Smart Attendance System

## Introduction

Ever since mass attention was drawn to the IoT in the early 2010s, it has fast been obtaining traction and with RFID as a technology, it does not seem that it will slow down any sooner. The use of RFID has become vast, with many industries incorporating their use in daily operations, from supermarkets in monitoring of stock to government buildings’ authentication of staff and visitors.

Before the invention of the RFID, employees of most of the companies had to use punch cards or record their time of arrival in books. Nowadays, with the use of RFID, one scan is enough and a computer takes over filling in the details. This process has helped save clocking-in time and thus increase valuable production time. This technology has also been employed in various education institutions with mass student populations such as universities and colleges.

## Objectives

To build a RFID smart attendance system with a database

## Literature Review

Radio Frequency Identification, commonly referred to in short terms as RFID, is the wireless non-contact use of radio frequency to transfer data. They are mainly classified in terms of their frequency range for transmission, from low to high to ultra-high on the electromagnetic spectrum. Its use comes close to that of a bar code reader except for the fact that the tag data can be read outside the line of sight.

An RFID system, for example the RFID based attendance system, has three components- the tag, reader and the antenna. The tag consists of two parts, the antenna that transmits and receives signals, and a chip which stores the tag ID and other relevant information. The readers are devices that transmit and receive data so as to communicate with RFID tags. Antennas convert RFID reader’s signal into RF waves that can be picked up by the tags. An active RFID tag has its own power source while a passive one receives power from a reading antenna.

## Bill of Materials

RFID-RC522

NodeMCU

Cables

RFID tags

XAMPP software was to act as the database for the attendance system

## Methodology

<https://drive.google.com/file/d/19COsvAA6qtZQc8IashxnoNUaesrDhCWT/view?usp=sharing>

## Flowchart

REGISTER CARD TO APPLICATION DATABASE

READER DECRYPTS UID AND SENDS TO ATTENDANCE APPLICATION IN PHP

ATTENDANCE SYSTEMS CHECKS AND COMPARES UID WITH ITS DATABASE

DOES UID MATCH WITH DATABASE?

ATTENDANCE IS SAVED

APPLICATION DATABASE

RFID TAG SENDS DATA TO RFID READER

STORED UID’S IN DATABASE

NO

Y

## Conclusion

### Challenges

Even with widespread applications, the use of RFIDs has still encountered challenges. These include lack of privacy, as the tag data can be read by anyone, and the inability to accommodate encryption due to their low power computability.

### Future

The RFID is expected to grow with the increase of projects in the IoT. This system could be merged with another, say for example, staff evaluation, whereby the progress of the staff throughout a time period, a month maybe, is recorded side by side with his or her information and easily accessible by one tag. The world of RFID still has more to be explored and their findings may lead to a better and efficient production process.