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RFID AND GSM BASED DOOR LOCK SYSTEM USING ARDUINO

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Abstract - RFID, frequency Identification may be a cheap technology, are often implemented for several applications like security, asset tracking, people tracking, inventory   detection, access control applications. the most objective of this project is to style and implement a digital security system that will deploy during a secured zone where only an authentic person is often entered. We made a security system that performs a locking mechanism with a passive kind of RFID which will activate, authenticate, and validate the user and unlock the designed system in real-time for secure access. The tags functionality without power is an added advantage for the system with lighter weight and inexpensive than the active tags. A centralized system manages the controlling, transaction, and operation tasks. The door locking system functions in real-time because the door opens quickly when the user puts their tag in touch with the reader. The system also contains an interface to the phone of the user from which he can access or control the locking and   unlocking   function   by   simply messaging.
Keywords: RFID, Security System, Secure Access, Messaging

CHAPTER I
INTRODUCTION

Most of the reputed organizations or Schools/Colleges/Universities bother about the security of the person entering into the area. Most   educational   institutions administrators are concerned about student security. The traditional method allowing access to students/a Person inside an Area/University/Educational campus is by showing a photograph i-card to a guard is extremely time-consuming and insecure, hence   inefficient.   Radio   Frequency Identification (RFID) based security system is one among the solutions to handle this problem. this technique is often wont to allow access for college kids in class, college, and university. It can also be used to record the presence of workers/Attednece in   working

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places/Campus. Its ability to uniquely identify everyone who supported their RFID tag quite ID card makes the tactic of allowing security access easier, faster, and secure as compared to the traditional method. Students or workers only need to place their ID cards on the reader which they're getting to be allowed to enter the campus. And if any fault detected with the authentication tag then the defined alarm will be turned on. By utilization the unique feature of frequency Identification (RFID) technic we can increase the scope of security. The advancement in this technology motivated future research which made to initialize this technic of RFID into various applications ranging from inventory control/monitoring to human/animal tracking. However, the sensible significance of this technology wasn't fully realized, until mass manufacturing of RFID tags and readers, at different scales and for various ranges, was made possible. So, Most recently, RFID

technic based systems are lighting up for the

alternatives to previously established technologies (e.g. Wi-Fi for indoor identification and tracking) and as

extensions to others (e.g. GPS localized

tracking in indoor settings).

CHAPTER II
EXISTING AND PROPOSED SYSTEM

2.1 Existing System

We have seen the protective personnel checking the employees'

identification cards at the entrances to avoid illegal entry. the workers sign a register at the doorway before stepping into. this is often still being practiced in most of the businesses. However, the disadvantages are that, when there is a necessity of providing control at many locations inside the

company, a private at each point won't be an inexpensive way of implementing it. Then came were the punch cards. Employees

possess cards, which are punched once they enter the building. But it had disadvantages. Workers began to practice buddy punching, for his or her co-workers. Concerns about buddy punching-the practice where employees fraudulently clock their

co-workers in or bent give them credit for

the time that wasn't actually worked Continental Airlines to implement a

fingerprint ID system to strengthen their automated employee time and attendance sound system. the corporate expanded the system from Control Module after it saved an estimated $100,000 within the primary year. This led to the Universal Product Code readers.

2.2 Proposed System

RFID, frequency Identification may

be a cheap technology, are often

implemented for several applications like security, asset tracking, people tracking,

inventory detection, access control

applications. the most objective of this project is to style and implement a digital security system that will deploy during a

secured zone where only an authentic person is often entered. We designed a frequency utilized security system containing a door locking and unlocking devices by employing a passive kind of RFID based Tags with a

unique frequency ranges which can activate, authenticate, and validate the user and unlock the door in real time for secure access. The tags functionality without power is an added advantage for the system with lighter weight and inexpensive than the

active tags. A centralized system manages the controlling, transaction, and operation tasks. The door locking system functions in real-time because the door opens quickly when the user puts their tag in touch with the reader. The system also contains an interface to the phone of the user from which he can access or control the locking and unlocking function by simply messaging.
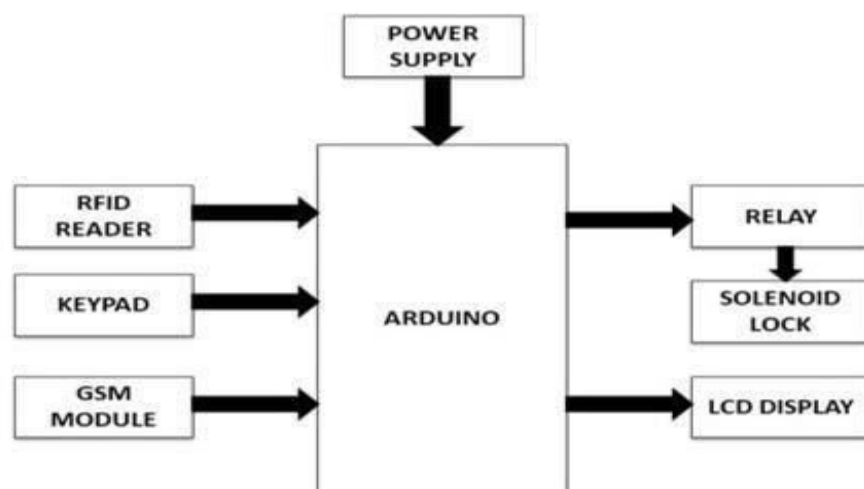
2.2.1 Arduino Mega

An open-source AtMega 2560 with an Arduino Platform based IDE which acts as a Micro Controller to Control and processes the instructions given. It has a digital input/output pins with a count of 54. Among which 14 are often used for PWM outputs, 16 for analogue inputs and 4 for UARTs (hardware serial ports), Where this Once the programming is done using IDE Environment we can access the device by connecting to an AC-to-DC adapter or Power storage bank to urge started. The Mega

device is named Arduino mega Which contains 16 MHz Crystal oscillator. To power this device we have a USB connection port and an influence jack with an ICSP header and a push switch to reset. This device operates automatically where we can connect it to our Personal Computer and can reprogram it to control the flow of instructions to perform a defined Tasks;

device is more compatible withwell-used shields that are designed for the Arduino Duemilanove or Diecimila. This device facilitates many ways of

Fig 2: EM-18 RFID module

communicating with a computer and another EM-18 is employed like all other Arduino, or Microcontrollers. It also sensor modules. First, we select the mode of provides four different hardware UARTs for communication between the MODULE and TTL (5V) serial communication.The CONTROLLER. Next, we'll program the Arduino IDE platform is user friendly which controller to receive data from the module to also includes serial monitoring system display. Next power the system. When a tag which visualizes simple textual data from is brought near the MODULE it reads the ID the board, and also to transfer data to the and sends the knowledge to the controller. board. The transmission and receiving of The controller receives the knowledge and data's status was been indicated by the performs action programmed by us. onboard Tx and Rx LEDs

2.2.3 GSM module

2.2.2 EM18 RFID Reader module

GSM (or Global System for Mobile EM18 RFID Reader may be a Communications) was developed in 1990. module that reads the ID information stored the primary GSM

operator has subscribers in in RFID TAGS. This ID information is 1991, the start of 1994 the network exclusive for every TAG which cannot be supported the quality, already had 1.3 copied. This module directly connects to any million subscribers, and therefore the end of microcontroller UART or through an RS232 1995 their number had increased to 10 converter to PC. It gives UART/Wiegand26 million. there have been first-generation output. Where this Frequency Identification mobile phones within the '70s, there are 2nd module works with any 125 kHz RFID tags. generation mobile phones within the '80s which also need future authentication to get and '90s, and now there are 3rd gen phones accessed in the RFID configuring setup. which are close to entering the Indian market. GSM is named a 2nd generation, or 2G technology. during this project it acts as an SMS Receiver and SMS sender. With the help of different GSM technical specifications which defines the various entities that can form the GSM network by defining their functions and interface requirements.

Fig 3: GSM module

2.2.4 LCD

LCD (Liquid Crystal Display) may be a sort of flat panel display that uses liquid

crystals in its primary sort of operation. LEDs have an outsized and ranging set of use cases for consumers and businesses, as they're going to be commonly found in smartphones, televisions, computer

monitors, and instrument panels. LCDs were a leap in terms of the high-end technology where they replaced with a LED (LED) and gas-plasma displays. LCDs

allowed displays to be much thinner than the

beam tube (CRT) technology. When

compared with LEDs, LCDs consume much less power than LEDs because they work on the principle of blocking light rather than emitting it.

CHAPTER III
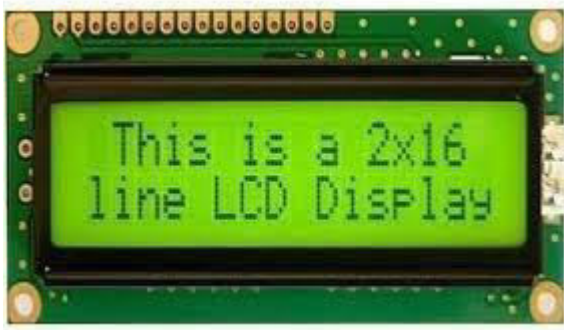## RESULTS

Fig 4: LCD module

CHAPTER IV
CONCLUSION

RFID based security and access system is safer and fast responded as compared to the other system like biometric. The main advantage of the Frequency tag-based authentication system is it can perform without any contact and also works without-line-of-sight of the tags. By using Arduino,

it's easy to access and works very quickly while burning the code it's sort of a Plug and Play device. The End developer can change the function of the system accordingly by using a different types of Processors/Controller. It's easier to use and accurate also. Hence this paper is often useful for the implementation of access control applications for tracking systems also as providing security benefits. This paper can improve by raising the range of readers during which the tag read. the target of the project is to realize a reliable low cost electronic secured locking system by considering my different parameters to form safe user things.

FUTURE SCOPE

The Radio Frequency based Identification system's business is going to

become an energizing period in which expanded selection will give the way to innovation suppliers to put resources into

new, energizing developments in a

well-secured manner. Alongside the new improvements depicted above, headways in

materials, natural polymers, Nano

innovation, and different territories will change the way RFID is fused into items. It relies on how unique one could be to

improve the utilization of this venture. Yet, for us this task is reasonable for future uses, for example, Smart truck can be interfaced with remote innovations to make it totally versatile sooner rather than later. Installment of bills utilizing portable can be actualized.

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