

IOT Based Instrument Security And Maintenance Management System

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Abstract- Workers safety is an important factor for all the companies. The workers safety is not only based on the workers but also it majorly depends on the equipment and tools used by them. Most of the time the accident caused by the quality by the equipment or tool. In this project we designed a IoT solution based on RFID tag (1) system. As we know Internet of things (IoT) in automation industry is show to be a game changer for automation companies. Industrial automation companies that use IoT solution can reap new benefits. The internet of things (IoT) helps to make new technologies to resolve problems, amplifies operations, and expands productivity.

Keywords- IoT,LCD,AudioAmplifier,RFID-RC522.

I. INTRODUCTION

Presently, the go on with growing of Internet of things (IoT) has construct amazing advance in information technology. The technique has become an important engine of economic growth around the world. The design IoT proceed back on the 1998, when it was given a initial description by a British tester and author of Massachusetts Institute of Technology (MIT). He sing out the IoT the set of “all objects that are attach with Internet through sensor, such Radio Frequency Identification (FRTD), to arrive at bright singling out and direction”. In this sense, the Internet of Things can be considered “a family of technologies whose aim is to make any type of object or device connected tothe Internet, able to enjoy all the features that the objects to use the networks”. Those equipment and instruments need high standard and requirement in precious and accuracy of tests. Managing maintenance work effectively is extremely difficult in construction lab owing to various equipment and instruments with different statement. In addition, it will grasp big amount to maintain those instruments in the good order for the check correctness. With theadvent of the Internet, web-based details management suspensions enable information split and information sharing among related conservation staff arm. Generally, maintenance managers and staffs require access to the equipment and instruments location to handle inspection

and maintenance work in construction lab. Usually, maintenance staff generally use sheets of paper to handle various types of maintenance information, including checklist, specification, and maintenance procedure. As a result, there is important rework progress as regards the data catch and arrival in maintenance progress. In order to enhance the effectiveness of survey and maintenance work in construction lab, this study presents a novel system called mobile RFID based maintenance management (M-RFIDMM) system for the acquisition and tracing of lab equipment and instruments maintenance information on locations and providing an equipment and instruments maintains information sharing platform among all participants using web technology and RFID- enabled PADs. Integrating promising information technologies such as RFID- enabled PADs, Radio Frequency Identification (RFID) scanning and data entry mechanisms, can help improve the effectiveness and convenience of information flow in the maintenance management. The primary objectives of this project includes applying such a system that integrates RFID technology with RFID enabled PADs to increase the efficiency of equipment and instruments inspection and maintenance data and collection, and designing a web-based portal for equipment and instruments management and, control, providing real-time information and wireless communication between offices and instruments locations. The M-RFIDMM is then put in an application in a building lab in Taiwan to show to be true our present approach and give an demonstrate of the successfulness of maintenance progress in construction lab. The combined results, demonstrate that, an M-RFIDMM system can be a useful web-based lab maintenance management platform by apply the RFID approach and web technology. In appropriate modifications, the M-RFIDMM system can be utilized at any instruments inspection and maintenance service for maintenance management divisions or suppliers in support of the M-RFIDMM system

II. LITERATURE SURVEY

Matija Bumbak (2005): Bearing in mind huge vast plate on which RFID will be utilize and considering the factuality that

it will be attending allover in our living it is completely necessary for it to be a secure system. Even so RFID is quiet networking on huge scale, some exploratory retail store, literary work write down regarding it is kindly large. They are three main matter background RFID and the need to keep safe exclusive details. Protecting data stored on the tag; manufacture the integrity of the tag (and thus the product); securing data related to the serial number on a tag, which maybe stored in a network database.

Charlie Fine et. al (2006): RFID machinery has result in much publicity in the rear not many years. The vital engineer for its growth has been the mark of physical object – human being, spot, and article– with single chip radios so they can confluence with computers. RFID technology is the pair shower as the clue to the – Internet of Things, and condemned to tell as forward observation technology, and in extra greatest group it is be fearful of as the mark of the beast. An RFID system can be burst downwards into two pointer measurements. The practical architecture comprise the actual data catch technology consists of tags, readers, and transference medium. The logical configuration mention to the general Identification (ID) strategy used in appear for article.

Ahuja Sanjay and Potti Pavan (2010): RFID is still in a expand phase and more is in the pipeline in terms of new application. Among applications already developed, FRID tags (1) are being used in clothing for billing and security purposes. RFID tags (1) are impact inside beast for trace motive. RFID tags (1) embedded in uniform can be used to known the number of hours an employee spends to complete a particular task. There are a number of union that are protesting hostile to the operate of a RFID to track people be afraid of the crash on people’s communal living and privateness.

1. RFID TAG

Dahiya Ritu and Dahiya Ravindra (2012): RFID (Radio Frequency Identification) is recently becoming popular due to its comfort and economical efficiency. More ever, RFID these days move near into the light as a automation to replacement the barcode. On the other hand, RFID is threaten from many charge and difficulty as an block of general RFID distribution: respond, take off, traceability, attending, unscalability, and tag copying. Two authentication protocol with proxy, including the properties of the proxy, and how it helps in authentication is proposed.



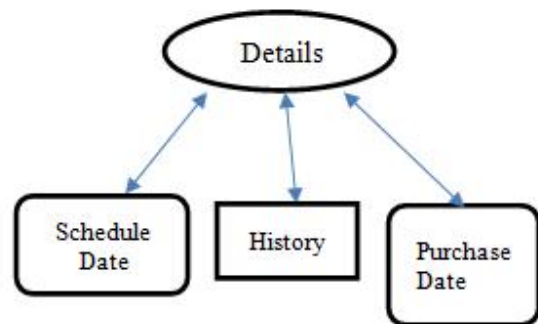
Existing System

In this existing system all the machine details are maintained in a maintenance ledger which has the details (2) about the machine purchase date, scheduled maintenance, service history, etc. but there is no such record for the equipment or tool.

Limitations

1. The service engineer needs to read the maintenance ledger before going to attend a machine. To access the ledger he needs to get the support from the shop floor in-charge.
2. Equipment or tools are not having any usage records.
3. There is a possibilities for the manual mistakes in those records by the shop floor in-charge.
4. Keeping a manual record for a long period of times is difficult.

2. DATA’S OF MACHINE



Proposed System

In the proposed system each equipment, tool, machine is going to have an RFID tag(1) which has all the details including date of purchase, usage history, service history, expected date of replacement, etc.

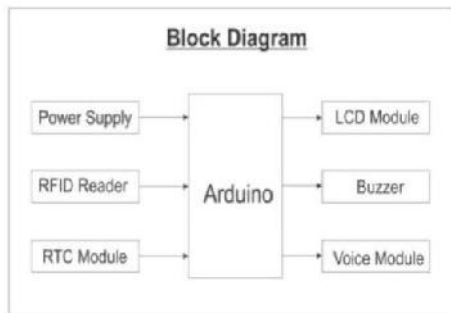
The service engineer can access the details in a small LCD screen attached to their work jacket. It will help them to avoid the accidents based on the equipment or tool wear and tear.

Advantages

- The data is up to date automatically.
- There will not be any manual mistakes.
- The authorized service engineer can access the data at any time i.e. without the support from the shop floor in-charge.
- This proposed system can not only for machines but also the equipment and tools.
- The proposed system has a voice module to share the data to the service engineer.

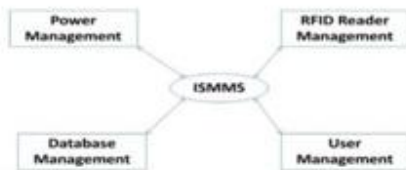
3. BLOCK DIAGRAM OF PROPOSED SYSTEM

Block Diagram



4. DATA FLOW DIAGRAM OF PROPOSED SYSTEM

Data Flow Diagram – Level 0



System Implementation

- Computer
- NodeMCU
- RFIDRC522
- RTC
- LCD16X2
- Speaker
- Power Adaptor

Software Requirements

- Windows (to work with computer)
- ArduinoIDE (to program the Node MCU)

IoT: The Internet of Things (IoT) report bodily devices (or groups of such objects) with sensors, clarifying capability, software, and extra machinery that attach and interchange data with more piece of equipment and systems over the Internet or other communications networks. History, application, trends and characteristics, enabling technologies for IoT Internet of things has been considered a misnomer because devices do not need to be connected to the public internet, they only need to be connected to a network and be individually addressable politics and civic engagement, government regulation on IoT. The area of activity has complicated due to the combination of different technologies, product sensors, progressively heavy embedded systems, and appliance studying. Criticism, problems and controversies Traditional fields of embedded systems, wireless sensor networks, control systems, automation (including home and building automation), independently and collectively enable the Internet of things. IoT adoption barriers. In the consumer offer for sale, IoT technology is the majority synonymous with by-product concern to the idea of the "smart home", inclusive of implement an instrument (such as lighting fixtures, thermostats, home security systems, cameras, and other home appliances) that hold up one or more ordinary environment, and can be managed via devices related with that atmosphere, such cellular phone and announcer. IoT is also used in healthcare systems.

Audio Amplifier: An audio power amplifier (5) (or power amp) is an computerized loudspeaker that make louder low-power electronic audio signals, such as the wave from a transmission recipient or an electric guitar pickup, to a quantity that is big sufficient for operate loudspeakers or headphones. Audio power amplifiers (5) are set up in all fashion of concept systems as well as sound augmentation, general address and property hearing systems and musical apparatus amplifiers such as guitar amplifiers. It is the last electronic stage in a classic audio playback chain previous to the signal is sent to the loudspeakers.

5. AUDIO POWER AMPLIFIER

The activities stages in such a bonds are least power audio amplifiers which execute charge similar to pre-amplification of the signal (this is particularly associated with record turntable signals, microphone signals and electric instrument signals from pickups, such as the electric guitar and electric bass), coordination (e.g., adjusting

the bass and treble), tone power, mingle various input signals or attach electronic outcome such as repercussion. The inputs can also be some numeral of audio origin identical to record players, ghetto box, digital audioplayers and cassette players. Most audio power amplifiers require these low-level inputs, which are line level.



RFID-

RC522: MF RC522 is a extremely desegregated study and write down card chip appeal to the 13.56MHz noncontact imparting. start by the NXP Corporation, it is a less-voltage, low-cost, and little-categorize non-contact card chip, a best option for bright apparatus and movable console devices. The MF RC522 utilize modern alteration and extract idea which fully hand over in all methods of 13.56MHz passive non-contact communication procedure and agreement. Furthermore, it keep up fast CRYPTO1 encode algorithm to confirm MIFARE results. MFRC522 also carry MIFARE series of fast-moving non-contact conveying, with a two-way data transference range of up to 424kbit/s. As a recently developed member of the 13.56MHz greater desegregated editor card sequence, MF RC522 is a lot of alike to the be living MF RC500 and MF RC530 when there are also considerable contrast. It be in contact with the host tool via the serial way which require smaller roping. You can select between SPI, I2C and serial UART style (similar to RS232), which help out lower the relationship, rescue PCB board expanse (smaller size), and lower price.

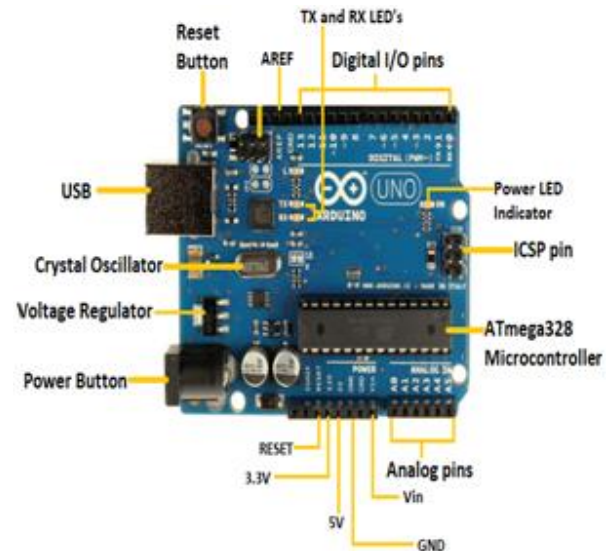
Arduino UNO:

Arduino UNO(6) is an open source computerhardware and software company, project, and user section that plan and manufacture single-board microcontroller and microcontroller kits for building digital devices and interactive objects that can sensation and control objects in the physical and digital world. The project’s products are distributed as open-source hardware, which are licensed under the GNU Lesser General Public License (LGPL) or the GNU General Public License (GPL), permitting the manufacture of Arduino UNO(6) boards and software distribution by anyone. Arduino UNO (6) boards

are accessible commercially in preassembled form, or as do-it-yourself (DIY) kits.

Arduino UNO (6) board designs use a variation of microprocessors and controllers. The board are equipped with sets of digital and analoginput/output (I/O) pins that may be interfaced to various expansion boards or breadboards (shield) and other circuits. The board feature serial communication interfaces, including Universal Serial Bus (USB) on some models, which are also used for loading programs from personal computers. The microcontrollers are commonly programmed using a dialect of features from the programming languages C and C++. In addition to using traditional accumulator tool chains, the arduino UNO(6) project provides an integrated development environment (IDE) based on the processing language project

6. Arduino UNO



III. CONCLUSION

This project presents RFID-based Maintenance Management system that incorporates RFID technology and mobile devices to improve the effectiveness and IoT cloud service as a data base for keeping the datas of machine maintenance schedule and previous history of service at the place of machine. The M-RFIDMM system not only improves the acquisition of data on instruments maintenance efficiency using RFID-enabled PDA, but also provides a real time service platform during instruments maintenance progress. In this project, plugging a RFID scanner into a PDA creates a powerful portable data collection tool. Additionally, RFID readings increase the accuracy and speed of information search, indirectly enhancing performance and productivity. Maintenance staff members use RFID-enabled PDAs to

enhance seamlessly maintenance work processes at instruments locations, owing to its searching speed and ability to support any information during the process. Meanwhile, on the server side, the M-RFIDMM system offers IoT hub center for fetching data from server and to provide instruments management division with real-time to monitor the maintenance progress. Based on experimental result, this study demonstrated that UHF passive RFID technology with IoT cloud server has significant potential to enhance inspection and maintenance work in instruments management. The integration of real-time maintenance data from IoT connected instruments helps maintenance staff members to track and control the whole inspection and maintenance progress. Compared with current methods, the combined results demonstrate that, an M-RFIDMM system can be a useful IoT-based lab maintenance management platform by utilizing the RFID approach and IoT technology.

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