

# IMPLEMENTATION OF RFID (RADIO FREQUENCY IDENTIFICATION) FOR STUDENT ATTENDANCE SYSTEM

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## ABSTRACT

IBI Darmajaya is one of private university that located on Bandar Lampung which still use manual attendance. that is use attendance book every time student come or leave the class. This final report has a purpose to build an attendance system prototype that use a RFID technology which is integrated with arduino to increase the discipline attitude program of student's honesty IBI Darmajaya.

The prototype of RFID attendance system consist of several main components such as tags and card that will be used in KTM (Kartu Tanda Mahasiswa) and reader that will be used to read the information related to the student attendance. The result of this final project is a prototype of RFID for student attendance which has a function to store student's attendance data, with a maximum range 5cm and a minimum read 0,7 second to do an optimal functionability.

**KEY WORDS** : Student Attendance System, RFID.

## I. INTRODUCTION

Recording for student attendance is an obligation for the university during the class. The information that has been gotten from the student attendance can determine the student follows the class or not and can be one of factors to determine the student scoring.

Darmajaya is one of private university in Lampung which still use manual student attendance. The recording of this attendance needs many employees and student's honesty

to fill the attendance during the class. In this case there is a manipulation to filling the attendance by the student.

RFID (Radio Frequency Identification) is one of modern technology that can help human to identifying in some cases. RFID consists of tag that has an information special code and a reader that has a function to read the code of the tag.

## II. LITERATURE REVIEW

### 2.1 RFID

Radio frequency identification (RFID) is a rapidly growing technology that has the potential to make great economic impacts on many industries. While RFID is a relatively old technology, more recent advancements in chip manufacturing technology are making RFID practical for new applications and settings, particularly consumer item level tagging. These advancements have the potential to revolutionize supply-chain management, inventory control, and logistics.

At its most basic, RFID systems consist of small transponders, or *tags*, attached to physical objects. RFID tags may soon become the most pervasive microchip in history. When wirelessly interrogated by RFID transceivers, or *readers*, tags respond with some identifying information that may be associated with arbitrary data records. Thus, RFID systems are one type of automatic identification system, similar to optical bar codes. There are many kinds of RFID systems used in different applications and settings. These systems have different power sources, operating frequencies, and functionalities. The properties and regulatory restrictions

of a particular RFID system will determine its manufacturing costs, physical specifications, and performance. Some of the most familiar RFID applications are item-level tagging with *electronic product codes*, proximity cards for physical access control, and contact-less payment systems. Many more applications will become economical in the coming years.

### 2.1.1 MFRC 522 RFID

The MFRC522 is a highly integrated reader/writer IC for contactless communication at 13.56 MHz. The MFRC522 reader supports ISO/IEC 14443 A/MIFARE mode.

The MFRC522's internal transmitter is able to drive a reader/writer antenna designed to communicate with ISO/IEC 14443 A/MIFARE cards and transponders without additional active circuitry. The receiver module provides a robust and efficient implementation for demodulating and decoding signals from ISO/IEC 14443 A/MIFARE compatible cards and transponders. The digital module manages the complete ISO/IEC 14443 A framing and error detection (parity and CRC) functionality. The MFRC522 supports MF1xxS20, MF1xxS70 and MF1xxS50 products. The MFRC522 supports contactless communication and uses MIFARE higher transfer speeds up to 848 kBd in both directions. The following host interfaces are provided:

1. Serial Peripheral Interface (SPI)
2. Serial UART (similar to RS232 with voltage levels dependant on pin voltage supply)
3. I2C-bus interface



Picture 2.1 MFRC 522

### 2.1.2 Features and Benefits

Highly integrated analog circuitry to demodulate and decode responses<sup>1</sup>. Buffered output drivers for connecting an antenna with the minimum number of external components

2. Supports ISO/IEC 14443 A/MIFARE
3. Typical operating distance in Read/Write mode up to 50 mm depending on the antenna size and tuning
4. Supports MF1xxS20, MF1xxS70 and MF1xxS50 encryption in Read/Write mode
5. Supports ISO/IEC 14443 A higher transfer speed communication up to 848 kBd
6. Supports MFIN/MFOUT
7. Additional internal power supply to the smart card IC connected via MFIN/MFOUT
8. Supported host interfaces
9. SPI up to 10 Mbit/s
10. I2C-bus interface up to 400 kBd in Fast mode, up to 3400 kBd in High-speed mode
11. RS232 Serial UART up to 1228.8 kBd, with voltage levels dependant on pin voltage supply
12. FIFO buffer handles 64 byte send and receive
13. Flexible interrupt modes
14. Hard reset with low power function
15. Power-down by software mode
16. Programmable timer
17. Internal oscillator for connection to 27.12 MHz quartz crystal
18. 2.5 V to 3.3 V power supply
19. CRC coprocessor
20. Programmable I/O pins
21. Internal

## 2.2 ARDUINO

Arduino is an open-source prototyping platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. All this is defined by a set of instructions programmed through the Arduino Software (IDE).

Over the years Arduino has been the brain of thousands of projects, from everyday objects to complex scientific instruments. A worldwide community of makers - students, hobbyists, artists, programmers, and professionals - has gathered around this open-source platform, their contributions have added up to an incredible amount of accessible knowledge that can be of great help to novices and experts alike.

Arduino was born at the Ivrea Interaction Design Institute as an easy tool for fast prototyping, aimed at students without a background in electronics and programming. As soon as it reached a wider community, the Arduino board started changing to adapt to new needs and challenges, differentiating its offer from simple 8-bit boards to products for IoT applications, wearable, 3D printing, and embedded environments. All Arduino boards are completely open-source, empowering users to build them independently and eventually adapt them to their particular needs. The software, too, is open-source, and it is growing through the contributions of users worldwide.

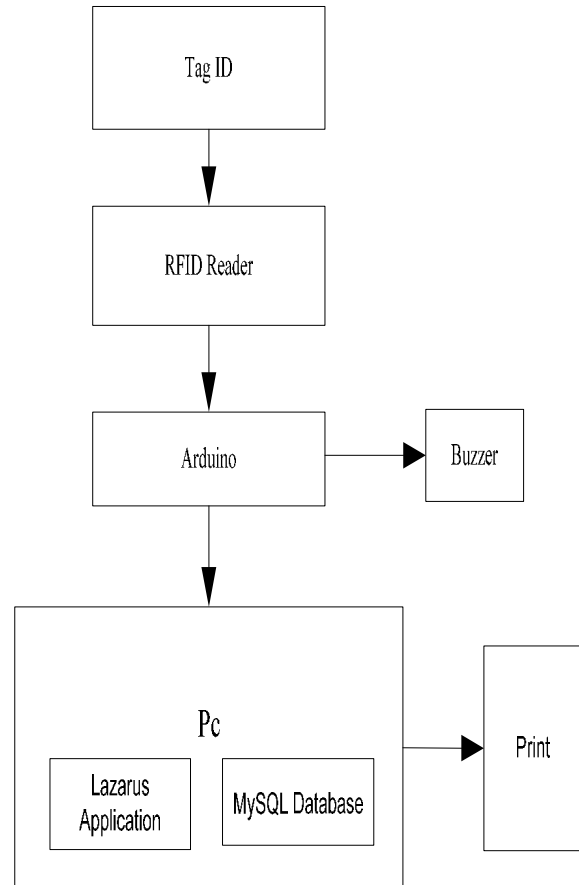
## III. RESEARCH METHODE

### 3.1 DESIGN SYSTEM

Design system of student attendance using RFID in the student card cover of design hardware and design

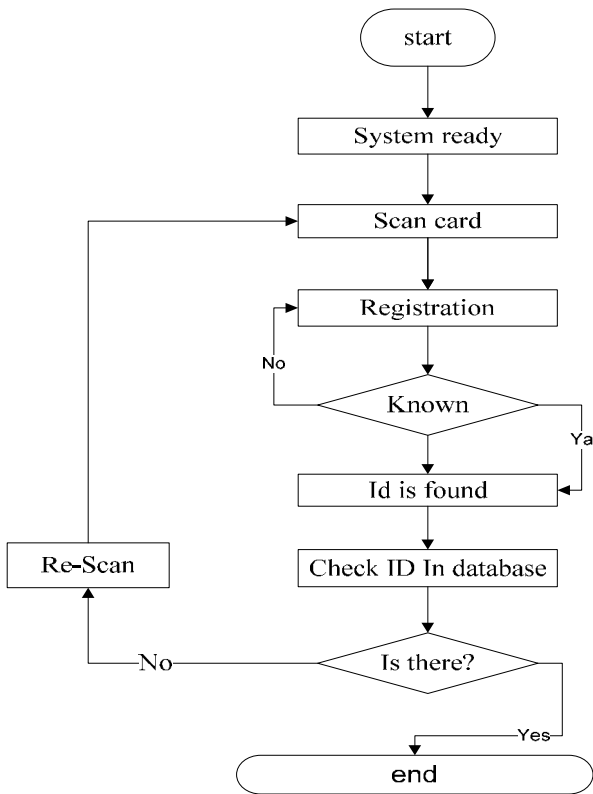
software. The system that will be designed will form a control system in the student attendance by using RFID.

In the below is Diagram block of attendance system by using RFID.



How the attendance system works by using RFID is RFID reader will get the input from ID Tag. The inputan data will be processed by arduino and will be run by lazarus to see if Tag ID already registered in the list of database then if the ID already registered, so the output will be showed by buzzer.

3.2 FLOWCHART



Program flowchart explanation

1. System ready : System is ready to running
2. Scan card : Card ID which is had by the student is a must to affixed in the RFID reader.
3. Registration : If ID which has not registered in the database. It is a must to registered first in the registration form.

4. Known : If ID is already known, so automatically ID will can be found easily by the system.
5. Check Database: If ID is already found, so the next step, the system will check the student's identity from the owner of ID KTM in database.
6. There is : If there is the student's identity in database, it means the system will be end. But if there is no, the students should do the re-scan.

IV. RESULT AND DISCUSSION

The purpose of making this tool is to do the measurement in the range of read the ID card to the RFID reader and fill the data of the student in the student attendace.

V. CONCLUSION

According to the designing, testing and analysis that has been done, so we can take the conclusion of this research. There are :

1. It has been designed the control system of student attendace by using MFRC 522 RFID.
2. After doing the trials in the RFID card to the RFID reader and the system is able to run the program well.
- 3.ID card can be read with the maximum range 5 cm and Tag ID can be read with the maximum range 1 cm.

REFERENCES

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NO	Date and Time	Range of read to the RFID Reader	ID Card and TAG RFID		
				Read (1)	Not Read (0)
1	14 : 49 12/06/2015	1 cm	ID Card 4298F4550	1	-
2	14 : 52 12/06/2015	1 cm	Tag B326A450	1	-
3	14 : 58 12/06/2015	2 cm	ID Card 4298F4550	1	-
4	15 : 02 12/06/2015	2 cm	Tag B326A450	-	0
5	15 : 04 12/06/2015	3 cm	ID Card 4298F4550	1	-
6	15 : 07 12/06/2015	3 cm	Tag B326A450	-	0
7	15 : 09 12/06/2015	4 cm	ID Card 4298F4550	1	0
8	15 : 10 12/06/2015	4 cm	Tag B326A450	-	0
9	15 : 12 12/06/2015	5 cm	ID Card 4298F4550	1	-
10	15 : 14 12/06/2015	5 cm	Tag B326A450	-	0
11	15 : 15 12/06/2015	6 cm	ID Card 4298F4550	-	0