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Research Paper

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Automatic payment collection on Petrol pump Using RFID

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Abstract: Radio frequency identification is a contactless technique that uses the radio waves to identify the object uniquely. RFID Tag and Reader are major two parts of the RFID System. Tags are used to store the information about the object and Readers read tag's stored information when tag enters in the range of the Reader. This paper focuses on automatic collect the payment on a petrol pump. This system removes the manual work and save the time. Whenever the collection is made manually, it results in more time consumption as compared to automated system. Automated system reduce the manual work of that person who collects the payment from any costumer and save the time of everyone .This results in speeding up the whole process.

Keywords: RFID, RFID tag, RFID reader, automatically payment collection system, Metlab semiconductor.

I. INTRODUCTION

This technology is implemented with the help of Radio frequency identification (RFID) .RFID is a non-contact technology which is used for identifying any vehicle or object .This system is identify any object without any contact with the help of radio waves. This system can identify object uniquely .The components which are used in RFID technology that given below.[1]

- A. RFID tags
- B. RFID reader

A. RFID tags

Tags are the hardware .Tag is like card that is placed on the vehicle. These tags have a small chip (microchip). That chip is used for store some information. The antenna is used for receive signal which are from reader .Then tag amplify it. The receiving signal of the tag is used for activate that tag then tag send store information to the reader. [2][3]

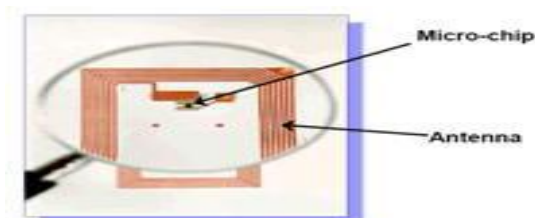


Figure1: RFID tag

RFID reader

RFID reader receive the information that comes from the tag .The reader has an antenna that generate the radio waves. These waves are received by the antenna of the tags in the range of the reader. These waves are used for the activation of tags. After

activating the tag send his information to the reader. Then reader receive the information that come from the tag .Reader is also known as antenna or interrogator. [4]



Figure2: RFID Reader

Communication between Tags and reader

- During this communication Tags stored the information and read by the reader .When reader collect the information from the tag then further transfers that information computer system .In the communication first reader sends the radio waves in reader's range .If any tag find in the range of the reader then radio wave is captured by the antenna of the tag .Antenna amplify that wave (energy) and passed to the microchip of the tag. That energy activates the internal circuitry of the tag and sends the information to the reader. Then reader receives that information and passes that information to the computer system which attached with it. [5]

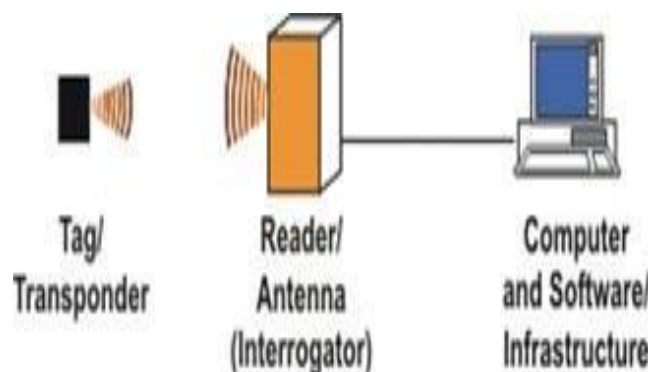


Figure3: Communication between Tags and Reader [5]

II. RESEARCH DESIGN

Automatic payment collection on petrol pump is a technology implement for the automatically collect payment on petrol pump .In this technology the owner of the petrol pump can collect money (payment) from the user by electronically. We develop this technology with the help of RFID (Radio frequency identification).For implement this technology we will use the RFID tags and RFID reader for detect any vehicle.

Electronic payment on petrol pump is a technology that is used for getting payment automatically. In this system first we should registered with the organization of petrol pump. For registering any vehicle authority of the petrol pump placed tag on every vehicle. Every tag contains the deferent Identification number for identifying or detects the vehicle uniquely. For the automatically electronically payment every owner of the vehicle has to give his Bank account .That bank is used for collecting money .Reader is used for detect the vehicle which is the costumer of petrol pump. When any vehicle goes to in the range of reader then reader can detect the vehicle .Then system gets his payment automatically from bank account of the owner of vehicle .This system reduce the manual work and solve the problem of cash payment.

III. WORKING

In this system first we should registered the vehicle from the organization of the petrol pump (owner of the petrol pump) which vehicle wants to pay his payment automatically. If anyone wants to pay his payment automatically then registration is a compulsory .Without the registration no one can pay his payment automatically. During the registrations the members of the organization of the petrol pump place tag on vehicle. That tag contains the unique ID number .That number give to the owner of vehicle. That tag number connects with the bank account for automatically payment. On the petrol pump they are set up a reader for reading the ID number of the tag which is placed on the vehicle and in a range of reader. Reader is always producing the radio waves. Radio waves go to circulation area always. If any vehicle comes in the range of that reader then tag which is placed on the vehicle that receive the energy waves. That waves which captured that is amplify by the tag. That energy waves use for activates the internal circuitry of tag. Then tag is responsible for passing information which stored in a tag. Tag sends the information to the reader. Then reader read that information from the tag .That information/ID number display on screen with the help of Metlab simulator. When many vehicle come on the petrol pump them Reader reads all vehicle's ID number and display on the screen. Anyone who buy the petrol from the petrol pump he will select his ID number from the display screen. When costumers select his ID number from the display screen and press enter then select ID goes to the computer system. Computer system has all information about that ID number like name, address and Bank account etc. Then system can collect his payment automatically from his bank account.

IV. METLAB SIMULATOR

Metlab semiconductor is worked as an interface between the Reader and Display screen. Metlab simulator is use for picking a value from the reader and display on the screen. Display screen is used for show all vehicles' ID number on the screen. When many vehicles come on the petrol pump then all display on the screen. A person who buys the petrol, he will select his ID number from the screen.

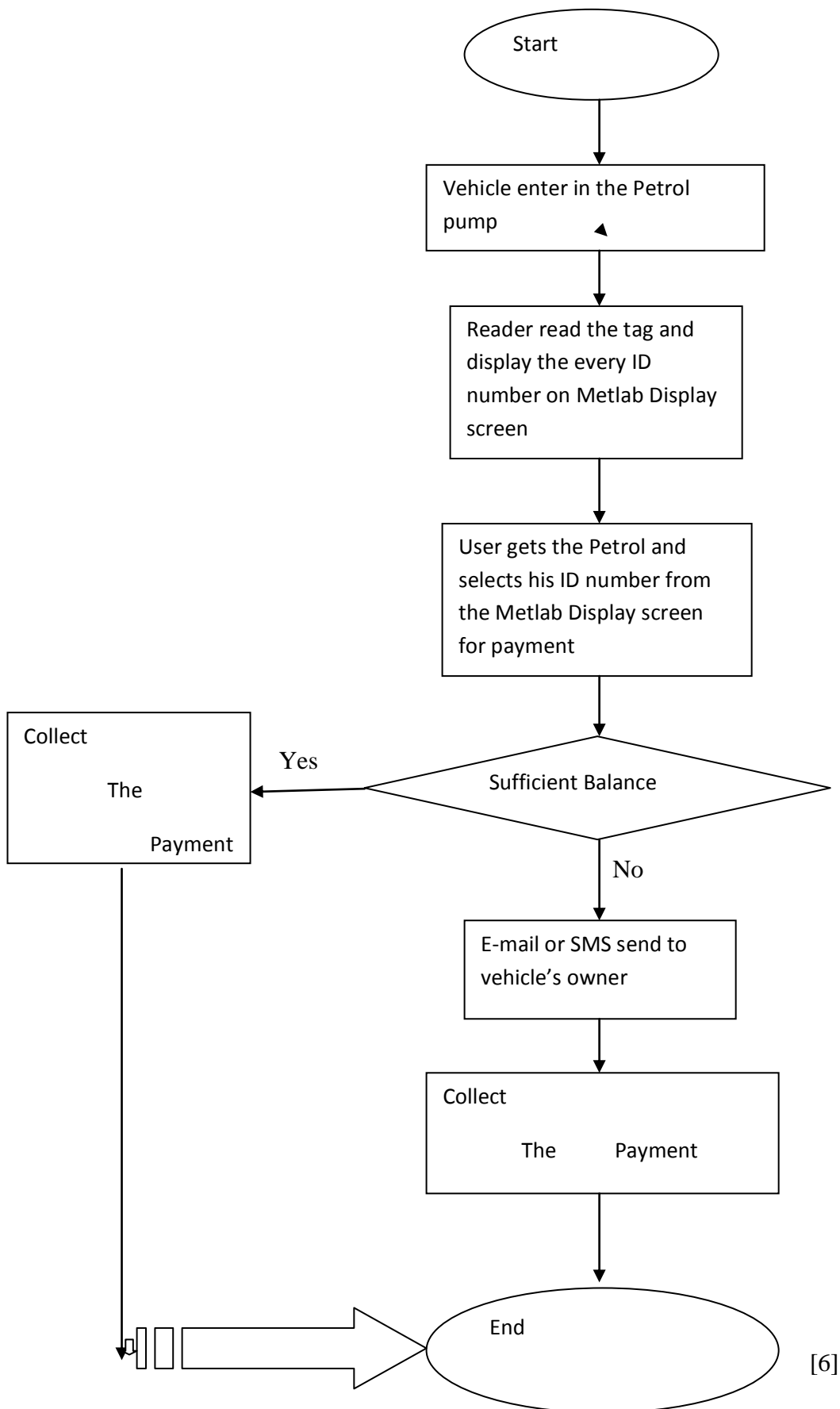


Figure 4



Figure 5 manual collections (By hand)

Process



All steps

- First step is a registration of the vehicle. During the registrations Bank account is needed for collect a payment and RFID tag placed on vehicle .Every RFID tag have a different number or a ID .That ID is use for identifying uniquely any vehicle .This work is done by the organization of the petrol pump (owner of the petrol pump).
- After the registration, a reader set up on the petrol pump for identifying any vehicle. Reader is a hardware which is use for identifying an object.
- Reader connects with a display screen for showing ID number on that screen with the help of Metlab simulator.
- Reader which is placed on the petrol pump, always generates the radio waves. Radio waves go to circulation area always means goes to in petrol pump's everywhere.
- When any registered vehicle come in the range of Reader Then the antenna of the tag which is placed on the vehicle captured radio wave.
- Every wave has energy .Therefore when tag captures the waves and amplifies. This energy works to activate the internal circuitry of the tag.
- Tag has store the information about the vehicle .After the activate tag sends the information to reader.
- That information received by the reader.
- Reader sends that ID number to display screen with the help of Metlab simulator. If many vehicle come on the petrol pump then all vehicle's ID number are read by reader and all display on the screen which is connect with the reader.
- After buying the petrol that person will select his ID number from the screen and press the enter button.
- When anyone press the enter button then his ID number goes to the computer system.
- Computer system has all information about that ID number or vehicle's detail like name, address, Bank account detail etc.
- Then system is capable for collecting his payment.

V. BENEFITS OF THIS SYSTEM

1. This system is faster. Here system collects his payment automatically from user's bank account.
2. Anyone does not exchanging payment of petrol pump by hand.
3. This system is reducing the manual work .No need to request for receipts from the owner of petrol pump.
4. This system more accurate and remove the human errors.
5. By this facility time will be saved.[7][8]

VI. CONCLUSION

In an old system on petrol pump any person manually collects the payment from the user. When he collects his payment then he get more time and do his efforts. Old system is not an accurate for collecting payment. Old system is a very slow for collecting his payment. Our approach is that, this system collects the payment automatically with the help of RFID. This system increases the speed and also save the time .This system is more accurate which remove the human errors. This system is faster from manual system. Manual system is not an accurate because any human can be mistake. In this system identify any vehicle with the help of RFID tag and RFID reader.

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