offer to their users or patrons (Putriaurina et al., 2021). The Indonesian National Standardization Agency has established criteria for each institution's library services, which vary. In this instance, the school library offers a number of national standard library services, including reading services, circulation services, reference services, and services for information and communication technology. However, in

practice, many school library institutions have not fully implemented school library services based on national criteria.

(Dismukes, 2017) There are three key facets of library services: varieties of libraries, professionalism in library services, and gauging how well they are evaluated. Service is significantly influenced by the function of librarians. The sorts of library services and ways to assess the quality of library services are both understood by librarians who oversee libraries. (Zuhrah, 2021) Library services are significantly influenced by librarian professionalism. (Yuliana & Mardiyana, 2021) In order to ensure that library services are of a high standard, librarians must be able to prove that there are school libraries and perform their duties in a precise and consistent manner. The performance of library staff is changed to meet student expectations, which includes being on time, providing the same level of service to all students, and having librarians who are competent and eager to assist students and offer quick, accurate service as well as properly communicate information. The development of a registration form for library membership that serves as a membership service is one of the enabling factors in circulation services. A membership card is typically just a regular card that is just used to let someone know that they are already a member of the library. Then a new membership card appeared, this time with the member's information encoded in a barcode. The purpose of the library is to offer its patrons great service, as stated in Law Number 43 of 2007. Using Radio Frequency Identification (RFID) technology is one way that information and communication technology can be used to develop library services.

According (Inawati, 2019) The findings of the study demonstrate that the adoption of an automated system has a significant impact on user satisfaction. The R Squere value of 0.469 with a significance level of 0.000 indicates that the library automation system has a 46.9% influence on user satisfaction. (Safii et al., 2020) Although it goes without saying that libraries need to stay current with technology and be able to offer services based on it, not all school libraries operate in accordance with those criteria, let alone employ library automation. (Asari et al., 2020) When introducing automation systems, school libraries have issues with human resources and the information and communication technology infrastructure. Although there are many challenges, implementing a library automation system can help libraries manage their collections more effectively and efficiently while also doing it more rapidly, more cheaply, and with less energy use. (Azwar, 2013) Every organization is encouraged to use technology in the contemporary information era to provide a variety of conveniences. One of the applications of this technology is the development of automation systems by libraries as a professional institution. In order to support librarians' performance in the various services offered in libraries, a relatively new technology called RFID (Radio Frequency Identification) has emerged. This technology, called library automation, uses radio waves to identify objects.

(Yoanda, 2017) Users can perform self-service, or independent service, using RFID technology. The benefit of providing this independent service is that it can expedite the loan and return circulation procedure, making efficient use of the time

needed. The user must be taken into consideration when deploying RFID so that they may make full use of it. Since the development of RFID (Radio Frequency Identification), identification technology like barcodes has advanced significantly. Radio wave-based identifying technology called RFID (Radio Frequency identifying) is adaptable, simple to use, and excellent for automating processes. This technology's existence has changed library operations, including the handling of books and circulation services, as well as offering collection security. (Primadhasa et al., 2017) RFID is a radio-based identification method that allows data to be collected without physical contact between the RFID reader and the RFID tag. The RFID tag, which stores each unique code as an identification, and the reader, which is used to read the unique code in the RFID tag, are its two primary parts. RFID is utilized to identify membership cards, admin cards, and each book's identity. There is an urgent need for the use of technology in attempts to improve the quality of services in libraries, according to an analysis of numerous findings in studies published in recognized national journals. (Azizah et al., 2020) Self-service RFID technology in circulation services is a service that is performed independently without the assistance of circulation officers. The most recent innovation in the field of libraries is radio frequency identification (RFID) technology, which has taken the place of barcodes in order to identify library materials. RFID technology is useful for storing data information on each library item, making it possible to identify at a distance and multiple items at once. (Insan et al., 2019) state, the usage of RFID has changed a variety of library operations, including book processing, inventory, circulation, membership, and material security. RFID technology can be used for all of these tasks, assisting library employees in managing the collection. According to (Saputra et al., 2010) Creating an RFID-based library can make it easier for library management employees to do their jobs. If the source is still in static paper form or depends on a person's memory as the storage medium, data processing and information distribution in conventional libraries frequently run into impediments or challenges, leading to numerous issues like data loss. Initial findings have been made on the Palembang Aviation Polytechnic Library service system, which is still in the process of switching to single card services employing RFID technology, which is thought to be highly efficient in resolving sign-on queueing issues. The library membership system has started to transition to the usage of cadet ID cards, which both serve as e-money and library membership cards, from the former method of manually entering the cadet ID number into a membership card. It makes it possible for library services to run more quickly and without lines by integrating RFID technology devices. This is what drove the author to conduct research into the efficacy and user satisfaction of RFID technology devices in library membership services so that it could later serve as a guide for maximizing other services in the library by utilizing the benefits of RFID technology devices.

B. Methods

This study used a quantitative research method with a descriptive research design. This study seeks to provide an overview of the effectiveness and cadets' satisfaction with deploying RFID technology devices in library services to enhance educational services. The study's data analysis method was univariate analysis. All members of the Palembang Aviation Polytechnic Library participated in a univariate analysis to get a sense of how effective and satisfied they were with their work. Members of the Palembang Aviation Polytechnic Library who were enrolled in the Diploma IV Airport Engineering Technology Study Program (TRBU), the Cadets/I Diploma III Fire Fighting Rescue and Prevention Study Program (PPKP), and the Cadets/I Diploma III Management Study Program made up the population of this study. In the airport (MBU), 327 individuals were present.

(Abdhul, 2022) Research drawing or sampling methods are extremely important since they affect the study's findings. Each researcher fully comprehends the methods used to create and choose samples. 214 people made up the research's sample. All Palembang Aviation Polytechnic Library users who completed the informed consent form and the entire examination questionnaire met the study's inclusion criteria. For the purposes of this study, incomplete or missing data is an exclusion criterion. The research sample completed 15-question exam questionnaires using a Google Form, and the questions were then categorized using a Likert scale as part of the data gathering technique. Utilizing participant observation, data will be gathered through exam questionnaires that the study sample filled out using a Google Form. Before being given to all research participants, the research instrument was evaluated. (Amanda et al., 2019) To ascertain whether the instrument or question in the questionnaire actually measures what it is supposed to measure, validity testing is done. Testing for reliability is an index that determines how much a questionnaire can be depended upon or trusted. Through a number of testing phases, such as the (1) Validity Test, used to assess how well the instrument measures the intended idea. The approach used to test construct validity is the correlation between the results of each question and the overall result. (2) Reliability Test. Reliability testing, according to (Narimawati, Anggadini, 2010), primarily seeks to gauge how trustworthy or reliable a measurement is. If a measurement yields predictable findings, it can be said to have a high level of reliability. Although dependability plays a significant part in determining validity, it is not the only factor necessary to establish validity. A research variable that has a value > 0.60 is considered to be dependable.

Validity Test

The findings of this study's instrument validity test are displayed in the table below.

Table 1. Results of Validity Tests

Variable	Indicator	*Pearson Correlation*	Information
(X)	X_1	0,803	Valid
	X_2	0,795	Valid
	X_3	0,855	Valid
	X_4	0,787	Valid
	X_5	0,787	Valid
	X_6	0,855	Valid
	X_7	0,886	Valid
	X_8	0,885	Valid
	X_9	0,811	Valid
	X_{10}	0,835	Valid
	X_{11}	0,850	Valid
	X_{12}	0,863	Valid
	X_{13}	0,792	Valid
	X_{14}	0,866	Valid

Source: SPSS version 24 data processing (attachment D)

The validity of 100 samples has been examined by researchers based on the findings of instrument testing, which involved distributing questionnaires to 100 respondents. Because the calculated r values obtained are more than the r table values > 0.202, all variable indicators in this study are declared valid, as shown in the table above.

Reliability Test

The One Shot approach or one measurement can be used to test reliability. This approach uses a single measurement, followed by comparisons with other questions or measurements of the correlation between responses to questions. Cronbach's Alpha is one of the tools used to assess reliability. A variable is deemed to have strong dependability if its value is greater than 0.60, while it is deemed to have low reliability if its value is less than 0.60.

Table 2. Reliability Test Results

No.	Variable	Cronbach's Alpha	Informant
1	RFID	0,970	Reliable

Because each instrument's Cronbach's Alpha value is greater than 0.60, it can be inferred from Table 2 above that all of the instruments stated above have a high level of dependability. This conclusion demonstrates the validity and applicability of all research tools for conducting research and testing research hypotheses.

C. Results and Discussion

The purpose of this study is to determine how successfully and satisfactorily cadets can use RFID technology devices in library services to enhance educational services. Based on the findings of a research survey on library services for visitors at the Palembang Aviation Polytechnic Library, it was discovered that library membership was still distinct from the cadet card, that sign-on required a librarian's assistance and that there was a backlog because the process was still manual. 89.3% strongly agreed and 10.5% strongly agreed that library membership cards were still separate from other cadet cards, 76.3% strongly agreed and 23.5% strongly agreed that the sign-on process is impractical and still needs a librarian's assistance because it is still done manually by entering the cadet's identification number, 80.1% strongly agreed and 19% strongly disagreed. The findings of a survey on library services conducted prior to the use of RFID technology are shown in Figure 1 below:
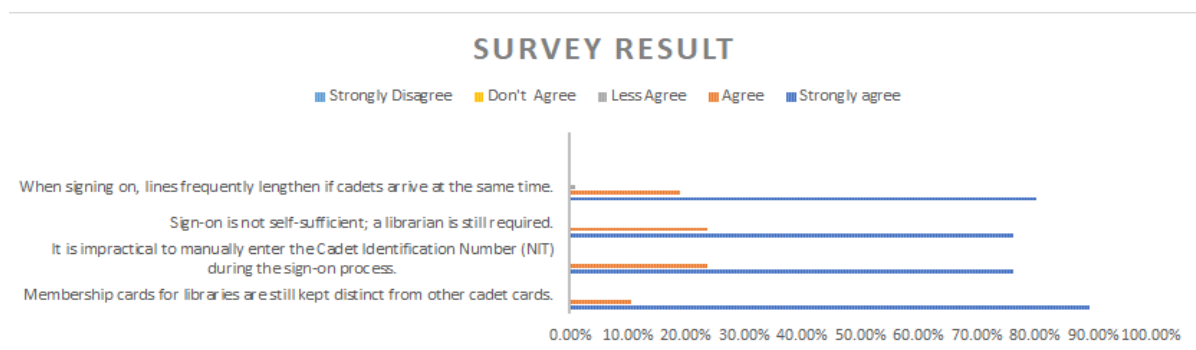
Figure 1. Library Service Survey Results Before Using RFID Technology

In this study, user satisfaction will also be assessed in relation to the enhancement of educational services provided by libraries using RFID technology. Of those surveyed, 55.1% strongly agree, 42.1% strongly agree, 49.3% strongly agree, 46.5% strongly agree, and they find it simple to serve library visitors using RFID technology. Additionally, 49.3% strongly agree and 46.5% strongly agree that RFID technology is simple to operate. The adoption of RFID technology is in conformity with Poltekbang Library circulation service criteria, according to 43.5% highly

agreeing and 53.7% agreeing. In Palembang, 49.5% strongly agree and 49.5% agree that the integration of library membership cards with cadet ID cards is effective and efficient, 46.7% strongly agree and 50.9% agree that the Palembang Poltekbang Library's circulation services are improved by the use of RFID technology, 46.7% strongly agree and 50.9% agree that the library's librarian staff is limited, RFID raises the bar for circulation service standards, and 45.3% strongly agree and 54.2% agree that the use It can be seen in Figure 2 below in schematic form:
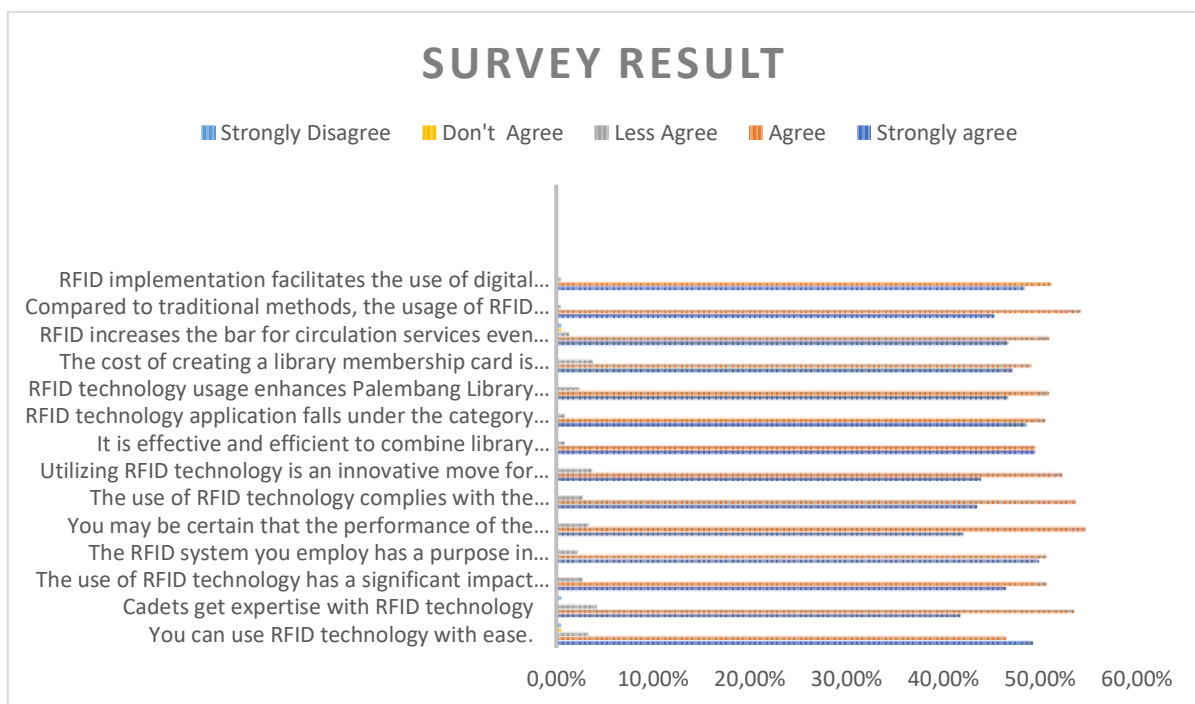
Figure 2. Results of a Survey on the Use of RFID Technology in Library Services

The Palembang Aviation Polytechnic library circulation services were found to be more effective as a result of (1) the use of a membership card being replaced by a single card and (2) a switch from the traditional sign-on system of entering the cadet identification number into the computer to access via RFID technology devices. 96% quantifiable efficacy value. 97.2% of users who expressed satisfaction with sign-on circulation services employing RFID technology devices expressed satisfaction with library services as a whole.

D. Conclusion

One of the key components in offering users educational literacy resources to support the caliber of graduates is library services. Circulation services are one of the library's primary offerings. Because this service appears to be the front line of library services, circulation services frequently reflect the caliber of library services as a

whole. 1) The sign-on circulation service at the Palembang Aviation Polytechnic Library has seen a considerable 96% boost in effectiveness. A single membership card was implemented, along with integration of cadet identification cards with library membership cards to increase effectiveness and efficiency and lower production costs; 2) A high percentage of users (97.2%) expressed satisfaction with the use of RFID technology devices to improve library services, including the following: (1) RFID raises circulation service standards; (2) the use of RFID technology is more flexible than conventional modes; and (3) the use of RFID technology to support digital-based libraries.

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