1.0 INTRODUCTION

The Online Library Management System (OLMS) is a system that keeps track of the books in the library, their authors, the library members to whom books are provided, the library personnel, and everything else. Manual organisation is really challenging.. RFID (radio frequency identification) is a fast developing technology that enables for increased efficiency and convenience. Radio Frequency Identification (RFID) is a relatively recent technology of data collecting and auto identification creation that aids in the automation of business operations.RFID enables for the identification of a large number of tagged items such as books. This proposal offers an RFID-based Library Management System that will allow for quick transaction flow and will make it easy to handle the issue and return of books from the library without the need for human bookkeeping, with the added benefits of traceability and security. This system would be able to issue the return book date and all the details can be updated by just scanning the tags on the books and clients registered RFID card on the scanner.

2.0 4TH INDUSTRIAL REVOLUTION TECHNOLOGY USED

2.1 IOT AND RFID

The 4th IR Technology that we used for this project is Internet of Things(IoT). The Internet of Things (IoT) refers to physical objects (or groups of such objects) that are equipped with sensors, processing power, software, and other technologies and can communicate with other devices and systems over the Internet or other communication networks. In our project, we are using RFID Technology to implement it in a library system. This includes tracking systems that combine security with more effective

tracking of materials throughout the library, as well as charge and discharge, inventorying, and materials handling that is easier and faster.
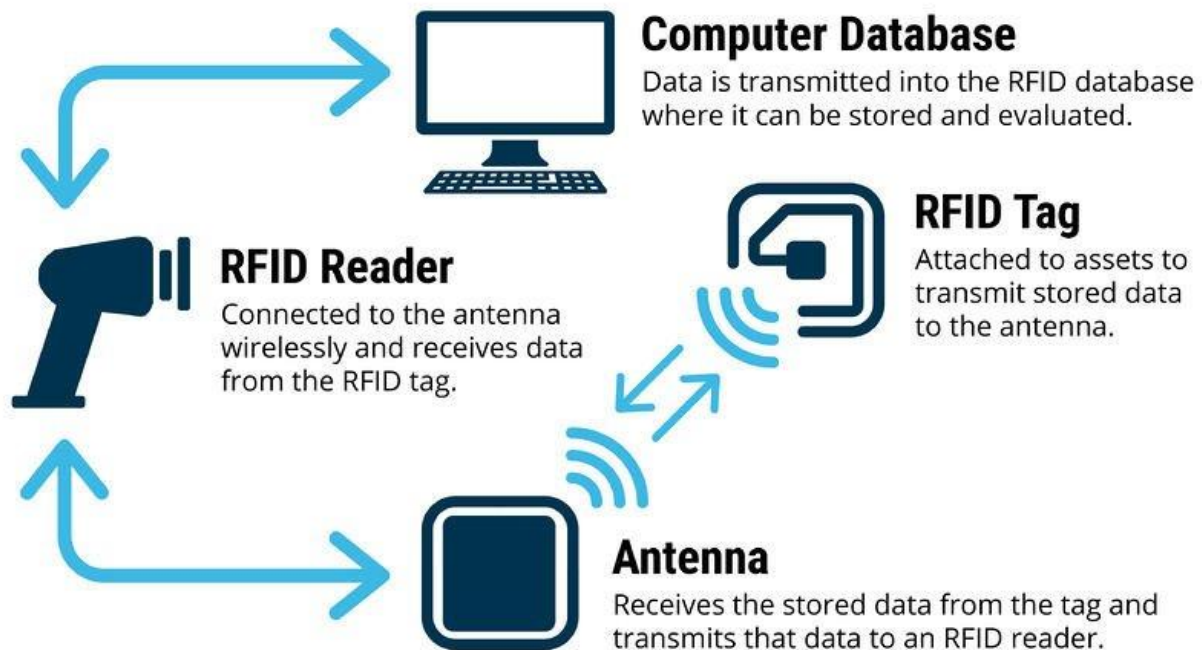
2.2 DEFINE RFID

RFID is an abbreviation for "radio-frequency identification," and it refers to a technology in which digital data contained in RFID tags or smart labels is acquired by a reader using radio waves. RFID tags and smart labels are small, flexible tags that may be attached to objects. An RFID tag or label is similar to barcoding in that the data from the tag or label is acquired by a device that then records the information in a database. RFID, on the other hand, provides a number of advantages over barcode asset tracking software systems in terms of efficiency. In particular, RFID tag data can be read even when the tag is not directly in front of the reader, whereas barcodes must be aligned with an optical scanner.

2.3 HOW RFID WORKS?

RFID is part of the Automatic Identification and Data Capture (AIDC) technology group. With little or no human intervention, AIDC methods automatically recognise items, collect data about them, and enter that data straight into computer systems. Radio waves are used in RFID methods to accomplish this. An RFID tag, an RFID reader, and an antenna are the three basic components of an RFID system. RFID tags are made up of an integrated circuit and an antenna that transfer data to an RFID reader (also called an interrogator). The radio waves are then converted to a more usable kind of data by the

Basic RFID System

Computer Database
Data is transmitted into the RFID database where it can be stored and evaluated.

RFID Tag
Attached to assets to transmit stored data to the antenna.

RFID Reader
Connected to the antenna wirelessly and receives data from the RFID tag.

Antenna
Receives the stored data from the tag and transmits that data to an RFID reader.

reader. The data acquired from the tags is subsequently sent to a host computer system via a communications interface, where it can be saved in a database and evaluated later.

2.4 HOW LIBRARIAN CAN USE RFID TO EASE THEIR WORKS

RFID library management, using RFID tags library, is easy and convenient. A RFID library management system consists of books, each attached with an RFID tag, RFID reader, computer network and software. Library staff handle lending, returning, sorting, tagging etc. of books, using RFID tags in this library system. A person can locate

RFID library books marked with a RFID tag, using the RFID reader which identifies and locates the book. When the book is carried to the counter, the library staff can either activate or deactivate the electronic article surveillance bit in the book's tag. If a book is borrowed, then the surveillance bit is deactivated.

By automating operations, RFID in libraries saves time for library employees. An establishment that uses RFID library management saves a book reader valuable time that would otherwise be spent waiting in line to borrow or return a book. Taking care of books and making them accessible to readers are crucial responsibilities. The majority of the time spent by library employees is spent recording information about incoming and exiting books.

Self-check in/out systems can completely automate the borrowing and returning of books. This system demands installation of special software. A person using this system to borrow books, is offered with selections on a computer screen. A code, preferably a personal identification number or any other type of unique identifying code, must be used to identify the person. The system's built-in RFID reader identifies the books chosen by the user. The system also deactivates the surveillance bit in the book's tag. The check-in/out mechanism triggers the surveillance bit when a book is returned.

2.5 ADVANTAGES AND DISADVANTAGES OF RFID IN LIBRARY SYSTEM

2.5.1 Advantages of RFID in Libraries

The use of RFID reduces the amount of time required to perform Circulation operations. The most significant time saving with bootable is the fact that information can be read from RFID tags much faster than form barcodes and that served items in the stack can be read at the same time.

- Self charging discharging

- Reliability

- Streamlined Inventory Management

- Faster Circulation

- Easy stock verification

- High level of security

2.5.2 Disadvantages of RFID in Libraries

- High Cost

- Frequency Block

- User Privacy concern

- Reader collision

- Tag collision

3.0 Potential Client

3.1 Interview

In the process of finding input and problem scenarios for our project, we decided to interview a librarian who was working at the University of Malaya Library. We began the interview by informing the librarian about the surface of our project and the goals we were trying to accomplish. The person that we interviewed was Faizal Rosli, 43 years old. We asked him about the system that was used in the UM Library.

These are some questions that were asked during the interview ;

Q : What is your name and age?

A : My name is Faizal Rosli and I am 43 years old.

Q : How long have you worked here?

A : Approximately 11 years.

Q : What kind of system does this library use?

A : We use a combination of bar code and RFID system for cataloging.

Q : Are there any obstacles you face when using this system?

A : At first, it was a bit of a hassle to integrate RFID technology into our system because we have to make sure each of the books are tagged. In addition, the old books that use bar codes also need to be changed to RFID tagging.
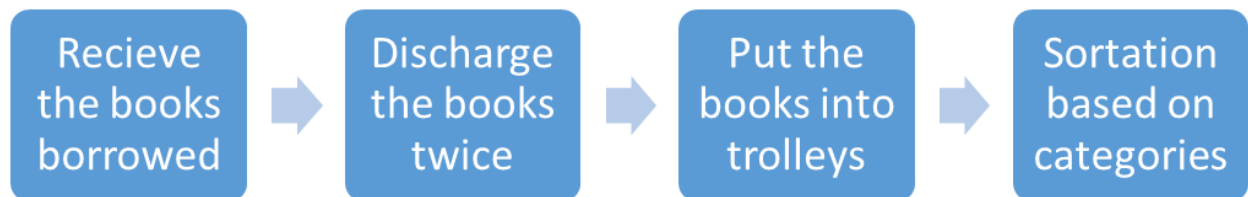
3.2 INFORMATION GATHERED

System used : A combination of barcode and RFID for cataloging.

Challenges :

1. Integrating RFID into barcode system.
2. Scanning a stack of books that use barcodes.

Work process :

1. The books are received from the borrower.
2. The books are discharged to deactivate the books from the borrower's account.
3. The books are put into trolleys that are categorized.
4. The books are sorted by the person in charge of each category.

Security feature : Gate sensors are put at the exit. This gate can detect books that are not in the system for borrowed books to prevent the books from being stolen.

4.0 CLOUD COMPUTING ARCHITECTURE

In our project,we propose the use of Amazon Web Services as our main cloud computing platform to be used in our RFID system.Cloud computing offer many advantage such as easier scalability and also low cost that will allow even small library with limited fund to implement cloud computing technologies in the RFID system.

By using this technologies,we are able to reduce the time needed to record the lending period of a book.The technologies we are planning to use that are offered in the AWS are:
-Amazon s3,Amazon Recognition,Amazon Cloudwatch,AWS Service Catalog,AWS Lambda,AWS Database Migration Services and Amazon Simple Storage service.Amazon Web Services will allow library to use RFID system effectively.
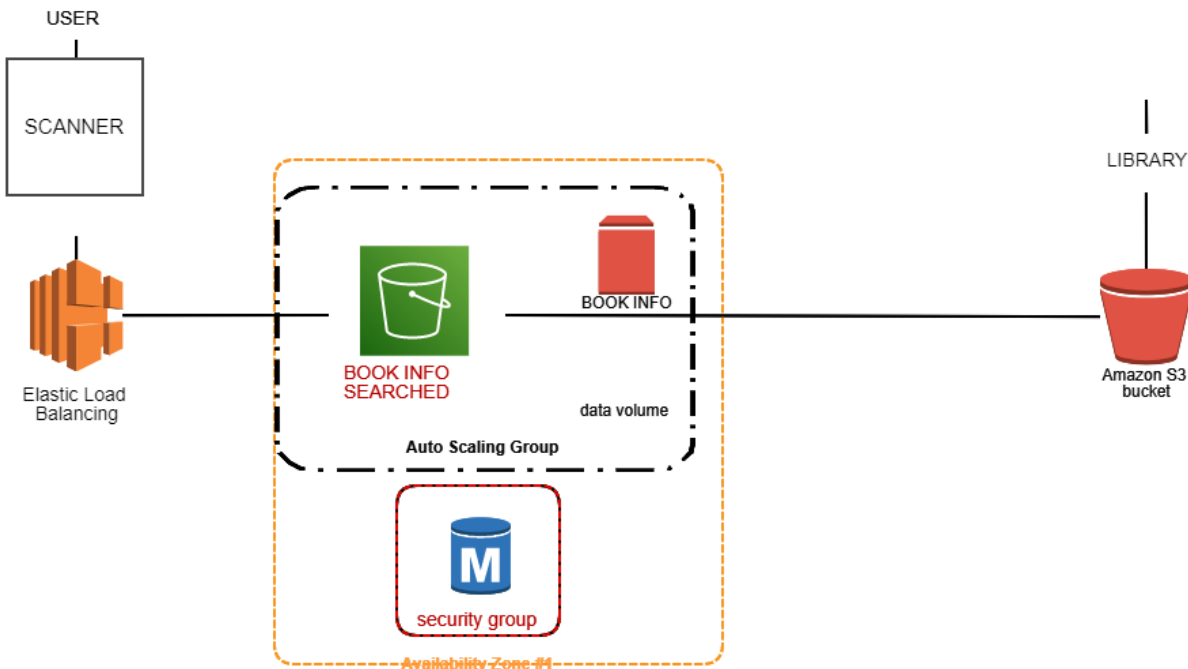
5.0 CONCLUSION

Reaching the end, rfid is the newest and latest technology in the library system. Rfid has a lot of benefits, it speeds up the process and saves the user time by automatizing the tasks compared to barcode, it can scan more than one tag, and it's better in tracking and sorting in order. As amazing as it sounds it has some limitation for example, a library that has around 40,000 items will cost around 70,000$, also since the rfid uses the radio waves sabotaging the entire system and causing the radio wave to be blocked is as easy as

Wrapping the tag with aluminum foil. Rfid is an amazing piece of technology and I see its potential in being used everywhere in the world.