INDEX

SR. NO.	EXPERIMENT	DATE OF EXPERIMENT	DATE OF SUBMISSION	REMARKS / SIGNATURE
	Future of Wireless network.	06/05/2023	13/05/2023	
	Cloud computing and IOT.	20/05/2023	27/05/2023	
	Automated vehicle parking system using RFID.	15/07/2023	22/07/2023	
	Building IOT Application	22/07/2023	05/08/2023	

"Future of wireless network"

Introduction:-

* What is a wireless network?

→ A technology that enables two or more entities to communicate without network cabling.

→ Wireless networking today is about where broadcast radio was in the late 1900. the use of wireless technology is quickly becoming the most popular way to connect to a network. Wifi is one of the many available technologies that offer us the convenience of mobile computing.

→ mobile communication systems (cellular or satellite) are the realisation of the "anytime, anywhere anyone" concept.

→ Initial system were your voice and your complementing fixed telephone systems.

→ wireless network subscriptions has increased due to
  → Continuous development of new technologies.
  → expansion of service area
  → Introduction of compact terminals
  → Increased popularity of mobile communications.

→ Status of mobile communications is changing from "complementary" to "requisite".

General Trends

→ An increasing portion of wireless traffic is data traffic eg :- SMS messages.

→ 2001 was year of world-wide introduction of data capable third-generation (3G) wireless systems

→ New wireless services can be classified as.

* Social Communication and Safety, e.g. radio, telephony, photo messaging, alarm notification

* time saving and empowerment, eg online shopping and banking, remote control of home.

* Fun and pleasure, e.g. games, music, sports information.

Wireless Networking Generations

→ A currently debated item is a 4th of wireless networks available in about a decade.

→ the generation characteristics includes.

* 1G! deployed in the 1980 was based on analog FM transmission technologies

* 2G! Introduced on market in 1991 applied digital technologies such as TDMA, GSM, Cdma one 2G systems offered higher capacity

And lower costs for network operators as well as short messages and low-rate data services for users.

Wireless Networking Generations [2]

→ "2.5G": Introduced ability to use packet switched (vs ckt switched) radio connections over the air. For GSM systems, this is the General packet Radio Service (GPRS) GPRS offers users the opportunities to always be online but only be charged for data transferred.

→ "3G" Achieves a maximum bit rate of 2Mbps. and offers packet-Switched voice services. GSM/TDMA operators can evolve towards EDGE or WCDMA with higher and variable bit rates and improved spectrum efficiency. Cdmaone operators can evolve to cdma 1000.

Wireless networking Generations [3]

→ "4G" Expected to build upon 3G and evolved 3G systems

Scenarios to consider:-

* Anything Goes: possibility of cheap co-existing products from the telecommunicati companies.

* Big Brother: personal integrity and privacy as more personal information is readily available online.

* pocket computing :- reduction of the digital divide with everyone having the digital divide with everyone having the opportunity for some level of computing.

working Assumptions for UIs [?]

* OneStop shopping :- for all hardware and software needs
* Non-homogenous Infrastructure :- digital based transpo-rent interworking.
* Mixed public and private access :- Variable quality and band width available e.g urban v rural, home vs office
* Ad-hoc, unlicensed operation :- for spontaneous deployment and self-planning in desig nated unlicensed bands (5, 60 GHz bands)

working assumptions for UIs

* Telepresence : Application that create virtual meetings between individuals and provide full stimulation of all senses required to provide the illusion of actually being some where else.
* Security : data integrity and protection against unauthorised access for reliable banking, electronic payment and handling of personal information.

Working assumptions for 4G [3]

* multimode access port :- Available in public systems to accomodate a wide range of terminals.

* Terminals with a wide range of bandwidths :- From less than 10 kbs (simple appliances) to 100 mbps (telepresence terminals).

Wireless Transmission Characteristics [2]

* Coverage area :- Similar to 3G coverage area of approximately 100% of populated areas. But 4G systems will experience significantly higher propogation losses.

* Hierachical Service areas :- Intermediary terminals will be required as it may be difficult for small devices to be directly connected to the 4G system due to power consumption and antenna sizes.

wireless transmission Characteristics

* Transmission bit rates the 3G system achieves at most 2mbps which may decrease in vehicular speed environments. For 4G systems, more than 50 mbps should be available in pedestrain environment dropping to 20mbps in environments

* Spectrum :- Significant frequency resources will be required likely beyond 3 GHz since lower

frequency bands are already heavily. for example the Satellite Ka-band of 30/20 GHz.

Conclusion

* New generations wireless networking (terrestrial wireless (cellular) or satellite) will result in higher rate integrated communications.
* The complexity of the management of network resources (e.g. bandwidth, power capacity) will be significant increasing generation or evolution.

"Cloud computing and IOT"

I. Introduction :-

Cloud computing frees the enterprise and the user from the specification of many details. this bliss becomes a problem for latency Sensitive applications, which require nodes in the vicinity to meet their delay requirements. we argued that a new platform we call fog computing for Computing fog computing enables a new breed of applications and services and that there is a fruitful interplay b/w the cloud and the fog. particularly when it comes to data management and analytics.

In the second section we introduce Hofog computing paradigm, delineate it characteristics and those of the platform that supports fog services.

II. The FOG COMPUTING PLATFORM

fog computing also known as foggiay is a model in which data processing and applications are concentrated in devices at the network edge rather than existing almost entirely in the cloud. that concentration means that data can be processed locally in smart devices to rather than being sent to the cloud for processing.

Fog computing is one approach to dealing with the demands of the ever-increasing number of Internet connected devices sometimes referred to as the Internet of things (IOT)

In IOT scenario a thing is any natural or made object that can be assigned an IP address and provided with the ability to transfer data over a network Some such things can create a lot of data. Cisco provides the example of a jet engine which they say can create 10 terabytes (TB) of data about it performance and condition in a half-hour. Transmitting all that data to the cloud and transmitting response data back pls a great deal of demand on bandwidth requires a considerable amount of the time and consuffer from latency.

III Characterization of Fog Computing

* Fog computing is a highly virtualized platform that provides compute storage and networking services between end services and traditional cloud computing data centers typically but not exclusively located at the edge of network.

* Compute, Storage and networking resources are the building blocks of both the cloud and the fog

* the origins of the fog can be traced to early proposals to support end points with rich services

at the edge of the network, including applications with low latency requirements (eg. gaming video streaming)

* Large-scale sensor networks to monitor the environment and the smart grid are other examples of inherently distributed systems, requiring distributed computing & storage resources.

* very large number of nodes, as a consequence of the wide geo-distribution, as evidenced in sensor networks in general and the Smart Grid in particular

* Real time interactions important fog applications involve real time interactions rather than batch processing

* predominance of wireless access.

* Support for online analytic and interplay with the cloud. the fog is positioned to play a significant role in the ingestion and processing of the data close to the source.

we elaborate in section 4 on the interplay b/w fog and cloud regarding Big data.

IV Analytics And the Interplay Between the Fog and the Cloud.

while fog nodes provide localization, therefore enabling low latency and context awareness the Cloud provides global centralization many applications

require both fog localization and cloud localization particularly for analytics and big data.

For colleders at the edge ingest the data generated by guid sensors and devices some of this data relates to protection and control loops that require real time processing (from milliseconds to subseconds) the time scales of these interactions all part of the fog range from seconds to minutes real time analytics As a result of this the fog must support several types of storage, from ephemeral at the lowest tier to semi-permanent at the higher we also note that the higher the tier the wider the geographical coverage and longer the time scale.

V. Conclusions:

We have outlened the vision and defined key characteristics of fog computing a platform to deliver a rich portfolio of new services and applications at the edge of the network we envision the fog to be unifying platform rich enough to deliver this new breed of emerging services and enable the development of new applications.

We welcome collaborations on the substantial body of work ahead:

1.) Architecture of this massive infrastructure of compute, storage and networking devices

2.) Orchestration and resource management of the fog

3.) Innovative services and applications to be supported by the fog.

Automated vehicle parking system using RFID

I. Introduction:-

RFID today is the popular wireless conduction system. Each RFID tag in RFID system is given a unique ID (UID) when an independent RFID tag approaches the RFID reader the induction between tag and reader happens.

The RFID card is used to identify that a user is legal or not. According to the short distance wireless signal the RFID tag users can be monitored within the specific area.

This automated vehicle management system will enhance stage consists of embedding the code into a tag and assigning the same to car.

the tag project is implemented in four stages.

Step 1:- writing into tag :- By making use of write capability of the RFID reader RFID tag is embedded with unique code and is assigned to a car.
This is similar to embedding information on a magnetic strip and the process is called writing this step accomplishes the data feed to the tage

Step 2:- Reading from the tag:- the information from the tag needs to be during the car parking In this step the data is read from the tag with the help of an RFID reader

Step 3:- Data feed to the systems:- the data from the RFID reader has to be transferred to the system for the actual comparison of data and further processes. During this phase the data from the RFID reader is fed to the system using RS-232.

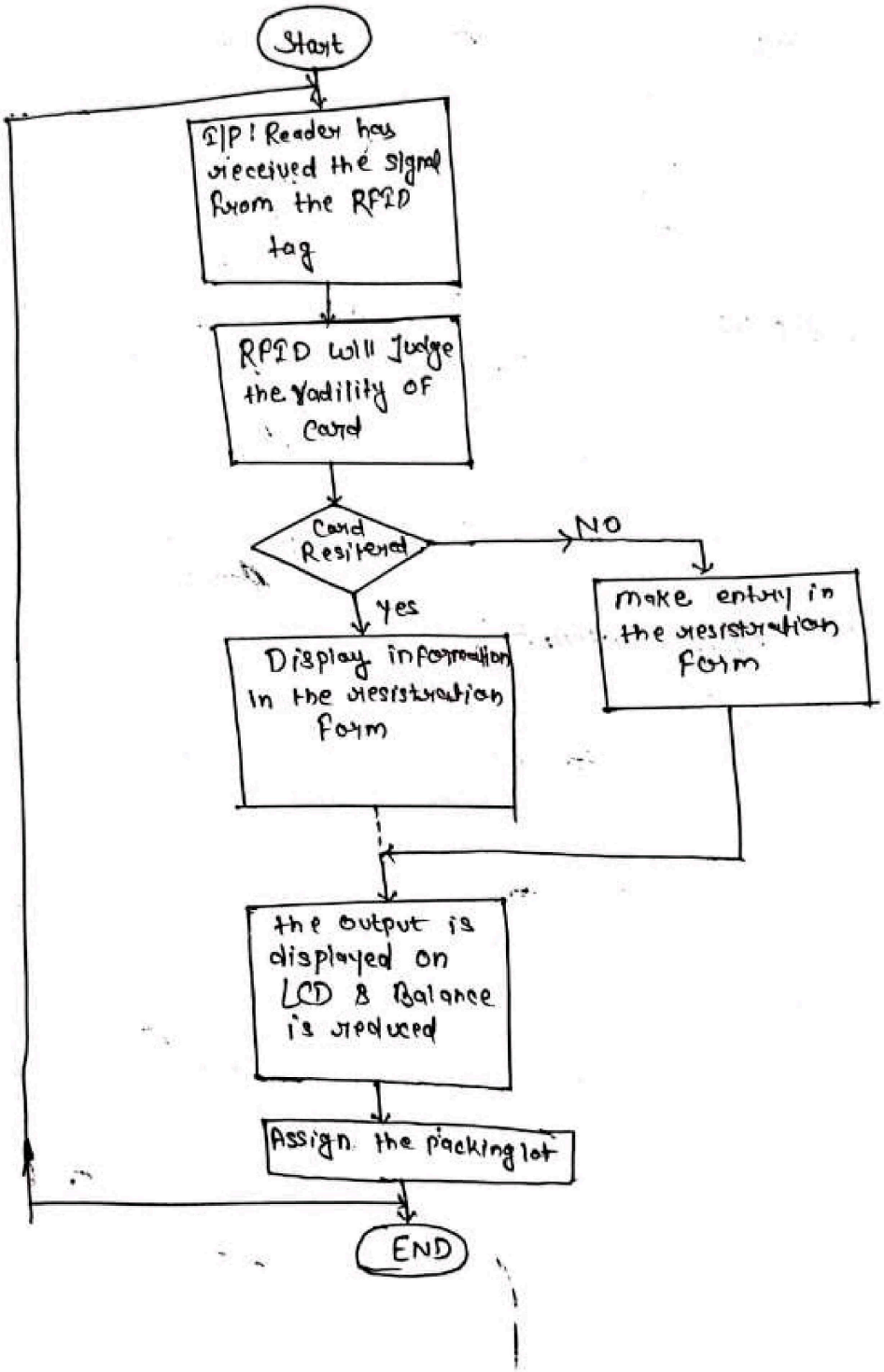
Step 4:- Tracking the count:- To properly utilize the parking lot, the number of the cars presented in the parking lot needs to be tracked in this the number of cars in the parking lot is incremented for every car entering the lot and is decremented for every car leaving the lot.

II. RFID System:-

the RFID system consists of a reader and RFID tags. Each RFID tag records a unique ID and finite information the tag is triggered when approaches the RFID reader the information recorded in the tag is transmitted to the RFID reader.

A RFID system will pass the signal into the digital and computing content In the proposed RFID parking system, the RFID reader is deployed at the gate.

When an RFID parking management system user's car approaches the gate the Induction and communication


Start
I/P ! Reader has received the signal from the RFID tag
RFID will Judge the Vadility of Card
Card Resitered
NO
yes
make entry in the registration form
Display information in the registration form
the output is displayed on LCD & Balance is reduced
Assign the packing lot
END

RFID tag inside the car and antenna of RFID system is automatically established then the reader of RFID system translates the signal information to the digital content.

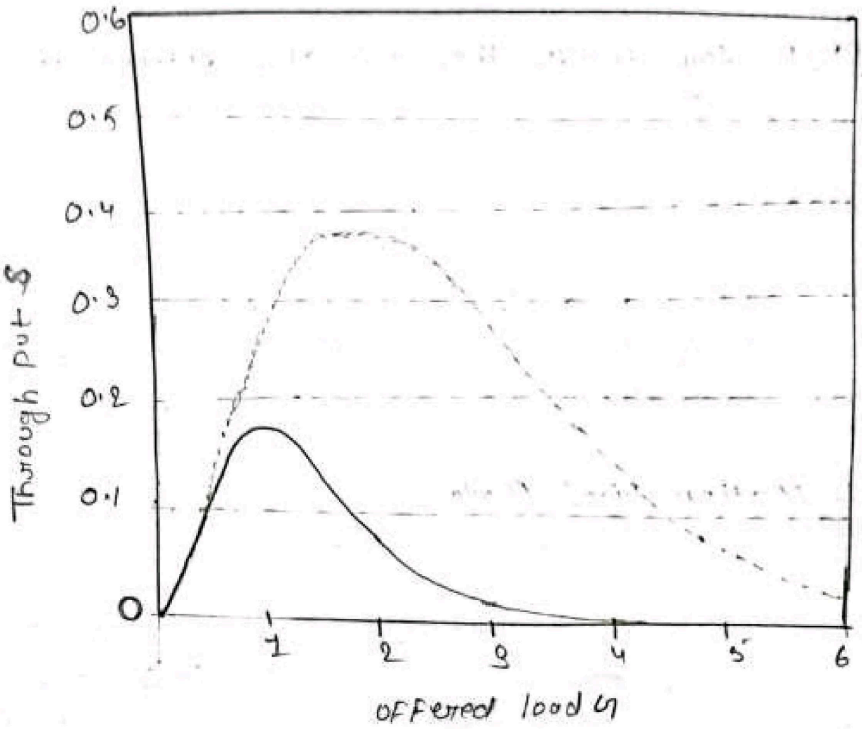
the same procedure will be followed whenever the vehicle leaves from a parking slot the user again have to swipe the card while coming out of the parking.

III. Mathematical Model

Slotted parking with RFID

Tags can transmit data at any time with the pure Aloha protocol But with the slotted Aloha protocol. Tags are not permitted to transmit data at any time. with slotted Aloha protocol tags should be transmitted at the beginning that the tags will collide.

Each tag that needs to be read should have a unique identification number the RFID reader in the wait mode will send a REQUEST command and the tags in the reader range will recognize the REQUEST command and respond to the reader by randomly selecting a slot in order to send the tag identification number to the reader. Using the READ-DATA command the selected tag will send stored data to the reader. throughput of the slotted Aloha protocol is increased by having the tags begin transmitting data at predefined synchronous time slots. the collision



Through put vs Offered load

- Throughput of the slotted protocol is defined as $S = G \cdot e^{(-G)}$

where S is throughput, and G is the offered load

IV System Objectives

the project aims at implementing a automated vehicle management system using radio frequency identification (RFID) technology.

The RFID technology has been used to maximize parking utilization. the RFID kit includes RFID windshield tags and RFID readers.

The applications of RFID are ubiquitous it can be used for inventory tracking animal tracking. animal tracking transportation payments and employe identification RFID technology solutions are reciving much attention in the research and development of many large corporations.

V Scope

one applications of the system can be installed at the parking lots of offices, malls or toll plazas.

In our project we would have all the vehicles with a unique RFID (Radio Frequency Identification) tags attached to it.

1) Video surveillance can be implemented.

Q. It can be implemented your two wheelers as well as your wheelers

Q. Count of no of vehicles coming in a month will be kept

VI OBSERVATIONAL RESULT:-

The observational results of Automated vehicle parking system are:

* the efficency of management can be improved.
* the RFID parking management system is modular and can be embedded in other similar parking system and hardware without additional re-modification.
* the cost of real construction for the RFID parking management system can be decreased and estimated.

VII Conclusions:-

the verification shows that the Automated RFID parking management system realistic and can control the parking automatically the response time delay within 1 second the total cost of Automated RFID parking management system infrastructure can be reduced.

Automated RFID parking management system offers utmost efficiency convenience safety & reliability. It is ideal solution for today car parking.

Building IOT applications.

→ Temperature and humidity monitoring using Raspberry Pi

This is IOT system is an amazing idea you will be fascinated by this wonderful IOT idea. Raspberry PI is a tiny size standalone PC that can work self-sufficiently and self-control a system. this project will send data on temperature and humidity over the internet.

You can configure such a way that an email will give your email address if temperature and humidity increase above a certain level, this system needs two components the first one is the DHT second sensor to detect the temperature humidity the second one is Rasberry Pi to act as the brain of the system and processes and sends the update to the cloud server.

→ Motion controlled servos

The main purpose of this IOT application is to clarify the real time data streaming over IOT devices four major components need to develop the system Raspberry pi acts as the brain motors to receive command of Raspberry pi and operates accordingly. Leap motion controller used for the motion tracking finally glove to

facilitate the sensing action.

→ operation of the Raspberry pi Air and Noise pollution monitoring system over IoT.

the IoT based air and sound pollution monitoring system using Raspberry Pi consists of sensors, a controller an o/p device and a wi-fi communication system contains three different sensors. All the data collected from these sensors is continuously fed to a controller which is a continuously fed to a controller which is a Raspberry pi board in our case the Raspberry Pi converts this sensor data into a convenient form then it transmits the data to a remote web server by making use of IoT - the Internet of things communication protocols.

The Raspberry pi displays the sensor data on an LCD display in real time A graphical user interface can be created on the IoT web server side.

Sensors used in Raspberry Pi air and Noise pollution monitoring system over IoT.

1. CO_2 sensor: the CO_2 sensor measures the carbon emission levels in the air.

2. methane sensor: the methane sensor measures the level of methane gas in the air.

which is extracted from the industrial units and vehicles

8.) Sound sensor :- The microphone measures the (microphone) level of sound pollution in the atmosphere.

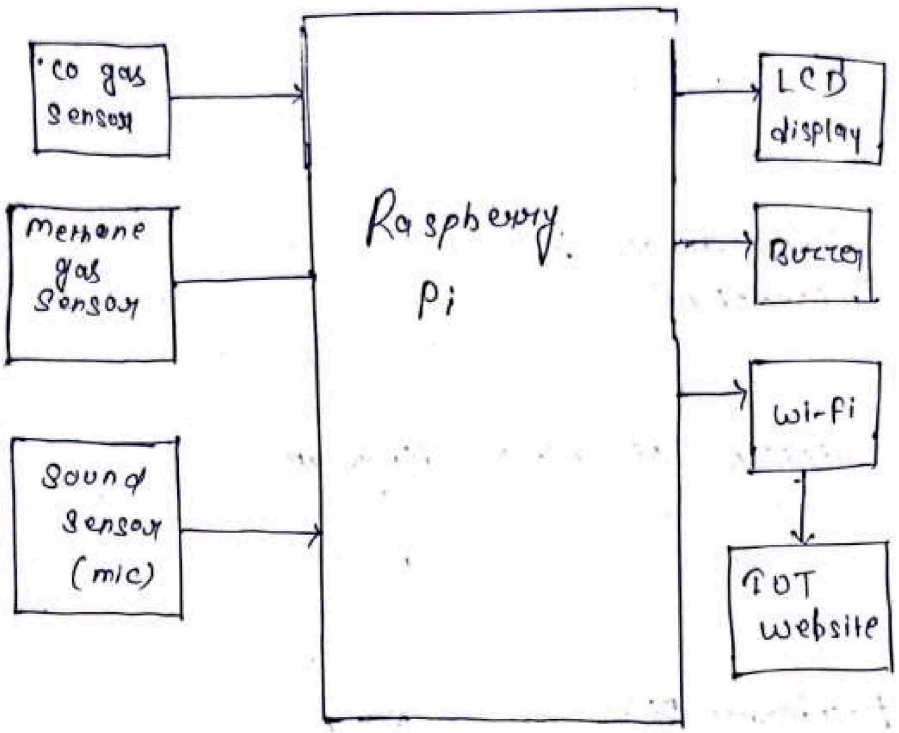
Description of block diagram

The block diagram of the Raspberry pi and IOT - based air and noise pollution monitoring project consists of 6 sub-blocks.

1.) Raspberry pi :- It is the most important part of the IOT air and sound pollution monitoring system. All three sensors send their data to the Raspberry pi single - board computer, the sensors are the i/p devices that send their data to the Raspberry pi controllere the output of Raspberry pi is connected to two o/p blocks these o/p blocks are the IOT web server block and the LED display screen block.

IOT web server

2.) ~~LCD display~~ :- the some air pollution sensor data which is displayed on the LCD is also communicated to the remote web server. this is implemented by means of onboard wi-fi of the Raspberry pi board this server data can then be monitored from a remote location using IOT website.



Block diagram of Air pollution and noise pollution monitoring system.

Applications of the air pollution and noise pollution monitoring project

IoT based air and sound pollution monitoring system using Raspberry pi can be used as a sub-system for smart cities.

We can monitor the real time air and sound pollution levels in any area using this Raspberry pi based pollution monitoring system.

Government can adopt this monitoring system which can be helpful in devising environment-friendly policies.

Advantages and future enhancements of the Raspberry Pi air pollution monitoring system

We can implement the raspberry pi air an monitoring system IoT project using low cost components.

This monitoring system is completely automated and requires very less human intervention also it requires less maintenance.

More environmental sensors can be added to the system in order to get more precise data about the air quality.