

Design of an Employee Tracking System using RFID

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Abstract:- Every organization, regardless of whether enormous or little, has human asset difficulties to survive. Each association has diverse representative administration needs, hence we outline select worker following framework utilizing Radio Frequency Identification (RFID) framework that are adjusted to your administrative prerequisites. This is intended to help with following of specialists inside an association for quick and simple availability, and will enable you to guarantee that your association is outfitted with the correct level of HR for your future objectives. Additionally, for those bustling official who are dependably in a hurry, our frameworks accompany remote access highlights, which will enable you to deal with your workforce whenever, consistently. These frameworks will at last enable you to more readily oversee assets, for example, time and vitality. RFID technology encourages programmed remote distinguishing proof utilizing electronic aloof and dynamic labels with appropriate reader. In this paper, an endeavour is made to take care of worker checking issue inside an association utilizing RFID technology. RFID is a technology that utilizes radio waves to exchange information from an electronic tag, called RFID tag or name, appended to a worker's identity card, through a reader to identify and following the representative which works in accordance with a product called middleware that encourages correspondence between the framework and the RFID gadgets. The use of RFID to representative checking as created and conveyed in this examination is equipped for wiping out time squandered amid manual looking. One of the main features in employee tracking system is time tracking for employees. Effective time tracking mechanism saves both time and energy for the organization.

Keywords:- Tracking System, RFID, Employee, Organization.

I. INTRODUCTION

In this day and age, man battles to make his life less demanding. The requirement for following has accepted high significance in view of differed and different assets, at that point be it a result of an organization being sent from the organization to customer, be it the benefits, and be it in the inventory network administration or so far as that is concerned even the labour. In extensive authoritative structures, where the labour is high, individuals are not generally in their lodges.

They need to meander from space to room, floor to floor to play out their work. In such cases, it turns out to be amazingly hard to monitor individuals and discover them when they are required.

Answer for the above issue is as further a following framework which can track a person when they go into a room would get the job done the need. This procedure should occur in a problem free way and along these lines a remote framework would be beneficial.

A collector can be put in every one of the rooms in the building and associated with a PC framework which can take contribution from the associated recipient and enter it in a database all things considered or work force in the building.

The recipient would get contribution from a transmitter which would be given to every one of the general population working in the building. Since all the data is signed in a database, any individual in the building will have the capacity to get to this data through any PC associated with this framework and come to know the area of the individual he or she is looking for.

Radio-frequency identification (RFID) is a programmed identification technique, depending on Storing and remotely recovering information utilizing gadgets called RFID labels or transponders. The innovation requires the collaboration of a RFID reader and a RFID tag. A RFID tag is a protest that can be connected in to a question with the end goal of distinguishing proof and following. This should be possible by utilizing radio waves. A few labels can be perused from a few meters away and past the viewable pathway of the reader. A RFID tag is a protest that can be joined into an item; here it is vehicles with the end goal of recognizable proof and following utilizing radio waves.

RFID following framework is likewise called a representative following application. There is a relative absence of research concerning following and observing the development of labourers inside an association premises. This examination goes for evaluating the plausibility of applying RFID for representative following purposes. There are distinctive sorts of GPS beacons accessible in showcase today. Radio Frequency Identification (RFID) is a rising innovation that utilizes remote radio waves to distinguish objects from a separation. RFID empowers the client to catch ongoing data in quick moving and massive item streams with the point of accomplishing a high level of effectiveness and guaranteeing high calibre. The parts of a common RFID framework incorporate a RFID tag, a RFID

reader, a RFID middleware and the backend framework. The RFID tag is the distinguishing proof gadget joined to the thing to be followed. The RFID reader and receiving wire are gadgets that can perceive the nearness of RFID labels and read the data put away on them. The point of RFID middleware is to process the transmission of data between the reader and different applications in the wake of accepting the data. Middleware is programming that encourages correspondence between the framework and the RFID gadgets. The lower costs and the expanding abilities of the RFID method pull in consideration in following along and observing the development of labourers/representative in an association.

A. Significant of the Study

In extensive authoritative structures, where the labour is high, individuals are not generally in their lodges. Henceforth RFID is proposed as a result of its lower cost and expanding capacities of the RFID procedure which pulls in consideration in following along and checking the development of labourers/representative in an association.

B. Aim and Objectives

The aim of this research is to design an employee tracking system using RFID. And the following objectives are:

- To explore the usage of RFID in Tracking.
- To design a database which will input and store employee information.
- To design an architectural framework for the tracking system using RFID.

In the paper, Section II is on some related concepts on Radio Frequency Identification (RFID), section III is on proposed architectural framework using RFID to track employee location within an organization. Section IV is on the system flowchart and section V is the conclusion.

C. Scope of the Study

The examination is focused on every organization, regardless of its size. Such associations might be Educational institutions, Hospitals, Banks, Company a so on.

II. RELATED WORKS

The utilization of Radio-frequency identification (RFID) innovation in computerized electronic condition and for following items has been generally looked into upon by analysts and conveyed by different associations as a component of their mechanization frameworks. Cases of a genuine RFID contact less information connect arrangements that use RFID innovation for question following and robotized information accumulation arrangement. RFID is an innovation that utilizes radio waves to exchange information from an electronic tag, called RFID tag or mark, joined to a question, through a reader to identify and following the protest (Mohd F. B. M, 2008).

In 1945, Leon Theremin imagined a reconnaissance device (for spy exercises) for the Soviet Union which

retransmitted occurrence radio waves with sound recurrence data. Sound waves vibrated a stomach which marginally adjusted the state of the resonator, which tweaked the reflected radio recurrence despite the fact that this gadget was secret listening gadget, not a recognizable proof gadget or tag, it is thought to be an antecedent of radio recurrence distinguishing proof (RFID) innovation since it was moreover aloof, being empowered and enacted by waves from an outside source. Comparative advancements, for example, the IFF (distinguishing proof companion and adversary) transponder created in the United Kingdom, was routinely utilized by the partners in the World War 2 to recognize flying machines as companion or enemy. Transponders are as yet utilized by most fuelled flying machines right up 'til the present time.

Mario .W. Cardullo was the first to have gotten the United States patent for a functioning RFID tag with re-writable memory on January 23, 1973 (Amirjan B. N, 2009). In that same year, Charles Walton, a California business person, got a patent for a detached transponder used to open an entryway without a key. A card with an implanted transponder conveys a reader close to an entryway, when the reader identifies a substantial recognizable proof number put away inside the tag, the reader opens the entryway. Walton authorized the innovation to Schalge bolt of San Francisco, a bolt producer and different organizations (Daniel M. D and Steven M. W 2010).

Time and participation frameworks are a noteworthy piece of the present human asset frameworks, take association towards better human asset practice, frameworks and greatness. The usage of time and participation framework has a ton of points of interest for the chief. The sort of framework that is actualized relies on what the association is endeavouring to accomplish by executing the framework. There are diverse kinds of programmed participation frameworks; each sort of framework is suited to various necessities and prerequisites (Gordon .N. W, 2002). Probably the most well-known composes incorporate; biometric participation framework, attractive stripe participation framework, scanner tag participation framework, and RFID participation framework.

Various related works exist in writing, use of RFID Technology to various zones and particularly to the zone of scholarly and association participation observing issue. Writers have composed and actualized a model of an anchored and compact inserted reader framework to peruse the biometric information from the electronic visa. The creators endeavoured to tackle issues of unwavering quality; security and protection in E-travel papers by confirming holder web based utilizing Global System of Mobile Communications (GSM) organize. The GSM arrange is the principle interface between ID focus and the e-travel permit reader (Mohamed A.B, et al 2009). The correspondence information is ensured amongst server and e-passport reader by utilizing AES to scramble information for insurance while exchanging through GSM organize. Creator checked on the ebb and flow examine use of RFID to various zones with accentuation on application for production network administration and built up an ordered system to arrange

writing which empowers quick and simple substance examination to help recognize regions for future research (Nambiar A.N. (2009)). It was surveyed the utilization of RFID in a coordinated circuit(IC) bundling house to determine stock exchange issues (Liu C.M and Chen L.S (2009)). His investigation recommends that RFID contributes critical upgrades to the water accepting procedure and the stock exchange process that diminish work cost and man-made mistakes. A computerized participation administration framework was actualized both in electronic and versatile stage utilizing stationary network AR 400 RFID reader with four circulatory enraptured radio wires and Symbol MC9000-G handheld RFID reader separately. In the electronic stage, the participation administration framework delineates a basic customer (receiving wires set at classroom entrance)/server (favoured understudy database) framework. Understudies can outwardly observe their names as they entered class on the screen and they are guaranteed that their essence has been entered in the educator's database (RFIDSensNet Lab, 2005). Be that as it may, one essential disadvantage about this framework is the RFID label read rates corrupt hugely as it comes nearer to electronic gadgets.

A. Components of RFID

An essential RFID framework comprise of three segments:

- An receiving wire (Antenna) or coil
- A handset (with decoder)
- A transponder (RF tag) electronically modified with exceptional data. These are depicted underneath:

➤ *Antenna:* The receiving wire transmits radio signs to initiate the tag and read and compose information to it. Receiving wires are the courses between the tag and the handset, which controls the framework's information securing and correspondence. Reception apparatuses are accessible in an assortment of shapes and sizes; they can be incorporated with a door jamb to get label information from people or things going through the entryway, or mounted on an interstate tollbooth to screen movement going by on a road. The electromagnetic field created by a radio wire can be always present when various labels are normal ceaselessly. On the off chance that consistent cross examination isn't required; a sensor gadget can initiate the field. Frequently the radio wire is bundled with the handset and decoder to wind up a reader, which can be designed either as a handheld or a settled mount gadget. The reader transmits radio waves in scopes of somewhere in the range of one inch to 100 feet or all the more, contingent on its capacity yield and the radio recurrence utilized. At the point when a RFID label goes through the electromagnetic zone, it distinguishes the reader initiation flag. The reader deciphers the information encoded in the label's incorporated circuit (silicon chip) and the information is passed to the host PC for preparing.

➤ *TAGS (Transponders):* A RFID tag is involved a microchip containing distinguishing data and a reception apparatus that transmits this information remotely to a reader. At its most fundamental, the chip will contain a

serialized identifier, or tag number, that particularly distinguishes that thing, like the manner in which many scanner tags are utilized today. A key distinction anyway is that RFID labels have a higher information limit than their standardized tag partners. This expands the alternatives for the kind of data that can be encoded on the tag. The measure of information stockpiling on a tag can shift, going from 16 bits on the low end to as much as a few thousand bits on the top of the line. Obviously, the more noteworthy the capacity limit, the higher the cost per tag. Like every single remote correspondence, there are assortments of frequencies or spectra through which RFID labels can speak with reader. Low-recurrence labels are less expensive than ultra-high-recurrence (UHF) labels, utilize less power and are better ready to enter non metallic substances.

➤ *RFID Reader:* A gadget used to speak with RFID Tag. The reader has at least one reception apparatuses, which discharges radio waves and get motions back, from the RFID Tag. Additionally called Interrogator since it questions the RFID Tag. Information recovery - RFID Reader – Device - Emits radio waves - Received by the RFID Tag - Activates the microchip information get transmitted.

B. Advantages of RFID

- Not requiring observable pathway access to be perused.
- Automatic checking and information logging is conceivable without Operator intercession.
- Each tag can hold something beyond a novel vehicle code.
- Everything can be separately named
- With the correct innovation a majority of labels can be simultaneously perused.
- Gives a high level of security and item verification – a tag is harder to fake than a scanner tag.
- The supporting information framework can permit information recovery and vehicle following anyplace gave the scanner/reader is sufficiently close to the tag.
- Since each tag can be one of a kind they can go about as a security highlight if lost or stolen.

C. Disadvantages of RFID

- Some normal issues with RFID are reader impact. Reader impact happens when the signs from at least two readers cover.
- Another issue is Tag impact. Label crash happens when numerous labels are available in a little territory

D. Advantages of RFID over manual Search

- *RFID Can Read Multiple Tags Simultaneously*

Playing out a manual stock process expects staff to separately coordinate label ID's or serial numbers. This can be an exceptionally tedious and inclined to mistakes. Utilizing scanner tags accelerates the stock procedure and makes it more precise, yet at the same time requires every advantage for being filtered separately. Numerous handheld RFID readers can read up to 20 labels or more at the same time.

- *RFID Does Not Require Line-of-Sight*

Both manual and standardized identification forms necessitate that the labels be physically found and perceptible. Another favourable position of RFID is the capacity to peruse labels that are not unmistakable. Not at all like standardized identifications and intelligible labels that must be physically found and visible to peruse, RFID labels don't should be noticeable to be perused. For instance, labelling a PC up under a work area would expect staff to creep up under the work area to physically find and view the label when utilizing a manual or standardized identification process. Utilizing a RFID tag would enable work force to peruse the tag through the work area without seeing it. There are a few special cases to this lead when metal and fluid are included.

- *RFID Improves Processes*

Physically reviewing and inspecting resources can be a tedious procedure that can pull profitable workers from their ordinary employment obligations to take part in a stock. As a rule these representatives are over-qualified and over-paid for the assignment. At least, pulling these staff far from their duties can influence the primary concern. Actualizing a RFID arrangement can drastically diminish the labour required to monitor your benefits and give better deceivability.

E. Operations

RFID gadgets and programming are bolstered by a modern programming engineering that empowers the accumulation and conveyance of area based data in close continuous. A total photo of the RFID representative following framework joins the RFID Tags and reader with access to worldwide institutionalized database, guaranteeing continuous access to a la mode data on the card. The card contains a one of a kind recognizable proof number called an electronic item code (EPC). The RFID tag can be perused from a separation and the inserted electronic data for each card can be over composed more than once. This builds innovations like reconnaissance cameras to be enacted in conjunction with a worker being in their region. The RFID

worker following framework is quicker, and does not require viewable pathway. The RFID framework has higher information stockpiling. In the RFID frameworks, the transponders are additionally simple to disguise or fuse in different things. For instance in 2009, specialists effectively stuck RFID small scale transponder to live ants with a specific end goal to think about their conduct (Daniel M. D and Steven M. W, 2010). Besides, different RFID cards can be perused all in the meantime. Data about the workers' entrance and participation can be put away on the database.

F. RFID Frequency band

Recurrence alludes to the measure of the radio waves used to impart between the RFID framework's segments. It can be expected that higher recurrence coming about quicker information exchange rate and longer perusing separation. Anyway as recurrence builds, the affectability to ecological factor additionally increments. RFID framework presently works at Low Frequency, High Frequency and Ultra High Frequency. For the most part a lower recurrence implies a lower read go and slower information read rate, however expanded abilities for perusing close or on metal or fluid surfaces (SEED RFID Reader Manual, www.seedstudio.com).

G. Miniaturization

RFIDs are anything but difficult to cover or consolidate in different things. For instance, in 2009 analysts at Bristol University effectively stuck RFID miniaturized scale transponders to live ants so as to examine their conduct (Carlos .C. Murphy, 2005). This pattern towards progressively scaled down RFIDs is probably going to proceed as innovation propels. Hitachi holds the record for the littlest RFID chip, at 0.05mm x 0.05mm. This is 1/64th the span of the past record holder, the mu-chips. Make is empowered by utilizing the silicon-on-cover (SOI) process. This residue estimated chips can store 38-digit numbers utilizing 128-bits read just memory (ROM) (Mohd F. B. M, 2008). A noteworthy test is the connection of the reception apparatuses, therefore restricting read range to just millimetres.

III. PROPOSED ARCHITECTURAL FRAMEWORK OF AN EMPLOYEE TRACKING SYSTEM

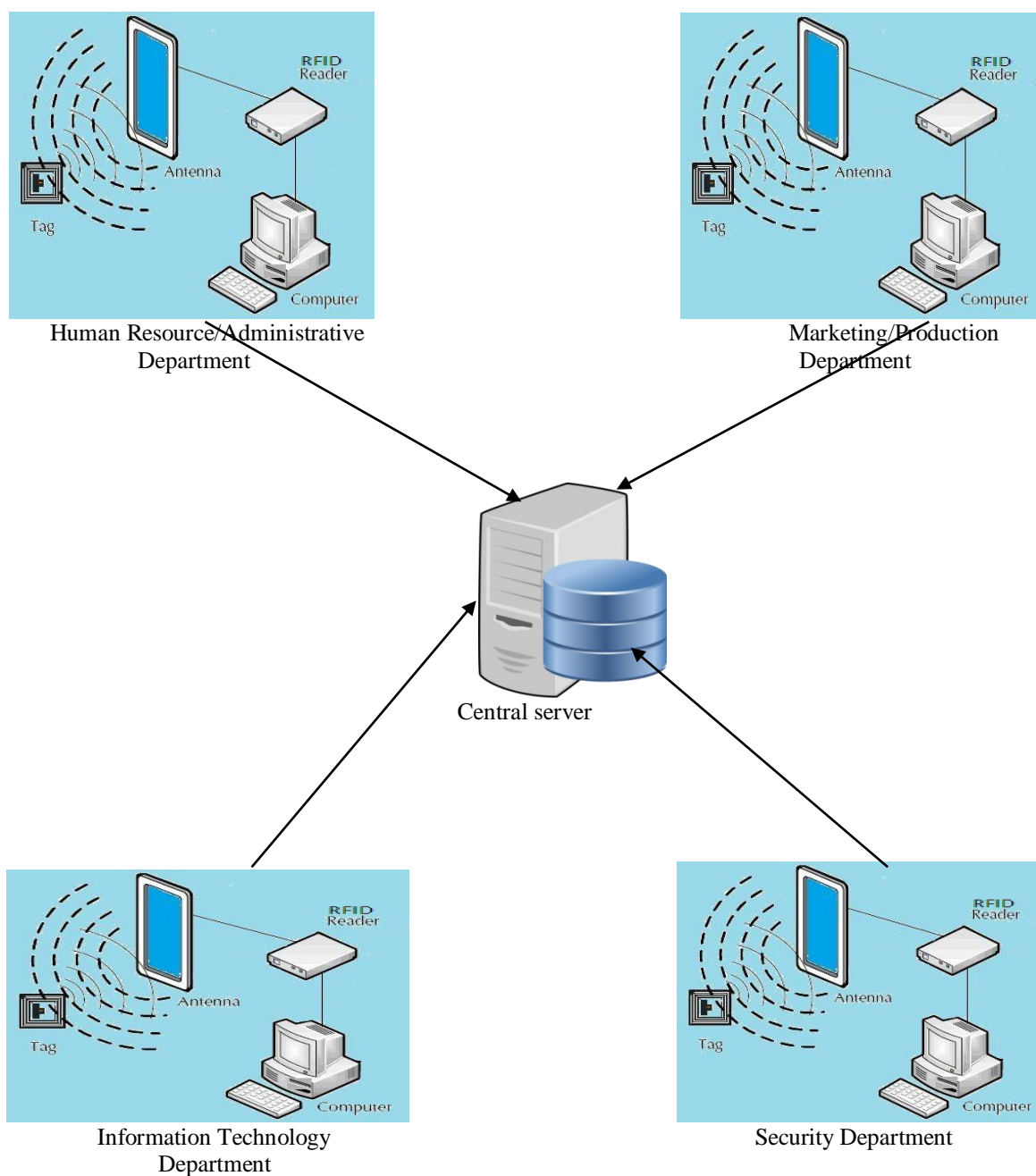
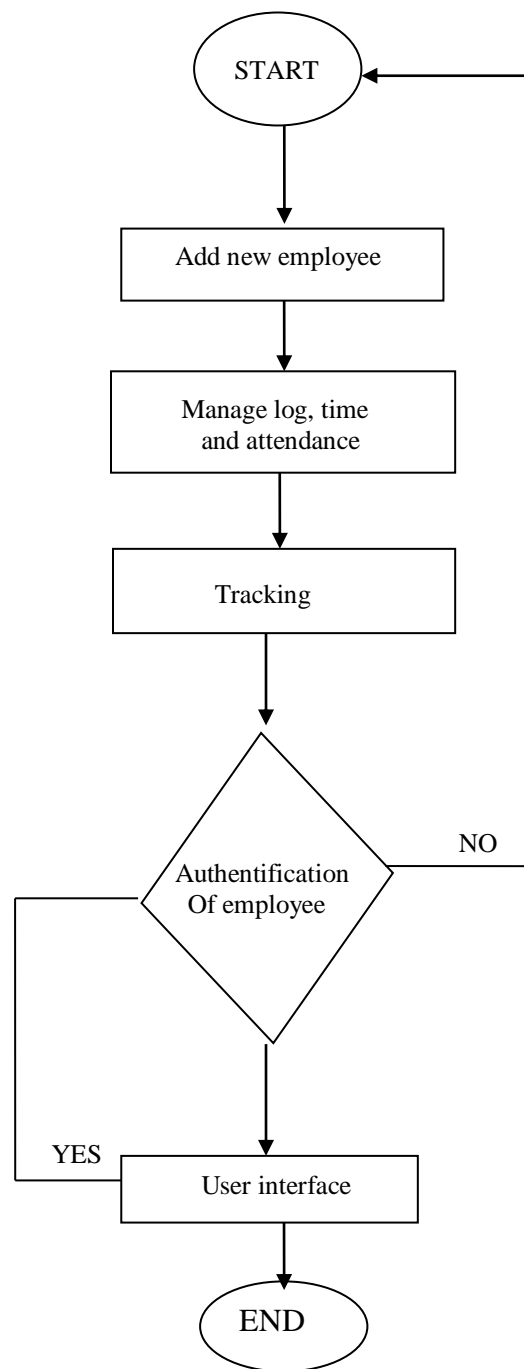


Fig 1:- Framework of an employee tracking system

IV. FLOW CHART OF THE PROPOSED EMPLOYEE TRACKING SYSTEM



A software framework is constantly separated into subsystems that make it simpler for the advancement and testing. The diverse subsystems are known as flowcharts and the way toward separating a whole framework into subsystems is known as modularization or decay. The diverse modules are:

- *Add New Employee*: This task is performed when new worker should be added to the framework. For instance, when organization enrolls new workers, their entrance is embedded in the representative database.
- *Manage Log*: Employee goes from entryway his data is get recovered in database and log of whole day will be

put away in database implies it gives where worker has experienced divisions.

- *Time and Attendance*: This module keeps section time of representative into organization/association and keeps up participation of worker.
- *Tracking*: This module is utilized to track specific representative and gives stream which is utilized to take after by worker for the duration of the day in the organization.
- *Authentication of representative*: When worker passes utilizing RFID-labels through entryways utilizing RFID reader he/she should be verified by sing catching picture of representative. On the off chance that any worker is

doing intermediary of any one it can be effortlessly distinguish be director and following move must be made on that representative.

- Provide intuitive GUI: This gives client straightforward cooperation through the framework.
- Administrator Login: It gives validation for executive for framework.

V. CONCLUSION

This system is design to automate the development of specialists in different division in an organization. For which we are presenting another idea that each labourer ought to have RF Device fitted with his/her character card. The RF Reading gadget is put at each passage of all office which will read the ID card subtle elements, and consequently approves the owner details. If any mismatch found the system will automatically send alerts to the specific department. If no mismatch the departmental Administrator can see the worker position. With this framework, it will be considerably simpler to discover the situation of each worker inside the organization premises; it tracks effortlessly representative's sign in and out. It sees worker points of interest and their exercises and furthermore decreases the multifaceted nature of representative detail support.

➤ Recommendation

This investigation is prescribed to each association, which will enable them to screen and deal with their workforce at record-breaking. It will likewise add to wipe out time squandered amid manual hunt.

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