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Research Papers

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EXPERIMENTAL INVESTIGATION OF RADIATOR SYSTEM FOR A STATIONARY C. I. ENGINE

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ABSTRACT

The radiator is an essential adornment of vehicle motor. Typically, it is utilized as a cooling arrangement of the motor and by and large water is the warmth exchange medium. For this fluid cooled framework, the waste warmth is evacuated by means of the circling coolant encompassing the gadgets or entering the cooling diverts in gadgets. In this paper different techniques for radiator execution assessment and testing of the radiator are considered in light of the fact that all inner ignition motors produce heat as a by result of burning and rubbing. This warmth can achieve temperatures up to 1925°C (3500°F) and can have disastrous effects on motor parts. Inner burning motors are fitted with a cooling framework which is in charge of expelling certain warmth from the motor and keeps the motor from overheating. This cooling framework requires an extensive space to address cooling issue furthermore have constrained warmth dispersal. Car radiator is key segment of motor cooling framework. Radiator warm investigation comprise measuring and rating of warmth exchanger. Radiator estimate for the most part relies on upon warmth dismissal prerequisite. Heat exchange estimations are imperative essentials to enhance radiator size. In this study, Ethylene glycol (EG) and Ethanediol with aliphatic added substances blended with refined water in different proportions as traditional coolant have been utilized as a part of car auto radiator. These warmth exchange liquid have low warm conductivity. In this Experimental study introduced the blend Ethylene glycol + water utilized as a part of auto radiator. General warmth exchange rate have been spoken to in the present work.

Keywords: Car radiator, Engine Cooling, Efficiency, Coolants etc.

I. INTRODUCTION

Today, the interest of car vehicles is on top. There is a considerable measure of rivalry existing between car commercial ventures. In this way, it is an incredible test for car commercial enterprises to give a proficient and prudent motor. There are different elements influencing the productivity of motor specifically, fuel supply frameworks, Lubrication framework, Transmission framework, Cooling framework, Climatic conditions, Size of chamber head, Ignition timing. Here cooling parameter is taken into thought and investigates are finished. The warmth produced amid burning in IC motor ought to be kept up at more elevated amount to expand warm effectiveness, however to keep the warm harm some warmth ought to expel from the motor. In air-cooled motor, augmented surfaces called balances are given at the fringe of motor chamber to build heat exchange rate. However, these days because of different enhancements in car field, enhanced cooling frameworks are utilized as a part of vehicles to expand the warmth exchange rate .They are examine bellows.

II. LITERATURE SURVEY

Yiding Cao and KhokiatKengskool [1], had gave utilization of the warmth channel in a car motor was presented. In this application, heat funnels were fused into the radiator of the car motor for more productive warmth exchange. The cooling heap of the radiator can be expanded for overwhelming obligation motors, while the force utilization of the cooling fan can be diminished for higher vitality productivity. Heat channels including two-stage shut thermo siphon were two-stage heat exchange gadgets with a viable warm conductance many times higher than that of copper. For the physical applications, gravity was regularly used to right hand the arrival of the fluid condensate and no wick structure was required inside the warmth channel. A little measure of working fluid was filled in a tube**.**

Hwa-Ming Nieh, Tun-Ping Teng, Chao-Chieh Yu [2], This study receives an alumina (Al2O3) and titanium (TiO2) Nano-coolant to upgrade the warmth scattering execution of an air-cooled radiator. The two-stage combination strategy is utilized to deliver diverse convergences of Al2O3 and TiO2/water (W) Nano liquid by utilizing a 0.2 wt. % chitosan dispersant, and the Nano liquid is blended with ethylene glycol (EG) at a 1:1 volume proportion to frame NC1 to NC6(Nano Coolant). The investigations were led to gauge the warm conductivity, thickness, and particular warmth of the NC with various convergences of nanoparticles and test temperatures, and after that the NC was utilized as a part of an air-cooled radiator to assess its warmth scattering limit, weight drop, and pumping power under various volumetric stream rates and warming temperatures. The test results demonstrate that the warmth dissemination limit and the EF of NC are higher than EG/W, and that the TiO2 NC are higher than Al2O3 NC in the vast majority of the trial information. The upgraded rate of the normal EF increments as the fixation and volumetric stream rate of the TiO2 NC increments. sort of compartment. Air was emptied from the compartment and the holder was fixed. Warmth was connected to the

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evaporator area, which causes the fluid to vaporize. The vapor then spills out of the more smoking area because of the higher vapor weight to the colder segment of the warmth funnel, where it was consolidated. The fluid condensate then comes back to the evaporator segment from the condenser segment under the help of gravity.

M. Naraki and S.M. Peyghambarzadeh [3], In this exploration, the general warmth exchange coefficient of CuO/water Nano liquids is examined tentatively under laminar stream administration (100 _ Re _ 1000) in an auto radiator. The Nano liquids in all the examinations have been balanced out with variety of pH and utilization of appropriate surfactant. The outcomes demonstrate that the general warmth exchange coefficient with Nano liquid is more than the base liquid. The general warmth exchange coefficient increments with the improvement in the Nano liquid fixation from 0 to 0.4 vol. %. On the other hand, the general warmth exchange coefficient diminishes with expanding the Nano liquid delta temperature from 50 to 80 C. In this article, the test general warmth move coefficient in the vehicles radiator has been measured utilizing CuO/water Nano liquid at various air and fluid volumetric stream rates, different Nano liquid fixations and a few bay temperatures of the fluid. Likewise, the outcomes have been factually examined utilizing Taguchi strategy.

Rahul Tarodiya, J. Sarkar, J. V. Tirkey [4], the utilized of "Nano liquids" have been created and these liquids offer higher warmth exchange properties contrasted with that of traditional car motor coolants. Vivacious examinations and also hypothetical execution investigations of the level balance tube car radiator utilizing Nano liquids as coolants have been done to study its execution change. Impacts of different working parameters utilizing Cu, SiC, and Al2O3 and TiO2 Nano liquids with 80% water-20% ethylene glycol as a base liquid are exhibited in this article. Utilization of Nano liquid as coolant in radiator enhances the viability, cooling limit with the lessening in pumping power. SiC-80% H2O-20% EG (base liquid) yields best execution in radiator having plate balance geometry taken after by Al2O3-base liquid, TiO2-base liquid and Cu-base liquid. The greatest cooling change for SiC is 18.36%, while that for Al2O3 is 17.39%, for TiO2 is 17.05% and for Cu is 13.41% as coolants. Present study uncovers that the Nano liquids may viably use as coolant in car radiators to enhance the execution.

Feovbokhan, Vincent Enontiemonria, Ohiozua, Ohireme Nathaniel [5], The cooling properties of a privately figured coolant (test C) versus, its bubbling qualities and particular warmth limit were examined close by with a typical coolant-water (as test An) and a business coolant (test B). The consequences of the examination demonstrated that example C gave the best execution contrasted with the other two specimens An and B: the breaking points of test C was 1100C, example A 1000C, and test B 1010C. This implies the likelihood of a bubble out of test C from the radiator is little contrasted with tests An and B. Likewise, for the same amount of coolant more warmth would be required to raise test C to its breaking point than for tests An and B. In other word, better cooling would be accomplished utilizing test C.

S.M. Peyghambarzadeh, S.H. Hashemabadi, S.M. Hoseini , M. Seifi Jamnani [6], Traditionally constrained convection heat move in an auto radiator is performed to cool coursing liquid which comprised of water or a blend of water and hostile to solidifying materials like ethylene glycol (EG). In this paper the warmth exchange execution of unadulterated water and immaculate EG has been contrasted and their double blends. Besides, diverse measures of Al2O3 nanoparticle have been included into these base liquids and its impacts on the warmth exchange execution of the auto radiator have been resolved tentatively. Fluid stream rate has-been changed in the scope of 2–6 l for each moment and the liquid gulf temperature has been changed for all the tests. The outcomes show that Nano liquids unmistakably upgrade heat exchange contrasted with their own base liquid. In the best conditions, the warmth exchange upgrade of around 40% contrasted with the base liquids has-been recorded.

S.M. Peyghambarzadeh, S.H. Hashemabadi, M. Naraki, Y. Vermahmoudi, [7], the warmth exchange execution of the vehicles radiator is assessed tentatively by ascertaining the general warmth exchange coefficient (U) as per the traditional ε-NTU Technique. Copper oxide (CuO) and Iron oxide (Fe2O3) nanoparticles are added to the Water at three focuses 0.15, 0.4, and 0.65 vol. % with considering the best pH for more steadiness. In these investigations, the fluid side Reynolds number is fluctuated in the scope of 50-1000 and the bay fluid to the radiator has a steady temperature which is changed at 50, 65 and 80 _C. The impacts of these variables on the general warmth exchange coefficient are profoundly examined. Nano liquids demonstrated more prominent warmth exchange execution contrasting and water. Expanding fluid and air Re builds the general warmth exchange coefficient. Expanding the channel fluid temperature diminishes the general warmth exchange coefficient.

D. Madhesh, R. Parameshwaran, S. Kalaiselvam, [8] An examine the warmth exchange potential and rheological qualities of copper–titania cross breed Nano liquids utilizing a tube as a part of the tube sort counter

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stream heat exchanger. The Nano liquids were set up by scattering the surface functionalized and crystalline copper–titania cross breed Nano composite in the base liquid, with volume focuses going from 0.1% to 2.0%. The surface functionalized and exceptionally crystalline nature of mixture Nano composite have added to the production of viable warm interfaces with the liquid medium, along these lines empowering the accomplishment of accomplishing enhanced warm conductivity and warmth exchange capability of Nano liquids. The viable warm conductivity and dispersion energy of half and half Nano composite in the liquid medium made ready for the enhanced warmth exchange Characteristics of crossover Nano liquid.

III. PROBLEM DEFINITION

CALCULATION OF HEAT TRANSFER RATE & HEAT TRANSFER COEFFICIENT.

To obtain Overall heat transfer rate.

Heat transfer rate can be calculated as follows.

$Q = m*Cp*\Delta T = m*Cp* (T2-T1)$

Where,

m is mass flow rate which is the product of density and volume flow rate of fluid,

Cp is the specific heat of fluid.

A is circumferential area of radiator tubes,

T1 and T2 are inlet and outlet temperatures, and It should also be mentioned that all the physical properties were calculated.

We will also calculate overall heat transfer coefficient are as follows.

$Q = H*A*\Delta T = H*A* (T2-T1)$

$H= Q/ A*\Delta T$

Where,

H = Overall heat transfer coefficient

A is circumferential area of radiator tubes, T1 and T2 are inlet and outlet temperatures,

AND To calculate Nusselt no.

Nusselt no = H*L/K

Where,

L = Length of Radiator.

FORMULATION OF PROBLEM AND EXPERIMENTAL PLAN

An aluminum stock radiator was tried with a 5L Tata Indica auto out of gear conditions. The coolant utilized as a part of the radiator was unadulterated water. The gulf and outlet temperatures for water were measured utilizing a thermocouple. For the water, a test can be embedded in the tube just before the liquid enters the radiator and directly after it exits. The gulf temperature of air will be accepted to square with the surrounding. A test was put around five inches from the fan on the posterior of the radiator to gauge the outlet air temperature. Ultimately, the stream rate through the radiator was measured by appending a Rota meter just before the coolant enters the radiator.

The TECHNICAL SPECIFICATION used in this research study is as follows:-

1.	Make	:	**Tata Indica Car**
2.	Material	:	**Aluminum**
3.	Flow Type	:	**Cross Flow**
4.	No. of plates	:	**02 {Top & Bottom}**
5.	Height	:	**14.5 inch (368.3 mm)**
6.	Width	:	**24 inch (609.6 mm)**
7.	Material for Tubes & Plate	:	**Aluminum**

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8.	No. of Tubes	:	**36**
9.	Fin & Tube Spacing	:	**<0.5 inch (12.7 mm)**
10.	Diameter of Tube	:	**10mm**
11.	Total No. of Fins	:	**11*24 inches = 264 Fins (1 inch contain**

11 fins & Total Width is 24 inches)

IV. PROPOSED SOLUTION

EXPERIMENTAL TEST RIG AND PROCEDURE

The test rig in Fig. 4 which is used to measured Temperature difference, Overall heat transfer rate & heat transfer coefficient in the automobile radiator engine cooling system. This experimental setup includes a reservoir plastic tank, electrical heater, water pump, a flow meter, tubes, thermostatic valves, a fan, a DC power supply, and Digital thermocouples for temperature measurement heat exchanger (Car radiator). The water flows through plastic tubes centrifugal pump from the tank to the radiator. And constant in all the experimental steps .Two thermocouples have been fixed on the flow line for recording the inlet and outlet water temperatures. Digital thermocouples. Two digital thermometer with the accuracy are used to read all the temperatures from thermocouples. Calibration of thermocouples and thermometers carried out by using a constant temperature water bath.The radiator of the engine was 368.3 mm in height by 609.6 mm in width as showed in Fig. 5, and had a total number of 36 tubes. All the 36 tubes were in a single row and each tube was 2 mm thick. The space between fins & tubes is 12.7 mm apart as shown in fig.5 the radiator was completely clean before the experiments has started.First of all we will fill up the water in the radiator tank & then water circulates in engine through the water pump At this conditions initial reservoir temperature will be note down before start vaporizations, when it reached at 70 to 80 degree Celsius temperature, at this situations thermostat valve gets open & water start vaporizes.it goes to at the inlet of the radiator at this end T1 temperature will be note down from outlet of the engine. Further, temperature rises water circulates it in to radiator .T2 is measured at outlet of the radiator. If any case overflow problem water it goes to the bypass to the tank.

Fig. 1 Coolants Sample

Fig. 2 Actual Experimental Radiator Test-rig.

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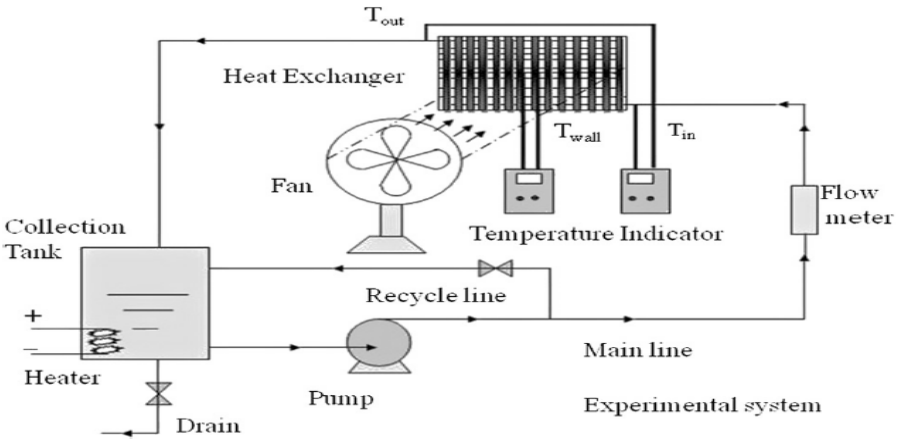

Fig-3: Experimental investigation of cooling performance of an Automobile radiator using Water + ethylene Glycol.

Table 4.1 Thermal And Physical Properties Of Coolants.

Properties	Water (A)	Coolant 1			Coolant 2		
		B(1:2)	C(1:1)	D(2:1)	E(1:3)	F(1:1)	G(2:1)
Density (Kg/m3)	1090	1140	1165	1190	1113.2	1136.4	1151.87
Specific Heat (J/Kg K)	4240	3370	2935	2500	3140	2040	1306.67
Thermal Conductivity (W/m-K)	0.563	0.363	0.263	0.163	0.149	-0.265	-0.54
Viscosity (Kg/m s)	0.000896	0.00198	0.002522	0.003064	0.000971	0.001046	0.001096
Molecular Weight (Kg/Kgmol)	18	62.079	40.0395	47.386	62	40	47.33

Table 4.2Actual Experimental Comparison of Results [Validation]

Sr. No.	Coolant			Inlet Tube Temp of Radiator T1(C)	Outlet Tube Temp of Radiator T2(C)	Temp Diff. across Radiator Tube ΔT(C or K)	Specific Heat, cp (J/Kg K)	Heat Transfer Q=m*cp* ΔT (kW)
1	A. Pure Water		With Fan	84	79	5	4240	53
			Without Fan	89	90	-1		-10.6
2	Coolant 1	B. Ethelene Glycol + Water **(1:2)**	With Fan	84	71	13	3370	**109.525**
			Without Fan	87	90	-3		-25.275
3		C. Ethelene Glycol + Water **(1:1)**	With Fan	84	75	9	3110	69.975
			Without Fan	87	88	-1		-7.775
4		D. Ethelene Glycol + Water **(2:1)**	With Fan	84	72	12	2840	85.2
			Without Fan	90	91	-1		-7.1
5	ola	E. Ethanediol with	With Fan	84	76	8	3140	62.8

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		Additives + Water **(1:3)**	Without Fan	87	90	-3		-23.55
6		F. Ethanediol with Additives + Water **(1:1)**	With Fan	84	76	8	2860	57.2
			Without Fan	88	89	-1		-7.15
7		G. Ethanediol with Additives + Water **(2:1)**	With Fan	84	73	11	2550	70.125
			Without Fan	89	90	-1		-6.375

V. EXPECTED RESULTS

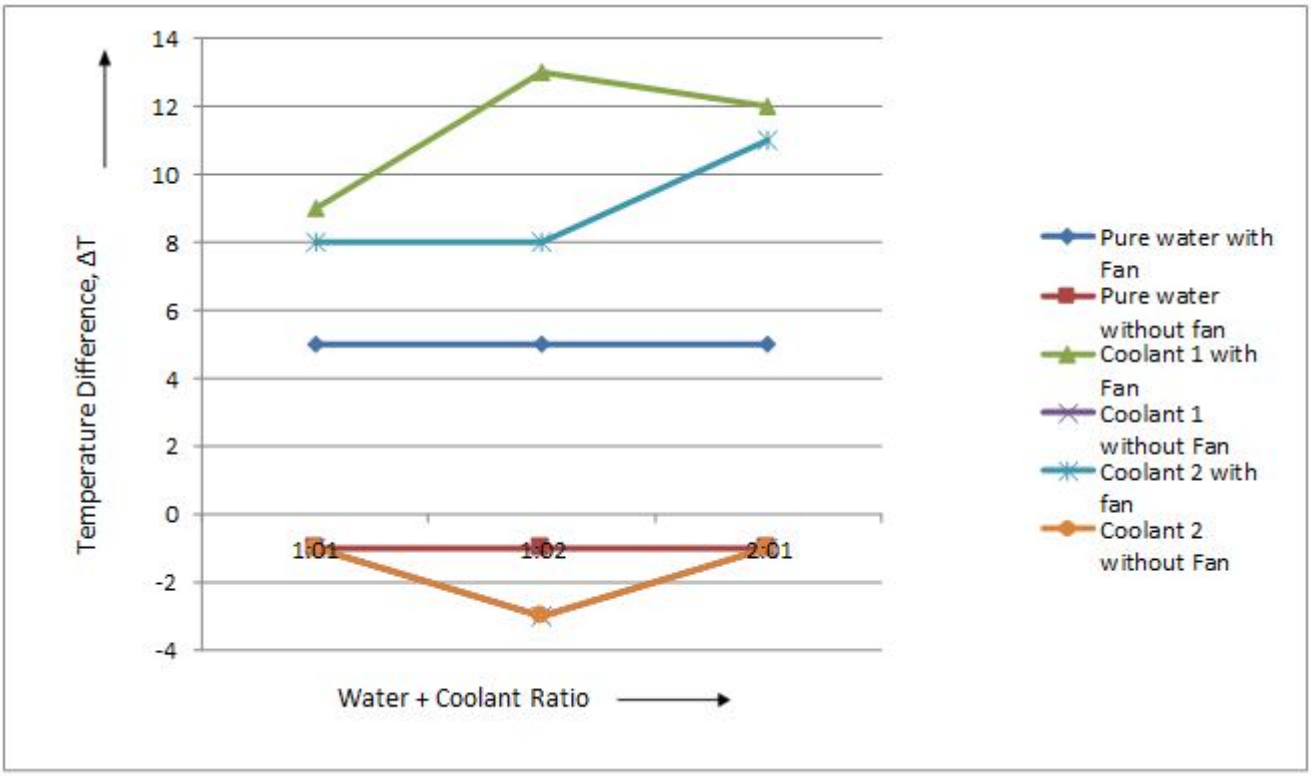

Fig. 4 Temperature difference vs water +coolants ratio

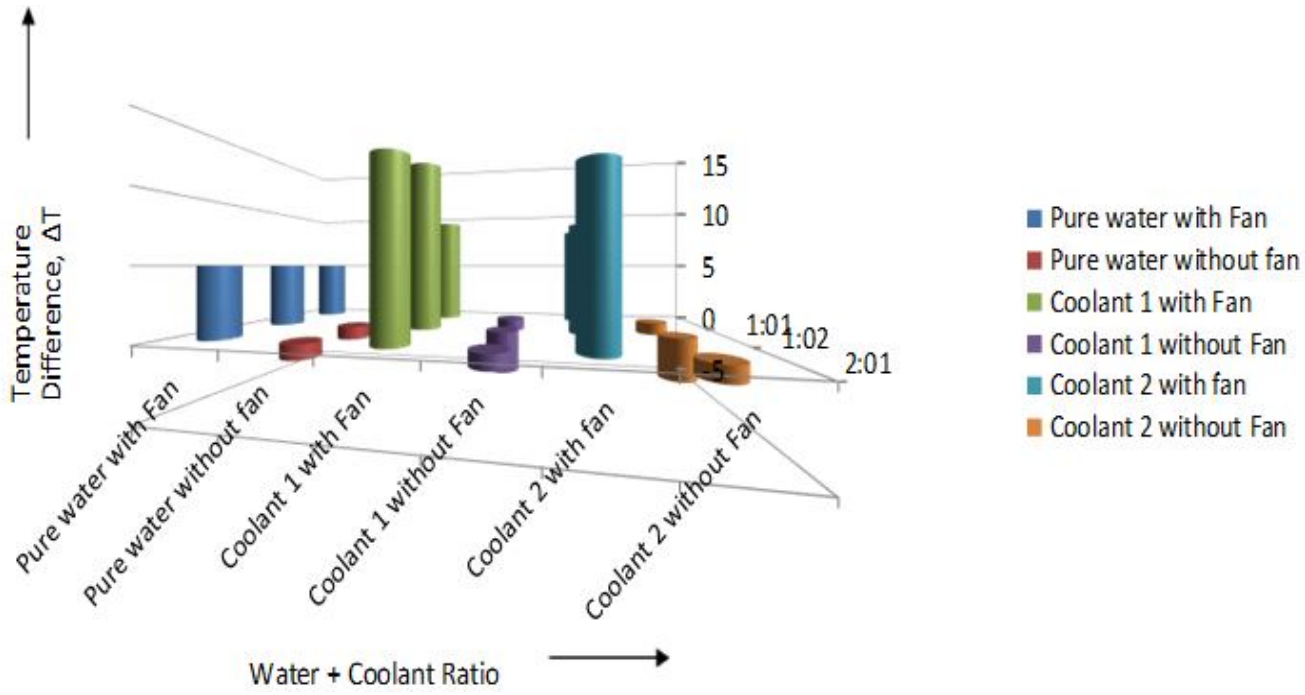

Fig. 5 Temperature difference vs water +coolants ratio

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VI. CONCLUSION

In this article, trial heat move rate in the vehicles radiator was measured with two distinct liquids blended with immaculate water i.e. Ethylene Glycol and Ethanediol with aliphatic added substance at various fixations (1:1, 1:2, 1:3 and 2:1) and the accompanying conclusions were made.

1. The Cooling limit and viability of Coolant 1 i.e. Ethylene Glycol with water blended in proportion 1:2 gives most extreme worth which is 109.525 kW.

2. The general warmth exchange rate diminishes with expanding grouping of coolant in water.

3. In motor cooling framework there is diminishment in fuel utilization.

4. To build warm proficiency of vehicles radiator.

5. To expand life of radiator motor cooling framework.

6. To minimize the weight on the motor cooling framework.

7. To expand cooling limit of the motor.

8. To minimize commotion and vibration issue when contrasted with air Cooled motors.

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POWER QUALITY IMPROVEMENT WITH THE COMBINATION OF ACTIVE AND REACTIVE POWERS

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ABSTRACT
With the public opinion, economically weaker sections have drawn the attention by the power suppliers to supply the power to them economically. In this paper the different types of power systems in the name of "Distributed Generation systems" have been combined. Most of the countries will have the renewable usual collection and about 20-30% electrical supply has been generated through renewable energy sources only. Hence the electrical power sales within 20 years may be through renewably power generated only. Most of the requirements have been attended by the generating companies and added in their list essentially, wind energy and solar energy as the bulk power systems. Distributed power systems concept is largely included through wind resources, run of river hydro power, such as hydro wave energy is made use of. In this concern major consideration is wind and solar energies. Most of the varieties of distribution. generation have been shared with similar characteristics, since the variability is largely driven by weather or other natural phenomena tic features.

Similar optimization and integration approaches are applied to these distribution generation resources. In fact the load is also influenced by weather conditions. Therefore the demand of distributed generation in optimization may come into existence.

Keywords: Distributed Generation System (Active, Reactive, Both Active and Reactive Powers), Photovoltaic System, Wind Energy, New Concept of power system

I. INTRODUCTION
The distributed generating System is the new and unique power generating systems of its own and economic type. In this system the small generators are used compared to conventional systems of power generations. They are distributed along with the power transmission and distribution lines closer to the load or load centers. In the normal conventional type generation the power is transmitted and distributed the transmission and distribution lines from a single generating plant, where many power quality issues incurred. While through distributed generating system the power quality is improved as per the expectation of consumers.

In this systems, most of the small generators are configured, the model represents as the centralized system of generation with economic way. This system of generation is located away from the city area or populated area as per the environmental reason and availability of fuel and water.

Hence this generating system has the following features
- ✓ Small generators are installed near the load centers
- ✓ It has decentralized generation aspect
- ✓ It has embedded quality generation
- ✓ It disperse the generated power efficiently

II. ADVANTAGES AND DIS-ADVANTAGES OF DG SYSTEMS
i. ADVANTAGES: Renewable
- ✓ Energy Sources: Reduce fossil fuel consumption
- ✓ Increase the Efficiency of the working systems
- ✓ Reduction of T & D electrical losses
- ✓ Deferral investments in T & D systems (enhance network capacity)
- ✓ Network support and auxiliaryservices
- ✓ Continuity, Reliability and Security of supply system
- ✓ Improves competitiveness and Market opportunities

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- ✓ Flexibility and locality (resources, business, employment

ii. DIS-ADVANTAGES

- ✓ High level of dependence on imported fossil fuels
- ✓ Environmental impact of greenhouse gases and other pollutants
- ✓ Security of supply under threat
- ✓ Transmission losses
- ✓ Necessity for continuous upgrading and replacement of transmission and distribution facilities
- ✓ Load demand is continuously growing

III. APPLICATIONS OF DG

In general, distributed generation system can use any type of electrical generator or static Converter/inverter which produces an alternating current which has the ability of parallel operation with the utility distribution system. It is designed to operate separately from the utility system and can feed the power to the load which can also be fed back by the utility electrical system also. A distributed generator can also be referred as only "generator"

IV. EQUIPMENTS FOR DISTRIBUTED GENERATINGSYSTEM

Reciprocating Engines, Gas Turbines, Micro turbines, Fuel Cells, Photovoltaic Systems, Wind Energy Biomass, Hydro-electric resources, new network technologies

V. PHOTOVOLTAIC (PV)SYSTEMS

The devices which are supplied from solar photo voltaic cells: Such as Night Lamps, car coolers, Toys etc. They consist of a small solar panel and motor, operated at the low voltage of 12 V D.C and current in the order of milli or micro amperes. The devices used in this system are different from the general system. They can be used to supply the power to house utilities, such as internet connection with utility offset to building energy consumption.

VI. Power Quality Improvement Using FACTS Controller D-STATCOM USE OF D-CUSTOM POWER DEVICE TO IMPROVE POWER

QUALITY: To overcome the problem of Power Quality issues in the conventional and Non conventional devices, the equipments are very sensitive to voltage sags and swell; they need the justifying devices to be very quick in action. So in order to overcome the power quality issues, new technology device called D-custom power device is used. This device is the newly designed of power electronics equipments for enhancing the power quality, such as reliability and flow of quality power with low distribution networks etc. In this paper, D-STATCOM is the proposed topology which can be used for compensating the current reactive power Compensation, power factor improvement and harmonic Suppression in all the feeders of conventional and nonconventional DG power.

VII. IMPACT OF DISTRIBUTED GENERATION ON DISTRIBUTION SYSTEMS

1. General Concept of Power Systems. In the general concept, power is generated by conventional method using thermal or hydro power resources and transmitted to the substation then its step-down as power the requirements say 110/33KV. 33KV line is send the consumer's area again step-down to 11KV then distributed through II/0.4KV systems.
2. New Concept of Power Systems: The new concept is presented in this paper. Where, the power is generated by Distributed generating concept with non conventional method using solar energy and wind power energy and sent the power to common grid which is installed near the load centre. Both the conventional generator power and non conventional generator power with improved power quality are connected to the consumer's end with auto or manual control switch. Whichever is convenient will be supplied to the consumers in the economic way.
3. Impact of Distributed Generation on Power System Grids: In DG system of power generation nonconventional energy system is used, which generates high active power is an advantage; the same transferred to grid system then sent to consumers in economical charges.
4. Impact of Distributed Generation on Voltage Regulation: The voltage regulation of more acceptable compared to conventional generation and distribution.
5. Impact of Distributed Generation on Harmonics: Harmonically distorted wave form can be rectified as a purely sinusoidal wave form in these systems as an advantage to the A C operated devices.

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6. POWER QUALITY RELATED ISSUES OF DISTRIBUTED GENERATORS: The major power quality issues may incurred on the distributed generating equipments connected to the grid system. Voltage Regulation, Grounding Issue, Harmonic Distortion, Flicker, Islanding, Sag and swell etc.

VIII. CONCLUSION

Distributed generation is the need to fulfill the requirements of Electrical supply in a present time, because of Continuity, Reliability and Security of supply. Improved competitiveness and Market opportunities, flexibility and locality (resources, business, and employment.) Distributed generation systems are smaller in size & can't design of any required rating with low cost. Most of the Distributed systems are based on natural resources.

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OBSTACLE DETECTION AND RECOGNITION WITH MACHINE LEARNING FOR BLIND USING SMART SHOES

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ABSTRACT
The paper presents an Intelligent Shoes for the visually impaired or the blind one which detects the obstacles as well as identifies it with the use of machine learning and will help the blind to exactly know what obstacles are present in front. The shoes are designed in such a way that it can be charged automatically as you move on. The shoes consist of different sensors embedded in it which will detect the obstacles, identify it and calculate the distance between the user and the obstacle. An Android application is developed which connects to the shoes using Bluetooth will specify the shortest route using maps. As soon as the obstacles are detected the shoes vibrates and send signals which is then converted into speech and voice commands are generated.

Keywords: Blind; Shoes; Navigation; User; Camcorder; Machine Learning; Obstacles; Sensors; Pico; Route.

I. INTRODUCTION

The world consists of more than 1.3 billion people which are visually impaired among which around 36 million are totally blind. 80% of all vision impairment is considered avoidable globally. Vision impairment is majorly caused after the age of 50 years and above. Most of these worlds visually impaired lives in the developing countries. Still people use the traditional white and red color cane for navigation.

Since blind ones are the part of world they are been treated with sympathy and pity are shown upon them but still they can't be helped out but with increase in the technology in day to day life some of the technology can be used for the blind one. The technologies will help them for making the impossible to possible. Communication with the environment for the blind can be the greatest advantage. Thus entertainment and comfort increases with the decrease in the stress, inferiority, grief, and distress. In order to communicate to the environment such people can stand up with the latest technologies. For people living in Developing countries it is quite possible to adapt such technologies. Adaptation of such technologies will enhance the life of the visually impaired one.

So, it is high time to replace such traditional equipment's with the latest technologies which may lead to great innovation in the life of the people. It can avoid unfortunate deaths caused due to accidents which may vary according to different situations and save their precious lives.

These intelligent shoes will drive the user to its relevant paths and will carry you to the destination without major challenges that blind people actually faces. It will not completely change or clear out all the difficulties, but it can change the way of living of blind person up to a great extent.

II. INTELLIGENT SHOES

A. Detection of obstacles

Obstacles may vary according to the environment and situations. It might consist of Stones, Speed breaker, Vehicles, walls, trees and many much more. The Obstacle may be a person coming towards the user. There are various Sensors to detect obstacles coming in front such as Ultrasonic sensor, Infrared Sensor etc. The sensor used in our project is a high range Ultrasonic sensor

The Ultrasonic sensor is placed in front of the shoes where it can detect the Obstacles coming or stable (constant) and can Measure the distance between the obstacle and the shoes. As obstacles are detected the data is sent to the Android app where it converts the Data from Text to speech by speech recognition libraries in Python. The user can communicate to its shoes as well as android app via a Bluetooth so voice commands are sent to the user which may allow him/her to get aside or change its route

As the shoes moves through its way Ultrasonic sensor CH-101 is assembled in the shoes. Non-intrusive property of Ultrasonic sensors allows them where physical contact with their target is not at all required. The properties of acoustic waves with frequencies above often at roughly 40 kHz i.e. the human audible range is measured by Ultrasonic sensors. High-frequency pulses of sound are generated on which these sensors operate then receiving and evaluating the properties of the echo pulse.

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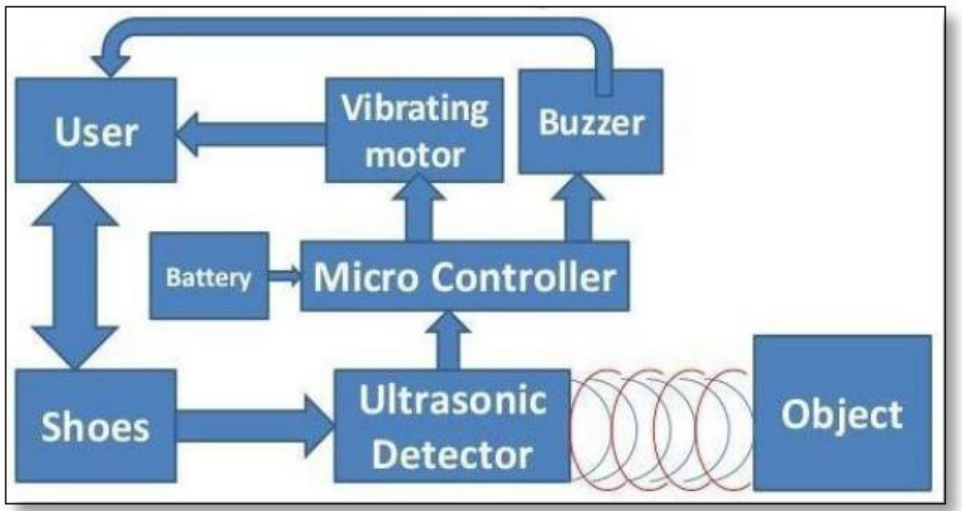

Fig-1: Block Diagram

For different sensing purposes, the received echo pulse may be evaluated with three different properties. They are:

- Time of flight (for sensing distance)
- Doppler shift (for sensing velocity)
- Amplitude attenuation (for sensing distance)

1) Time of Flight

a) 1A. Reflection Mode

In reflection mode (also known as "echo ranging"), an ultrasonic transmitter emits a short burst of sound in a particular direction. On detection of a target the pulse bounces off and returns to the receiver after a time interval t. The receiver records the length of this time interval and calculates the distance travelled r based on the speed of sound c:

$r = c * t$

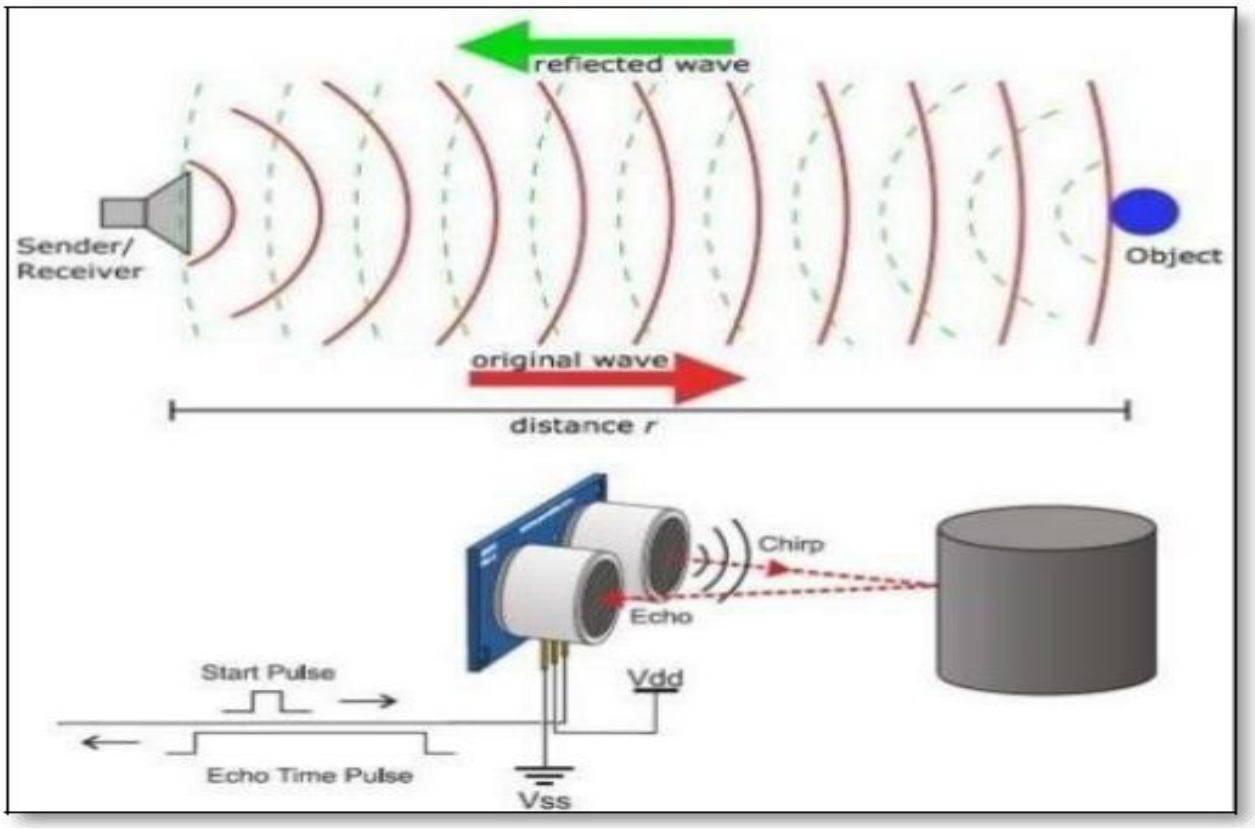

Fig-2: Reflection mode

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Very often, separate transmitting and receiving transducers are placed immediately next to each other, housed as a single unit. In these cases, the distance calculated will be twice the distance from the sensor to the target.

a) 1B. Direct Measurement Mode

The transmitter and receiver are two separate units in the operation of this mode that move relative to each other. Multiple transmitters can be used to increase the directionality of the transmitted pulse, whose signals were received by multiple receivers in the performance space, enabling a computer program to triangulate the performer's position.

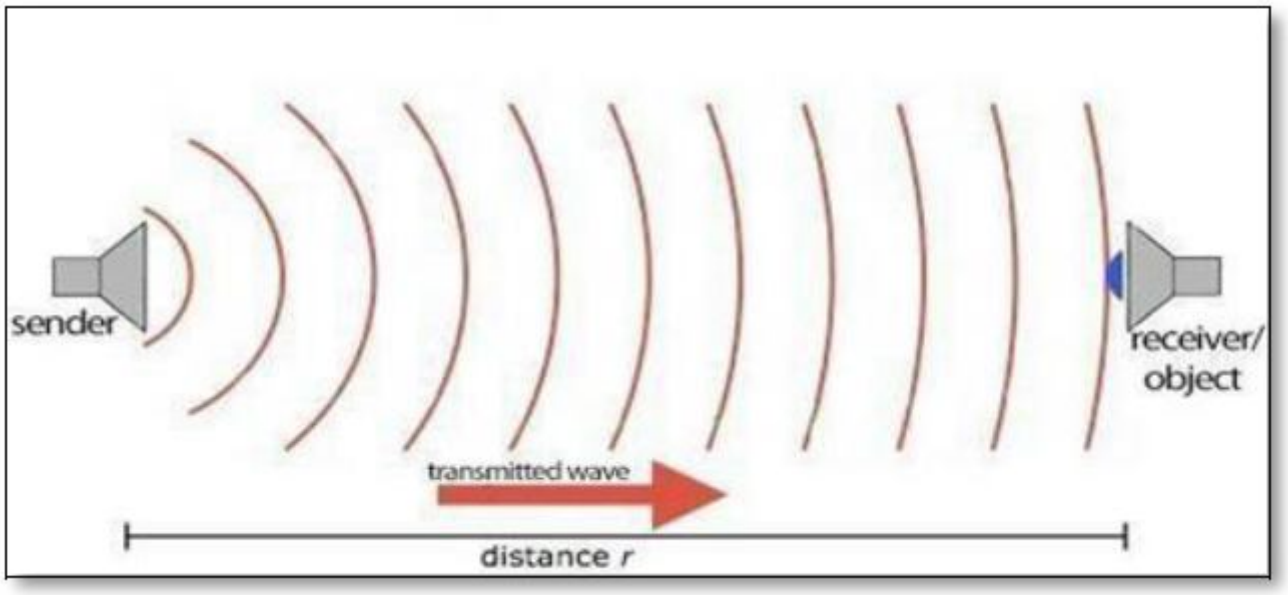

Fig-3: Distance measurement

2) Doppler Shift

When a wave reflects off of a moving object, its frequency is shifted by an amount proportional to the velocity of the object. In ultrasonic sensing this fact can be exploited by having the receiver measure not the time of flight but the frequency of the returning echo pulse. Knowing fe and fr, the frequency of the emitted and received pulse, respectively, the velocity v of the target may be calculated.

$fe - fr = 2\ fe\ (v / c) \cos(A)$

Here, A is the angle between the target's and the pulse's lines of motion.

3) Amplitude Attenuation

When propagating through air, the attenuation of Ultrasonic sound is much faster than audible sound. By measuring the intensity of the returning pulse, an estimate of the distance travelled can be made using the following equation:

$I = I0e\text{-}ax$

B. Identification and Determination of Obstacles

Once the Obstacles are detected the shoes can even determine the object coming infront of it which will help the blind to know the actual object. The technology used is machine learning and deep learning where the product is given the power to detect and learn the objects the blind is going through. A HD camera is installed infront of the shoes which capture the image of the obstacles and then it is saved to the Database where the image is recognized by use of machine learning.

C. Charging of the shoes

The charging of the shoes is the biggest disadvantage. What if the shoes get discharged in the middle of the path? At that time what could be the backup? It might Create difficulties in those situations hence the product fails else the user has to carry the Charger with them. Still it is not an easy task to carry everything with them. One Problem was that can the Batteries bear the load of a person which might range between 50 to 120 kg?

The solution to the problem we came up is we can use piezoelectric plates to charge the Shoes. The potentiality of certain substance to generate an electric charge as force is applied to it is known as piezoelectric effect. These Piezoelectric plates can be installed between the soles of the shoes. When the user uses the shoes while walking

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these plates get pressed it themselves generate electricity. The electricity generated can also be used to charge the smart phones. These will reduce the work of charging the shoes. Even there is no need to charge the shoes as it charges itself automatically on walking hence these shoes are named as intelligent shoes which doesn't need to charge its components.

4. On detection of an object the wireless camera continuously transmits the information to the controller which gets stored in the database and identification of obstacles is done and is sent to the user.
5. The Android app embedded with Google maps will allow you to search your shortest routes and will take you to your destination safely.
6. A piezoelectric plate will continuously provide charging to the components as the user starts on walking and stress is applied to the plates thus the components works well without interruption and the user is stress free.
7. The Android application is interfaced with the microcontroller and it helps continuous monitoring by the user.

Fig-4: Piezoelectric plates

III. CONTROL OPERATION

All the activities of the shoes are controlled by a centralized microcontroller attached with the shoes. This controller is interfaced with piezoelectric plates, vibrating motors, buzzers, wireless camera, ultrasonic sensor, driver circuit and Bluetooth modules. Micro controller does the following function.

1. When the shoes are turned on by the operator, the microcontroller enables the driver circuit.
2. The driver circuit enables the working of inside components of the shoes by turning on the motors. The operator can control the shoes as per pre-programmed instructions.
3. The output value is sent by the Ultrasonic Sensors periodically to the controller. When the controller senses an abrupt deviation in these values, it confirms the presence of an obstacle. The controller now interrupts the driver circuit and turns on the vibrating motors and the data is sent to the Android application where conversion of text in to speech takes place.

Fig-5: Smart Shoes model

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IV. DISCUSSIONS

A. Advantages

a) The shoes are easy to design and implement. All the components used have simple operation and is very simple to program.

b) The proposed product eliminates the need for the blind persons to get into the help of other people or using red and white canes for navigation.

c) The cost of shoes is economical that might cost few thousands. The maintenance is also cheap.

d) The shoes are highly user friendly. You don't need to operate it everything works automatically once the shoes is turned on.

e) The use of machine learning, additional details provided by the wireless cameras and sensors are also of great help to the users.

f) You don't need to charge your shoes even you can charge your smart phone with the shoes.

B. Disadvantages

These shoes cannot detect the obstacles at a height above the ground such as a ball coming towards the user at a great speed. As it is based on voice, language can be a barrier.

V. CONCLUSION

The proposed shoes is designed with the motive of helping the blind or visually impaired ones to prevent them from getting affected by various situations where they need help of other people or using white and red cane for navigation. The death also occurs due to accidents or falling off. It is high time that these shoes should be implemented for the visually impaired ones all over the world. Moreover, these shoes will help to detect the obstacles on their way and identify such obstacles for the user where the user will have knowledge of what he or she is passing through. The user can find its path through maps and can lead through it using Bluetooth.

When these shoes would be implemented in real time, it will not completely change the life of a blind but it will make changes in the way of living up to a great extent. It will save thousands of blind people's lives who face challenges at every moment of life. In this modern society, where everyone is busy with their own life let's use the science and technology for such needful people too. Hence, these shoes help to have a unique lifestyle even for those who are not blessed with the nature.

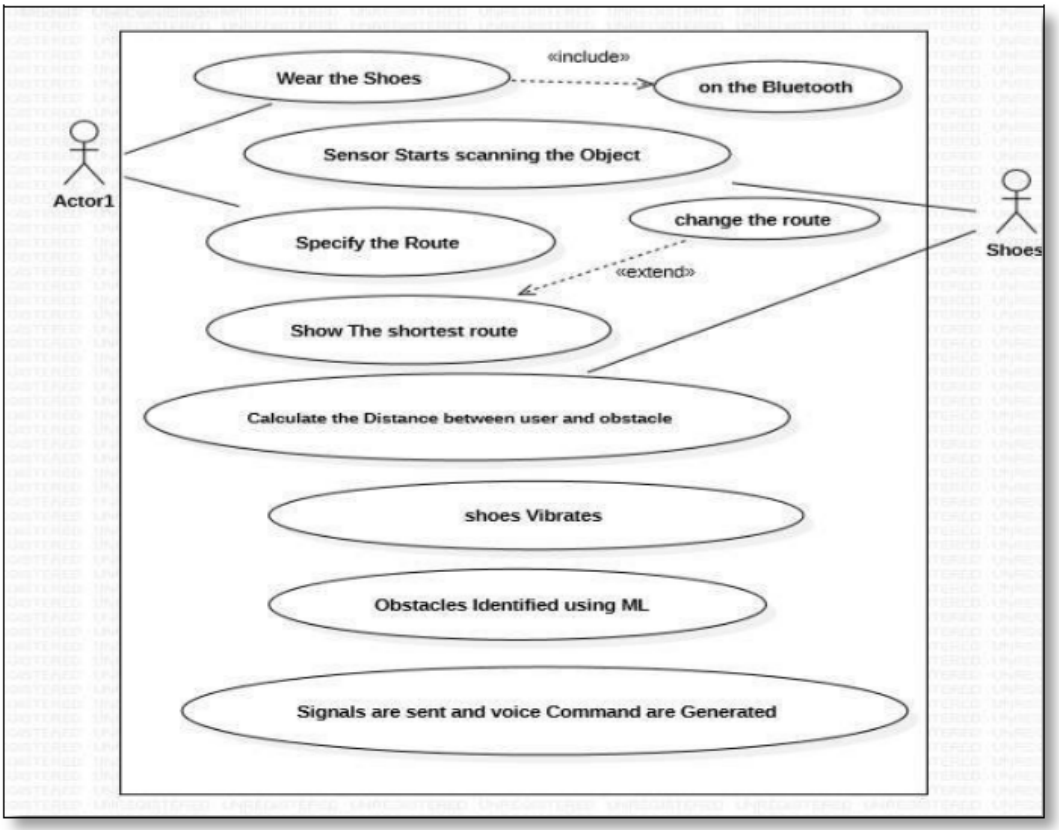

Fig-6: Use case diagram

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LITERATURE REVIEW ON DESIGN AND FABRICATION OF PATH FOLLOWING CART

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ABSTRACT
In every field, industrial automation is increasing day by day. The labor cost and the processing time taken by the human is being reduced by industries. Hence, the proposed project is useful for carrying and transporting the materials efficiently with less consumption of time.

The following path following cart is a small wheeled robot which will follow the user and will have a surface on which to conventionally place heavy objects. The present condition in the industries is that they are using the crane system to carry the transportation of goods from one place to another. Sometimes the lifting of big weights may cause the breakage of lifting materials and will also cause damage to the goods too. A line follower cart is an electronic system that can trace and follow the line of the desired path. Generally, the line is specified a predefined path that can be either visible like a black line on a white surface with a high contrasted color.

This technology is focused on the delivery of safe, timely, efficient and easier transportation in the industries. However, this cart could be adapted towards other purposes, such as carrying suitcases on airports for those who have a lot of luggage and also used in malls for carrying goods and other products for the costumers.

Keywords: cart, design and fabrication, path follower, sensor.

INTRODUCTION

In the automotive production carts accomplish the more are the castoff in small, regularly self-contained, segments of the construction lines. Humans are still mandatory to draw mechanisms from granaries and, in some circumstances, shift incompletely accumulated products segments amongst the stations on the production line. Line follower carts are used in semi to fully automated plants. In this environment the cart functions as carrier to deliver products from one manufacturing point to another, where rail, conveyor and gantry systems are not a suitable option. There are many rooms such as store house or warehouse, different workshops, and also some inventories for holding o carrying the finished or partly finished goods. A lot of workers cause the high labor cost for the owner. Some workers have to work there for machining this raw material that are inevitable. The line follower is a self- operating cart that detects and follows the line that is drawn on the floor.

DESIGN AND FABRICATION

Main Components of Line Follower Cart:

1. Sensors
2. Analog to Digital convertor
3. Comparator
4. Motor Drive
5. Actuators [Motor and wheels]
6. Arduino Uno
7. Chassis and Body structure
8. Power supply

BLOCK DIAGRAM

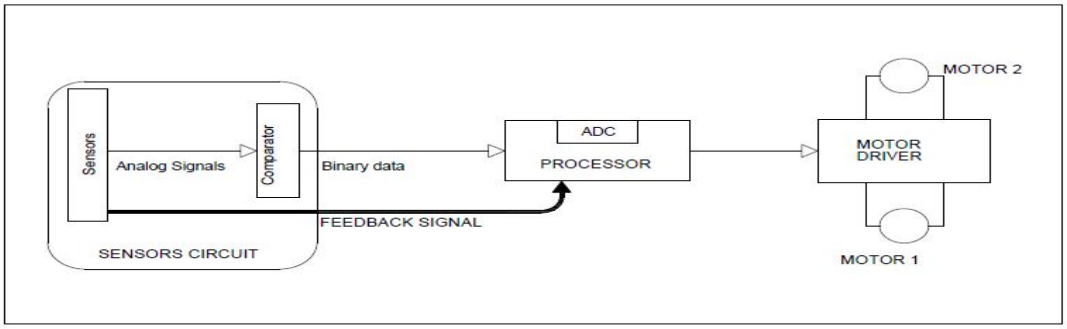

Figure-1.1: Block Diagram

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The electrical circuit of some line follower carts can compare the analog signal received from the sensors and then transmit the results to the processor in the digit '0' or '1' and some of them send the analog signals to the processor directly and the processors ought to convert them to digital form. Anyways, the analog signals must be converted to digital form and then the processor can process them.

1. Sensors

The distance between sensors and ground surface is important and it is more important that how we put sensors near each other. Measurement errors are the most common problem in these types of carts that has to follow the line. Thus, the final performance of the cart mostly depends upon the sensor type and the sensor placement.

1.1Types Of Sensors Used in Line Follower Cart:

1.1.1 Light Dependent Resistor (LDR)

1.1.2 Infrared Sensor (IR)

2. Analog to Digital Convertor

The received signal from the sensors are in the form of analog and must be converted to the digital form. Therefore, the circuit can be designed to send the sensors signals to the processor, directly. Hence, the processing time can be managed just by using an external ADC. The resistance of the receiver sensor is decreased when infrared is radiated on it.

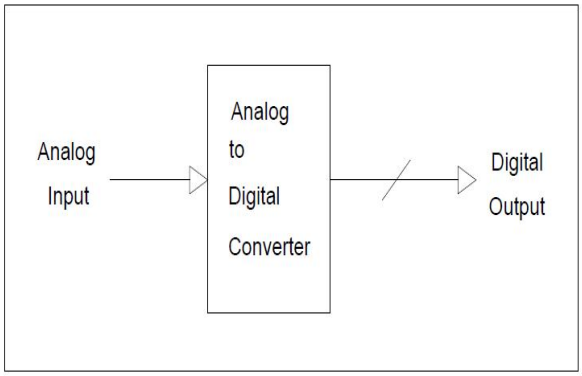

Figure-1.4: Analog to Digital Convertor

3. Comparator

Comparator is used to make the system sensitive as per the requirement and usually compares the voltages between the inverting and non- inverting terminals. A threshold voltage is set on the reference voltage in the operational amplifier in inverting and non-inverting terminal. If another terminal voltage that is input voltage is greater than this threshold voltage then it gives the output.

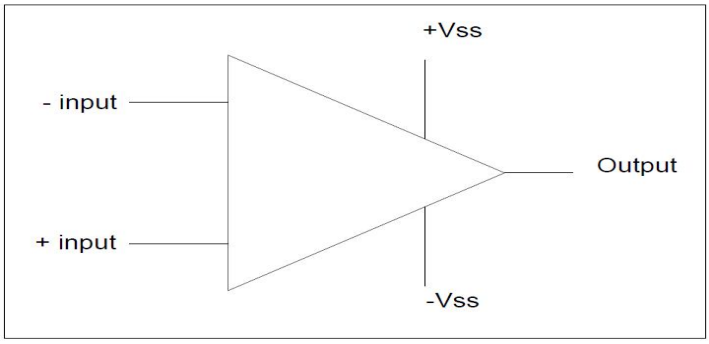

Figure-1.5: Comparator

4. Motor Drive

Motor driver acts like the current amplifier. It is also used for controlling the current in the motor. The motor drive provides high current as the DC motor needs when it receives low current in the circuit for driving the motors a high value of current is needed. By using the motor drive a line following cart can move in clockwise and in anticlockwise directions. It completely controls the movement of DC motor; hence it has been called as Motor Drive. It can rotate the motor in forward and reverse directions.

5. Actuators (Motors and Wheels)

Motors are very important part of the cart. Because the movement system is the main part of the line following. Some most important things are that both motors must be of the same kind, speed, power supply and smooth.

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So, choosing motors are very important as there are so many kinds of motors available in the market. Wheels also have to be same size and radius. Wheels size effects on the cart speed. Four wheels are used among them, two are connected at the back side of the chassis with motors and two wheels are independent and connected to the front side of the chassis.

6. Arduino Uno

Arduino controls the whole cart actions. The motor shield is placed about it. Motor shield pins are connected to Arduino pins. It contains everything needed to support the microcontroller by simply connecting it to a computer with a USB cable one can program it. It supports 5V DC to 12V DC. The safe power supply is 9V DC.

7. Chassis and Body Structure

Cart body is another important thing one can use many kin of chassis but it should be kept in mind that chassis has to support all devices and also has to be strong. There are some good materials for designing carts such as wood, plastic, aluminum and brass alloys. We must pay attention to the resistance, weight and mechanical ability for choosing one them. All components can be installed on the circuit fire to decrease the weight. Aluminum will be used for chassis because of its light weight and being strong enough for cart.

LITERATURE REVIEW

Ravi Kumar Mishra [1], has implied a robot which follows a white stripe on a black surface or a black strip on black surface and is an autonomous robot which drives itself. In this experiment LED-LDR sensors are used instead of microcontroller. They also implied that if the sensors are placed on a white surface, the motor is turned on and while on the black surface it will be turned off. Ashwini Bhor [2], has designed and constructed a follower robotic cart using ultrasonic sensor that tracks and follow the targeted person. In this article they also approached a control system that carries luggage and also follow the target person. Ultrasonic sensors are used to identify and follow the target person. The system is designed to provide a contactless transport along with the target person. The distance between the person and the robot is measured and the movement of the robot is decided by the inputs given to microcontroller by ultrasonic sensor. Michael Loong Peng Tan [3], therefore, a line following shopping trolley with a smart shopping system is developed to solve these problems. A line following portable system is installed under the trolley to lead the users to the items' location that they plan to purchase in the supermarket. This paper presents the hardware and software design of the portable robot and the result of the testing on the used sensors like ultrasonic and line sensors are presented. Lastly, the graphical user interface of Android application of the shopping trolley in operation is explained. Amal Ali Sreawi [4], therefore in this research the design robot that able to walk between two lines and at the same time, this robot can pass the barriers that facing it. This robot can help in many areas, such as to be a helper in hazardous work or in the transport of materials that are dangerous to human life, in this robots should sense the line with its Infrared Ray (IR) sensors, and the objects sensors should sense the objects in front of the robot to be able to pass it easily. Anusha K. Holla [5], in this ,they have depict reasonable and cost-effective Smart Shopping Cart utilizing IoT (Internet of Things) innovations .Such a framework is appropriate for use in spots such as Walmart & supermarkets, where it can help in lessening work and in making a superior shopping knowledge for the clients. Rather than influencing the clients to sit tight in a long line for looking at their shopped things, this framework helps in mechanizing the easy and comfortable billing process and the shopping is processed with two aspects, with a redefined list and random shopping. Our pro-posed system provides the nearest route to pick-up the listed items present indifferent racks of the Walmart. Also, with the added feature we have an approach where Cart-to-Cart communication is enabled that allows a customer to share their shopping list with co-shopper to enable parallel shopping using two or more carts. These features save time and make shopping easy. Along with these abilities, this system design is also capable of detecting theft by shoplifters. In addition, the Walmart or supermarket management will be able to analyze the shopping behaviors of various customers to arrive at valuable business insights. These will be very beneficial for the retail stores. Avni Garg [6], a smart cart is proposed that will be capable of generating a bill from the cart itself. The customer will make the payment in no time through a rechargeable credit card which will help to maintain database and introduce schemes and offers in stores accordingly. The designed cart eliminates the effort of self-packaging, makes the best use of cart storage space and involves security mechanism for theft control. The smart cart uses RFID technology for shopping and payment, AVR microcontroller for peripheral interfacing and inventory management and the innovative system will help the stores to see a rise in their sales along with delighting customers. Deniz Yildirim [7], in this work a line following robot used to carry children through shopping mall entertainment place, it can be moved manually forward, backward, left and right and it is operated using two permanent magnet DC motor. Manisha Joshi [8] the bot upon receiving the signal from the NRF transmitter installed on the tables traced the path (using the IR sensors) collected the order from the particular table,

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brought the order back to the kitchen, and delivered the same. The major drawback of this project is that the robot can cater at the maximum two tables. Badana Manasa [9], the main objective is to design a line follower robot is to carry products in the manufacturing process in industries and they mainly focused on the design to work the line follower efficiently with lighter weight. The line follower robot designed with 5 sensors to make the robot move in even complex paths. The paper discussed the mechanical and technical issues with the line follower robot and applications in various fields. In the working model, they used black detector infrared sensors so that speed of response of the robot is high.

CONCLUSION

The data was collected for designing and fabricating a path follower cart. It should be cost efficient, less processing time and should have a good strength to bear the loads and stresses acting on the cart. Literature review has been done for line following cart and many research papers were referred for the literature review. Thus, there is no need to pull heavy loads and if the user wants to lead the navigation, the smartphone can provide orientations to find the product regarded to its actual position of the cart and the user.

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PLANNING AND STRATEGY IN TEACHING-LEARNING PROCESS IN EDUCATION SYSTEM

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ABSTRACT
In this work, we try to address the different aspects of planning and strategy in teaching learning process of education system. We try to highlight why planning is the most important to achieve the specific goals. Preparation and planning are a critical aspect and a very important component of effective teaching. Lack thereof will lead to failure. Every teacher must be prepared for the effective delivery of the contents to the pupils. Good teachers are almost in a continuous state of preparation and planning. They are always thinking about the next lesson. The impact of preparation and planning is excellent on student learning outcome. A common misnomer is that teachers only work from 9:00 – 5:00, but when the time for preparing and planning is accounted for, the time increases significantly.

INTRODUCTION
Planning:
Planning is the process of thinking about the activities required to achieve a desired goal. It is the first and foremost activity to achieve desired results. It involves the creation and maintenance of a plan. Normally in academics we call it as Lesson plan document (LP). No matter if it's for your classroom, going to a supermarket, or buying a car. It answers and addresses all the necessary questions and provides sufficient support to the teachers, so that the teaching becomes smooth and easy. Instructional planning happens when a teacher is able to visualize and forecast the future of what, why, and how of the Teaching-Learning Process. A well-worked out course/lesson plan will act as a core of Teaching-Learning Process.

What is strategic planning?
Strategic planning is the process of setting goals, deciding on actions to achieve those goals and mobilizing the resources needed to take those actions. A strategic plan describes how goals will be achieved through the use of available resources

School districts of all sizes use strategic planning to achieve the broad goals of improving student outcomes and responding to changing demographics while staying within the funding box they are given. The nature of these goals and restrictions suggest that strategic planning in education is, and must be, different than the process used in the business sector. In the business sector the goal is to get more customers or make more money. Recognizing these differences, educators became early adopters of blending strategic planning with community engagement activities.

Where did strategic planning begin?
Goal directed planning has been around since humans developed a pre-frontal lobe. Strategic planning, as we know it today, evolved out of military strategy. Strategies literally means "general of the army" in Greek.

The strategic provided "strategic" advice to political rulers and war councils about managing battles to win wars as opposed to providing tactical advice about managing troops to win wars. That distinction has haunted the strategic planning process for close to 2000 years. Even the language of military strategy remains entrenched in the work place. "Front line" workers and being "in the trenches" are an accurate description of the reality of those on a battlefield, not those in an office or classroom.

We know that it can "feel" like there are enemies to rail against. The collaborative leaders we work with recognize and acknowledge the reality of the public education system while using language that builds relationships and reframes enemies to potential allies.

The adoption of strategic planning in the business world began somewhere between the 1950′s and 60′s. The exact date has yet to be agreed upon but most scholars and business historians agree that the practice along with the philosophy emerged over a few decades and that strategic planning continues to evolve today. Strategic planning in the education sector initially flowed out of business practices as a result of people moving from the business sector into positions in education leadership and bringing with them a set of planning tools and paradigms.

Make the Time to Plan
Teachers/professors get a planning period at school, but that time is rarely used for "planning". Instead, it is often utilized to contact parents as a Parents Teachers Meet, or to conduct a conference, or to catch up on

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emails, or evaluate or grade the papers and assignments. True planning and preparation occur outside of school hours. Many teachers arrive early, stay late, and spend part of their weekends working to ensure that they are adequately prepared. They search for different options, tinker with changes, and research fresh ideas in hopes that they can create the optimal learning environment.

Teaching is not something you can do effectively on the fly. It requires a healthy blend of content knowledge, instructional strategies, and classroom management tactics. Preparation and planning play a critical role in the development of these things. It also takes some experimentation and even a little luck. It is important to note that even well-planned lessons can quickly fall apart. Some of the best-conceived ideas will end up being massive failures when put into practice. When this happens, teachers have to go back to the drawing board and reorganize their approach and plan of attack

Why is planning so important
Planning is a roadmap to the instructor's success.

Whenever you make a plan, you know what you want to achieve.

At the same time, it becomes clear what the future might hold and what your goals are.

Your goals, which has been decided by planning, makes your decision making more efficient and more 'to the point'.

This is because you know that how a decision will affect your plan in the long term and whether or not, this decision will help you in achieving your goals.

Thus it helps you make decisions faster.

The bottom line is that preparation and planning do matter. It can never be viewed as a waste of time. Instead, it should be viewed as an investment. This is an investment that will pay off in the long run.

How to plan for classrooms
A successful lesson plan addresses and integrates these three key components :

1. Objectives for student learning

2. Teaching/learning activities

3. Strategies to check student understanding

Here's a bunch of questions to help you better prepare for the classroom. Try to answer them before you put your plan into action.

How will you check whether students know anything about the topic or have any preconceived notions about it?

What are some commonly held ideas (or misconceptions) about this topic the students might have?

How are you going to introduce the topic?

Outlining stage
Creating an overview of the curriculum, desirable outcomes, learning objectives etc.

Structuring the timeline for the plan.

Gathering data and teaching/course materials**.**

Decision stage
Decision stage is where you create your plan, and decide on what and how you are going to execute your plan. Workflow of step by step implementation, delivery methods, assessment techniques, backup options, etc. comes under this section.

Mapping stage
Map the things which you have decided on with the things you want to achieve. See if they align. If not, try to rethink your decision.

Strategies for More Efficient Planning
The first three years of teaching are the most difficult. Spend lots of extra time planning and preparing during those first few years as you are learning the nuances of teaching and sequential years will become easier. Keep all lesson plans, activities, tests, quizzes, worksheets, etc. in a binder. Make notes throughout the binder according to what worked, what did not, and how you might want to change things. Every idea does not have to

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be original. There is no need to reinvent the wheel. The Internet is the greatest teaching resource ever made. There are lots of excellent ideas from other teachers floating around that you can steal and utilize in your classroom. Work in a distraction-free environment. You will get a lot more accomplished when there are no other teachers, students, or family members around to distract you. Read the chapters, complete homework/practice problems, take tests/quizzes before assigning them to students. It will take some time to do this upfront, but reviewing and experiencing the material before your students do will ultimately protect your credibility. When conducting an activity, have all the materials laid out before the students arrive. Practice the activity to ensure that each works correctly. Establish specific procedures and guidelines for students to follow. Plan days to weeks in advance if possible. Do not wait until the last minute to try to throw something together. Doing so limits your effectiveness.

A few steps to walk you through the process Planning usually takes a lot of time and work from your side.

We have listed a few techniques and methods teachers usually use to create a successful course plan.

Step 1. Create an outline of the curriculum you want to cover.

Create an outline of the curriculum you want to cover

This is basically how you begin. Learn about what you are going to teach and how deep your subjects are.

This will give you an overall idea about how big your task is.

Step 2. Create a list of desired outcomes.

Of course you can't create a plan without targets. Desired outcomes and objective are your targets.

So creating a list of desired outcomes and objectives might help you align with the objectives of your university/board.

Step 3. Make another outline of the time — semester.

Having an idea about the time frame can help you plan better.

The effectiveness of your plan depends on intelligently distributing the curriculum across the year/semester.

Step 4. Break curriculum down into small manageable pieces

This could improve your productivity.

Small tasks would seem easy job and will get you through doing a lot more than within short time.

This could keep you from procrastinating and help you maintain a better control over the curriculum.

Step 5. Take time to decide which takes what time

Analyse the importance of each modules and decide how much hours you want to spend on each topics.

Also decide which parts can be skipped or omitted if you are pressed by time.

And conversely, which topics you can expand on if things moved faster than expected.

You can have a better authority over the time if you know how much time you need beforehand.

Step 6. Spread them across the timeline

Spread the curriculum across the timeline accordingly.

This one is totally your call and you shall decide how much you are going to cover within a given period of time.

You could also collaborate with other faculties to have better inputs and fresh perspectives.

Step 7. Gather teaching materials and supporting data

Besides the usual teaching materials, planning gives you time to gather enough data and resources to support your teaching.

You could make use of books and documents even from outside the curriculum and new technologies to assist your instruction.

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Step 8. Decide on how you are going to share course materials with students

The interactions you have with your students are really important.

You could save a lot of time and optimise the efficiency by implementing ICT enabled education to share course materials and other important documents.

Step 9. Decide how you are going to assess students , exams, assignments, projects, tasks etc.

Deciding the assessment mechanisms and evaluations beforehand can be of great help.

The way you assess will have an overall impact on the teaching, and it gives you valuable insights on the course progress.

But to be prepared and to be able to effectively map your outcomes to the curriculum. You might need to focus on the evaluation techniques even before you begin the semester.

HOW TO ASSESS YOUR PLAN

Nobody gets it right for the first time, or the second time.

So have techniques and measurement metrics to assess your plan.

Here are some of the proven techniques and metrics to keep in close watch if you want to know the effectiveness of your plan.

STUDENT RESULTS

Of course the most evident of outcomes.

The results of your students and their performance gives you solid feedback on how well your plan works, and how effective it is. You could reflect on it and resort to making improvements and improvisations in your plan. See whether if it provides any insights Your plan should ultimately provide some insights to you. It should help you realize your time management skills, teaching skills, and valid information about the curriculum.

Contributions into the TLP.

The plan should also contribute to the curriculum and the teaching-learning process.

It should help all the stakeholders keep a better track of the course and help them take more informed decision at the right time.

Having a well-worked plan could seriously improve how you, and your students perceive the curriculum. It gets things organized and accessible.

Check for productivity.

See if your course plan helps you increase you productivity.

Obviously the lesson plan can help you tackle problems more effectively. It keeps you informed which saves time and energy.

This way, your plan could tap into your productivity potential which you didn't even know existed.

You will be better equipped to complete tasks and evaluate outcomes faster.

How this plan helps the students

While planning, take time to assess how it helps your students.

A good lesson plan should contribute into the results and productivity of your students too.

A plan should benefit your students and keep them on track.

Discussing the whereabouts of the plan with your students will give them a clear picture of what to achieve and expect.

This could have a positive impact in the classroom and the desired outcomes.

Gathering feedback

Along the way till the end, you must gather feedback from the stakeholder and measurable metrics.

Continuous evaluation and gathering feedbacks is one of the most important aspects of Outcome Based Education (OBE).

Feedback is the easiest way to know if your plan is working or not. Your plan should be considered flawed if it does not give room for feedbacks.

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Improvising plans on the way
The mark of a great teacher is the ability to infer what their students need.

The education should ultimately be student centric.

Along the curriculum till the end, a teacher must consistently take feedback and perform course-correction in their plan.

No matter how good your plan is, there can always be room for unexpected twists and turns in your way.

Be that if the results of your students are way lower than you expected, or if the time allocated for a module was cut short by some extracurricular activities; all kinds of things can go wrong.

So the best thing you can do is to be prepared, and be ready to improvise the plan if needed.

Continuous Evaluation and keeping a close watch on your goals can help you take the right decisions at the right time.

Of course having an efficient Academic Management System helps you plan, implement, share, and monitor the effectiveness and achievement of your course plan.

So you could also consider the possibilities of incorporating such innovative technologies

Project Based Learning
Project Based Learning, or PBL, is an instructional approach built upon learning activities and real tasks that have brought challenges for students to solve. These activities generally reflect the types of learning and work people do in the everyday world outside the classroom. PBL is generally done by groups of students working together toward a common goal PBL teaches students not just content, but also important skills in ways students have to be able to function like adults in our society. These skills include communication and presentation skills, organization and time management skills, research and inquiry skills, self-assessment and reflection skills, group participation and leadership skills, and critical thinking. Performance is assessed on an individual basis, and takes into account the quality of the product produced, the depth of content understanding demonstrated, and the contributions made to the ongoing process of project realization. PBL allows students to reflect upon their own ideas and opinions, and make decisions that affect project outcomes and the learning process in general. The final product results in highquality, authentic products and presentations.

How is it Different?
Project-based instruction is innovative by its emphasis on cooperative learning. Additionally, students create tangible results to represent what they have learned. Students use technology and inquiry to respond to a complex issue, problem or challenge. PBL focuses on student centered inquiry and group learning with the teacher acting as a facilitator, as opposed to the one in charge. Activities match as nearly as possible the real-world tasks of professionals in practice rather than classroom-based tasks. This encourages interdisciplinary perspectives and enable learners to play diverse roles and build expertise that is applicable beyond a single well-defined. Lastly, it allows a range and diversity of outcomes open to multiple solutions, rather than a single correct response obtained by the application of predefined rules and procedures.

Research studies have demonstrated that PBL can

- Be more effective than traditional instruction in increasing academic achievement on annual state-administered assessment tests
- Be more resultant than traditional instruction for teaching mathematics, economics, science, social science, clinical medical skills, and for careers in the health occupations and teaching
- Be more practical than traditional instruction for long-term retention, skill development and satisfaction of students and teachers
- Be more serviceable than traditional instruction for preparing students to integrate and explain concepts
- Be especially effective with lower-achieving students
- Improve students' mastery of 21st-century skills, such as critical thinking, communication, collaboration, creativity and innovation
- Provide a fruitful model for whole school reform HOW IS PBL USED? Some teachers use PBL extensively as their primary curriculum and instructional method. Others use PBL occasionally during a school year. Projects vary in length, from several days to several weeks or even a semester. PBL can be

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effective at all grade levels and subjects, as well as at afterschool and alternative programs. As with any teaching method, PBL can be used effectively or ineffectively. At its best, PBL can be the spark in engaging learning experience and create a context for a powerful learning community to promoting achievement, self-mastery, and contribution to the community.

CONCLUSIONS

With this work we tried to put forward the need and necessity of planning to get the optimal and productive results from the delivery of contents there by improving the performance of the students and giving an edge among the peers. We hope to continue our work in this direction and try to motivate them and get the productive results to build a great nation with effective teaching learning methods.

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- http://www.bobpearlman.org/BestPractices/PBL.htm Bob Pealman's collection of PBL best practices, pilot projects, and student work Technology Support for PBL
- http://www.ed.gov/pubs/SER/Technology/ch8.html Examples of technologies which provide support for the implementation of project-based learning

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POSTER BASED MOVIE GENRE CLASSIFICATION USING CNN

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ABSTRACT
In this paper, we propose a movie genre classifier based on convolutional neural networks. The Movie Genre Classifier categorizes the movie posters into different movie genres. Since movies can belong to multiple genres, this is a multi-label image classification problem. Convolutional Neural Network is one of the most popular deep learning algorithms for solving machine learning problems especially with large image datasets and computer vision. To facilitate our study, we have compiled a large movie poster dataset from IMDB using a web crawler. To conclude we demonstrate the effectiveness of this classifier in classifying the movie dataset into classes such as action, drama, comedy and 7 other prominent movie genres.

Keywords: Convolutional neural networks, Deep learning, Image Classification, Movie genre classification, Multi-label image classification.

1. INTRODUCTION
In recent years, with the increase in multimedia content and online streaming platforms providing movies on the go, there is a need for a system which could classify these movies into specific genres to reduce time spent by users on selecting a content to watch. Customer research suggests that users tend to lose interest within 60 to 90 seconds of browsing online for movies if they don't find the right fit [1]. Movie poster plays a key role in selection of the movie as it sets the first impression providing the user with the gist of the movie at a glance.

In film theory, genre is a primary method of classifying movies into different categories. Various presets help in classifying movies into respected genres which helps the consumers select a movie according to their taste and mood. Mood can be defined as an emotion which is carried throughout the movie. Humans can get an idea about the genre of the movie based on low level features such as color, objects, actions and expressions of the actors. If humans are more or less able to predict genre of a movie only giving a look at its poster, then we can assume that the poster possesses some characteristics which could be utilized in machine learning algorithms to predict its genre.

Rest of the paper is organized as follows: literature survey is reviewed in section II. Section III and IV, describes research gap and proposed system respectively. In section V, we describe conclusion and future work.

2. LITERATURE SURVEY
There have been quite a few works on classifying movies into genres. Yann LeCun et al. [2] was first to introduce an architecture for convolutional neural network. Sanjay et al. [3] designed a neural network which categorized movie clips into genres using low level audio-visual features. The neural network performed well when the neural network was trained on audio video features together but failed when trained separately. Simoes et al. [4] proposed a deep learning strategy called CNN-MoTion which outperformed all state-of-the-art approaches of classifying movie clips into genres. They performed a comparative study between their novel method and other state-of-the-art feature extraction techniques such as Gist, CENTRIST, w- CENTRIST, and low-level feature extraction.

The researchers explain and define all the elements and important issues related to Convolutional Neural Network (CNN), and how these elements work. It also states the parameters that effect CNN efficiency. CNN has reduced the number of parameters used in Artificial Neural Network (ANN) making it popular to solve complex task. The main application of CNN is in solving machine learning problems with image data set. [5] This paper is based on image classification using Convolutional Neural Networks. Image classification is process including image pre-processing, image segmentation, key feature extraction and matching identification. Image processing can then be applied it to scientific experiments, traffic identification, security, medical equipment, face recognition and other fields. The idea of deep learning is to discover multiple levels of representation, with the hope that high-level features represent more abstract semantics of the data. One key ingredient of deep learning in image classification is the use of Convolutional architectures. Convolutional neural network design inspiration comes from the mammalian visual system structure. The optimization of Convolutional neural network is mainly concentrated in the following aspects: the design of Convolutional layer and pooling layer, the activation function, loss function, regularization and Convolutional neural network can be applied to practical problems. [6]

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This paper is based on classifying video using Convolutional Neural Network. The data set used for classification is of TV news. The application proposed in this paper is based on the following steps: First convert the input video into the frames and perform scene classification on each frame, the output of each frame is stored into the list along with the frame number. TV news is divided into eight categories Courts, Assembly, Sports, Law enforcement, Weather, Political Talk, Protest, Religious [7]. This paper is based on a comparative study of various video classification algorithm. At the end of the paper, a comparative report is provided to see which algorithm performs better. Classifiers such as support vector machine, K- nearest neighbour, neural network and gaussian mixture model are used. There are some issues in genre classification such as the boundaries between different genres are ambiguous. The genre of a piece of music is decided based on both objective and subjective measures. Genres are classified based on its features. Hence features and classifier selection play an important role. There are some issues in genre classification such as the boundaries between different genres are ambiguous. The genre of a piece of music is decided based on both objective and subjective measures. Genres are classified based on its features. Hence features and classifier selection play an important role. [8]

The aforementioned studies have been done on movie trailers and clips. Not many studies have been carried on movie posters. This may be due to the fact that movie posters provide limited information and features to be studied. Marina et al. [9] performed a multi-label movie genre classification based on low-level features. The classifier was tested on a small dataset of 1500 movie posters belonging to 6 genres, i.e action, animation, comedy, drama, horror, and war. The features used in the classification were low-level features based on color and edge combined with the number of detected faces on posters. Tianmei Guo et al. [10] proposed a low computational cost convolutional neural network on image classification. They analyzed various learning methods and optimization algorithms to find the optimal parameters for image classification. To conclude they verified that shallow network has a relatively good recognition effect. In our work, we propose to implement convolutional neural network on a large movie poster dataset which will perform well in terms of accuracy.

3. RESEARCH GAP

Above mentioned papers contain models which are trained on classifying movies into genres using video clips. Researchers have trained convolutional neural networks to extract the low- level features from the movie videos and train on them for classification of movies. Very limited studies have been conducted on classifying movies into genre from its poster images. The shortcomings of models based on movie posters have been the small dataset used for training the CNN model. Though systems have been able to achieve high accuracy, lack of diversity in movie poster dataset, the model fails to predict newer genres. Also, there was no proper dimensionality reduction algorithm used on the poster dataset, hence high computational power was required to train the movie poster dataset on the CNN model.

4. PROPOSED SYSTEM

To overcome the shortcomings of the existing systems, we propose to develop a poster based movie genre classifier using convolutional neural networks where convolutional neural networks will be trained on a large movie poster dataset. The model will then be tested on a test poster dataset, and the accuracy of the model will be tested, trying to outperform existing poster based movie genre classifiers. The proposed system is supported by a CNN (Convolutional neural network) and it is been used for movie posters according to their genres. Firstly, a movie poster dataset is taken form publicly available novel, which comprises more than 40,000 posters that belong to the following genres: action, comedy, horror, drama, animation and 12 other prominent genres. Then, the techniques under CNN classification are used and it is further explained in detail.

The problem of automatically analyzing posters through image-processing and machine learning approach is difficult and also the accuracy percentage through these methods are not satisfactory. Using CNN classification on movie posters will not only reduce the unnecessary steps but it also has better accuracy percentage when it is applied on the movie poster classification system.

5. CONCLUSION AND FUTURE WORK

From literature survey it can be concluded that Convolutional Neural Network has a proven track record of outperforming state-of-the-art machine learning algorithms when large image dataset is to be classified. The existing systems focus on classifying movies using video clips rather than movie poster as it is assumed that movie posters have less information from which the CNN model can learn from. But if the CNN model is trained upon a large movie poster dataset, it can learn from it and can accurately classify movies into its genre. In today's internet world, the use of multimedia has increased drastically as user have started using Digital platforms to browse movies and hence a system is required to help online streaming platforms to classify these movies into their respected genres so that the users can directly browse movie according to their taste of movies.

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The future scope of the project is vast as this convolutional neural network model can be incorporated in various large-scale movie recommender systems for recommending movies to its users. Every large-scale online movie streaming platform use movie recommender systems to enhance their user's experience by recommending them movies using NLP on movie summaries and titles. Instead of using text-based classification, the use of image classification on movie posters can turn out to be more efficient as users are more likely to judge a movie by its cover i.e. poster rather than reading its synopsis and deciding whether to watch the movie or not.

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QUANTUM COMMUNICATION - HACK PROOF COMMUNICATION TECHNOLOGY

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ABSTRACT
The main purpose of this paper is to examine some (potential) applications of quantum computing in quantum based secure communication. For the readers who are not familiar with quantum communication. We hope that this paper will be a useful map for researchers who are going to explore further and deeper connections in quantum computation as well as quantum theory although some parts of the map are very rough and other parts are empty, and waiting for the readers to fill in.

Keywords: Quantum Entanglement, Superposition Principle, Bells Measurement, Bells State

INTRODUCTION
Quantum communication is the art of transferring a quantum state from one place to another in other words we can say it quantum teleportation, With the help of Quantum communication we can teleport a photon from one place to another. Quantum communication is the most secured way of communication. Quantum communication doesn't makes faster than light communication successful & does not break any rules of Einstein's Theory of Relativity but it appears that's way so Einstein termed it's 'spooky action at a distance'.

HISTORY
Traditionally peoples use to transmit a secured message with stenography technique were they use to make a man blad and write a message on his head and wait until the hair grew up and then send him to the receiver and then receiver removes his head which was quite lengthy process.

Then we developed the communication medium

In October 29, 1969 the first message was sent over the internet. So let us explain just how difficult it in the evening researchers had gathered down in Los Angeles at Stanford research institute to send the first test message and they had agreed to send the message "login" looking into a remote computer because this was challenging they called each other on the phone make sure message arrived they type the first letter "L" and they asked on the phone did you see the L and excited message comes back "yes, yes, we see the L and they typed the second letter "O" and asked again did you see the O and he said "yes we also see the O" and they typed the letter G and the system crashed but any how they recover it and again sent the full message, and now we send a lot. Now we had to revolutionize the world by quantum Internet which is the most secured, fastest & perfect way of communication.

HANDS-ON QUANTUM PHYSICS
Quantum physics is a branch of science which deals sub atomic particles like electrons protons & neutrons and study there properties.

Quantum physics is the weird because it tells how a basic elementary particles like electrons change their nature when they had been observed that is wave to particle double slit experiment is a proof of it.

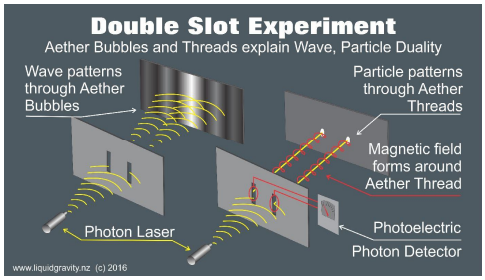

Figure-1: Double Slit Experiment [1]

In double slit experiment the electrons are fired from an electron gun in a slit which have to vertical holes. If the process has been observed or monitored then we get a single interference pattern as indicate a particles behavior, but if the experiment doesn't monitored then we get multiple interference pattern on the wall which shows the wave behavior.

This Experiment put the whole world in shock how that when we doesn't observe anything the actually.

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QUANTUM TELEPORTATION

Quantum teleportation is a process by which quantum information can be transmitted from one location to another, with the help of classical communication and previously shared quantum entanglement between the sending and receiving location.

Because it depends on classical communication, which can proceed no faster than the speed of light, it cannot be used for faster-than-light transport or communication of classical bits.

Quantum teleportation is not a form of transportation, but of communication: it provides a way of transporting a qubit from one location to another without having to move a physical particle along with it.

To understand the quantum teleportation we need to understand the to basic principle of quantum mechanics

1. Superposition: In a simple words superposition is the presence of a particle in all possible states either wave or particle if the particle is spinning then spin states like spin-up, spin-down and likewise.

This state is achieved when any quantum particle is not being measured or observed.

We can also relate this state as a coin in the air having the ½ possibility of getting Head or Tail In the world of Quantum computers this state available at the lowest possible temperature known as Absolute Zero temperature 0k or -273.015°C.

Superposition of a particle immediately collapse when we measure it and possible state is chosen and the particle is came on that state.

2. Quantum Entanglement: Quantum entanglement is a physical phenomenon which occurs when pairs or groups of particles are generated & interact, or share spatial proximity in ways such that the quantum state of each particle cannot be described independently of the state of the other, even when the particles are separated by a large distance instead, a quantum state must be described for the system as a whole.

When we generate a 2 polarized photons from 1 unpolarized photon then the spin of both the photons in such a way that it will be opposite to each other as per the law of conservation of spin

Such photons are in the quantum superposition state when we don't observe them but whenever we observe any of them the superposition of that photon get collapsed and one possible state is chosen, that chosen state of the observed photon instantaneously inform the other one that it had collapsed on which state by that the other one chooses the opposite one to maintain the law of conservation of spin This transportation of message instantaneously termed as Quantum entanglement.

At the time of 18 century this theory was new and didn't get supported by the legendry scientists like Albert Einstein because of its weird predictions, so Einstein decided to proof it wrong and he worked with his 3 friends and establish the EPR paradox and termed it as 'spooky action at a distance' which have solutions like hidden variables.

Algorithm of Quantum Teleportation

Below is a sketch of an algorithm for teleporting quantum information. Suppose Alice has state C, which she wants to send to Bob. To achieve this, Alice and Bob should follow the sequence of steps:

1. Generate an entangled pair of electrons with spin states A and B, in a particular Bell state: [7]

$$|\Phi_0\rangle = \frac{1}{\sqrt{2}}\left(|\uparrow\rangle_A \otimes |\uparrow\rangle_B + |\downarrow\rangle_A \otimes |\downarrow\rangle_B\right).$$

Separate the entangled electrons, sending A to Alice and B to Bob.

2. Alice measures the "Bell state" (described below) of A and C, entangling A and C.

3. Alice sends the result of her measurement to Bob via some classical method of communication.

4. Bob measures the spin of state B along an axis determined by Alice's measurement

Since step 3 involves communicating via some classical method, the information in the entangled state must respect causality. Relativity is not violated because the information cannot be communicated faster than the classical communication in step 3 can be performed, which is sub-light speed.

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The idea of quantum teleportation, which can be seen in the mathematics below, is that Alice's measurement disentangles A and B and entangles A and C. Depending on what particular entangled state Alice sees, Bob will know exactly how B was disentangled, and can manipulate B to take the state that C had originally. Thus the state C was "teleported" from Alice to Bob, who now has a state that looks identical to how C originally looked. It is important to note that state C is not preserved in the processes: The no-cloning and no-deletion theorems of quantum mechanics prevent quantum information from being perfectly replicated or destroyed [1]. Bob receives a state that looks like C did originally, but Alice no longer has the original state C in the end, since it is now in an entangled state with A.

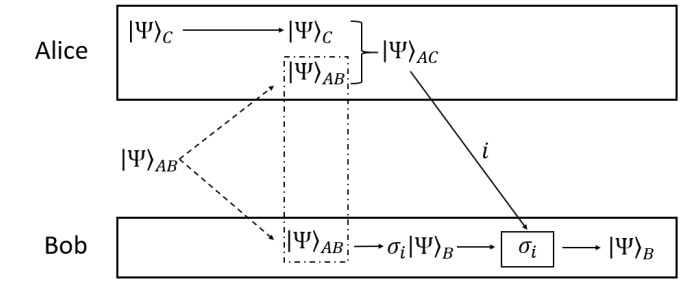

Figure-2: Bells Measurement [2]

The above Mathematics is quite complex to understand we use a simple figure to understand it

In the Bellow figure we need to teleport the photon C (Orange colored) from Alice to Bob via Quantum teleportation we have to use to an entangled pair of photon blue & yellow keep blue with Alice and Yellow with Bob. The blue colored photon will interact with photon C and transfer all the property of photon C to the yellow which is with Bob.

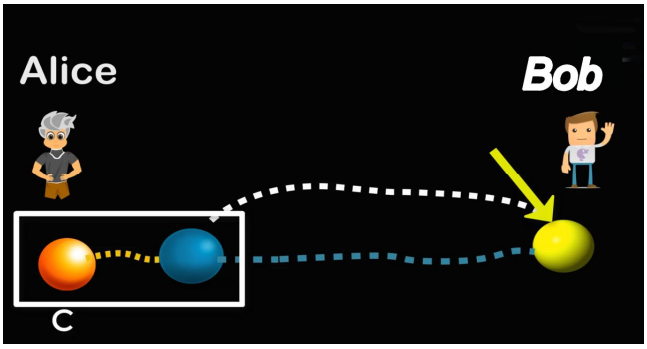

Figure-3: Entangled Information Transformation

We have to measure photon c and blue combined state through bells measurement and find whether the spin of both the photons C & blue are equal or opposite and collect that information to send it via any classical communication hackable channel to Bob.

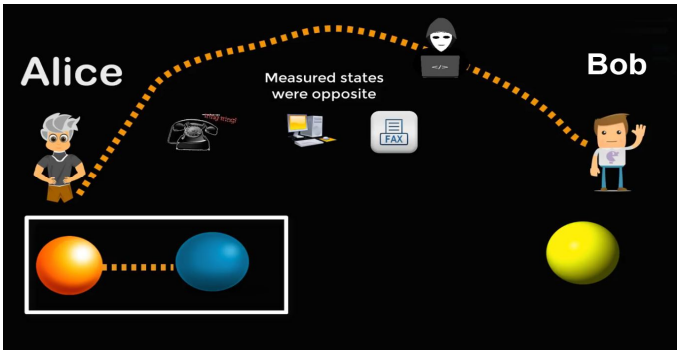

Figure-4: Informing the Bob about Quantum State

If the hacker compromised the classical channel and get the message what was sent then the message will be "The States Were Opposite" which will be useless for him/her.

After getting the Alice message that the "spin is opposite" Bob measure the photon (yellow) with him if the Bob get spin up then he will definitely know the spin of the photon blue(Entangle pair with Alice) is Down and if the spin of photon blue is down the now newly entangled photon c should have spin up.

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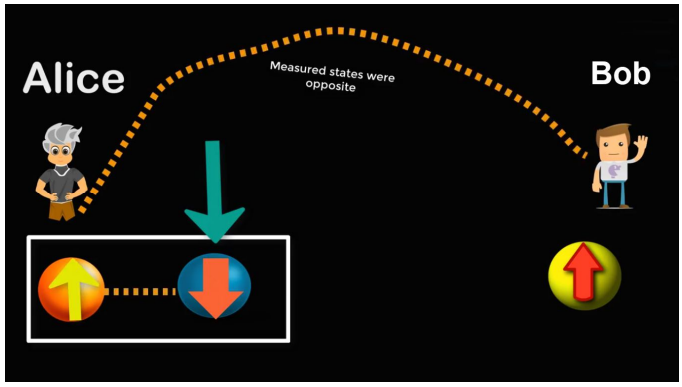

Figure-5: Bob estimates the Quantum State

With those Information now bob manipulate the photon with him and it will acquire all the properties of photon C which Alice wants to teleport and the yellow photon now becomes the photon C which means teleportation Successful and message received to the Bob.

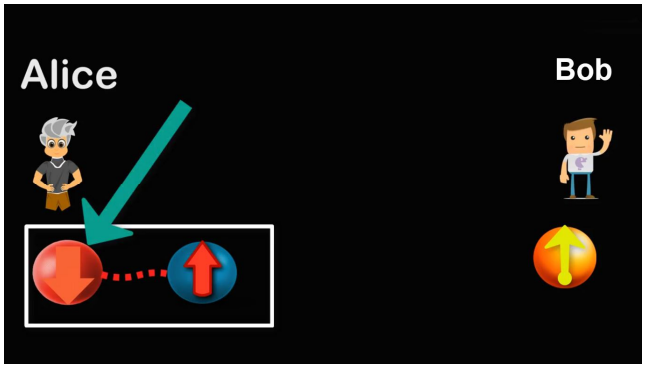

Figure-6: Photon C teleported to Bob

Now the teleportation is Successful the no-cloning and no-deletion theorems of quantum mechanics prevent quantum information from being perfectly replicated or destroyed.

So the state of Photon C (with Alice) should have to change in some other state and it will change instantaneously. [5]

Quantum Communication is a Hack-Proof Technology:

Quantum communication is a hack-proof technology because there is no actual message is transporting over the visible medium and time it is happening instantaneously so we can say that the Laws of Quantum physics are protecting the communication if someone wants to hack it then he should have to break the laws of physics which is nearly impossible.

CONCLUSION

In Conclusion we introduce a concept of Quantum Communication where we create a new hack-proof way of communication where we used an entangled pair of photons to teleport the photon having the message of sender.

In the above process we don't use any sort of real medium and dimension to transport the photon everything happens instantaneously and the no-cloning and no-deletion theorems of quantum mechanics prevent quantum information from being perfectly replicated or destroyed. Which makes the communication more secure and un-mirror able.

Quantum Communication doesn't breaks any laws of casualty & relativity because we need a classical communication channel to provide the information of the quantum state.

Therefore we can say that in near future quantum communication is best way of communication and teleportation of the messages.

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RECENT TRENDS IN MILD HYBRID VEHICLES (AN OVERVIEW)

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ABSTRACT
Introduction of electric vehicles (EVs) signals the beginning of the end for traditional engine vehicles. The major motivators for shifting to EVs are the need for reducing polluting engine emissions and reducing dependence on costly oil fuels. The growing acceptance of EVs is the outcome of several factors: technological advancements, rising storage capacity of traction batteries coupled with their falling costs, increased public charging facilities and Govt. incentives.

The impact of automobiles on the environment is increasing day by day such that its becoming one of the social issue day by day. In to protect the future from Air pollution, alternate Technologies like Electric Vehicles, Hybrid Vehicles, are required and introduced. Many studies have been done on hybrid vehicles in recent years. The hybrid vehicles need a large number of batteries creating up to 300V to meet the required voltage of electric motor. The size and weight of the batteries cause some problems. This research investigates the mild hybrid vehicle. A small electric motor, which can operate as engine starter, generator is located between the engines energy is generated using regenerative braking. The present study evaluates the properties of the mild hybrid vehicle, its structure and performance and proposes an energy control model for its optimum operation.

Keywords: Mild Hybrid Electric Vehicles, Air Quality, Development of MHEV, Challenges and Advantages of Mild Hybrid.

INTRODUCTION
The first hybrid vehicle reported was shown at the Paris Salon of 1899. These were built by Pieper establishments of Liege, Belgium and by the Vendovelli and Priestly Electric Carriage Company, France. In addition to being one of the two hybrid vehicle, and being the first parallel hybrid vehicle, the Pieper was undoubtedly the first electric starter.

However, the greatest problem that early designs had to cope with was the difficulty of controlling the electric machine. Power electronics did not become available until the mid-1960s and early electric motors were controlled by mechanical switches and resistors.

Toyota released the Prius sedan in Japan. Honda also released its insight and Civic Hybrid. They achieved excellent figures of fuel consumptions. Toyota Prius and Honda Insight vehicles have ahistorical value in that they are the first hybrid vehicles commercialized in the modern era to respond to the problem of personal vehicle fuel consumption.

The first electric vehicle powered by non-rechargeable batteries was built in 1834, much before the development of IC Engines. Electric vehicles were very popular during the 1890 to 1920 period despite their very high cost. In 1912, EVs have reached their prime, making up nearly 28% of the cars on the road. [22]

Compared with conventional vehicle, hybrid electric vehicle (HEV) is more complex because of their multi-power source. HEV has the advantages of low emission and fuel consumption. Mild Hybrid Vehicle is one of HEV which equips with low power traction motor.

In 2011, five German car makers announced that they will introduce 48V system into their cars. The powertrain of the next decade is being defined through 48V. The 48V system bridges the gap which allows Start/Stop performance that far outstrips existing pure 12V architecture system which enables the blending of electrical motors to be used to alleviate the transient response problems of larger turbochargers while enabling their optimization. All of these solutions and many more potential applications both improved CO2 performance and eventually reduce cost though making unnecessary the inherent complexity of today's 12V solutions. Managing the development and introduction of 48V systems is not without some significant engineering challenges, but it is the gateway to the kind of energy efficiency needed by OEMs to meet forthcoming emissions challenges and the aspirations of customers. [4]

Mild hybrid vehicle does not have major differences with full hybrid vehicles in terms of hardware but, it can be different in terms of control algorithm. In other words, mild hybrid vehicle is in fact a hybrid vehicle with a lower degree of hybridization (about 15%). In this vehicle, the scale size of the electric driving force component

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is smaller in respect to a full hybrid vehicle due to the fact that, the production of propulsion energy is mainly upon the internal combustion engine. [2]

In mild hybrid vehicle, due to the low level of electric engine power, the DC voltage level of the feed engine declines and so, lower number of batteries are needed, thus, the weight and volume of batteries and the overall weight of vehicle drops significantly in comparison to a full hybrid vehicle. The voltage level of the electric engine feed in mild hybrid vehicles is considered about 42 (V). This level of voltage has been chosen based on the presence of consumers and electric charges in a new hybrid vehicle. It should be mentioned that, a 12 (V) battery can also be used for supplying energy to conventional charges in a vehicle. Super capacitors are also used as another component for storing energy to supply instant currents and to set up electric engine. [3]

Mild Hybrid vehicle uses regenerative Braking system to charge 48v battery used. Regenerative braking is an energy recovery mechanism which slows down a vehicle by converting its kinetic energy into another form, normally into electrical energy, which can be used immediately or stored until needed in high voltage batteries. The electric motor is operated in reverse during braking or coasting, acting as generator. The rotors of electric traction motor are coupled with wheels, they experience opposing torque as current is induced in the motor coils. The wheels transfer kinetic energy via drivetrain to generator. At the same time, generator resistance produced from the electricity created, slows the vehicle. When more braking torque is required than the generator alone can provide, additional braking is accomplished by friction brakes. [1]

Table-1: Comparison Of Different Energy vehicles

Type of Energy	Comparison of Different Energy Vehicles		
	Advantage	***Disadvantage***	***Examples***
Gasoline Powered Vehicle	Technology is Mature	High Cost and less Technology is Used	Fiat Linea
Micro Hybrid Vehicle	Assists Power Steering and Air Conditioning	Only suitable for Light Vehicles	Mercedes Smart
Mild Hybrid Electric Vehicle	Provides supplementary Torque	Battery size is bigger than Micro Hybrid	Honda Civic
Full Hybrid Electric Vehicle	Less Noise & Pollution	Most Expensive	Toyota Prius

OBJECTIVES OF STUDY

1. Mild hybrid electric vehicle technology development trend

In the existing technology, HEV acts as an achievement whose purpose is improving fuel economy and reducing emissions. This adds a great perspective for development of Vehicles for the future. From the current scenario, automotive emission regulations become more processed, the rapid development of electronic technology will further promote the development of hybrid vehicles.

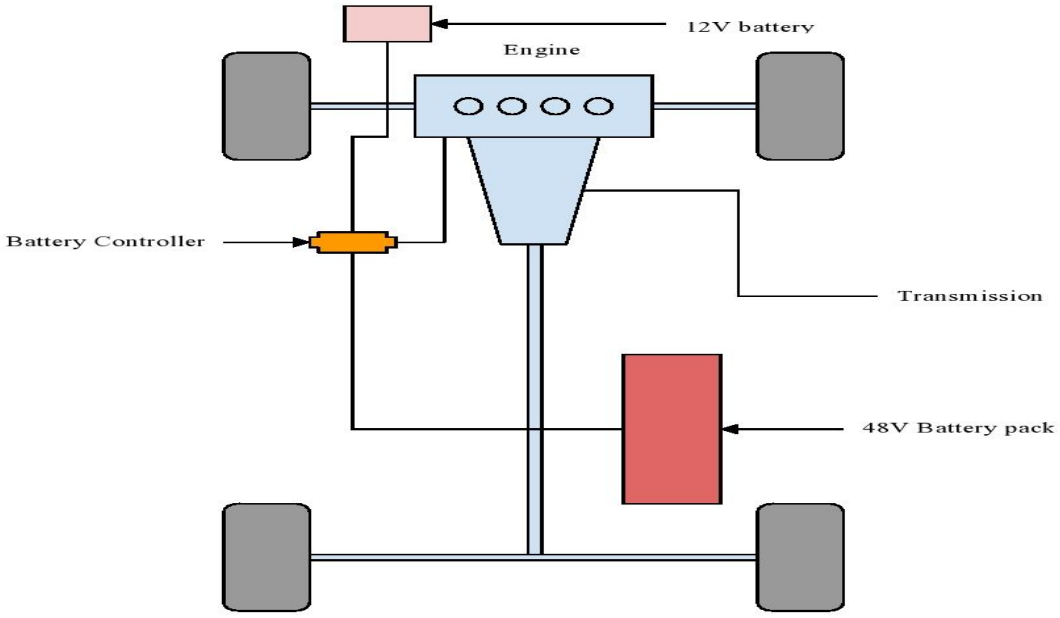

Fig No-1: Mild Hybrid Vehicle System Overview

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• **COST EFFICIENCY**

Comparing with the traditional cars, MHEVs can ensure the same Performance and advantages, while being superior in energy saving and emission. Hybrid vehicles have similar voltage and power ratings as electric vehicles, but their battery capacity is greatly reduced, making them less costly than electric vehicles. Currently, the price of HEV is about 20% higher than traditional cars. Reduce costs is one of the directions to improve the competitiveness of hybrid electric vehicle.

2. Mild hybrid vehicle conceptual working

• **MHEV PURPOSE**

To maximize fuel economy and vehicle drivability, the development of hybrid vehicle functions needs the fusion of internal combustion engine and the electric machine as well as the energy storage device. The actual function of a hybrid vehicle includes the function of mild and micro hybrid systems.

• **ENGINE CUTOFF**

During the heavy traffic conditions, the hybrid control system is able to shut off the engine automatically providing certain preconditions are met, e.g. the vehicle speed is lower than the specified figures; the driveline is open and the power supply system is able to support the electrical load during engine stop. The main aim is to save fuel consumption and exhaust emission during engine idling condition. As soon as the driver wants to pull away, or the system requires the engine running in order to support certain vehicle functions, the engine will be restarted automatically.

• **ELECTRIC DRIVE**

If the driver wants to launch the vehicle slowly, the electric machine alone can drive the vehicle slowly. As the driver demand torque increases, the engine will be started to join the propulsion. To strengthen the vehicle launch performance, especially for automatic transmissions, a torque smoothing algorithm is needed.

• **ELECTRIC ASSISTANCE**

When the driver wants to accelerate rapidly, for example overtaking on a highway, the electric machine will join in to assist the propulsion. Due to the fast response of the electric machine the vehicle acceleration is immediate. By using this torque assist function, the transmission and fuel map can be optimized so that the best fuel economy can be achieved without compromising the vehicle drivability.

• **REGENERATIVE BRAKING**

During deceleration and braking kinetic energy is produced. This kinetic energy is converted in electrical energy which is used to charge battery pack provided into mild Hybrid Vehicle. This stored energy can be used immediately or whenever it is needed. While regenerative braking electric motor acts as a generator which generates electrical energy and it is stored in a 48V battery pack. Fig No. 2 shows Conversion of electrical energy to kinetic energy while Acceleration and Fig No. 3 shows Conversion of kinetic energy into electrical energy while braking

• **SMART BATTERY CHARGING**

During normal vehicle driving conditions, the battery voltage, state of charge, state of health and state of function are constantly monitored throughout. Based on the battery information, the battery charge is controlled in a manner that will keep the engine, electric machine and the battery working in the high efficiency region.

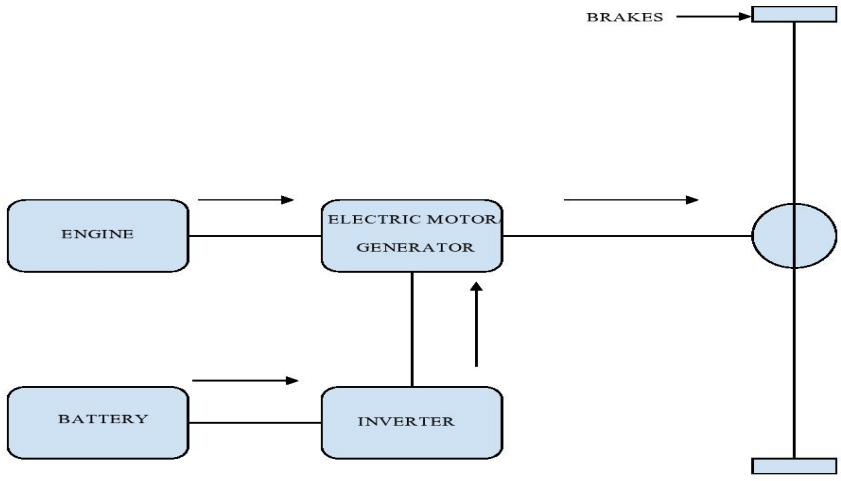

Fig. No-2: Conversion of electrical energy to kinetic energy while Acceleration

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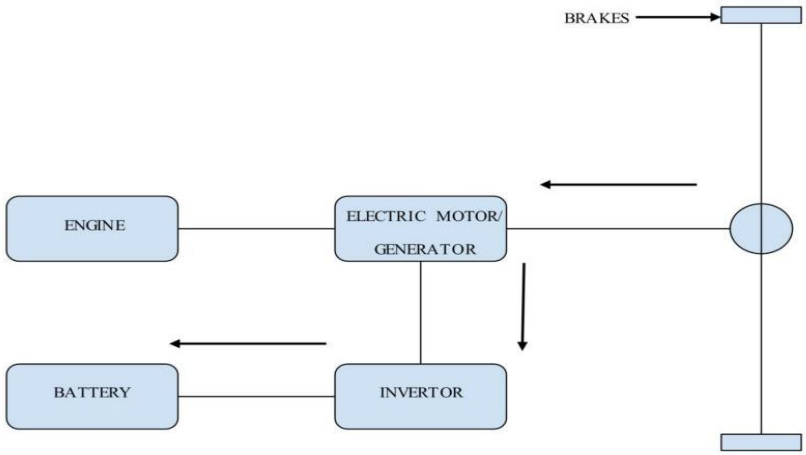

Fig. No-3: Conversion of kinetic energy into electrical energy while braking

FUTURE SCOPE

The results approved that the MHEV can contribute in improving fuel economy significantly on real world and standard driving cycle (city activities). Moreover, the emissions decreasing were significant also in specific vehicle activities. The fuel economy improvement for MHEV's was limited on highway standard driving cycles. Furthermore, the engine efficiency could be improved also, which may give an opportunity to increase ICE life span.

It can be seen that the growth in market potential of MHEV's is strongly influenced by the movements of legislation. The US and the European markets are two important automotive markets which have been analysed in order to demonstrate the current success of MHEV's. The Indian market is one which is showing its growth in the automotive industry has been developing major constraints to improve hybridization and control the emission as low as possible. The hybrid vehicles can deliver a sub-descriptive high performance and efficiency. In short Mild Hybrid and Electric Vehicles are the future which could help us reduce the consumption of fuel and also emission norms.

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A BRIEF STUDY OF EDUCATION USING DIGITAL TECHNOLOGY

Altaf Chougule and Prof. Abdul Sadique

ABSTRACT
Evaluation in education using digital equipment is full steam ahead, and it's affecting more than just the classroom. It is become easy to learn and educate himself/herself using technology.

We use technology to accomplish various tasks in our daily lives, in brief; we can describe technology as products and processes used to simplify our daily lives. We use technology to extend our abilities, making people the most crucial part of any technological system.

WHAT DO YOU MEAN TECHNOLOGY?

Technology is a body of knowledge devoted to creating tools, processing actions and the extracting of materials. The term 'Technology" is wide, and everyone has their way of understanding its meaning.

Technology is also an application of science used to solve problems. But it is vital to know that technology and science are different subjects which work hand-in-hand to accomplish specific tasks or solve problems.

Technology is dynamic; it keeps on improving because our needs and demands for technology keep on changing. We have moved from the industrial age **(industrial revolution)** to an information age.

BEST TECHNOLOGY FOR EDUCATION:

It is important to **use technology in schools**, technology is made to simplify the way we do things, and so both **students** and **teachers** can benefit from the integration of technology **in schools**. Some **educational technologies** for schools are not expensive, so every school can be in position to own at least 10 – 20 technologies for schools on this list. Also school administrators will find the technologies I have listed here very important and once integrated in schools; their job will also become easier. However, we need to know some benefits of integrating technology in our schools. So, on every **school technology** I have listed below, I have mentioned how useful it can be to either students or teachers.

1. **Computers:** Now a days computers are necessary thing in every education place. Without it we cannot work.
2. **Wifi Technology & Internet:** Schools can use Wifi internet to enhance students learning abilities. This internet can be accessed for free across the campus, so this will enable the student to learn individually while using their laptops or tablets.
3. **Cell Phones:** The debate of using cell phones in schools is still on table. Many educators think that they should ban cell phone usage in schools, but these cell phones have resulted into a new style of learning.
4. **Smart White Boards:** Schools are replacing the black and white black board with a digital smart white boards. Teachers have found these smart white boards more flexible and students tend to learn better when a smart board is used in the classroo
5. **LCD projector:** Schools use these LCD Projectors to enhance clear classroom demonstration. You can connect this projector to your computer and derive data from your computer to white board in the classroom. Teachers can use them in science classroom, geography classrooms, art classroom, music classroom and many more.
6. **SMART Board interactive displays:** Unlike the smart white board, this interactive board display is more advanced and it comes with great functions. It displays images and information in a digital form, it is more like a flat plasma LCD screen, and basically it is a touch screen so you will enjoy using it in your classroom.
7. **Social Networking and Blogs:** This is a new type of free technology used by most advanced schools. Teachers and students both use educational social networks like **Piazza.com, epals.com** to connect to other educators and fellow students.
8. **Audio Files – Podcasts:** Schools can take advantage of providing educational material in form of audio so that students can download them via the school network and listen to them anywhere.
9. **Tablets:** Schools can provide these portable tablets to their teachers to simplify their job. Tablets are a quite expensive, but they are better than laptops.

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10. **Laptop cart for schools:** Since most schools allow their students to come with laptops at school, this laptop cart will be needed to keep students laptops safe. Some on these laptop carts can also work as laptop charging terminals. Students don't have to move with their laptops or keep them in lockers where they can be stolen; this Laptop cart for schools can keep more than 50 laptops, so each classroom can have its Laptop cart.
11. **Digital camera:** Schools need to provide digital cameras to each teacher, these cameras can be used to take pictures in the field and these pictures can be used for visual illustration while in the classroom.
12. **Digital audio recorders:** Very few schools are using this device; it is commonly used by journalists. But teachers can also use these digital audio recorders to create audio files for their students to download and listen to lessons while not at school.
13. **CD/DVD Digital Duplicators:** Schools need to have a digital duplicator, and you don't need to have many of them. Teachers and students can use these digital duplicators to make copies of educational materials. For example, a biology teacher can make various illustrations and record them on a DVD for their biology classroom, then use this DVD digital duplicator to make copies of a full lesson for each student.
14. **Laser Printer:** Schools need to have these digital laser printers to complete some tasks. This printer can be used to print important educational documents like school notes, making of photo copies of various documents
15. **Computer Software: – Classroom management software:** Different types of software can be used by schools. For teachers and students to accomplish certain tasks using computers, they will need help from specific software's. For example, the SMART Sync classroom management software has various practical features which enable smooth transitions between individual, small group and whole class activities, which will help a teacher to make the most out their classroom
16. **Micro phones:** Schools need to give these digital microphones to each classroom. The microphone can be connected to loud speakers and teachers can find it simple to teach a big classroom without straining their voices using this digital micro phone. It is very light and you can even adjust the volume so that every student in the classroom hears you very well.
17. **MimioVote:** The Mimio Vote is an assessment system which can help teachers easily measure their students understanding capacity. This tool can help teachers track students progress through instant feedback and scores tallied over time.
18. **MimioView:** MimioView is a smart document camera which lets you easily add pictures or live streaming videos to your interactive whiteboard lessons. This is a great tool which can help teachers who don't have access to digital smart boards. It is cheap in price and it will deliver great visual illustration to your students which will improve on the way you teach and also improve on the way students learn.
19. **MimioPad:** The MimioPad is a wireless tablet which teachers can use in their classrooms. This device can help a teacher walk around the classroom while teaching from the whiteboard. So the teacher will not be tied in one place, and this will help them exercise their bodies while teaching, yet they will also be in position to reach every corner of the classroom and inspect students as they teach.
20. **MimioCapture:** MimioCapture is an Ink Recording System. This is a fabulous tool for teachers; the tool will allow you to save whiteboard notes and drawings to your computer as you teach for later usage. Many schools will find this tool technology important, because it comes at an affordable price.
    - Teachers can capture notes for absent students.
    - Teachers can call up the same note for multiple classes which saves them time.
    - You can use it without a projector
    - Teachers can save, print and edit their whiteboard notes for students anytime, using different formats, which include PDF, JPEG and HTML.
21. **MimioTeach:** MimioTeach Interactive System will save you from buying an interactive whiteboard which might be too expensive for your school, but it will enable you turn a whiteboard into an interactive whiteboard.

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22. **DyKnow Software:** You can easily supervise your classroom with this software. The all package of DYKNOW software comes with a classroom management software which you can use to guide computer use in the classroom and an Interactive Learning Software which you can use to present and share data, assess and save students work or record and replay past events in the classroom.
23. **Megaphones:** These are very common in most schools and colleges. A megaphone can be used to gather students for a specific reason; you can use a megaphone on a school parade to deliver a message

BEST CLASSROOM TECHNOLOGY FOR SCHOOLS

"*Teachers you can take a great advantage of this* ***technology for classroom*** *and improve on your teaching experience and also help your students learn better***"**

CONCLUSION

We believe that there are various technologies are available in market to impart important knowledge to the pupils is less time and efforts with minimum cost. Every educational institutes should use some technology to impart education among the students.

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GREEN COMPUTING: CURRENT RESEARCH TRENDS

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ABSTRACT
Green computing in a broader way is the practices and procedures of designing, manufacturing, using of computing resources in an environment friendly way while maintaining overall computing performance and finally disposing in a way that reduces their environmental impact. This means reduction in use of hazardous materials, maximizing output from the product during its lifetime while minimizing energy consumption and also reusability or recyclability and biodegradability of used products and wastes. Many corporate organizations are taking initiatives to reduce the harmful impact of their operations on the environment. United Nations Framework Convention on Climate Change (UNFCC) is an international environment treaty whose objective is to stabilize the emission of green house gases in the atmosphere at a level that would prevent dangerous anthropogenic interference with the eco system. Sustainable development means developing without damaging the requirements of the future generations. That is meeting human development goals while preserving natural resources and ecosystems on which the society depends. This paper is a survey of several important current researches related to the field of green computing which emphasises the importance of green computing for sustainable development.

INTRODUCTION
In this section a brief discussion is made on various issues related to green computing. This is followed by a section on survey of recent researches in the field of green computing. Earth and the Environment: Over the past few decades there has been lot of change across in temperature and weather patterns due to increase in greenhouse gases on account of massive deforestation, burning of fossil fuel and rapid industrialisation. Consequently, the average temperature of the air and the ocean has increased. Due to increase in the air temperature there has been more melting of snow resulting in an increase in sea levels. Impact of Information Technology upon Environment: Over the same period of time the rise in the use of computers have increased manifold. The combined effect of the energy needed to run these devices and the electricity required to maintain the cooling infrastructure for these devices have an impact on the environment. This is an area of serious concern and is drawing people for research in the field of Green Computing which is about using computer in an eco friendly way.

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I am thankful to my colleague Rafey Khan & Ansari Danish for critically reading the manuscript and suggesting some modifications to it.

CONCLUSION
In the coming years there is a scope of lot of research work that needs to be done in the field of green computing. Research could be concentrated around making data centers and cloud computing more energy efficient. The corporate organizations must take more green initiatives. All stake holders must work jointly for a greener world. Otherwise, the human race will face severe problems in the coming years. There are as such no limitations of this survey but in future it is expected that there will be lot of research related to green computing. That is the scope of future improvement of this work.

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ALTEREGO: A PERSONALIZED WEARABLE SILENT SPEECH INTERFACE

Asrunnisa Mohammad Ashfaq

ABSTRACT

AlterEgo is a closed-loop, non-invasive, wearable system that allows humans to converse in high-bandwidth natural language with machines, artificial intelligence assistants, services, and other people without any voice—without opening their mouth, and without externally observable movements—simply by vocalizing internally. The wearable captures electrical signals, induced by subtle but deliberate movements of internal speech articulators (when a user intentionally vocalizes internally), in likeness to speaking to one's self. We use this to facilitate a bi-directional natural language computing system, where users receive aural output through bone-conduction earphones without obstructing a user's physical senses. This enables a user to transmit and receive streams of information to and from a computing device or any other person without any observable action, in discretion and without invasion of the user's privacy. AlterEgo aims to combine humans and computers—such that computing, the internet, and AI would weave into human personality as a "second self" and augment human cognition and abilities.

INTRODUCTION

AlterEgo comprises of a device and a computing system that can read and transcribe your inner voice. It is made up of a neural network that that uses neuromuscular signals to understand thoughts.The testing phase revealed an average precision accuracy of 92%.

Computers being able to pick up what a person is thinking has been so far a product of our imagination. We used to look at these other worldly concepts in movies, or read about them in books, and our imagination used to soar.

Those fictional worlds are inching closer to becoming real-life application.Researchers at MIT have developed a device and a computing system (together called AlterEgo) that picks up the words you don't say aloud but vocalise internally.

AlterEgo is a wearable silent speech interface that enables a discreet, seamless and bi-directional communication with a computing device in natural language without discernible movements or voice input.

BACKGROUND AND RELATED WORK

Voice InterfacesConversational interfaces currently exist in multiple forms. The recent advances in speech recognition methods have enabled users to have interaction with a computing device in natural language [1,12]. This has facilitated the advent of
ubiquitous natural voice interfaces, currently deployed in mobile computational devices as virtual assistants (e.g- Siri , Alexa , Cortana etc.). These interfaces have also been embedded in other devices such as smartwearables, dedicated hardware speakers (e.g - Google Home , Amazon Echo), and social robots. Another broad category under voice interfaces are modern telecommunications devices for person-person communication (e.g - smartphones, Skype etc). Although, all the aforementioned platforms offer robust voice based interaction, they share common limitations. There are fundamental impediments to current speech interfaces that limit the possibility of their adoption as a primary human machine interface.

SILENT SPEECH RECOGNITION MODEL:

The signal undergoes a representation transformation before being input to the recognition model. We use a running window average to identify and omit single spikes (> 30 □□above baseline) in the stream, with amplitudes greater than average values for nearest 4 points before and after.

We use mel-frequency cepstral coefficient based representations to closely characterize the envelopes of human speech. The signal stream is framed into 0.025s windows, with a 0.01s step between successive windows, followed by a periodogram estimate computation of the power spectrum for each frame. We apply a Discrete Cosine Transform (DCT) to the log of the mel filterbank applied to the power spectra. This allows for us to effectively learn directly from the processed signal without needing to hand-pick any features. This feature representation is passed through a 1-dimensional convolutional neural network to classify into word labels with the architecture described as follows. The hidden layer convolves 400 filters of kernel size 3 with stride 1 with the processed input and is then passed through a rectifier nonlinearity. This is subsequently followed by a max pooling layer.

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This unit is repeated twice before globally max pooling
over its input. This is followed by a fully connected layer of dimension 200 passed through a rectifier nonlinearity which is followed by another fully connected layer with a sigmoid activation. The network was optimized using a first order gradient descent and parameters were updated using Adam during training. The network was regularized using a 50% dropout in each hidden layer to enable the network to generalize better on unseen data. The error during training was evaluated using a cross entropy loss.

AURAL OUTPUT

Silent speech recognition of the AlterEgo system attempts to open up a unique opportunity to enable personalized bidirectional human-machine interfacing in a concealed and seamless manner, where the element of interaction is in natural language. This potentially facilitates a complementary synergy between human users and machines, where certain tasks could be outsourced to a computer while the computation still seeming as "intrinsic" to the human user. After an internally vocalized phrase is recognized, the computer contextually processes the phrase according to the relevant application the user accesses (e.g -An IoT application would assign the internally vocalized digit 3 to device number 3 whereas the Mathematics application would consider the same input as the actual number 3). The output, thus computed by the application, is then converted using Text-to-Speech and aurally transmitted to the user. We use bone conduction headphones as the aural output, so as to not impede the user's sense of hearing.

FUTURE WORK

There remain many avenues for future work. In particular, we identify the following key future tasks for our silent speech device:

1. Collect more data to develop a more generalized multiuser silent speech recognition model: We aim to develop a generalized multi-user system that is user-independent, but can also be tuned and personalized for each user when they start using the device.
2. Extend the system to include a broader vocabulary of words: In the current instantiation, we implemented accessibility to multiple vocabulary sets simultaneously, albeit on limited data. Our experimental evaluation was based on an arithmetic computation application. We plan to augment our recognition models to accommodate for a larger dataset, and plan to follow this with thorough multi□user longitudinal accuracy tests of our system.
3. Test the system in real-world ambulatory settings: Our existing study was conducted in a stationary setup. In the future, we would like to conduct longitudinal usability tests in daily scenarios.

CONCLUSION

Silent speech entails that the user communicates with the device by internally talking to oneself instead of actual speech articulation. We akin this to reading something to oneself without moving one's lips, producing an audible sound and without any discernable action.

Silent speech interfaces allow the user to communicate with computers, applications and people as seamlessly as they do through speech interfaces (telecommunications devices, speech based smart assistants, social robots etc.), but without the overhead of saying things out loud. As a result, silent speech interfaces are more private and personal for each user, and do not conflict with the existing verbal communication channels between people. We envision that the usage of our device will interweave human and machine intelligence to enable a more natural human-machine symbiosis that extends and augments human intelligence and capability in everyday lives.

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ARTIFICIAL INTELLIGENCE ADVANCED ANALYSIS AND DESIGN

Master Ansari Danish, Prof. Abdul Sadique and Prof. Nashra G.

ABSTRACT
Artificial Intelligence was first proposed by John McCarthy in 1956 in his first academic conference on the subject. The idea of machines operating like human beings began to be the center of scientist's mind and whether if it is possible to make machines have the same ability to think and learn by itself was introduced by the mathematician Alan Turing. Alan Turing was able to put his hypotheses and questions into actions by testing whether "machines can think"? After series of testing (later was called as Turing Test) it turns out that it is possible to enable machines to think and learn just like humans. Turing Test uses the pragmatic approach to be able to identify if machines can respond as humans. ("Smith", (n.d.)).

INTRODUCTION
I have chosen this topic to spotlight on one of the most technological trend these days known as AI (Artificial Intelligent). Therefore; I will discuss some of the most important aspects related to AI in which it will help in a better understanding of Artificial Intelligent and both its advantages and disadvantages to be able to protect ourselves from the upcoming technological trend. This paper will also discuss some of the algorithms used in AI systems.

HISTORY OF ARTIFICIAL INTELLIGENCE
Artificial Intelligence was first proposed by John McCarthy in 1956 in his first academic conference on the subject. The idea of machines operating like human beings began to be the center of scientist's mind and whether if it is possible to make machines have the same ability to think and learn by itself was introduced by the mathematician Alan Turing. Alan Turing was able to put his hypotheses and questions into actions by testing whether "machines can think"? After series of testing (later was called as Turing Test) it turns out that it is possible to enable machines to think and learn just like humans. Turing Test uses the pragmatic approach to be able to identify if machines can respond as humans. ("Smith", (n.d.)).

DESCRIPTION ARTIFICIAL INTELLIGENCE
Artificial Intelligence is: the field of study that describe the capability of machine learning just like humans and the ability to respond to certain behaviors also known as (A.I.). The need of ARTIFICIAL INTELLIGENCE 4 Artificial Intelligence is increasing every day. Since AI was first introduced to the market, it has been the reason of the quick change in technology and business fields. Computer scientist are predicting that by 2020, "85% of customer interactions will be managed without a human". ("Gartner", (n.d.)). This means that humans simple request will depend on computers and artificial intelligence just like when we use Siri or Galaxy to ask about the weather temperature. It is very important to be prepared for AI revelation just like UAE have by installing a state minister for AI in Dubai.

PROS AND CONS OF ARTIFICIAL INTELLIGENCE
AI offers reliability, cost- effectiveness, solve complicated problems, and make decisions; in addition, AI restrict data from getting lost. AI is applied nowadays in most fields whether business or engineering. One of the great tools in AI is called "reinforcement learning" which is based on testing success and failure in real life to increase the reliability of applications. Unfortunately, AI is limited with its capability and functionality. ("Sadek",(n.d.)) Although Artificial Intelligence made our lives much easier and saved us more time than ever, scientists are predicting that by the huge dependency on AI humanity could extinct. Scientists argue that by having a AI machines, people will be jobless and that will conclude in losing the sense of living. Since machines are learning and doing thigs more efficiently and effectively in a timely manner, this could be the reason of our extinction.

AI ALGORITHMS AND MODELS
AI is mainly based on algorithms and models as a technique which is designed based on scientific findings such as math, statists, and biology (Li& Jiang, (n.d.)). AI works based on several models such as: Ant Colony Algorithm, Immune Algorithm, Fuzzy Algorithm, Decision Tree, Genetic Algorithm, Particle Swarm Algorithm, Neural Network, Deep Learning and in this report, I will discuss some of the most known models which are: Support Vector Machine, and the Artificial Neural Network.

• Support Vector Machine (SVM) where it is used to build a classification model by finding an optimal hyperplane based on a set of training examples as shown in (figure A-1). It is also have been used for pattern classification and trend prediction lots of applications for instance: power transformer fault diagnosis, disease

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diagnosis and treatment optimization. (Li& Jiang, (n.d.)). Figure A-1 Describes how SVM algorithm being represented in AI ARTIFICIAL INTELLIGENCE 6

• Artificial Neural Network (ANN) is a representative model of understanding thoughts and behaviors in terms of physical connection between neurons. ANN has been used to solve variety of problems through enabling the machine to build mathematical models to be able to imitate natural activities from brains perspective.

CONCLUSION

AI nowadays is being implemented in almost every field of study through several models such as SVM and ANN. We should be able to proceed with knowing and understanding the consequences of every technological trend. In my opinion, we are in the AI revelation era and therefore; we should adopt into this change and welcome it too by embracing AI and moving toward a better society.

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PEOPLE COUNTING USING COMPUTER VISION

Shaikh Khalid Alim, Prof. Abdul Sadique and Nashra Mam

ABSTRACT

A real-time People Counting System is presented in this Paper. Using a single overhead mounted camera, the system counts the number of people going in and out of an observed area. Counting is performed by analyzing an image zone composed by a set of virtual counting lines.

The system runs on a Commercial PC, does not need a special background and is easily adjustable to different camera height requirements. We have tested the performance of the system, achieving a correct people counting rate of 95%.

INTRODUCTION

Tracking people using surveillance equipment has increasingly become a vital tool for many purposes. Among these are the improvement of security and making smarter decisions about logistics and operations of businesses. Automating this process is an ongoing thrust of research in the computer vision community.

With many different camera locations, we are very interested in finding out how many people exited, and which routes they used to exit the building. Our ultimate goal is to uniquely identify the people who exited, however that is beyond the scope of this paper.

Thus the aim of this work is to automatically count the number of people to use each exit in a particular video. To do so, it will be necessary, to first detect the people in the video, then to track the movements of each person, and finally decide if they exit.

COMPUTER VISION

The scientific discipline of computer vision is concerned with the theory behind artificial systems that extract information from images. The image data can take many forms, such as video sequences, views from multiple cameras, or multi-dimensional data from a medical scanner. The technological discipline of computer vision seeks to apply its theories and models to the construction of computer vision systems.

Sub-domains of computer vision include scene reconstruction, event detection, video tracking, object recognition, 3D pose estimation, learning, indexing, motion estimation, and image restoration.

DEFINITION OF COMPUTER VISION

Computer vision is an interdisciplinary field that deals with how computers can be made to gain high-level understanding from digital images or videos. From the perspective of engineering, it seeks to automate tasks that the human visual system can do.

Computer Vision tasks include methods for acquiring, processing, analyzing and understanding digital images, and extraction of high-dimensional data from the real-world in order to produce numerical or symbolic information, e.g. in the forms of decision

REQUIREMENTS

Python is an interpreter, high-level, general-purpose programming language. Created by Guido van Rossum and first released in 1991, Python's design philosophy emphasizes code readability with its notable use of significant whitespace. Its language constructs and object- oriented approach aim to help programmers write clear, logical code for small and large-scale projects.

PyCharm is an integrated development environment (IDE) used in computer programming, specifically for the Python language. It is developed by the Czech

Company JetBrains. It provides code analysis, a graphical debugger, an integrated unit tester, integration with version control systems, and supports web development with Django as well as Data Science with Anaconda

OpenCV (Open source computer vision) is a library of programming functions mainly aimed at real-time computer vision. Originally developed by Intel, it was later supported by Willow Garage then Itseez (which was later acquired by Intel). The library is cross- platform and free for use under the open-source BSD license.

A Camera is an optical instrument used to capture still images or to record moving images, which are stored in a physical medium such as in a digital system or on photographic film. A camera consists of a lens which focuses light from the scene, and a camera body which holds the image capture mechanism.

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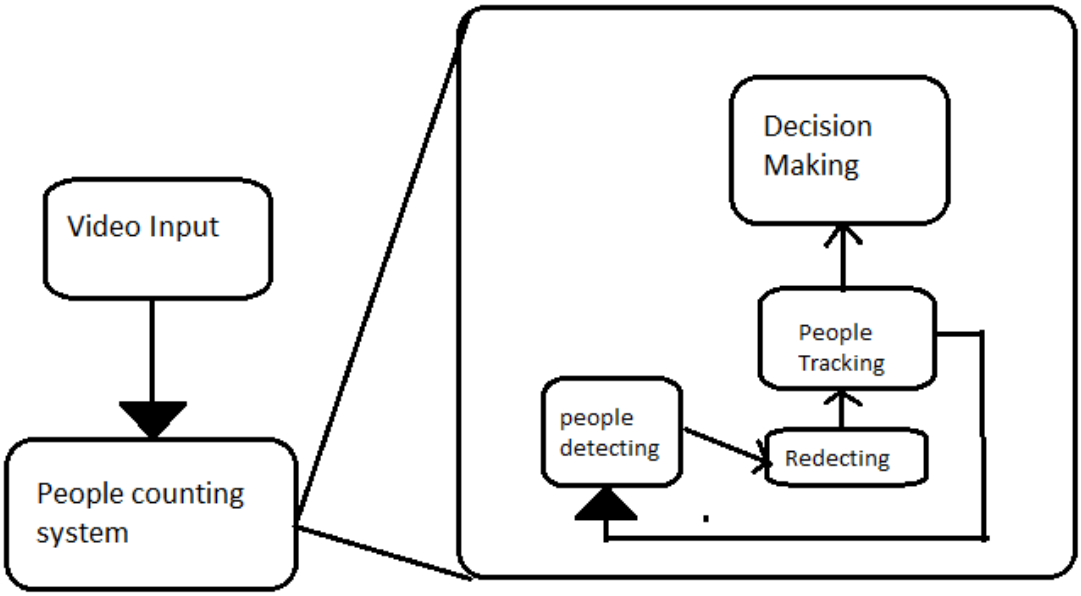
YOLO (You Only Look Once) is a state-of-the-art, real-time object detection system. On a Pascal Titan X it processes images at 30 FPS and has a mAP of 57.9% on COCO test-dev.

YOLOv3 is extremely fast and accurate. In mAP measured at .5 IOU YOLOv3 is on par with Focal Loss but about 4x faster. Moreover, you can easily tradeoff between speed and accuracy simply by changing the size of the model, no retraining required!

ARCHITECTURE



EXPLANATION

The Live video or just a video is converted into images and then the people counting is performed using YOLOV3 on the images of the video. After detection of the vehicle a particular ID is given to that vehicle and that ID is upgraded in every images of the video.

And when the people crosses a particular line that is made by the OpenCV the actual decision is being performed there by the Program using xmin, ymin, xamx, ymax, of the person

And with the help of ffmpeg.exe the images are converted into a video as the final output.

After that the video is stored in the Database for further use.

CONCLUSION

An algorithm to track and count the number of people exiting a door or building in a given surveillance video has been presented. This algorithm has been qualitatively shown to work well on sparsely populated videos, but fail when multiple people and events overlap, as expected.

Further work is continuing to implement a more complicated algorithm to deal with these failures. While the ultimate goal of this project has not been achieved quite yet, it certainly seems to be within reach.

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INTERNET OF THINGS (IOT): A LITERATURE REVIEW

Master Ansari Abu Rafey, Prof. Abdul Sadique and Prof. Nashra G.

ABSTRACT

One of the buzzwords in the Information Technology is Internet of Things (IoT). The future is Internet of Things, which will transform the real world objects into intelligent virtual objects. The IoT aims to unify everything in our world under a common infrastructure, giving us not only control of things around us, but also keeping us informed of the state of the things.

In Light of this, present study addresses IoT concepts through systematic review of scholarly research papers, corporate white papers, professional discussions with experts and online databases. Moreover this research article focuses on definitions, geneses, basic requirements, characteristics and aliases of Internet of Things. The main objective of this paper is to provide an overview of Internet of Things, architectures, and vital technologies and their usages in our daily life. However, this manuscript will give good comprehension for the new researchers, who want to do research in this field of Internet of Things (Technological GOD) and facilitate knowledge accumulation in efficiently.

Keywords: Internet of Things, IoT, RFID, IPv6, EPC, Barcode, Wi-Fi, Bluetooth, NFC, ZigBee, Sensors, Actuators

INTRODUCTION

"The most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it" was Mark Weiser's central statement in his seminal paper [Weis 91] in Scientific American in 1991. There is a sea change in human's daily life as well as in working conditions in organizations after the arrival of IT and ITeS technologies. This is becoming well-known concept across many horizontal and vertical markets including a common man's everyday life in the society, as it has several applications. The development of the Internet of Things [IoT] has been primarily driven by needs of large corporations that stand to benefit greatly from the foresight and predictability afforded by the ability to follow all objects through the commodity chains in which they are embedded [1].

INTERNET OF THINGS

The Internet of Things is a novel paradigm shift in IT arena. The phrase "Internet of Things" which is also shortly well-known as IoT is coined from the two words i.e. the first word is "Internet" and the second word is "Things". The Internet is a global system of interconnected computer networks that use the standard Internet protocol suite (TCP/IP) to serve billions of users worldwide. It is a network of networks that consists of millions of private, public, academic, business, and government networks, of local to global scope, that are linked by a broad array of electronic, wireless and optical networking technologies [3]. Today more than 100 countries are linked into exchanges of data, news and opinions through Internet. According to Internet World Statistics, as of December 31, 2011 there was an estimated 2, 267, 233, 742 Internet users worldwide (Accessed data dated on 06/06/2013: from the Universal Resource Location http://www.webopedia.com/TERM/I/Internet.html). This signifies 32.7% of the world's total population is using Internet. Even Internet is going into space through Cisco's Internet Routing in Space (IRIS) program in the coming fourth years (Accessed on 10/05/2012:

DEFINITIONS

There is no unique definition available for Internet of Things that is acceptable by the world community of users. In fact, there are many different groups including academicians, researchers, practitioners, innovators, developers and corporate people that have defined the term, although its initial use has been attributed to Kevin Ashton, an expert on digital innovation. What all of the definitions have in common is the idea that the first version of the Internet was about data created by people, while the next version is about data created by things. The best definition for the Internet of Things would be:

"An open and comprehensive network of intelligent objects that have the capacity to auto-organize, share information, data and resources, reacting and acting in face of situations and changes in the environment"

REQUIREMENTS

For successful implementation of Internet of Things (IoT), the prerequisites are (a) Dynamic resource demand (b) Real time needs (c) Exponential growth of demand (d) Availability of applications (e) Data protection and user privacy (f) Efficient power consumptions of applications (g) Execution of the applications near to end users (h) Access to an open and inter operable cloud system.

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According to another author, there are three components, which required for seamless Internet of Things (IoT) computing

(a) Hardware—composed of sensors, actuators, IP cameras, CCTV and embedded communication hardware

(b) Middleware—on demand storage and computing tools for data analytics with cloud and Big Data Analytics

(c) Presentation—easy to understand visualization and interpretation tools that can be designed for the different applications.

ARCHITECTURES

One of the main problems with the IoT is that it is so vast and such a broad concept that there is no proposed, uniform architecture. In order for the idea of IoT to work, it must consist of an assortment of sensor, network, communications and computing technologies, amongst others [14]. Here, some of IoT architectures or models are given by several researchers, authors and practitioners.

TECHNOLOGIES

The Internet of Things [15] was initially inspired by members of the RFID community, who referred to the possibility of discovering information about a tagged object by browsing an internet address or database entry that corresponds to a particular RFID or Near Field Communication [16] technologies. In the research paper "Research and application on the smart home based on component technologies and Internet of Things", the included key technologies of IoT are RFID, the sensor technology, nano technology and intelligence embedded technology. Among them, RFID is the foundation and networking core of the construction of Internet of Things [17]. The Internet of Things (IoT) enabled users to bring physical objects into the sphere of cyber world. This was made possible by different tagging technologies like NFC, RFID and 2D barcode which allowed physical objects to be identified and referred over the internet [18]. IoT, which is integrated with Sensor Technology and Radio Frequency Technology, is the ubiquitous network based on the omnipresent hardware resources of Internet, is the Internet contents objects together. It is also a new wave of IT industry since the application of computing fields, communication network and global roaming technology had been applied. It involves in addition to sophisticated technologies of computer and communication network outside, still including many new supporting technologies of Internet of Things, such as collecting Information Technology, Remote Communication Technology, Remote Information Transmission Technology, Sea Measures Information Intelligence Analyzes and Controlling Technology etc. [19].

CONCLUSIONS

IoT has been gradually bringing a sea of technological changes in our daily lives, which in turn helps to making our life simpler and more comfortable, though various technologies and applications. There is innumerable usefulness of IoT applications into all the domains including medical, manufacturing, industrial, transportation, education, governance, mining, habitat etc. Though IoT has abundant benefits, there are some flaws in the IoT governance and implementation level. The key observations in the literature are that (1) There is no standard definition in worldwide (2) Universal standardizations are required in architectural level (3) Technologies are varying from vendor-vendor, so needs to be interoperable (4) For better global governance, we need to build standard protocols. Let us hope future better IoT.

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INFORMATION TECHNOLOGY INDUSTRY IN INDIA

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- **ABSTRACT**

The Information Technology (IT) industry has been growing at a rapid pace.

To be accurate, it was only from the 1990s; the IT sector has achieved a breakthrough and is now considered as one of the major industries in India.

Unlike other sectors, which have seen turbulent times, this is one sector that has been meeting or even exceeding the expectations of the industry veterans and trade bodies.

This brief article examines the trends and the growth of the IT sector and the major factors, which have contributed to the growth of this industry.

Two important segments of IT are software and hardware.

To state a fact, the software sector has risen as a key industry in the field of electronics.

One of the key reasons for its rapid growth is the huge ocean of technically skilled manpower that has provided a great boost to transform India into a major.

- **INTRODUCTION**

The Indian IT industry came into the picture under very unfavourable conditions.

The Indian IT Industry was kick-started by Bombay-based conglomerates that entered the business by supplying programmers to global IT firms located overseas.

During the 1970s the Indian economy was state-controlled and remained hostile to the software industry.

To put more pressure, Import tariffs were high like 135% on hardware and 100% on software.

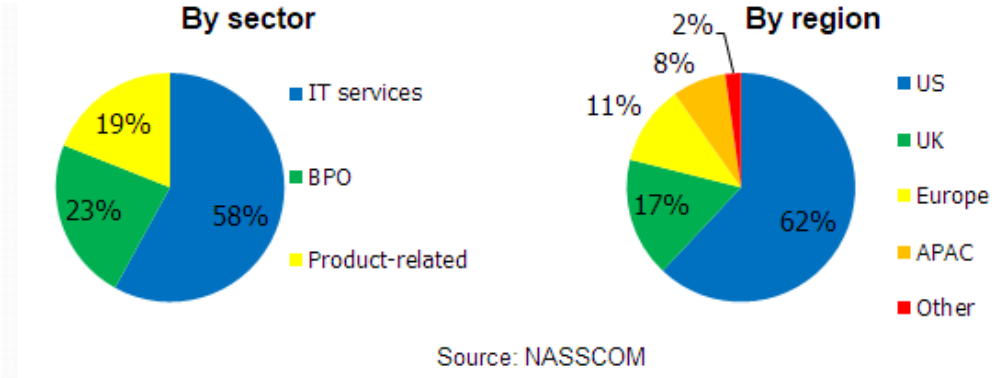
Even the exporters were ineligible for bank finance.

In 1984 Rajiv Gandhi became Prime Minister and the Government policy towards the IT sector changed.

Indian IT Industry's development and contribution to the world's information technology sector is of the highest reputation.

This might be the reason for the basis of the high growth statistics of India and the changing outlook of the companies towards India.

Urban Metro Cities like Bangalore, Mumbai, Delhi, Chennai, and Hyderabad have become the favorite destinations for all the big banners like HSBC, Dell, Microsoft, GE, Hewlett Packard, and several Indian multi-national firms like Infosys Technologies, Wipro, and TCS have set up their offices in these cities as the cities offer good infrastructure, with large floor space and great telecom.



Breakdown of India’s IT related service exports

- **PROBLEM DEFINITION**

In spite of the recent growth of the IT industry in India, there are signs the growth is slowing.

Also, hiring rates have decreased by around 40% in the last three years.

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According to the recent data from the National Association of Software and Services Companies (NASSCOM), the IT sector in India only grew by 5% in 2018.

The Indian IT industry is currently facing problems such as:

- ***H1-B Visas***

The H1-B visa is a program that grants companies based in the US to temporarily employ highly skilled professions from other countries.

Regrettably, the new procedure makes it difficult for companies to prove that the H1-B worker comes with specific and non-speculative qualifying assignments in a certain occupation.

This recent year, the Trump administration changed the policy of issuing H1-B visas.

- ***Economic Slowdown***

The IT Industry in India brings in most of its clients from Western countries like the US, the UK, Spain, and Canada.

In the past few years, these Western countries have faced slowing economic growth, which has hurt the growth of the IT industry in India.

To rub salt in the wound, there has always been a biasing relationship between the dollar and the rupee.

The ever increasing value of the dollar against the rupee has further strained the industry.

- ***Data protection and privacy rules***

According to the new data protection and privacy rules enforced by other countries are preventing Indian companies to serve in those countries.

As an example, the European Union's GDPR (General Data Protection Regulation) law became effective in May 2018.

GDPR applies to all the companies that operate in the EU or have their customers in the region – any company that deals with the personal data of European customers.

- ***Domestic Challenges***

This is the era of digital transformation, where companies around the world are embracing modern technologies like cloud computing, artificial intelligence (AI), the Internet of Things (IoT), and blockchain.

These are the technologies that help reduce costs, accelerate time to market, save time and increase employee productivity.

But, Indian organizations are slow in adopting these technologies.

This is due to the lack of skilled employees, conventional infrastructure, as well as restrictive regulations.

More than 400,000 students graduate every year in India.

In comparison, only 20% of them get employment.

This is due to the universities and colleges that are focused on providing degrees rather than enhancing student skills.

- ***Negative reputation around the world***

India's IT tycoons, TCS was slammed by a penalty of $420 million by the US court in April 2016.

The US-based company Epic Systems had accused them of stealing trade secrets, confidential information, and data that belonged to Epic.

In another case, Infosys paid a penalty of $1 million for violating the visa and immigration rules in the US.

It was accused of employing foreign workers in New York without paying taxes and wages.

TCS and Infosys are among the pillars of the IT industry in India.

Such incidents have negatively impacted the image of the Indian IT industry in the global market.

- **PREPARED METHODOLOGY**

❖ **Factors that affect growth**

- A high growth demand for exports from new vertical

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- The State Government of Telangana began construction of a technology incubator in Hyderabad—dubbed T-Hub—to reposition the city as a technology destination.
- The rapidly growing urban infrastructure has fostered several IT centers in the country
- The ever-expanding economy to propel growth in local demand
- The IT firms have a large number of delivery centers in the various parts of the world
- Increase in internet penetration
- Rise of the e-commerce market

❖ **Government Initiatives**

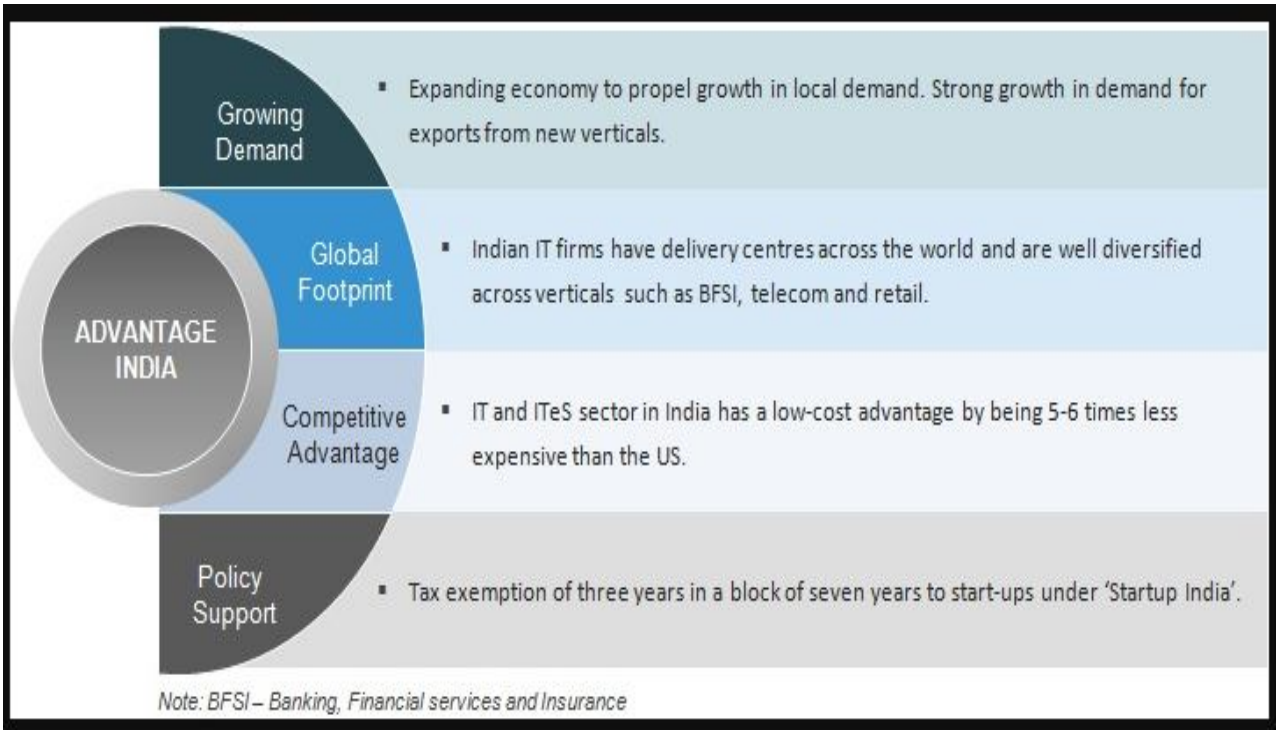
With the adoption of key technologies across sectors spurred by the 'Digital India Initiative' could help boost India's gross domestic product (GDP) by US$ 550 billion to US$ 1 trillion by 2025, as per research firm McKinsey.

Some of the major initiatives taken by the government to promote the IT and ITeS sector in India are as follows:

- India and the United States (US) have mutually agreed to join their forces and explore opportunities for collaboration on implementing India's ambitious Rs 1.13 trillion (US$ 18.22 billion) 'Digital India Initiative'. Both of them also agreed to hold the US-India Information and Communication Technology (ICT) Working Group in India later this year.
- India and Japan held a Joint Working Group conference for the Comprehensive Cooperation Framework for ICT. Japan was offered to manufacture ICT equipment in India.
- The State Government of Telangana began construction of a technology incubator in Hyderabad—dubbed T-Hub—to reposition the city as a technology destination. The state government is initially investing Rs 35 crore (US$ 5.64 million) to set up a 60,000 sq ft space, labeled the largest start-up incubator in the county, at the campus of International Institute of Information Technology-Hyderabad (IIIT-H). Once the project is completed, it is proposed to be the world's biggest start-up incubator housing 1,000 start-ups.
- The city of Bengaluru has received US$ 2.6 billion in venture capital (VC) investments in 2014, making it the fifth-largest recipient globally during the year, an indication of the growing vibrancy of its start-up ecosystem. India received the third-highest VC funding worth US$ 4.6 billion, among other countries.

- **RESULTS**

The following representation describes the strong foothold of the IT industry in India to capture the international market.



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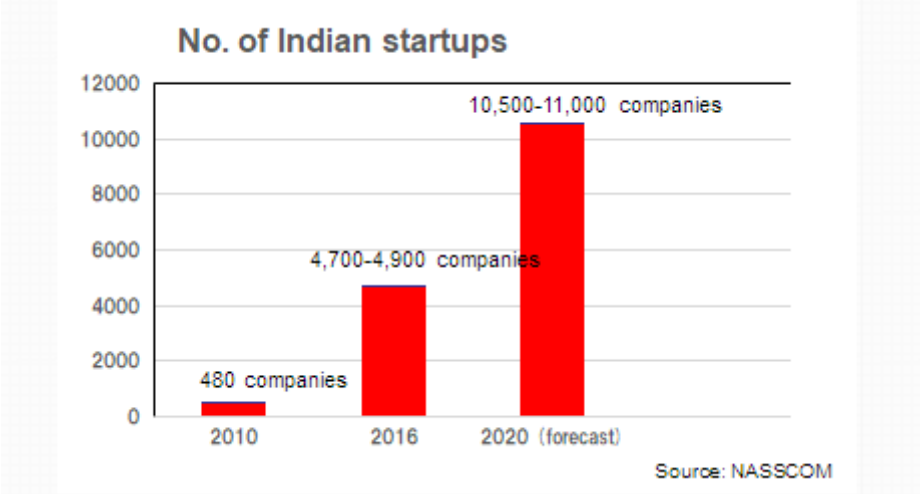
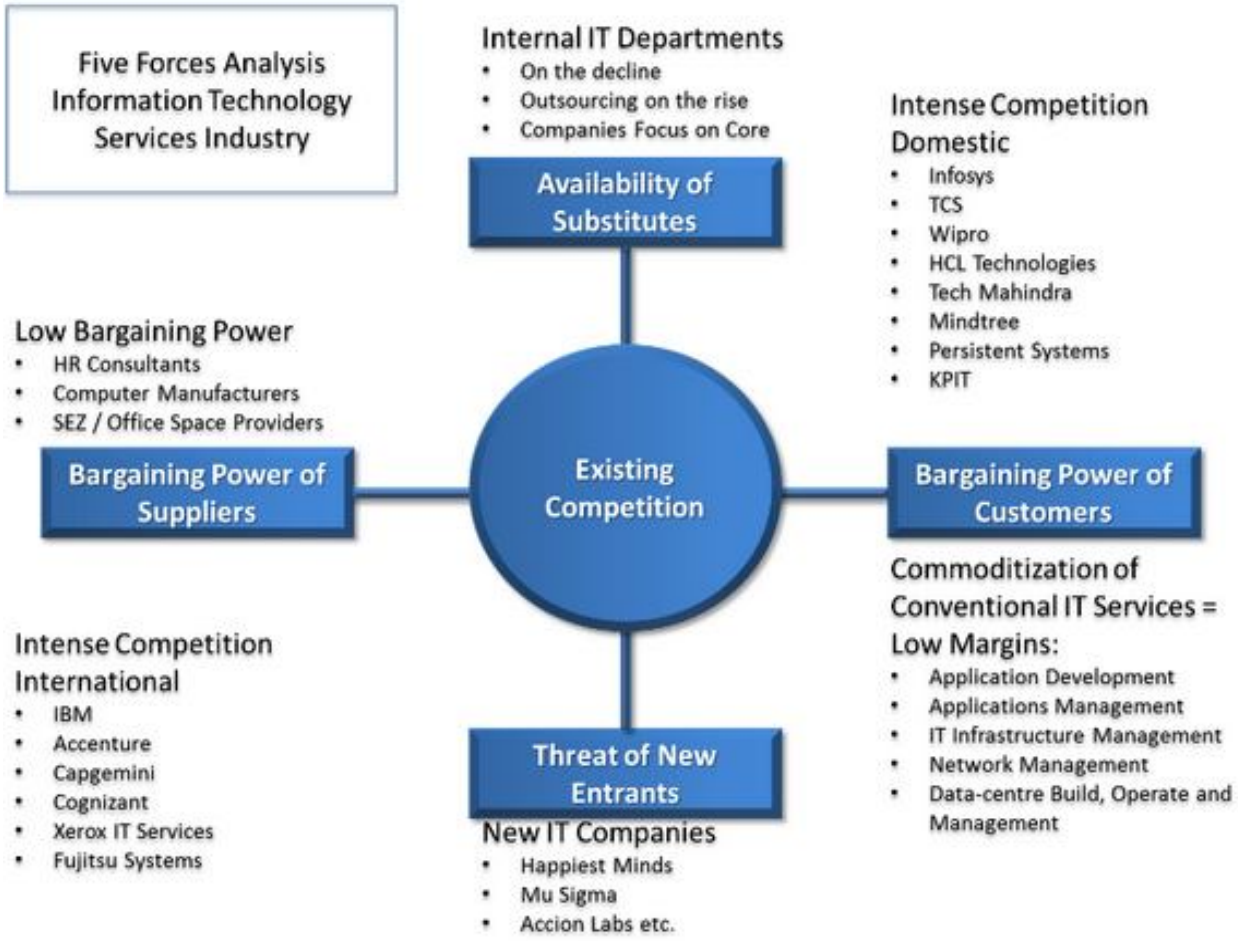
Indian Technology Start-ups power growth



Similarly the competition in the IT industry can be represented by this Five Force Analysis



- **CONCLUSION**

Based on NASSCOM's research, the IT sector is likely to generate revenues running into several billions of dollars by the end of 2020 that will give a big boost to the Indian economy.

Apart from that, the Government is also expected to increase its e-governance initiatives.

However, the key driver for the IT industry is innovation, which means companies need to respond to the requirements of the dynamic environment by developing and deploying new products and solutions.

Technologies like Big Data, Artificial Intelligence, Machine Learning, Blockchain, and Cybersecurity are some of the innovative technologies that are shaping the current IT sector and would do so in the coming years as well.

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PEOPLE'S JUDGMENTS OF HUMAN AND ROBOT BEHAVIORS

Idresi Sana Parveen and Mohod Aalam

ABSTRACT

The emergence of robots in everyday life raises the question of how people explain the behavior of robots—in particular, whether they explain robot behavior the same way as they explain human behavior. However, before we can examine whether people's explanations differ for human and robot agents, we need to establish whether people judge basic properties of behavior similarly regardless of whether the behavior is performed by a human or a robot

We find lot of differences in human and robot .While establishing a pool of robust stimulus behaviors (whose properties are judged similarly for human and robot), we detected several behaviors that elicited markedly discrepant judgments for humans and robots. Such discrepancies may result from norms and stereotypes people apply to humans but not robots, and they may present challenges for human-robot interactions and also we compared ' people's moral judgments about human and robot agents.'

Keywords: HRI (human robot interaction), intentional stance, humanoid robot, social cognition, human behavior.

INTRODUCTION

Human-robot interaction (HRI) is an increasingly important topic, as robotic agents are becoming more developed, and are likely to take a conspicuous role as social agents in fields like health care and education, as well as daily living as they are artificial human-like agents and thereby unlike any other natural social stimulus. We will consider the issue of adopting intentional stance toward artificial embodied agents (robots), we will discuss its relationship to other, lower-level mechanisms of social cognition, and we will critically evaluate methods to assess adoption of intentional stance. We posit that an intentional mindset, in which we frame a robot's actions in terms of its goals and desires, on the part of the user, might be crucial for well functioning HRI.

The rise of robots in everyday life demands an investigation into how people conceptualize robots and their social behaviors—in particular, whether people interpret robot behaviors by way of mental states such as beliefs, desires, and intentions, just as they do for humans

Examining people's explanations of robot behavior may therefore unveil some of the concepts and cognitive processes that robots elicit in human perceivers, which will in turn help clarify to what extent robotic agents are regarded as social beings.

to determine whether people genuinely explain robot and human behaviors differently, we must examine behaviors that are equated, across human and robot, for at least these three properties. Otherwise, any seeming differences in how people explain robot and human behaviors may in reality be due to differences in how people perceive the behaviors (e.g., as more intentional or less surprising) when performed by a robot or human. Both differences are of potential interest, but their theoretical and practical implications differ.

In our investigation we identified a pool of behaviors that people judged as similar on the properties of intentionality, surprisingness, and desirability, regardless of whether they were performed by humans or robots. However, we also detected behaviors that showed markedly discrepant judgments for humans and robots on two or more of the above properties. These behaviors may reveal insights about boundaries of interactions between humans and robotic agents.

EXISTING SYSTEM

Our midst could be much more disruptive. Especially as machines are made to look and act like us and to insinuate themselves deeply into our lives, they may change how loving or friendly or kind we are—not just in our direct interactions with the machines in question, but in our interactions with one another related to human.

1. In early stage 'people things only human can do the work properly'.
2. Making robot which same like to the human cantain lots of money.
3. In robot we are not added the same thinking capacity just like human to Handel any situations.

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PROPOSED SYSTEM

Robots are joining us at work, schools, and even at home. But, beyond assisting us, can they influence the way we act? Researchers at Cornell have conducted a series of experiments to address whether--and how--the presence of a robot can influence human behavior.

- Robots can help human in their work to do on time.

1) Human and robots can work to get her in an organization.

- In latter stage they become friends of each other.

c) Robot were never get tired form their work .they do multiple work simentenously.

METHOD

We identified candidate behaviors from the robotics and HRI literatures and from previous studies on human behavior explanations. We aimed for sufficient representation in three classes of behaviors: unsurprising intentional (n = 14), surprising intentional (n = 28), and unintentional (n = 10). Many of these behaviors will be Performed only by future robots, so we also identified a fourth class of control behaviors that current robots already perform (n = 26).We recruited 239 participants from Amazon Mechanical Turk and asked them to judge one half of each behavior class (39 out of 78 total) for one agent type (human or robot) on one of the behavior properties (intentionality, surprisingness, or desirability). We examined inter-rater reliability among participants who rated a given agent on a given property across behaviors. We excluded judges (n= 30, 12.6% of all judges) with very low correlations with the rest of the group ($r < .30$) from further analyses.

The remaining judges displayed intra-class correlation coefficients ICC(2,1) in the .50s and .60s for desirability and intentionality, for both agents. More judges had to be excluded for surprisingness and, even then, reliability was in the .30s for robots and .40s for humans.

RESULTS

We computed the average ratings of intentionality, surprisingness, and desirability for each of the 78 behaviors, separately for robot and human agent. To examine whether the properties differed between agents, we performed three ANOVAs in a 2 (agent: human vs. robot) by 4 (behavior class: control, intentional-surprising, intentional-unsurprising, unintentional) design. We observed the expected main effects for behavior class (e.g., intentional behaviors judged as more intentional than unintentional behaviors) but no interactions with agent. Behavior class explained 62% of the variability in intentionality ($F(3, 147) = 81.0$, $p < .001$), 45% in surprising ness ($F(3, 148) = 40.9$, $p < .001$), and 45% in desirability ($F(3,148) = 40.3$, $p < .001$). Across the four behavior classes, we identified 28 robust behaviors that were sufficiently similar between the two agent types on all three properties (i.e., no significant agent differences below $p < .001$, nor effect sizes above Cohen's $d > .50$). However, 17 of the 78 behaviors had significant ($p < .001$) and substantial ($d > .50$) human-robot discrepancies on at least two properties.

CONCLUSION

In sum, adoption of intentional attitudes in HRI is a topic to be addressed, as it might facilitate and enhance the effectiveness of social cognitive mechanisms, and thereby the overall quality and efficiency of human-robot communication. This has implications for robot design, as robots that are able to spontaneously induce intentional attitudes in their users will most likely be more effective communicators. Current research into robot behavioral parameters that induces this intentional attitude in users has certain limitations. For example, the lack of a reliable and common method to measure the adoption of intentional attitudes seriously impedes the validity of experimental findings and the comparability of different studies. Without a consensus on what constitutes adoption of the intentional stance and how one can quantify this, researchers in the field of HRI will be using different measuring rods. We propose that after having established well-validated methods for measuring adoption of the intentional stance, it would be of great importance to understand the conditions under which the intentional stance is adopted toward artificial agents.

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BLOCKCHAIN TECHNOLOGY

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ABSTRACT
The 21st century is a digital age. Today everything has become digital. Be it any banking transaction, shopping, or buying groceries. All are just one click away. Not only that we have digital cash in our digital age. We do not need to carry any physical money or bills. It is all possible because of cryptocurrency, a digital or virtual currency designed to work as a medium of exchange. It is a decentralized currency that uses cryptography for security and verification purposes during transactions. Since we all know about cryptocurrency, let's know the technology behind it. The technology used behind cryptocurrency is Blockchain technology. Blockchain sometimes referred to as Distributed Ledger Technology (DLT), makes the history of any digital asset unalterable and transparent through the use of decentralization and cryptographic hashing. Blockchain can be used in every field. Blockchain will create a revolution by changing all traditional methods. We will study how it can eliminate the traditional practices and how they can work towards the betterment of mankind.

Keywords: Bitcoin, Blockchain, Cryptocurrency, Decentralization, Mining

INTRODUCTION
1991-2008: Early Years of Blockchain Technology

Stuart Haber and W. Scott Stornetta were first to work on blockchain in 1991 wherein they built a cryptographically secured chain of blocks that no one could tamper with timestamps of documents.

In 1992, they upgraded their system to incorporate Merkle trees that enhanced efficiency thereby enabling the collection of more documents on a single block. Blockchain History gains relevance in 2008, thanks to the work- one person or group by the name Satoshi Nakamoto.

People believed that Nakamoto could be a person or group of people that worked on Bitcoin. Very few is known about Nakamoto. He built the first application of digital ledger technology. Blockchain evolved and found its way into many applications beyond cryptocurrencies

Blockchain first whitepaper released in the year 2009. He provided details of how the technology was well equipped to enhance digital trust given the decentralization aspect that meant nobody would ever be in control of anything.

Satoshi Nakamoto released the first whitepaper about the technology in 2009.

Since Satoshi Nakamoto exited the scene and handed over Bitcoin development to other core developers, the digital ledger technology has evolved resulting in new applications that make up the blockchain History.

PROBLEM DEFINITION
There are various traditional problems we face in our day to day life. Let’s discuss a few of them here.

1. Currency and Transaction Support
Ever wondered if we could complete transactions without having to deal with: Online Wallet, Banks, third Party Applications. There are various problems a user face when doing online transactions: Technical Issues, Account Hacking, Daily Transfer Limits, high transfer Charges.

2. Supply chain management
You ordered food online and then got it delivered. After the delivery of food, you were surprised by the poor quality of food. So how do you trace the history of food back to its source in such a way that tampering with it would be impossible?

3. Intellectual Property
The illegal sharing of intellectual property such as music, movies, texts, poems and works of art is a big problem today. Tons of great artists and authors end up having their content leaked all over the internet and lose out on rightfully earned revenues.

4. Voting
Voting is an integral part of every country. But what would happen if you realize the vote that you cast for the candidate was submitted for another candidate. In this process, it would be a failure of good governance.

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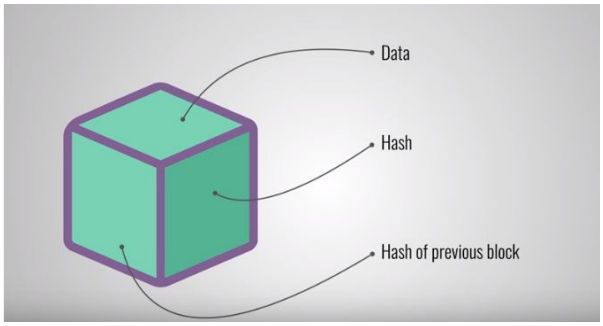
5. Healthcare
In a hospital a person always has to wait for the reports, despite the delay, any person having access to the system can change the data. A major problem in the healthcare sector is also counterfeit of medicines.

Proposed Methodology-
We saw a few problems above. Now let us find solutions to the problem using blockchain technology.

Blocks, nodes, and miners are the three important concepts in blockchain technology.

1. Blocks
Blockchain is a chain of blocks. Once data has been recorded inside a block it becomes nearly impossible to change it. Each block contains data, Hash, and Hash of the previous block. Data is a piece of information stored in the block. Hash is like a fingerprint that is unique for each user. Hash is important as when data changes inside the block the hash changes. Hash of the previous block creates the chain.



2. Miners
New blocks on the chain are added by miners through a process called mining. A block has its unique nonce (A 32-bit whole number called a nonce) and hash (hash is a 256-bit number wedded to the nonce) and also references the hash of the previous block in the chain. On large chains, mining a block isn't easy.

Miners solve the incredibly complex math problem of finding a nonce that generates an accepted hash using special software. Roughly 4 billion nonce-hash combinations must be mined before the right one is found because the nonce is only 32 bits and the hash is 256.

When a "golden nonce" is found, their block is added to the chain. Changing a block in the chain requires re-mining not just the block with the change, but all of the blocks that come after. So it is extremely difficult to hack blockchain technology. Finding golden nonce requires an enormous amount of time and computing power.

The miner is rewarded financially when a block is successfully mined and the change is accepted by all of the nodes on the network.

3. Nodes
Decentralization is an important concept in blockchain technology. No one can own the chain neither the computer nor the organization. It is a distributed ledger via the nodes connected to the chain.

Every newly mined block has to be updated, trusted and verified and every node has its copy of the blockchain. Every action in the ledger can be easily checked and viewed because blockchains are transparent. A unique alphanumeric identification number is given to each participant.

Blockchain creates trust among users and maintains integrity by combining public information with a system of checks-and-balances. Blockchain provides scalability of trust.

As we now know how blockchain works, let us discuss the solution to the above problems.
1. Currency and Transaction Support
Blockchain provides fast, cheap and borderless payments across the world. The need for a third party can be eliminated to make transactions with the help of cryptocurrencies. Blockchain records are publicly accessible by bitcoin users that store all the transactions in a decentralized ledger.

2. Supply chain management
With the help of Blockchain technology, one could easily find out where a product was made, by whom, and if the quality and condition of said product or item is of acceptable quality and if not where the mistake was made whether at the farm part or Production, Distribution, Retailer or Purchaser. Permanent transparency and validation of transactions can be shared by multiple supply chain partners.

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3. Intellectual Property
With certain Blockchain projects such as CREA and Po.et, creative individuals will soon have the opportunity to share their content online and be able to prove that they are indeed the creators of said content and hold all intellectual property rights regardless of where it ends up, and everyone else would be aware of this too.

4. Voting
If Blockchain technology were to be used for voting purposes, voters can vote without revealing their identity in public. Fake votes cannot be created as data tampering is nearly impossible. There would be no question as to the results' authenticity and legitimacy.

5. Healthcare
Blockchain eliminates a central authority which results in rapid access to data. The major problem of counterfeit medication can be prevented with supply chain management where the medicine provenance can be traced.

CONCLUSION

The traditional industry can be transformed into blockchain technology. Because of its characteristics such as decentralization, persistence, transparency, anonymity, and audibility. We first gave an overview of the traditional problems. And explained how blockchain functions and then listed how these traditional problems can be solved permanently with their key characteristics. Blockchain-based applications are increasing and we plan to conduct in-depth investigations on blockchain-based applications in the future. Blockchain is everywhere be it healthcare, education, agriculture, real estate, crowdfunding. I would end up saying,

"Blockchain is the answer

Now tell me the question?"

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SELF DRIVING CAR SIMULATOR USING NEURAL NETWORKS

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ABSTRACT
Autonomous driving is a topic that has gathered huge attention from both the research community as well as other industries or companies, due to its potential to radically change mobility and transport. In this by include Machine Learning algorithms that can automatically learn to control a software simulated vehicle based on its own experience of driving. More specifically we are planning to employ two Reinforcement Learning (RL) algorithms called Deep Deterministic Policy Gradient (DDPG), and Actor-Critic with Experience Replay (ACER). Reinforcement learning is a broad class of algorithms for solving Markov Decision Problems.The algorithms were trained and evaluated in a synthetic or environment that is developed by software. The input to both models are images captured by a front-facing virtual camera and internal states of the vehicle, i.e., velocity, acceleration,breaking system etc. The RL-methods are capable of controlling the vehicle (i.e. changing lane in this case), using only images through CNN algorithm to provide information regarding the position of the vehicle.

PROBLEM STATEMENT
The traditional way to control a simulated self driving car is to implement a lot of code for perception techniques distinguishing between different classes of objects seen by diverse technologies such as RGB cameras, radar, etc. This information feeds traditional navigation algorithms based on mapping and planning. The methods need a big process capacity and expensive technologies that increase the costs. The incipient way studied in this project, much more simpler, feeds a deep convolutional neural network which controls the car movements with just simple images and applying an endto-end strategy.

SCOPE AND MOTIVATION
Each year just in US around 37,000 people lose their life in car accidents. That is a 5.6 % increase from 2015. Human errors caused up to 90% percent of car accidents. Autonomous vehicles may help reduce this huge number of fatalities. One of the first, most popular and most useful technologies is the line detection and lane keeping. It started developing earlier and to this day it is still being improved. The aim is to increase the safety of vehicles on road, has led to the development of different systems, that can be implemented to real life modles.Different approaches to develop systems for self-driving vehicles exist and almost all of them are very complex and with very high hardware requirements. The solution presented in this paper proposes the machine learning based system to be as simple as possible with only software implementation. Based on a input image the neural network should choose one of the four available commands (forward, left, right or stop). With the help of the training data the system learns to follow the road ahead and stay in its lane by tackling the traffic or obstacle sin its lane. The system automatically learns necessary road features with only the steering angle as the input from the virtual driver.

FUNCTIONAL REQUIREMENT
Artificial Neural Networks – Neural Networks for artificial intelligence are mathematical models inspired by natural structures in the human brain and applied in modern computers. Typical applications are to use the models as complex function approximators. In this chapter brief explanations and motivations for these building-blocks in Neural Networks are summarized. The mathematical models, algorithms, and concepts presented in this section are relatively short.

Feed Forward Neural Networks – A Neural Network is simply a computational graph, with the objective to approximate some function $f*(x)$. The Neural Network models the function through $f(x, \theta)$ by adjusting its parameters θ. The input x, flows through layers of artificial neurons, where an artificial neuron i, in layer j is defined as Where n is the number of output nodes. In a feed forward neural network all the hidden activations, aj, from one layer are passed through the network as input to the next layer.

Reinforcement Learning – Premises for RL are that there exists an environment and a controllable Actor. The Actor is capable of changing the state of the environment with actions, e.g., move left or right. In a broad sense, the environment is rewarding the Actor based on its current behavior and in reinforcement learning the objective is to find the behavior/policy that maximizes the cumulative reward. This section will introduce the reader to the basic theory in RL and recent algorithms that are relevant.

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Reward and objective function –The simulator is based on an Reward system, where the Actor if performed a positive action with respect to the simulation will receive a Reward, whereas if a wrong action is conducted, a percent of reward is deducted from the sum. Non-functional requirements.

SYSTEM REQUIREMENTS

Hardware Requirements

• Computing Device (Laptop/PC)

• i5-3rd Generation Processor

• 4 GB Ram

• 128 MB Video Memory

SOFTWARE REQUIREMENTS

NumPy

It is a library for the Python programming language, adding support for large, multidimensional arrays and matrices, along with a large collection of high-level mathematical functions to operate on these arrays.

TensorFlow

It is a free and open-source software library for dataflow and differentiable programming across a range of tasks. It is a symbolic math library, and is also used for machine learning applications such as neural networks.

Matplotlib

It is a plotting library for the Python programming language and its numerical mathematics extension NumPy. It provides an object-oriented API for embedding plots into applications using general-purpose GUI toolkits like Tkinter, wxPython

Open CV

It is a library of programming functions mainly aimed at real-time computer vision. Originally developed by Intel, it was later supported by Willow Garage then Itseez. The library is cross-platform and free for use under the open-source BSD license.

Use Case Diagram

The Use Case Diagram of the automated car system behaves in such a way , where the actor “car” has total 3 use cases, as soon as the project is opened the car starts running ,the car can also change speed and change lanes

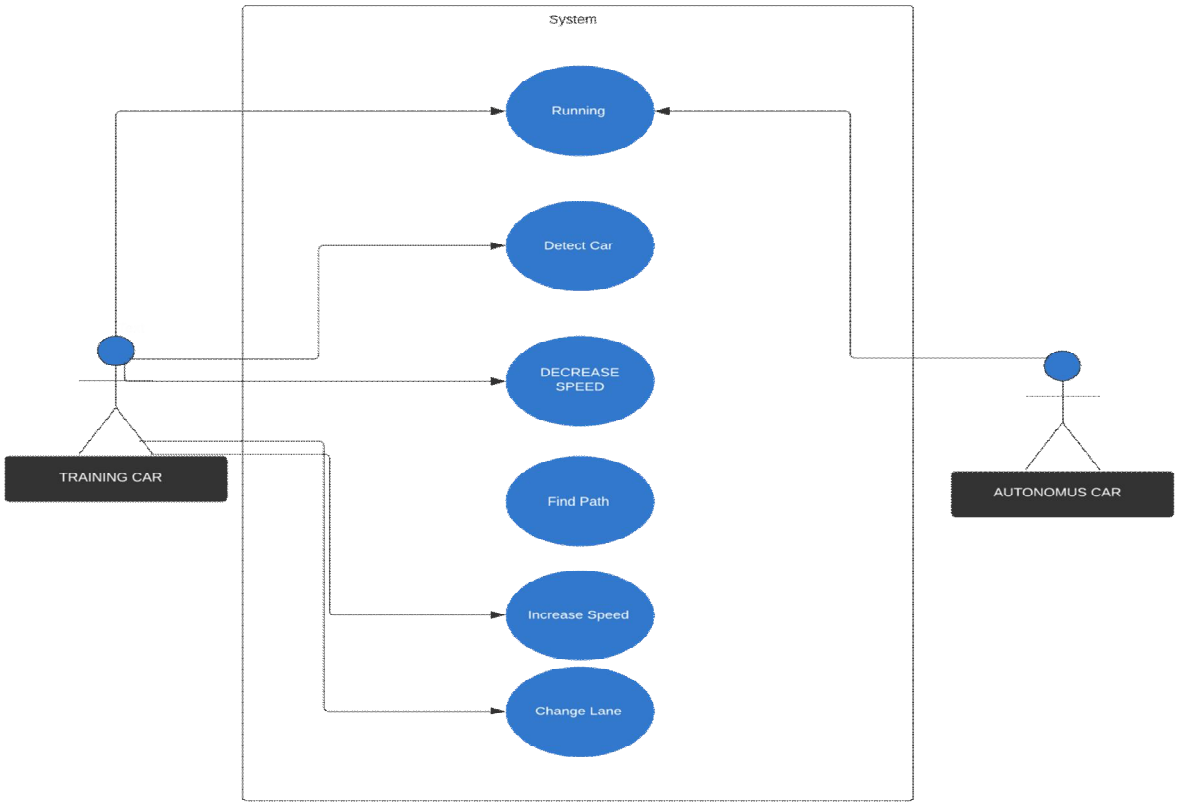

Figure: Use Case Diagram

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OBJECT DIAGRAM

Figure shows a static view of the structure of Lane & Car identification model at a specific time. Here as we can see, there are various objects Front Camera, Right Door Camera, System are few examples to be named.

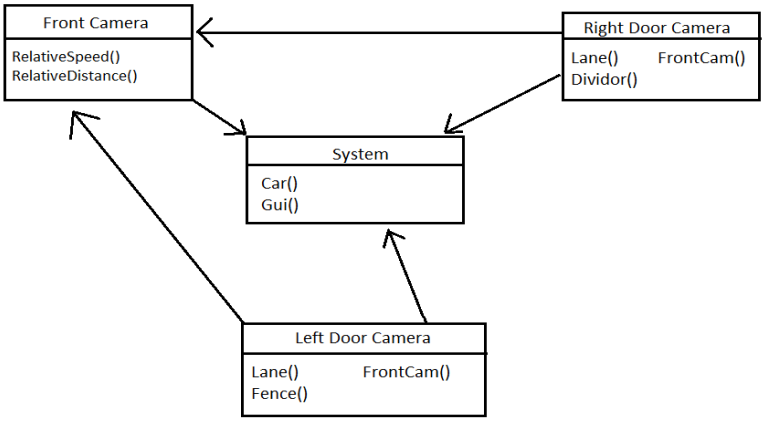

Figure: Object Diagram

There are various attributes associated with each object, For example, for the object FrontCamera, there are attributes like RelativeDistance(), RelativeSpeed(). Similarly there are attributes for other objects as well. Here the object diagram is used to render a set of objects and their relationships as an instance.

STATE CHART DIAGRAM

Figure represents various states that the system takes while processing. The foremost state is related to the initial observation in which the image detection is processed. After the image is recorded the entire processing of the image takes place which will then lead to state where the system will apply the convolution networks algorithm and decide whether to change the lane or not, thus being in an intermediate state. The final state is the Terminal State in which the actor critic will start again and will reward the agent, until it ends.

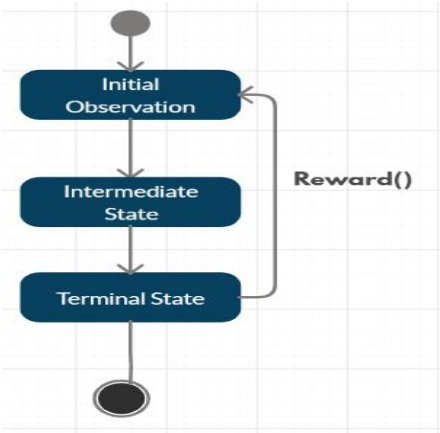

Figure: State Chart Diagram

SEQUENCE DIAGRAM

Here the objects used in the Sequence Diagram are the Environment , Neural Networks Functions , Image detection and applying the changes back to the screen .

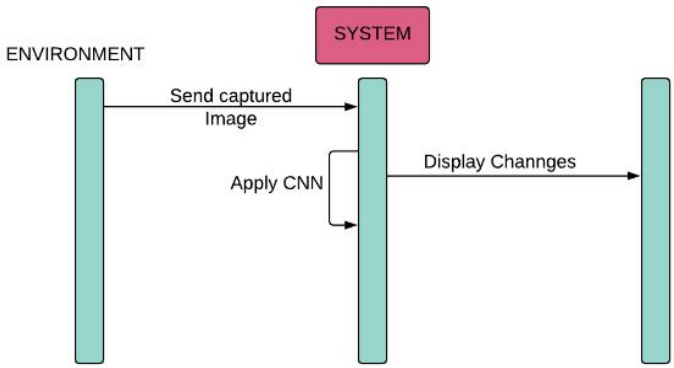

Figure: Sequence Diagram

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CONCLUSION

Using the self-driving car simulator, the model can traverse through a path within a feasible time provided the input is well defined and highly accurate. This model can be implemented as a full fledged real world self-driving car application with some modifications.

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SELF-CHARGING CAR

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ABSTRACT
The natural resource (crude oil) is getting vanished slowly and also in future it is possible that it will be completely finished. We know that crude oil is the main source of petrol and as crude oil is being vanished, petrol will not be produced in future. So, the alternate solution for this problem is the E-Vehicle. But E-Vehicle needs batteries to run the vehicle. Due to that reason, everybody is not able to afford this type of vehicle. So we have over come from a problem of battery discharging. But E-Vehicle contains more weight other than the self-charging system and the passenger's weight. The concept of self-charging car is that it will charge your car's battery with the help of dynamo. As the dynamo will start rotating, it will produce electric charge. Due to direct connection of dynamo with the car battery, it will start charging the battery.

Keywords: Crude Oil, Vanished, Petrol, E-Vehicle

I. INTRODUCTION
The natural resource to generate the petrol which is the fuel used in vehicle is crude oil and we all know that crude oil is being running out slowly. Due to running out of crude oil, it is not possible to generate petrol for vehicle. So, we have an alternate solution for this problem which is E-Vehicle. But the negative point of this E-Vehicle is that it requires charging for the vehicle and it takes hours-and-hours to charge the vehicle from empty-to-full. So, for that problem we came here with an alternate solution which is self-charging car. The reason to use this system is that we can cover more distance we want.

We can travel as much distance we want and there will be no problem for battery drainage. This was the main reason that everybody was not able to afford the E-Vehicle. After using this self-charging system the cost of the E-Vehicle will reduce to some extent. The car will also help to reduce the pollution and also will help to reduce and control the pollution.

With the help of E-Vehicle we are able to reduce the noise pollution generated from the petrol fuelled vehicles.

Fig-1: Prototype of Self-charging Car.

According to our concept the wind energy will be converted into electrical energy and then electrical energy will be converted into mechanical energy. The component required to convert wind energy into electrical energy is the dynamo. The dynamo will be placed or kept at the front side of the car. The dynamo will rotate with the help of air which will be generated when the car will start moving.

II. WORKING OF COMPONENTS
We are going to use the dynamo or the alternator to charge the battery. The alternator is the device that is used to convert wind energy into electrical energy. Due to this quality of alternator it becomes the second main component of the car because the first main component is the motor. The alternator can generate upto 24V which is more than enough to keep the battery fully charged. We are also using a battery for movement of the vehicle. A battery is the component which will provide the required power to the motor. A battery is a device which will produce electrons and will also supply them to the motor and the motor will start rotating. The battery of an electric car runs out within 100,000 miles but after installing the self-charging system the battery will last more than 100,000 miles which will help to reduce the electricity cost.

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Fig-2: Car Battery of 12V.

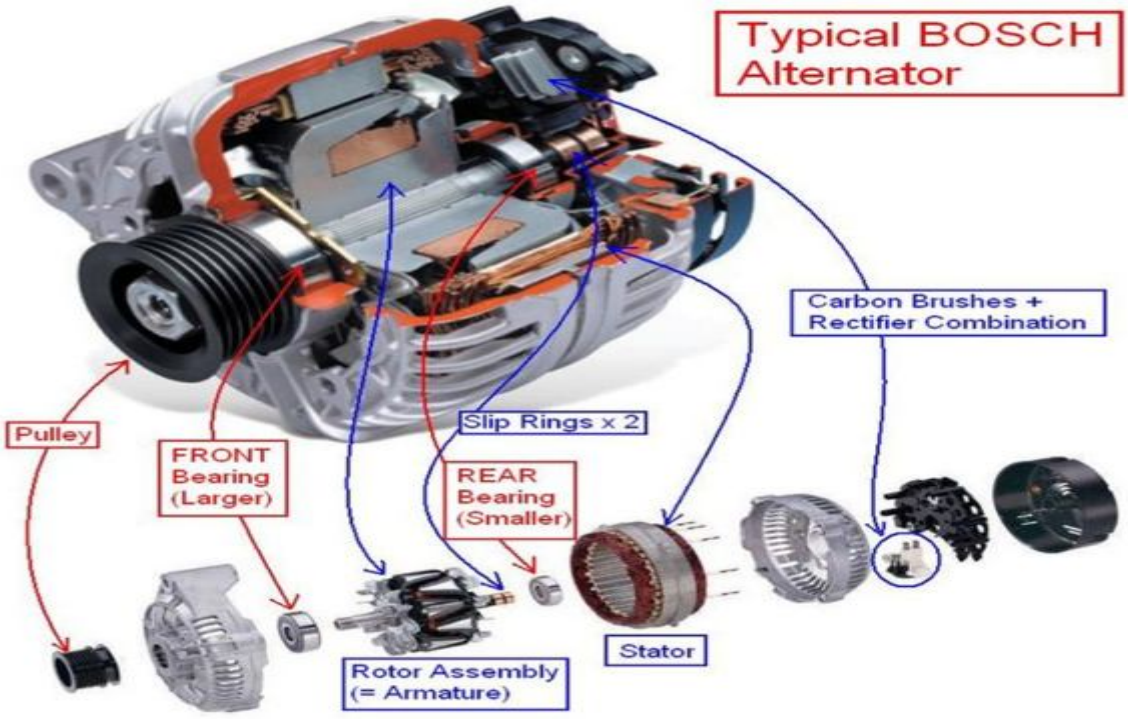
The charging time for the car will be become half of the total time required. We can see that we required is of 12V and the alternator or dynamo produces 24V at a time.

The alternator available in the car has the capacity to produce 24V.

Fig-3: Alternator used in the car.

This alternator has a pulley which is connected to the engine shaft through the belt. When the engine starts rotating its shaft also rotates and as the shaft starts rotating, the pulley of the alternator also rotate as it is connected with the engine shaft with the help of belt drive.

Fig-4: Components used in Alternator



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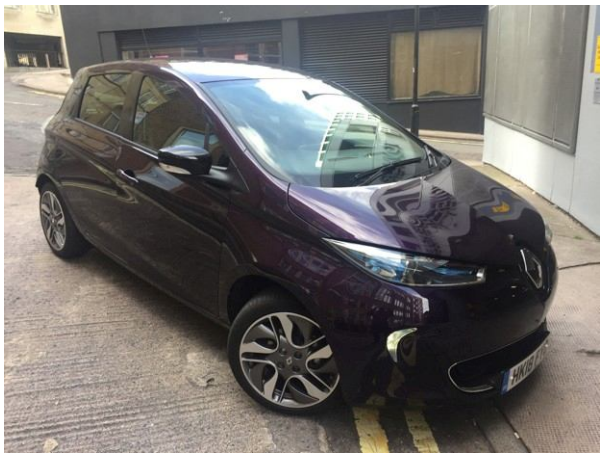
III. ADVANTAGES OF THIS SYSTEM

We are here to complete the requirement of the consumer. The reason to invest your money in E-Vehicle in this modern time is listed below:-

1. **No Gas is required**: - So basically, in E-Vehicle we do not require to fill gas or any other type of liquid fuel in the vehicle. The electric car will run with the help of electricity. It is easy and cheaper than the liquid fuel used today.
2. **Savings**: - It will save the cost of fuel and the maintenance of this car will be less as compared to the cars which are recently used.
3. **No Emissions**: - As these cars are completely electrical so there are no chances of releasing any type of harmful gases in the atmosphere.
4. **Safety**: - It is safe to drive the electric vehicle as it will be fully computer based. It will help you and other passengers to avoid serious injuries.
5. **Low maintenance: -** As these cars fully electric there is no need to provide any type of lubrication to the parts. We also don't have to send it to the service centre as compared to the gasoline or liquid fuelled cars.
6. **Reduce Noise Pollution: -** As this is an electric vehicle there is no chance of any noise to be produced.



IV. CONCLUSION

This concept is the best solution for the battery drainage of the E-Vehicle. The extra electrical energy produced can be used for increasing the speed of the car.

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SMART AUTOMATED IRRIGATION SYSTEM WITH DISEASE PREDICTION

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ABSTRACT
The advancement in Internet of Things (IOT) through which we can connect real world objects to obtain the information such as physical phenomenon through sensors in the field of agriculture. This paper reports on the smart automated irrigation system with disease detection. The system design includes soil moisture sensors, temperature sensors, leaf wetness sensors deployed in agriculture field, the sensed data from sensors will be compared with pre-determined threshold values of various soil and specific crops. The deployed sensors data are fed to the Arduino Uno processor which is linked to the data center wirelessly via GSM module. The data received by the data center is stored to perform data analysis using data mining technique such as Markov model to detect the possible disease for that condition. Finally, the results and observed physical parameters are transmitted to Android smart phone and displayed on user interface. The user interface in smart phone allows remote user to control irrigation system by switching, on and off, the motor pump by the Arduino based on the commands from the Android smart phone.

Keywords: Disease detection, precision agriculture, IOT, Hidden Markov model, Sensors.

INTRODUCTION
India is an agriculture focused on country with more than 60 percent of population depends directly or indirectly on agriculture. 80% of our country's GDP is added by agriculture. As per the recent approximation India would require more than 450 million tons of food grains to feed 1.65 billion people by the end of 2050 which will be a huge task. Although no exact estimates on total crop loss due to insect, disease and weeds could be found and it approximately ranges from 10-30% loss on farm field [1]. In terms of monitory values, $12 billion accounts due to stress on biotic factors. As a result of diversified agro-echo system, a huge number of crops grown in India often serves as host to many different kinds of insects, pests and pathogens. In India, most of the regions are subtropical to tropical, the agro climate is more conducive for the development of insect pests. Lepidopteran, coleopteran and dipteran insect pests cause severe yield losses in many of the commercial crops grown all over India.

Along with biotic there are some abiotic conditions like temperature, moisture, light etc., which leads to loss in agriculture. Although, India stands at second place in largest irrigated country of the world after China, only one third of the agricultural area is irrigated. Irrigation plays a major role in tropical monsoon country like India where rain is uncertain, unreliable and erratic [1]. However, care must be taken to safeguard against effects caused by over irrigation. To overcome all the above problem, IOT technology can be implemented. IOT is an emerging trend which has its application in all the fields. It can be referred to as “connected devices”.

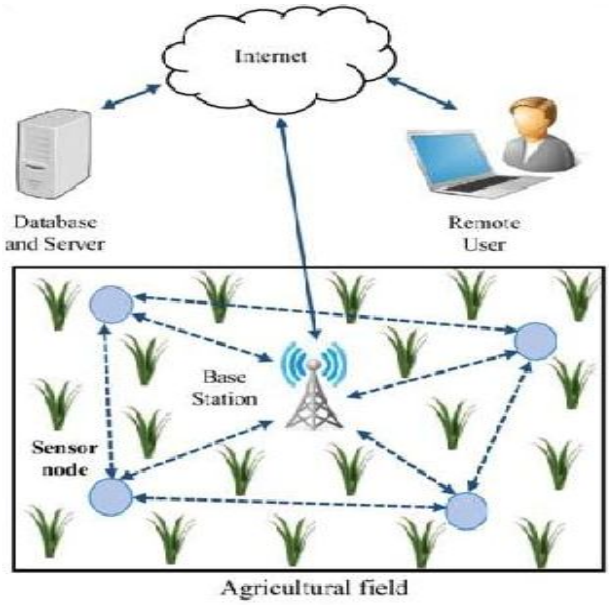

Fig-1: Architecture of Precision Agriculture

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As shown in above Fig 1, The devices which are connected will possess some sensors. In 2013, the global standards initiative on Internet of things define the IOT as "The infrastructure of the information society" The IOT allows the object to be sensed or controlled remotely across the existing network infrastructure, creating opportunities for more direct integration of the physical world into computer based systems and resulting in improved efficiency, accuracy and economic benefit in addition to reduce human intervention. IOT is expected to offer advanced connectivity of devices, systems and services that goes beyond machine-tomachine communications and covers a variety of protocols, domains and applications. The organization of paper is as follows, section II deals with Methods and Materials used in our proposed work. Section III deals with Related work in field of Precision agriculture, Section IV provides the different phases associated with our proposed work, Section V provides overall proposed system architecture. Finally, paper ends with conclusion and few references.

II. MATERIALS AND METHODS

A. Sensors

B. Arduino Uno and GSM Module

Sensor is an electronic component whose purpose is to detect events or changes in its environment and sends the information to other electronic devices like computer processor. A sensor's sensitivity indicates how much the sensor's output changes when the input quantity being measured changes. In this paper, we are using sensors that senses external parameters of agriculture. Namely, Water level sensor is used to detect the level of substances that can flow. Soil moisture sensor that measures the volumetric water content in soil. Temperature sensors measures ambient temperature.

C. Data mining

Data mining refers to the procedure of extracting useful information from huge sets of data. There are many techniques in data mining. Most common applications of data mining includes biological data analysis, interaction among the genes of a living being, relationship among web pages available in internet, in agricultural related fields [3]

Arduino Uno is a microcontroller board based on ATmega328. It contains everything needed to support the microcontroller, it may be connected to J. computer with a USB cable or to AC-toDC adapter or to battery to get started. It has a memory of 2KB of SRAM and 1KB of EEPROM. It has number of facilities for communicating with a computer or another Arduino or other microcontroller. GSM is a cellular network used for communication purpose. It has a key feature of detachable SIM card containing the user's subscription information. Its network operates in number of different carrier frequency and has secured wireless system.

III.RELATED WORK

A. Precision agriculture

The main objective of this work is to deploy a low costs sensor system, gather field data and display the data through a graphical user interface (GUI). Sensors such as humidity, temperature, luminosity, electrical conductivity and leaf wetness was used for data acquisition and the Raspberry Pi, acting as a local server, was used for data processing and transfer. The data sent was stored in a main server and organised using SQL.A GUI was developed to provide visualization of the data gathered. The whole system was tested and proven to work by the application of fertilizer to the soil and seeing its response in the GUI. This work presents development of WSN application as sustainable and accurate solution in monitoring different environmental parameters that would affect crop development [11]. Temperature, humidity of the surroundings, soil moisture, leaf wetness,

B. Data mining in Precision Agriculture

In agriculture, data mining is used to predict the abnormal conditions such as drastic change in climate and diseases that are favourable with respect to observed physical phenomenon. Data mining techniques are mainly divided into classification and clustering. In classification technique, there are two types training sets and k-nearest neighbour. In training set technique, unknown samples are classified by using information given by a set of classified samples. In k-nearestneighbour technique, every time classification must be performed using training set. Clustering technique can be used to split the group of unknown samples into clusters. K specifies the number of clusters in which data must be partitioned [3]. The main goal of this technique is to group the similar data in a same cluster and to find partition of the set when unknown classification of data is given.

C. Sensor drone in agriculture

The Electronic nose(E-nose) module based on six polymers/single walled carbon nanotube (SWCNT) gas sensors was installed and tested on quadcopter. This system was found to detect volatile compound such as

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ammonia and toluene. In the static gas measurement, the sensors were observed to increase response with increasing concentration of ammonia and toluene. Polyvinyl Pyrrolidone (PVP)/SWCNTCOOH shows the highest sensor response to both ammonia and toluene. The E-nose has been demonstrated under two situations, i.e., in a closed cleaned room with presence of ammonia evaporation and in open air with low wind environment. The sensor responses from all sensors under different situation are clearly distinguished. If we collect enough characteristic odour data from various places into the database, then we can identify irregular situation when new data pattern shows differs from the database .

D. Disease and Pest Control in agriculture

This work introduces the concept of IOT technology to percept information, and discussion the role of IOT technology in agriculture disease and insect pest control, agriculture disease and insect pest control, which includes agriculture disease and s insect pest monitoring system, collecting disease and insect pest information using sensor nodes, data processing and data mining etc.,A disease and insect pest control system based on IOT is proposed, which consisted of three levels and three systems. The system can provide a new way to access agricultural information for the form.

IV. SMART IRRIGATION SYSTEM

The Smart irrigation system provides a way to save water on timely management of water resources to agriculture field based on the real-time data sensed by the sensors. The hidden Markov model is used on recorded data to predict the possibility of diseases based on threshold values which are favourable for any disease growth in our proposed work. Finally, our proposed system works on two major constraints such as water supply and diseases associated in the field of agriculture. Our proposed work consists of five different phases as shown in Fig.

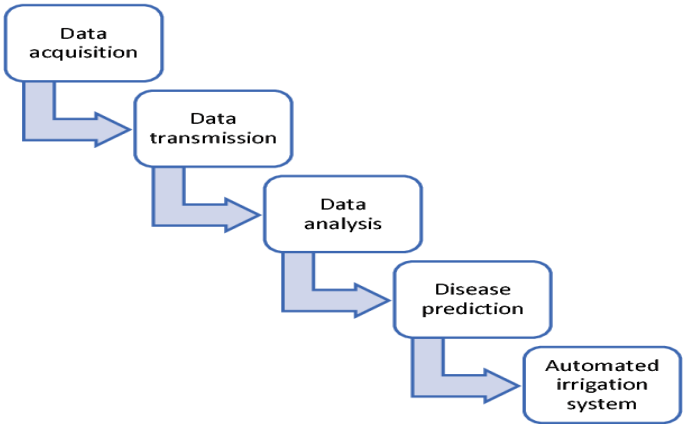

Fig-2: Phases of our proposed system

Values present in the database. The resultant data is sent to phone through SMS by GSM.

A. Data acquisition

We use different types of sensors like temperature sensor, moisture sensor, leaf wetness sensor that takes real time weather parameters as input and provides signals to micro controller (Arduino Uno). An Arduino based irrigation system that operates automatically via signals provided by soil moisture sensors which is subject to remote control by an android smart phone.

B. Data transmission

In farm land sensors are deployed at various places to sense external data like temperature, soil moisture, relative humidity(RH), pressure. These sensors collect data at continuous intervals. Arduino Uno which are connected to sensors converts Analog signals to Digital data. Then data is transferred to data server using GSM module. GSM module is basically a GSM modem connected to PCB with different types of board and RS232 over a subscription to a mobile operator, just like a mobile phone. The practically obtained data is compared with the predefined.like a mobile phone. The practically obtained data is compared with the predefined.

C. Data Analysis

Hidden Markov Model

In this stage, we are analysing data acquisition which are collected from ‘n’ number of sensors from agriculture farm.Hidden Mrkov model is a statistical Markov model in which the system being modelled is assumed with unobserved states [6-10]. Based on the data collected we are discriminating the possible disease according to their favourable aspects which can be done using hidden Markov model.

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D. Disease prediction

The platform includes administrators, experts and ordinary visitors through computers, mobile phones, tablet computer etc., they can login the remote server and choose to view real time data, historical data and remote parameters setting collected by the sensors; agricultural experts can analysis the collected data, construct and expert data base.

CONCLUSION

The Smart automated irrigation system provides a wayto save water on timely management of water resources to agriculture field b ased on the real-time data served by the sensors. The hidden Markov model is used on recorded data to detect the possibility of diseases based on threshold values which are favourable for any disease growth in our proposed work. Finally,our proposed system works on two major constraints such as water supply and diseases associated in the field of agriculture. In future, we are planning to advance our work to detect insects and pest's growth favorable conditions in the field of agriculture.

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SMART ENERGY METERING SYSTEM

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ABSTRACT
An automatic remote meter-reading system based on GSM is presented in this paper. The paper is useful to obtain meter reading when desired so meter readers don't need to visit each customer for the consumed energy data collection and to distribute the bill slips. Microcontroller can be used to monitor and record the meter readings. In case of a customer defaulter, no need to end a person of utility to cut-off the customer connection. Utility can cut off and reconnect the customer connection by short message service (SMS). Furthermore, the customer can check the status of electricity (load) from anywhere. In this system energy meter readings are being transferred by making use of GSM.

INTRODUCTION
In the present billing system the distribution companies are unable to keep track of the changing maximum demand of consumers. The consumer is facing problems like receiving due bills for bills that have already been paid as well as poor reliability of electricity supply and quality even if bills are paid regularly. The remedy for all these problems is to keep track of the consumers load on timely basis, which will held to assure accurate billing, track maximum demand and to detect threshold value. These are all the features to be taken into account for designing an efficient energy billing system.

The present project "IoT Based Smart Energy Meter" addresses the problems faced by both the consumers and the distribution companies. The paper mainly deals with smart energy meter, which utilizes the features of embedded systems i.e. combination of hardware and software in order to implement desired functionality. The paper discusses comparison of Arduino and other controllers, and the application of GSM and Wi-Fi modems to introduce 'Smart' concept. With the use of GSM modem the consumer as well as service provider will get the used energy reading with the respective amount, Consumers will even get notification in the form text through GSM when they are about to reach their threshold value, that they have set. Also with the help of Wi-Fi modem the consumer can monitor his consumed reading and can set the threshold value through webpage.

This system enables the electricity department to read the meter readings monthly without a person visiting each house. This can be achieved by the use of Arduino unit that continuously monitor and records the energy meter reading in its permanent (non-volatile) memory location. This system continuously records the reading and the live meter reading can be displayed on webpage to the consumer on request. This system also can be used to disconnect the power supply of the house when needed.

1.1 MOTIVATION
Utility billing is yet unavoidable in the World as for concern post-paid energy meter. In Pakistan, utilities are using a conventional way of billing. A meter reader goes Home to home takes the meter reading and note down it, manually. These readings are brought to utility administration office. The criterion of utility billing is applied according to the utility service rules and regulations. The employee of the utility goes door to door again and gave the bill slips of the utility to the respective consumer.

Smart energy meter are used for Automatic Meter Reading (AMR) to increase the accuracy of meter reading. For instance, a utility person might not read the correct value of the total energy consumed that is displayed on energy meter or may intentionally give lower value than the exactly read one.

1.2 PROBLEM STATEMENT
Energy meter reading is a tedious and an expensive affair. The meter reader has to go and take the reading manually to issue the bill, which will later be entered in the software to automate the billing and payment system. It would have reduced the laborious task and financial wastage if can automate the manual meter reading process and bill data entry process.

1.3 OBJECTIVE
Smart meters provide data that enable customers to make choices about how much energy they use by allowing them to access accurate real-time information about their electricity consumption.

Unlike the old meters they replace, smart meters are up to date two-way, digital communication systems that record electricity usage every 30 minutes and automatically send this data to a customer's electricity distributor, virtually bringing an end to estimated bills and manual meter readings.

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Smart meters communicate meter readings directly to electricity distributors, eliminating the need for someone to come out and read meters – whether that is required for each bill, to change electricity retailers or to reconnect power when customers move house. Not only does this reduce fees, but electricity bills will also be more accurate – virtually eliminating estimated bills.

1.4 LIMITATIONS

- With new, resource-saving technology comes new challenges that will arise regarding expensive, energy-intensive data storage and the privacy issues that loom large over these domestic and commercial technologies. If consumers are not familiar with managing new energy systems on their own, they are less likely to pay close attention to the energy-saving potential of such smart meters (or how their personal data is being used).
- The majority of the smart meter's disadvantages may seem short term, but such challenges will slow down the rate of adoption for these technologies in some cases, especially in rural and presently off-grid areas.

1.5 ADVANTAGES

- Eliminates manual monthly meter readings.
- Monitors the electric system in real time.
- Encourages more efficient use of power resources.
- Provides responsive data for balancing electric loads while reducing blackouts.
- Enables dynamic pricing.
- Avoids the capital expense of building new power plants.
- Helps to optimize the profit with existing resources.

1.6. DISADVANTAGES

- The additional cost to train personal, develop equipment, and implement new processes for data storage.
- Managing public reaction and feedback concerning new meters.
- Making a long-term financial commitment to new hardware/software.
- Ensuring the security and privacy of metering data.

LITERATURE REVIEW

Energy meter reading is a tedious and an expensive affair. The meter reader has to go and take the reading manually to issue the bill, which will later be entered in the software to automate the billing and payment system. It would have reduced the laborious task and financial wastage if can automate the manual meter reading process and bill data entry process. This paper proposes a new network communication system for energy meter reading by internet communication technology and software system along with the existing meters. An IOT modem will be integrated with electronic energy meter to read the usage of electricity and uploaded on server or website. Energy meter deliver the reading details and it is uploaded on the website instantly. This communication system is further useful for electricity regional/sub-regional office, who can monitor the value and power consumption. And they cut the power supply for any specific house, who had not paid the electric bill. Moreover, this power cut control system is done by using same website which is used for monitoring. In this project each customer is differentiated using address or Id, this ID are used for identification by the consumer and as well as by office to monitor the reading and payment detail. It is secured by any network standards. Energy meter deliver the reading details and it is uploaded on the website instantly. Moreover, this power cut control system is done by using same website which is used for monitoring. In this project each customer is differentiated using address or Id, this ID are used for identification by the consumer and as well as by office to monitor the reading and payment detail.

METHODOLOGY

The proposed smart energy meter with advanced prepaid billing system is a device to make electricity billing user friendly and much more readable to the common man. The Smart Energy meter contains an energy meter, a GSM modem, a microcontroller (Arduino) and a relay circuit, which is connected between the energy meter and the load. The proposed smart energy meter is able to provide all the metering and billing services like counting the consumed energy, sending the generated bill by the SMS (short message service) over the GSM network as well as the security services like tempering etc. Factually at present, the metering and billing system of our

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country is totally conventional and it is very much slowed, faulty and corrupted so our proposed smart energy meter is highly deserved for national implementation.

A Smart meter works by communicating directly with wireless data protocol with your energy supplier, so the company will always have an accurate meter reading and there is no need for us to take a meter reading by ourselves. Smart meters can work in a variety of different ways, including using wireless mobile phone type technology to send data. After switching power on the Arduino and the GSM modem, turn on the relay and connect the energy meter to load via relay. Then read the EEPROM and display the current data. Arduino checks the impulse from energy meter i.e. If impulse occurs increase the data and display current data. GSM modem checks the new SMS. If there is a new SMS and read it. If the SMS is "DATA", send data to the specific number. If the SMS is "LINE CUT", turn OFF the relay, so load will disconnect. Again the SMS is "LINE OK" and then turn ON the relay so load will connect. If there is any other SMS in any other formats, then delete the SMS. Any tampering attempt occurs in the metering unit; Arduino turns OFF the relay, turns ON the buzzer and sends SMS to the service provider. Our proposed system is also having some unique features like

1. Operating frequency 50Hz
2. Operating voltage 250v
3. Pulse rate 3200/kwh
4. GSM modem: tri band GSM modem
5. Memory: non-volatile

The present power usage reading is made manually by moving to the consumer locations. This requires large number of labour operators and long working hours to accomplish the task. Manual billing is sometimes restricted and delayed by bad weather conditions. The printed billing also has the tendency of getting lost. Over the last few years, Smart (Prepaid) Energy Meter has been proposed as an innovative solution aimed at facilitating affordability and reducing the cost of utilities. This mechanism, essentially, requires the users to pay for the electricity before its consumption. In this way, consumers hold credit and then use the electricity until the credit is exhausted. If the available credit is exhausted then the electricity supply is cut off by a relay. Readings made by human operators are prone to errors. This project addresses the above mentioned problems. The development of GSM infrastructure in past two decades made meter reading system wireless. The GSM infrastructure, which has national wide coverage, can be used to request and retrieve power consumption notification over individual houses and flats. Apart from making readings using GSM communication, billing system is needed to be made prepaid to avoid unnecessary usage of power. The use of Prepaid Energy Meter is still controversial. On the one hand, those that support the diffusion of prepaid meters claim that they benefit both consumers and utilities because they help users to consume more efficiently and to improve the management of their budget, while allowing firms to reduce financial costs. On the other hand, those that are against prepaid meters argue that their adoption is expensive for firms and risky for low income consumers, as the insecurity and volatility of their income may force them to make little use of the service, or ultimately, bring about involuntary self-disconnection.

BLOCK DIAGRAM

DESCRIPTION OF BLOCK DIAGRAM

The size of smart meters and traditional meters is same and smart meters are digital. Smart Energy Meter measures more detailed readings than Kwhr so that utility can plan the expansion of network and power quality. The Smart Energy Meter is designed so that it measures voltage and load currents by the use of voltage and current sensors instead of potential and current transformers and then feeds these values of voltage and current into power factor controller IC and energy metering IC the power factor and power calculations respectively. The design of Smart Energy Meter involves the measuring of load current and voltage using sensors and then feeding them to energy metering IC which converts it into the real power consumed by the load. Power factor is measured by measuring the phase shift between voltage and load current. Microcontroller used to perform the calculations related to power and energy consumed and shows the reading on LCD as well as it sends the reading of Smart Energy Meter with the help of GSM modem. Active power, reactive power, voltage, load current, power factor and units (kWh) are measured and displayed successfully.

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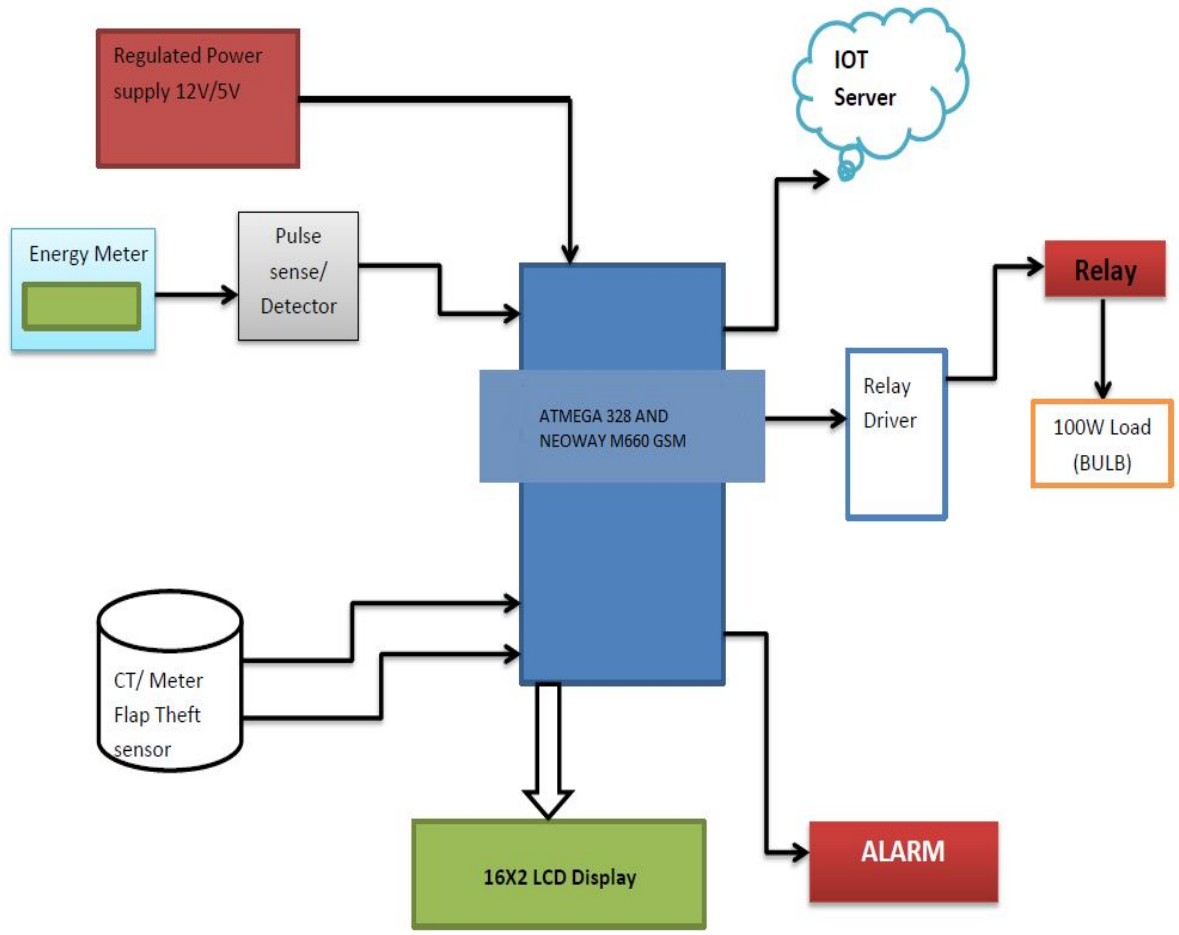

Fig: Methodology - Block Diagram

Meter reading are sent from GSM modem and received on mobile successfully. Two-way communication is done by smart energy meter between the meter and utility administration as well as between meter and customer so that customer is able to check the status of his consumed energy units and can manage his load accordingly to reduce his bill. The main features of smart energy meter are listed as follows;

- Get automatic reading of Energy Meter and sent it to consumer as well as to utility.
- In reading it measures Voltage, Load Current, Real power, Reactive power, Power factor and units consumed.
- Utility is able to cutoff/restore the supply of the defaulter through SMS.
- Smart Energy Meter responds to the SMS and sends you back the readings whenever it is asked.
- Consumer is able to check the status of his load from anywhere in the world by SMS.

IMPLEMENTATION

GSM communications network is used to transfer the electricity consumed data to the utility administration as well as to the customer when demanded. Antenna, attached on or near meter box, can be used for improvement of signal strength in GSM communication.

Smart metering communication is centralized meter reading, so meter readers don't need to visit each customer for data collection. However, for testing and maintenance meters may need to observe occasionally.

The main duty of Smart Energy Meter is to measure the meter reading and sends it to utility when demand as well as to costumer. The voltage and current sensors measure the RMS values of voltage and current and feed them to microcontroller, where calculations for active and reactive power are performed. In Smart Energy Meter we used sensors to measure voltage and current instead of current and voltage transformers. The reading from Utility administration SMS is being received by smart energy meter programmable interface and the action is performed by the meter according to provided information.

A major feature of Smart Energy Meter is that utility company can cut off and reconnect the connection of energy of any user with the help of SMS without sending the person to perform the task manually. It can be

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utilized in case when the utility company needs to disconnect a consumer due to non-payment of bills or some other reasons. Another major feature of Smart energy meter is that it gives alarm when the consumer load is exceeding the upper limit for which he got the utility connection. In case consumer does not reduce his load, meter automatically cut off the consumer connection. GSM communications network is used to transfer the electricity consumed data to the utility administration as well as to the customer when demanded. Antenna, attached on or near meter box, can be used for improvement of signal strength in GSM communication.

CONCLUSION AND FUTURE WORK

The overall goal of this project is to illustrate the existing approaches used for enhancing the performance of smart metering system. This report discusses about the smart meter with an aid of its essential components, basic operation, existing research trends, exploring research gap, followed by anticipated line of research work in future. The studies show that there are various forms of techniques being used for addressing different ranges of problems associated with smart metering system. The prime motivation to work on smart meter is due to its balanced advantages to both consumer and utilities e.g. i) transparency of usage information and billing related information, ii) Maximised information about the service delivery, iii) generates awareness among consumers to save energy, iv) minimises outage conditions and demand peaks, v) faster process of monitoring electrical system with dynamic pricing and many more. However, after reviewing the various scripted literatures, it is found that there are various impediments toward research work in smart meters e.g. i) expensive affair as there is a need of transition from old to new technology, ii) more exposed to security risk especially the privacy factor. The prime contribution of this review paper is its findings associated with the effectiveness of existing system i.e. i) less studies are found to be benchmarked, ii) more adoption of experimental approach compared to computational modelling in real sensor, iii) less focus on investigating how wireless technologies improves energy efficiency, etc. Hence,the future work will be in a direction to cover up the above mentioned issues.

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SOIL BIOTECHNOLOGY: AN ECO-FRIENDLY METHOD OF WASTE-WATER TREATMENT – A REVIEW

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ABSTRACT
This innovative technology titled "Soil Biotechnology" uses soil as the reaction medium for the treatment of waste-water. (In contrast to other technologies till date, wherein all the reactions are carried out in aqueous phase). This is a new and more efficient treatment technique, implemented in several cities of India wherein soil is used as the media, earthworms as culture, plantation, gravels and certain other additives and thereby carries out the complete treatment of waste-water. The treated water, unlike the other methods of treatment, gets purified to such an appreciable extent that it can even be reused for agricultural or gardening purposes, in construction sites, automobile washing yards, hydropower electricity generation, etc.

This paper deals with the review of an SBT plant for treating waste-water. This technique of waste water treatment re-engineers and provides a relook at soil chemistry and soil biology. This project is expected to meet a growing need for cleaner and safer water disposal and even water reuse in the area.

Keywords: Soil-bioreactor, wastewater renovation, COD removal, BOD, DO

INTRODUCTION
Soil bio-technology is a system which is in practice by Govardhan Eco Village at Galtare (wada, district palghar), which uses living organisms for the treatment of the wastewater. It is the patented process developed by Mr. Biplab Patnaik (IIT-B) of Life link Technologies. In soil biotechnology, soil is used as a media for treating the wastewater. SBT is a synthesis process which harnesses the energy, carbon and other elements of the waste and converts them to precious "bio-energy" products like vegetation, energy rich soil, complete bio-fertilizer and water. SBT involves removal of organic matter by adsorption followed by biological degradation and oxygen supply by natural aeration to the treatment system. The photosynthetic activity of green cover serves as a bio-indicator for the kind of micro-habitat in SBT. The SBT, is designed to provide the requisite filtration, aeration and bio-chemical processing for removal of toxicity, including BOD, COD, nitrate, phosphate, suspended solids, colour, odour, and bacteria. SBT uses only natural materials, natural agents (bacteria culture, worms) and natural processes (respiration, photosynthesis, nitrogen fixation) – it is ecologically 100% safe.

Disposal, after the treatment of sewage, is one of the major problems in India. Sewage has to be disposed off, before it decomposes, as it causes unsanitary conditions in the locality. This may lead to breeding of mosquitoes, flies, bacteria etc. and cause health hazard. Also, when the sewage is disposed in nearby water course or on land, it causes water pollution, danger and discomfort to the people living around. Therefore, environmental engineers have designed a system which helps to overcome this problem. This system is known as waste water treatment plant. This system collects and treats the waste of the town or city for public interest. The treated waste is then disposed into water courses such as streams, rivers, lakes or ocean. This waste can harm the aquatic life present in the water; also, it can pollute the water if not treated properly. Waste water treatment plants are huge and complicated. They require large place for their installation. Also large amount of fund is required for construction and maintenance of these plants.

Water is becoming an increasingly scarce resource, so the use of wastewater in agriculture could be an important consideration when its disposal is being planned. Soil Biotechnology (SBT) has helped a lot to bridge the gap between onsite sanitation and conventional centralized systems. As a technology, SBT stands as an attractive option to address the challenges of wastewater treatment in India. The water which comes out after treatment is then used for agricultural, gardening & plantation purpose, the solid waste after decomposing is used as manure. Thus disposal process is completely eliminated. Some of the national & international credentials of SBT are as:

- The Ministry of External Affairs, GoI, has recognized SBT as best innovations
- Siemens (International) have acknowledged and awarded SBT as best innovation
- Ministry of Defense, Airport Authority of India has listed SBT for water recycling
- Acknowledged by NABARD for Rural Sanitation

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- Working with Uttarakhand PeyJal Nigam, Maharashtra Jeevan Pradhikaran etc.

SBT is already in the domain of Municipal Corporation such as Bombay Municipal Corporation, Brihat Bangalore Municipal Corporation, etc.

ADVANTAGES

- 100 %of treated water is being used in agriculture, gardening and plantation.
- The by-products from waste water treatment system based on SBT are Biomass and Bio-fertilizer.
- Max 2 Metric Tons /year of bio-fertiliser can be generated from the system as by-product.
- Any form of unsafe sewage disposal is completely avoided; it prevents a form of damage to the local ecology.
- Being a relatively low energy consuming operation, the carbon foot print of the entire treatment plant is much lower than the modern sewage systems.
- No toxic waste and foul smell is produced.

LAYOUT OF PLANT

Comprising of several innovative features, an SBT plant has got a very simple set up. The untreated water is first stored in a tank, which is later pumped into the bio-reactor and after treatment it is collected in the fresh water tank under the flow of gravity. The tanks can be underground or overhead and can be made out of brick, steel or concrete depending upon the feasibility.

The bioreactor contains material having almost the similar density as that of the soil in its surrounding. Hence if no load bearing structures are required if the bioreactor in constructed inside the ground. The design of a bioreactor can be mould for special requirements.

There are no moving parts in the bioreactor hence the energy consumption is very low. There is one pump to pump the raw water onto the reactor and one to pump the treated at the site of use. The reactor is composed of graded material starting from big gravels at the bottom. Over this, a thick layer of media is placed which comprises of the biomass. This whole set up is covered with a thin layer of soil in which some shrubs can be planted giving a look of a garden.

The whole set up is completely odourless and eco-friendly. There is no unwanted sound produced during its operation.

Hence an SBT could be easily installed in a house, a society or anywhere in a city without any area constraints or facing any restrictions from the people living in its vicinity.

WORKING OF PLANT

The wastewater is first collected in a holding tank after which it is pumped into a trapezoidal-shaped bioreactor. The bioreactor is constructed by excavation and made waterproof. The under drain is laid at the base. The tank is then filled with layers of media and culture. The surface of the bioreactor contains rows of plants. A network of perforated pipes is constructed on the surface that spreads the incoming wastewater evenly over the surface of the bioreactor. Another set of pipes is also laid vertically extending into the bioreactor for aeration.

Water is pumped over the bioreactor through the perforated pipe network and begins to trickle down the filtering media. The suspended solids in the wastewater are held back by the top media. As the water seeps through the rest of the layers, dissolved pollutants are removed, and finally treated water passes through an outlet at the bottom of the tank and is collected in a treated water storage tank constructed alongside.

If required, recirculation pumps can be added to transport the water back into the bioreactor. This creates a second round of purification, obtaining the desired hydraulic retention and improved output water quality to the desired level. Shrubs and trees are planted on top of the bioreactor to act as bio-indicators, organisms used to monitor the health of the environment. In this case the growth of these plants will determine their ecological health thereby indicating the quality of the recirculated water. This entire treatment process can be operated on a batch or in continuous mode.

SCOPE OF PROJECT

Rural folk which tends to dump all the waste in local water bodies, were advised to transport their waste to the SBT plant. This was an initiative to be different and they are educating farmers on this. There is a lot of scope for this technology to grow into a popular Human waste recycling method around the world. They have also

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grown fragrant flowers like Rajnigandha grown around the collection tank to minimize the stench. This technique is readily scalable. For example, if the population of the community doubles in a short period, they can have a second unit ready in as much time. Corporate teams from various sectors have witnessed this unit and have expressed appreciation.

CONCLUSION

Soil Biotechnology not only treats water for disposal but recycles it to the standards that it can be reused. Almost 50% of water consumption is for purposed like flushing, horticulture, cleaning, washing etc. which can be served by the recycled water from an SBT plant. On the other hand, setting up an SBT plant to treat the Waste water would help to prevent the deterioration of rivers to a great extent. Since the applied technology is not demanding i.e. no skilled labour or high operational and maintenance cost is needed hence it would sustain easily in the adverse conditions without any breakdown. Hence this innovative soil biotechnology would prove to be a boom in the field of water treatment and a great step towards a better tomorrow.

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SQL DATABASE AND NOSQL DATABASE COMPARISON

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ABSTRACT
SQL Database is a Relational Database and Structured Database.SQL is the standard language for Relational Database and it also used to perform various operations such as Insertion, updation and manipulation of data from Relational Database.SQL has properties like Atomicity, Consistency, Isolation, Durability to maintain data integrity and data consistency.SQL is essentially declarative language, it also include procedural elements. NoSQL, which is stands for not only SQL, it is used for working with large sets of distributed data.It is not a Relational Database as it is not built in tables. Relational Database Model may not be best solution for all the situations then we can use NoSQL to get best solutions for that situation. It also may not provide Atomicity, Consistency, Isolation and Durability [ACID] properties to the database. NoSQL gives high performance with high availability and high scalability. NoSQL also offers rich query language than SQL. It is simple to implement and does not requires high performance server. NoSQL can handle structured, semi-structured and unstructured data with same effect.

Keywords: SQL Database, NoSQL Database.

INTRODUCTION
Database is the collection of data. Database supports manipulation and storage of data. Database Management system (DBMS) is used for management of database. It is the collection of programs which provides users to do various operations on database, like retrieval of data, manipulation of data and representation of data. The database management system was first implemented in 1960s.

Charles Bachmen's Integrated Data Store (IDS) is said to be first DBMS in history. DBMS makes it is possible for end user to create, read, delete and update data in database. The database manages three important things like the data, schema and the database engine. Schema is used to represent logical structure of database and database engine allow users to access, modify and lock the data from database. This element provides concurrency, data integrity and uniform data administration procedures. The DBMS can offer both logical and physical data independence.

A relational database system is common type of database whose data is stored in tables. Most relational database systems use SQL language to access the database.SQL stands for structured query language which is used to communicate with data stored in relational database management system. It is designed for retrieval and management of data in relational database. Some common relational database management systems that use SQL are Oracle, SQL server, Access etc.

The standard SQL commands are Create, Select, Insert, Update, Drop and Delete used to perform various operations on relational database.SQL consists of four type of languages such as Data definition language(DDL), Data manipulation language(DML), Data query language(DQL) and Data control language(DCL).

The upcoming category of Database Management System is NoSQL. It does not adhere with Relational Database Concepts. The concept of NoSQL database is associated with internet giants. Internet giants like Google, Facebook, etc. deals with large amount of data. When relational database is used for such huge data, the system started giving slow response. To overcome this, two methods are followed. One is, scale up the system by improving the existing hardware and second one is, distributes database load on hosts when loads are increasing. NoSQL databases are called as horizontal scalable databases. Various database technologies are enclosed in NoSQL database system which can store structured, semi-structured, unstructured and polymorphic data. The main property of NoSQL is BASE (Basically Available and Eventually Consistent).

In 1998, Carlo Strozzi first uses the term NoSQL for his open source relational database. In 2000, the Graph database is launched which is named as Neo4j. The performance of graph database is better than the SQL database. In 2004, Google BigTable and in 2005, CouchDB are launched. In 2009, the NoSQL term was again introduced.

There are four different types of NoSQL databases. These are used as per their requirement. The names of the databases are: Key-Value, Document, Wide-Column and Graph. 1) Key-Value databases: The technique called hash table is used in key-value databases. To find the particular item in hash table, key number and pointer are

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used. Hash table provides the efficiency to process large amount of data. 2) Document databases: It stores data in the form of key or value. Document databases are different from the key-value databases. It also used to search a particular document. XML, JSON (Java Script Object Notation) and BSON (Binary JSON) forms are used to store a Document. MongoDB and CouchDB are the examples of Document databases. 3) Wide-Column databases: Techniques of relational databases and key-value databases are used to store schema in these database. Hbase, Cassandra and Accumulo are the examples of Wide-Column databases. 4) Graph databases: These databases are widely used where data is in connected form. Main feature of graph databases is it stores objects and also the relation among them. Neo4j, Pregel, ArrangoDB and OrientDB are the examples of graph databases.

COMPARISON OF SQL AND NOSQL

A.Language

Based on the SQL, the SQL database processes the data. SQL is most widely used language. It is also restrictive and one of the safe choice for the complex queries. It requires the predefined schemas to determine the structure of data. In NoSQL, Dynamic schema is used and data is stored in many ways. In NoSQL the documents can created without having definite structure.

B.Scalability

SQL databases are vertically scalable. This means that the load on a single server can be increased by increasing things like RAM, CPU or SSD. (More floors can be added to this building). On the other hand, NoSQL databases are horizontally scalable. This means that more traffic can be handled by sharding, or adding more servers in your NoSQL database. (More buildings can be added to the neighborhood).

C.Schema Design

There is no standard definition of schema in NoSQL. They are either key-value pairs, document-based, graph databases or wide-column stores depending on the requirements. On the other hand the SQL database have table-based schema. Due to this difference of schemes, SQL database is better option for applications that require multi-row transactions and NoSQL database is option for Bigdata which gives more flexibility.

D.Community

SQL is a mature technology and there are many experienced developers who understand it. Also, great support is available for all SQL databases from their vendors. There are even a lot of independent consultants who can help with the SQL database for very large scale deployments.

On the other hand, NoSQL is comparatively new and so some NoSQL databases are reliant on community support. Also, only limited outside experts are available for setting up and deploying large scale NoSQL deployments.

CONCLUSION

This paper compares the SQL and NoSQL databases. While NoSQL databases are generally optimized for key-value stores, SQL databases are not. From our survey we come to know that not all NoSQL databases perform better than the SQL. Note that we did not performe the actual implementation but it’s a survey.

To handling of large amount of data it is efficient to use NoSQL instead of SQL. Also from SQL and NoSQL comparisons we can understand that for execution of complex queries we need to use SQL instead of NoSQL. And we can understand that SQL gives better data consistency than NoSQL.

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STRATEGIES FOR IMPROVING INTERVIEW SKILLS IN STUDENTS

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ABSTRACT
Interview is one of the essential steps in the selection process of job, and admission for the higher education. This research paper focuses on the importance of interview skills with the suggested strategies to develop the skills of students and it also tries to bring the awareness for building the confidence in them. There is fear in the mind of students about the interview so student can not prepare properly for the interview. Instead of considering the word interview we should keep in mind, it is nothing but the test of personality. Employers try to surprise interviewees to get a sense of how they think and react in unfamiliar situations. It is a part of your challenge is to stay open-minded and relaxed so you can build confidence, even in unfamiliar situations.

Keywords: Interview, Strategy, Skill, Improvement, students

INTRODUCTION

Interview is a social process, which involves interaction between two persons. One is the interviewer and other is the interviewee. It gives chance to the interviewer to have a glimpse of the inner traits and qualities of the interviewee. Interviews usually take place face-to-face and in person, although modern communication technologies such as internet, videoconferencing and telephonic interviews. Interviews almost always involve spoken conversation between two or more parties, although in some instances a conversation can happen between two persons who type questions and answers back and forth.

OBJECTIVES OF THE STUDY

The research paper aims at the following objectives.

1) To map the current position of job interview skills of the students.

2) To analyze critically the problems of the interview skills of students.

3) To suggest some of the strategies that can be implemented to improve the status of interview skills of students.

RESEARCH METHODOLOGY

The present study is based on secondary data and information collected from a various source like reference books, published articles, and websites etc. A sincere attempt has been made to interpret and analyze the data at the backdrop of the current position of the interview skills of students. The paper limits itself to deal with some of the problems as well as strategies which will be brought in practice if one needs to improve interview skills.

TYPES OF INTERVIEW?

Let's understand the various types of interview as per the nature of the role and the industry.

1. **Behavioral interview:** The focus of this interview is on candidate's experience and its relevance to the position.
2. **Situational interview:** In this type of interview the questions are based on the skills and personality traits that are required for the role.
3. **Structured interview**: This type of interview is conducted with a proper setting and format.
4. **Unstructured interview:** This interview is free-flowing discussion to gain the information of the candidate.
5. **Stress interview:** This type of interview is conducted to test the ability to cope with stress.
6. **Walk-in-interview:** This interview is conducted at the job fair.

What types of skills are required for the interview?

Interviewee should know the required skills for the interview which is as follows-

- Subject knowledge
- Work skills
- Finer skills

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- Communication skills
- Ability to listen
- Honesty
- Body language
- Etiquettes
- Attitude
- Dressing and grooming

Reasons of Rejection of the Interview Candidate

- Doesn't have spark
- Looks too casual
- Doesn't listen or think
- Too slow
- Too confused and unclear
- May not adapt to the situation
- Doesn't have much credentials
- Couldn't express himself
- Aggressive
- Poor physical appearance
- Poor eye contact

Preparation of questions for the Interview

1. **Direct Questions**: In which interviewee's answer should be clear and specific.
2. **Indirect Questions:** Specific information is not required in this type of questions. for example. "Tell me about yourself?"
3. **Behavioral or Descriptive Questions**: In this question one should describe first situation then problem and action you have taken and finally result.
4. **Situation Questions:** These questions use a problem-solving approach to check your analytical skills and critical thinking ability.
5. **Leading Questions:** These questions prompt you to answer.
6. **Open ended Questions:** These questions required mix of knowledge, and feelings.
7. **Close ended Questions**: This type of questions should answer only in yes or no.

Strategies of Effective Interview Skills

1. Review your resume thoroughly
2. Learn more about the organization
3. Prepare answers to sensitive questions about yourself.
4. Have a mock interview with a friend or relatives.
5. Arrive before the scheduled time of your interview.
6. Dress appropriately.
7. Make an eye contact.
8. Be polite, respectful and sincere
9. Do not chew gum or smoke.

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10. Relax a bit.
11. Answer each question concisely as per expectation.
12. Respond promptly to the interviewers.
13. Use proper language
14. Avoid artificial slang
15. While coming out from cabin don't look back.
16. Keep smiling face
17. Shake hands.
18. Be conscious of your posture.
19. Speak clearly and thoughtfully.

CONCLUSION

The paper covers the major and minor points related to the development of interview skills with the match up qualities recruitment. The employers want to see whether the interviewee has good interpersonal communication skills or not by checking their ability of working in the team. The nervousness of the interviewees to be possible to go away by referring this paper which emphasises the effective preparation for interview and building confident with proper practice to treat the interview like a conversation.

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SYSTEM CONTROLLED EMBEDDED ROBOT FOR SECURITY APPLICATIONS USING ZIGBEE

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ABSTRACT
Our main objective for making this project is as far as possible minimize the human life risk. We can afford the loss of a machine or a robot instead of loss of human life. Often people have used robots and sensors for security, and issues related to advancement in security. A basic idea about our project is that we have tried to design a robot which has some sensors interfaced to it and this robot and the sensors are controlled wirelessly by a local system from a distance.

Basically, our project deals with provided safety & security to places which mostly deal with dangerous substances such; bio-hazardous gases, and oil refineries, isolated area from humans etc. So the main objective is to reduce human risk in industries.

Keywords: Robots, Sensors, Zigbee, System Controller

INTRODUCTION
The project is basically an embedded robot used for security applications in factories, industries, military applications, and also in some domestic purposes.

LITERATURE REVIEW
We have taken reference from many projects or papers which are made in this field. The main reference of our project is Web based embedded robot for safety & security applications using zigbee in the International Journal of Wireless & Mobile Networks (IJWMN), Vol. 4, No. 6, December 2012 [1].

In the existing system consist of 2 sensors, MQ6 Gas Sensor & PIR Sensor. Microcontroller AT89C51 is used which is not an ISP IC i.e. In System Programmable IC which means whenever we have to burn the IC we have to remove the IC from the PCB and then it can be programmed. The use of relays for the driver circuit, is very complicated to use four relays and to check the combination of relays for robot movement. The wireless Audio-Visual Camera which is used is very complicated as we need TV tuner to receive its signal, more importantly it is very costly. The zigbee at the local system is connected to the laptop by RS232 cable instead of a USB which is not compatible to all systems or systems.

IMPLEMENTATION
Hardware Description
In our project we are interfacing four sensors, PIR sensor, MQ6 Gas sensor and Fire sensor for detection of fire and a Ultrasonic sensor for determining the distance between the robot and the obstacle. Here in our project we are using zigbee module for transmission and reception of the data between the robot and the local system. A zigbee is a transreceiver that is it can transmit as well as receive the data at the same time. The zigbee has good range and it works best when in line of sight. We are using. It works on a frequency of 2.4 GHZ. On the local system we use a zigbee with USB provision known as NRF24L01 USB module. This module is used to send the controlling data of the robot direction to the robot. And it receives the data from the robot, the GUI updates its data by using this data. The module used at the robot site is NRF24L01 UART. This module sends the sensor data to the local system and receives the controlling data from the local system.

There is an LCD at the robot site, which displays the continuous status of the sensors. The LCD is programmed. The LCD displays against each sensor Y or N to indicate whether any sensor detected anything or no. Even the ultrasonic sensor displays the distance from the obstacle. And even it displays MAX if the distance from the obstacle is more than 400 centimetres. The robot moves on two wheels and one caster wheel. The two wheels comprise of two DC motors. The motors are controlled by the driver IC L293D. This IC is controlled by the local system through the microcontroller.

The heart of this project as most of the robotics and embedded projects is our Microcontroller AT89S52. It is an on chip programmable IC. This helps us to burn the microcontroller without removing the microcontroller from the circuit. So we have also installed a burner in the robot for testing the project and the mistakes in the project. First of all the microcontroller is programmed for the LCD display. In this program we write codes for all the four sensors.

In these codes we used logics for displaying the results of the sensors on the LCD. Then in the second phase we programmed the microcontroller for controlling the motors of the robot by the local system

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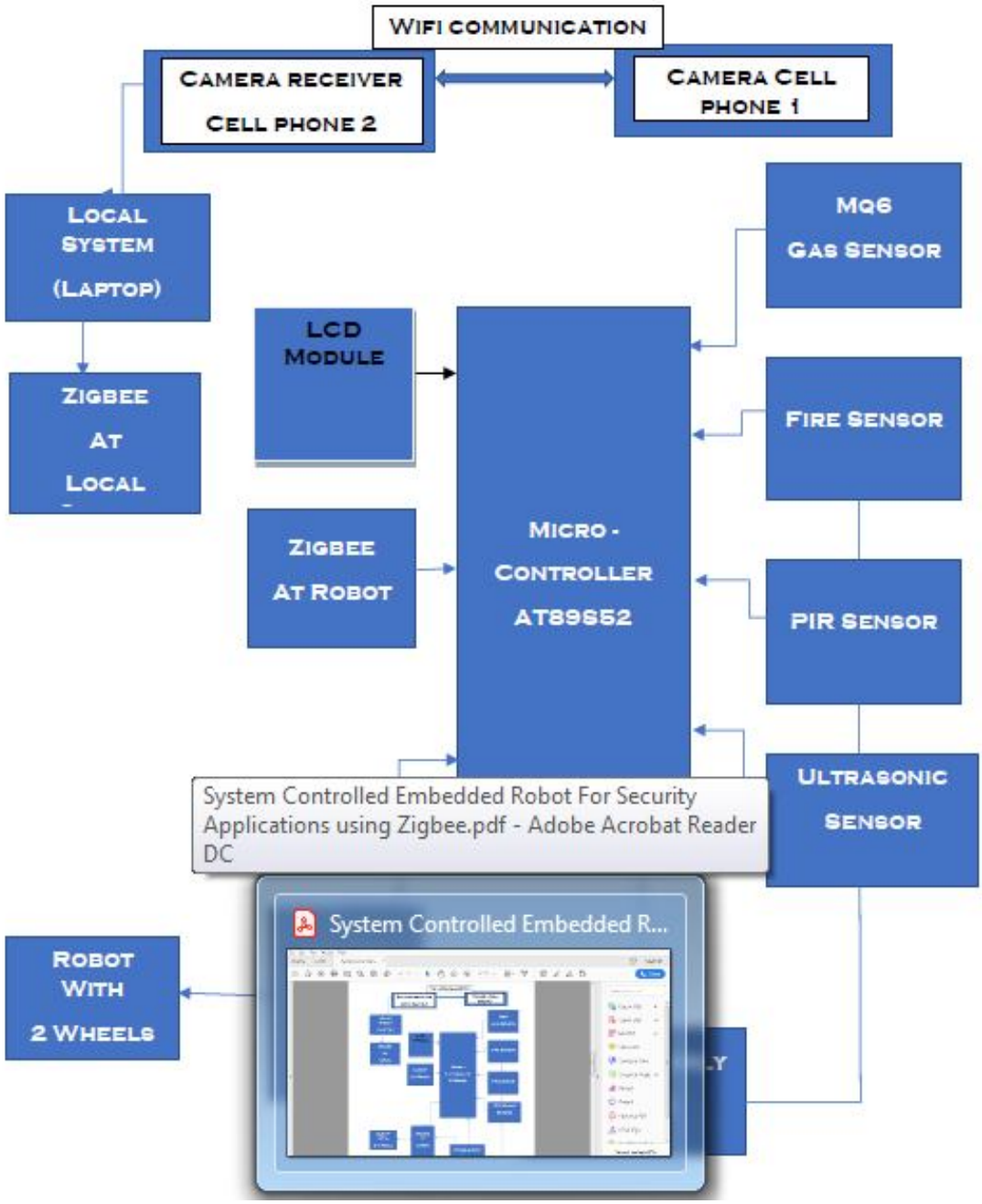

Block Diagram Description

SOFTWARE DESCRIPTION

We have used many software's in the project. Our software part includes the programming for controlling the robot from the local system for movement, programming for the LCD for displaying the data of the sensors, programming for designing the GUI for a systematic view and display of the robot control buttons and to display the data received from the robot. Also our software part includes the testing of the working of both the zigbee modules, whether they are transmitting and receiving correctly or no.

LCD Programming: First of all we programmed the LCD which is at the robot site to display the data provided by the sensors. We used C language for programming.

Microcontroller Programming: Then we programmed or rather burned the microcontroller with the controlling programs of the robot by the local system.

GRAPHICAL USER INTERFACE (GUI) DESGINING

We have designed the Graphical User interface for systematically displaying the data received from all the four sensors. We have also designed 5 buttons in the GUI which are used for controlling the movements of the robot, F, B, R & L for controlling. The fifth button is the STOP button for stopping the Robot. We have designed this GUI in the software named VISUAL BASIC v6. It is very simple software for designing a GUI.

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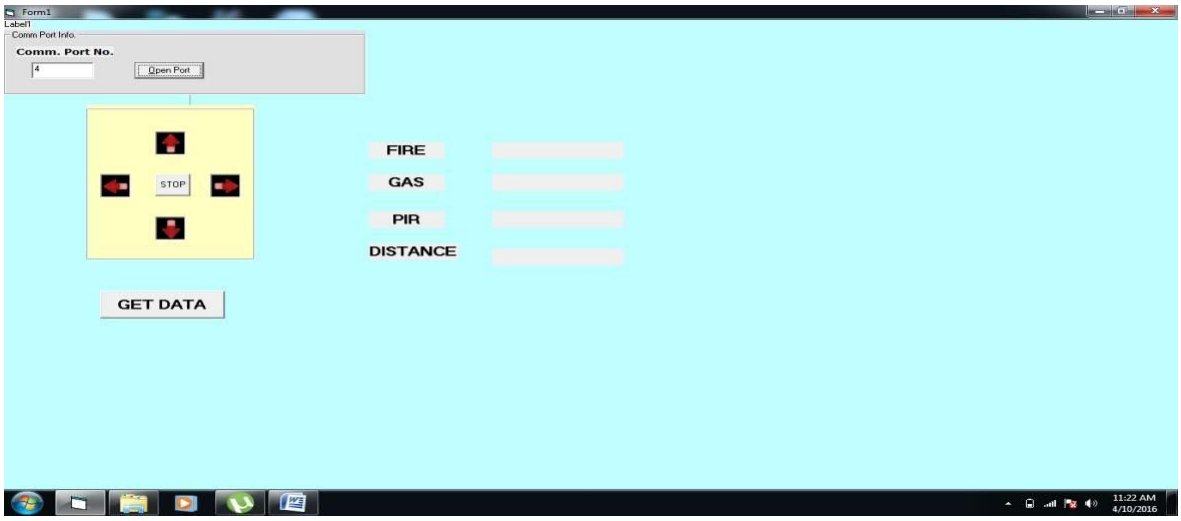

Graphical User Interface

CONCLUSION AND FUTURE SCOPE

Robot is in complete control of the local systems and it is reacting perfectly to the commands of the laptop. It moves left, right, forward and backward as per the commands of the laptop.

As our robot only indicates about the situation or about any risk at the robot site, in future there can also be some additions, so that the robot itself can control the situation without use of any manpower.

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CLASSIFICATION OF UNINTENDED BIAS IN TOXIC TEXT PRESENT IN SOCIAL CONCLAVES

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ABSTRACT
We have a vast pool of data in the current emerging technological era. Currently. The amount of data we produce every day is truly mind-boggling. There are 2.5 quintillion bytes of data created each day at our current pace, all this data stored and handled in the form of big data needs to be classified and stored in a structured format. The text data generated, needs to be monitored for its social acceptance likely, it should not be a threat or an insult hurting anybody's feelings on the web. For the same we need to build machine learning models to perform the check on this infinitely increasing data as it is not feasible to do all of it manually. We can use various machine learning techniques for the same. Convolution Neural Networks (CNN) or other deep learning techniques can be used. CNN is widely used for various text analysis. It requires the text data to be represented as vectors and then fed into the layers, for further processing. We have various techniques for vectorization. Each one of which has their pros and cons. These techniques have been described in this paper. We also have a detailed comparison of each techniques stating the different pros and cons.

Keyword: CNN (Convolution Neural Networks), GLOVE (Global Network for Word Representation), FastText, CBOW Model, TF-IDF.

INTRODUCTION
Social Conclaves have made communication easier and more convenient than ever. This era has seen all kinds of personalities, introverts, extroverts etc. but social media is a platform where any of them are not discriminated. Millennials open up freely and communicate, put forth their thoughts and opinions on various topics by means of either sharing comments, images, videos, podcasts, etc. With such a diverse pool of opportunities available, issues like cyber bullying, abusive content, harassment, threats arise, which creates a negative environment and disturbs the audience consuming the content. No platform would want to seize the freedom of speech of their active users, but every problem has a solution and we can always use preventive measures to deal with such situations.

When the Conversation AI team first built toxicity models, they found that the models incorrectly learned to associate the names of frequently attacked identities with toxicity. Models predicted a high likelihood of toxicity for comments containing those identities (e.g. "gay"), even when those comments were not actually toxic (such as "I am a gay woman"). This happens because training data was pulled from available sources where unfortunately, certain identities are overwhelmingly referred to in offensive ways.

Training a model from data with these imbalances risks simply mirroring those biases back to users.

A single model can be used to simulate having a large number of different network architectures by randomly dropping out nodes during training. This is called dropout and offers a very computationally cheap and remarkably effective regularization method to reduce overfitting and improve generalization error in deep neural networks of all kinds.

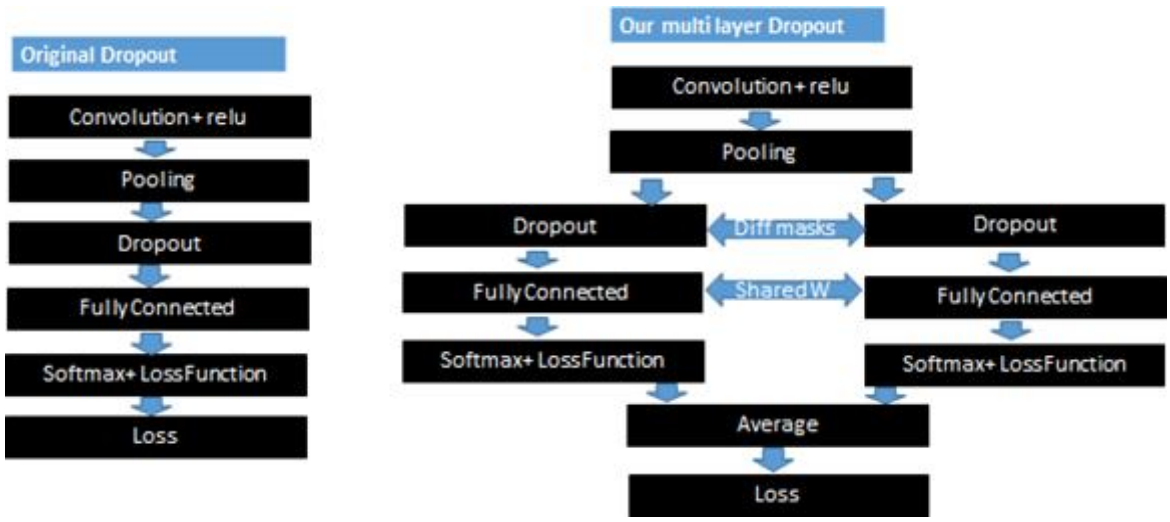

Figure-1: single layer and multilayer dropout layers

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DISCUSSION

CNN for Text Classification

The CNN have been widely applied to image classification problems due to their inner capability to exploit the two statistical properties that characterize image data, namely 'local stationarity' and 'compositional structure' [8]. Local stationarity structure can be interpreted as the attribute of an image to present dependency between neighbouring pixels that is reasonably constant in local image regions. Local stationarity is exploited by the CNNs' convolution operator. We may claim that for text classification problems the original raw data also present the aforementioned statistical properties based on the fact that neighbouring words in a sentence present dependency, however, their processing is not straight forward. The components of an image are Simply pixels represented by integer values within a specific range. On the other hand the components of a sentence (the words) have to be encoded before fed to the CNN. For this purposed we may use a vocabulary. The vocabulary is constructed as an index containing the words that appear in the set of document texts, mapping each word to an integer between 1 and the vocabulary size. The variability in documents length (number of words in a document) need to be addressed as CNNs require a constant input dimensionality. For this purpose the padding technique is adopted, filling with zeros the document matrix in order to reach the maximum length amongst all documents in dimensionality. In the next step the encoded documents are transformed into matrices for which each row corresponds to one word. The generated matrices pass through the embedding layer where each word (row) is transformed into a low-dimension representation by a dense vector. The procedure then continues following the standard CNN methodology. At this 2-point, it is worth mentioning that there are two approaches for the low dimension representation of each word. The first approach called 'randomized' which is achieved by placing a distribution over the word, producing a dense vector with fixed length. The values of the vectors are tuned via the training process of the CNN. The other very popular approach also evaluated here is to employ fixed dense vectors for words, which have produced based on word embedding methods such as the word2vec [16] and GloVe [18]. In general the word embedding methods have been trained on a large volume dataset of words producing for each word a dense vector with a specific dimension and fixed values.

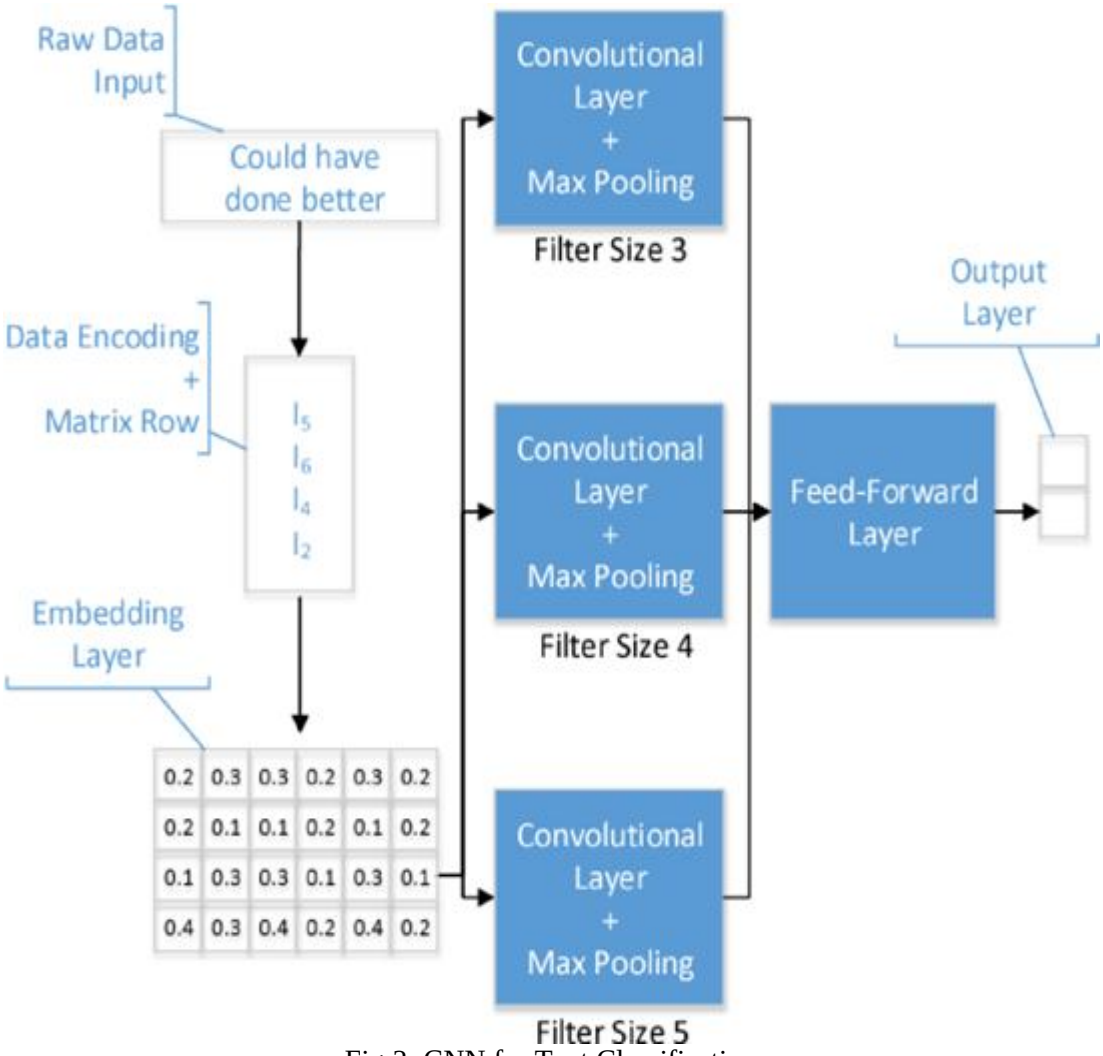

Fig-2: CNN for Text Classification

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Word Embedding and word2vec

Consider the following similar sentences: Have a good day and Have a great day. They hardly have different meaning. If we construct an exhaustive vocabulary (let's call it V), it would have V = {Have, a, good, great, day}. Now, let us create a one-hot encoded vector for each of these words in V. Length of our one-hot encoded vector would be equal to the size of V (=5). We would have a vector of zeros except for the element at the index representing the corresponding word in the vocabulary. That particular element would be one. The encodings below would explain this better. Have = [1,0,0,0,0]`; a=[0,1,0,0,0]` ; good=[0,0,1,0,0]` ; great=[0,0,0,1,0]` ; day=[0,0,0,0,1]` (` represents transpose) If we try to visualize these encodings, we can think of a 5 dimensional space, where each word occupies one of the dimensions and has nothing to do with the rest (no projection along the other dimensions). This means 'good' and 'great' are as different as 'day' and 'have', which is not true. Our objective is to have words with similar context occupy close spatial positions. Mathematically, the cosine of the angle between such vectors should be close to 1, i.e. angle close to 0.

FastText

FastText is another word embedding method that is an extension of the word2vec model. Instead of learning vectors for words directly, fastText represents each word as an ngram of characters. So, for example, take the word, "artificial" with n=3, the fastText representation of this word is <ar, art, rti, tif, ifi, fic, ici, ial, al>, where the angular brackets indicate the beginning and end of the word.

This helps capture the meaning of shorter words and allows the embeddings to understand suffixes and prefixes. Once the word has been represented using character ngrams, a skip-gram model is trained to learn the embeddings. This model is considered to be a bag of words model with a sliding window over a word because no internal structure of the word is taken into account. As long as the characters are within this window, the order of the n-grams doesn't matter.

FastText works well with rare words. So even if a word wasn't seen during training, it can be broken down into n-grams to get its embeddings.

Word2vec and GloVe both fail to provide any vector representation for words that are not in the model dictionary. This is a huge advantage of this method.

Working of word2vec

Word2Vec is a method to construct such an embedding. The word2vec embedding method for example, has been trained on 100 billion words from Google News producing a vocabulary of 3 million words. The embedding layer matches the input words with the fixed dense vector of the pre-trained embedding methods that have been selected. The values of these vectors do not change during the training process, unless there are words not already included in the vocabulary of the embedding method in which case they are initialized randomly. It can be obtained by involving Neural Networks Common Bag of Words (CBOW)

CBOW Model (for text mining)

This method takes the context of each word as the input and tries to predict the word corresponding to the context. Consider our example: Have a great day.

Let the input to the Neural Network be the word, great. Notice that here we are trying to predict a target word (day) using a single context input word great. More specifically, we use the one hot encoding of the input word and measure the output error compared to one hot encoding of the target word (day). In the process of predicting the target word, we learn the vector representation of the target word.

TF-IDF

The Inverse Document Frequency is the the number of times a word occurs in a corpus of documents. tf-idf is used to weight words according to how important they are tf-idf is used in a number of NLP techniques such as text mining, search queries and summarization. How is tf-idf calculated?

TF(t) = (Number of times term t appears in a document) / (Total number of terms in the document). IDF: Inverse Document Frequency, which measures how important a term is.

While computing TF, all terms are considered equally important. IDF(t) = log_e(Total number of documents / Number of documents with term t in it). Tf-idf(w) = tf(w)*idf(w)

The more important a word is in the document, it would get a higher tf-idf score and vice versa. There are many use cases where TF-IDF based representations help in empowering the NLP algorithms:

Document classification: TF-IDF forms a fundamental feature vector to train various classifiers such as LSI, SVM etc.

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Topic Modelling For auto tagging the documents, one way is to use TF-IDF directly where a model is trained by computing the vector for each document and setting a threshold. Terms with scores above this threshold can participate in predicting the topics for new documents. Alternatively, TF-IDF features as an input to the algorithm such as LDA, LLDA etc. helps to obtain better accuracy and performance.

Information retrieval systems: TF-IDF complements text mining and search algorithms by assigning a score representing how important the word is in defining the meaning of the document. The search results would be better if these important words closely relate to the search query.

Stop word filtering: TF-IDF is also a highly useful tool to filter out less important common words and can remove the requirement to manually maintain an extensive list of stop words.

However, TF-IDF has several limitations: – It computes document similarity directly in the word-count space, which may be slow for large vocabularies. – It assumes that the counts of different words provide independent evidence of similarity. – It makes no use of semantic similarities between words.

TF-IDF is based on the bag-of-words (BoW) model, therefore it does not capture position in text, semantics, co-occurrences in different documents, etc. So it depends a lot for what you want to use TF-IDF.

Log-Loss

This method will be used to measure the performance of models made : first on simple machine learning models and then minimizing the loss by applying deep learning models (to determine the difference). This can help attain higher accuracy. Multi-sample dropouts can be used to reduce the errors in the learning and minimize the loss function.

Architecture

- Wvn is the weight matrix that maps the input x to the hidden layer (V*N dimensional matrix)
- W'nv is the weight matrix that maps the hidden layer outputs to the final output layer (N*V dimensional matrix). CBOW is faster and has better representations for more frequent words.

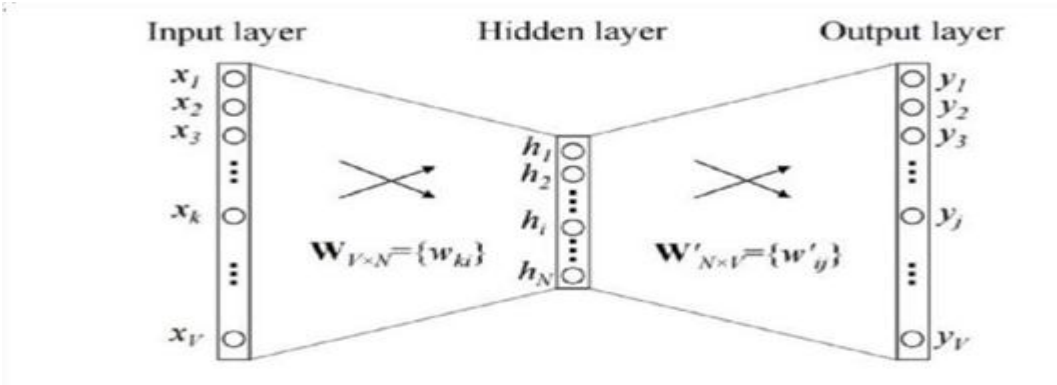

Figure-3: Layers in the CBOW architecture.

The following Table 1 is a comparative study made for suitable model for which should be used for process of vectorization.

Parameters	TF - IDF	Word2vec	Glove	fast-text
Working	Judge category of comment with the kind of words it contains.	Models that learn from that learn from vectors of words by taking into consideration.	Models that learn from that learn from vectors of words by taking into consideration.	Breaks words into several n-grams / sub words.
Process	Provides a score which indicates how important a word is to a document.	Improves its ability to predict.	Modelled to do dimensionality reduction.	Built on top of linear models with a rank constraint and a fast loss approximation.
Pros	Easy to compute, easily compares the similarity between 2 documents	Can leverage pre-trained models, Understand the Relationship between words	Lesser training time	Character based, can deal with unseen data, can leverage pre- trained models

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Cons	Dense, High Dimension, Does not capture position in text,	Inability to handle unseen words, Active Research- to go	Larger memory footprint needed. Inability to	Longer to train than Word2Vec, Active Research needed for
	does not capture semantics	from word vector to sentence vector	handle unseen words	word vector to sentence vector

Table-1: Comparative Study on various techniques

CONCLUSION

The reported results provide enough evidence that CNN enhances toxic comment classification reinforcing research interest towards this direction. While, Tf-idf does not capture position in text and also is incapable to capture the semantics of the text written. Understanding the semantics is of utmost importance to improve the prediction results and also to reduce the chances of false outputs. We use the method named Log Loss which is used to measure the performance of models made : first on simple machine learning models and then minimizing the loss by applying deep learning models (to determine the difference). Multi-level classification has better recall rates as compared to other classification techniques. This solves the problem of low recall rates in the previous applications during implementation.

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AUTOMATED TROLLEY MACHINE

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ABSTRACT
*A shopping mall or complex is a place where people buy product/s for their regular use. The customers have to wait in long queues to get their products scanned using barcode scanner and get it billed. To get rid of this, we have proposed a new 'Smart Shopping Trolley using RFID (Radio Frequency Identification)'. This implementation is used to assist a person while shopping and also to avoid standing in long queues and thus saving time. The smart shopping trolley would consist of a microcontroller, Android Device, RFID Reader and an 16*2 LCD Display. The products in the shopping centers will have RFID tags to retrieve/access information about it. When a customer places a product in the smart trolley, the RFID Reader will read the Product ID and the information related to it will be stored in controller.The total amount of the products in the trolley will be calculated on 16*2 LCD display and will be updated on server and the Central billing System.*

Keywords: RFID, Billing process.

INTRODUCTION
People tend to overshoot their budget when they are shopping at a big shopping center. Moreover they end up in long queues at the end of their shopping waiting for the products to be scanned and billed. The "Automated Trolley Machine" addresses the above problems with ease. It helps the customer in ensuring that he does not overshoot his pre decided budget and only buys the essential commodities actually needed by him, also the system aids in eliminating the long queues at the billing counter as the products are already read by RFID and the customer just has to pay the bill and bag the items purchased. The system is profitable for the shopping centers as it can help in reducing the number of billing counters and in turn will help in reducing employee costs significantly. The aim is to design a "Automated Trolley Machine" in cart aiding the customers in their shopping and reducing the queue at the billing counter. The device must be user friendly and have an interface via which the customer can read the products he/she intends to buy, also the system must have a LCD display so that the customer can know the total cost of the commodities purchased. The system must also have a feature to delete a purchased product in case the customer changes his/her mind. There is also a need of a centralized database which contains the cost of all the products in the shopping market. It is very common that people tend to overshoot their expenditure at large shopping centers due to a simple fact that they are not able to anticipate the cost of the products they have placed in their shopping cart.

Also on weekends and during festive seasons the customers have to wait in long queues just to get their products scanned at the counter and get them billed. This project helps in eliminating or reducing the above mentioned problems substantially. The "Automated Trolley Machine" not only displays the total cost of the commodities in the cart it also has a feature to remove any product if the customer wishes to do so. The "Automated Trolley Machine" also eliminates the tedious process of scanning the products at the counter as this process is already done by the customer during the shopping itself.After the Product reading by RFID we can our bill Amount By ownself with the help of automated billing system..

PROBLEM DEFINATION
An imperative product with social acceptance is the one that aids the comfort conveniences and efficiency in everyday life. Purchasing and shopping at big malls is becoming daily activity in metro cities. There will be rush at these malls on holidays and weekends. People purchase different items and put them in trolley . After completion of purchases, one needs to go billing counter for payment. At billing counter the cashier prepare the bill using barcode reader which is very time consuming process and results in long queue at billing counter.

In this project we are implementing a system "Automated Trolley Machine" being developed to assist a person in everyday shopping in terms of reduced time spent while purchasing. The main objectives of proposed system is to provide a technology oriented , low-cost, easily scalable and rugged system for assisting shopping in person.

III. LITERRATURE SURVEY
1] Manikandan, Mohammed aejaz, Nithin Krishna, Mohan Kumar, "RFID based advanced trolley for Super Market", Journal of Chemical and Pharmaceutical Sciences 8th june 2017. As per our survey money and average time spent to each customer is high especially in over- crowded supermarkets.

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Our idea has a stable and simple billing process of making payment in the trolley itself. It can be paid using customer card or the ATM card. Above concepts doesn't ensure security and theft of products either intentionally or accidentally. We used door by which products cannot be dropped without scanning by the customer. We also have used separate IR sensor to avoid the accidental dropping of products. To make it more effective we used code logic which correlates the IR count and RF count in the microcontroller. For security we installed password authentication feature by which each customer possesses unique card with unique password. Barcode technology is replaced by RFID in our system which gives fast and accurate scanning of products

2] Ravindra Jogekar, Ruchita Ghodeswar, Payal Kadu,"Automated Shopping Trolley System shopping Using Raspberry Pi Device" International Journal Of Reasearch Culture Socitey,Volume - 2, Issue - 2, Feb – 2018. The smart trolley which consist of raspberry pi device, barcode scanner and LCD touch screen will help the customer to save his time during the bill payment at the bill counter [2].

The automated shopping trolley system is linked with various devices such as barcode scanner, Raspberry Pi, touch screen. It provides the facility to customer to self-scan the products which the customer wants to purchase. After purchasing or self scanning the product if customer wants to make changes in product detail such as add or remove he can easily update the products detail by using the touch screen where the add, remove , update, delete keys are provided. A wireless smart device make note of all the scan products of the particular trolley and is linked with supermarket backend database which contains detail of the products such as price, stock. As we have provided the self-scan facility to the user and the wireless smart devices which makes of all the scanned products and connected with supermarket database. The scan products automatically billed in the wireless smart device for their purchase. At the time of purchasing the products customer is aware about the total bill.

3] Mr.P. Chandrasekar, "Smart Shopping Cart with Automatic Billing System through RFID and ZigBee." International Conference on Information Communication and Embedded Systems(ICIES2014). This paper provides centralized and automated billing system using RFID and ZigBee commu- nication. Each pro- duct of shopping mall, super markets will be provided with a RFID tag,to identify its type [3].

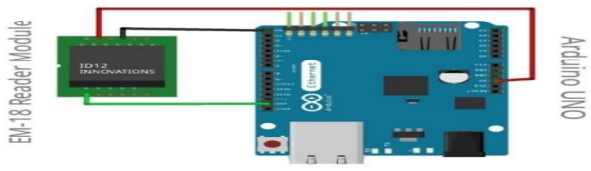
This application creates an automated central bill system for supermarkets and mall. Using PID, customers no need to wait near cash counters for their bill payment. Since their purchased product information is transferred to central billing system. Customers can pay their bill through credit/debit cards. The 8- microcontroller used here has the capability of receiving 8-bit data from RFID reader. The AT89S52 doesn't have inbuilt I2C protocol, programmer has to create a separate EMBEDDED C program to communicate with EEPROM. This may create some difficulties in writing program for programmers to synchronize with EEPROM. Some of other microcontrollers and microprocessors have inbuilt I2C protocol features. Those can be used as further improvement in efficiency and compatibility of this application.

4] Suganya.R, Swarnavalli. Vismitha. S, Mrs.G.M. Rajathi "Automated Smart Trolley" with Smart Billing Using Arduino International Journal for Research in Applied Science & Engineering Technology (IJRASET),Volume 4Issue III, March.This paper provides an app which helps the customers in finding the location of the product. It also provides a centralized and automated billing system using RFID [4].

Technological developments have opened up new opportunities for the company to conduct its business activities. According to the report published by techinasia, there are several smart phone technology bases that have been popular among people and it plays a big part of a day to day necessity. The development of mobile technology is very rapid and it enables a new approach to emarketing. Today's consumers are surfing more, shopping more and socializing more on their mobile devices. In this paper, a mobile application is used. It displays the list of products present and its cost. The user is asked to select the products. Once the selection process is over, the products are sorted and displayed based on its location.

IV. HARDWARE AND DESGIN IMPLEMENTATION

i. Circuit Diagram



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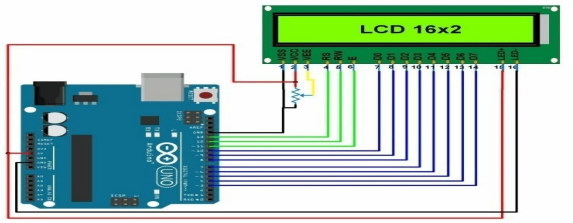
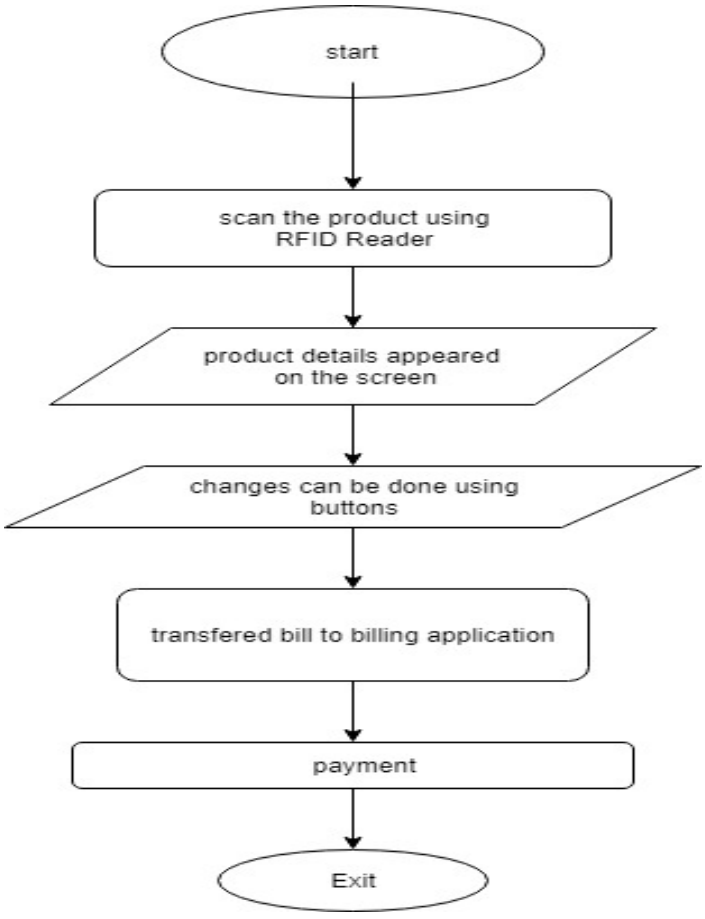


ii. System Archietecture

III. METHODOLOGY

Every product has an RFID tag which contains a Unique ID .These ID's are fed in the database assigned to the corresponding products .Product can be dropped in the cart where the RFID reader reads the tag. The information of the product is extracted and displayed on the LCD screen. At the same time billing information is .also updated. When a customer wants to remove any product from the trolley , then that product needs to be scanned again. The total amount of purchases is also displayed on screen RFID Then that product can be dropped in the cart where RFID reader reads the tag.

- **FLOWCHART**



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Our project start from first we collect the trolley,then choose the product which you have to buy, Then scan the product using RFID reader, RFID reader scan the product, in case without scanning customer put the product into trolley then IR Sensor blink the message first scan the product then put into trolley. After that 16*2displays on the screen which product has been choose price of product. Some times it happens when customer don't want to buy the product so there is one option present that i.s you have to scanned product again, so customer gets more comfortness. After that it shows the total bill of shopping.So, with the help of Credit/Debit card or mobile application customer can make the payment.

- **MICROCONTROLLER**

Fig: ArduinoUno

The Arduino Uno is an open-source microcontroller board based on the MicrochipATmega328P microcontroller and developed by Arduino.cc The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits. The board has 14 Digital pins, 6 Analog pins, and programmable with the Arduino IDE (Integrated Development Environment) via a type B USB cable. It can be powered by the USB cable or by an external 9-volt battery, though it accepts voltages between 7 and 20 volts. It is also similar to the Arduino Nano and Leonardo..

- **RFID READER**

Fig: RFID Reader

RFID Proximity OEM Reader Module has a built-in antenna in minimized form factor. It is designed to work on the industry standard carrier frequency of 125 kHz. This LF reader module with an internal oran external antenna facilitates communication with Read-Only transponders—type UNIQUE or TK5530 via the air interface. The tag data is sent to the host systems via the wired communication interface with a protocol selected from the module Both TTL and WiegendProtocol. RFID Reader Radio-frequency identification (RFID) is a technology to electronically record the presence of an object using radio signals. It is used for inventory control or timing sporting events. RFID is not a replacement for the bar-coding, but a complement for distant reading of codes. The technology is used for automatically identifying a person, a package or any item.

- **RFID Tag**

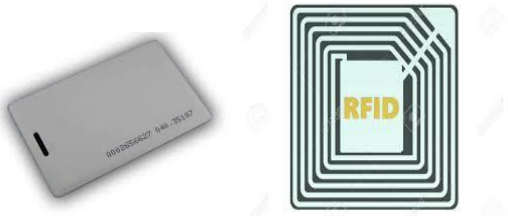

Fig : RFID Tags

A Radio Frequency Identification Tag (RFID tag) is an electronic tag that exchanges data with a RFID reader through radio waves.Most RFID tags are made up of at least two main parts. The first is an an antenna, which receives radio frequency (RF) waves. The second is an integrated circuit (IC), which is used for processing

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and storing data, as well as modulating and demodulating the radio waves received/sent by the antenna.A RFID tag is also known as a RFID chip.

- **LCD Display**

Fig :16*2 LCD Display

A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character isdisplayed in 5x7 pixel matrix. This LCD has two registers, namely, Command and Data. The command registerstores the command instructions given to the LCD. A command is an instruction given to LCD to do are defined task like initializing it, clearing its screen,setting the cursor position, controlling display etc. Thedata register stores the data to be displayed on the LCD. The data is the ASCII value of the character to be displayed on the LCD.

- **IR Sensor**

Fig: IR Sensor

An infrared sensor is an electronic device, that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion.These types of sensors measures only infrared radiation, rather than emitting it that is called as a passive IR sensor. Usually in the infrared spectrum, all the objects radiate some form of thermal radiations. These types of radiations areinvisible to our eyes, that can be detected by an infrared sensor.The emitter is simply an IR LED (Light Emitting Diode) and the detector is simply an IR photodiode which is sensitive to IR light of the same wavelength as that emitted by the IR LED. When IR light falls on the photodiode, the resistances and these output voltages, change in proportion to the magnitude of the IR light received.

- **The Advantages of RFID Over Bar Coding**

No "line of sight" requirements: Bar code reads can sometimes be limited or problematic due to the need to have a direct "line of sight" between a scanner and a bar code. RFID tags can be read through materials without line of sight.

- More automated reading: RFID tags can be read automatically when a tagged product comes past or near a reader, reducing the labour required to scan product and allowing more proactive, real-time tracking.
- Improved read rates: RFID tags ultimately offer the promise of higher read rates than bar codes, especially in high-speed operations such as carton sortation.
- Greater data capacity: RFID tags can be easily encoded with item details such as lot and batch, weight, etc.
- "Write" capabilities: Because RFID tags can be rewritten with new data as supply chain activities are completed, tagged products

- **RFID Applications**
  - Large volume operations
  - Highly automated operations
  - High value assetss
  - Assets that are moved frequently
  - Mixed pallet or serialized product
  - Significant data tracking requirements for product

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- **Tkinter**

Tkinter is Python binding to the Tk GUI toolkit. It is the standard Python interface to the Tk GUI toolkit and is Python's de facto standard GUI. Tkinter is included with standard Linux, Microsoft Windows and Mac OS X installs of Python.The name Tkinter comes from Tk interface. Tkinter was written by Fredrik Lundh.Tkinter is free software released under a Python license.

- **RESULT AND DISCUSSION**


Trolley

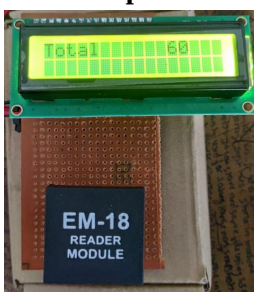
Step-1

Welcome Message

Step-2

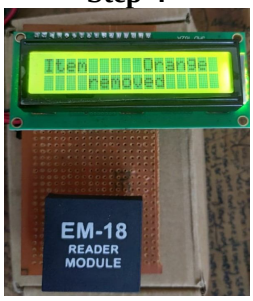
Product Name and Price

Step-3



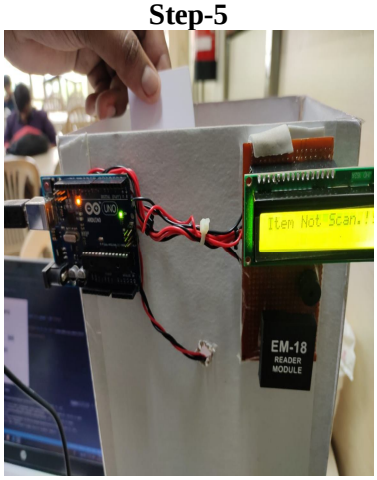
Total Will Be Displayed

Step-4



Product Remove

Step-5



Item Not Scan

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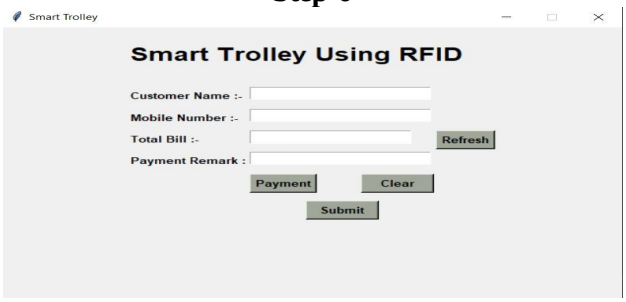
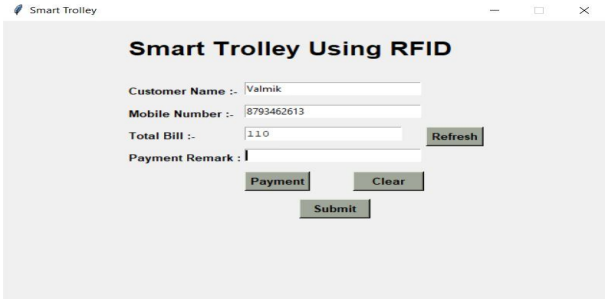
Step-6



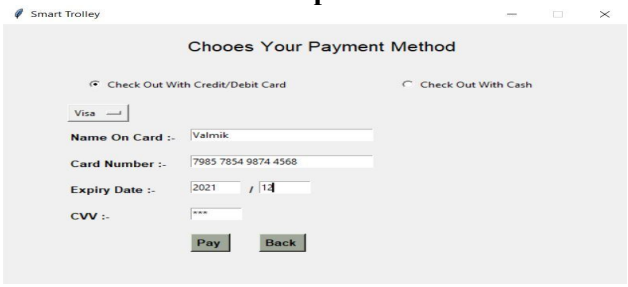
Billing Portal

Step-7



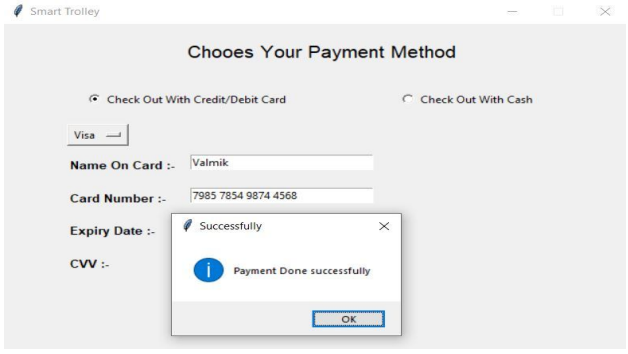
Feeling Customer Personal Details

Step-8



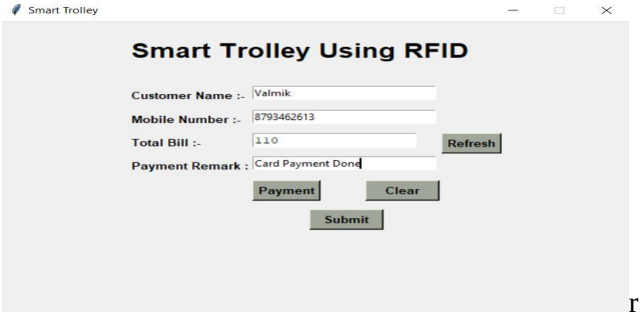
Fill Payment Details

Step-9



Successful payment message

Step-10



r

Remark display

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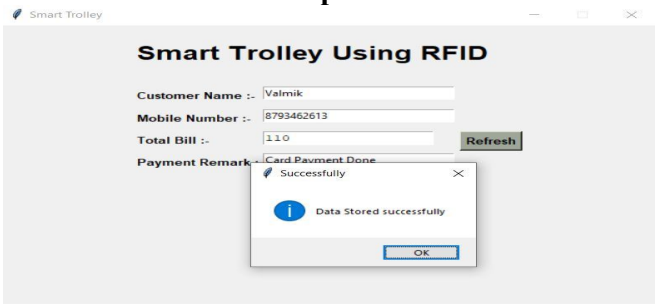
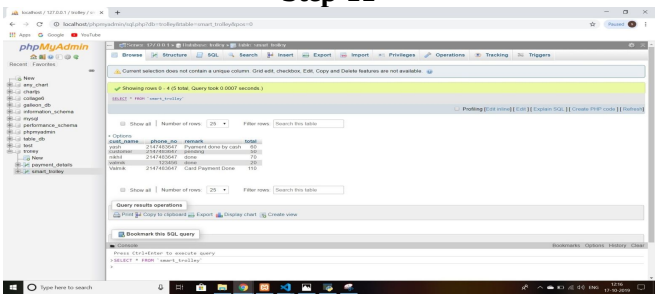
Step-11



Database store

Step-11



Database

V. FUTURE SCOPE

- Development of shopping navigation system to search the products in mall can be implemented
- A low-cost rfid scanner can be manufactured and used which can scan multiple tags (products) simultaneously for faster processing and lesser resources.
- There can be voice assistance included.
- Robotic arm can used for picking and dropping products in which
- Case theft can be avoided.
- Using a gsm module, we can transfer the bill to the mobile instead of printing it. this saves paper.

VI. CONCLUSION

According to customer's point of view our project has redefined the way of purchasing. Evidently RFID has outsmarted barcodes by its accuracy, fast response and durability. Our concept has erased the tradition of customer relying on the shopkeeper for acquiring information about products. Billing is completely avoided which in turn saves time for the customer and makes process easy for shopkeeper. It avoids queue for customer since billing is completed in the trolley. It reduces one third of the overall investment of the shopkeeper for billing department. Thus the model allows better shopping experience using improved technology which can be handled by any common man who just knows to read and write thing.

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VERBAL PROPENSITY FOR EMPLOYMENT – A PRACTICAL APPROACH

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ABSTRACT
The main intention of teaching English language is to provide the students with adequate communicative skills. The communication procedure is a fundamental part of creative living. Every individual needs to be well equipped with the tool called communication in order to accomplish his goals in life. Communication has become the means to success in every business. A person can reach the height of success if he possesses excellent communication skills. On the other hand, a person cannot endure without the expertise of these skills. The foremost idea of communication is to convey clearly. It is not possible to visualize a world without communication. English being an international language, communicating effortlessly in English has become obligatory for those who wish to communicate well in the professional and academic areas. Modern education system leaves no stone unturned to make the students employable. But, unfortunately various studies reveal that only a meagre percentage of students are being placed. Rest struggle hard for employment, because of their poor communication skills. It is a fact that vocabulary plays a pivotal role in effectual communication. Mastery of verbal dexterity can help develop expertise in language skills. The students, who hail from vernacular medium background, have a fear and notion that they cannot develop vocabulary. In the present scenario, it has become a great challenge for language teachers to make the students proficient in communication skills which comprises of all the four skills – reading, writing, listening and speaking. A strong vocabulary improves all these four domains. Words are the currency of communiqué. Since vocabulary is an integral part of language learning, it becomes all the more important to make the students pick up vocabulary. This article focuses on various practical approaches which can be implemented in the classroom to enhance vocabulary.

Keywords: Accomplish, Adequate, Communiqué, Dexterity, Implemented

INTRODUCTION

Communication is an elementary factor of our life. A person is unsuccessful and cannot achieve his goals, if he does not possess unmatched communication skills. The chief idea of communiqué is to transfer ideas unequivocally and clearly. Communication becomes effective and blooming only when the recipient gets the similar message as favoured by the sender. Communiqué includes all the four skills – reading, writing, listening and speaking. English being a universal language, interacting fluently in English has become obligatory for everyone who aspires to shine professionally. One of the foremost fields of education is Engineering and Engineers the pride of humanity. Unfortunately, it is a fact that engineers who come from a vernacular medium background during their schooling lack proficiency in communication skills, though very strong technically. Insufficient communication skills hinder their performance as well as job openings in MNCs.

Osterman (1997) says, "Engineering is a very wide profession that encircles many other sciences and specialisms. Engineers cannot spend a lot of time behind the closed office door. They have to communicate and share ideas and thoughts with other collaborators and authorities". Formerly, the engineers were anticipated to do technical things only. The requirement for proficiency in English was not in demand. The engineering curriculum did not give any importance to communication skills in English. But as time passed, India became a constituent of the worldwide market and English being the most accepted tongue of the international business, the Indian corporations are concentrating and absorbing persons who excel in English.

"Good English Communication Skills are a vital element of an engineer's profession and the lack of such skills only undermines the image of an engineer." Shikha, Seetha (2012) In the present scenario, a person should be technically strong and also proficient in English. Communication is the elementary dogma of human communiqué. One has to write in English, read in English, listen and speak in English with people of divergent nationalities, different backgrounds and dissimilar cultures because of globalization. Thus, proficiency in English is the need of the hour.

DEPTH IN VERBAL PROPENSITY

Nathaniel Hawthorne says, "Words, so innocent and powerless as they are, standing in a dictionary; how potent for good and evil they become in the hands of one who knows how to choose and combine them." Vocabulary is an inseparable part of any language learning process. It would be impossible to learn a language without vocabulary. The important role of vocabulary has been emphasized in all different methods in language teaching. Maryam EslahcarKomachali (2012) According to Rivers (1981), "Vocabulary cannot be accomplished. It can be accessible, explained, encompassed in all types of events, but it must be learned by the

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individual". According to Laufer (1997), vocabulary knowledge is at the heart of language learning and language use. In fact, it is what makes the crux of a language. Without vocabulary presenters cannot transport meaning and connect with each other in a particular language.

Verbal propensity plays a vital role in deciding one's language proficiency. Most of the students who pursue their graduation courses are not prepared for the requisitions career platform lays down. Examination on verbal aptitude is one of the various methods of eliminating candidates during competitive examinations and also during placements. Thus, it is the responsibility of every college to produce not only knowledgeable graduates but also prepare them for the workforce. Education should furnish its learners expertise to maintain a balance between academic and practical experience.

To correlate and convey their knowledge, thoughts and academic credentials, students need to acquire communicating in English as their chief skill. As Moir and Nation (2008) write, at one time it was widely assumed that lexical instruction is not essential as it can happen by itself; therefore, the teaching of vocabulary was not popular. However, nowadays, the significance of vocabulary and its significance in learning a language have become more accepted. Nation (2001) further describes the relationship between vocabulary knowledge and language use as complementary: knowledge of vocabulary enables language use and, conversely, language use leads to an increase in vocabulary knowledge.

At the same time, it is a known fact that vocabulary learning is the greatest single source of problems (Meara, 1980). Students desire to improve their vocabulary but they are ignorant about the various strategies that can help them to build up vocabulary. Verbal proficiency can be evolved with regular practice gradually. Language teachers can help the students acquire vocabulary through various practical methods which can be applied in the classroom to enrich terminology.

ROOT WORDS: ETYMOLOGY

Etymology is the learning of the source of words and how the sense of words has transformed over the passage of history. According to Sweetser (1990), a polysemous word usually has a core meaning and all the other meanings come from it; the word-meaning expansion works like a ripple. The teacher can explain to the students that many words of English language have more than one meaning which is often linked. There is always a core meaning with all the other meanings up coming from it. Anuthama .B (2010)

The language teachers should focus on the proper usage of words and should promote the progress of reading, writing, listening and speaking vocabularies. SyaefulRizki M, et al (2013) Many of the English words have evolved through the mixture of morphemic components, that is, root word, prefixes and suffixes. If students understand how this combinative process works, they possess one of the most potent understandings needed for vocabulary growth. (Anderson and Freebody, 1981).

The teacher can give the list of the root words to the students along with its meaning and from which language the word originated. Then the class can be divided into five or six groups depending on the strength of the class. All the groups are given one root word and two minutes time to think. Maximum words should be formed by each group. In the group all the students should maintain a diary and write down the words. One of the students from each group will read aloud the words framed by their group and others will note down in their diaries. This activity will not help the students pick up vocabulary but also enhance reading and writing skills. Marks are awarded based on the correct formation of the words by the teacher. Few examples related to root words are given below; in which it is explained about the origin of the root word, meaning and how a new word is formed with a new meaning.

EXAMPLES

1) Anti - (Greek) Against, opposite

Antibody: A substance which destroys microbes; Antisocial: Opposing social norms; Antiseptic: Preventing infection

2) Bene – (Latin) Well, good

Benevolent: Showing goodness or kindness; Beneficial: Producing a good effect; Benefactor: Person who gives money to a cause

3) Dia – (Greek) Across, between

Diagnosis: Understanding a condition ; Diabetes: Disease; Dialogue: Conversation between two persons

4) Fract, frag – (Latin) Break

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Fragile: Easy to break; Fragment, fraction: A part of a large whole; Fracture: A break

5) Lingu – (Latin) Language

Multilingual: To speak in multiple languages; Linguist: One who studies language; Lingual: Pertaining to languages

Similarly, the above mentioned activity can be played using prefixes and suffixes. The teacher will explain the students how new words can be formed by adding word at the beginning and ending.

PREFIXES
A number, word or letter positioned afore another word. In other words, when something is added at the beginning of a word then a new word emerges. For example, 'Im' is added to possible and the word 'impossible' emerges.

EXAMPLES
1) Dis (opposite of) – dislike, disown, dishonest, distant, disappear

2) In (not) – incorrect, inadequate, inability, incomplete, inaccurate

3) Co (with) – co-pilot, coexist, co-worker, co-operation, colleague

4) Re (again) – refold, replay, recall, recapture, reflect

5) Mid (middle) – midday, midnight, midsummer, midway, midst

SUFFIXES
A set of letters or a single letter added at the termination of a word. In other words, when something is added at the end of a word, then a new word is formed. For example, 'meant' is added to the word manage and the word management is formed.

EXAMPLES
1) -ion (the action or process of) – hospitalization, rationalization, differentiation, celebration, decision

2) -ity (the state or condition of) – equality, probability, responsibility, respectability, sentimentality

3) -ship (position held) – internship, worship, spaceship, township, hardship

4) -ive (quality or nature of) – creative, expensive, expressive, representative, sensitive

5) -en (become) – soften, fasten, lengthen, golden, tighten

COLLOCATIONS
McCarten (2007) states, "The technique in which two or more words are frequently used is termed collocation" The word collocate (verb), is derived from the Latin word 'collocare', which means to place together. To be precise, two or more words that often go together.

According to Nation (2001), collocations facilitate learning similar items such as, 'take medicine', 'take a pill', 'take a tablet.

The teacher should explain the students what is meant by collocation. Then the entire class can be divided into eight groups like Adverb + adjective group; Adjective + noun group; Noun + verb group; Verb + noun group;

Noun + noun group; Verb + adverb group; Verb + preposition group and Noun + preposition group.

Each group will be given two minutes time to think and say the words. The teacher will write the name of the group on the board and the words spelled by the particular group. At the end, the group which says maximum words will be declared as winners.

EXAMPLES
Collocations can be formed in the following ways –

Adverb + adjective – Totally different; Adjective + noun – Nice wedding; Noun + verb – Cash flow

Verb + noun – Make progress; Noun + noun – Tea leaf; Verb + adverb – Eat quickly

Verb + preposition– Participate in; Noun + preposition – Information about

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MEANING OF WORDS IN CONTEXT, SYNONYMS AND ANTONYMS

Context can prove to be impactful on learners' vocabulary development. But to learn words from context is a lengthy procedure. Through unequivocal teaching, teachers of language can wrap that procedure, so that pupils learn extra words in less period time. Stahl (1999)

Context means the situation of a term or occasion. We use it now to talk about any circumstances in which something happens. You might say that you cannot understand what happens without looking at a context. The teacher will make the students listen small audio clips on various situations and context related like at the office, at the bank, at the market place and so on. The students will listen carefully and try to make out the meanings of the words in context.

SYNONYM

A synonym is a word or phrase that means the same as another word in the language.

EXAMPLES

1) Wise – Bright, brilliant, sharp; 2) Essential –Crucial, vital, integral

3) Irrelevant – Meaningless, trivial, useless; 4) Difficult – Tough, tricky, challenging

ANTONYM

An antonym is a word or phrase that means exactly the opposite of another word in a language.

EXAMPLES

1) Arrive x depart; 2) Borrow x lend; 3) Compulsory x voluntary;4) Grant x refuse

The students will also try to find out synonyms and antonyms. Afterwards, the students are asked to make sentences with similar meanings, synonyms and antonyms**.** Once the students write down the sentences, the teacher can ask them to read it aloud. This activity helps to develop listening and speaking skills along with vocabulary development. The teacher should appreciate the students, who write correct sentences.

WORD FORM CHARTS

Word chart offers opportunities for numerous exposures to verbal items. It encourages students to make acquaintances amid novel and known words. Word chart can be utilized in response to meaningful contexts. Ellis (1997) Word chart is a device which can be used to convey information graphically.

WORD CHART

Context	Word form	Part of speech
Harry took part in various	activities	Noun
The generator was	activated	Verb (past tense)
John is very	active	adjective
He took part in sports	actively	adverb

Context	Word form	Part of speech
Truth is more important than	beauty	noun
The stage was	beautified	Verb(past tense)
Mary looks	beautiful	adjective
The room was decorated	beautifully	adverb

The teacher can ask the students to read a newspaper article or a small story in the class (silent reading). Afterwards, the students can create their own word chart. All the students who write more than five words in the word chart should be appreciated. The students inculcate reading habit and also their vocabulary is developed.

CONCLUSION

This study has suggested actual vocabulary methods for refining learners' communicative proficiency which can be implemented practically. It is difficult to acquire every type of terminology through these methods, though it is definite that they are beneficial in order to procure vocabulary for the communicative situations. However, it is to be noted that vocabulary acquisition depends significantly on the learners' needs, objectives and language adeptness levels. Nation (2001) emphasizes that "learners should know what their vocabulary goals are and what vocabulary to focus on in terms of these goals". A teacher should also know the art of combining numerous teaching techniques according to students' variables.

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Vocabulary is a vital part of English language and can be accomplished through various activities and games. Students, irrespective of their age whether primary, secondary, higher secondary or degrees love games. Thus, they should learn vocabulary effortlessly and naturally. Teachers should be adapted with the existing vocabulary learning methods and apply them in the class. As Nation (1982) and Meara (1996) correctly observe, language learning is a continuing procedure. Being able to remember one meaning of a list of words within a week or two is easy, developing a functional lexicon that contains morphological, semantic, syntactic, logical and expressive links necessitates a steady procedure that takes considerable time and effort.

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DEVELOPING COOLING SYSTEM FOR INJECTION MOULDING DIES

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ABSTRACT
This paper focus on determining the appropriate method to designed and fabricated the cooling system using the wire drawing method in which the wire tube is placed from inside the die, the gap should be maintained of 3mm between the die hole and the tube inserted or else it will get wore out. Cooling tower is used for cooling the water.

Keywords: Cooling Systems, Wire Drawing, Injection Moulding,Pkastic Products, Warpage and Heating

INTRODUCTION
Riya enterprises located in vicinity of Palghar is manufacturer of precision plastic components and engineering components. They have equipped injection moulding machines with various types of dies giving a wide range in variety of products. Injection moulding is a technology that has been used since the late 1800's. Injection moulding machines incorporate a huge screw to force molten plastic into the mould at high pressure. This screw drive method was invented in 1946 and is still the method used today. Injection moulding machines definitely do not have the modern, high-tech feel of 3D printing technology. There is really nothing cool about injection moulding but nonetheless it is a requirement for most hardware products. An injection mould consists of two halves that are forced together to form a cavity in the shape of the part to be produced. Hot, liquid plastic is then injected at high pressure into this cavity. The high pressure is needed to ensure that the plastic resin fills in every crook and cranny of the mould cavity. Once the plastic has had time to cool, the two halves of the mould are pulled apart, and the part is ejected.Although designing for injection moulding can be quite complicated, and the cost of the moulds themselves are incredibly expensive, there is one huge reason why injection moulding is still used today. No technology can beat injection moulding when it comes to producing millions of identical copies of a part at an incredibly low price.

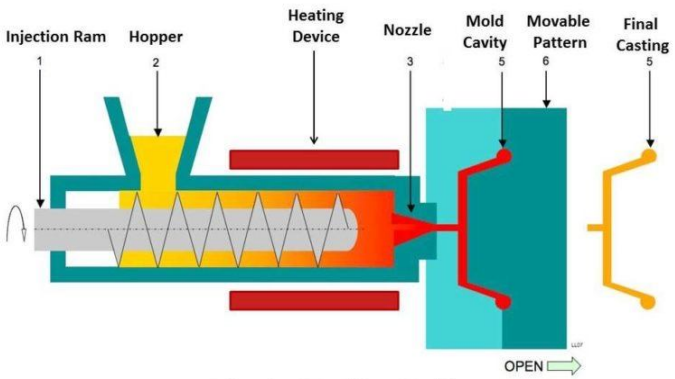

Fig-1: Injection Moulding Construction

OBJECTIVES OF STUDY
1. **Problem Definition**
2. **Proposed Methodology**
3. **Process Parameters**

LITERATURE REVIEW
[1] Shaileshbhai P Patel, et.al [2017], presents a simulation study of different types of cooling channels in an injection moulded plastic part and compares the performance in terms of cooling time, temperature profile and part warpage to determine which configuration is more appropriate to provide uniform cooling with minimum cycle time. [2] Parag Chinchkhede, et.al [2016], compared various cooling systems namely; parallel cooling system, series cooling system, robust cooling system and conformal cooling system and presented results in terms of cooling time, average mould cavity and part temperature, and average cycle time to decide suitable cooling channel system. [3] Ekadewi A Handoyo, et.al [2018], designed and fabricated the cooling system using the wire drawing method in which the wire tube is placed from inside the die, the gap should be maintained of 3mm between the die hole and the tube inserted or else it will get wore out. Cooling tower is used for cooling the water. [4] Hong S Park, et.al [2017], presented the conformal cooling system with the help of the spiral form

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of cooling lines around the die. [5] Li Ren, Rui Yang, et.al [2010], considering the cooling channels, location, size, number and the calibrator materials distribution simultaneously, the optimization cooling system is investigated. [6] Suchana A. Jahan, et.al [2017], explained that the present straight drill cooling channels for die does not impart optimal thermal performance. The conformal cooling channels can impart the optimal thermal performance. The incorporation of conformal cooling channels can improve the thermal performance of the injection moulding die. Design of experiments (DOEs) technique is used to study the effect of critical design parameters of conformal channels. [7] Volker Maag, et.al [2008], this work proposes that to guarantee high quality and faster production one has to ensure adequate cooling system for the die. They generated a complex geometric constrains resulting from the internal structure of the mould should get 8 satisfied. They showed us the numerical approach by combining the bound and branch algorithm, by using non- linear programming to generate geometric constrains. [8] HU Xinping, et.al [2012], worked on the Die casting die method in which a die is made to make a die of particular product. They used the finite element method to describe the cooling of the die. Some factors influenced the die temperature such as the temperature of cooling water, the location of cooling water channel, the diameter of cooling water channel, the amount of cooling water channel was discussed [9] MrozekK.l, et.al [2013], they showed us the cooling efficiency of the moulding used in the electric and electronic industry. They used the electric connector casing method for increasing the cooling efficiency and uniformity of the die which is used in the electric industries. The analysis process uses 3D model created in PTC Creo and any simulation was carried out by means of Autodesk Mouldflow for PA 6.6 with trade name of FRIANYL RV0 GN A63. [10] Sabrina Marques1, et.al [2015], they also showed us the conformal type of cooling system for the injection of moulding die. But they used the heat flow simulation to show us the different types of results evaluated in the system of the injection moulding die. However, conventional methods to manufacture cooling channels (drilling) can only produce linear holes.

PROBLEM DEFINITION

In this project the primary activity is to decrease the cycle time of one product to be made in the Injection moulding die, by decreasing the temperature of the die. The major problem faced during the manufacturing process is the over heating of the die resulting in poor surface finish and poor quality. We have to ensure proper cooling of the product the cycle time of the product has to be decreased which is different for different type or grade of material used in the injection moulding die. Although they have a chiller plant of cooling tower, but it does not cope up with the need of targeted number of products they manufacture. The machine is not effectively used to it fullest due to this issue. We are going to design and fabricate such cooling system which can give proper surface finish and reduce the cycle time of one product which will result in increase of product. And to do so we have proposed different types of cooling techniques which will be effective to the machine and will be effective to the surrounding and structure of the machine.

Fig-2: Existing Cooling System

PROPOSED METHODOLOGY

- Collecting data from the company
- Study of different cooling system
- Comparing different cooling system considering the machine design
- Selecting optimal cooling system and Performing initial design calculation
- Fabrication and results evaluation in terms of percentage capacity utilization

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A. Parallel cooling system

Parallel cooling channels are straight drilled channels that the coolant flows from a supply manifold to a collection manifold. Due to the flow characteristics of the parallel cooling channels, the flow rate along various cooling channels may be different, depending on the flow resistance of each individual cooling channel**.**

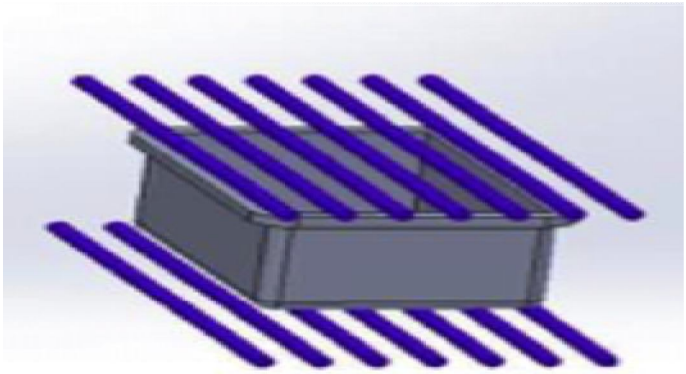

Fig-3: Parallel cooling system

B. Series cooling system

Cooling channels that are connected in a single loop from the coolant inlet to its outlet are called serial cooling channels. This type of cooling channel network is the most commonly used in practice. By design, if the cooling channels are uniform in size, the coolant can maintain its turbulent flow rate through its entire length. Turbulent flow enables the heat to be transferred more effectively.

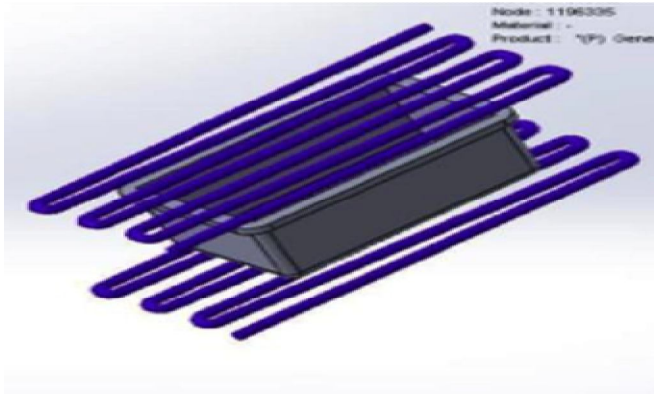

Fig-4: Series cooling system

C. Wire Drawing

This type of cooling system involves drilling in die which will induce stress concentration drilled in the die. The holes are than provided with the hoses drawn through it. The wire hoses carry water in it which then cools the die properly from inside out.

Fig-5: Default water supply

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PROCESS PARAMETERS

- Process parameter varies according to condition and requirements.
- Weight of the parts produced by this process is generally 100 to 500 g.
- Cycle time for produce a single part is generally 5 to 60 seconds depends upon the parts manufacture.
- Heating temperature of moulding material is 150-350 ^{o}C.
- Injection pressure is 100-150 MPa.
- Locking force is 0.1 to 8.0 MN

CONCLUSION

The present study was to design and fabricate the optimal cooling system for the cooling of injection molding dies. This whole process is based on the experimental method and not the analytical form. The above data is required for the experimental purpose.

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DEVELOPMENT OF QC TOOLS TO IMPROVE THE QUALITY OF MANUFACTURING PROCESS

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ABSTRACT
The purpose of this paper is to apply quality tools to ascertain the root causes of quality complexities related to manufacturing. Methods of faults on the production line are investigated through direct observation on the production line and enhance the process by continuous monitoring through the inspection of samples using statistical tools such as check sheets, histograms, Pareto analysis, cause and effect diagrams, etc. Is done in the effort demonstrates the utility of quality tools to discover and eradicate the root causes of problems. Seven outdated quality control tools are a set of QC tools that can be used to enhance the performance of production processes from the first phase of production or the final stage of production of a product.

Keywords: flow chart, pareto chart, scatter diagram, histogram, cause and effect diagram, control chart, check list PDCA List.

INTRODUCTION TO QUALITY CONTROL
Quality improvement is a primary requirement in any production system that sends products or service as its output. Thus, it is a major target in any manufacturing industry. The manufacturing industry puts a lot of effort into maintaining and improving the quality of its products using a variety of control devices and techniques. Quality concerns affect the entire organization in every competitive environment. This is necessary not only to reduce wastage, but also to meet customer expectations, continuous cost reduction and continuous improvements to survive in a highly competitive environment.

Seven Quality Control Tools Various tools are used to check product quality to define the weather whether the product is a quality or not and to take further necessary action to bring the process under control.

1) Flow Chart

2) Check Sheets

3) Pareto Chart

4) Histogram

5) Cause and effect diagram

6) Scatter diagram

7) Control Chart

FLOW CHART
The flow chart is one of the basic tools used to study the entire process. It shows the entire process in a phased manner. Flow charts of the entire process from material to product are studied. The graphical representation of data makes it simple and easy to understand.

CHECK SHEETS
Since measurement and collection of data form the basis for any analysis, this activity needs to be planned in such a way that the information collected is both relevant and comprehensive. Check sheets are tools for collecting data. They are designed specific to the type of data to be collected. The check sheet helps in the systematic collection of data. Some examples of check sheets are daily maintenance check sheets, attendance records, production log books etc. There is a need to meaningfully classify the data collected using check sheets. Such classification helps to gain an early-feminine understanding of the relevance and dispersion of data so that further analysis can be planned to obtain a meaningful output. The meaningful classification of data is called stratification. Stratification can occur by group, location, type, origin, characteristics, etc.

PARETO CHART
A Pareto diagram, named Wilfredo Pareto, an Italian economist, is a special type of bar graph used to describe the relative frequency of another entity in various events such as faults, repairs, claims, failures, or any other entity, in the descending order. This helps to focus on the major defect rather than many small defects to improve quality.

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Pareto charts are used in statistical process control for quality improvement. After collecting the data, it is necessary to organize it properly to focus on the most important factor responsible for 80% of product rejection in the manufacturing industry. The Pareto Principle is also known as the 80/20 Rule.

HISTOGRAM

Histograms are also known as frequency distribution diagrams. Bar charts show distribution patterns in orbit intervals arranged in order of magnitude. Histograms are useful in study patterns. The rectangular area is a variable equal to the frequency of the square interval and width. A histogram is a special bar chart for measuring data. It is used to chart the frequency of the event.

CAUSE AND EFFECT DIAGRAM

After finding out the problems in the process, it is necessary to find out the cause which causes major problems. Various factors are considered as human beings, materials, environment and process etc. A cause and effect diagram is a tool that shows the systematic relationship between an outcome or a symptom or an effect and its possible causes. It is an effective tool for systematically generating ideas about the causes of problems and presenting them in structured form. This device is designed by Dr. Kauro was drawn by Ishikawa and as mentioned earlier it is also known as Ishikawa diagram. It is also known as Ishikawa diagram or fish bone diagram.

SCATTER DIAGRAM

When solving a problem or analysing a situation one needs to know the relationship between the two variables. A relationship may or may not exist between two variables. If a relationship exists, it can be positive or negative; It can be strong or weak and can be simple or complex. An instrument for studying the relationship between two variables is known as a scatter diagram. It consists of plotting a series of points representing multiple observations on a graph with one variable on the X-axis and the other variable on the Y-axis. If more than one set of values is the same, more points are needed at the same location, a small circle is drawn around the original point to indicate another point with the same values. The way the scattered points in the quadrant give a good indication of the relationship between the two variables.

CONTROL CHART

Control charts are used to study how the process changes over time. This tool is used to control the data for rejection of any product. Some solution is provided after analysing the root cause of the problem. So, the control chart is used to check whether the solution is in range or not. These charts separate the assigned reasons. Control charts make it possible to diagnose and improve many presentations troubles and significantly improve the quality of products and deterioration and re-work. It tells us when to take action to correct the trouble as well as when to leave a process alone.

7 QC TOOLS THROUGH PDCA-CYCLE

An implemented quality management system is an advantage in the successful application of quality tools. The quality management principle is a starting point for the management of the company which strives for continuous efficiency improvement and customer satisfaction over a long period of time. A quality management system is based on the integrity of all production and support resources of a certain company. This enables a lossless process flow to meet the associated contracts, standards and market quality requirements. The implementation of a quality management system is always a part of the entry and / or process analysis of a company's development process. As the fifth principle of QMS (ISO 9001: 2000), continuous improvement cannot be realized without the means of quality, which are presented through Deming's quality cycle or four groups of PDCA-cycle activities, The PDCA-cycle is an integral part of process management. Is designed to be used as a dynamic model because a cycle represents a complete phase of improvement. The PDCA-cycle is used to coordinate continuous improvement efforts. It emphasizes and demonstrates that improvement programs should start with careful planning, consequently take effective action, and move forward again to careful planning in a continuous cycle - the quality cycle of deming never ends. It is a strategy used to achieve success improvement in safety, quality, morale, delivery costs and other important business objectives. The end of one cycle continues with the beginning of the next. A PDCA-cycle consists of four consecutive phases or stages, which are as follows: analysis

- **Planning** - Analysis of the need for improvement by considering areas that have opportunities for change. Decisions on what should be changed.
- **Do** - Implementation of the changes decided on the planning step.
- **Check** - Control and measurement of processes and products, policy, goals and requirements on products according to the changes made in the previous steps. Report on results.

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- **Act** - Response to adopt changes or re-run the PDCA-cycle. Keep on moving.

LITERATURE SURVEY

Jeetendra A. Panchiwala, presented Brief study and his understanding about Quality and Productivity improvement in small scale foundry industry. In this paper he is aimed to review the research work made by several researchers and an attempt to get technical solution for minimizing various casting defects and improve the entire process of casting manufacturing. he concludes from several research work that modem method of casting component using various software and simulation techniques is really a boon for the industrial sector. To complete globally, foundry men have to move ahead from the slogan of "satisfying customer" and adopt and ruinously endeavour for "customer delight". Meeting customers' demands will not be sufficient. requirements will be to exceeding them through quality and productivity improvement.

Shyam H. Bambharoliya, this paper aims to identify the problems related to different products and probable solutions based on that problem. Use of 7 QC Tools is best way to reduce rejection and defect of product after analysing of manufacturing process. Another advantage is increasing customer satisfaction by use of 7 QC Tools in today competitive market. Based on application of these tools will increase the level of standard products which they required as vision of an organization. After reviewing all research papers different defects are observed by application of 7 QC tools and individual solution is given with probable root causes. After studying all problems related to each research papers individual solutions are provided as per requirement. based on that problems effect on production is changed as increase in productivity or reduction of rejection rats.

Varsha M. Magar, the main aim of this paper is about to provide an easy introduction of 7 QC tools and to improve the quality level of manufacturing processes by applying it. QC tools are the means for collecting data, analysing data, identifying root causes and measuring the results. These tools are related to numerical data processing. All of these tools together can provide great process tracking and analysis that can be very helpful for quality improvements. These tools make quality improvements easier to see, implement and track. The work shows continuous use of these tools upgrades the personal characteristics of the people involved. It enhances their ability to think generate ideas, solve problems and do proper planning. The development of people involved. It enhances their ability to think generate ideas, solve problem and do proper planning. The development of people improves the internal environment of the organization, which plays a major role in the total quality culture.

CONCLUSION

These following conclusions were obtained from the review of the above-mentioned papers.

1. 7 All majorities use quality circle tools as they are very simple and easy to use.

2. We are able to improve quality by reducing rework and rejection rate using 7 quality control devices.

3. Reduction in rejection is indirectly improving both the prod and profitability of the organization.

4. 7 quality control devices have shown better results in quality improvement according to several usage studies

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DOMAINS OF CRACKING JOB INTERVIEWS

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ABSTRACT
Everyone is familiar to the word 'Interview'. This paper briefs about 'Job Interview' which is the most common process in companies or organizations recruitment. Generally, after hearing the word 'Interview', what comes in every candidate's mind is 'fear of getting rejected' in the interview process and hence they fail in it. To overcome this issue, this paper provides domains for cracking a job interview with some required skills related to the interview process. It also presents the importance of communication skills and methodologies in a simple and precise way through which a candidate can explore his/her dream job by cracking an interview.

Keywords: interview process, candidates, fear of getting rejected, communication skills, methodology

I. INTRODUCTION

This paper aims to help students how to crack a job interview by using some interview techniques and by presenting their subject or technical knowledge with communication skills. Customarily, the interview is conducted between two persons or a group of individuals in conversational discussion. The person who conducts an interview is known as **Interviewer** while the candidate appearing for the interview is known as **Interviewee**. The job recruitment process involves various stages such as *aptitude test, group discussion* and *personal interview*, etc. in which **the personal interview** is the most important process that usually conducted to observe the ability and personality of the candidate and to justify his/her suitability for the job.

II. ESSENTIAL SKILLS AND COMPETENCIES

Why do students fail in interview?

Students fail in interview due to the following reasons:

- Lack of Interview Skills **(**Work Ethics, Positive Attitude, Time management, Self-confidence, Dress and grooming, Interpersonal Skills)
- Lack of successful tips on job interview (Conduct research on the employer, hiring manager and job opportunity; Review common interview questions and preparation;; Arrive on time, relaxed; Prepared for the interview and Make your first impression)
- Lack of English Language (LSRW - Listening, Speaking, Reading and Writing skills)
- Lack of Proper Body-language (Knowledge about non-verbal communication)
- Lack of Technical Knowledge (Core Skills)

Employers place a lot of emphasis on finding candidates with very specific skills, abilities and knowledge for their organizations. To get a job after graduation, you need to have the core skills and key employability skills which is known as transferable skills that will make you effective at work and career development. Therefore, you must have the following competencies which are keys to crack a job interview:

1. **Commercial Awareness:** You must know that how a business or industry works and what makes a company drive. It means the understanding of the organization's goals and method of achieving through its products and services and its marketplace strives.
2. **Communication:** Good communication is a two-way process that makes the effective exchange of information in business through listening and speaking out and good writing skills. Communication is really more of a package such as leadership and management, teamwork, influencing skills, etc. than an individual skill. To impress recruiters, you need to be able to express yourself concisely, phrase the right questions, understanding your audience and tailoring the essential information, good listening and speaking skills.
3. **Leadership:** Leadership proves you more than an entry-level to hire. Traditionally, in business and management academics, leadership and management roles are distinctively defined as the "**Leaders set vision**" by motivating and conveying of what can be achieved; "**Managers get things done**" by defining the individual tasks that need to be completed within the timeframes and by monitoring performance and

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budgets. The best graduate hires can do both so the savvy employers are always on the hunt for them. Thus, you must improve this skill to become a successful leader.

4. **Teamwork:** Teamwork builds positive work environment and rapport among members which helps everyone to achieve the goals and business objectives of an organization. So *being as a team player* as well as *having ability to manage and delegate to others* and *take on responsibility* is required skills in every employee.
5. **Negotiation and Persuasion:** Negotiation skill means being able to understand other person by studying his/her positive attitude, culture and set out to achieve the common goals. This skill helps to motivate other person to listen or accept you and cooperate with you to complete the task.
6. **Problem-solving:** Problem-solving is a skill which helps you to show your ability to approach problems from different angles such as *logical* and *analytical approach* to solve problems and *resolving issues.*
7. **Organization:** Time Management, Prioritization and Organization are important to know that when and where to direct your efforts to be ahead of the game and to succeed. It is a core skill for all employees but many graduates new to the workplace find challenging. This can be practiced well while doing your graduation through organizing your workload, prioritizing your time realistically to make your study successful. During recruitment process, employers assess your instincts using your time in the best way and they also provide training to build your ability required for these courses.
8. **Perseverance and Motivation:** You are sometimes expected one of the best actions that you can take is to ask for help The ability to cope with hindrances and failures is called as resilience and it also means that recognizing the affected things and then having coping strategies to manage it. It is one of the essential expected qualities from employee because in that situation you must learn the art of asking for help instead of doing some superhuman activity.
9. **Ability to work under pressure:** "How do you handle stress?" a tricky interview question asked by interviewer to study your *self-awareness, preparation skills, motivation and resilience*. Stressful situation could be a regular occurrence of working life but to find the way to cope with it you have to understand your own strengths and responsibilities of the job and make a balance to take confident decision. You must be honest with yourself where deadline pressure is to be expected. Stress is different for everybody but recruiters want to find out what your own personal response to stress is.
10. **Confidence:** You will feel more confident when you are clear in your own mind what you want and what you can offer at this stage in your career. Alexandra states, "You need to be clear on your options, and clear on your value." Dr. Sue Black a senior research associate at University London and an IT industry figurehead suggests, "Pretend to be someone you know who is confident;" "I have pretended to be one of my more confident friends in interviews and I have worked!" Interview nerves are a good thing.
11. **Analytical skills:** Analytical skills are often assessed by using aptitude or psychometric tests. It enables you to work with different kinds of information and trends to draw meaningful conclusions.
12. **Enterprise and Entrepreneurial Skills:** Employers often seek entrepreneurial mindset in graduate to study their grabbing opportunities, to spot gaps in the market and trying something new or improving a process to increase efficiency or boost results.
13. **IT Skills:** You need to show employers that you have mastered essential skills like numeracy, communicating clearly, organization and drive. The best way to show your IT skills and using ability to employers is that you can demonstrate your achievement from your studies, extracurricular activities or work experience.

However, these are general competencies essential for successful working but with these complements the core skills are often overlooked when you write application and answering interview questions.

III. PREPARATION FOR CRACKING A JOB INTERVIEW

A. Pre-Interview Tasks

1. Know about yourself: The first skill you should learn is to know about yourself. Observe yourself, analyze about your strengths, weaknesses, likes, dislikes. This will enhance you to develop analytical skills. Generally, at the beginning of every interview, a trick question they ask you is "**Tell us about you**". It means you have brief them about your professional and educational experience and background not your life story or repeating

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the matter of CV and covering letter because they have already analyzed that. This question helps them to study that whether you possess the art of communication to engage and keep them interested.

KEEP IT BRIEF

1. **Tell us about you** should be in brief - one, two, three minutes not more than that because too long could probably say goodbye to the job.
2. Do not tell your life story, you do not get any points for giving a long answer and you risk alienating the interviewers.
3. You do not need to talk about everything on your CV this is just the first question and if you forget something, if you get something important, it does not matter you can discuss it later in the interview.
4. Your talk should be interested and the interviewer should be thinking "I want to know more" and not "I already know too much".
5. **The content of your talk is** –

- You should basically tell them a story about your professional background and educational background if it relates to the current position
- You should mention some of the special points that are relevant to the seeking job
- You can say about how you started your career
- You can mention some accomplishments
- You could talk about your motivation
- Tell them a story of how you changed something or made a difference in your previous job or at university
- *Tell them what you can do for them and what you want for the future and why you are best suited for the job*
- It is good to show that you have a life outside of work and if one of your interview shares the same interest it can help you bond but keep it very short to connect with them on an emotional level
- Have a good tone of voice with nice rolling intonation not flat or sound like a robot
- When you get passionate raise your voice a little do not shout though. You can speed up, you can slow down, you can use hand gestures
- Your eye contact makes communication obvious and engaged
- Your covering letter and CV is probably written in **formal English** but when you speak these matter let it sound more conversational and a little animated and informal way
- Learn the key points but let the words come out naturally and leave room for spontaneity
- As English is not your first language, you might be worried about your grammar mistakes well certainly you should not be

✓ First of all, the interviewers are not grammar teachers (unless of course you are going for a job as an English language teacher and that is a different story)

✓ Assure yourself that they *won't notice any small grammar mistakes* they want to know that you can communicate in English

✓ You can have perfect grammar and be a bad communicator and you can have no good grammar and be a great communicator and that is what they want

✓ The words you use are much less important than the way you communicate and the story you tell

✓ Even though, your English level is not that great you can answer this question and it will put you in a good position for the rest of the interview

THE PERSONAL TALK

1. I would describe myself as someone who is versatile and determined and someone who loves learning.
2. I am creative, open-minded and easygoing and I enjoy working with others and I always try to use these qualities in my professional life.

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3. I have been working at XYZ Company. I started out at the help desk where I worked closely with clients and I built some good relationship.
4. After that, I did a number of roles in the company and I have been promoted several times now for the last three years I have been working as a project manager.
5. The company has been pretty successful and I would like to think that I contributed to that success.
6. Your company is renowned for being one of the most innovative in the sector. And I know this is a more the passion you need and I do believe I can make a positive impact and that is why I am here today.
7. When I am not working professionally, I like to go hiking at weekends and I like reading books.
8. Okay, that is it. I hope you found that useful and if you have any tips of your own about how to answer this question, do put them in the comments and good luck with the interview stay warm and I will see you next time (www.letthemtalk.fr)

2. Ask yourself 'why': Everything has some purposes that exists in some or the other way. Before doing anything, ask you, 'Why am I doing it? Before appearing for the interview, find the purpose why you are seeking that job. Do you possess the skills required for the job you are seeking for? Only when you think you have Find the right answer to your question, step ahead.

3. Research the Company: This skill is a part of pre-interview task. Do a complete research on the company which is offering you the job. Try to find what product does the company produce, what ethics does the company follows, what are the methods and techniques that the company follow, what are the latest achievements and developments of the company etc. This skill will surely win you half the battle. It will ensure that the candidate is passionate about the job he/she is applying for.

4. Job Description: Read and analyze the Job description well. Find out whether you are suitable and do you possess the skills that are required for the job you are seeking for. Make a small set of Points. Match those points with your skills. Try to develop the skills required in the area in which you are lacking behind.

5. Make the roots strong: A tree stands strong when its roots are strong. You should have a good basic knowledge related to your Job description. Along with it, you should have a good subject knowledge regarding your core stream.

•Example:-A good Mechanical Engineer should have a strong basic knowledge related to Motion, Machines, Inertia, Forces, etc.

5. Dressing and grooming: A good physical appearance influences the people around you and creates a good impression. Before appearing for the interview, dress well in formals and groom your hair properly. It means you are ready to face the professional world.

6. Be prepared for tests: Make sure you are well prepared for the questions that an interviewer may ask you which may be related to your job or the intelligence and thinking level required in the job that you are applying for. Try to practice puzzles, quizzes. This will built your IQ level.

7. Strength and weakness: This is a general question that is usually asked in every interview. Know your strength and weakness and try to work on your weakness. Convert that weakness into strength. This will be a bonus point.

B. Interview Day

1. Be on time: It is better to reach the interview session before time than to delay. This will make you feel relax and calm and also you may get some time to do your last moment revision. It will ensure that you are serious about the interview.

2. Body language: '*We communicate the most, when we are not speaking'*. This skill plays an important role in any interview. Mental abilities are not enough to prove you a good aspirant. Physical structure of a candidate is also observed during interview. Many interviewers figure out within 30 seconds whether they want to hire someone or not. It is advised to maintain a good erect and standard posture while sitting for a interview. Don't panic, avoid folding your hands during conversation process, maintain a proper spinal posture and maintain a suitable gap between the legs.

During an interview, follow these steps to avoid undesirable body language:

- ✓ Do not keep your elbows and arms on the interview table

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- ✓ Lazy posture
- ✓ Avoid any body movements such as scratching head, nail biting, legs movement etc.
- ✓ Do not bend your body downwards while sitting

3**. Be Attentive:** Be a good listener. Listening and hearing are two different terms appearing similar. Good listening skills will help you analyze the question well and let you think well while if you allow Interviewer to repeat the question, that means you are lacking the interest.

4. Eye Contact: Eye is one of the six senses through which humans communicate. During the conversation process, maintain a good eye contact with your interviewer. It means you are focused and paying attention.

5. Vision and Mission: Define your vision, mission, short term goals, and long term goals in a precise and relevant manner. Mention your aim, mission and future goals. While defining these terms, keep the topic short and relevant. Don't extend it and make it bulky.

6. Patience: While facing tough questions and situations in interview, try to remain patient. Take some time to sort out the situation and make your thought clear. Patience can be mastered by practicing emotional intelligence.

7. Speak clearly: Keep a clear voice pitch, volume and tone. While speaking, do not mumble or make sounds such as 'um', 'am', etc. It means you are not confident about what you are speaking. Do not take a long pause and waste your time. Don't shy to keep your opinion. Practice speaking skills.

8. Don't argue: Discussion and argument are two different terms. Discussion is a conversation process that involves negotiation skills. While argument is a process of proving yourself right. Avoid argument with the interviewer. Practice negotiation skills.

C. Post Interview

1. Express Gratitude: It does not matter how the interview goes, always remember to express your gratitude and a take moment to thank your interviewer for their time and considerations. No matter, what is the outcome of interview, but practicing this skill will help you build a positive impression.

2. Ask some questions: Interview is a conversational process. Even candidate can ask questions to the interviewer. It ensures that you are interested in having a discussion.

3. Feedback: It is a good practice to ask for a feedback when the interview is over. It signifies how you performed, what were your positive sites and what were your drawbacks on which you need to work on.

Hope, this article was helpful for the candidates those who are preparing for interview and dreams to develop their career and explore various opportunities.

BENEFITS

1. Overcome the fear of getting rejected in job interview
2. Increased recruitment possibilities and career opportunities
3. Explore dream job and build a career
4. Improves communication skills

IV. CONCLUSION

As we know that getting a job after graduation required some core skills and key employability skills for being effective at work and career development, this paper focused on some domains such as professional skills and competencies for making a candidate to present their very specific skills, knowledge and abilities to secure his/her dream job. This paper ensures that the person, who goes through it, will definitely get success in writing application and answering interview questions and finally getting the dream job.

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EXPERIMENTAL INVESTIGATION ON BEHAVIOR OF BAMBOO REINFORCED CONCRETE BEAM

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ABSTRACT
The use of bamboo which is fast growing and ecological friendly material for structural applications is being considered as quite appropriate. The tensile strength of bamboo is quite high and can reach up to 125 MPa. This makes bamboo a pretty alternative material to steel in tensile loading applications. The bamboo concrete composite elements can be used as alternate for concrete, steel and wood used in housing and other products required in the day today applications. In this study it has been attempted to develop engineered bamboo structural elements for use in low cost housing. The tension and compression tests are conducted on the bamboo specimen and flexure test is conducted on the bamboo reinforced concrete prism beam of size 150×150×750mm. The flexure test consists of 3 numbers of plain concrete beams,3 numbers of untreated prism beams and 9 numbers of treated bamboo reinforced prism beams. The treatment of bamboo avoids the swelling action and the fungi attack of bamboo and also increases the bond strength and durability of concrete. The study revealed that the tensile strength of bamboo is about 33% that of the steel, this is sufficient for masonry structure and the load carrying capacity increased about 3 times that of plain concrete beam having same dimensions. This study also revealed that the comparative study of modulus of elasticity for both plain concrete beams and bamboo reinforced concrete beam and concludes that 27% of increase in modulus of elasticity by using bamboo as a reinforcement member.

INTRODUCTION
Problems encountered with the commonly used construction material like steel are rise in cost, degradation of the non-renewable material, the pollution of the environment due to industrial process are common in the globe. However, with sustainability as a key issue in the last decades the environmental load of building materials has also become a more important criterion. The building industry, directly or indirectly causing a considerable part of the annual environmental damage, can take up the responsibility to contribute to sustainable development by finding more environmentally benign ways of construction and building. One of the directions for solutions is to look for new material applications: recycling and reuse, sustainable production of products, or use of renewable resources. Attention has to be given to materials such as vegetable fibers including bamboo, jute, and glass, wastes from industry, mining and agricultural products for engineering applications to control environmental degradation and to minimize cost. Due to the above advantageous characteristics of bamboo, in the last few years studies have been made on bamboo as structural material and reinforcement in concrete. The water absorption in the Bamboo is high so the water proofing to the Bamboo is required. Khosrow Ghavami in his study has focused about the summary of the information about the bamboo as a structural member.

His study also reflects about the design of the flexure and axially loaded elements. The concluded part of the study throws light on satisfactorily substitution of Bamboo against steel.

OBJECTIVES OF STUDY
The goal of this paper is to determine the practicability of bamboo reinforcement for concrete beams. Whereas the mechanical properties and behavior of steel reinforced concrete have been thoroughly studied and well documented, there exists no comprehensive data describing bamboo reinforced concrete. Therefore, the aim of this study is to provide a preliminary contribution toward the collection of the mechanical properties and behaviors of bamboo reinforced beams.

4. To study the suitability of bamboo for replacement of steel in reinforcement for low cost construction
5. To study the compression, tension and flexural behavior of bamboo as a reinforcement
6. To study the strength of treated and un treated bamboo reinforced beam prism
7. To study the plain and bamboo reinforced beam pris

LITERATURE REVIEW
- The International Standard Organization (1999) came up with lab manual for determining the physical and mechanical properties of Bamboo. This document gives a practical step by step explanation of how to perform each test of moisture content, density, shrinkage, compression, bending, shear, tension and specifically

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following the International Standard Complement Document "Determination of Physical and Mechanical Properties of Bamboo."

- K Ghavami (2004) discussed the mechanical properties of Bamboo, specifically pertaining to Bamboo in concrete. This study showed that the ultimate load of a concrete beam reinforced with Bamboo increased 400% as compared to un-reinforced concrete. It was found that, compared to steel, there was lower bonding between the Bamboo and concrete, and the Bamboo had a Modulus of elasticity 1/15 of steel. Bamboo's compressive strength was much lower than its tensile strength, and there was high strength along the fibers, but a low strength transverse to the fibers. Stated is the need for the development of a simple design code for the application of Bamboo as a construction material.

- Dr. Nobuyoshi Yashima (2010) conducted a study where he determined a mechanical property of a specific bamboo specimen from Chiba, Japan and 3 other bamboo specimens from 3 different locations in Cebu, Philippines namely, Minglanilla, Guadalupe and Consolation. He conducted a tensile test to 18 specimens (9 from Japan and 9 from the Philippines) and found out that all specimens from the Philippines have stronger tensile strength in comparison with Japanese bamboo. The wall thickness of Cebu A, B and C specimens are ranging from 4mm to 6 mm and these are rather thin while wall thickness of Japanese bamboo section is from 5mm at upper part to 12mm at lower part. As the results tensile strength of Philippine bamboo were about 15% stronger than Japanese bamboo in average.

MATERIAL AND TESTING

A. Properties of bamboo

1. **Physical Structure of Bamboo**: is commonly compared to wood products due to its similar chemical structure. The physical structure is the aspect that differentiates bamboo from wood. Wood has anisotropic properties and contains grains oriented in the same direction throughout the whole structure. On the exterior edge of each node, branches form creating different types of grass looking leaf structures.

2.**Shrinkage and Swelling of Bamboo**: like wood, changes its dimension when it loses or gains moisture. Bamboo is a hygroscopic material thus the moisture content changes with the changes in the relative humidity and temperature of the surrounding environment.

3.**Bending**: is an important parameter, deciding the suitability of bamboo as a construction material. Because of this ability, Bamboo can be used as a substitute for reinforcement in construction of buildings.

4.**Elasticity**: the enormous elasticity of bamboo makes it to a very good building material for earthquake endangered areas. Another advantage of bamboo is its low weight. It can be transported and worked easily, thus rendering use of cranes and other big machines unnecessary.

5.**Fire Resistance**: the fire resistance of bamboo is very good because of its high content of silicate acid. Filled up with water, it can stand a temperature of 400° C while the water cooks inside.

B. CEMENT

Ordinary Portland cement of 53 Grade conforming to IS 8112 -1989 9, and the specific gravity of cement was found to be 3.15. The physical properties of cement are given in Table 1

Table-1: Physical Properties of Cement

Component	Results	Requirements
Fineness (%)	1.63	<10%
Initial setting time (Minutes**)**	135	Minimum 30minutes
Final setting time (Minutes)	315	Maximum 10 h
Soundness (mm)	5.53	Maximum 10mm

C. Fine Aggregate

Natural sand obtained from the river and normally available in the market was used. The artificial sand obtained from the local crusher was used. The physical properties of natural sand and the sieve analysis details are given in table 2. Both types of fine aggregate are confirming to zone II of IS 383-1970.

Table-2: Physical properties and sieve analysis of fine aggregate

Property	Specific Gravity	Bulk Density (kN/m^3)	Fineness Modulus
Value	2.6	15.6	2.89

Sieve description (mm)	10	4.75	2.36	1.18	0.6	0.3	0.15

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weight retained (%)	0	16.4	24.8	62.2	76.4	96.2	99.6
weight passing (%)	100	83.6	75.2	37.8	23.6	3.8	0.40

D. Coarse aggregate

Table-3: Physical properties of coarse aggregate

Property	Specific Gravity	Bulk Density (kN/m^3)	Fineness Modulus
Value	2.96	13.23	4.20

TREATMENT OF BAMBOO

Treatment of bamboo helps to avoid the fungi attack and swelling action of bamboo. The treatment of bamboo also increases the bond strength of the concrete and the durability of a structure. Lot of treatments are used for the bamboo, in that we selected coal tar as a treatment material because of local available and low cost.

In this method the 20 mm bamboo splices are as shown in fig. (2) are used to dip in the coal tar sample. and kept it to drying for 48 hours. After that the dipped bamboo splices are rolled on the fresh sand and again kept it for 24 hours in the sunlight. After that we can use these bamboo splices as a reinforcement member.

Figure 1: Treated bamboo splices

TEST EXPERIMENT

a) Compressive Strength Test

3 Numbers of bamboo cylinders were prepared of 10 cm length throughout the length of bamboo with varying diameter it is to be noted that bamboo samples must be well seasoned and finished before placing it on UTM for compressive strength of bamboo and about 30 of such samples were created.

Fig.2 Compresion test setup and failure pattern of bamboo sample

b) Tensile Test

Numbers of First a bamboo was divided into two pieces length wise with the carpenter's tools like hammer, chisel etc. Each of the two halves was further divided into three pieces. Samples of finished bamboo without GI spiral and 5samples of finished bamboo with GI spiral were taken for tensile test each having the following criteria: a) specimen contained at least 1 knot. b) Any form of imperfection was avoided. c) Any undulation was trimmed off. d) Diameter was measure four different locations and then the average diameter was calculated.

Fig.3 Tension test setup and failure pattern of bamboo sample

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c) flexure test on bamboo reinforced prism beam

Concrete is poured in moulds of 150 mm width, 150 mm depth and 750 mm length. In this research, three types of beam are used namely plain concrete beam, doubly reinforced beam and steel reinforced beam having same dimensions. In plain concrete beam, no bamboo stick is used. Two bamboo sticks are placed at the top and bottom with 1inch clear cover in the case of doubly reinforced beams. Figure show the dimensions and cross section of sample beams. The resulting concrete is poured in cylindrical moulds of 150 mm diameter and 300 mm height. After casting, the concrete samples are kept in wet place and de-moulded at 24 hours age. They were submerged in open water tank for curing up to 28 days as required for test.

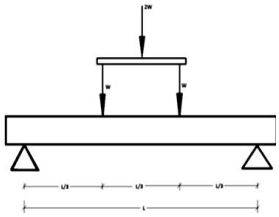
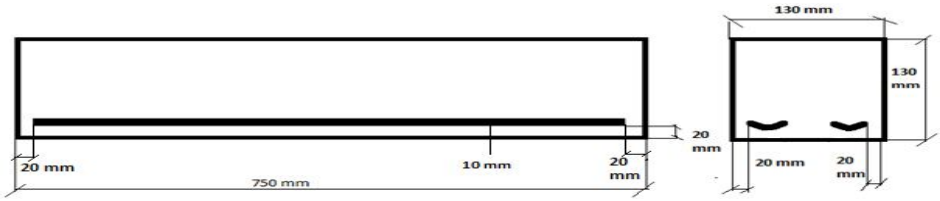


Fig.4 loading pattern of flexural test



$A_{bt} = 1.377\%$

Fig.5 specifications of prism beam

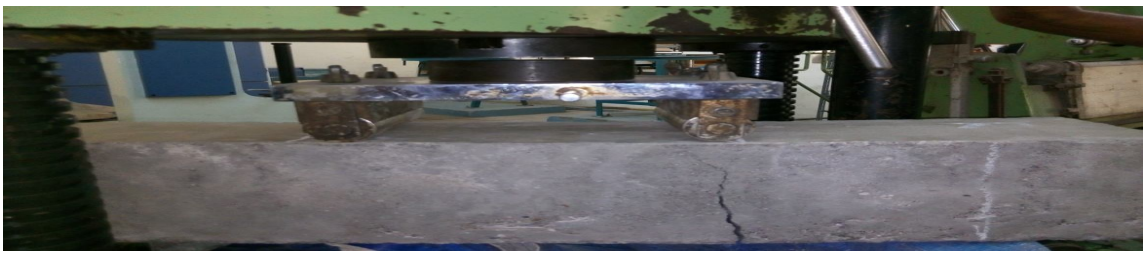


Fig.6 Failure pattern of flexural test specimen

Concrete Mix Design

A. Grade designation = M30
B. Cement type = OPC 43 grade
C. Coarse aggregate = 20 mm down size
D. Minimum cement content =320kg/m^3
E. Max. w/c ratio =0.45
F. Workability =100 mm (slump)
G. Degree of quality control = Good
H. Type of exposure = sever
I. Method of concrete placing =by manual
J. Degree of supervision =good
K. Max. cement content =450kg/m^3

The mix proportion of concrete per cubic meter of concrete then becomes

Water =0.197m^3

Cement =0.451m^3

Fine aggregate =706.18kg/m^3

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Coarse aggregate =1307.456kg/m^3

Result and discussion

Compression test on bamboo specimen

In this section the results after experimental program discussed in detail.

The results of compression test are given in the table

Area=314.159mm^2

Table 4 compression test results

Specimen 1	Specimen 2	specimen 3	average	Compressive strength N/mm^2
2680	2720	2640	2680	83.33

Tensile strength test

Table 5 tensile strength test results

Load (kg)	400	800	1200	1600	2000	2400	2800	3800
Load (N)	3924	7848	11772	15696	19620	23544	27468	37278
Mean deflection	0	0.02	0.25	0.55	2.17	3.83	7	13
Strain (mm)	0	0.0004	0.0013	0.0028	0.011	0.019	0.035	0.08
Stress (N/mm^2)	19.62	39.24	58.86	78.48	98.1	117.7	137.34	186.4

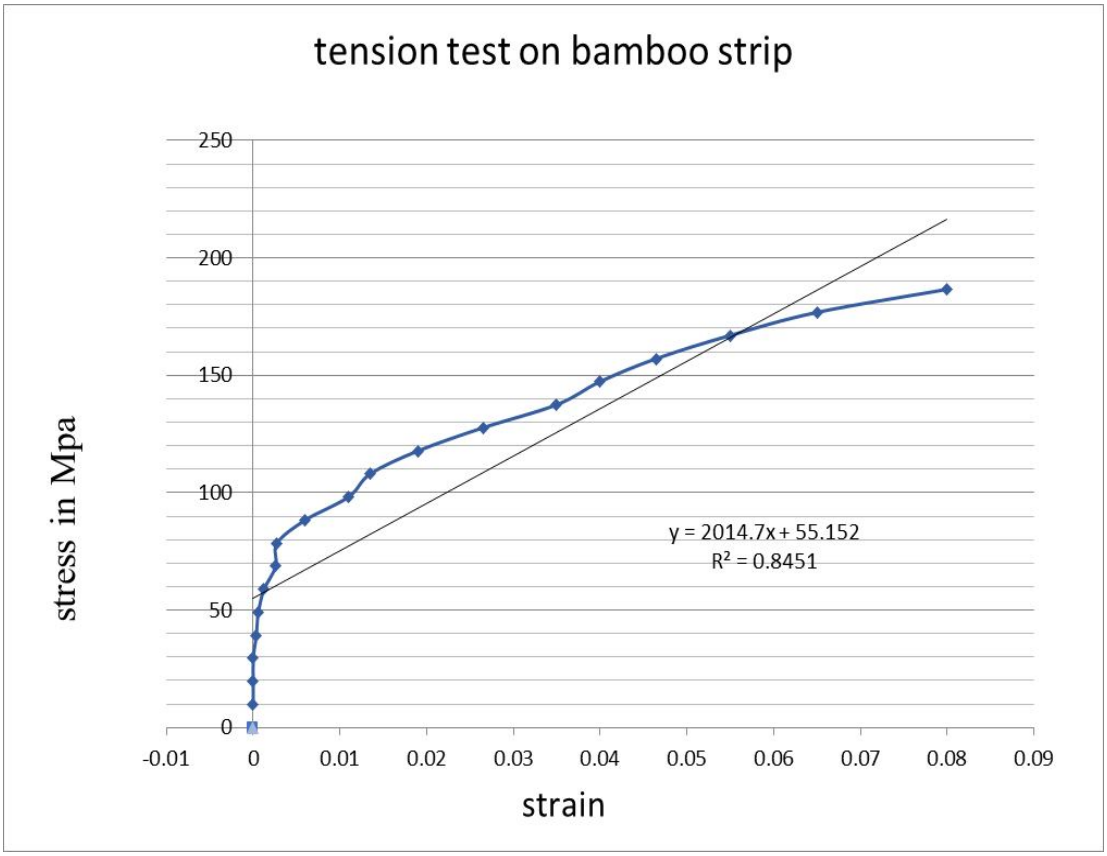

Fig.7 tensile strength test

FLEXURAL TEST

Flexural test is conducted on 3 numbers of plain concrete beams and 6 numbers of reinforced concrete beams having 2 strips of bamboo reinforcement for both treated and un treated conditions.

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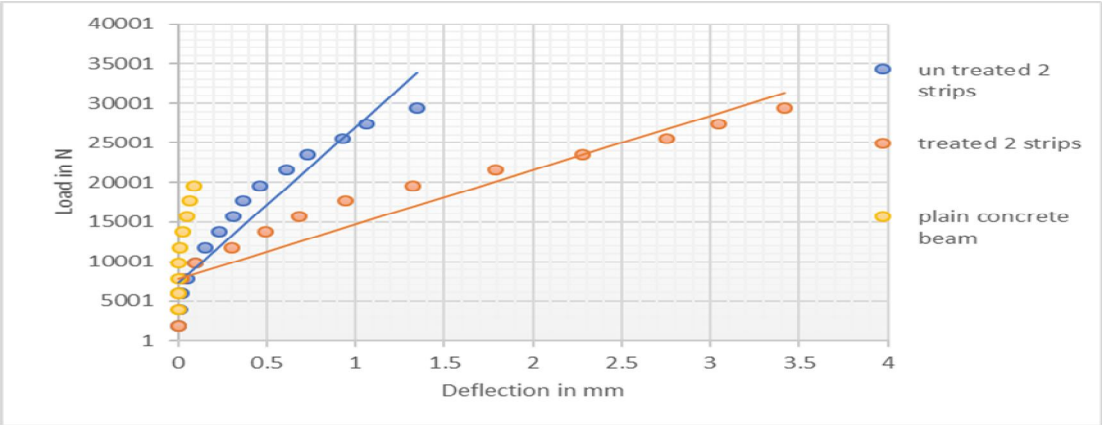

Fig.8 scatter plot of flexural strength test

CONCLUSION

After the experimental program following conclusions are obtained

- The tensile strength of bamboo is about 33% that of the steel, this is sufficient for masonry structure & provides more economical & environmentally friendly
- For bamboo reinforcement concrete beam, the load carrying capacity increased about 3 times that of plain concrete beam having same dimensions
- The maximum deflection of bamboo reinforced concrete is about 1.5 that of plain concrete
- The coal tar treated bamboo reinforcement beam have 27% higher modulus of elasticity than that of untreated reinforcement beam
- the 3 strips reinforcement having 1.2% higher load carrying capacity than that of 2 strips reinforcement thus area of bamboo increases load carrying capacity increases

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FACE RECOGNITION BASED ATTENDANCE AND DOOR UNLOCK SYSTEM

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ABSTRACT
In recent years, the security constitutes the most important section of the human life. In light of current circumstances security are controlled by using keys, Pass codes, Patterns, Keycards and Fingerprints. These systems can be cracked at some extent but using Face recognition system in which whole Face is used as access, it is much difficulty to bypass security. Face is a complex multidimensional structure and needs great registering procedures for location and acknowledgment it is difficult to split. The face recognition is implemented by using the Local Binary Patterns Histograms. The main objective of our system is to secure office by recognizing employees and mark attendance and at the same time unlock the door if the face is recognized. For this purpose, when the user presses the button, the camera will capture the images. If the captured face is recognized the attendance will be marked and at the same time the door will be unlocked.

Keywords: Face Recognition, LBPH, Attendance, Door unlock.,Security.

INTRODUCTION
The face recognition is employed by using the Local Binary Patterns Histograms. Face Recognition based on LBPH is to reduce the nearby structure in a picture by opposing every pixel and its neighborhood. Initially the approved Faces are trained into a local database. These Database faces are compared with the captured test image. In the event that a face is alleged, it is known, else it is ambiguous. The main objective of our system is to secure office by recognizing employees and mark attendance and at the same time unlock the door if the face is recognized. For this purpose, when the user presses the button, the camera will capture the images. If the captured face is recognized the attendance will be marked and at the same time the door will be unlocked. If someone else whose data is not stored in the database presses the button a notification with captured face will be sent to the admin and he/she can give access to the person manually from the Smartphone. The proposed systems are real-time, fast and have low computational cost. Nowadays security is the important element that is required to safe guard users' resources. Because of the improvement in different security frameworks there is a high need in security frameworks which are difficult to hack. So when we plan a security framework which is hard to break This will increase the security of every one of our homes, office, organization etc. Face Recognition System will recognize or validates the identity of a person from images taken from a camera. Attendance is one of the important parts of the company, our system is designed to mark attendance in a most secure way, it prevents many attendance frauds as well as any employee cannot mark proxy of other employee. Our system can be deployed in every company as security is the major concern of every company.

EXISTING SYSTEM
1) Kennedy Okokpujie, Etinosa Noma-Osaghae1 , Samuel John1 , Kalu-Anyah Grace has developed a project named Face Recognition Attendance System with GSM Notification in which during enrollment, a camera is used to acquire facial images that were made into templates using Fisher faces algorithm. These templates were stored in a database. During verification or attendance taking, facial features extracted from acquired face images and stored picture templates were compared using Fisher Linear Discrimination algorithm for any match within the pre-set threshold. Vital information about collated attendance reports were sent via a cellular network to designated handheld devices. The designed and implemented system had 54.17% accuracy during verification when lighting was varied without any variation in facial expression during enrollment. The system had 70.83% accuracy during verification when facial expressions were varied along with variations in lighting conditions during enrollment.

2) Priyanka Wagh, Jagruti Chaudhari presents Attendance System based on Face Recognition using Eigen face and PCA. In the different approaches for face detection are holistic approach, feature based approach, and appearance based. In Holistic approach, the entire face region is considered as input to face detection system. In feature-based approach, the features of face such as nose and eyes are segmented and then taken as input in face detection system. For face recognition, different algorithms, like PCA and Eigen face techniques are used which use the concept of region of interest.

METHODOLOGY
Face Recognition System have three steps in which the initial step is Face Detection using Viola Jones Algorithm and the second step is Face Recognition using LBPH Algorithm. Final step is Door Unlocking i.e., closing and opening of the Door using a motor based on the Sensor processes.

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A. Viola Jones Face Detection

The vital standard of the Viola-Jones calculation is to check a sub-window equipped for uniquely distinguish faces over a given information image. There are 3 steps required in this Face Detection.

The initial step is to convert the information picture into another picture representation called a necessary picture that permits a quick element valuation in Haar Cascade.

The second step is building a classifier with a specific end goal to choose few important components utilizing AdaBoost learning calculation.

In the third step, the full classifier is utilized to figure out if a given sub-window classifier is certainly not a face or possibly a face.

B. LBPH Algorithm

The Local Binary examples Histogram philosophy as its underlying foundations in 2D surface investigation. The important process of LBPH is to plot the nearby structure in a picture by contrasting every pixel and its neighborhood. In the event that the force of the middle pixel is more projecting or equivalent its neighbor, then signify it with 1 and 0 if not. You will wind up with twofold number for every pixel. So with 8 surrounding pixels you will wind up with 2^8 possible blends, called local double examples or LBP codes. The principal LBP administrator portrayed in writing really utilized as a settled 3 x 3 neighborhood.

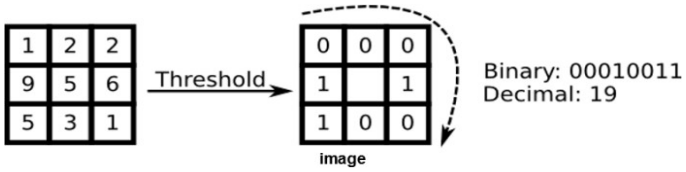

Fig 1. LBPH operation

C. Door Unlocking

The door opening is done using a Motor revolution. The Edge sensors are kept outside to catch the Image just when a person comes before the camera. The caught picture is handled and the Door is opened if the face in the caught Image is a known Face and at whatever point the individual crosses the Inside Edge sensors the Motor will begin turning in reverse bearing. If the individual before the camera is unauthorized the Alarm will ring.

D. Flow Chart:

Fig 2. Flow chart

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E. Comparative Studies of Different Face Recognition Algorithm

Table: -1. Comparative Studies

Parameters	LBPH	Eigen Faces	Fisher Faces
Method	Sliding Window Concept (3x3matrix)	Principal Concept Analysis (PCA)	Linear Discriminate Analysis (LDA)
Training Set	Separate and Independent	Consider Whole training set	Consider Whole training set
Light	Not affected by light uses gray-scale	Affected by light	Affected by light
Alignment	Alignment is not that necessary	Sensitive to position of head	Alignment is necessary

HARDWARE DESIGN

A. Raspberry Pi 3

The Raspberry Pi 3 Model B highlights a quad-center 64-bit ARM Cortex A53 timed at 1.2 GHz. This puts the Pi 3 around half speedier than the Pi 2. Contrasted with the Pi 2, the RAM continues as before – 1GB of LPDDR2-900 SDRAM, and the representation capacities, gave by the Video Core IV GPU, are the same as they ever were. As the spilled FCC docs will let you know, the Pi 3 now incorporates on-board 802.11n Wi-Fi and Bluetooth 4.0. Wi-Fi, remote consoles, and remote mice now work out of the case.

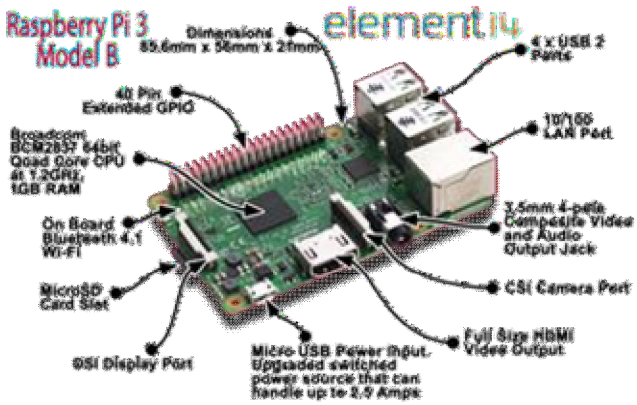

Fig 3. Raspberry Pi 3.

B. Power Supply

The contribution to the circuit is connected from the managed control supply. The microcontroller voltage is of 5V. The A.C. input i.e., 230V from the mains supply is venture around the transformer to 12V and is nourished to a rectifier. The yield acquired from the rectifier is a throbbing D.C voltage. So with a specific end goal to get an immaculate D.C voltage, the yield voltage from the rectifier is nourished to a channel to expel any A.C segments introduce even after correction. Presently, this voltage is
given to a voltage controller to get an unadulterated consistent dc voltage. We are utilizing an IC 7805 as voltage controller to get a 5V yield Voltage.

C. Raspberry Pi Infrared IR Camera Module

This Raspberry PI Infrared IR Night Vision Surveillance Camera Module 500W Webcam is useful in daylight as well as in the darkness of night also!!!It features 5MP with OmniVision 5647 sensor which is in fixed focus mode. The 5MP camera module is perfect for small Raspberry Pi projects which have very little space

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allowance just boot up the latest version of Raspbian and you are good to go!!!. The high-definition 5MP camera delivers outstanding photos but can also shoot video, ideal for drones or a CCTV project. The camera overcomes the disadvantages offered by our other Raspberry Pi Cameras as it has provision for night surveillance too. **This** Raspberry Pi Camera Module **is a custom designed add-on for Raspberry Pi. It attaches to** Raspberry Pi **by way of one of the two small sockets on** the board upper surface.

Fig 4. Raspberry Pi Infrared IR Camera Module.

Features: -

1) This camera can also work at night.

2) Supported Video Formats: 1080p @ 30fps, 720p @60fps and 640x480p 60/90 video.

3) Fully Compatible with Raspberry Pi 3 Model B.

4) Small and lightweight camera module.

5) Plug-n-Play camera for Raspberry Pi 3 Model B.

D. Push Button

Push-Buttons are normally-open **tactile switches**. Push buttons allow us to power the circuit or make any particular connection only when we press the button. Simply, it makes the circuit connected when pressed and breaks when released. A push button is also used for triggering of the SCR by gate terminal. These are the most common buttons which we see in our daily life electronic equipment's.

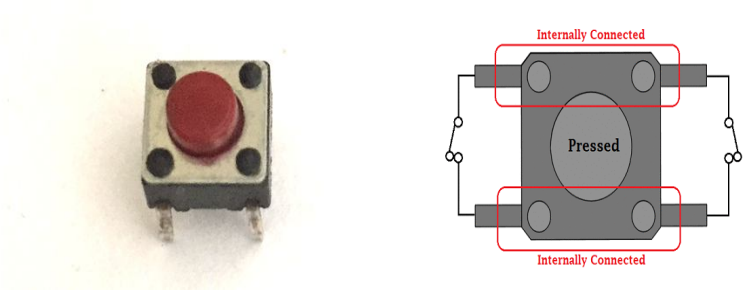

Fig 5. Push Button.

Features

1) Prevent flux rise by the insert-molded terminal.

2) Snap-in mount terminal.

3) Contact Bounce: MAX 5mS.

4) Crisp clicking by tactile feedback.

4) Dielectric Withstanding Voltage 250V AC for 1 minute.

RESULTS

As our System will be use in offices for monitoring the employees. Our face recognition system will give the access to the person if he/she is the employee of the office and at the same time it will also mark the attendance. First of all we have to save the all employees face in the database in-order to recognize the face while entering to the office.

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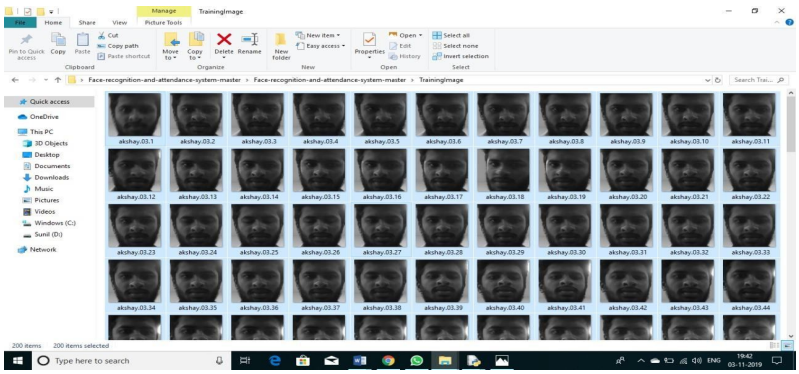

Fig 6 User Dataset

As seen in the Fig 6, we have capture face image of the employee ad save in the database. Datasets are users captured image that are trained and converted into a (.yml) extension file which is used by LBPH algorithm for face recognition. Our system takes about 70 images which are saved in gray-scale, the higher the images the better is the system's accuracy. After taking the images we have to train that all images so that system can properly recognize at the time of face recognition.

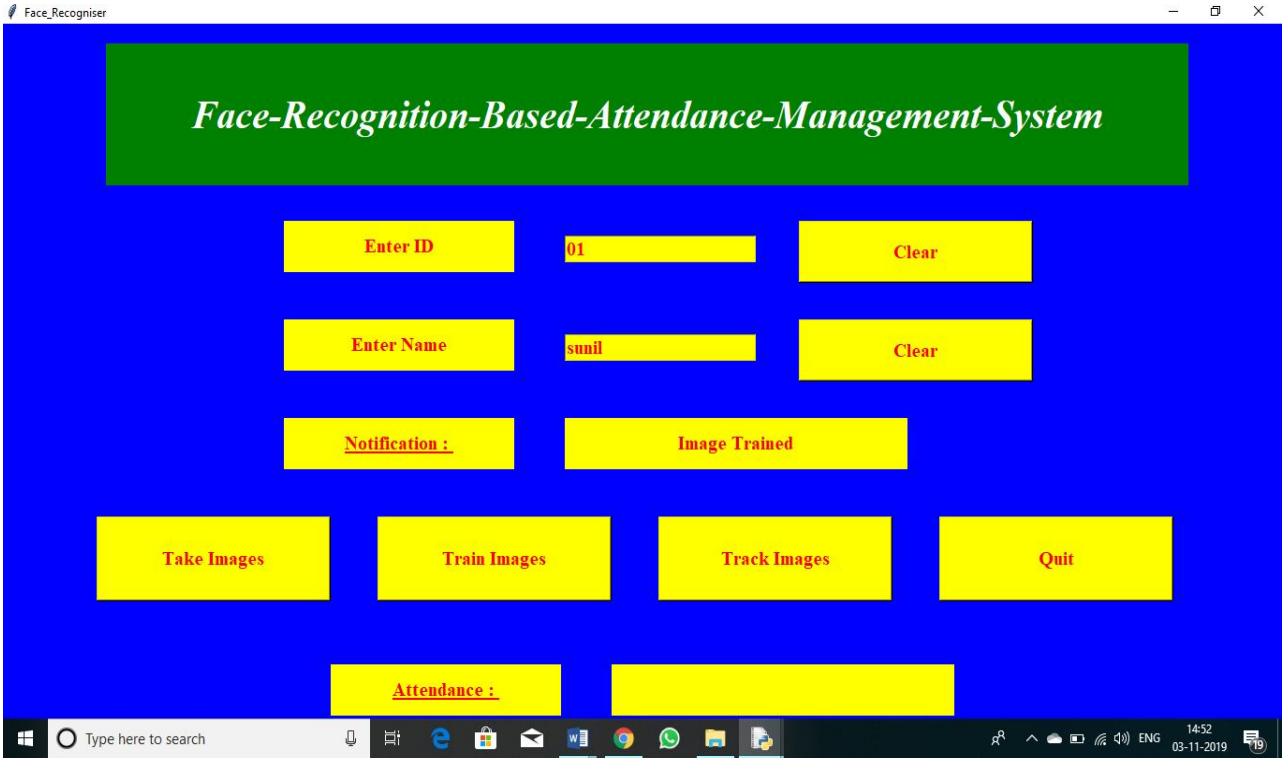

Fig 7. GUI of our system.

Fig 7, shows the GUI of our system from which we will take face images and train them to recognized the face.

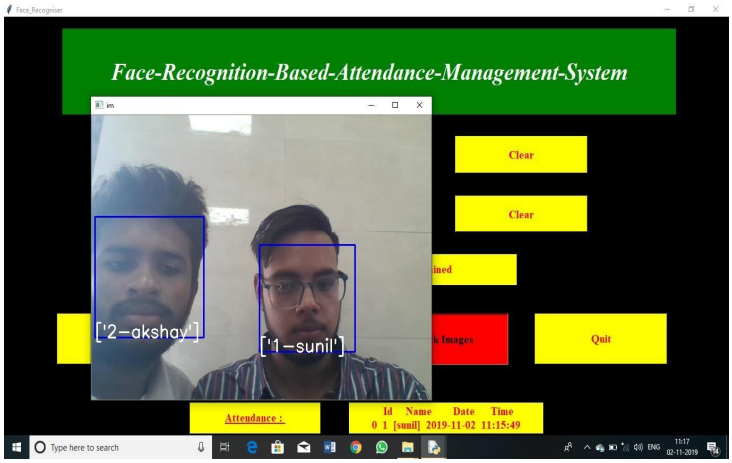

Fig 8. Output window.

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Fig 8, shows the final output window of our system that it has been properly recognized the face and mark the attendance with the employee name and the employee id in the sheet.

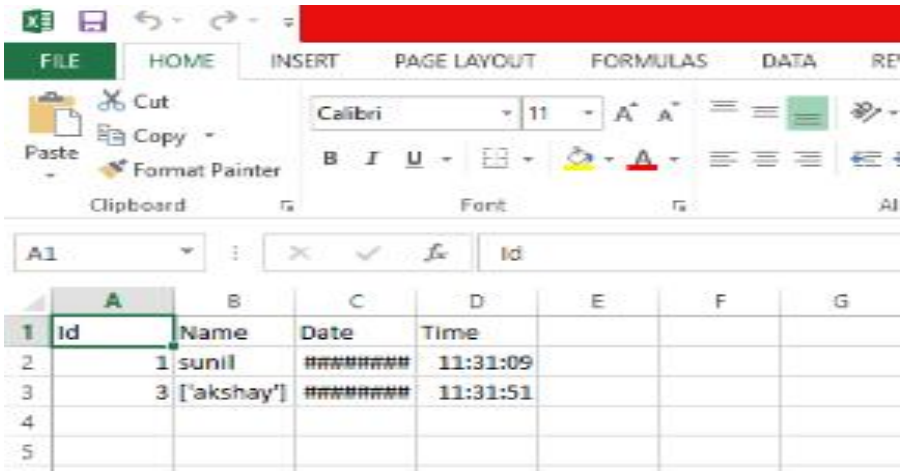

Fig 9. attendance.yml

CONCLUSION

The set up of the Face acknowledgment framework utilizing Raspberry pi will build the littler, lighter and with lower management utilization, therefore it's a lot of advantageous than the desktop-based face acknowledgment framework. In light-weight of the open source code, it's a lot of unengaged to do programming advancement on UNIX operating system. The Hardware prices around 3000 INR and also the software package used in Pi is freed from price. we tend to utilize local Binary Patterns histogram formula for the face recognition purpose. The designed and enforced face recognition system worked with varied levels of accuracy. A combination of lighting, facial and angular factors were responsible for the variations in accuracies got from the tests administered on the enforced style. Results obtained showed clearly that the face recognition attending system performs higher in terms of accuracy once facial expressions and angles are varied along with lighting conditions throughout enrollment (at least (70) face pictures for every enrollee). As a demand the designed system is employed solely beneath smart lighting conditions. There are a lot of biometry Systems which may be used for managing attending, however the Face Recognition has the most effective performance. Our system is a high level security system that not only ease employees attendance system but also prevent unauthorized door access. It can be easily deployed in office ,industries or other confidential areas.

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FANET USING HONEYPOT SCHEME

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ABSTRACT
FANET introduces the ad hoc networking of flying UAVs to allow real time communication between them and control stations. Flying drones can also form FANET to establish real time communication to achieve their mission. FANET will help in handling of the circumstances like crisis, natural disaster, military combat zones, and package delivery. Efficient real-time routing is a major challenge in FANET because of the very high mobility which results in unpredictable dynamic topology. In FANET, each UAV behaves independently and as a result, some UAVs might behave selfishly to save their resources. This issue can induce network latency, network break down, security breach, and other issues. In this paper, we address this issue by proposing a honeypot detection approach which endeavors to mitigate selfish UAVs from the network. For experimental results, proposed scheme is incorporated with AODV protocol. We present the behavior of selfish UAVs based on energy constraints. Simulation results under various network parameters depict that the proposed approach provides more robust and secured routing among the UAVs in FANET.

Keywords: Flying ad hoc networks · Selfishness · Bait mechanism · AODV

INTRODUCTION
FANETs (Flying Ad-hoc Networks) is a group of Unmanned Air UAV (UAVs) communicating with each other with no need to access point, but at least one of UAV must be connected to a ground base or satellite. UAV can be small aircraft, drone and balloon. These are remotely controlled and pre-programmed networks. The applications of UAV networks are they are used in emergency situations such as flooding military and civil application (search and rescue operations, data mining, and forest fire detection). Security is the biggest challenge in FANET. There are several numbers of attacks occurring in the FANET. These attacks occur due to malicious nodes that enters in the network. However, dealing with these malicious nodes in FANET is the biggest challenging task in the network. There are many terms which effect network such as energy efficiency, number of UAVs, resources, and security of the data transmission over network. In FANET, each UAVs behave independently, from that some UAVs behave selfishly by dropping packets during routing or transmission to fulfill their malicious purpose. The selfish UAVs use the network without pay back for the usage of network. So, the result of these malicious activities impacts on network QoS become low in terms of network breakage, latency occurred, low transmission rate, less security, energy constraints, etc. To address the selfishness problem in the network, many researchers develop the different techniques and mechanisms. There are various techniques developed to solve different types of selfish UAVs such as energy based, speed based, memory based, and so on. Here in our work we proposed a solution for the energy-based selfish UAV. Here, we developed the selfish UAVs which aim to save its energy. We designed the selfish UAV which drop the packets when it's remaining energy is less than 50% of total energy. For prevention of the network from the selfish environment, numerous strategies were produced in past years by numerous researchers. They are as follows: Trust-based approach, watchdog model based, Reputation-based approach, and many more. These mechanisms provide security but, in some scenario, some of the techniques increase overhead, and in trust-based approach more memory is required. So here we proposed honeypot mechanism-based selfish UAV detection scheme named as honeypot selfishness detection scheme (HPSD). This HPSD uses honeypot mechanism to detect selfish UAVs when UAV noticed as suspicious UAVs by its activities. After that, it adds into the suspicious list, bait RREQ unicast to that suspicious UAV if it drops the bait packet then it's mentioned as selfish UAV and discard it from the network.

Selfish UAVs in AODV-Based FANET
FANET scenario is assumed, in which X UAV acts as a source UAV and G UAV acts as a destination UAV. Now, A UAV wants to communicate with UAV G. For that, X UAV broadcast RREQ packet to its all neighbour UAV to know whether G UAV is its neighbour node or not. Now in cooperative environment all UAVs check the RREQ packet and compare destination id with its own. If destination id matches, then it forwards RREP packet to source node and communicate with it directly. But if destination UAV id does not match with its own id, then it further broadcast RREQ packet to its neighbour UAV until it meets a destination. Now, if selfish UAV is present in network, it simply drop the packet and do not further broadcast RREQ packets to its neighbour. Now assume that UAV B behaves selfishly and drops the RREQ packet during routing from source UAV A to destination UAV G.

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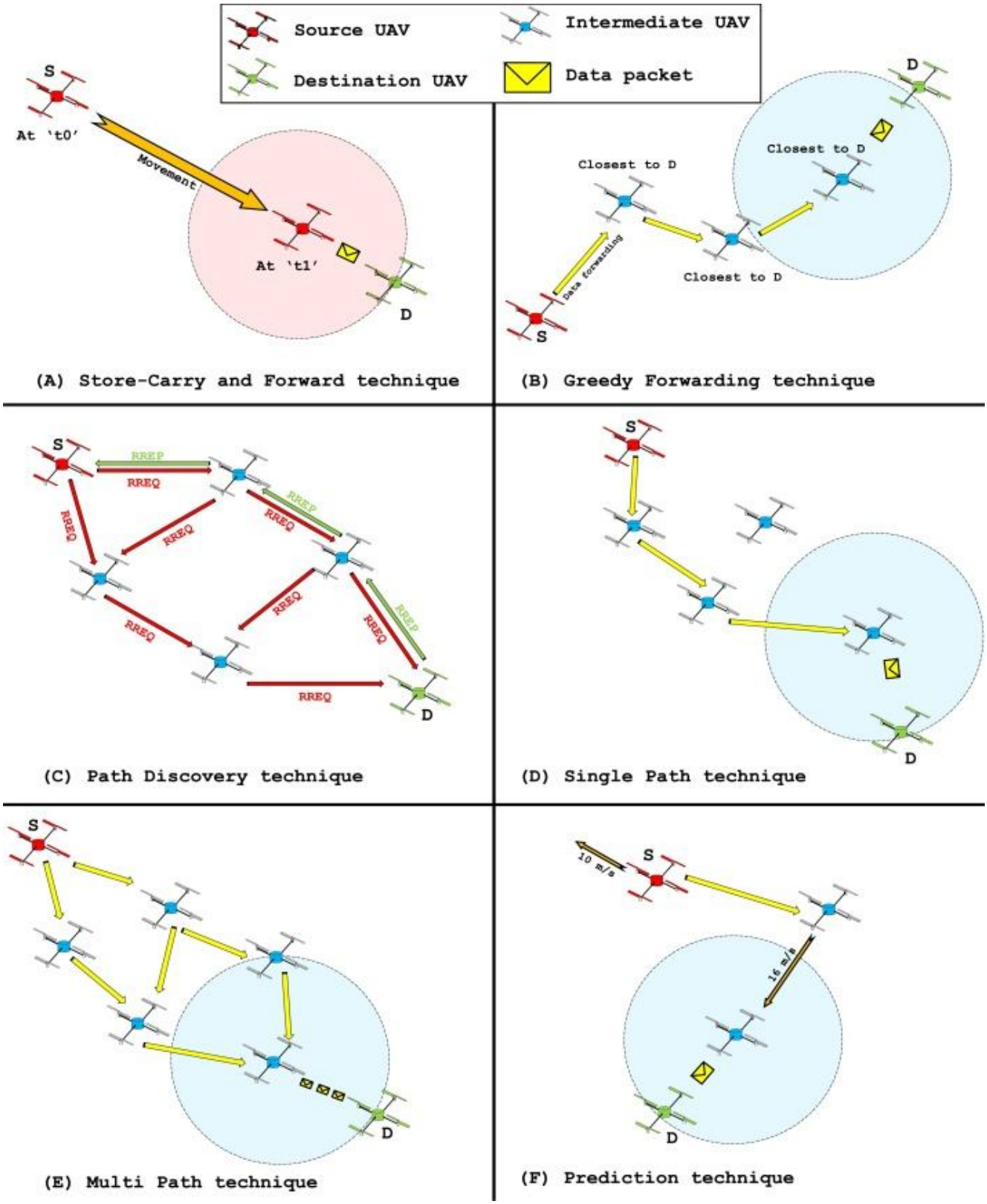

Existing and Proposed Approach:

EXISTING APPROACH

During creation of a path, source UAV checks its routing table first. If the destination UAV is not present, then it broadcast the RREQ message to all neighbour UAVs. The cooperative neighbour UAV will again rebroadcast it to their one-hop neighbour UAVs and this process continues until it reaches destination UAV. Meanwhile source UAV is also a one-hop neighbour node of each of these nodes, so it will receive the same. So, each time UAV monitor its neighbour UAVs' character based on receiving back RREQ packet from neighbours. If it has not received the same RREQ from one of its neighbour UAVs within a prefixed timeout, then that node will be

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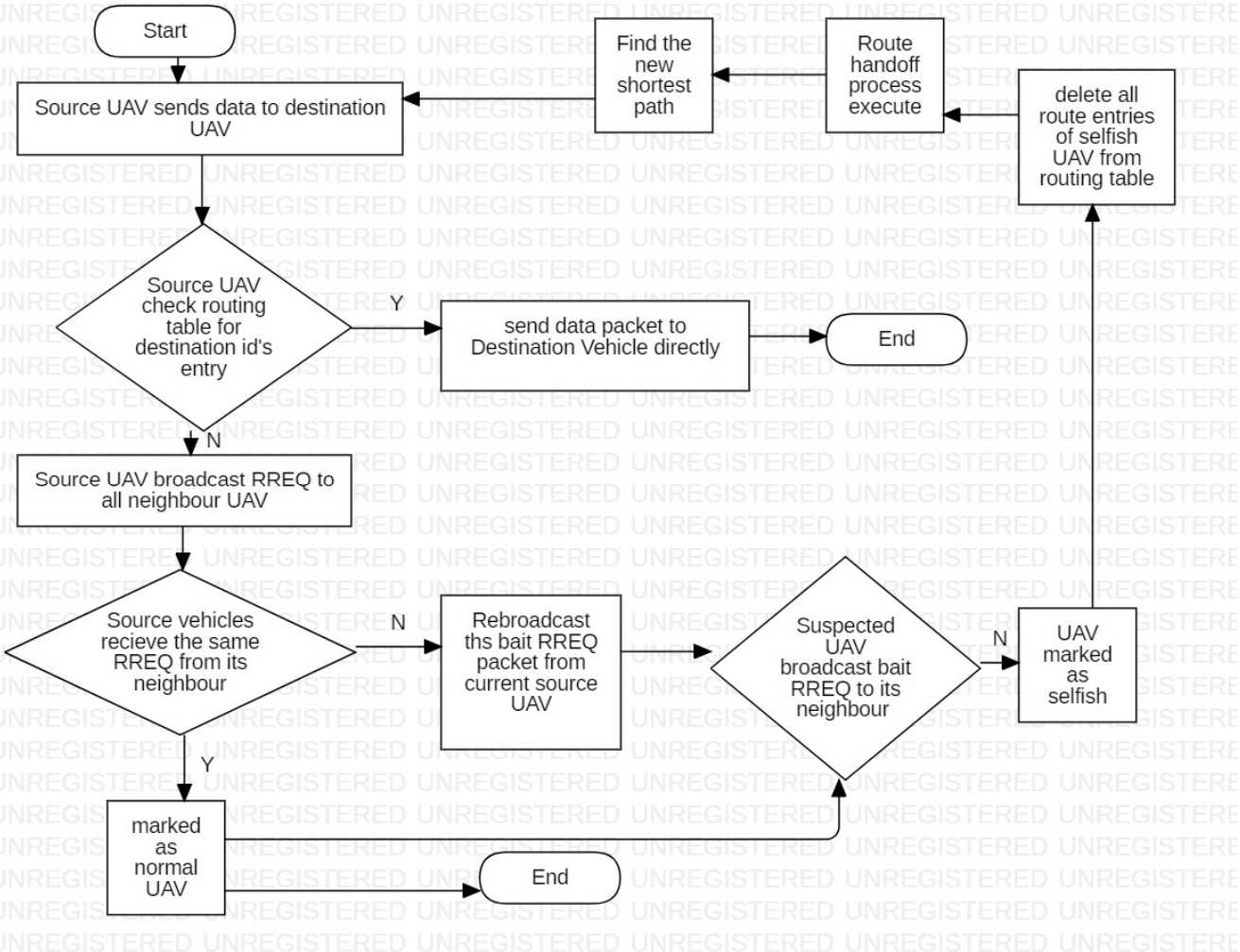
marked as potential misbehaving UAV. This process continues repeatedly. For each potential misbehaving node, a threshold value is maintained. If the number of times a UAV is marked as a potential misbehaving node beats this threshold limit, then that UAV will be declared as selfish UAV and this information will be sent to all other UAVs of the network After detecting selfish UAVs in the network, new path established through game theory, which help to find shortest path from the source to destination.

Proposed Approach

To improve the existing approach here for detection of selfish UAVs bait method used in which whenever any UAV drop the packet, bait mechanism used for detection of selfish UAVs. During creation of a path, source UAV checks its routing table first. If the destination UAV is not present, then it broadcast the RREQ message to all neighbour UAVs. The cooperative neighbour UAV will again rebroadcast it to their one-hop neighbour UAVs and this process continues until it reaches destination UAV. Meanwhile source UAV is also a one-hop neighbour node of each of these nodes so it will receive the same. So, each time UAV monitor its neighbour UAVs' character based on receiving back RREQ packet from neighbours. If it has not received the same RREQ from one of its neighbour nodes within a prefixed timeout, then current source node sends the bait RREQ to its suspicious neighbour. If suspicious UAV drops that bait RREQ packet, then that UAV will be marked as selfish UAV, otherwise, if it broadcast that bait RREQ packet then it will be marked as cooperative UAV. After that all path entry related to that selfish UAV will be deleted and route hand off process done for new path. Among all possibility shortest path will be select for further process.

FLOWCHART FOR PROPOSED WORK



SIMULATION RESULTS

The simulation is carried out on NS-2 and SUMO simulator. Scenario for the FANET generated using OSM. Here simulation is carried out in 1000 × 1000 m area of simulator, where AODV, SVAODV, and HPAODV were executed. The performance of these three-routing protocol measured in four different metrics: PDR, Normalized Routing Overhead, End to End Delay and Average Consumed Energy.

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PARAMETERS	VALUES
Simulator	Ns-2
Area	1000*1000
Number of nodes	35
Node speed	30m/sec
Malicious speed	2
Threshold value	60m/sec
Packet size	512kb
Packet type	TCP
Protocol	AODV

CONCLUSION

Flying ad hoc network has been an active research area in recent years due to its ubiquitous nature and need of intelligent transportation systems for developing smart cities. This is advantageous on the one hand, while proves to be disadvantageous when selfish UAVs start misbehaving. Selfishness is a serious issue in VANET, Which directly affects PDR of the network. To solve selfishness problem, here we introduced honeypot selfish UAV detection scheme. Proposed scheme based on bait RREQ packet, which manipulate selfish UAV to behave selfishly again so that it can be detected. The simulation results show that performance of the AODV protocol in presence of selfish UAVs degrade performance up to 30–50% in terms of packet delivery rate. Furthermore, routing overhead and delay increase than that of normal AODV protocol. Due to the characteristics of selfish UAVs, the average consumed energy slips below to that of normal AODV where selfish UAVs are present in the network. Here, proposed approach HPAODV is able to improve packet delivery ratio up to 30%, and it also degrade the end to end delay. These make proposed approach more effective in terms of network lifetime. However, due to proposed approach, overhead will be increased in the network because of multiple forwardness of fake request packets to detect selfish UAVs over the network. Here, this is the drawback of proposed scheme, which can be taken as future work.

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DATA PROCESSING BETWEEN FIELD INSTRUMENTS AND LABVIEW SOFTWARE USING ARDUINO

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ABSTRACT
This paper aims to replace the conventional NI's DAQ card by Arduino microcontroller, to interface the field instruments and LabVIEW for data processing. The LabVIEW interface for Arduino toolkit offers an easy to use interface for the Arduino microcontroller platform. The LabVIEW interface with Arduino allows quickly and easily to create graphical user interface, for virtually any component that is compatible with the Arduino microcontroller. This open source toolkit is made for customization, allowing user to create custom drivers for their sensors.

Keywords: LabVIEW, Arduino, Field Instruments, Auctioneering Control

1) INTRODUCTION
The main objective of this paper is to implement a Data Processing between Field Instruments and LabVIEW using Arduino. DAQ card is generally use for interfacing the field instruments to LabVIEW but it will be more expensive for small scale process. Cost of NI's low cost, USB multifunction I/O device DAQ card is Rs.13300/- , which has 8 analog input channels. This problem can be overcome by replacing the DAQ card by Arduino microcontroller. Arduino is cost effective and provides better and faster result. Cost of the Arduino is around Rs.400/-. This paper provides an idea through which field instruments are interface with LabVIEW via Arduino microcontroller.

2) SYSTEM BLOCK DIAGRAM
The block diagram has been developed for auctioneering control as shown in fig. 2.1. The variable temperature is sensed at various locations by the RTD employed at the respective locations, and necessary control action is performed depending on the requirement

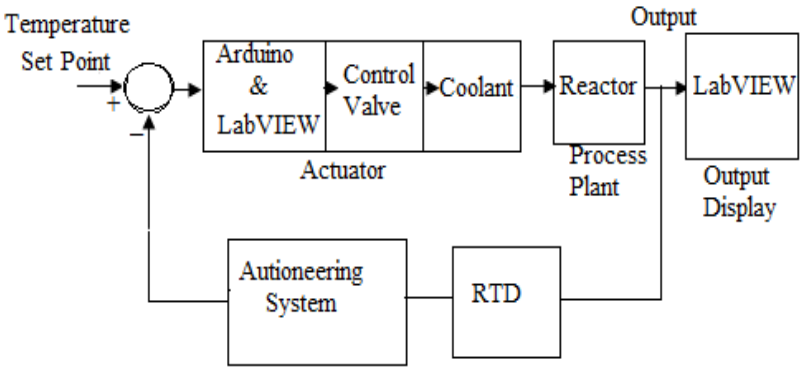

Fig.2.1 System Block Diagram

In a plant, sometimes it is required to have multiple measurements for a specific variable which has to be regulated through a single action of control which is known as auctioneering control system shown in fig.2.2.

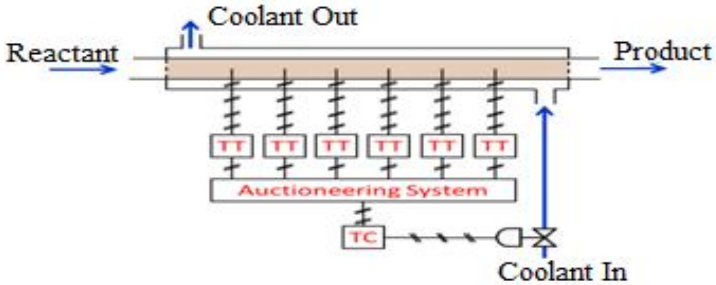

Fig.2.2 Auctioneering control

Many measurements are available for our specific variable at different points in the system but the control action should be based on the most critical measurement of the system variable- in our case it is the temperature. Such a technique is known as Auctioneering control. [1]

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As the reaction inside the reactor is exothermic, reactants will give out heat during the formation of product. Hence it is very important for the temperature to be maintained under maximum threshold beyond which unwanted changes can take place and unstability may occur. The RTD's at various points will detect the temperature and the point corresponding to the maximum temperature which is the hotspot and will be selected by the Auctioneering system. This temperature will be compared to the desired temperature by the Arduino. The Arduino will then command the motor to allow the coolant to circulate through the system so the temperature is absorbed by the coolant and the temperature is maintained under control.

3) SYSTEM COMPONENTS

A) DAQ SYSTEM

The field of data acquisition encompasses a very wide range of activities. At its simplest level, it involves reading electrical signals into a computer from some kind of sensor. These signals may represent the state of a physical process i.e. position and orientation of machine tools, furnace temperature, size and shape of a manufactured component etc. The acquired data may have to be stored, printed or displayed. Often the data have to be analysed or processed in some way in order to generate further signals for controlling external equipment or for interfacing to other computers. [2]

B) ARDUINO

The Arduino is an open source platform which accounts for both the software and the hardware part of the system. It provides a physical computing platform on a simple microcontroller board as well a development environment for writing programs. The system uses the Arduino Uno which consists of the ATmega328 microcontroller. Arduino Uno has been chosen for processing because it is inexpensive, open source and has a simple programming environment.

C) LAB VIEW

LABVIEW is the software that provides virtual instrumentation. With the help of LABVIEW here we are developing a graphical user interface to display the measured parameters. It has a block diagram coding so it is very easy to use and provides best solutions.

Top 5 reasons LabVIEW makes more productive when using Arduino:

1. Interact with the system through a graphical user interface.
2. Streamline the design process with intuitive graphical programming.
3. Improve the debugging experience with interactive tools.
4. Leverage built in resources/functions for implementing simple to complex tasks.
5. Open API (Application Programming Interface) allows for complete customization.

D) RTD

RTDs or Resistance Temperature Detectors are temperature sensors that contain a resistor that changes resistance value as its temperature changes. They have been used for many years to measure temperature in laboratory and industrial processes, and have developed a reputation for accuracy

Most RTD elements consist of a length of fine coiled wire wrapped around a ceramic or glass core. The element is usually quite fragile, so it is often placed inside a sheathed probe to protect it. The RTD element is made from a pure material whose resistance at various temperatures has been documented. The material has a predictable change in resistance as the temperature changes; it is this predictable change that is used to determine temperature.

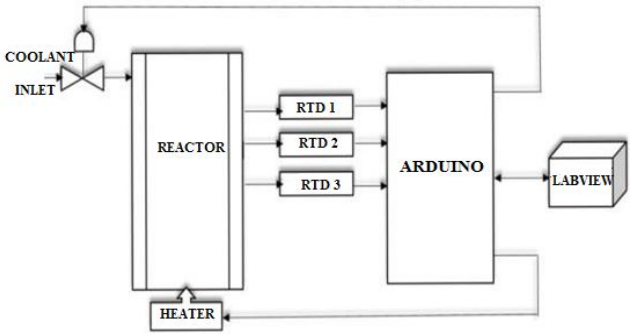

Fig.3 System Architecture

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E) LabVIEW Interface for Arduino (LIFA)

The NI LabVIEW toolkit helps us easily to interface LabVIEW software with Arduino microcontroller. With this toolkit and LabVIEW, one can control or acquire data from the Arduino microcontroller. Once the information is in LabVIEW, analyse it using the hundreds of built-in LabVIEW libraries, develop algorithms to control the Arduino hardware, and present the findings on a polished User Interface (UI). A sketch for the Arduino microcontroller acts as an I/O engine that interfaces with LabVIEW VI's through a serial connection. This helps for quickly to move information from Arduino pins to LabVIEW without adjusting the communication, synchronization, or even a single line of C code. Using the common Open, Read/Write, Close convention in LabVIEW, and can access the digital, analog, pulse-width modulated, I2C, and SPI signals of the Arduino microcontroller. [3]

Step by Step Start-up Guide

- Get Arduino board and accessories.
- Make sure you have LabVIEW
- 2009 or newer installed.
- Install NI-VISA Drivers.
- Install the Arduino IDE and drivers for Windows.
- Install the LIFA.
- Upload the sketch
- LIFA_Based.pdf to the Arduino.
- Start writing your program / block diagram

3) SYSTEM VISUALIZATION ON LABVIEW

The simulated block diagram of auctioneering control system is shown in fig.3.1, which includes terminals, subvi, functions constants, structure and wires that transfer data among other block diagram objects.

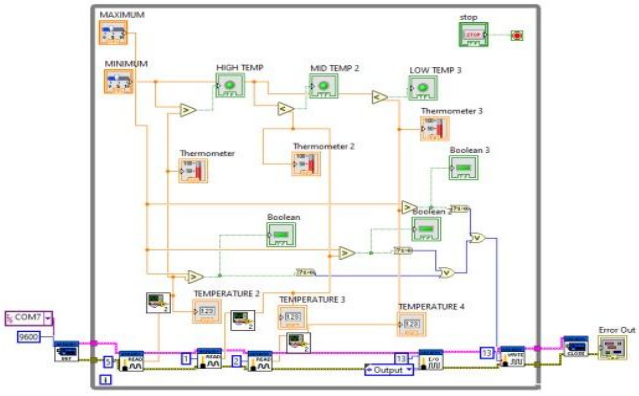

Fig.3.1 Block Diagram (LabVIEW)

The front panel interface design is an important part of virtual instrument. The functions of instrument parameters setting and test results displaying are realized by using the software, which requires a simple, direct and convenient software interface. The Fig.3.2 shows the front panel of the temperature control system.

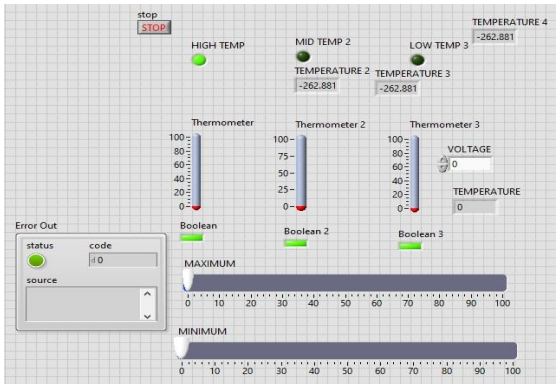

Fig.3.2.Front Panel (LabVIEW)

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4) RESULT

A. Condition 1

- Set point = 60

When process value is greater than set point value coolant valve will be ON and heater will be OFF.

INPUT DEVICE	PROCESS VALUE	OUTPUT DEVICES	
		COOLANT VALVE	HEATER
RTD 1	80.42>S.P	ON	OFF
RTD2	71.35>SP		
RTD 3	71.35>SP		

Table 4.1 For condition 1

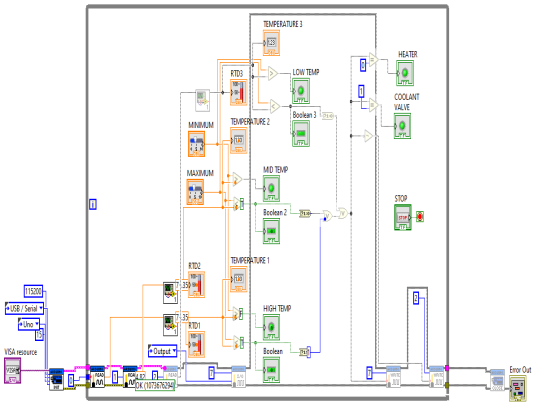

Fig.4.1 LabVIEW simulation for condition 1

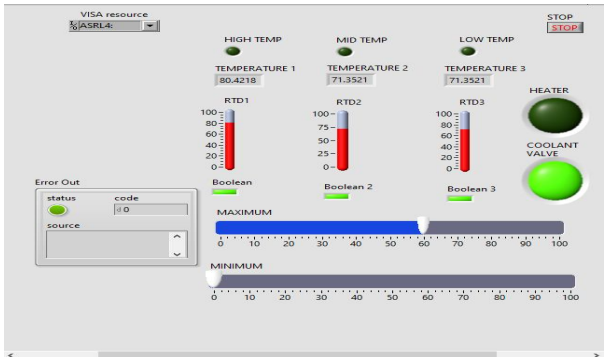

Fig. 4.2 Output display for condition 1

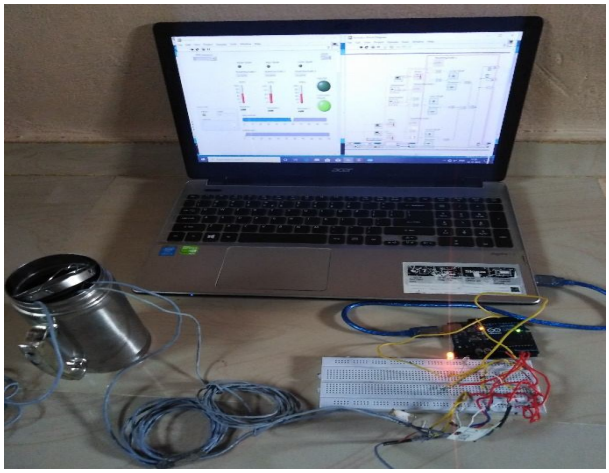

Fig.4.3 Construction setup for condition 1

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The yellow LED shows that the coolant valve is in ON state.

B. Condition 2

- Set point = 60

When process value is less than set point value coolant valve will be OFF heater will be ON.

INPUT DEVICE	PROCESS VALUE	OUTPUT DEVICES	
		COOLANT VALVE	HEATER
RTD 1	44.25<S.P	OFF	ON
RTD2	35.25<S.P		
RTD 3	44.25<S.P		

Table 4.2 For Condition 2

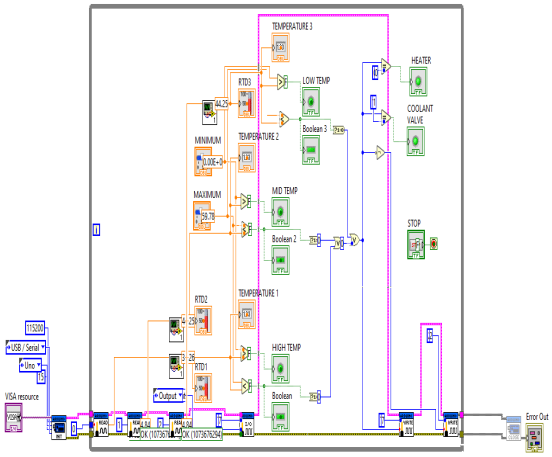

Fig.4.4 LabVIEW simulation for condition 2

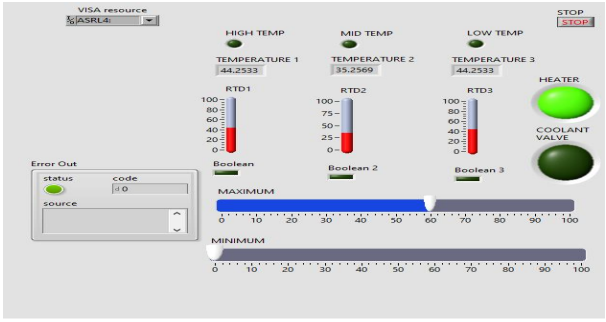

Fig.4.5 Output display for condition 2

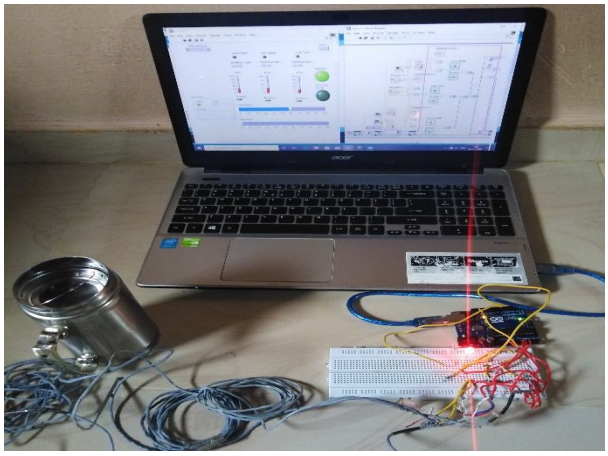

Fig.4.6 Construction setup for condition 2

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The Red LED shows that the heater is in ON state

5) CONCLUSION

In this paper we have developed a system for measurement and control of various parameters in the field level by using Arduino controller and LabVIEW software. Arduino controller is much cost efficient than the DAQ card.

This can be utilizes in various field of measurement and control. It can be useful in small scale process like temperature level of reactor, for temperature and humidity control of food items and many small scale processes where cost effective solution is needed.

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DEVELOPMENT OF SMART DUSTBIN FOR COMMERCIAL USE

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ABSTRACT
In this paper, a system of smart dustbin which utilizes solar energy via solar panels is proposed. The proposed smart dustbin can control the overflow of the waste through the ultrasonic sensors which are interfaced with arduino. A separate GSM module is incorporated which sends a message to the concerned authority of municipal council regarding the waste level in the dustbin. This smart dustbin will surely be useful for indulging cleanliness & sanitation which is the goal of "Swachha Bharat Abhiyan 2018."

Keywords: Solar panel, Arduino, Ultrasonic Sensor, GSM module, Smart Dustbin

INTRODUCTION
The world is in a stage of up-gradation, there is one stinking quandary. We have to deal with Garbage. In our quotidian life, we visually distinguish the pictures of garbage bins being overfull and all the garbage spills out. An astronomically immense challenge in the urban cities is solid waste management not only in India but for most of the countries in the world. Hence, such a system has to be build which can eradicate this quandary or at least drop it to the minimum level. A society will get its waste dispatched felicitously only if the dustbins are placed well and amassed well. The main quandary in the current waste management system in most of the Indian cities is the insalubrious status of dustbins. Now with the elevate of technology, it is the correct time that we should utilize technology for waste management systems. As we have visually perceived that technology with analytics has made the world a better place to live by its application in the field of genetics, indemnification, marketing, engineering, banking etc. in past many years. So, in this Project, we have integrated analytics and electronics in order to create optimal vicissitudes in the conventional methodology of waste amassment. Most of the urban cities and town in India are not well designed to facilitate the felicitous garbage disposing and amassment mechanism. Adscititiously, the cities are expanding rapidly putting the pressure on subsisting infrastructure which is not expanding at the same pace that of urbanization. As the govt. of India has launched keenly intellective city project to utilize the IT-enabled solution so there is an implicit need to make the city cleaner.

In past few decades there is a rapid magnification in the rate of urbanization and thus there is a desideratum of sustainable urban development plans. Now utilizing early age technology and strategic approach, the concept of keenly intellective cities are coming up all around the world. While the noetic conception comes up form keenly intellective cities there is a requisite for keenly intellective waste management. The conception of smart dustbin is for the keenly intellective buildings, colleges, hospitals, and bus stands. The astute dustbin thus thought is an amendment of mundane dustbin by elevating it to be smart utilizing sensors and logic.

HARDWARE
- Arduino: Arduino is an open-source physical computing device based on a simple I/O operations and used to implement the program written in Arduino IDE. The open-source IDE can be downloaded for free to write a program to implement a project. It has 14 digital IO pins with 6 PWM pin multiplexed on it, 6 analog inputs, a 16 MHz quartz crystal oscillator to provide clock to microcontroller, a USB connection, a power jack for power supply and a reset button and operates on 5V 1A supply. It's simply a trainer learning kit, with open source software.

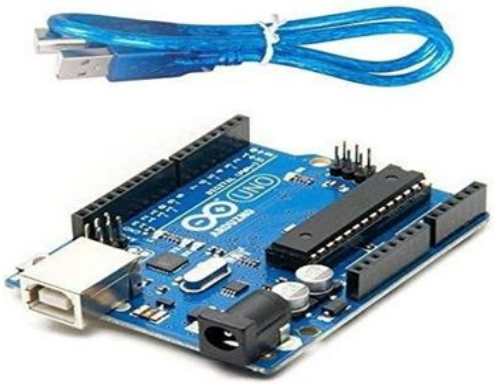

Figure 1. Arduino.

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Features

Microcontroller:

ATmega328

Operating Voltage: - 5V

Input Voltage: - 5-12V

Digital I/O Pins: - 14 (of which 6 has PWM output) Analog Input Pins: - 6 DC Current on each I/O Pin: - 40 mA

DC Current for 3.3V Pin: - 50 mA

Flash Recollection: - 32 KB of which 0.5 KB utilized by boot- loader SRAM: - 2 KB

EEPROM: - 1 KB

- **Ultrasonic Sensor**

An Ultrasonic sensor is a device which measures the distance to an object by using a sound wave. It measures distance by sending out a sound wave at a specific frequency and waiting for a sound wave to come back by striking the object. When the signal is received then the distance is calculated by the formulae given below

Speed = distance/time.

By using calculated distance we can perform many different tasks.

Figure 2. Ultrasonic Sensor.

Features:

Supply voltage: - 5V

Current Consumption: - 15ma Ultrasonic Frequency: - 40 KHz Maximum Range: - 400 cm Minimum Range: - 3 cm Resolution: - 1 cm

Trigger Pulse Width: - 10 s Dimension: - 43x20x15 mm

- **GSM**

The main objectives of GSM module are to utilize it as a communication contrivance. It can connected computer through serial (RS232) connector. A GSM modem is a standard GSM mobile phone with a congruous cable and a software driver to connect to a serial connector on your computer. The GSM uses AT Commands for its operation.

Figure 3. GSM SIM900A.

Features

SIM900A fortifies Dual-band 900/1800 MHz

Supply voltage range is 3.4 to 12V Low power consumption Operation temperature:-

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〖40〗^0 to 〖85〗^0.

Control AT commands (3GPP TS 27.007, 27.005 and SIMCom enhanced AT Commands)

- **SOLAR PANEL**

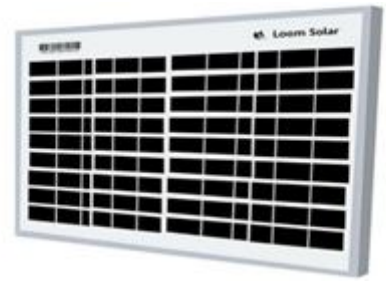

Figure 4. Solar Panel

Solar panel 10 Watt, 12 Volt Solar Panel - Poly Crystalline

- Efficiency 10.03%
- High Load Resistant
- Low - Light Performance
- Dimension (L*W*H) mm - 285 x 350 x 22
- Poly Crystalline Technology
- SERVO MOTOR

Figure 5. Servo Motor

- Weight: 55g
- Dimension: 40.7×19.7×42.9mm
- Stall torque: 9.4kg/cm (4.8v); 11kg/cm (6.0v)
- Operating speed: 0.19sec/60degree (4.8v); 0.15sec/60degree (6.0v)
- Operating voltage: 4.8 – 6V
- Gear Type: Metal gear
- Temperature range: 0- 55deg
- Dead band width: 1us
- Wire length: 32cm
- Aluminium 6061-T6.

BLOCK DIAGRAM

Block diagram shows the overview of a smart dustbin. In this block diagram is Arduino, which controls the function of the system. The level detectors used is the ultrasonic sensor. It detects the level by formulae

Speed = distance/time.

The above formulae are used to determine the distance traveled by the signal. Then the level is detected by the controller. This gives the signal to the GSM used in the system, GSM uses the AT commands to send a message. In this, the GSM is used to send a message to a concerned authority of the municipal council Arduino.

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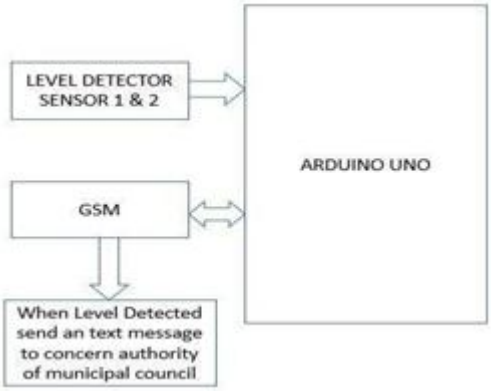

Figure 6. Block Diagram.

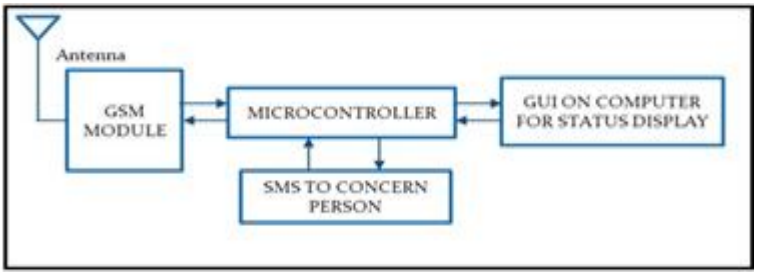

Figure 7. Reception Part to Dustbin

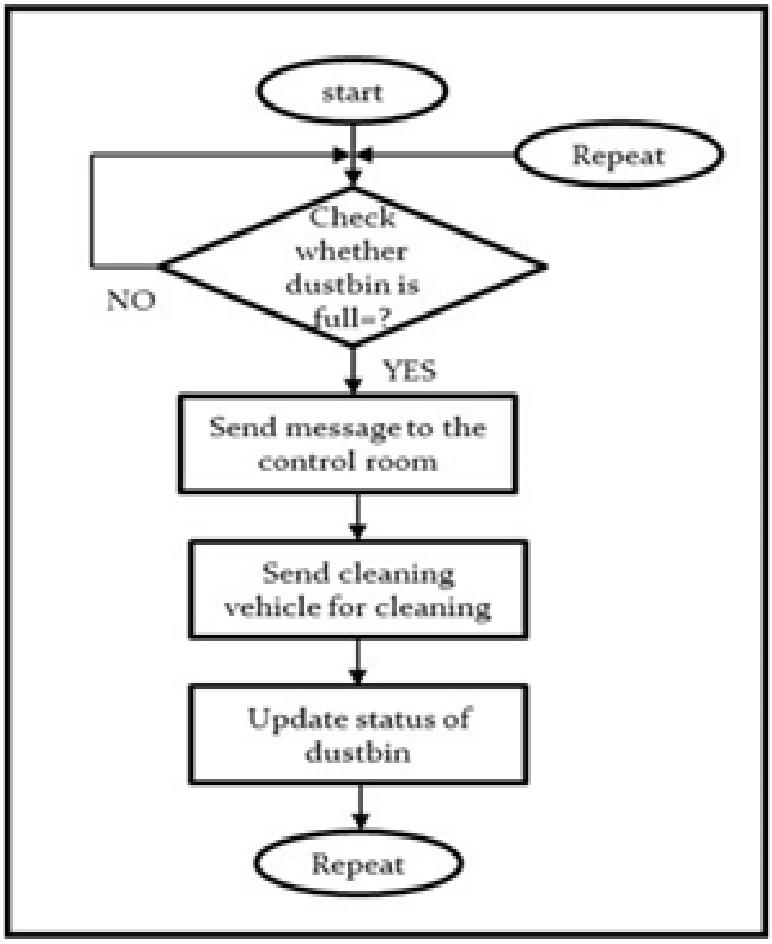

Figure 8. Flowchart

CIRCUIT DIAGRAM

Circuit diagram shows the Smart Dustbin. It consists of Components as shown in the Hardware Table. The Arduino is used as a Controller. The ultrasonic sensor detects the level of the dustbin. If any of the sensors don't detect the level then it doesn't

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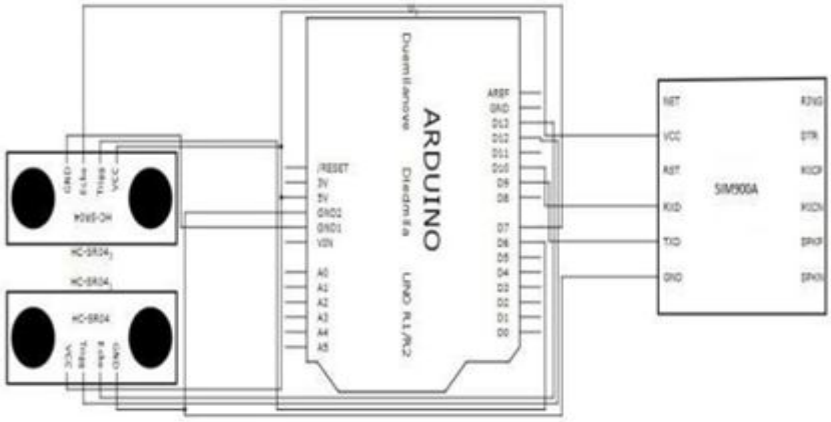

Figure 9. Circuit Diagram works as the description.

Send the text message to the concerned authority of the Municipal Council is sent. When the level is detected by both the ultrasonic sensor then it sends the signal to the Arduino Controller for further process. As the Signal is received by Arduino then it activates the GSM module. As GSM is activated then GSM (SIM900A) sends a text message to the concerned authority of the Municipal Council is sent. Then the authority will send a van by informing the van driver to replace the fully filled dustbin by a blank dustbin. When the blank dustbin is kept at that place then it's utilized by the general people go through the waste in that dustbin.

A. Interfacing Arduino to ultrasonic

The ultrasonic sensor detects the level by calculating the distance. The distance is calculated when the transmitter transmits the pulse and receiver receive the signal and calculate the time period. Then the distance is calculated by using formula as below.

Speed = Distance/Time

The ultrasonic transmit the signal with the speed of 340 m/s.

B. Interfacing Arduino to GSM

The GSM used is SIM900A in this circuit. The GSM uses the AT commands to send a text message to a concerned authority as discussed in the description of the circuit diagram.

C. Interfacing of final process

Both Sensor & GSM is finally interfaced with the Arduino. This project works according to the circuit diagram discussed in this paper.

CONCLUSION

As this system utilizes the greatest and the most feasible renewable energy so it's the most efficient and effective in its use. The complete design of the dustbin is given above as well as the specifications of prior components used in the smart dustbin are been explained above .implementation of these smart dustbins can prevent the accumulation of the garbage along the road side to a significant extent thereby controlling the dispersed of many hazardous and fatal diseases. Thereby it can prevent pollution to an improved and notable level. The smart dustbin can contribute a lot towards a clean and hygienic environment in building a smart city. This system is cost-effective & maintenance is much less as compared to another project. This will reduce the overflow of waste in the dustbin and also can keep the environment clean & waste free.

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DESIGN AND FABRICATION OF FARMBOT

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ABSTRACT
Agriculture plays an important role in the life of an economy. It is the backbone of our Nation. For survival, humans need food which mainly depends upon farming, so farming plays an important role. The farmers have to Implement new techniques which will not affect the soil texture but will increase the overall crop production. The aim of this project is to design and develop a set of few mechanisms with some additional attachments which would ease the effort of the farmer and help them in increasing their crop production. Most of the conventional and traditional ways of farming can fasten up with a minimum amount of modification and by introducing smart mechanism techniques which are most importantly affordable to the farmers. Fertilizer, natural or artificial substances are used in farming so productiveness of plants can be improved. By using more amount of fertilizers in crops, crops reduce its natural fertility by which it gives proteins and nutrients given to the plant while growing. Without crop protection, including pesticides, more than half of the world's crops would be lost to insects, diseases, and weeds. Pesticides are important. By spraying more amount of pesticides it helps reducing pets and diseases growing in plants which would destroy the crops, so spraying would result in more growth of plants with proper nutrients and an increase in production per hectare.

INTRODUCTION
About 40 per cent (approximate) of the agricultural area in India is irrigated, accounting for 69 per cent (approximate) of total fertilizer consumption. Six crops (rice, wheat, cotton, sugar cane, rapeseed, and mustard) are estimated to consume more amount of fertilizer in the country.

Fertilizers are compounds that are added to plants for increasing growth. The two types of fertilizers used in India are - organic and inorganic. Organic fertilizers are carbon-based and are mixtures of organic matter like leaves, cow dung and parts of plants. Inorganic fertilizers contain simple inorganic chemicals. Some of the common nutrients present in fertilizers are nitrogen, phosphorus, and potassium (NKP). They also contain plant nutrients such as calcium, sulphur, and magnesium. Some special fertilizers contain elements or micronutrients for the nutrition of plants like boron, chlorine, manganese, iron, zinc, copper and molybdenum. Farmers know the exact combination of fertilizers to be used for a specified crop and amount of each chemical elements to be mixed to avoid damage through excessive or improper use.

While fertilizers help in plant growth, pesticides save the crops against pests. A pesticide is a substance or mixture of substances designed for preventing the crops been destroyed by pests, insects, etc.

Pesticides mostly include chemical substances such as phosphamidon, lindane, chlorpyrifos, heptachlor and malathion. Many pesticides are known to be poisonous to humans.

Pesticides are substances that are meant to control pests, including weeds The term pesticide includes all of the following herbicides, insecticides (which may include insect growth regulator, termiticides, etc.) nematicide, molluscicide, piscicide, avicide, rodenticide, bactericide, insect repellent, animal repellent, antimicrobial and fungicide. The most commonly used pesticide among all the pesticides is herbicides which are almost 80%. Most pesticides are intended to serve as crop protection product, which in general, protect plants from weeds, fungi, or insects.

In general, a pesticide is a chemical or biological agent which contains such as a virus, and bacterium that destroys, or kills, pests. Target pests can include insects, plant pathogens, weeds, molluscs, birds, mammals, fish, nematodes (roundworms), and microbes that destroy property, cause nuisance, or spread disease, or are disease vectors. Along with these benefits, pesticides also have drawbacks, such as potential toxicity to humans and other sections.

LITERATURE REVIEW
[1].HUGH SAVOY,et.al,(1914), discussed about the different elements which is been required in crop production and the main amendments lime and fertilizer materials. Also the tools required for measuring the chemical proportion of fertilizer and for measuring soil fertility.[2].OENE OENEMA,et.al,(2002)proposed an information regarding the pros and cons of balanced fertilization as a policy tool and suggests operational measures. Essential steps are book keeping of nutrients of farm and fields levels, and evaluation of soil fertility level and nitrogen and phosphate surpluses relative to vulnerability of the environment.[3]. Hillel MAGEN

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,et.al,(2008), proposed an information regarding the proportion of potassium and nitrogen contents in fertiler. What should be the ration of potassium and nitrogen.The negativity of excessive use of nitrogen in fertilizer and how it affects the soil fertility.[4].SrijitMishra,et.al,(2010),proposed an information how to maintain balanced fertilization by proper using of nitrogen in fertilizer and which should be eco-friendly to environment and because of that nutrition of soil should not be lost.[5]. MahirDursun, et.al,(2011), proposed an information on application of a wireless sensor network for low-cost wireless controlled irrigation solution and real time monitoring of water content of soil. Data acquisition is performed by using solar powered wireless acquisition stations for the purpose of control of valves for irrigation.[6].EmilieSnauwaert (BE), et.al, (2014) proposed an information regarding how accurate fertilization should be done. Propotions of different chemicals required in making fertiler for different crops. Also the tools required for measuring an proportion of chemicals.[7].NITI AYOG,et.al,(2015) This paper is based on the work of the Task Force of Agricultural Development constituted by the National Institution for Transforming India (NITI), Government of India in March 2015. The paper does not represent the views of either the Government of India or the NITI. It concentrates on a subset of important issues confronting Indian agriculture and does not try to be exhaustive.[8]. Till Kuhn ,et.al, (2017) proposed an information how to reduce an amount of nitrogen and phosphate and how to dispose the nitrogen and phosphate to water bodies whithout affecting the environment.[9].AmeetaSharma ,et.al,(2017) proposed an information regarding using eco-friendly fertilizers. Instead of nitrogen, ammonia and phosphate use organic fertilizer.To reduce and elimination of adverse effect of synthetic fertilizer on environment and human beign.[10].Peiyu Cao,et.al,(2017), proposed an information about the percentage of nitrogen content in fertilizer and its effect on soil fertility. How the nitrogen affects on crop production and destroys the crop grown and what effect will be faced by the farmer for next crop production.[11]. NAYANA SHARMA,et.al,(2017), proposed an information regarding the chemical fertilizers used by the farmers while fertilization and their diverse effect on the soil fertility and also the crop being grown and also this chemical fertilizer is harming human beings health and environment.[12].ThoratSwapnil V, et.al,(2017), proposed an information on sowing machine which is operated manually but reduces the efforts of farmers thus increasing the efficiency of planting also reduces the problem encountered in manual planting. For this machine we can plant different types and different sizes of seeds also we can vary the space between two seeds while planting. This also increased the planting efficiency and accuracy.[13].Ravi Gorli, et.al,(2017), proposed an information on the review of the improvement in the Smart Farming sector.[14].Nitave Ranjit Vilas, et.al,(2017), proposed an information on to design and develop a solar operated seed sowing machine. In this machine solar panel is used to capture solar energy and then it is converted into electrical energy which in turn is used to charge 12V battery, which then gives the necessary power to a shunt wound DC motor. This power is then transmitted to the DC motor to drive the wheels.[15].V. Nivash, et.al,(2018), proposed an information on seed sowing processes and tried to solve the problem. In seed sowing machine system they are used wheels. In each complete rotation of rotating wheel there is seed falls from this seed drum and the seed plantation process can take place smoothly as well as without wastage of seeds. This system provides all the facility which can work efficiently. The human illness as well as reducing the cost at the same time the seed is sowing at right depth and equal space entire agricultural land.[16]. Senthilnathan N, et.al,(2018), proposed an information on the work of seed sowing machine has been developed that help the farmers in harvesting the best crop with least efforts. A mechanical device that helps in sowing operation and controlled using IoT (Internet of Things) has been developed.[17]. Roshan V Marode, et.al,(2018), proposed an information on the various sowing methods used in India for seed sowing and fertilizer placement. The comparison between the traditional sowing method and the new proposed machine which can perform a number of simultaneous operations and has number of advantages.[18]. Anchal Das, et.al,(2018), proposed an information on is to derive a set of resource development and utilization practices, which lead to substantial and sustained increase in agricultural production .There exists a chain of interactions among the components within the farming systems and itbecomes difficult to deal with such inter-linking complex systems. This is one of the reasons fora slow and limited progress in the field of farming systems research in the country. This problem can be overcome by construction and application of suitable whole farm models. However, it is worth mentioning that inadequacy of available data from the whole farm perspective currently constrains the development of whole farm models.[19]. Mohd. HudzariRazali, et.al,(2018), proposed an information on on measure soil moisture in field by using soil moisture sensor. The sensors should be located in the effective root zone at locations which will give a representative picture of the soil water status of the field. Water penetration and holding capacity across a field can differ due to soil type, soil interfaces and topography.[20]. Dr. V. Berlin Hency, et.al, (2018), proposed an information on to develop an automated irrigation system based on sensors which are interfaced to the microcontroller unit. The sensors used in this paper are temperature and humidity sensor DHT11 sensor and soil moisture VH400. These sensors are interfaced to the microcontroller unit and the whole unit was placed under the root zone of the plant. The main

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motive of using microcontroller is to send an SMS to the mobile phone of an owner who is in the remote location. The sending of SMS is done by using SIM900A module which is also interfaced to the microcontroller unit.

METHODOLOGY

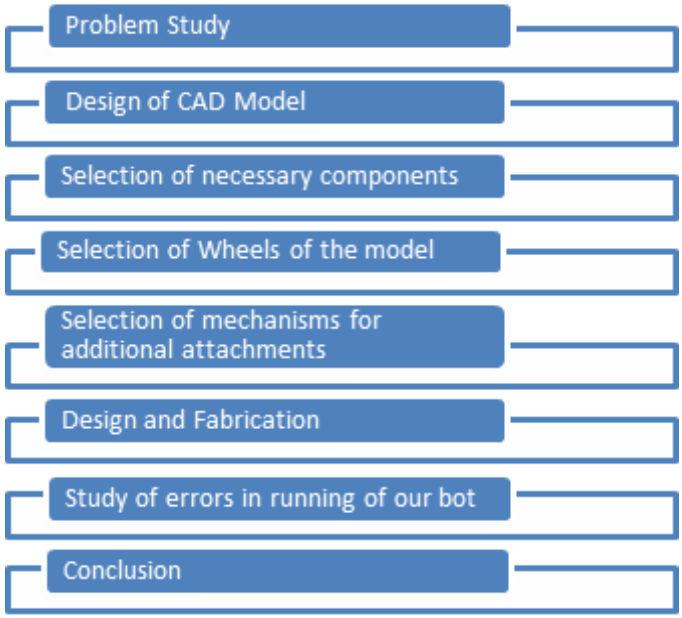

Fig. 1: Flow Chart Of Optimization Of Farmbot

[A]. Problem Study
The first step starting in methodology starts with a problem study of the conventional practices is done by the farmers for farming. The various issues that farmers face by practicing such problems which would be easily automated by our concept and model.

[B]. Design Of Cad Model
Before starting with the model first we have to make a cad design using software with a particular and proper dimensions in a cad software. Model would comprises of different attachments and with proper dimensions and different type of processes it would carry.

[C]. Selection Of Necessary Components
After the design when we start for the fabrication it is very necessary to select a proper components and material required for each section and each part of the farmbot.

[D]. Selection Of Wheels Of the Model
As the bot is going to be run on fields which will not be smooth surface there would be hurdles and potholes so for running on such a rough surface wheels are an important parameter to be considered. It should be strong enough to resist the forces while running on uneven surfaces. It is necessary to select a proper wheel base proper rims and wheel size for serving the desired output while running with proper efficiencies.

[E]. Selection of mechanism for additional attachments
As we have several attachments for our bot such as mango diggers, extra sprinklers for distant crops the selection of a mechanism for additional attachments is also important. The pipes of proper diameter and material of pipe has to be selected.

[F]. Fabrication:
After selecting all the materials for the components and parts which are going to be attached in the bot the frame is the fabricated as per the cad design and all the attachments as well as parts are been attached to frame with this process continuing land it leads to all electrical measures are taken into considerations. As our moto is to make the bot detachable so it can be compacted and consume less space when not it is not in use.

[G]. Study of errors in running of our bot
After fabrication of our bot we would run it on different fields to check its stability and errors facing by the bot would be recorded so that it can be rectified for smooth running on the field without any problems and error.

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CONCLUSION

A Multi-Function Farmbot that solves all the above problems by working in a automated way that does Fertilization, Spray Pesticides & does Cattle Shedding as well. Addition to this our bot is capable of an attachment that can be used to burry holes which are needed for mango plantation. Most of the farmers need to get workers ion hourly wages for the job for small farms as well as large ones. Our bot can easily dig small holes for a small as well as large farm in less time then the workers and can also save the money of farmer It can also be used for sowing of seeds in a uniform and systematic manner as seed sowing is a high precession work to do for farmers. Proper plantation of seeds with proper spacing and gaps is must which our bot could do with some amount of alterations.60% of farming work can be done by our bot. Its is usable for mainly large scale farmers but can also be used by small scale farmers having multi crop production. It is an onetime investment machine with very less maintenance which could ease the work of farmer.

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FINGERPRINT BASED ATTENDANCE SYSTEM

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ABSTRACT
Fingerprint attendance system aims to automate the attendance procedure of an educational institution using biometric technology. This will save time wasted on calling out names and it gives a fool-proof method of attendance marking. A hand-held device is used to mark the attendance without the intervention of teacher. The device can be passed and students can mark attendance during the lecture time. Students would be made to place their finger over the sensor so as to mark their presence in the class. It can communicate with a host computer using its USB interface. This device operates from a rechargeable battery and mobile phone. GUI application in host computer helps the teacher to manage the device and attendance. The fingerprint-based attendance management system was implemented with Microsoft's C# on the .NET framework and Microsoft's Structured Query Language (SQL) as the backend. The experimental result shows that the developed system is highly efficient in the verification of users fingerprint with an accuracy level of 97.4%. It consists of two processes namely, enrollment and authentication. During enrollment, the fingerprint of the user is captured and its unique features extracted and stored in a database along with the users identity as a template for the subject.

Keywords: Fingerprints, Attendance

INTRODUCTION
Fingerprints are a form of biometric identification which is unique and does not change in one's entire lifetime. This paper presents the attendance management system using fingerprint technology in university. Attendance is a concept that exists in different places like institutions, organizations, hospitals, etc. during the start and end of the day to mark a person's presence. In early days and even now in many places attendance is recorded manually in attendance registers by calling out the names. This results in waste of time and human effort. Also there are many fraudulent issues that happen when we use a register. For example, in educational institution, the teacher calls out the names of the student's one after the other and marks their presence after they answer. The other way that is followed is the teacher passes the attendance sheet around the class for the students to sign besides their names. But these methods have a major drawback where the students tend to answer or sign for their friends who are not present for that day. These fraudulent issues may become more frequent if the class strength is high. A solution to overcome these problems is by using a system that will record the attendance automatically. In this direction, this paper presents a fingerprint based biometric system that records the attendance automatically.

This Application consists of a fingerprint sensor which is used to detect the person's identification. For example, in educational institutions, the student needs to place their finger on the fingerprint sensor to obtain their attendance. The fingerprint captured is recorded in a flash memory and then each time it is checked whether the obtained fingerprint matches with the record in the database after which the student gets the attendance. By making use of this system, we overcome the issues such as proxy so no student can give attendance for their friends who are absent. This causes time wastage during lecture time. This becomes more and more important where number of students in a class is very large. Fingerprint based technique use computer and also mobile application to store and verify fingerprint.

OBJECTIVES OF STUDY
1. To understand the concept of fingerprint scanner
2. To understand the concept of image acquisition
3. To develop mobile application for fingerprint based attendance system

CONCEPT
A. Fingerprint Scanner
A Fingerprint scanner is types of electronic security system that uses fingerprint for biometric authentication to grant a user access to information. A direct fingerprint reader (DFR) also called a fingerprint scanner or fingerprint reader, is a biometric device that uses automated methods of recognizing a person based on unique physical characteristics of a person's fingerprint.

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B. **Image Acquisition**

In image processing, it is defined as the action of retrieving an image from sum source, usually a hardware based source for processing. It is the first step in the workflow sequence because, without an image, no processing is possible. The image that is acquired is completely unprocessed.

C. **Literature survey**

We had studied various research papers amongst which these are followings :

1.Hitesh Walia,Neelu Jain. May 2016 "International Research Journal of Engineering and Technology."

Implements Fingerprint Based attendence system using RFID technology.Radio frequency identification is the wireless technology which uses electromagnetic waves for RFID reader.

2.Zin Nwe Soe,Dr. Aye Mye Win "Implementation of fingerprint based student attendence system with notification by GSM module" in these paper they have implemented a attendence system using biometrics using GSM SIM modem.for the purpose they used SD card with card reader for saving and exctracting text file and sending them via messages.

3.Huzefa Shabbir Sadikot,Omkar Ravindra Kavitkar,Krishna Bajaj."Biometric attendence Monitoring system using Raspberry PI and fingerprint"

The paper represents Attendence system based on fingerprint based biometric with software platform used is Raspberry-pi(Linux os),python programming language which overcomes the issue of proxy.

4.GunjanTalaviya,Rahul Ramteke,A.K.Shete.Feb 2013"Wireless fingerprint based college attendence system using Zigbee Technology"

The paper represents an Attendence system works on Zigbee technology which spreaded over wide network via intranet to internet.the database of attendence has been maintained and will be sent to each student,parent,HOD etc.

5.Vishal Suryawanshi,Kiran Puri,Prashant Devkar."Attendence Monitoring system automation using fingerprint module"

The papers represents an attendence system which uses a optical sensor to scan the fingerprint and API module using GSM module which is based on java soft core module.the automatic marking and updation of the database is done after insertion of fingerprint is done.

D. **Proposed System**

This proposed system introduces a new automatic attendance management system, which integrates fingerprint authentication into the process of attendance management for both staff and student. It is made up of two processes namely; enrolment and authentication. During enrolment, the biometrics of the user is captured and the minutiae data are extracted and stored in a database as a template for the subject along with the user's ID. The objective of the enrolment module is to admit a user using his/her ID and fingerprints into a database after feature extraction. These features form a template that is used to determine the identity of the user, formulating the process of authentication. The enrolment process is carried out by an administrator of the attendance management system. During authentication, the biometrics of the user is captured again and the extracted features are compared with the ones already existing in the database to determine a match. After a successful match, attendance is marked against the user's id used in matching the templates. The work utilized a fingerprint reader as the input to acquire images, developed program that has fingerprint recognition and identification system as well as database to store user's information. The database comprises the fingerprint templates and other bio-data of the users together with the attendance records made by the users.

E. **Project Methodology**

The main purpose of this system is to take attendance of the students for lectures, calculate the attendance rate of each student and use this record with specified percentage requirement to perform authentication for access into examination venues. The lecturer fingerprint is captured via a fingerprint scanner and the minitues is extracted and processed. The feature sets are stored in the database as template. On taking another lecture, the lecturer's fingerprint is captured again for verification and also the lecture count is recorded respectively. When there exist a period for promotion for a staff, the performance rating of the staff will be carried out via an online Question answering survey containing various performance indices and filled by the students. The result will be analyzed and evaluated to validate the staff performance.

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THE MODULES IN THE ARCHITECTURE ARE PRESENTED AS FOLLOWS:

Fingerprint Capture: This module interfaces with the fingerprint scanner to capture the fingerprint of the individual to be enrolled or authenticated. This is also termed as the Enrolment Phase.

Fingerprint Processing: This module accepts the fingerprint image taken by the sensor and extracts the unique features of the fingerprint to be used for matching with features saved for the templates in the database.

Fingerprint Matching: This module compares the features extracted from the taken (new) fingerprint sample with features of fingerprint templates stored in the database. This is done by performing comparison on a one-to-one basis.

Database: The database stores students finger print templates as well as fingerprint history. It also provides data storage for daily lecture attendance records.

Lecture Attendance: This module shows the attendance result for each staff while Performance Rating module shows the result of student justification of the performance of staff toward lecture delivery.

CONCLUSION

Attendance system could not only speed up the process taking attendance but also reduce the error rate and produce faster verification process of authenticating student attendance. This system calculates the attendance of students and sends alert message for the absence students to relevant guardians' mobile phone. This system can also store the data of students for long time. Efficient identity management system has become very important in this highly interconnected world with increased concerns of identity fraud and national security. Biometric systems provide a greater degree of security and user convenience than the traditional authentication methods. Multimodal systems, if properly designed, are able to increase the matching accuracy of a recognition system as they, consolidate the evidences from different biometrics, increase population coverage and prevent spoofing attacks. This thesis presented a novel approach of random selection of biometrics to enhance the identification accuracy of Multimodal Biometric Systems. Two design approaches of multimodal biometric system are developed. In first approach sensor level fusion of two randomly selected biometrics are used and in second approach feature level fusion of two randomly selected biometrics are used. Two randomly selected biometric approaches reduce the search space at the time of identification. Both of these approaches reduces time and improves the accuracy of biometric system. Moreover, random selection of biometric traits would ensure that the system is interacting with a live user. Four biometric traits used are face, fingerprint, palm print and hand geometry. It has been seen that each biometric trait has its own advantages and limitations, a single trait can never meet all the necessary requirements effectively such as efficiency, practicality and expenses at the same time. Therefore, we can say that there is no universally best accepted biometric trait; search for best biometric trait is still going on. Also the selection of particular biometric trait depends on the nature of the particular application for which the trait is to be employed. The results proved the increased performance of Feature level fusion using random selection over the other state of the art methods.

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FLOOR CLEANING ROBOT

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ABSTRACT
With the progression of innovation, robots are getting more consideration of analysts to make the life of humankind agreeable. This paper shows the plan, advancement and creation of model Smart Floor Cleaning Robot (CLEAR) utilizing IEEE Standard 1621 (IEEE Standard for User Interface Elements in Power Control of Electronic Devices utilized in Office/Consumer Environments). The subject robot works in self-sufficient mode just as in manual mode alongside extra highlights like planning for a particular time and bagless earth holder with the auto-soil transfer system. This work can be extremely helpful in improving the way of life of humanity.

IndexTerms: Autonomous roaming, manual control, power status indications, power controls, power efficient, cleaning robot.

I. INTRODUCTION

This work can be extremely valuable in improving the way of life of humanity. As of late, automated cleaners have taken significant consideration in apply autonomy inquire about because of their viability in helping people in-floor cleaning applications at homes, inns, cafés, workplaces, emergency clinics, workshops, distribution centers and colleges, and so on. Fundamentally, mechanical cleaners are recognized on their cleaning skills like floor wiping, dry vacuum cleaning, and so forth. A few items depend on basic hindrance evasion utilizing infrared sensors while some use laser mapping methods. Each cleaning and working system of mechanical floor cleaners has its own points of interest and hindrances. For instance, robots using laser mapping is moderately quicker, less tedious and vitality productive however expensive, while deterrent evasion based robots are generally tedious and less vitality proficient because of irregular cleaning yet less exorbitant. Nations like Pakistan are a route back in assembling mechanical cleaners. Bringing in them from abroad builds their expenses. The primary goal of this work is to give a significant answer for the issue of assembling mechanical cleaner using neighborhood assets while keeping its low expenses.

In this work, "brilliant floor cleaning robot (CLEAR)" has been intended for customer/office conditions and all its segments as per IEEE Standard are talked about. The proposed plan is being worked in double modes. In one of the modes, the robot is completely self-governing and settling on choices based on the yields of infrared closeness sensors, ultrasonic sensors, and material sensors in the wake of being prepared by Arduino (super) controller and control the actuators (2 DC encoder engines) by the H-connect driving hardware. In manual mode, the robot can likewise be utilized to clean a particular territory of a room by controlling it physically from a PC with a Graphical User Interface (GUI) in Visual Studio (C# programming language) through Bluetooth availability.

This paper is masterminded in eight areas. IEEE standard utilized in this venture is examined in Section II. A nitty gritty writing survey of mechanical vacuum cleaners is introduced in Section III.Section IV covers

the mechanical design of robotincluding chassis design, brushing, vacuum cleaning mechanism and auto-dirt disposal mechanism .Electronic circuitry (including motor controllers, vacuum cleaner controller, battery status meters and brushing motor controller along with safety circuit for power supply to sensors, arduino controller as well as precautionary circuit) is discussed in Section V.Graphical User Interface (GUI) of the project and robot operation are discussed in Section VI and VII respectively. All these sections describe their relevance to the application of IEEE Standard 1621. Conclusions of the project are summarized in Section VIII.

II. STANDARD APPLIED

The standard being applied is IEEE Std 1621™-2004(R2009) "IEEE Standard for User Interface Elements in Power Control of Electronic Devices Employed in Office/Consumer Environments" for the structure and manufacture of "Brilliant Floor Cleaning Robot". IEEE Standard 1621 empowered creators to learn and execute fundamental power and control components for the subject robot, hence making it easy to use. The method of usage of IEEE Standard 1621 is examined in detail in later segments.

III. LITERATURE REVIEW

A mechanical vacuum cleaner is an independent electronic gadget that is brilliantly modified to clean a particular region through a vacuum cleaning gathering. A portion of the accessible items can brush around sharp edges and corners while others incorporate some of the extra highlights, for example, wet cleaning and UV sanitization as opposed to vacuuming. A portion of the accessible items is talked about underneath.

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A comparison of proposed robot CLEAR with the top selling robotic cleaners in international market on the basis of general specifications like operating time, charging time, scheduling, floor type, battery indicators and navigation features is summarized in Table I.

TABLE-I: COMPARISON OF CLEAR WITH AVAILABLE PRODUCTS [6].

	ROBOTS		
FEATURES	**NEATO -XV**	**ROOMBA**	**CLEAR**
Operating time (hr)	1.5	2	1.2
Charging time (hr)	3	4	2
Scheduling	Yes	Yes	Yes
Battery indicators	Yes	Yes	Yes
Full-bin indicators	Yes	Yes	Yes
Remote control	Yes	Yes	Yes
Return to base	No	No	Yes

A. Comparison with previous Patented Devices

A detailed comparison of previous patented robotic vacuumcleaners with CLEAR on the basis of main featuresof control mechanism like automatic or manual mode and cleaning expertise like dry vacuum cleaning or mopping along with additional features like bag-less container etc. is summarized in Table II.

TABLE-II: COMPARISON OF CLEAR WITH PATENTS.

PATENTS	**SALIENT FEATURES**	**'CLEAR' FEATURES**
Autonomous floor mopping apparatus[7] US-6,741,054	This robot is autonomous and can be remotely controlled.	Autonomous motion using IR sensor mechanism and manually controlled via GUI controls.
	A feed roller lets out a roll toweling, take-up roller reels in the toweling, and a motor system causes it to rotate while robot moves.	Simple roller brushing and vacuuming.
Autonomous floor-cleaning robot[8] US-6883201 B2	Self-adjusting cleaning head with brush assembly having counter-rotating, asymmetric brushes.	Simple roller brushing.
	Independent, vacuum assembly so that the cleaning capability and efficiency is optimized.	Separate vacuum assembly.
	A removable dust cartridge.	Dirt compartment with auto-disposal.
	A control system, in	Autonomous motion

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	communication with the motive system having feedback from sensors.	using IR sensor mechanism and manually controlled via GUI controls.
Autonomous surface cleaning robot for wet and dry cleaning[9] US-7,389,156	The robot chassis carries cleaning elements to suck particles up from the cleaning surface and apply a cleaning fluid onto the surface to collect the cleaning fluid up from the surface using a rotating sponge.	A roller brush brooming the dirt into dirt compartment aided by a vacuum cleaner.
	The robot includes controls and drive elements configured to control the robot using sensor mechanism.	Autonomous motion using IR sensor mechanism and manually controlled via GUI controls.
	A removable dust cartridge with separate tank for cleaning fluid.	Dirt compartment with auto-disposal.
Cleaning Robot and control method thereof[10] US-2013/0231819	Contains a movement module, a sound wave sensor module, a cleaning module (vacuum only) and a controlling module.	Autonomous motion using IR sensor mechanism and manually controlled via GUI controls with brushing and vacuuming.
Autonomous surface cleaning robot for dry cleaning[11] US-8,782,848	Includes a transport drive and control system arranged for autonomous movement of the robot.	Autonomous motion using IR sensor mechanism and manually controlled via GUI controls.
	Vacuuming assembly and a waste container for storing waste.	Brushing and vacuuming assembly with a waste container capable of auto-disposing.
	Also includes wet cleaning separately.	Wet cleaning feature is not available.
System and method for autonomous mopping of a floor surface[12] US-8,892,251	Cleaning the surface with a cleaning pad and cleaning solvent.	Brushing and vacuuming with auto-disposal of waste.
	Movement of robot can be programed by a class of trajectories that achieve effective cleaning. The trajectories include sequences of repeated steps like forward and backward motion with optional left and right motion in accurate paths.	Movement is controlled by IR sensor data using obstacle avoidance technique but can be programmed for calculated trajectories and orientations using a Magnetometer module.

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IV. ELECTRONIC CIRCUITRY

All circuits are first planned and reenacted in Proteus programming. After the improvement of qualities for segments, circuits were actualized on PCB. There are five fundamental circuits incorporating three batteries being utilized in this undertaking and all these circuits are structured, examined and afterward executed as per IEEE Standard 1621. Clarification of every one of these circuits is given beneath

A. Motor Controllers

Engine controllers usually known as H-Bridge, are utilized for driving engines in the two bearings that are clockwise and counterclockwise with a present rating of 15 A. This controller comprises of two sections. The initial segment is to empower transfers through the Arduino controller and drive engines while the subsequent part is for controlling the speed of engines. Transfers are utilized for exchanging purposes while transistors are utilized for speed control. Transfers utilized in this circuit have a rating of 12V dc curl and 15A current while a lead-corrosive battery of a 12V and 1.2Ah rating. Since encoder engines have a slow down current of 7A so for wellbeing purposes 15A transfers have been utilized. Two diodes are executed in a fly back diode arrangement. This is a condition wherein a diode is placed in the switch state between battery terminals and is regularly known as a free-wheeling diode. At de-empowering of hand-off, colossal voltage is created in the retrogressive state and can harm different parts so to maintain a strategic distance from this harm a diode in fly back setup is utilized alongside the transfer. Heartbeat width balance (PWM) is utilized for speed control. PWM is given to transistor BJT 2N2222 alongside some obligation cycle to urge the engine to turn over at certain interims bringing about controlling the pace. This circuit is fueled up through a different battery associated through ON/OFF switch and wire to give assurance and a Red LED gleaming if the circuit is Disconnected inferable from a segment: 4 of IEEE Std. 1621.

B. Vacuum Cleaning Controller

The circuit utilized for controlling the vacuum cleaner comprises of one transistor, one transfer, one diode, and two batteries. One Lead-corrosive battery of 12V and 1.2Ah evaluations is for control controlling (ON/OFF) of vacuum cleaner by empowering loop of transfer having diode in a fly back position while one LIPO battery of 18V and 5Ah is for providing capacity to vacuum cleaner with various ground terminals to stay away from hampering and appropriately disengage the batteries from circuit including a different Yellow LED for Disconnected state inferable from segment: 4 of IEEE Std. 1621. The sign from the Arduino controller is given to transistor BJT 2N2222 which invigorates transfer and hand-off switches. Subsequent to exchanging, the hand-off will enable 18V battery to supply control through it and turns on the vacuum cleaner through an ON/OFF switch. This circuit is appropriately protected to give wellbeing since flows may surpass to 7A.

C. Battery Meters

This circuit comprises two cushions ICs, six shaded LEDs (3-Red and 3-Green) showing battery control status and four resistors for the voltage divider. The positive terminal of circuit battery is associated with one resistor and yield is taken from the subsequent resistor gives a fixed voltage that fixed voltage goes to cushion IC so no current ought to be drawn from circuit and procedure should be possible effectively. That fixed voltage after support IC goes to Arduino where it is modified and prepared; brings about killing ON/OFF of LED's indicating whether the battery is charged or released relying upon the estimation of voltage being

fed into Arduino. Resistors should have values in kilo ohms so that current would be in mille amperes to meet the offset of buffer IC. If resistors of high wattage and values of mega ohm used then current will be in micro amperes and buffer IC offset will not reached and IC would not be in working state. This feature of power level indication using average power over an extended period affecting long term energy consumption on hardware separately is in accordance with from section: 4.2 of IEEE Std. 1621

D. Brushing Motor Controller

The circuit comprises of two transistors. One transistor takes a sign from an Arduino controller and drives another transistor. A transistor that takes a sign is BJT 2N2222 and another one is TIP-122. Circuit chips away at 12V DC supply associated through a switch and breaker. Two transistors are utilized in light of the fact that solitary TIP-122 has a high current rating and can't be initiated by Arduino straightforwardly. Transistor BJT 2N2222 isn't utilized exclusively on the grounds that slow down current of brush engine is a lot of high and BJT won't give essential currently. So blend of these two gives a fruitful circuit to drive brush engine

E. Power Supply to Sensors

All sensors utilized are evaluated at 5V yet batteries are of 12V and 18V. So to offer 5V to five IR sensors, 2 encoder sensors, one magnetometer and one Bluetooth module, this circuit has been structured and executed. Controller IC 7805 is utilized for changing over 12V to 5V with the current in milliamperes extend. Capacitors

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are likewise utilized for voltage guideline and in the event that there is some drive which can separate capacity to sensors, at that point these capacitors will go about as hotspot for keeping up an association with sensors. If there should arise an occurrence of a detached condition of intensity supply to sensors, White LED shines named as disengaged inferable from the area: 3.1.14 of IEEE Standard 1621.

F. Precautionary Circuit

This circuit fills in as a principle circuit comprising of scaffold rectifiers, transfers, transistors, diodes, wires, Positive voltage flexible controller, LEDs, terminal squares, and thin headers. This circuit comprises of three sections. One is for engine battery security and guideline of voltage, second for circuit battery voltage wellbeing and third is for controlling engine battery through circuit battery and offering the capacity to Arduino controller. In first section, one hand-off with diode in fly back mode, one transistor, one breaker, terminal squares, one controller and the variable resistor is utilized. Right off the bat battery terminals are associated with terminal square shorted with contributions of scaffold rectifier that is KBPC 5040 having a voltage rating of 1000V and 50A. An extension rectifier is utilized to keep the stock voltage positive and secure the circuits if the battery terminals are associated with a positive or negative way. The signal from the Arduino controller is given to transistor BJT 2N2222 which empowers hand-off and transfer will enable engine voltage to go to combine from rectifier and afterward it will go to controller input. The controller utilized is LM338k which is sure movable voltage controller having a rating of 15A and can direct voltage from 12V to 6V. This controller is utilized so that there will be no fluctuations in yield and engine works consistently. Subsequent to changing the voltage to 12V yield will be shorted with terminal square and that square is presently utilized for battery yield both for encoder engines and brush engine. For more wellbeing, combine holders are utilized so that in the event that there is any shot circuiting happens, at that point, it won't hurt different parts and wire can without much of a stretch be changed. Circuit utilized is of 10A rating as slow down current for encoder engine is 7A and for brush, engine slow down current is 5A. Driven alongside resistor is put soon after controller so that to guarantee whether the voltage is coming to yield terminal or not.

battery terminals are connected to terminal block shorted with inputs of bridge rectifier that is KBPC 810 having a voltage rating of 800V and 10A. Bridge rectifier is used because whether battery terminals are connected in positive or negative direction, output will remain positive and circuits will remain secure. Firstly voltage from bridge rectifier goes to fuse and after this signal from Arduino given to BJT 2N2222 which energizes relay which results in switching of relay and relay will allow voltage to pass through it and shorted with terminal block which acts as circuit battery output terminal block and other circuits are powered up from this output terminal block. For more safety, fuse holders are used so that if there is any shot circuiting occurs then it will not harm other components and fuse can easily be changed. Fuse used is of 2A because there is no component which drew more than 800 mA current. LED along with resistor is placed just after relay so that to ensure that whether voltage is reaching to output terminal or not. In last part that is controlling of motor battery circuit through circuit battery circuit consists of one transistor and one relay with diode in fly back mode. 7809 regulator is also used for giving power to Arduino through slim header. Signal from Arduino given to transistor BJT 2N2222 energizes relay connected to motor battery circuit. Energizing that relay results in close circuit of motor battery and hence controls motor battery through circuit battery circuit. Further for testing long wires are used for connecting between output terminal blocks of motor battery and circuit battery. Power Switches (section: 3.1.11 of IEEE Std. 1621) are also attached with these wires to turn on or off in any emergency.

V. GRAPHICAL USER INTERFACE (GUI)

The primary reason for the GUI is to give all controls in the hand of the client, with the goal that he can utilize this item as indicated by his needs. The product utilized for the programming of GUI of this gadget is Visual Studio 2012. As talked about, the robot can be utilized in manual mode just as a self-governing mode. The choice of the model should likewise be possible from this GUI. Visual Studio gets the information from COM port and shows it on the GUI in the wake of interpreting. In any case, the correspondence by means of Bluetooth is 2-way for example it sends a few information as a conveyance report. The terms, pointers, and marks utilized in GUI for control controlling and the executives are utilized under segments: 4.3-4.6 of IEEEStd. 1621. A photo of GUI for a keen floor cleaning robot (CLEAR) appears in Figure 2.

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Figure 2. Graphical User Interface (GUI) for 'CLEAR'.

The significance and usage of different parts of the GUI are discussed

below:

A. Battery Status

Batteries are the most significant component in a robot since it gives the power source to all the electronic parts. So as to occupy the consideration of the client towards battery status, the presentation of the battery begins flickering when the battery is under 20% inferable from areas: 4.1 and 4.2 of IEEE Std. 1621. A photo of battery status appears in Figure 3.

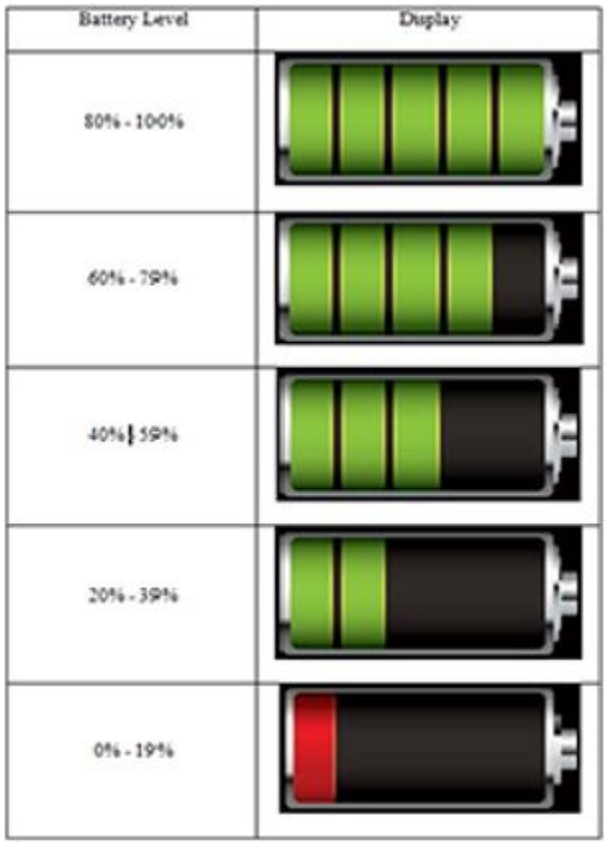

Figure 3.Battery status.

B. Vacuum ON / OFF Button

An ON/OFF catch specific for the control of the Vacuum Pump unit is likewise given in GUI. This catch works precisely like the Brush button. Be that as it may, these the two catches don't influence the working of each other at any moment. This control is roused by area: 4.5.2 of IEEE Std. 1621

C. Selection of Gears

These apparatuses are like programmed autos so as to efficiently oversee battery control, increment its working time and control speed as per the need, in this manner alluding to the segment: 1 of IEEE Std. 1621. At

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whatever point gears are chosen, a clicking sound is acquainted with guarantee the client of apparatus change alluding to the segment: 4.5 of IEEE Std. 1621. The rigging choice can be seen in Figure 4.

Figure 4.Gear selection controls.

1. Parking (P)
It keeps the gadget in rest mode wherein all the hardware of the gadget is turned off. Nonetheless, the Arduino board and the Bluetooth module are as yet dynamic, so the gadget can react to any direction got from the UI in the workstation.

2. Reverse (R)
It is the inverted gear, in which the two engines are run so that the robot moves in the turn around heading. As talked about previously, particularly structured engine controllers are utilized for altering the course of the pivot of engines. These engine controllers additionally have the achievability of speed control utilizing Pulse Width Modulation (PWM). A tone is presented if there should arise an occurrence of invert movement as referenced by segment: 4.5.3 of IEEE Std. 1621.

3. Neutral (N)
Impartial apparatus goes about as the halfway rigging wherein the robot isn't moving toward any path yet at the same time the hardware switches ON, hanging tight for the order from the client. It is to be noticed that the brush engine and vacuum siphon can be kept ON in this condition of the gadget.

4. Drive (D)
The drive gear is the forward rigging with the max throttle of the engine. The engines are synchronized utilizing PWM in the engine controllers with the goal that the two tires pivot at equivalent speed. The synchronization of the engines along these lines makes the robot move precisely the forward way with no tilt some other way.

5. Low Gear (L)
Low rigging is intended for compelling cleaning of the floor. In this rigging, the robot moves in half of its max throttle. In any case, the brush engine and vacuum siphon work at a similar speed, so net cleaning efficiency of the gadget is expanded to the twofold of its ordinary efficiency.

D. Scheduling of Operations
Another symbol of schedule is accessible on the primary GUI for booking settings. Another GUI opens when the client clicks this symbol. The client needs to choose the date and time for setting the cleaning timetable of the robot. Planning is done to keep away from visit pointless activity and make it a daily practice so that at whatever point a wake occasion is called from a rest state, it deals with its cleaning cycle itself in independent mode. Planning is finished attributable to Sections: 4.8 and 3 of IEEE Std. 1621. Besides, the client can likewise choose any of the four choices for the booking like Only Once, Daily, Weekly or Monthly. This can be seen in Figure 5.

Figure 5.Scheduling settings.

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E. Current Date & Time

The present date and time of the framework is likewise shown on the GUI for simplicity of the client and a similar date and time is utilized in booking highlight as referenced by segment: 4.1 of IEEE Std. 1621.

F. Mode Toggle

The robot can be used in two different modes i.e., automatic mode & manual mode. An icon is placed on the main GUI to toggle between automatic mode and manual mode. When the robot is in manual mode, icon shows A, showing that the user can click to convert it to automatic mode. When the robot is in automatic mode, the icon shows M, showing that the user can click on it to convert the robot to manual mode. Whenever mode is toggled, it is notified to user by a buzzer sound owing to section: 4.6 of IEEE Std. 1621.

G. Help Options

Another symbol of help to facilitate the clients is additionally accessible on the GUI which opens another GUI which contains various Frequently Asked Questions (FAQs). It additionally contains essential manuals for open and administration the gadget whenever required and the client manual is likewise accessible to edify them with fundamental images, control alternatives and wordings alongside definitions as referenced by section:1 and section:3 of IEEE Std. 1621.

VI. DISCUSSION ABOUT ROBOT OPERATION

The target of this venture is to make a vacuum cleaning robot that is completely independent and manual highlighted with an easy to use interface. The vacuum cleaner can clean, get over and auto arrange. The robot named CLEAR (cleaning entresol self-sufficient robot), it has variable speed and power productive.

The testing of the robot indicated that it can accomplish practically every one of the functionalities which were intended to execute initially. CLEAR can be utilized in self-ruling and manual modes according to the client's will. During its self-governing mode, this robot can be planned with legitimate date and time. At the point when that opportunity arrives this item consequently starts and tidies up the entire room and counter check design. At the point when this robot finishes the entire way it naturally cleans itself in the station from where it began cleaning. Also, manual mode is to spare the vitality of the robot and to clean the specific spot. Clients are given an easy to use interface to work the robot with no trouble. CLEAR above all expends incredibly low vitality which is 90W and take lead from the contenders. The vacuum cleaner has dependable hardware

furthermore, it has the wellbeing circuit which redresses various shafts and confines high voltage to influence the circuitry. However, the shortcoming of the robot is that it just cleans the little particles, it additionally doesn't see which molecule as cleaned and which isn't to be cleaned. This robot additionally can't do wet cleaning. These two capacities can be remembered for future upgrades of this robot.

The assessment shows that our item is solid and savvy. It works with less vitality utilization. The outcomes demonstrated that clients from the college found no trouble in utilizing the item. Its outcomes likewise demonstrated that this item is client-friendly the two modes.

VII. CONCLUSIONS

This paper shows the usage of the IEEE Standard 1621 IEEE Standard for User Interface Elements in Power Control of Electronic Devices Employed in Office/Consumer Environments as far as a brilliant floor cleaning robot. The paper demonstrates a superior and basic way to deal with give an outline of the structure of a straightforward mechanical cleaners control configuration utilizing contraptions and instruments effectively accessible in the Pakistani market. This robot (CLEAR) is uncommonly made based on current innovation. CLEAR has every one of the highlights which are required for a vacuum cleaner. It can work consequently and physically. It has the component of the booking and it would auto be able to deplete itself. CLEAR has numerous contenders who are selling the same item insignificant expenses. This is first privately produced shrewd vacuum cleaner with every one of the highlights up to the benchmarks of IEEE. Highlights of this robot can be improved with the expansion of mapping and high suction. As it has a planning highlight which can be worked with PC just, android and windows applications can be made to make it minimal more easy to understand. The intended interest group with every one of the highlights is the center and privileged of a Pakistani people group. It can likewise be utilized for the businesses where cleaning with the assistance of human is poisonous, the vacuum cleaner can without much of a stretch be utilized

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HIGH Tc SUPERCONDUCTIVITY: AN OVERVIEW

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ABSTRACT
High T_C Superconductivity is one of the interesting phenomena in modern science. In this review article, the subject has been discussed in simple manner, so that a reader can have the primary idea of superconductivity, especially at high temperature region. Mathematical expressions and complicated theories are intentionally avoided to give only an overview.

INTRODUCTION
In 1911, Kamerlingh Onnes first discovered the phenomenon of superconductivity in mercury at 4.2K, the temperature of liquid Helium. The discovery of vanishing resistance led to a promising field in science. The discovery of superconductivity in several other elements like tin and lead was soon found. Meissner and Ochsenfeld discovered in 1933 the expulsion of magnetic flux from the superconducting state, known as Meissner effect, proving superconductors to be perfect diamagnets. The much celebrated microscopic theory of the phenomenon was put forth by Bardeen, Cooper, and Schrieffer (BCS) in 1957. They presented the quantum mechanical theory of superconductivity due to an attractive interaction between two electrons, known as Cooper pairs, through electron–phonon interaction leading to BCS theory of superconductivity. The discovery of high temperature superconductivity by Bedrnoz and Müller on 1986 introduced a new horizon. Since then scientists are trying to find a material that will exhibit zero resistance in room temperature, and the energy problem of the world will be solved!

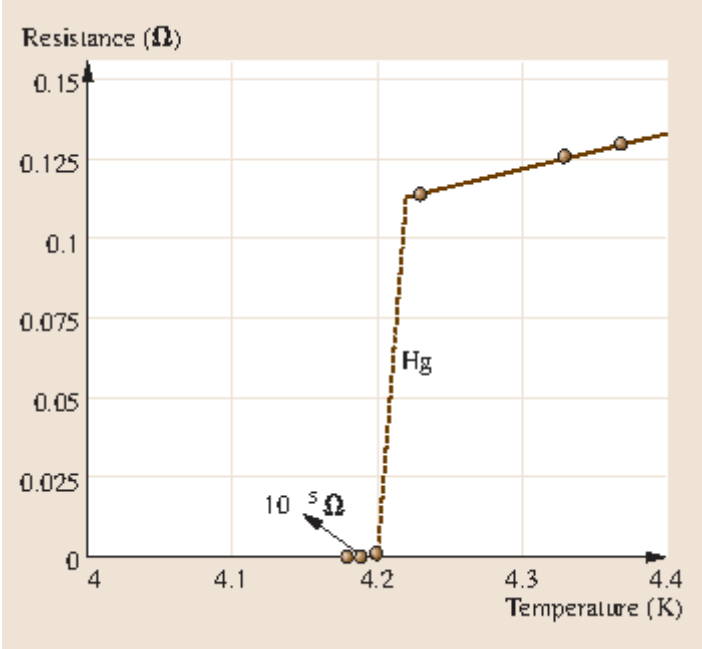

Figure 1

FIG. 1: Resistance–temperature plot for mercury obtained by Heike Kammerlingh Onnes

CONVENTIONAL SUPERCONDUCTORS
A superconductor is generally considered as a conventional superconductor if it can be explained by BCS theory. Most elemental superconductors are conventional. Between 1911 and 1974, the critical temperatures T_c of metallic superconductors steadily increased from 4.2 K in mercury up to 23.2 K in sputtered Nb_3Ge films. The first superconducting oxide $SrTiO_3$ with a transition temperature as low as 0.25 K was discovered in 1964. A remarkably higher critical temperature of 13 K was found for the perovskite $BaPb_{1-x}Bi_xO_3$ in 1975. Nb_3Ge had the highest critical temperature in metallic superconductors until the discovery of superconductivity at 39 K in MgB_2 in 2001.

Bardeen–Cooper–Schrieffer (BCS) Theory
J. Bardeen et al. proposed a microscopic theory of superconductivity introducing the concept of Cooper pairs. When an electron passes through the lattice it interacts with the stationary atoms and hence distorts the crystal

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structure. A concentration of positive charge is produced. This positive charge can attract another electron with opposite momentum and spin, passing by. Thus a weak electron-electron interaction is developed through lattice vibration. These two electrons with opposite momenta and spins, do not behave as two separate particles rather they form a pair. The pairs characterized by zero spin and momentum, behave as new particles. Because one of them is spin up (↑) and the other is spin down (↓) their total spin is zero. The pair does not obey Pauli's exclusion principle and can exhibit *Bose-Einstein condensation*. The probability that a state is occupied increases with the number of particles populating the same quantum state. Therefore, all Cooper pairs occupy the same quantum state with a single value of the momentum in the presence of an applied electric field. Thus all the electron pairs are condensed in a ground state and can flow without a resistance. The electron–phonon interaction leads to an energy gap 2Δ in the density of states for the single electrons. The width of the energy gap at zero temperature is

$2\Delta(0)=3.5\ kBTc,$

High T_C Superconductors

In 1986 J. G. Bednorz and K. A. Müller, at IBM in Switzerland, worked with a new class of superconducting materials starting with La-Ba-Cu-O, observed superconductivity up to 35K. This discovery gave rise to a new resurgence in research. Soon after in 1987, M. K. Wu and P. W. Chu, at the Universities of Alabama and Houston, replaced Lanthanum with Yttrium and announced the discovery of the 93K superconductor Y-Ba-Cu-O. After a year, in 1988 Bi- and Tl-based superconducting cuprates were discovered, having Tc= 110 and 125 K, respectively. Hg-based cuprates with the highest critical temperature Tc= 135 K were discovered in 1993 (at high pressure, Tc increases up to 164 K). The most recent research made use of lanthanum hydride and its isotopic variation lanthanum deuteride in high pressure, about half of the pressure in earth's core, to successfully produce a superconductor with Tc ranging from 215 K to perhaps as high as 280 K. Recently, scientists at IISC Bangalore have claimed to observe vanishing resistance and Meissner effect in films and pellets of a nanostructured material that is composed of silver particles embedded into a gold matrix. They have found Tc as high as 286K. If accepted the research can introduce a new resurgence in study of superconductivity.

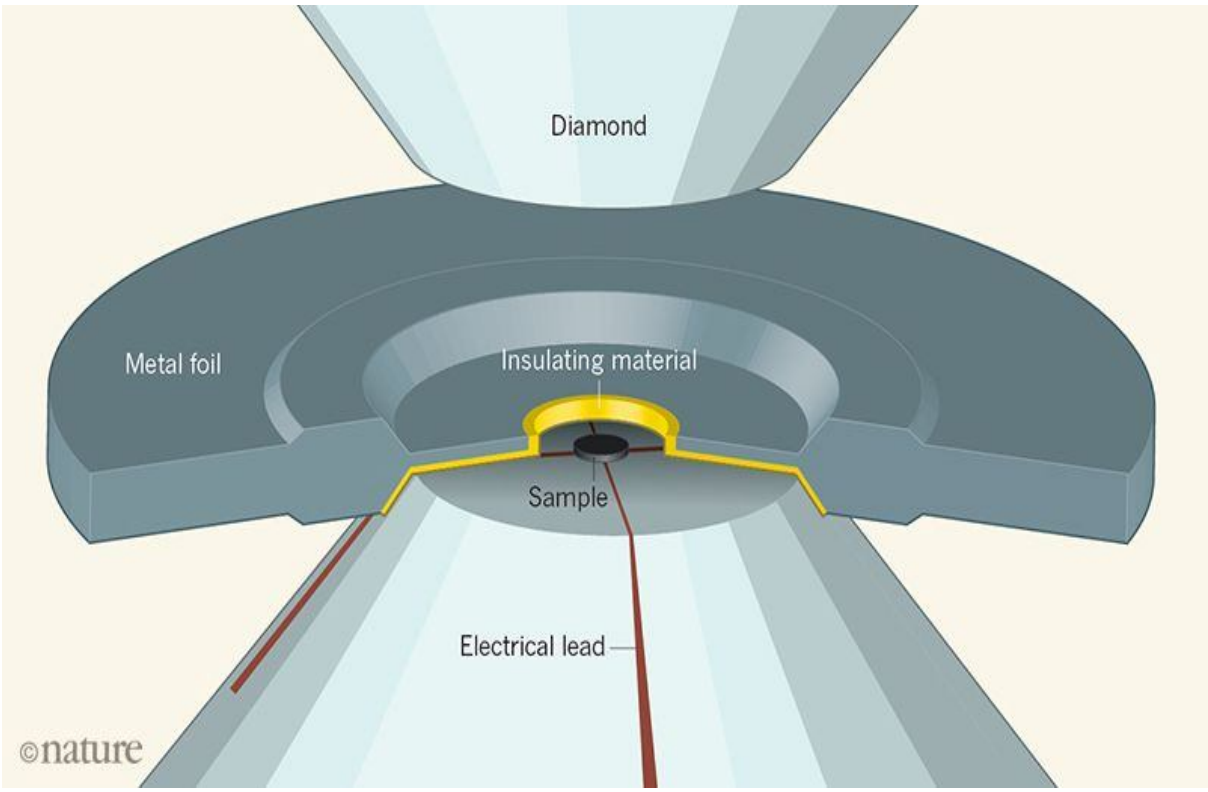

Figure 2

FIG 2: Drozdov *et al*. report an experiment in which a tiny sample of lanthanum is enclosed inside a hole in a thin metal foil. The hole is filled with liquid hydrogen (not shown). Four electrical leads make contact with the sample but are electrically isolated from the foil by an insulating material. The sample is squeezed between two diamonds and transforms into lanthanum hydride at high pressure.

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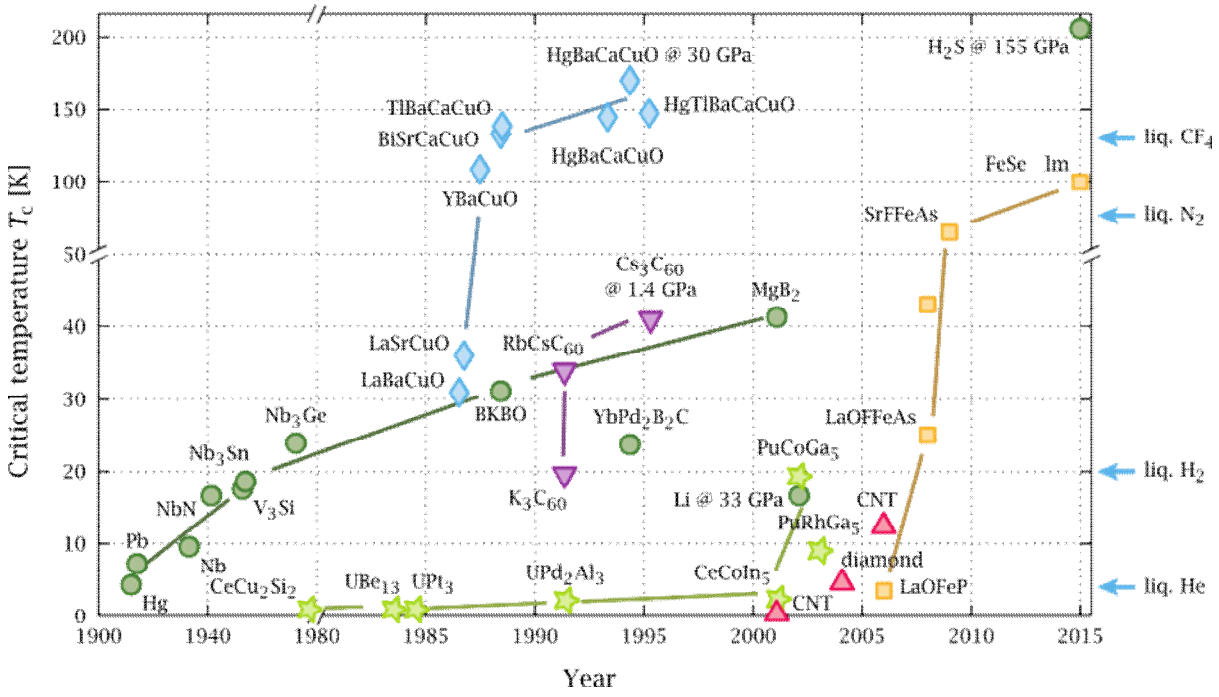

Figure 3

FIG 3: Timeline of Superconductivity from 1900 to 2015

Cuprates

Most relevant and extensively studied high Tc superconductors are doped cuprates. The undoped cuprate compounds are Mott insulators and exhibit antiferromagnetic (AFM) order below the Néel temperature. The copper oxide CuO2 planes in the cuprate plays the most dominant role to determine its magnetic and electric properties. When doped with holes the antiferromagnetic long range order is rapidly destroyed, and at sufficiently low temperature the compounds exhibit superconductivity .The cuprates are member of the family of strongly correlated electron systems. Basically the structure is two dimensional, with weak interaction between the CuO2 planes forming charge reservoir (CR) layers. Holes or electrons can be added to the CuO_2 plane by alteration of CR layers. At a critical doping AFM order is lost and superconductivity sets in.

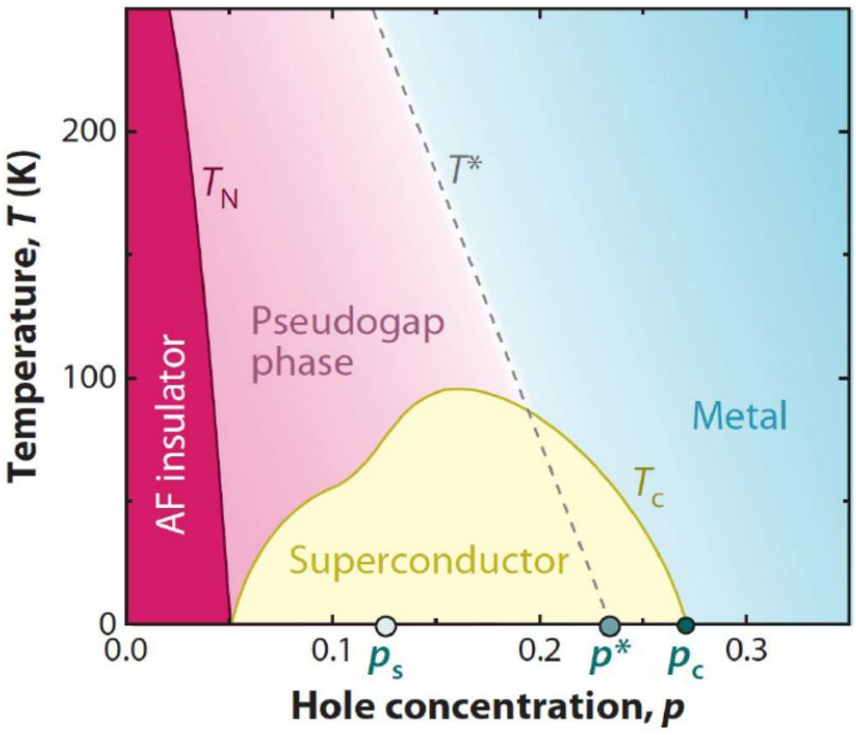

Figure 4

FIG4: Phase diagram of cuprates

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Table 1: Different Cuprates

Name	Formula	Temperature (K)	Number of planes of CuO2 in unit cell	Crystal structure
Y-123	$YBa_2Cu_3O_7$	92	2	Orthorhombic
Bi-2201	$Bi_2Sr_2CuO_6$	20	1	Tetragonal
Bi-2212	$Bi_2Sr_2CaCu_2O_8$	85	2	Tetragonal
Bi-2223	$Bi_2Sr_2Ca_2Cu_3O_{10}$	110	3	Tetragonal
Tl-2201	$Tl_2Ba_2CuO_6$	80	1	Tetragonal
Tl-2212	$Tl_2Ba_2CaCu_2O_8$	108	2	Tetragonal
Tl-2223	$Tl_2Ba_2Ca_2Cu_3O_{10}$	125	3	Tetragonal
Tl-1234	$TlBa_2Ca_3Cu_4O_{11}$	122	4	Tetragonal
Hg-1201	$HgBa_2CuO_4$	94	1	Tetragonal
Hg-1212	$HgBa_2CaCu_2O_6$	128	2	Tetragonal
Hg-1223	$HgBa_2Ca_2Cu_3O_8$	134	3	Tetragonal

Superconducting temperature, crystal structure and lattice constants of some cuprate superconductors

Resonating valence bond theory:

In 1971, Anderson proposed the RVB theory to explain high T_C superconductivity, particularly in cuprates. Valence bond is formed by two electrons, one up and one down to form a singlet, with spin 0. If we consider a lattice of atoms with spin ½ configuration at each site then the RVB state in the Hilbert space of many atoms is

$$|\psi\rangle=\sum|(a1,b1)(a2,b2)\ldots(aN,bN)\rangle$$

Where (M,N) represents singlets given by,

$$|M,N\rangle=\frac{1}{\sqrt{2}}(|\uparrow\downarrow\rangle+|\downarrow\uparrow\rangle)$$

The sum defines the RVB state of all possible arrangements. The singlets are formed considering nearest neighbor interaction among the atoms. The valence bonds can change their position giving rise to resonating valence bond or a quantum spin liquid.

Since the singlets are of spin zero and do not obey Pauli exclusion principle, they may be considered as Boson and can contribute to superconductivity. Unlike BCS theory, these singlets can exist in high temperature also.

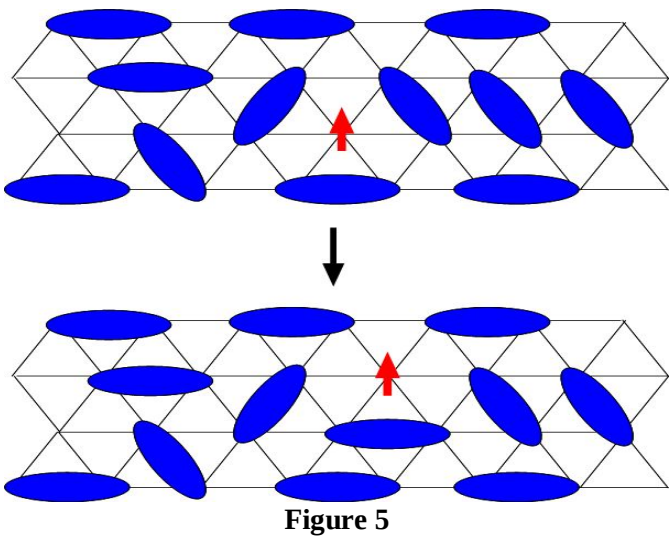

Figure 5

FIG 5: A graphical representation of RVB

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CONCLUSION

Though discovered over 100 years ago, the subject of superconductivity is still fascinating. The two challenges remaining are:

1) To find a material which can show superconductivity at ambient temperature

2) To develop a theory explaining high temperature superconductivity.

Till date a total of five Nobel prizes have been awarded in this field only, and several are waiting to be given. Since the cuprates are antiferromagnets in their ground state, a new found interest in magnetism has also been generated. May be the study of the ground state properties can enlighten us with the mechanism of hole doped superconductors. Beside the cuprates, scientists are experimenting with several materials applying high pressure to produce superconductivity at relatively high temperature. No doubt in near future we will observe many stimulating experiments trying to bring the critical temperature to the room temperature. The main problem of superconducting applications lies with the cooling costs, the invention of HTS may solve the problem. Major applications are expected in saving energy. It is beneficial to environment and healthcare also.. The greatest opportunity for HTS is to reduce the threats to the environment, by producing persistent electrical power, thereby reducing the use of fossil and hazardous nuclear fuels.

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HIGH VOLTAGE MARX GENERATOR USING MOSFET

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ABSTRACT
The main aim of the project proposes high voltage DC generation using Marx generator precept that uses MOSFET alongside capacitor stacks. The Marx precept turned into brought with the aid of Erwin Otto Marx. The system includes 10 stages such that everyone is made up from resistors , MOSFET in conjunction with capacitor. Resistor are used in capacitor charging at every stage and MOSFET is used as switches between capacitor. It is used to generate a high voltage pulse at the output with the smaller DC voltage. It uses cascading of charged capacitors in series to generate the output voltage ideally equal to the sum of voltages of all the capacitors connected in series. To charge the capacitors a DC voltage is applied with a series charging resistor and a diode to prevent discharge.

Keywords: Capacitor, MOSFET, Resistor.

INTRODUCTION
Marx Generator is an outlandish voltage generator. The imperative rule of Marx Generator is that the capacitors are charged in parallel as much as its data DC voltage compose. Those capacitors are then associated nonparallel the utilization of changes to give AN over the top voltage beat all through the weight innovation. With the development of solid state natural philosophy, solid-state devices became more and additional acceptable for periodical power application. they could supply the periodical energy systems with compactness, responsibleness, excessive repetition fee, and extended existence time. The rising of periodical electricity generators the usage of solid-state gadgets gets eliminate barriers of ancient additives, and guarantees periodical strength to be extensively used in business packages .However, strong-state switch devices inclusive of MOSFET to be had now are best rated up to three kg volts. most of periodical power systems demand of a lot of higher voltage rating. switch devices are important additives in periodical power systems. typical Marx Generator use spark gas switches. These switches possess barriers like short lifestyles time in terms of range of operation cycles, low switching frequency, immense length, additional maintenance and lots of others. In current strong country switches like MOSFET or IGBT is used in situ of spark gaps. The benefits of solid country switches are compact, reliable, bendy, more efficient, long lifestyles time, low charges and reduced losses. The output pulse breadth and amplitude every could also be varied by dominant the gate management pulses to the switches. Rapid discharge of keep energy in brief interval as electrical pulses into a load produces huge amount of instant power. The traits of pulse as rise time, fall time, pulsewidth, repetition charge, a voltage and strength tier varies with distinctive applications. High voltage periodical electricity have intensive kind of programs in exclusive fields like industrial, environment.

OBJECTIVE OF STUDY
1. The principle goals of Marx generator will be to create high motivation voltage with great productivity in high voltage research facility.

2.To provide an environment friendly power source.

3.Producing a big amount of energy and storing it to use later when the electricity shut down.

4.To make cheap and easy maintainable power source.

5.To produce low Cost high voltage DC generator.

Concept
Problem Definition:- In this mode of operation of the capacitor discharges from the impulse generator. The shape of the pulse is controlled by external impedances at the output of the pulse generator. When the voltage gets higher it’s difficult to get practical resistors with low parasitic inductance that will also stand the full impulse voltage. The usualremedy for this is to include the wave shaping resistors in the Marx generator. Physical size of the circuit components are huge. The six of the circle is bigger. This requires a high DC charging voltage.

Block Diagram :-

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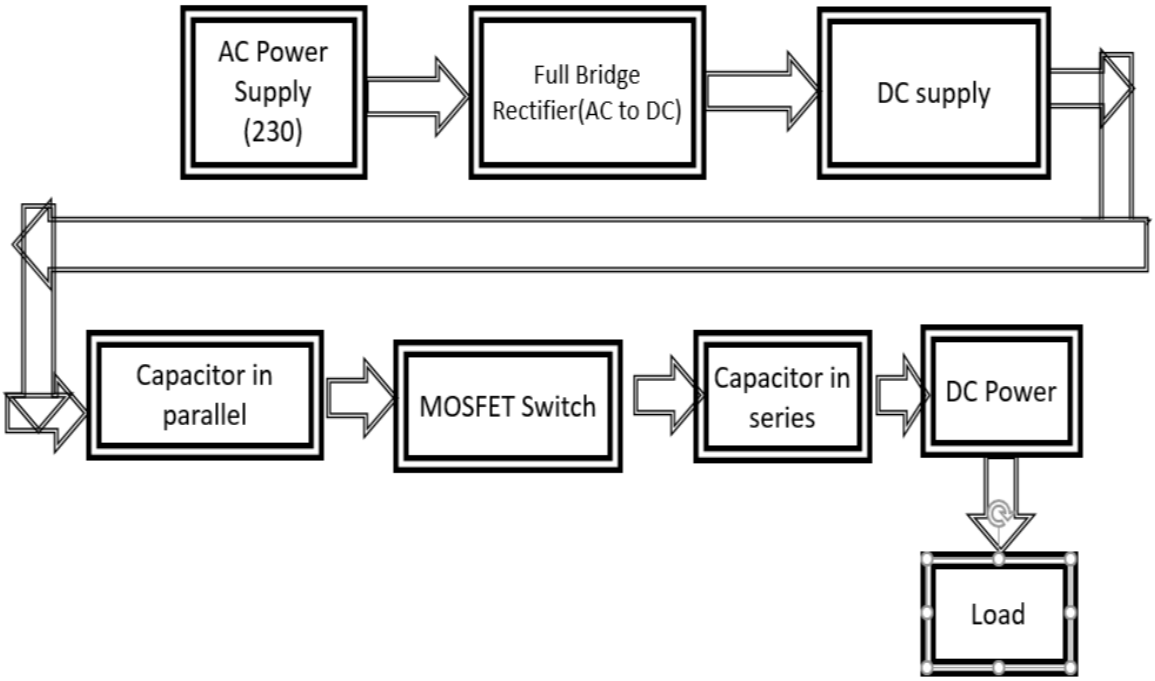

We need to generate the pulse greater 900v at the output by using 300V DC. We get 300V DC supply by using socket supply of 230V AC followed by a rectifier circuit. To generate voltage greater than 900V we use a 20 stage Marx generator. The capacitors full charge voltages will be near 50V each. The total stages are increased to compensate the losses. We will be using MOSFETs as the switches to connect the capacitors in series. We are planning to use IRF84 MOSFETs with external trigge .We will be using a 12v 30A relay at the charging and discharging side to control the operation . The number of stages is just calculated value at this point of time. They may vary according to the requirements in the final stage of implementation. The charging and discharging will be manually controlled by using the switches. The current required at the output will decide the capacity of the capacitors. Currently we are using0.1µF/50V capacitors. If load require more current, we can cascade the capacitors in parallel at every switch or we can use capacitors with higher farad ratings

Design Methodology :- • Number of stages=10 • Rectifier:- – MUR460-4Nos-Diode – Ultrafast Rectifier(Reverse recovery time) – Low leakage current

• Calculation of Rectifier:- Charging current=I = C ∗dv/dt If charging time =100ms Charging voltage=100v for capacitor of 470µF= 470 ∗ 10−6 ∗100/100∗10−6 I= 0.47A for 1 capacitor For 10 such I total = 0.47 ∗ 10 = 4.7Amp

• Rectifier:- – MUR460-4Nos-Diode – Ultrafast Rectifier(Reverse recovery time)

– Low leakage current

• Calculation of Capacitor:- C =(t∗V o)/(20%of V o)∗(R)

t=maximum pulse width=10ms

Output voltage=1000V

= Loadresistance = 1000Ω C =(10∗103∗1000)/((1000∗20)100 ∗1000)

C = 50 ∗ 10−6=50µF

We will use 10 stages, Cstage=50*stage=500µF

per stage Vstage =1000/10 = 100V Capacitor required = 470µf Numbers= 10

• Capacitor
Electrolytic type capacitor. – 0.1µF/50V – Longer life. – 10W leakage curren

• Calculation of MOSFET:- The voltage Across each MOSFET =100V Current through each MOSFET = 1A MOSFET choice = 25k2962,100v ,1A

• MOSFET:- – IRF840-20Nos-500V – Linear characteristics

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– High input impedance

CONCLUSION

Marx generator are used to provide high voltage pulses for the checking out of insulation of an electrical equipment such as massive strength transformers or Insulators use for aiding power transmission lines. The voltages applied can also exceed two million volts for a high voltage equipment of the Marx generators. Generated voltage is twice the provide voltage. The number of diodes and switches are reduced. Power loss reduction in capacitors charging process. Marx generator are effective device for efficient. The output voltage increment relies upon on the amount of stages. The switching units i.e., MOSFETS is replaced through way of the alternative devices. In this circuit we reap high voltage and low modern-day so in future we increase voltage as nicely as current.

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PLANT DISEASE DETECTION USING DEEP LEARNING (KRUSHIMITRA)

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ABSTRACT
Crop cultivation plays an essential role in the agricultural field. So, if plant leaf are affected by the diseases, it may affect the production as well as the economy of the country. To identify the plant leaf diseases at an ultimate phase is not yet explored. In order to find out which disease affect the leaf, the farmer need to contact the expert for the detection of disease. The expert provides the suggestions which is based on its knowledge and information whereas sometimes searching the expert suggestion is time consuming, expensive and may be not precise. Therefore, to resolve this problem, Image processing techniques can be used which provides the accurate and fast solution. In this project we have made a mobile application which uses MobileNet and Inception Model, enhanced convolutional neural network algorithms to predict the infected area of the leaves. A colour based segmentation model is defined to segment the infected region and placing it to its relevant classes. Our project is used to detect the leaf diseases of Potato and strawberry.

Keywords: plant disease, deep learning, neural networks

I. INTRODUCTION

In early days, the monitoring and analysis of plant diseases were done manually by the expertise person in that field. This requires tremendous amount of work and also requires excessive processing time. Also identifying plant disease incorrectly leads to huge loss of yield, time, money and quality of product.

Plant disease diagnosis through optical observation of the symptoms on plant leaves, incorporates a significantly high degree of complexity. Due to this complexity and to the large number of cultivated plants and their existing phytopathological problems, even experienced agronomists and plant pathologists often fail to successfully diagnose specific diseases, and are consequently led to mistaken conclusions and treatments.

To overcome this, we have proposed an mobile application ' Farmitra ' through which we can detect the plant leaf diseases and offer a corresponding treatment measures as well as the farmers can post a comment or issues in the forum. The Plant leaf disease detection is done by using image processing .Image recognition of plant diseases is to extract the characteristic feature information from the diseased regions in the obtained images by using image processing techniques, and then to achieve disease recognition by using pattern recognition methods such as neural networks.

Deep learning can be thought as a learning method on neural networks. Due to image recognition, the Farmitra app is able to identify the plant type-as well as the appearance of a possible disease. The Deep Learning Model we have proposed is the MobileNet and Inception Model, which are widely used Image Recognition models and with a greater accuracy rate of around 99.7% as compared with the other Deep Learning Models such as Vgg(95%) and Resnet(97%).

React native, an upcoming cross platform app development which provides optimal performance, simple user interface and support third party plugins makes a very efficient front-end. In our product we have built our front-end on react native so that the farmers find it easy to use.

India is an agricultural country and about 70% of the population depends on agriculture. Farmers have large range of diversity for selecting various suitable crops and finding the suitable pesticides for plant. Diseases on plant leads to the significant reduction in both the quality and quantity of agricultural products. Monitoring of health and disease on plant plays an important role in successful cultivation of crops and plant growth in the farm.

The image processing techniques can be used in the plant disease detection. A neural network learns how to extract features while training. CNN being a multi-layer feed-forward neural network, is the popular deep learning model. Image recognition of plant diseases is to extract the characteristic feature information from the diseased regions in the obtained images by using image processing techniques, and then to achieve disease recognition by using pattern recognition methods. Generally, the extracted features from the images of plant diseases include color features, shape features, texture features, and so on. It is very important to extract the effective characteristic features for the image recognition of plant diseases

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II. BASIC TYPES OF PLANT FAMILY

A. Monocot Family Plant

Disease identification can be determined on the basis of their type of plant family. There are mostly of two types of plant Monocot family plant and Dicot family plant. The Monocot family plant has various characteristics such as one seed leaf, leaf veins, seed leaf are straight and parallel, which are in absence of wood.

Fig.1. Leaf Blotch

1. Leaf Blotch: The leaf blotch has small oval and rectangular or in the form of irregular brown spots appear on leaves and will become dirty brown as Volume 6, Issue 3, March 2017 shown in Fig. 1. The disease is governed by use of Mancozeb pesticides.

Fig.2. Leaf Spot

2. Leaf Spot: Leaf spot causes greyish or whitish spots with brown boundary of various sizes which appear on the upper surface of leaves and the spots are greyish or whitish dark in the center. Due to leaf spot, leaves will get dry and died as shown in Fig. 2. The disease is only controlled by the use of Zineb or Bordeaux pesticides.

B. Dicot Family Plant:

Dicot family plant has significance such as two seed leaf, nested leaf veins and complex structured, woody as well as woodless. The examples of Dicot family plants are cotton, coffee, potatoes, tomatoes, beans, honeysuckle, roses, peppers, strawberry, etc. Cotton is selected to make textile products and yarn products in India. Different precautions and pesticides are available to control the cotton Diseases. The cotton plant diseases are mention in detail in the following section.

Fig.3. Bacterial Blight

1. Bacterial Blight: It is the most dangerous disease obtained in cotton plant which infects all the different parts of plant leaf as shown in Fig. 3. Because of bacterial disease about 10% to 30% are losses in cotton production. This specific type of disease affects during the development of cotton plant. And it also causes seedling blight, boll rot, black arm and leaf spot. This spots convert into brown spots on plant leaf. Bacterial Blight can be controlled and variety of pesticides are available such as Pseudomonas fluorescents and Bacillus subtilis.

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Fig.4. Fusarium Wilt

2. Fusarium Wilt: It is fungal disease as shown in Fig. 4. It affects the plant at any growing stage. Fusarium disease can causes the drooping of the older lower leaves, yellowing of the lower leaves, and followed by stunting of the plant and death of the plant.

Fig.5. Target Spot

3. Target Spot: It is disease formed tan to brown color spot that have concentric rings like a bull's-eye as shown in Fig. 5 affected plant may look healthy from the top view, so it is very important to inspect lower leaves, where the first spot usually seen. It will start with only a few spots whereas after that, the disease will progress with more affected, and it does not take so much time to spread all over on plant.
4. Leaf Curl: It can be caused by fungal or virus as well as it can easily visible as shown in Fig. 6. In view of leaf curl disease the development of plant leaf will stop and also it is an incurable disease.

Fig.6. Leaf Curl

5. Grey Mildew: This disease mostly found in middle aged or older aged plant and it looks like pale spot or irregular angular spots on leaf as shown in Fig. 7. Usually this spots are of 4-5 mm in diameter on the surface of plant leaf.

Fig.7. Grey Mildew

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C. Literature Survey

In the related works we came across, several Neural Networks were used for plant disease prediction like the basic Convolutional Neural Network(CNN) and other Artificial Neural Networks(ANN) like VGG, Alexnet and Resnet. In order to understand their accuracy levels and the losses incurred, these models were trained against our dataset. Numerous approaches have been proposed over the years.

In traditional systems approach for detection and differentiation of plant diseases can be achieved using Support Vector Machine algorithms. But the problem with SVM is that its not suitable for training large datasets as the complexity is dependent on the size of the dataset. Other drawbacks are that the training time needed is high and the accuracy is less. Another approach based on leaf images and using ANNs as a technique for an automatic detection and classification of plant diseases was used with K-means as a clustering procedure but that gives an accuracy of somewhere between 65% to 90%. As mentioned above, we tried the following models and these were our observations.

“Magnetization”, or “Magnetization, M”, not just “M”. If including units in the label, present them within parentheses. Do not label axes only with units. In the example, write “Magnetization (A/m)” or “Magnetization {A[m(1)]}”, not just “A/m”. Do not label axes with a ratio of quantities and units. For example, write “Temperature (K)”, not “Temperature/K”.

ACKNOWLEDGMENT

The objective are to ease farmers problems they are facing with their plants. The plant leaf image is usually captured in plain background to get accurate results. The algorithm was contrasted with other deep learning modules to increase accuracy of getting results.

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IMPACT OF OPERATIONAL DELAYS ON PROJECT OVERRUN IN MUMBAI REGION

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ABSTRACT
Delays occurs almost in every construction project and the significant of these delays varies considerably from project to project. Today in construction industry several challenges are faced by construction projects. Many of them directly affect the performance of project. This delay negatively affects economy, growth of infrastructure and the society at large. To improve performance of project it is important to study the delay factors which affect the success of project. The purpose of this study is to logically explore the delay factors of project and how these can be avoided or controlled. With the help of Questionnaire survey the construction delay factors were grouped into six categories of constraints. Using statistical tool T-Test is conducted to study the correlation of two ranking methods Relative Index Method (RII) with Importance Index IMPI. SPSS test results are compared with analytical results and it is found that both methods of analysis.

From the study is concluded that technical and financial constraints are ranked 1 and 2 respectively by the respondents and the T-test using SPSS tool is in agreement with the fact there is significant correlation between the ranks analysed using RII (relative Importance Index) and IMPI (Importance Index Method.

Keywords: *Delay factors, RII, IPMI, T-test*

6) INTRODUCTION
Construction projects claims, a "Delay" is the time during which some part of the construction projects has been extended or not performed due to an unanticipated circumstance. Delays can cause a number of changes in a project such as late completion, lost productivity, acceleration, increased costs, and contract termination. The party experiencing damages and the parties responsible for them in order to recover time and cost. However, in general delay situations are complex in nature. A delay in an activity may not result in the same amount of project delay. A delay caused by a party may or may not affect the project completion date and may or may not cause damage to another party. A delay may occur concurrently with other delays and all of them may affect the project completion date. The delay in dispute settlement has manifold effects such as it will give detrimental to the relationship between owner and contractor. Moreover, it will also contribute to the cost and time overruns. The most serious problem is it sends bad signals to foreign investors thereby slowing down the national progress. It is generally said that the contract language is considered difficult to comprehend and they are therefore a major source of disputes. Therefore, it is essential to identify the actual causes of delay in order to minimize and avoid the delays and their corresponding expenses**.**

7) REVIEW OF RESEARCH ON DELAYS IN CONSTRUCTION
Studies conducted by the researcher (Theodore, 2009) have made this (Fig 1) classification possible

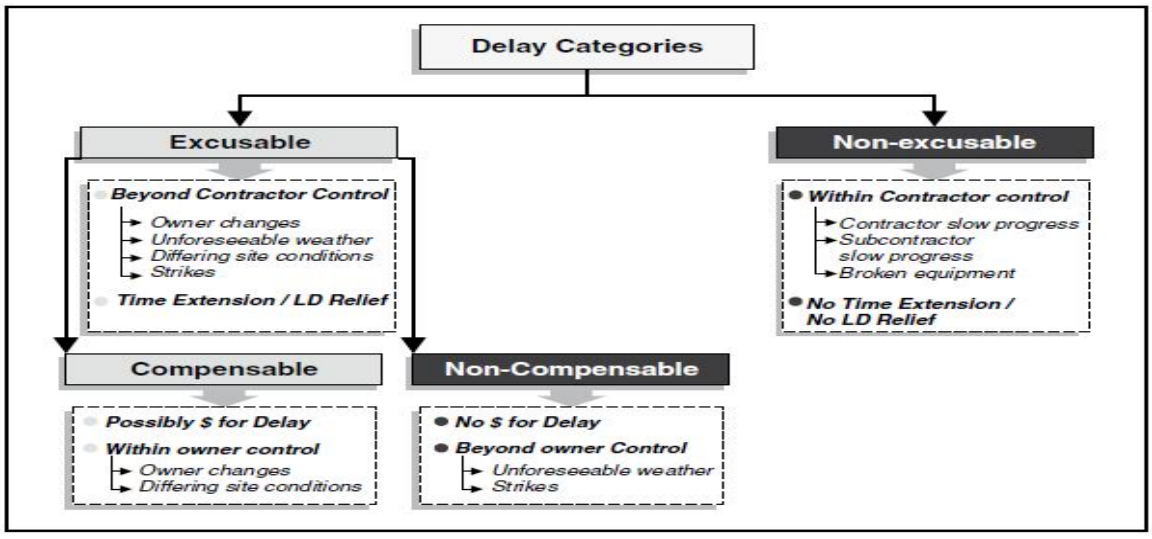

Figure 1 Classifications of delays in construction projects.

In the study of Alaghbari[1](2007), delay is generally acknowledged as the most common, costly, complex and risky problem encountered in construction projects. Because of the overriding importance of time for both the

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Owner (in terms of performance) and the Contractor (in terms of money), it is the source of frequent disputes and claims leading to lawsuits.

I.A Majid[2] (2006) stated that delays can be minimized when their causes are identified. Identification of the factors that contributed to the causes of delays has been studied by numerous researchers in several countries. Delay is a situation when the contractor, consultant, and client jointly or severally contributed to the non-completion of the project within the original or the stipulated or agreed contract period.(till here) J. Theodore[3](2009) studied the effects of construction delays on project delivery in Nigerian construction industry. The six effects of delay identified were: a) Time overruns b) Cost overrun c) Dispute

d) Arbitration e) Total abandonment and f) Litigation.

In the study of M.R Manavazhia,D.K Adhikarib[4] (2002) delays in the delivery of materials and equipment to construction sites are often a contributory cause to cost overruns in construction projects in developing countries. The actual impact of these delays on project costs was found to be on average, only about 0.5 per cent of the total budgeted cost of the projects.

III. METHODOLOGY

A questionnaire survey was designed based on the objectives of the study, which are causes of construction delays. Keeping in mind the scope of the work, common delay factors were identified. The preliminary data for this research was collected by a questionnaire survey. There were two parts of the questionnaire, Part A and Part B. Part A was about the respondent's personal information, If the respondent is a client, a consultant, a contractor or a subcontractor and number of years of experience in construction projects. Part B was about the information related to major constraints and factors of delay in construction projects of India. A survey was conducted through mails, personal interviews and using social media networks.

Iv. DATA COLLECTION

There are in total of fifty sets of survey questionnaire was distributed to the targeted respondent in order to identify the most important factors that cause delays. The survey questionnaires were distributed to the contractors, engineers and owners who take part in the construction site. The questionnaire was completed by experienced directors, project managers, projects engineers, site manager and designers. The total number of questionnaire distribution and responses has been analyzed and shown in *Table1*.

Table1 Respondent and Response data

Respondent group	No. Of distributed	No. of respondents	Response received (%)
Owners	10	3	12.5
Contractors	20	9	37.5
Engineer	20	12	50
Total	50	24	100

DATA ANALYSIS

The questionnaire was mainly based on Likerts scale of 5 ordinal measures from 1 to 4 according to (5) = strongly Agree (4) = Agree 3= neutral (2) = Disagree (1) = Strongly Disagree. Two methods of ranking the factors based on responses of the stakeholders was considered

ci) Relative Importance Index (RII)

cii) Importance Index (IMPI)

Method 1: Relative Important Index (RII)

To determine the ranking of different factors from the viewpoint of contractors and consultants, the Relative Importance Index (RI) was computed as:

$I = \Sigma Wi * Xi / \Sigma xi$

Where:

i = response category index

Wi = the weight assigned to ith response = 1, 2, 3, 4, 5, respectively.

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Xi = frequency of the ith response given as percentage of the total responses for each factors

Method 2: Importance Index Technique (IMPI)

In this technique two criteria namely frequency of occurrence and degree of severity. Both of these are categorised on a five point scale.

Frequency Index (F.I)

Frequency of occurrence is categorised as always (5), often (4),sometimes (3) and rarely(2)never(1)

This is a formula which is used to rank the causes of delay based on frequency and occurrence.

FI=a (n/N)*100/5

Where, a=constant expressing weighing given to each response.

n=frequency of response

N=total number of response.

4. **Severity Index (S.I)**

Degree of severity is categorised as extreme (4), severe (4), great (3), Moderate (2) and little (1).

(S.I) (%) = Σ a (n/N) * 100/5

Where a=constant expressing weighting given to each response (ranges from 1 for little up to 5 for extremely severe, n is the frequency of response and N is the total number of response.

5. **Importance index**: The importance index of each cause is calculated as function of both frequency and severity indices, as follows:

Importance Index (IMPI) (%) = [F.I. * S.I.]/100

Where, FI=Frequency index (%)

SI=Severity index (%)

Based on above calculations, different groups are ranked on delay factors grouped in six groups.

Table 2 Delay factors categorized as social factors and their ranking

Delay factors	RII	RANK	IMPI	RANK
Lack of effective communication.	75.8	5	57.45	5
Slow decision making.	72.5	6	52.56	6
Mismanagement by contractors	83.3	3	69.38	3
Conflicts in works schedule.	85	2	72.25	2
Contractual relationships.	83.3	3	69.38	3
Late communication from clients	78.3	4	61.30	4
Political influence	75.8	5	57.45	5
Social influence	69.2	7	47.88	7
Negligence	67.5	8	45.56	8
Dispute	85.8	1	73.61	1
Religious factors.	53.3	9	28.4	9
Possible prejudices.	72.5	6	52.56	6
AVG	75.1		57.25	

Similar analysis is done for other five groups of constraints and summarised as in Table 3.

Table 3 Ranking of constraints

CONSTRAINTS	RII	RANK	IMPI	RANK
Technical	80	1	58.77	3
Financial	79	2	63.97	1
External	77	3	58.91	2
Legal	76	4	58.33	4
Social	75	5	57.25	5
Material	72	6	53.25	6

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Hypothesis testing
The null and the alternate hypothesis was framed as followed and using analytical and SPSS tool was used for testing the Ho: Null Hypothesis

There is NO significant correlation between RII and IMPI for Material constraints.

Ha: Alternate Hypothesis
There is a significant correlation between RII and IMPI for Material constraints.

Two tailed T-Test is carried out test the hypothesis ,as sigma0.0001 is less than 0.05 significance level, Null hypothesis is rejected.

Similar hypothesis testing was done for all remaining constraints and it is found by the Two tailed T-tests there is significant correlation between the RII and IMPI for each group of constraints

Group 1- Social Constraints

T Test

T-test pairs=IMPI with RII (paired)

/criteria=ci(.9500)

/missing=analysis.(pair: IMPI and RII)

Table 4 Group 1- Social Constraints

Paired Samples Statistics					
Mean	**N**	**Std. Deviation**	**Std. Error Mean**	**Mean**	**N**
Pair 1	IMPI	57.3150	12	13.15683	3.79805
	RII	75.1917	12	9.24136	2.66775

Table 5 Paired Differences

Paired Differences					t	df	Sig. (2-tailed)
Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
			Lower	Upper			
-17.8	4.015	1.159	-20.42792	-15.32541	-15.422	11	.000

Table 6 Paired Samples Correlations

Paired Samples Correlations				
		N	**Correlation**	**Sig.**
Pair 1	IMPI & RII	12	0.997	0.000

C. ANALYTICAL METHOD FOR HYPOTHESIS TESTING

Two types of hypothesis testing **(for Material constraints)**

Ho: Null Hypothesis

There is NO significant correlation between RII and IMPI for Material constraints.

Ha: Alternate Hypothesis

There is a significant correlation between RII and IMPI for Material constraints.

Select Distribution (Matching two pairs RII and IMPI)

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T-statistic is given by: $t_{cal} = \frac{\acute{D} - 0}{\frac{\sigma diff}{\sqrt{n}}}$

Where, Mean Difference $\acute{D} = \frac{\sum Di}{n}$

Standard Deviation of Differences $\sigma diff = \sqrt{\frac{\sum Di^2 - (\acute{D}^2) \times n}{n-1}}$

Table 6 Tabulated value of T-statistic

Constraints	RII (Xi)	IMPI (Yi)	Di= Xi − Yi	Di^2
1	0.733	0.537	0.196	0.038
1	0.742	0.551	0.191	0.036
1	0.716	0.513	0.203	0.041
1	0.725	0.526	0.199	0.040
1	0.729	0.533	0.196	0.038
Total			**0.985**	**0.0193**

D.F (Degree of Freedom) = n – 1

= 5 – 1

= 4

Level of Significance = 5% = 0.05, Hence, t_{tab} = 2.776,

calculated value of T-statistic: Mean Difference $\acute{D} = \frac{\sum Di}{n}, \frac{0.985}{5} = 0.917$

Standard Deviation of Difference $\sigma diff = \sqrt{\frac{\sum Di^2 - (\acute{D}^2) \times n}{n-1}}$

$= \sqrt{\frac{0.193 - (0.917^2) \times 5}{5-1}}$

= 0.016

Hence, T-statistic, $t_{cal} = \frac{\acute{D} - 0}{\frac{\sigma diff}{\sqrt{n}}}$

$= \frac{0.917 - 0}{\frac{0.016}{\sqrt{5}}} = 5.45$

$t_{cal} > t_{tab}$

Hence, we fail to accept the null hypothesis; this result is same as that obtained using SPSS T-test.

8) THE AIM OF THE STUDY WAS TO IDENTIFY THE DELAYS THAT MAKE THE PROJECTS (RESTRICTED TO MUMBAI) OVERRUN IN TERMS OF TIME AND COST **CONCLUSION**

1. . The questionnaire was distributed to 50 different stake holders of the construction Industry. We as a team visited 24 actual working project sites and studied the actual working and the through questionnaire, which was compiled from literature survey, collected the response on delay factors,
2. The forty five delay factors were then grouped into six constraints namely social, financial, external, material, technical and legal.
3. Delay factors of each constraint group were ranked based on two indices RII and IMPI.
4. Hypothesis testing was carried out using T-test using software tool SPSS and analytical method of statistical T test.
5. For each constraint hypothesis test carried based on null and alternative hypothesis.
6. Ho : There is no significant correlation between the ranking indices RII and IMPI
7. Ha : There is significant correlation between the ranking indices RII and IMPI

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8. For each constraint analysis using paired T-test analysis it was found that we fail to accept the Null hypothesis. as (sigma p <0.05) at 95 % confidence level and alternate hypothesis accepted.
9. Analytical method indicate calculated was higher that' 't" tabulated, indicating Null hypothesis had failed and hence for each constraint analytical analysis was matching with software analysis.
10. Based on the study It was found financial and technical constraints were the top ranked delay factors by stake holders and it was proved that there is significant correlation between IMPI and RII for all six groups of constraints
11. It is recommended delay factors under each of these constraint groups, specially the two top most ranked constraints encompassing delay factors need to be given importance and preventive measures are to be taken by the industry stake holders to minimise or eliminate the delays so as to improve the efficiency of the project.

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IMPLEMENTATION OF VANET

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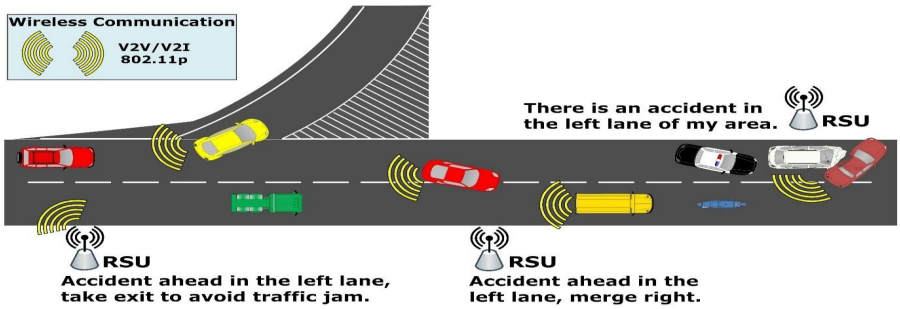
ABSTRACT
In VANETs, the vehicles and the environment communicate with each other using wireless sensors and On-Board Units (OBUs). This is useful as packet senders, receivers and routers that helps the vehicles to send, receive and forward packets to Road Side Units (RSUs). This kind of apparatus and devices cause wireless communication over small distances and can transfer kinematic data of vehicles to each other. VANET vehicles contain special dedicated hardware for this system which also includes Global Positioning Systems (GPS). Effective, reliable and timely communication is possible due to the fixed devices i.e. RSUs which is installed in specific locations so as to optimize the motive. RSUs uses IEEE 802.11p wireless communication to communicate over short ranges. The possible vehicular communication configurations in intelligent transportation system (ITS) include vehicle-to-vehicle (or inter-vehicle), vehicle-to-infrastructure and routing-based (RB) communication. Vehicles can directly establish communication wirelessly with one another forming V2V communication or with fixed RSUs forming V2I communications. These communications heavily rely on the real time data of kinematic states of vehicles and time message sharing between vehicles and Road Side Units (RSUs). To achieve this aid of GPS and other intelligent systems is required. Also, to achieve efficient and reliable communication, we need cross network protocols which are secure and can safely deliver packets, as its very important for the system to be safe from attacks or else the safety of people and property is on serious risk.

Keywords: VANET, V2V, V2I, Road Side Unit, AdHoc Networks, MANET.

I. INTRODUCTION
Rapid development of wireless communication has paved the way for transport and many other fields for mankind. Due to reckless driving and many other non-foreseen circumstances, the world now observes death of approximately 1.2 million people per year and more than 50 million people get injured and moreover the count is still increasing! According to stats it is estimated that these figures will increase by 60% in coming time if not taken proper action now. In VANET, vehicles can connect to each other and to internet wirelessly. VANETs can be considered a subset of MANETs (Mobile Ad Hoc Networks) wherein each node moves freely, that is there is no space constraints for the nodes. Whenever the nodes change their locations, they get connected and remain connected to VANET till they are in that region, this makes VANET a very dynamic topology. There are two methods by which the nodes can connect, these are single hop and multi hop. Each node in VANET is either vehicle or Road Side Unit (RSU). Communications in VANET are divided into two categories: Vehicle to Vehicle (V2V) communication, and Vehicle to Infrastructure (V2I) communication. In V2V, vehicle can communicate with other vehicles and it involves sending and receiving messages to or from other vehicles. V2I takes place when vehicles communicate with RSU. These helps in different applications to improve road safety and efficient transportation.

II. How VANETS Work?
As we know, VANET is formed by nodes and today these nodes are very large in number. In todays world, there are approximately 800 million vehicles. The nodes can communicate using radio signal and the range of communication is 1 km. Vehicles farther than the mentioned range need to use hop method to send or receive signals. Routing job is done by an RSU, it plays as a router between vehicles. However, the following figure shows the VANET structure. In order to connect vehicles with RSU using radio signals, each vehicle must be equipped with an On-Board Unit (OBN). Tamper Proof Device (TPD) is a device that holds all vehicle secrets such as driver identity, speed, and position.



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III. Aim of the Project

In today's busy world with traffic and accidents happening around, we need a technology which can help assure safety of humans.

In our project we will demonstrate the use of VANET by glowing the LEDs when an Ambulance approaches a section of the road. Our idea here, is to let the road vehicles know about the approaching ambulance on the emergency lane.

Any emergency vehicles arriving on the emergency lane at a distance will signal the other vehicles to leave the lane immediately.

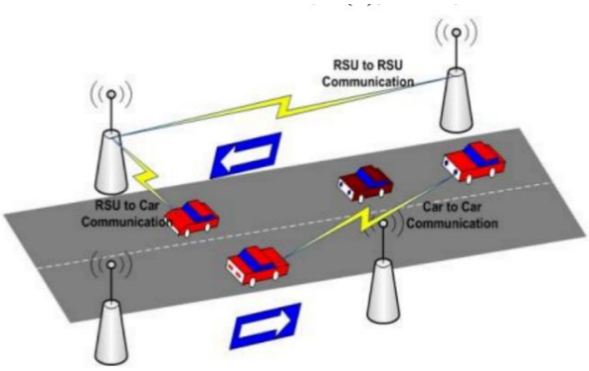
IV. Demonstration

First things first, the actual range of a Wi-Fi would span over a kilometer. Since, we have a limited space to demonstrate our project, we will leave the Emergency Vehicle Wi-Fi Module disconnected so as to represent that the vehicle is far enough and haven't yet connected to the RSU (Road Side Unit). Similarly, connecting the module depicts that the vehicle is in the range of RSU.

When an emergency vehicle comes in an RSU range, it gets connected to the Wi-Fi of RSU and the RSU then glows the LEDs and hence highlighting the emergency lane for the other vehicles to come to know about the emergency vehicle.

It is important to note here that the concept of VANET is quite large to be demonstrated in Mini Projects, hence we are demonstrating it by glowing the LEDs.

In reality, the emergency vehicle will directly communicate with other vehicles and send them a message to leave the lane.



V. Theory of the Project

The project consists of two ESP8266 Node MCU chips for Wi-Fi connectivity and some LEDs to glow when the two Node MCUs get connected.

ESP8266:

The ESP8266 is a low-cost Wi-Fi microchip with full TCP/IP stack and microcontroller capability produced by manufacturer Espressif Systems in Shanghai, China.

The chip first came to the attention of Western makers in August 2014 with the ESP-01 module, made by a third-party manufacturer Ai-Thinker. This small module allows microcontrollers to connect to a Wi-Fi network and make simple TCP/IP connections using Hayes-style commands. However, at first there was almost no English-language documentation on the chip and the commands it accepted. The very low price and the fact that there were very few external components on the module, which suggested that it could eventually be very inexpensive in volume, attracted many hackers to explore the module, chip, and the software on it, as well as to translate the Chinese documentation.

The ESP8285 is an ESP8266 with 1 MiB of built-in flash, allowing for single-chip devices capable of connecting to Wi-Fi.

The successor to these microcontroller chips is the ESP32, released in 2016.

VI. Features of Node MCU

High Durability:ESP8266EX is capable of functioning consistently in industrial environments, due to its wide operating temperature range. With highly-integrated on-chip features and minimal external discrete component count, the chip offers reliability, compactness and robustness.

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Power-Saving Architecture
Engineered for mobile devices, wearable electronics and IoT applications, ESP8266EX achieves low power consumption with a combination of several proprietary technologies. The power-saving architecture features three modes of operation: active mode, sleep mode and deep sleep mode. This allows battery-powered designs to run longer.

32-bit Tensilica Processor
The ESP8266EX microcontroller integrates a Tensilica L106 32-bit RISC processor, which achieves extra-low power consumption and reaches a maximum clock speed of 160 MHz. The Real-Time Operating System (RTOS) and Wi-Fi stack allow about 80% of the processing power to be available for user application programming and development.

Compactness
ESP8266EX is integrated with a 32-bit Tensilica processor, standard digital peripheral interfaces, antenna switches, RF balun, power amplifier, low noise receive amplifier, filters and power management modules. All of them are included in one small package, our ESP8266EX.

VII. Hardware Requirements:

ESP8266 NodeMCU X 2

Male-Female/ Male-Male / Female-Female Jumper Wires

Toy Cars (For demonstration purpose)

LEDs

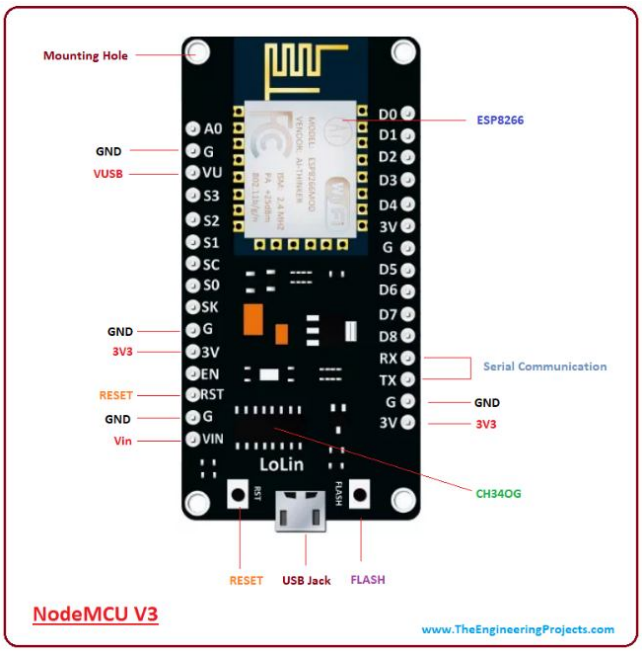
Cardboard

VIII. Software Requirements:

Operating System: Windows 7/10

Arduino IDE

ESP8266 Module



IX. CONCLUSION

As use of VANET increases, there will be a rise in intelligent transport vehicles. This network has got a quite attention due to its excellent traffic management and road safety. Research has been made to improve the protocol, range and thus efficiency and security. Security is given topmost priority in VANET since it is very difficult to provide security to such a dynamic topology system. In spite of the development of VANET system security is still not up to the mark due to the reason discussed earlier. Till now, we haven't found the security measures that can work efficiently and provide minimum overhead. The users, however, will demand privacy which is another challenge for the system since it will only increase the complexity of the system. Hence, the

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door of research is always open in this area. The current major challenge is how to attain a balance between security, privacy, and usability while ensuring a fewer overheads. It has been suggested that, there should be a security framework designed such that it includes all the desired security measures and produce least overhead and at the same time make the system well secured.

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INDOOR POSITIONING SYSTEM WITH NAVIGATION

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ABSTRACT
Every year, new technologies are introduced and improved where positioning service is one of the widely growing technology in the modern world. Positioning services are used in mobile applications for navigation and advertising. The outdoor navigation is based on GPS, whereas for indoor navigation devices are used to pass a signal through an interface which is much tougher challenge. Devices used for passing signals are Bluetooth, Wi-Fi and other sensors. The IPS helps the people to reach the destination on its own. The application gets the input from the user about its starting point as well as the destination. Then the application provides the shortest path to reach the destination. As the user walks on the path the user pointer starts moving i.e. its shows the remaining path to the destination. This pointer moves as the user device gets connected to the beacons or sensors. When the user pointer and the destination pointer meets then the application shows that the user is reached to its desired destination. This application is also helpful to the people with speaking and hearing disability. The application is less time consuming as it provides the shortest path to its destination and gives the real time navigation with positioning accuracy.

Keywords: Positioning Services, Sensors, Less time consuming, Accuracy, Real time navigation.

INTRODUCTION
Complex layout of buildings are difficult to understand some time new visitors find their way quickly, in malls, airports, university campuses etc. When new visitors entered in such complex layout, visitors are not able to find their path easily. So that's why we need of Indoor Positioning and Navigation application for finding the paths in complex layout buildings. Simple floor maps are not understood by most of people, and it is difficult to change when some information is changes on them. Indoor positioning and navigation application database are easily maintained when changes are introduced. Indoor positioning and navigation application helps to locate and guide the visitor to navigate through campus using their mobile devices. Now-a-days everyone uses smartphones for high accessibility; these devices thought to use sensors that are now found in present day in advanced cell phones. Sensors like Wi- Fi, Bluetooth, Gyro sensors, Accelerometer, Wi-Fi, Bluetooth, and compass.

In this research, we have focus on Bluetooth particularly Bluetooth low energy beacons. Bluetooth uses low energy and gives perfect accuracy for the distance measures compare to the other devices like Wi-Fi and Bluetooth. At present in every mobile phone these days we can easily use Bluetooth for Indoor positioning and navigation application. GPS is not useful for indoor positioning system because GPS is the satellite based positioning system. The building structure distorts and absorbs the signals. That's why we use new technology and techniques that had to be developing for indoor environment. For example Wi-Fi, Bluetooth, ultrasound, infrared based positioning. GPS uses the triangulation method for determine the location using radio signals GPS receiver measures the distances to satellites. The signal received from two or three different points. Triangulation is sometimes used in cellular communications to determine a user's geographical.

OBJECTIVE OF STUDY
1. To decide the position of a person in an Indoor Environment.
2. To guide a person, inside an unfamiliar building, from place to another.

For tracking any person or finding path to reach our destination we use GPS in outdoor environments but it is not possible in indoor environments because GPS signal are weak to penetrate the walls and roofs of buildings.

That's why we use new techniques to find the path and position of any person in indoor environment using Bluetooth technology with the help of Indoor positioning and navigation application.

When new visitor enter in new indoor environments that visitor nothings knows about the environment so it is difficult to find destination and also its own position in that indoor environment so With the help of this application visitor can easily find their destination and its own position in indoor environment.

RESEARCH METHODOLOGY
Navigation systems can be distinguished by their field of application and the technologies used. Indoor navigation systems provide a route for the user inside buildings. You have to take individual levels into account

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and signal loss due to various interferences in internal navigation. The system based on internal positioning systems are firstly built in USA using the same concept of GPS. The application is widely used in the modern world. Countries like Malaysia, Sweden, Japan, China and many other countries uses the indoor positioning services in Hospitals, Airports, Stations, Malls and many other places.

We studied previous years research papers in that we studied about Indoor Positioning system they have used Wi- Fi or Bluetooth beacons. And according to their study Wi-Fi gives us more range compare to the Bluetooth beacons but the accuracy of Bluetooth beacons is more compare to the Wi-Fi. Bluetooth beacons consume less battery as compared to Wi-Fi. Also there are other sensing devices which sends signal to the user device works similar to other devices. Bluetooth beacons is more useful in the indoor positioning system but the installation of beacons is quite costly compared to other sensors.

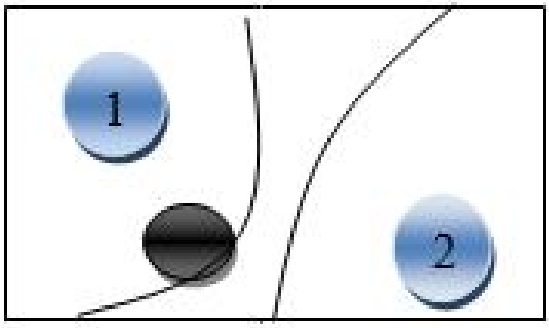

Fig 1. Bluetooth technique for accuracy

The figure 1 shows the two Bluetooth devices provides signal to their maximum range. If a user is detected in the range the user can connect to the device and get their location. The figure also shows that more the number of devices more the position is accurate.

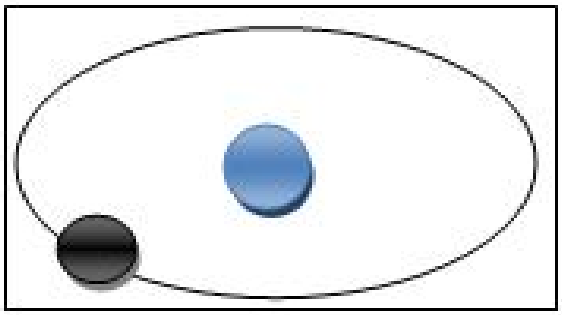

Fig 2. Wi-Fi technique for accuracy

The figure 2 shows the Wi-Fi device providing signal to a large area. If the user gets detected in the Wi-Fi range the user gets connected to the signal and get their location, but as the user moves the accurate position is not provided as the range is larger than that of Bluetooth.

PROPOSED ARCHITECTURE

Indoor positioning and navigation application can be used by the visitor who are new for the indoor environment. Such as large buildings, malls, railways, airports, university campuses, etc. All these buildings cover more areas and therefore, it becomes a challenge for visitors to find the way quickly.

Indoor navigation application helps to locate and guide the visitors to navigate through the campus using their mobile devices. So, in our project we are going to use Bluetooth beacons i.e. BLE that advertise the signals from the beacons that are the base of the indoor navigation system. Basically our Architecture has different components.

1. Android Application

Android Application recognize BLE advertising signals Ray from the beacons to determine the location and finding path destination into the map which is uploaded into the database .Once the destination is detected from the map it will show the path from visitors source to destination. The application provides the shortest path to reach the destination which makes it less time consuming. The application is user friendly so that the people with disability can also get benefitted.

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2. Beacons

Beacons BLE device which allows mobile devices to understand position. It work as signal transmitting channel which is carried by batteries. As the beacons are functional through Bluetooth, it consumes less battery compared to Wi-Fi. Beacons repeatedly transmit a single signal that other devices can detect the signal.

3. Bluetooth low energy

It is a wireless personal area network used for transmitting data over short distances. Smartphone and beacons communicate using this technology.

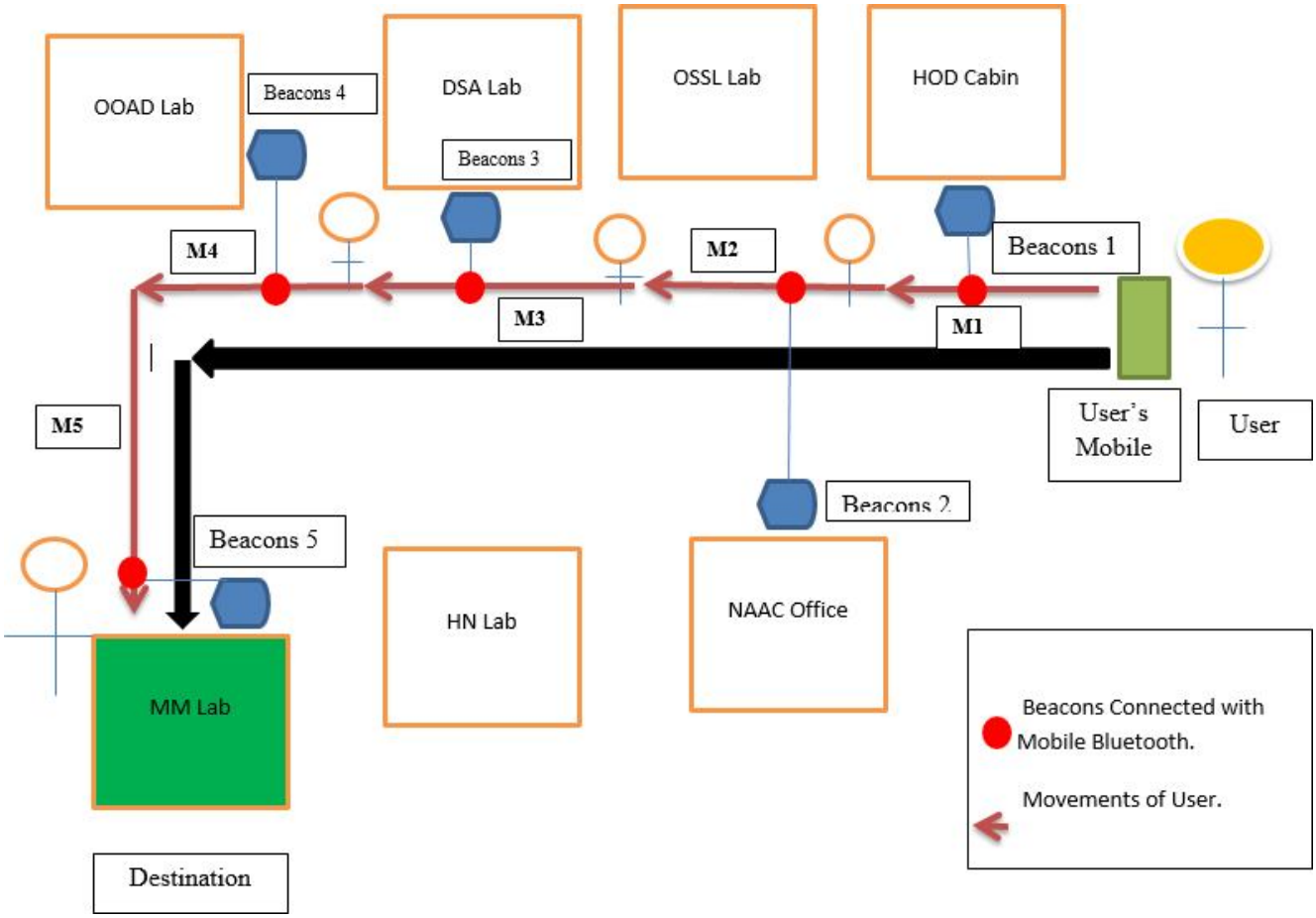
4. SQLite Database

SQLite is an open source SQL database that stores data in a text file on a device. Android comes with the implementation of the integrated SQLite database.

SQLite supports all the features of the relational database. SQLite is an autonomous transactional SQL database engine, without server and zero configuration.it does not have separate server process. Hence, SQLite is a good option for Data storage in smartphones.

- Firstly the user have to download the application from the Google Play Store or IOS Once the user installed the application he/she had to login to the application if he/she doesn't have account he will have to register once the Registration process is done he have to update his source and have to give the destination address.
- We take an example of Computer Department of Our College, inside the campus in Computer Department there are many labs such as Head of Department Cabin, NAAC office, OSSL Lab, MM Lab, etc. The Beacons are placed at several location that is outside of the labs inside the campus. Placement of the beacons device is very important step to ensure that the desired accuracy is achieved in navigation. Beacons will constantly broadcast the signal with a unique identifier to the nearby mobile devices.
- The Mobile application in the smart phone will first locates user location through GPS and then uses beacons signal for navigation. Mobile devices can approximately determine their distances to the beacon via quality of signal strength. Beacons transmit the signal to smart phones using BLE.

Figure-3: Proposed Architecture of IPS



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Based on the strength of the BLE advertising signals received by mobile device distance is estimated. A routing algorithm calculates the optimal path from user location to the destination. API gives the approximate distance to a beacon in meters.

When the user moves forward he will be connected to the nearest Bluetooth beacon as soon as he/she will be connected to the beacons he will get the further navigation path to reach to the destination. In this way, it is possible to determine the user's location and continuously navigate them inside the campus.

Mobile application not only helps user to know their position but also help them to find the route to their destination inside the campus. Thus indoor navigation system can be used to provide better experience to user.

CONCLUSION

As the idea of the project was initialized, the project was an IOT based which works only in the parking slot of a mall, but as the information was gathered than the idea brought us to the next level which can be used in most of the sectors like college campus, hospitals, shopping malls, airports and many more. As people may not visit such places regularly, it is useful for the people to know the environment of the surroundings. The project is an android application which is user friendly that helps the user to reach their destination on their own as well as quickly. The application is also used for the people with disability, as it makes the user to understand the application easily. The people visiting places like malls, college campuses and many other places in other countries may not understand the language, so the people can use this application to navigate themselves to their destination.

As the project was initiated and implemented, we studied about android studio application with React Native framework which works on React i.e. a Java Script library, Node JS which is just an environment for JavaScript that handles the backend functions.

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LITERATURE REVIEW ON: THE ELECTRIC BIKE

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B.E students[1,2,3,4] and Assistant Professor[5], Theem College of Engineering Boisar(E)

ABSTRACT
An electric bicycle also known as an e-bike is a bicycle which use an electric motor for propulsion. there are various kinds of e-bikes are available through the world, from e-bikes that only having a small motor to assist the rider's pedal-power (i.e. pedelecs) to more powerful e-bikes which are as same as a moped-type functionality. All retain the ability to be pedaled by the rider and are therefore not electric motorcycles. E-bikes uses a lighter weight battery which can be recharged easily and help to travel up to 25 to 32 km/h (16 to 20 mph),which is to be depended on local laws, while the more high-powered varieties can often touch the speed limit of 45 km/h (28 mph). In some markets, such as in Germany as of 2013, they are gaining in popularity and taking some market share away from conventional bicycles, while in others, such as China as of 2010, they are replacing fossil fuel-powered mopeds and small motorcycles. Depending on local laws, many e-bikes such as pedelecs are legally classified as bicycles rather than mopeds or motorcycles. This frees them from the more stringent laws regarding the operation of more powerful two-wheelers which are often classified as electric motorcycles. E-bikes can also be defined separately and treated under distinct electric bikes laws. E-bikes are the electric motor -powered versions of motorized bicycles, which have been in use since the late 19th century.

Keywords: BLDC motor, controller, batteries.

I.) INTRODUCTION
An e-bicycle is one with an electric motor (attached to the bottom bracket or front wheel) that assists the rider with their pedalling. This means that while you're still getting a workout – and enjoying the scenery – you don't need to pedal nearly as hard, especially up hills. The electric vehicles industry is continuously evolving. One type of such electric vehicle is the electric bicycle (e-bike). E-bikes typically incorporate a battery, which can be charged at an ordinary domestic power socket, linked to an electric motor in the bicycle transmission system. The rider have the power to controls the output power from motor i.e speed using a handlebar mounted computer display panel and controller. The term 'e-bike' is generic and includes a combination of different electrically powered two-wheelers some of which function by simply turning a throttle. Electric bicycles, like other electric vehicles, use a BLDC motor. Main reason to identify the need of finding and modifying E-Bike is to overcome the issue of the pollution because of vehicles in metro towns & urban zones is swelling uninterruptedly. Considering the all class of society it is not reasonable for all to purchase (scooters, mopeds or motorcycles). So, combining both issues, environmental progress supporting and economical affordable alternative would be the best solution. In the modern days, the primary concern of government is to find out a way by which we can minimize consumption of fossil fuel and promote the use of electric vehicle our daily life. However, there are certain barriers while adopting these latest technology in our daily life.

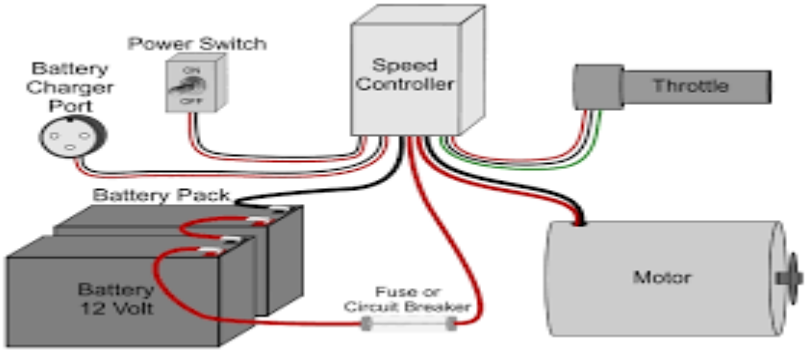

FIG.1 Major components of e-bicycle

INSTRUMENT SPECS
Some important parts required for propulsion of e-bikes are: a.)Motor, b) Battery, c) PIC Controller

a.)Motor
In e-bicycles brush less DC (BLDC) motors are to be used which consists of armature windings on the stator permanent and magnets on the rotor. The stator of this BLDC motor consists of stacked steel laminations with

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windings placed in the slots and these stator winding can be arranged in two patterns i.e. a star pattern or claw pattern. The major difference between the two patterns is that the star pattern gives high torque at low RPM and the delta pattern gives low torque at low RPM. There are many advantages of BLDC motor such as better speed versus torque characteristics, high dynamic response, better efficiency, long lasting operating life, noiseless operation, higher speed ranges.

b.)Battery

E-bikes use rechargeable batteries, electric motors and some form of controller. Battery systems in use include sealed lead-acid. battery or lithium ion battery vary according to the voltage, total charge capacity (amp hours), weight, the number of charging cycles before performance degrades, and ability to handle over-voltage charging conditions. The energy costs of operating e-bikes are least, but there can be battery replacement costs. The lifespan of a battery pack varies depending upon the type of usage. Not exhibiting discharge/recharge cycles will help extend the overall battery life. The range is a key consideration with e-bikes, and it is affected by factors such as motor efficiency, battery capacity, efficiency of the driving electronics, hills and weight of the bike and rider itself.

c.) Controller

Here we use controller to control the electric bicycle system. In this electric bicycle system, some components are installed such as brushless dc motor; PIC controller and battery are required to the controller for controlling different component of electric bicycle system. There are different functions of this controller such as under voltage protection, over current protection, control power supply, also to drive and control the Brushless dc motor. There are different signal was transmitted to pin of PIC controller to drive and control brushless dc motor, such as current detection signal, motor speed control signal, capacity detection system

II.) PROBLEM DEFINATION

In coming future days the main objective of the government is to find out a way by which we can minimize use of fossil fuel and promote the use of electric vehicle in our daily life.

III.) LITERATURE REVIEW

Duarthe.M.Souza, et.al-[1] In this paper, a traction system useful for an autonomous Electric Vehicle of individual use is described. The developed system is constituted in a first approach by two different power sources: one is constituted by batteries or by fuel cells, and the other by super capacitors. This paper describes a technical solution joining and accomplishing the usage of two energy storage systems in the same traction system. Kunjan shinde, et.al-[2] This paper details about the Electric Bike which runs on the battery thereby providing voltage to the motor. This paper compromises with design and fabrication of Electric Bike which makes use of Electric energy as the primary source and solar energy if possible by attaching solar panels. It also highlights on the design aspects of the bike. There is a provision for a charging the battery by ejecting it from the main system. The electrical power generated which is used to run the bike can give better fuel economy compared to conventional vehicle, better performance and also causes less pollution. Mitesh M. Trivedi, Manish K. Budhvani, et.al-[3]The main purpose of this research is to review the current situation and effectiveness of electric bicycle researched by various researchers. In order to approach this purpose, following objectives are specified: i. To maximize the speed and efficiency. ii. To optimize the cost. Objective of this paper to was to explore the acceleration and speed of orthodox and electrically powered bicycles under truthful statuses. Authors distinguished between electric bicycles which deliver provision up to 45 km/h (as known as S-pedelecs) and 25 km/h (speed of pedelecs).Chris Keifer, Frauke behndehrt. et.al-[4] Title “Smart e-bike monitoring system”: Real-time open source and open hardware GPS assistance and sensor d eta for electrically-assisted bicycles. The smart e-bike monitoring system (SEMS) is a platform for the real-time acquisition of usage d eta from electrically-assisted bikes (also called pedelecs or e-bikes). It is autonomous (runs off the bike battery), replicable (open source and open hardware), scalable (different fleet sizes) and modular (sensors can be added), so it can be used for further research and development. The system monitors location (global positioning system), rider control d eta (level of assistance) and other custom sensor input in real time. The SEMS data feeds an online interface for data analysis, for riders to view their own d eta and for sharing on social media. Chuanxue Song, Shixin Song, Yulong Shao et.al-[5] A” Novel Electric Bicycle Battery Monitoring System Based on Android Client”- The battery monitoring system (BMS) plays a crucial role in maintaining the safe operation of the lithium battery electric bicycle and prolonging the life of the battery pack. This paper designed a set of new battery monitoring systems based on the Android system and ARM single-chip microcomputer to enable direct management of the lithium battery pack and convenient monitoring of the state of the battery pack. The BMS realizes the goal of monitoring the voltage, current, and ambient temperature of lithium batteries, estimating the state of charge (SOC) and state of health (SOH), protecting the battery from

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abuse during charging or discharging, and ensuring the consistency of the batteries by integrating the passive equalization circuit. Filipe J. Rodrigues, Jose Alfonso et.al-[6] Title " Automatic Control of Cycling Effort Using Electric Bicycles and Mobile Devices". This paper describes the development and evaluation of a novel effort control system for cycling, which contributes to promote the users' mobility and physical health. This system provides automatic control of the motor assistance level of an electric bicycle in order to ensure that the cyclist's effort remains inside the desired target zone, regardless of changes in other variables which normally affect the effort, such as the slope of the road. The system presented in this paper controls the pedaling resistance perceived by the cyclist through the use of a sensor device placed inside of the bicycle crank set, which provides the required torque signal. The data processing, effort control algorithm and user interface are implemented in a smart phone application, whereas a microcontroller on the bicycle is responsible for the data acquisition, wireless data exchange with the smart phone, and real-time control of the motor assistance level. Experimental results validate the effectiveness of the implemented effort control system. Christian Gorenflo, Ivan Rios et.al-[7] This paper presents an analysis of data collected through the Waterloo We Bike project: a field trial in which over 30 sensor-equipped electric bicycles (e-bikes) were given to members of the University of Waterloo for personal use. Our dataset includes e-bike trip and battery charging sessions spanning nearly three years, from summer 2014 until spring 2017. We also conducted three surveys both before and during the trial. Our main findings were th et the primary purpose of the e-bikes in our trial was for commuting, with most trips lasting less than 20 minutes and most trips taking place in the summer months.Chetan Mahadik, et.al-[8] This paper presents the development of an associate degree, Electric Bicycle System" with an innovative approach. The aim of this paper is to show that the normal bi-cycle can be upgraded to electric one by some means– that including the development of a regenerative braking system and innovative BLDC motor control – but also uses real-time sensing and the powers of crowd sourcing to improve the cycling experience; get more people riding bikes; and to aid in the design and development of cities. Electric bikes have simultaneously gained popularity in many regions of the world and some have suggested that it could provide an even higher level of service compared to existing systems.Ying-Yi Hong et.al-[9]Title "Electric Power Systems Research" is a special issue of Energies for the publication of original papers about the generation, transmission, distribution, and utilization of electrical energy. This special issue presents important results of work on power systems. Papers can present applied research, the development of new procedures or components, an original application of existing knowledge ,or new design approaches. ANNETTE MUETZE et.al-[10] Electric bicycles have been gaining increasing attention worldwide, especially in China, Europe, Japan, Taiwan, and the United States. In the following, the most distinguishing aspects of electric bicycles in these countries are summarized, based on the authors' own studies.A. Rakesh Kumar, et.al-[11] The global pollution is on rise and every effort made, being to reduce the CO2 emissions and save the planet. One such effort is the introduction of Electric Vehicles (EV). The transport sector is one of the biggest emitter of CO2 and hence it is very important to convert the sector to a green sector. Indian government has come up with ambitious plans of introducing the EVs to Indian market and keep in pace with the development of EVs globally. The National Electric Mobility Mission Plan 2020 (NEMMP 2020) has come with a detailed report on the EVs. C. Abagnalea M. Cardoneb, et.al-[12] A new model of power-assisted bicycle has been designed, set up and tested. The main innovative solutions for the pedelec prototype are described in the present paper: the electric motor position; the new mechanical transmission; the low cost measurement system of the driving torque; the special test rig. Differently from a common approach, in which the electric motor is located on one of the three hubs of the bicycle, the idea of the pedelec prototype consists of an electrical motor in the central position that, by means of a bevel gear, transmits the torque on the central hub.K.V.Muralidhar Sharma, et.al- [13] This paper gives a general overview of Trends in electric vehicle. History of EV, World market for the EV. Different countries current EV trend, electric vehicle in Indian market, Key developments, government support for EV, challenges, benefits of increasing EV. Electrification of automotive power train is one of the main trends in current vehicle development. The growing threat of global warming, excessive petrol dependence, ever increases prices in fuel, and driving trends are just a selection of reasons which have accelerated the development of Electric Vehicles also The transport sector represents a critical percentage of greenhouse gas emission. Transport emissions are estimated to increase by 84% . Key technologies such as hydrogen fuel cell, electric cars and bio fuels are expected to contribute to emission reduction in the long run. Aim of this study is to compare and analyze the development of market, government support for the trend. And to accelerate the trend to save the nation, world from pollution. Esther Salmeron et.al- [14] The bicycle has gone from being an old-fashioned recreational product to a less polluting means of transport and a compact, ultra-light personal mobility tool. This is how electrical bicycles will be used as the pillar that could support individual public transport in large cities worldwide. The objective of this manuscript is to detect how worldwide research on the electric bicycle is being developed, and, especially, around which scientific domains is it clustered, to finally identify the main trends in the field. This study has

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been carried out based on the Scopus database, where all the public relations related to the topic of the electric bicycle have been analyzed up to the year 2017.Therefore, research on the global research trends of this topic was conducted. Its evolution over time shows that since 2008 the growth of publications is much higher than in the previous period. Ian Vince McLoughlin, I. Komang Narendra et.al-[15] Sustainable and practical personal mobility solutions for campus environments have traditionally revolved around the use of bicycles, or provision of pedestrian facilities. However many campus environments also experience traffic congestion, parking difficulties and pollution from fossil-fuelled vehicles. It appears that pedal power alone has not been sufficient to supplant the use of petrol and diesel vehicles to date, and therefore it is opportune to investigate both the reasons behind the continual use of environmentally unfriendly transport, and consider potential solutions. This paper presents the results from a year-long study into electric bicycle effectiveness for a large tropical campus, identifying barriers to bicycle use that can be overcome through the availability of public use electric bicycles. Yashwant Sharma ,Praveen Banker et.al-[16] Sustainable and personal mobility solutions for our bicycles or provision of pedestrian facilities. An electric bicycles offers a cleaner various travel short to-moderate distance instead of fossil fueled automotive. From conventional automobile experience problems like traffic congestion, parking difficulties and pollution from fossil fueled vehicles. It appears that only pedal power has not been sufficient to supplant the usage of petrol and diesel automotive to d ete, and therefore it is necessary to investigate both the reason behind continuous use of environment unfriendly transport and consider potential solutions. Elliot Fishman, Christopher Cherry et.al-[17] Electric bicycles (e-bikes) represent one of the fastest growing segments of the transport market. Over 31 million e-bikes were sold in 2012. Research has followed this growth and this paper provides a synthesis of the most pertinent themes emerging over the past on the burgeoning topic of e-bikes. The focus is transport rather than recreational e-bike research, as well as the most critical research gaps requiring attention. China leads the world in e-bike sales, followed by the Netherlands and Germany. E-bikes can maintain speed with less effort. E-bikes are found to increase bicycle usage. E-bikes have the potential to displace conventional motorised (internal combustion) modes, but there are open questions about their role in displacing traditional bicycles. Zhenying Shao ,Yan Xing et.al-[18] Through this project, we interviewed 27 e-bikers in Sacramento-Davis area and found that there are four benefits unique to the riding of e-bikes: Speed, Acceleration, Green, and Enabling. They are fast so that e-bikers can cut down their commute time and allow them to ride more frequently than if they ride traditional bikes, especially during hot and windy days. The ease of acceleration makes obeying stop signs or riding uphill less onerous and provides e-bikers with more confidence when only vehicle lanes are available to bikers. They also provide those who, for various reasons, don't or can't ride traditional bikes an option for green transportation. Cairns, S, F Behrendt, D Raffo et.al- [19]This paper reports on a review of the European literature about the impacts of having an electrically-assisted bike available to use, together with results from a trial in the UK city of Brighton, where 80 employees were loaned an electrically-assisted bike for a 6–8 week period. In the Brighton trial, three-quarters of those who were loaned an e-bike used them et least once a week. Across the sample as a whole, average usage was in the order of 15– 20 miles per week, and was accompanied by an overall reduction in car mileage of 20%. et the end of the trial, 38% participants expected to cycle more in the future.

IV.) METHODOLOGY

This section represent the detailed plan and the implementation carried out to acess the complete bicycle working. The diagram shows the proposal work of the project-

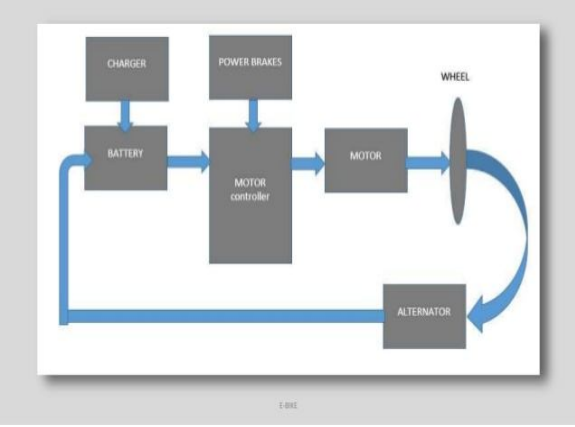

FIG. 2

In choosing an motor for electric bicycle, which is Brushless DC motor (BLDC), there is few method will be used, the method is torque calculation, Losses, efficiency. While selection of motor for Electric Bicycle, torque

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calculation is necessary to be considering, as because each motor have its own torque limit for the motor to hold specific load. If the motor is to be used without calculating its torque or how much torque can the motor provide, amount of torque to the electric bicycle, if the motor have low or insufficient amount of torque so it can lead to Electric Bicycle not even move or maybe can move but only without any load or rider. So calculation of high Torque motor is important when choosing suitable motor for Electric Bicycle.

V.) CONCLUSION

With the help of these research paper we are able to design an e-bike which may be the solution to our problems which we are experience now a days like traffic congestion, parking difficulties and pollution from fossil fueled vehicles. We established an idea to develop an e-bike which discard the usual mentality i.e only pedal power can be used to move an bi-cycle. This paper shows the results from a year-long study into electric bicycle effectively. This paper identifies potential barriers of electric bicycle.We can overcomes it by using innovative "E- BICYCLE" with electric motor for assistance.

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[19].Carian ,S,F Behrendt, D Raffo tittle "Electrical assisted bike for maximum weight carrying".at UK city of Brighton, three-quarters of those who were loaned an e-bike used them at least once a week.Across the sample as a whole, average usage was in the order of 15– 20 miles per week, and was accompanied by an overall reduction in car mileage of 20%. at the end of the trial, 38% participants expected to cycle more in the future.

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MANHOLE DETECTION SYSTEM

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ABSTRACT
Good and Smart man-hole management may be a image of an honest town. today man-holes area unit the most drawback within the cities. All the man-holes don't seem to be insecure position. Most of the man-holes area unit in broken condition. thanks to the broken man-holes, there area unit possibilities of prevalence of accidents within the road. These broken man-holes are a threat to private safety. This project work is to style an efficient accident avoid system by preventing open man-hole in major cities. The devices just like the tilt device and weight sensor wont to observe the crack and therefore the harm within the man-hole cowl then the knowledge are sent to the authority of the corporation department and therefore the councillor of the realm wherever the hole is gift. The management and maintenance area unit created through the Internet of Things(IoT). The implementation of this project are terribly helpful to society. several sensors established within the cover to time period monitor its scenario, this technique might monitor the town cover in time period and provides AN alarm mechanically and therefore the Live Location the hole on the automaton Android App. there's no doubt that it might improve the management ability of the cover and greatly enhance the security of people's travel.

Keywords: Android App, Crack, Tilt, IoT, Sensors, Smart man-hole.

INTRODUCTION
Nowadays manhole management is more important. Because damages in manhole cover lead to many accidents. It's very important to have a secure manhole management System in smart cities. Because the rate of accidents due to Insecure manhole coverage is high. There is a chance of a Leakage of dangerous gases which causes an explosion and even Death to the persons. If any change in the angle of the manhole Cover, it causes accidents. Also if any crack in it, it may break. So manhole management is very important. Previously the Person of the corporate office has to go directly and check The man-holes or the people of that area have to inform to the Corporation office But in this 21 st century it is difficult to go Directly and check the man-holes manually. Because Everything is automated nowadays. So a smart hole manhole Cover management is required. So in this paper, we use various Sensors to sense the damages. Then if there is any problem, The message can be sent to the corporation office using IoT And it can be viewed from any place of the world. With its great quantity and wide distribution, the manhole cover is an important part of the city drainage system. But owing to the complex structure and imperfect function of manhole cover, hundreds of people suffer from all kinds of losses because the manhole cover is broken or missing every year.

PROPOSED ARCHITECTURE
In the proposed method, the development of IoT based drainage and manhole monitoring system is designed. This system monitors atmospheric temperature, the release of toxic gases, blockages, overflow in drains and manhole lid position. Maximum levels are set and sensors keep monitoring the changing conditions. As the levels reach a maximum set point the sensors detect and send the signal to the controller, where it commands the IoT network to generate alerts to the municipal corporation. most of the cities adopted the manhole system to avoid the accidents and spreading of disease in the city. The manholes during the rainy season are left open and there is a chance to people fall in it. If the manhole lid is not closed properly there is a chance of occurrence of accidents and can lead to death. This problem is solved, suppose imagine if we should have an alerting system for the things that happen to a manhole and are notified on the android device application.

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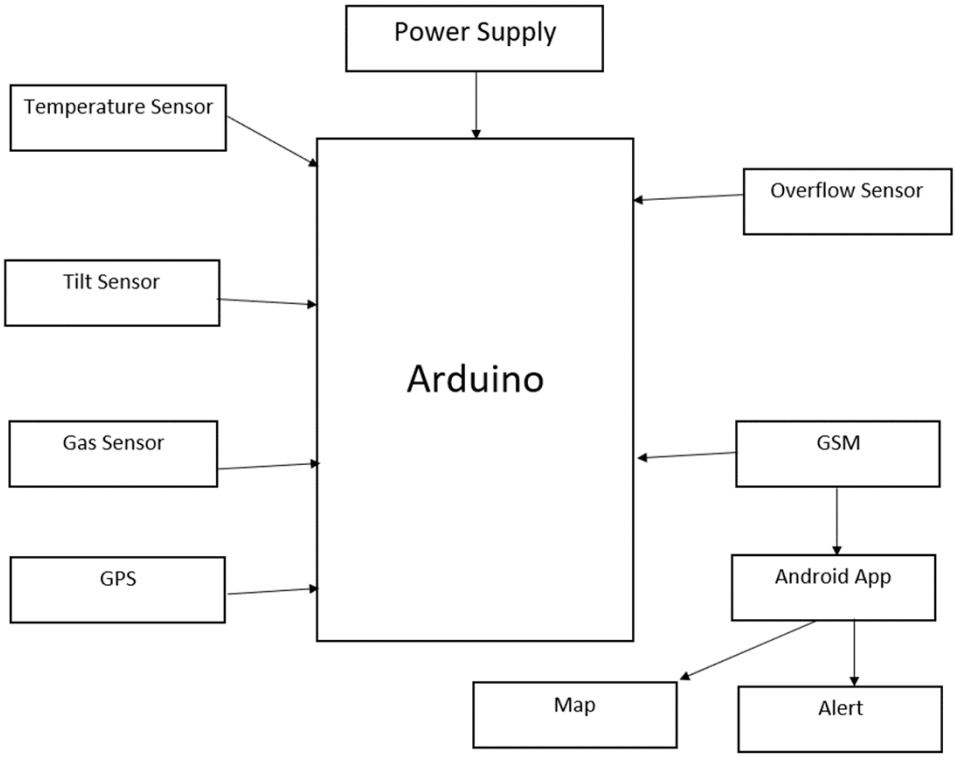
Fig-Proposed Architecture



SOFTWARE

Android Studio

Android Studio is the official integrated development environment for Android OS, built on JetBrains' IntelliJ IDEA software and designed specifically for Android application development.

Arduino IDE

The Arduino integrated development environment is a cross-platform application that is written in Java, C, and C++. It is used to write and upload programs to Arduino to work as per the programmer's desires.

HARDWARE

Arduino

Arduino is an open source hardware and software company, project and user community that designs and manufactures single-board microcontrollers and microcontroller kits for building digital devices and interactive objects that can sense and control objects in the physical and digital world. Its products are licensed under the GNU Lesser General Public License (LGPL) or the GNU General Public License (GPL), permitting the manufacture of Arduino boards and software distribution by anyone. Arduino boards are available commercially in preassembled form or as do-it-yourself (DIY) kits.

Sensors

A sensor is a device that detects and responds to some type of input from the physical environment. The specific input could be light, heat, motion, moisture, pressure, or any one of a great number of other environmental phenomena. The output is generally a signal that is converted to human-readable display at the sensor location or transmitted electronically over a network for reading or further processing.

GPS(Global Positioning System)

The Global Positioning System (GPS) is a space-based satellite navigation system that provides location and time information in all weather conditions, anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites. The system provides critical capabilities to military, civil and commercial users around the world.

CONCLUSION

This project deals with the ideology of detection effects in the manhole that is the drainage system of our city with the help sensors and the Internet of things technology that will alert the officials about it through the android device application and the map location will be provided to the officials. it will provide greater resolution. whenever the sensor detects anything that will send an alert to the Arduino and that Arduino will be

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sending an alert through the gsm sim connect to it on the android device and when the owner of the application clicks on the alert generated , the owner will get know the type of problem has occurred at the manhole and which manhole has giving the alerts and the location will be provided by the means of the GPS obex that has been connected to the hardware system.

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AUTOMATIC FLOOR CLEANER

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ABSTRACT
Households of today are becoming smarter and more automated. Home automation delivers convenience and creates more time for people. With the advancement of technology, robots are getting more attention of researchers to make life of mankind comfortable. Several robotic vacuum cleaners are available in the market but none of them implement wet and dry cleaning of floors simultaneously. The purpose of this project is to design and implement an automatic floor cleaner that can do sweeping and Mopping simultaneously. Automatic floor cleaner is designed to make cleaning process become easier rather than by using manual vacuum. The main objective of this project is to design and implement an automatic floor cleaner by using a microcontroller, ultrasonic sensor, proximity sensor, position sensor, set of swapping motor, and vacuum motor and to achieve the goal of this project. Automatic floor cleaner will several criteria that are user friendly.

Keywords: Automatic floor cleaner, cleaning, household.

INTRODUCTION
Household cleaning is the most common and tiresome job done every day. The most basic of it is cleaning the floors. For years we've been using the traditional ways of cleaning the floors i.e. sweeping and mopping using broom and a piece of cloth. Well this being the simplest method of cleaning they are very tiring as they cause body pain to some extent. To tackle this problem vacuum cleaners had been introduced few years ago. But they are inefficient as they provide only dry cleaning action.

New era is starting to develop robots among both professionals and non-professional electronics users. With the increased use of open source software and more recently open source hardware, as well as the downfall in prices in the world of electronic tools, engineers find themselves in a situation where they can think of and carry out a vast range of projects. With the use of these open source tools we developed this project. The focus of this project is to design and implement an intelligent robot. It can operate all its operations automatically by using its own intelligence. Artificial intelligence is implemented using sensors and programmed accordingly. The main highlight of this project is that it aims to build and implement a robot that is capable of doing the dry and wet cleaning i.e. sweeping and mopping of floor simultaneously. It is the first of its kind that can do this job with a vacuum cleaner and mop pad both fitted in the same body.

LITERATURE SURVEY
Edward Finch, US November 28, 2001
An automatic floor cleaner uses a body part that has a changes of direction driving mechanism such that when body fined that it is in front of an obstacles, the direction of the body is changed. An extension extends outwardly from the body members and has cleaning implemented while moving along the ground.

Mohsin Raza, Shahbaz Munir, 2003
This thesis present the design, development and fabrications of prototype floor cleaning robot. All hardware and software operation are controlled by AUDINO MEGA. This robot can do moping action. Robot operates automatically and find its way skillfully in a way that it can clean all the room without human assistance. Ultrasonic sensor is used to detect the hurdles. The whole circuit is connected with 12V battery. This may be proven helpful in lifestyle of mankind.

Vatsal shah, 2015
The objective of this project is to design and implement a vacuum robot automatically and via phone application. Vacuum cleaner robot is design to make cleaning become easier rather than by using manual vacuum. The main objective of this project is to design and implement a vacuum prototype by using Arduino Mega, Arduino Shield , LDR sensors, Real time clocks and IR sensors to achieve the goal of the this project. Vacuum robot will have several criteria we are user-friendly.

Yi Song Park, Young Pung (North Korea)
Purpose of the invention is to provide a remote controllable automatic moving vacuum cleaner having a body that is movable in the forward, backward, leftward, rightward direction by remote control using power source, According to the invention, a remote controllable automatic moving vacuum cleaner comprises of a body

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including motor, impeller, a collecting filter mounted there and intake port including intake hole formed on the bottom of the in taking dust. A handle including a switch foe applying power to motor to clean a room.

Albert Khol, Thomas Moser (Switzerland), 1996
This invention relates generally to a mobile automatic floor cleaner, and more specifically to floor cleaner comprising integrated fresh liquid and soiled liquid compartments. A cleaning rotor design to be supplied from the fresh liquid compartment and least one suction nozzle which feeds into liquid compartment.

Jason Yan 2005,
The objective of the present invention is to provide a self-moving vacuum cleaner which can suits a variety of the floor surfaces and which has movable intake nozzle that can ensure cleaning performance of the vacuum cleaner on an uneven floor surface.

OBJECTIVE OF STUDY

As world is moving towards automation and in this busy life people think about such a device that perform their residential cleaning purposes. As rooms or residential places are not so smooth, there are many hurdles and goods in their way. So we have to design such a robot that not only perform cleaning actions from A to Z but also detect hurdles on its way and take its way automatically. People desire to use things that are efficient and helpful for reducing their tasks. For keeping this in mind there was the main challenge that robot should clean the floor efficiently and accurately. For this purpose we use not only vacuum cleaner but also mopping pads that will run wet along the floor so as to provide

Effective cleaning. Apart from achieving intelligent hurdle detection and efficient cleaning another important objective is to develop the robot and it must be of low cost and user friendly. So we design a robot that is not only cost effective but also easy to operate. The another objective is to provide the robot with a high autonomy in the sense of hours of use without the need for recharging. At the moment, the robot uses a rechargeable battery that can be again charged after the rated life when fully charged.

CONCLUSION

Artificial intelligence using sensors and programs increases the efficiency of the robot thus the cleaning. It guarantees in effective cleaning of house with autonomous action carried by human like thinking action of the robot. Battery monitoring, self-charging, lighter body weight and to set alarm on/off time manually are the future scope of this project.

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- https://patents.google.com/patent/US7246405B2/en
- https://www.researchgate.net/publication/327065350_Sweepy_
- The_Smart_Floor_Cleaner?_sg=uCDBM02_CdUcxAqIQp1a6SPPnOCHtPKnOED3t3qOd2p4dxHYW69APm8Gfv6ub2i3yoUUiK Yn5v7hrRg

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MULTIPURPOSE AGRICULTURE MACHINE

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ABSTRACT
Energy demand is one the major thread for our country. Finding solutions, to meet the Energy – demand is the great challenge for social scientist, engineers, entrepreneurs and industrialist of our country according to them, applications of non-conventional energy is the only alternate solution for conventional energy demand. Now a day the concept and technology employing this non-conventional energy becomes very popular for all kinds of development activities. One of the major area, which finds number applications are in agriculture sectors. Solar energy plays an important role in drying agriculture products and for irrigation purpose for pumping the well water in remote villages without electricity. Here we are fabricating the agriculture multipurpose machine is a new innovative model which is mainly used to water spraying, weeding and the seed sowing. Our main aim of this concept is to reduce the man power and also avoid time consumption and to utilize solar energy.

Keywords; 3 Way Agriculture M/C, Multiprupose, Effortless Machine

1. INTRODUCTION
For the proper growth of plants like tomato, cotton, graphs etc. there is need of keeping away this plants from different disease and also the unwanted grass should be removed from the farm field after the specific interval of time. For this lot of effort are require and also the different agriculture equipment's which needed lot of money. The agriculture equipment like spraying machine, dusting machine, cutting machine are used to spray the pesticides solid liquid or mist and the cutting machine is used to harvest or used as a grass cutter in the farm field. Also the pesticides are spreads for improving the quality of the crop therefore the pesticides should be sprayed uniformly all over the plant. For spraying the pesticides uniformly the spraying machine and dusting machine is required. Agriculture is the backbone of India. Paddy and Wheat is one of the new targets in agriculture where still, not many researchers and manufacturers participate. This field faces some problems such as how to maximize the profit, how to increase productivity and how to reduce the cost. In India, two types of agricultural equipment are used, manual method (conventional method) and mechanized type.

Mechanization involves the use of a hybrid device between the power source and the work. This hybrid device usually transfers motion, such as rotary to linear, or provides ample of mechanical advantages such as increase or decrease or leverage of velocity. Agricultural machinery is machinery used in farming or other agriculture. Mechanized agriculture is a process of using agricultural machinery to mechanize the work of agriculture, greatly increasing farm worker productivity.In modern times, powered machinery has replaced many farm jobs formerly carried out by manual labour or by working animals such as oxen, horses, and mules. The entire history of agriculture contains many examples of the use of tools, such as the hoe and the plough. But the ongoing integration of machines since the Industrial Revolution has allowed farming to become much less labour-intensive. The biggest profit of automation is that it saves the labour. However, it also saves energy and materials and to improve the quality, accuracy, and precision. The seed feeding, pesticides sprinkling and crop cutting are the important stages in the agriculture field.

LITERATURE SURVEY
International Journal of Innovative Research in Science, Engineering and Technology.(February,2018) Power conversion efficiency has certainly been a very popular topic in solar industry. PV inverter manufacturers have invested significant amount of effort to achieve even a 0.1% higher efficiency year over year. But just how important is efficiency to a solar system? The U.S. installed more than 7 GW of solar in 2014. Every single installation required some type of power conversion from DC (solar panel) to AC (grid). To simplify the discussion, if we assume 97% efficiency for the inverter loss, that equals about 6.86 GW of AC power generated. If all the inverters performed at 98% power conversion efficiency, and all else being equal, that number would be 6.93 GW. That is a 70-MW difference and equivalent to a large utility-scale PV plant! Higher efficiency equates to more energy harvest and is therefore critically attributed to the total revenue stream of the PV system. The PV inverter is a complex piece of equipment made up of thousands of components. Roughly 80% of losses come from a switching device and AC inductors. One of the most critical components within PV inverter is this "switching device" or semiconductor device being used to perform DC to AC conversion.

International Journal of Recent Development in Engineering and Technology (April,2015).

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The paper deals with utilization of solar energy and it is converted into the chemical energy, which is used to drive the different units of the system. In this paper we had tried to explain how the different agriculture equipments are combined and work together efficiently with reducing the manufacturing cost which will be in affordable budget.

B.Venu: A solar grass cutting is machin that uses sliding blade to cut lawn at an even length .even more sophisticated device are there in every field. Power consumption becomes essential for further[1].

V.Vasu, R. Joshua: Energy demand is the measure thread for our country. Finding solution to meet the energy demand is great challenge to the scientist engineers, interpreneurs & industrialist of our country[2].

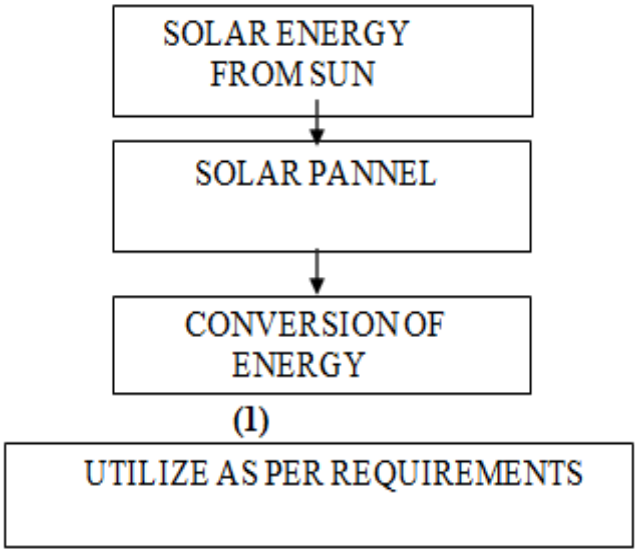
F.A. Adamu, B. G. Jahun and B. Babangida

In this paper authors draws our attention towards the performance factor of a powertiller.Among those demand for light weight power tiller was sought out most.Fuel efficiency and field capacity such parameters are also discussed. We taken those points in consideration while designing a sustainable multifunctional agricultural vehicle.

D.A. Mada, Sunday Mahai

In this research paper author has mentioned importance of mechanization in agricultural by giving examples. The conclusion from the paper was need of multifunctional single axel vehicle for pre and post harvesting . We have taken this as base for our research and further production of our multifunctional agricultural vehicle. 4. V.K. Tewari, A. Ashok Kumar, Satya Prakash Kumar, Brajesh Nare[2012] In this research papers author have done case study on farm mechanization in west Bengal as being part of India it give clear status about availability and progress in India. This ensured us to take right steps compared to current steps

PROPOSED METHODOLOGY



AIMS AND OBJECTIVES

- Pollution free.
- Cost effective.
- Easy in operation.
- Multiple operations can be performed at a time.
- Portable.
- Less maintenance cost.
- High efficiency.
- Construction is easy.
- No need of skilled operator.
- Smooth working.

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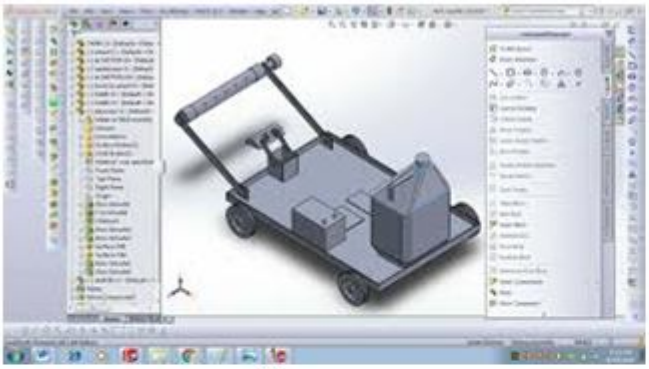
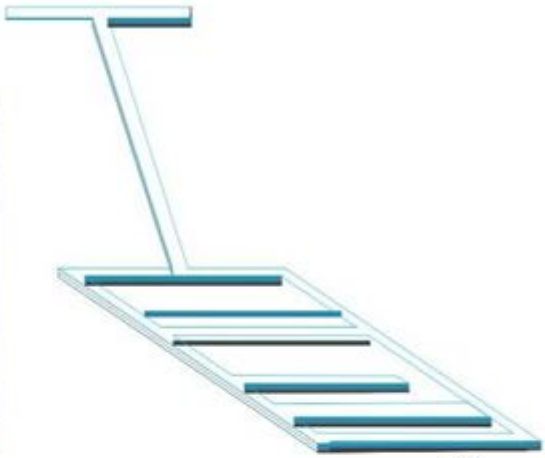
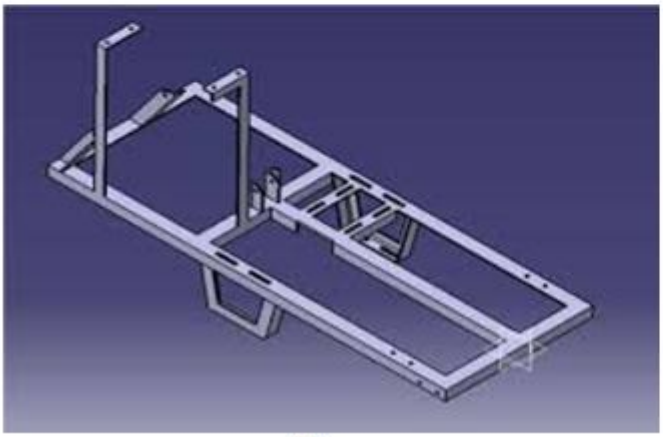
CAD MODEL DESIGN
(TYPES OF CHASIS)



(2)



(4)



(3)

Multipurpose farming machine consist of following components

1)Chassis frame 2) Engine 24 cc 3) Sprayer 4) Auger bit drill tool 5)Hopper 6) Fertilizer tank 7)

12 V Motor 8) 12V Battery 9) Switch 10)

- It consists of an internal framework that supports a man-made object in its construction and use. It is analogous to an animal's skeleton. An example of a chassis is the under part of a motor vehicle, consisting of the frame (on which the body is mounted). If the running gear such as wheels is included then the assembly is described as a rolling chassis.
- The chassis is considered to be one of the significant structures of an automobile. It is the frame which holds both the body of machine and the power train. Various mechanical parts like the engine and the drive train, the axle assemblies including the wheels, the suspension parts, the brakes, the steering components, etc., are bolted onto the chassis.

CONCLUSION

The Aim of the Project is to Design and Fabricate the MULTI PRUPOSE AGRICULTURE. In order for the project to be successful all the suitable parts and components had to be found and put together properly that can be used for observatory purposes .it would be cost efficient so that the farmers can buy it and easily share their work

This multipurpose agro machine is designed and fabricated as a multipurpose equipment which is used for agricultural processes like ploughing, sowing seeds and sprinkling water. This machine works in both directions when it is pushed forward it ploughs the field with the help of plough. The height of the plough can be adjusted, with the help of screw arrangement and simultaneously the seed feeder will drop the seed one by one which is connected to the back shaft by chain and sprocket arrangement

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NEAREST KEYWORD SET SEARCH IN MULTI-DIMENSIONAL DATASETS

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ABSTRACT
As Cloud Computing becomes prevalent, sensitive information are being increasingly centralized into the cloud. For the protection of data privacy, sensitive data has to be encrypted before outsourcing, which makes effective data utilization a very challenging task. Ranked search greatly enhances system usability by returning the matching files in a ranked order regarding to certain relevance criteria (e.g., keyword frequency), thus making one step closer towards practical deployment of privacy-preserving data hosting services in Cloud Computing. We first give a straightforward yet ideal construction of ranked keyword search under the state-of-the-art searchable symmetric encryption (SSE) security definition, and demonstrate its inefficiency. To achieve more practical performance, we then implemented ranked searchable symmetric encryption, and give an efficient design by properly utilizing the existing cryptographic primitive, order-preserving symmetric encryption (OPSE). Extensive experimental results demonstrate the efficiency of the proposed solution.

Keywords: ranked search, cloud computing, searchable symmetric encryption (SSE), order-preserving symmetric encryption (OPSE)

I. INTRODUCTION

Cloud Computing enables cloud customers to remotely store their data into the cloud so as to enjoy the on-demand high quality applications and services from a shared pool of configurable computing resources. The benefits brought by this new computing model include but are not limited to: relief of the burden for storage management, universal data access with independent geographical locations, and avoidance of capital expenditure on hardware, software, and personnel maintenances.

Despite of the various advantages of cloud services, outsourcing sensitive information (such as e-mails, personal health records, company finance data, government documents, etc.) to remote servers brings privacy concerns. The cloud service providers (CSPs) that keep the data for users may access users' sensitive information without authorization. A general approach to protect the data confidentiality is to encrypt the data before outsourcing. However, this will cause a huge cost in terms of data usability.

For example, the existing techniques on keyword-based information retrieval, which are widely used on the plaintext data, cannot be directly applied on the encrypted data. Downloading all the data from the cloud and decrypt locally is obviously impractical. In order to address the above problem, researchers have designed some generalpurpose solutions with fully-homomorphic encryption or oblivious RAMs. However, these methods are not practical due to their high computational overhead for both the cloud sever and user. On the contrary, more practical special purpose solutions, such as searchable encryption (SE) schemes have made specific contributions in terms of efficiency, functionality and security. Searchable encryption schemes enable the client to store the encrypted data to the cloud and execute keyword search over ciphertext domain. So far, abundant works have been proposed under different threat models to achieve various search functionality, such as single keyword search, similarity search, multi-keyword boolean search, ranked search, multi-keyword ranked search, etc.

Among them, multikeyword ranked search achieves more and more attention for its practical applicability. Recently, some dynamic schemes have been proposed to support inserting and deleting operations on document collection. These are significant works as it is highly possible that the data owners need to update their data on the cloud server. But few of the dynamic schemes support efficient multikeyword ranked search.

Cloud computing can be assumed as a model for delivering information technology services (like storage space, networking, applications etc) in which resources are retrieved from internet using web based tools, rather than a direct connection to server. Cloud computing provides hardware and software resources from a shared pool of resources on rent according to user's demand. So this technology releases user from burdens of management efforts and also from headaches of installation and maintenance.

Problem Definition: Traditional searchable encryption schemes allow users to securely search over encrypted data through keywords, these techniques support only boolean search, without capturing any relevance of data files. This approach suffers from two main drawbacks when directly applied in the context of Cloud Computing.

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On one hand, users, who do not necessarily have pre-knowledge of the encrypted cloud data, have to post process every retrieved file in order to find ones most matching their interest, On the other hand, invariably retrieving all files containing the queried keyword further incurs unnecessary network traffic, which is absolutely undesirable in today's pay-as-you-use cloud paradigm.

II. LITERATURE SURVEY

1] "Nearest keyword set search in multidimensional datasets", Published by: Vishwakarma Singh, Ambuj K. Singh, Published year: 2014, www.geabios.com

In this paper we studied nearest keyword set search queries on text-rich multi-dimensional datasets. This query is the set of user provided keywords. They propose a novel method called ProMiSH (Projection and Multi Scale Hashing) that uses random projection and hash based index structures, and achieves high scalability and speedup. They proposed ProMiSH to efficiently solve NSK queries. They presented an exact and appropriate version of the algorithm. They proposed a solutions for the problem of top k nearest keyword set search in multi-dimensional datasets. They implemented all methods in java.

2] "An approach towards efficient ranked search over encrypted cloud", Published by: RajpreetKaur, Manish Mahajan, Published year: 2015, Journal of Information Technology and Software Engineering

In this paper the main objective is to enable efficient utilization of data files using ranked searchable encryption scheme and to enable security by preventing cloud server from learning plaintext of data files. To ensure security and final result ranking, order preserving encryption is used to preserve numerical ordering for protecting relevance score. The implementation is done by generating local environment in MATLAB. In the early techniques for symmetric search like fuzzy keyword search etc, were mainly used for searching. However, this technique enhances search flexibility and usability. Based on the relevance score file can be ranked for more symmetry.

3] "Secure ranked keyword search over encrypted cloud data", Published by: Cong Wang, Ning Cao, Jin Li, KuiRen, Published year:2009-19, www.ece.wpi.edu In this paper the design goal is to enable ranked searchable encryption for effective utilization of outsourced cloud data. To explore different mechanism for designing effective ranked search schemes based on the existing searchable encryption framework. In this paper for the first time they define and solve the problem of effective yet secure ranked keyword search over encrypted cloud data. They solve the problem of supporting efficient ranked keyword search for achieving effective utilization of remotely stored encrypted data in cloud computing. They proposed several possible directions for future work on ranked keyword search over encrypted data.

4] "Nearest keyword set search queries on multidimensional datasets", Published by: Rachael Christian M.S. Vimuktha Evangeleen Sails, Published year: June 2018, www.ijret.org

The main result of the work carried out is to get the list of files based on the keywords weightage in the form of ranked list. The analysis is done based on the uploading and downloading time. It has two main modules: admin and the user. In this the data mining is applied over the text document. The result of the work carried out is to get the list of files based on the keywords weightage in the form of ranked list. The application developed is useful in any organization where the huge amount text data is stored in the form of files, so late at the time of retrieval the work of user becomes easier by searching the file with the keyword.

5]"An Efficient Nearest Keyword Set Search in Multidimensional Datasets", Published by: Ruksar I. Attar, Shraddha S. Hon, Ruchita M. Agrawal, Published date: December2016, www.ijret.org

Its main contribution is to conduct extensive experimental studies to demonstrate the performance of the model. The real data is collected from photo sharing websites. It analyses image keyword relation between points. The system modules retrieve all images from the database, and then it analyses keywords. It displays nearest keyword as an output. It has a problem that it fails to provide real time answers on difficult inputs. The main advantage is that it will save lack of processor cycles used in multi-dimensional datasets for finding image. All keywords are searched with less time and more accuracy.

III. SYSTEM IMPLEMENTATION

The cloud architecture is widely spread in the form of public cloud and is available to all the users. The presented work is the agent based work performed by the middle layer to perform service level agreement. In this, at first the user query will be analyzed respective to the user requirement specification. Now a parametric match will be performed based on the availability and the requirements. For this kind of match a cloud search

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will be performed to identify the keyword occurrence and will assign an initial rank based on the keyword match.

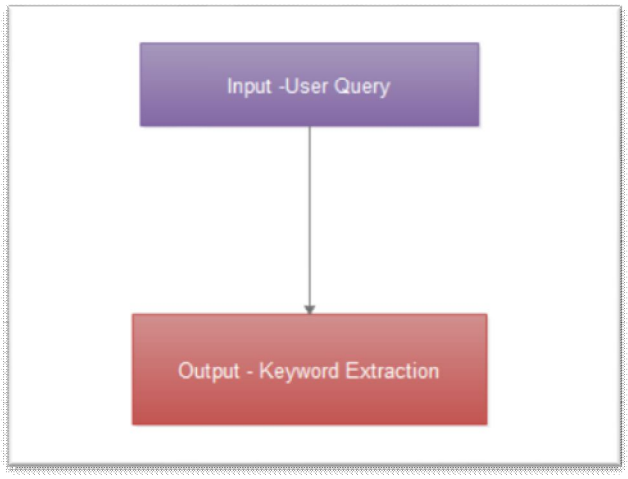
The second generic criteria defined here is the security, the clouds that provides the communication in secure way will be assigned with some higher rank. The security will be identified based on the SSL availability and the https transmission for cloud access. The first level is completely the based on server side features. The second level of ranking will be done based on the availability and the response time factors.

This layer will work for the middle layer architecture that will exist between the user and the cloud server. The middle layer will maintain a database to identify the minimum, maximum and average response time for all cloud services and based on which the rank will be affected. The parameters taken will be the user interest and the user visit over a cloud. More the user interest, higher the cloud rank will be. Finally these three levels will be collected together and will generate an effective ranking formula.

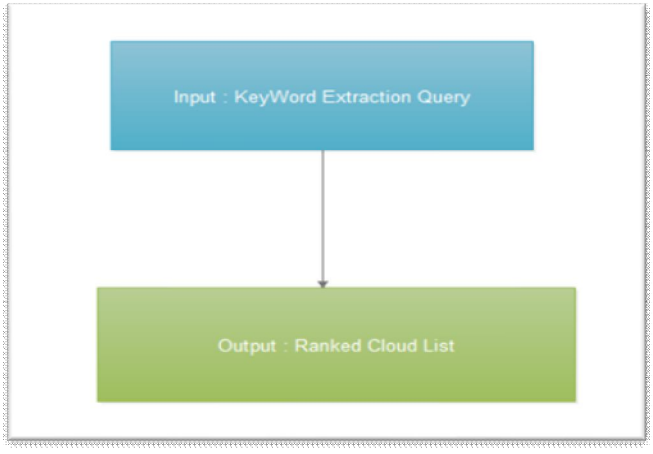
As the approach is rule based, the results here are more reliable. The work will perform a segmented search that will also increase the efficiency of the search mechanism. In this, user will interact with the web for his topic based query to retrieve the web pages. As the page is query performed it will send request to the web and generate a basic list of all the URLs related to the topic.

Now it will retrieve the data from the web. For the URL collection it will use the concepts of indexing and ranking. Indexing will provide a fast access to the web page and ranking will arrange the list according to the priority. The analysis includes the keyword extraction by removal of stop words. Once the keyword is extracted the next work is to perform the keyword summarization based on frequency of keywords. Once we get the summarized keywords it will be used as the content based analysis. In this, at first the query is made by the user and on this a query analysis is performed.

Methods to implement:



Now this extracted keyword will work as input to the cloud search architecture and based on the algorithmic approach it will return the effective URL list along with ranking.



Basic concept of the Ranked Keyword Search

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RANKING ALGORITHM

- Define the list of available clouds on any public cloud server called Cloud(1),Cloud(2)…..Cloud(n)
- For i=1 to n {Identify parameters for Cloud (i) called Availability (i), Response Time(i), Security(i) }
- Accept the User Query called Req under the specification ReqKeyword, ReqSecurity, ReqDeadLine,
- Activate the Middle layer to provide the best service selection
- Accept the user query and filter it to retrieve the keywords under the following step:
  - Remove the stop list words from the query list
  - Rank the different keywords respective to category
  - Find the frequency of keywords
  - Keep the most occurring keywords and present as relevancy measure
- As the keywords retrieve perform query on each public cloud and perform the content and tag based match.
- Find the list of M clouds that satisfy the relevancy criteria as well as identify the other cloud parameters like response time, security measure
- For i=1 to M [Perform the Content based similarity measure as]
- RelevencyVector = 0 For j=1 to Length (User Keywords){RelevencyVector = RelevencyVector + Keyword Occurrence(Cloud(i) ,Keyword(j)) /Total Keywords(Clound(i),Keyword(j)); }
- Security Vector=0; If (UserSecurityReq=Security (Cloud(i)) Security Vector=1;
- ResponseTimeVector=0 If (User Deadline>Response Time(Cloud(i)) Input: User Query Output: Keyword Extraction Input: Keyword Extraction Query Output: Ranked cloud list Ranked Keyword Search in Cloud… www.ijceronline.com ||June ||2013|| Page 42 {ResponseTimeVector=UserDeadline-ResponseTime(Cloud(i) }
- Rank (Clound(i))= RelevencyVector*w1 +Security Vector*w2 +ResponseTimeVector*w3;
- As user get Ranked list of clouds, selection can be performed for best cloud service provider respective to user interest.

SYSTEM ARCHITECTURE

Hardware Requirements

- Hard Disk: 80 GB.
- Monitor: 15 VGA Colour.
- Mouse: Logitech.
- Ram: 2 GB.

Software Requirements

- Operating system: - Windows 07/Above.
- Coding Language: J2EE
- Data Base: MYSQL 5.1/Above
- Tool :Navicat, Eclipse

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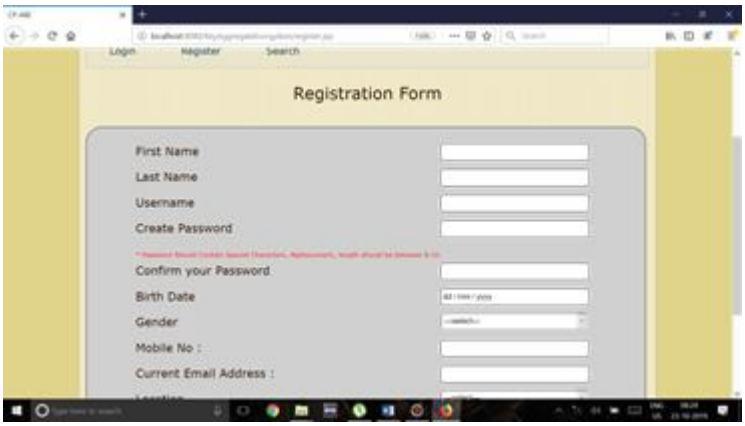
IV. RESULTS

The home page of the project contains the login, register and the search menu.

- First the user has to register to the website.



- The user has to login to the website to search or upload a file.

When you login to the website you will get the page where the file is need to be uploaded.

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 While uploading the file the user needs to enter whether the file is public or private. The n the user should enter the keyword and description of file, select the particular file from the browser to be uploaded. By clicking the upload button the user can upload the file.

The message will be shown.

V. FUTURE SCOPE

In this present work, the GUI interface will be created to pass the user query like a search engine. The first output will be drawn in terms of query filtration and extraction of keyword from query analysis. Once the keyword analysis is performed, keyword reduction will be done and finally the keywords will be drawn as output. Now, this extracted keyword will work as input to the cloud search architecture and based on algorithmic approach, it will return the effective URL list along with ranking. The proposed ranking method proves to be efficient in analyzing user query and returning highly relevant document corresponding to submitted search terms.

VI. CONCLUSION

Our multi-keyword ranked search system provides encrypted cloud data that utilizes efficient similarity measure of co-ordinate matching. Previous systems mainly focused on providing privacy to the data on cloud. We provide more real privacy system. In our system, stringent privacy is provided by allocating a unique ID to cloud user. Our system hides this user ID from the cloud service provider as well as the third party user, to protect the user's data on cloud from the CSP and the third party user. To maintain data confidentiality, to hide user identity may work efficiently. Also multiple owners for data are concept newly introduced in our system. While uploading the data index terms are generated that helped for indexed search which is efficient one. In contribution we provide an efficient backup and restore facility to the end user.

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NEW ECO-FRIENDLY GYPSUM MATERIALS FOR CIVIL CONSTRUCTION

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ABSTRACT
The sustainable world's economic growth and people's life improvement greatly depend on the use of alternative products in the architecture and construction, such as industrial wastes conventionally called "green materials". This paper concerns the main results of an experimental work carried out with the objective of developing new composite materials based on gypsum and incorporating waste material as granulated cork, a by-product of cork industry, and cellulose fibres, a waste of paper industry. Such materials are intended to be used as composite boards for non structural elements of construction, such as dry walls and ceiling. Cork (bark of the plant Quercus Suber L), a substance largely produced in Portugal, is a material whose characteristics are of considerable interest for the construction industry. It is regarded as a strategic material with enormous potential by its reduced density, elasticity, compressibility, waterproof, vibration absorption, thermal and acoustic insulation efficiency. During the first stage of this research work the gypsum binder and its properties were studied. Then, composites with mineral additions (added to increase the waterproofing and resistance) were also developed and submitted to tests to determine their physical and mechanical properties. In last stage, reinforced composites using different industrial by- products have been developed. This paper will present the properties and the manufacture methods used to produce the above mentioned eco-friendly composites that can ease ways for using industrial wastes as new construction materials, with excellent inherent thermal and acoustic properties.

INTRODUCTION
The gypsum is a large used material in building construction by its diverse applications. However it is up till now a material with a lack of know-how, mainly at research level. The European production of extracted gypsum attained 21milions in 1996. The European industry has 220 factories that produce gypsum products and employ, direct or indirectly, more than 400 000 people. In Portugal it have been produced about 500 000 ton of gypsum for ear since 2000. The building sector consumes about 95% of total gypsum produced. It is calculated that about 80 to 90% of finishing interior work and partition walls in buildings are made of gypsum products, such as plaster and card gypsum. According to those thermal and acoustical properties, these products contribute significantly for the comfort of millions of persons. Having an extraordinary resistance to fire, the gypsum products contribute for the buildings security, particularly in public buildings such as cinemas.

One of biggest deficiencies of gypsum as construction material is the low resistance to water presence. Although, actually, this aspect can be partially solved by adding to the gypsum some compounds based on silicones or other polymers, namely in gypsum card boards. This way, gypsum can be submitted to humid conditions, but even so do not permit utilization in external environments because of its low resistance to long direct contact with water.

The main purpose of this research work was the developing of gypsum boards with enhanced mechanical and water resistance. To these boards were also incorporated wastes to turn them more lightweight and sustainable. It was intended to show that the manufactory of these boards for not structural construction elements is possible, for example, for internal and external coverings, dry walls and ceiling. For this, it was carried out the characterization and improvement of gypsum as construction material, turning it more resistant to water action. After, applications of this enhanced gypsum based material were studied focused on the mixture preparation, methods of casting and its corresponding physical performance. The results obtained shows that the water resistance improvement can be achieved, above all, through the reduction of water content in paste, by the addiction of a mineral admixture, that act also as a retarder, and by replacing the traditional casting procedure by pressure curing. To improve the flexural behaviour and to achieve more lightweight boards with better thermal and acoustical properties, it was studied the incorporation of wastes or by-products (granulated cork and waste paper at pulp state).

MATERIALS
For this study four commercial available types of gypsum were selected: one plaster gypsum, recommended for manual application, one for projection, one for finishing and one escayola gypsum. According to the developed chemical analysis of these gypsums it was verified that the manual plaster and escayola gypsum presented a bigger purity than the finishing plaster one by the higher calcium sulphate content (CaSO4). For this reason, these plasters were selected as the main materials for this research work. In terms of particle dimensions

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it was seen at laboratory tests (EN 13279-2 (2004)) that the escayola gypsum have a bigger fineness. In terms of moisture content the tests (NP 319 (1963)), shows that the plaster gypsum have a moisture of 1,05% and the escayola of 1,32%. It was also determined through tests (NP 318 (1963)) the water/gypsum ratio necessary for a conventional plaster and the minimal gypsum content essential for hydration. The obtained water/gypsum ratio necessary for a conventional plaster was 0,52 and for the minimal hydratation reached 0,20.

The used granulated cork is a by-product of a Portuguese industry containing diverse parts of cork with different particle sizes. The density is 384,5 kg/m3 and the bulk density is 160,0 kg/m3. The cellulose fibres or paper pulp was made in the laboratory joining waste office paper, triturated in a mix machine, and the water necessary to the mixture with gypsum. The water absorption tests were realized according to the Portuguese standard, NP 762 (1969). For developed mixtures cured under pressure it was added a retarder mineral to make extend the time of cure.

METHODOLOGY AND RESULTS

Incorporation of cellulose and cork on gypsum plasters. It was produced three different plasters with a constant water/gypsum relation of 0,7 with the plaster for finishing. One was made without any addiction (mixture G), one with cellulose fibres (mixture G/paper) and the other with granulated cork (mixture G/cork) (see fig. 1). These samples were tested for compressive strength at dry and saturated after immersion Comp Dry and Comp Moist), to evaluate the lost of resistance during a water contact, and flexural (Flex) strength and tested for water absorption by immersion. The samples were cured at room temperature until 7 days and maintained at 40ºC, to stabilize the moisture amount, and the immersion was realized until two hours (120min) at room temperature. Analysing the obtained results it can be seen that

the cellulose fibres addiction slightly improves the flexural strength and maintains the compressive resistance, even in dry or moisture conditions samples (see fig. 2). For both addictions more ductile behaviour was verified during the mechanical tests. The fig. 3 shows a reduction of 15% of water absorption on reinforced mixtures developed.

Fig. 1 – Gypsum plasters with cellulose fibres and cork

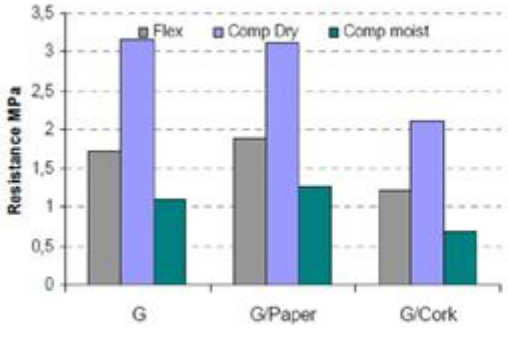

Fig. 2 – Compare of gypsum plasters with paper or cork

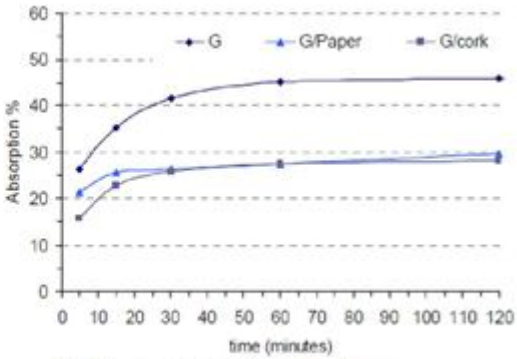

Fig. 3 – Absorption of gypsum plasters

Reducing water absorption by pressure curing. A tested method for reducing the water absorption was by pressure curing of the gypsum based mixture. With this procedure it was possible to minimize the voids content and enables a reduction the amount water necessary to the mixture. This way, one can produce a much more compact mixture and, consequently, enhance significantly its performance.

In this stage it was prepared a low consistence mixture joining plaster gypsum to only 20% of water (in mass), the minimal experimental determined value needed for hydration. Using a manual hydraulic press cylindrical

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samples were produced under a pressure of about 40,0 Psi (275,8 kPa). These samples were made at two different temperatures (room temperature (25ºC) and 50ºC) and both were maintained after casting at room temperature until 7 days. For the tests the samples were maintained at 40ºC to stabilize the moisture amount. After this the samples was submitted to compressive tests, absorption tests by immersion until 2 hours, being the saturated samples also submitted to compressive tests.

Observing fig. 4 one can compare the compressive strength results obtained in these pressed gypsum based mixtures made with the others selected plasters available on Portuguese market. As one can see a considerable increase on the compressive strength on the dry samples of pressed gypsum (legend on graphics as Press25º and Press50º), mainly at 50ºC, was attained. On the other way, the moist samples small increase in compressive strength.

In fig. 5 it is possible to observe the water absorption test results obtained on pressed and un-pressed samples (pressed gypsum, plaster and commercial card gypsum board designated at market as water resistant WR and in the fig. 5 as card gypsum WR). These results demonstrated the greatly favourable effect of pressed curing, responsible for a decrease in water absorption of about 40%. Comparing the pressed gypsum with the commercial available card gypsum tested, the pressed one maintains the values and the absorption of card gypsum continue to increase along the time.

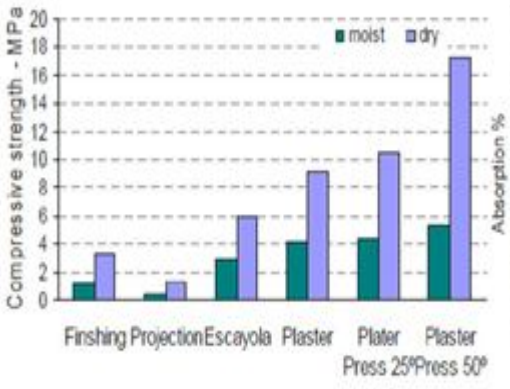

Fig. 4 – Compare of plasters /pressed gypsum

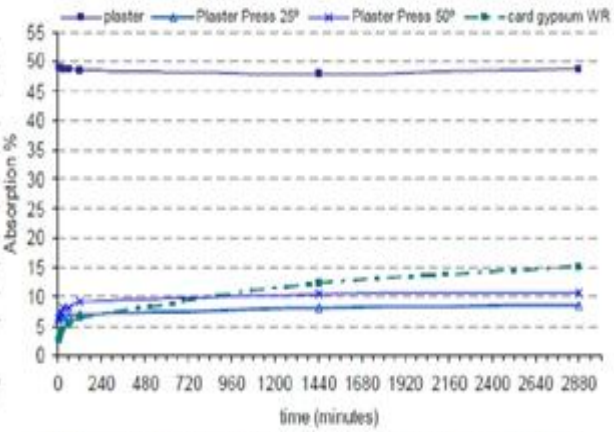

Fig. 5 – Compare of pressed/plaster/card board gypsums

Incorporation of cellulose and cork on pressed gypsum boards. Once the pressure curing reveals to be very promising, it was adopted to the producing of gypsum boards. For the development of these boards it was necessary, at a first stage, to make them without any addiction to obtain the better process of manufacture and to achieve the adequate cohesion and finish. These boards was prepared with a metallic mould of 200x200 mm2, filled with the fresh mixture made with a water/gypsum ratio of 0,20 and incorporating 0,3% (of gypsum mass) of mineral retarder. The boards were submitted to a pressure of 87,0 Psi (600,0 kPa) during 10 minutes. The boards were removed from the mould at the day after the casting and conserved subjected to 40ºC for curing and drying during 7 days. These have the designation P0 in Table 1 and fig.

10. As the same way, the boards with granulated cork and/or cellulose fibres or paper pulp were prepared following the same methodology of mix, casting, pressure and conditions of curing. Four mixtures were prepared: two introducing granulated cork (2,5 % and 5 % of the mass of gypsum) and the other two were prepared with paper pulp (3 % of the mass of gypsum in paper) and the referred cork content (see Table 1).

Table 1 – Material Percentages of boards (in mass of gypsum)

Board	Cork %	Paper %	[Kg/m3]
P0	–	–	1531,863
P1a	2,5	–	1460,39
P1b	5,0	–	1269,36
P2a	2,5	3,0	1168,939
P2b	5,0	3,0	1321,123

The next figures show the final appearance of the developed boards and the texture correspondent at near the real scale (see fig. 8). Fig. 6 shows the simple board and fig. 7 shows the incorporation of granulated cork and paper pulp in pressed gypsum-based boards.

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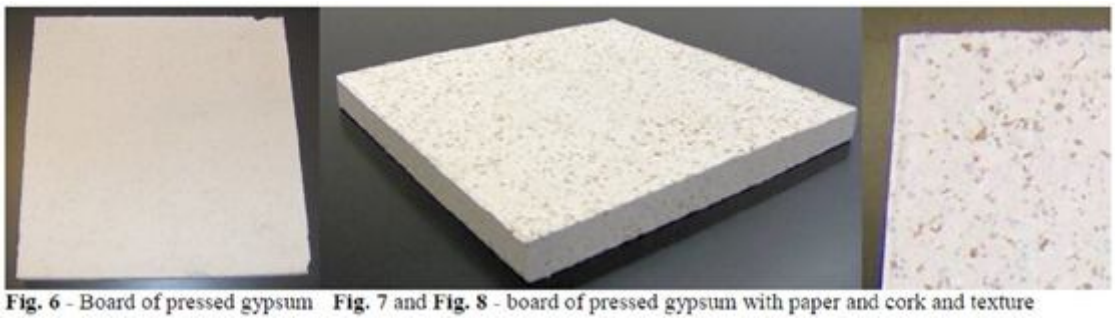

Fig. 6 - Board of pressed gypsum **Fig. 7** and **Fig. 8** - board of pressed gypsum with paper and cork and texture

These boards were submitted to flexural tests at 7 days of curing to evaluate their mechanical behaviour. By observing fig. 10 it is possible to conclude that the mixtures flexural strength diminish with an increase of incorporated waste content, either for cork granules or for paper fibres. But, the paper fibre reinforcement on the mixture made with the greater cork content (P2b) reduces significantly the difference of resistances. This happened because the cellulose fibres behaved as a link between cork and gypsum turning the material more compact. The two materials together work as an adequate complement turning the boards more ductile that P0 (see curves at fig. 9).

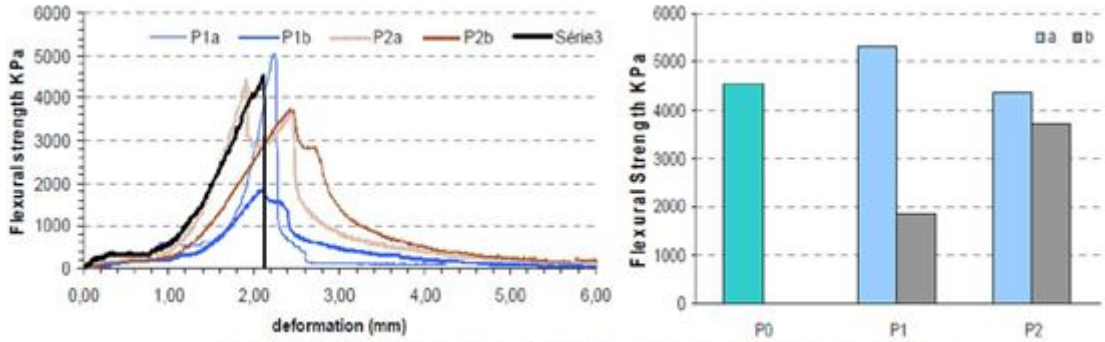

Fig. 7 and **Fig. 8** - Flexural behaviour of pressed gypsum: gypsum/cork and cork/paper

CONCLUSIONS

According to the obtained results in the tested boards one can conclude that the incorporation of granulated cork on plaster gypsum and pressed gypsum seems to be possible but reduces their mechanical performance. However these disadvantages can be compensated when compared with sustainable profit, the density reduction and the improvement of the conventional gypsum board in terms of thermal and acoustical behaviour (properties to be tested with the continuity of the research). This research work shows that it is possible to reduce significantly the water absorption by immersion, permitting an external application of these gypsum boards. The addition of cellulose fibres can improve the flexural behaviour allowing higher cork contents with less reduction on resistances. Furthermore, this addition offers a better cohesion and finishing appearance when applied on pressed gypsum boards. As well, it was verified the possibility of manufactory of non structural construction elements, for example, internal and external coverings, dry walls or ceiling.

These are new applications for the waste materials mentioned, turning the boards more environmental friendly, and promoting a new possibility for use gypsum in the external environments.

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CHABOT USING PYTHON

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ABSTRACT
I*n today's world computers play an important role in our society. Computers gives us lots of information also helps us in many manner. Chatbots, or conversational interfaces as they are also known, present a new way for individuals to interact with computer system. A chatbot allows a user to simply ask questions in the same manner that they would address a human. The most well-known chatbots are voice chatbots: Alexa and Siri. However, chatbots are currently being adopted at a high rate on computer chat platforms. Chatbot recognize the user input as well as by using pattern matching, access information to provide a predefine acknowledgment.*

1. INTRODUCTION

1.1 Motivation

Before the invention of the computers if any person want's the information they refer the books or ask any other person for that information. Later on when computer were invented the person try to fetch the information from the web pages. But the disadvantage of the web pages is that if any person asks the question then it does not get the satisfactory answer. So there is the new technology called as a Chabot.

1.2 Problem Definition

There are many websites which takes time to provide information related college. Any college websites if we want some information regarding college the college website will provide the information but user needs to navigate many links. This navigation process is time consuming there is no guarantee that user name find the information he/she is looking for.

If user has queries regarding college activity e/she needs to personally visit corresponding staff to clear his/her doubt. Staff f has to take some time from their busy schedule to clear the doubts of students. In this process both students (question) and corresponding college staff has to sacrifice some of their time from their busy schedule.

1.3 Objective of Project

The main objective of this project is that, to fetch the exact information from the chatbot. By using the chatbot, the user can get the exact required information or satisfactory answer without getting unwanted information.

2. LITERATURE SURVEY

In today's world computers play an important role in our society? Computers give us information; they entertain us and help us in lots of manners. A chatbot is a program designed to counterfeit a smart communication on a text or spoken ground. But this paper is based on the text only chatbot. Chatbot recognize the user input as well as by using pattern matching, access information to provide a predefined acknowledgment. For example, if the user is providing the bot a sentence like "What is your name?" The chatbot is most likely to reply something like "My name is Chatbot." Or the chatbot replies as "You can call me Chatbot." based on the sentence given by the user. When the input is bringing into being in the database, a response from a predefined pattern is given to the user. A Chatbot is implemented using pattern comparing, in which the order of the sentence is recognized and a saved response pattern is acclimatize to the exclusive variables of the sentence. They cannot register and respond to complex questions, and are unable to perform compound activities. Chatbot is relatively a new technology. The application of a Chatbot can be seen in various fields in the future. This paper covers the techniques used to design and implement a Chatbot. Comparisons are made, findings are discussed and conclusion is drawn at the end.

3. METHODOLOGY

College Enquiry Chat Bot project will be built using artificial intelligence algorithms that will analyse user's queries and understand user's message. This system will be a web application which will provide answers to the queries of the students. Students will just have to register and then login to the system and then ask the query to the bot that will be used for chatting. Artificial intelligence is used to answer the student's queries. The student will get the appropriate answers to their queries. The answers will be give using the built in artificial intelligence algorithms. Students won't have to go to the college to make the enquiry. The system replies using an effective Graphical user interface which implies that as if a real person is talking to the user. The user just has to register himself to the system and has to login to the system.

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4. FLOW CHART AND DISCRIPTION

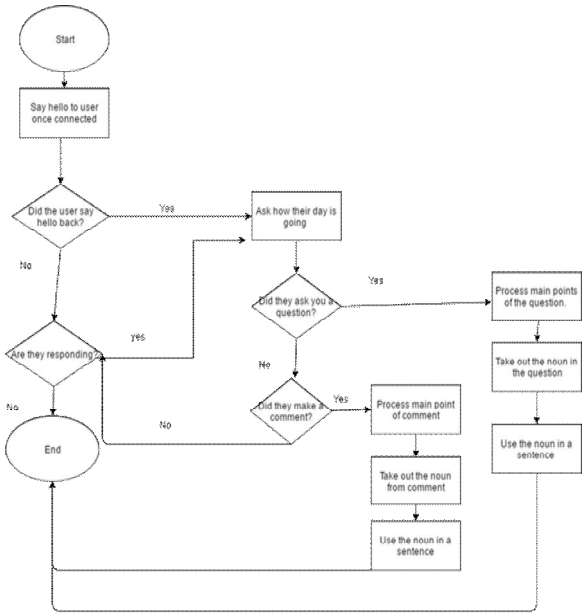

Fig:1

Our Chatbot would say hello once connected. If the user doesn't respond, the chatbot would disconnect and the conversation ends. If the user says hello back, the chatbot would ask how their day is going. If they ask a question, the chatbot would process the main points of the question by taking out the noun of the response. Then use the noun in a sentence. If they didn't ask a question, they may have made a comment. If they didn't make a comment, the conversation ends. If they did, the chatbot would process the main points of the question by taking the noun out of the response and use it in a sentence.

The strengths of this chatbot is how it is able to give a response that relates to what the user is saying. It doesn't ask question upon question without a comment relating to the answer that the user had given. The chatbot is able to react to what the user had answered.

The weaknesses of the chatbot is how it is only able to give a response to a question or comment given by the user when there is a limited amount of nouns in the sentence. When there is more than one noun in a sentence, it is not able to process the main idea of the response. Also, the chatbot isn't able to carry a longer conversation.

5. IMPLEMENTATION

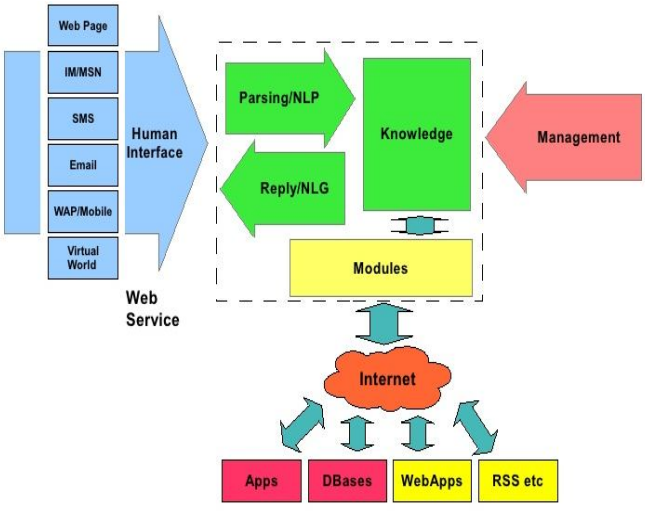

Fig:2

Parsing

- Implemented as web service – so the bot can look however you want it to look, or even sound.
- Implemented as web service – so the bot can be accessed from almost any Internet environment.

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- Discourse uses extend AIML – artificial Intelligence Markup Language
- Supports keywords and phrases
- Supports context variables
- Google-like syntax
- Easy support for alternate words

Knowledge

- AIML
- Stores “Knowledge” in reply string eg “The sky is blue”
- Triples
- “Atomic” level of knowledge
- Needs language generation

Reply

- AIML
- Reply is stored text “The sky is blue”
- AIML allows alternate replies
- Triples
- Need language generation

Modules

- Provide specific additional functionality, eg:
- User tracking
- Time questions
- Maths questions

Web modules

- Specific modules for:
- RSS feeds
- News and Weather
- Wikipedia

6. PYTHON

Python is a high-level, interpreted, interactive and object-oriented scripting language. Python is designed to be highly readable. It uses English keywords frequently where as other languages use punctuation, and it has fewer syntactical constructions than other languages. Python is a MUST for students and working professionals to become a great Software Engineer specially when they are working in Web Development Domain. I will list down some of the key advantages of learning Python:

- Python is Interpreted − Python is processed at runtime by the interpreter. You do not need to compile your program before executing it. This is similar to PERL and PHP.
- Python is Interactive − You can actually sit at a Python prompt and interact with the interpreter directly to write your programs.
- Python is Object-Oriented − Python supports Object-Oriented style or technique of programming that encapsulates code within objects.
- Python is a Beginner's Language − Python is a great language for the beginner-level programmers and supports the development of a wide range of applications from simple text processing to WWW browsers to games.

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7. ADVANTAGES AND DISADVANTAGES

7.1 Advantages

 Humans can serve a limited number of clients at the same time. This restriction does not exist for Chabot's, and they can manage all necessary queries simultaneously.

 24/7 Availability.

 Reduced costs.

 Easy to communicate.

 Learning and updating.

7.2 Disadvantages

 Complex interface.

 Installation cost.

 Proper internet connection requires making this device useful.

 Bad memory.

8. CONCLUSION

The Proposed System will be based on Natural language processing algorithm that will be used to identify answers related to user submitted questions. The need is to develop a database where all the related data will be stored and to develop a User Interface. The Web interface developed will have three parts, one for Student, Guest Users and one for the Administrator. A background research took place, which included an overview of the conversation procedure and any relevant chat bots available. A database will be developed, which will store information about questions, answers, keywords, logs and feedback messages.

9. FUTURE SCOPE

The future scope of this chat bot application will be-More efficient chat bot. It will replace the classroom instruction, textbook, practices and homework. Live Chats, Video-Calling can be used in future to make the software more useful and demanding

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"OPTIMIZING THE FLEXURAL BEHAVIOR OF LOW COST MATERIAL SLAB PANEL"

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ABSTRACT
The steady increase of population density in urban areas of many developing countries like India, from the past decade, has posed a challenge to civil engineers. High-rise buildings serve as workplace accommodations as well as residential buildings. Aesthetic demands of such high-rise buildings are not usually compromised with; Architects in the recent times come up with buildings of irregular shapes which are visually pleasing but can prove to be structurally deficit if they are not designed properly. In the event of an earthquake, these buildings do not respond similar to regularly shaped buildings since the distribution of forces within these structures vary considerably. The lateral displacement of the structures should be carried gradually with the height in order to ensure good seismic performance of the structure which otherwise can cause irrevocable damage. The general approach towards analysis and design of a structure is made under an assumption that the base of the structure is infinitely rigid and consequently restraining the displacements and rotations. Under Seismic loads, the foundations and soil media are subjected to lateral displacements and it influences the superstructure response significantly and imparts redistribution of forces in the structure differing from the forces obtained from fixed base scenario. Hence, the effect of soil-structure interaction has to be addressed and factored into the analysis of a structure. In this thesis, an attempt is made to study the seismic response of an irregular building using E-tabs (V15.2) & SAFE (v12) software. The interoperability of these software facilitates modeling soil-foundation-structure with mutual compatibility. The analysis is performed by equivalent static lad method and response spectrum method as per guidelines of IS- 1893(Part 1): 2002 for Seismic zone V.

INTRODUCTION
Concrete is a broadly used construction material for various methods of structures due to its strength and durability. For quite a while it was thought to be an exceptionally though materials requiring practically zero support. Concrete is a complex construction material self-possessed of cement, crushed stones or rock, river-sand and water. The water causes the hardening of concrete through a process is termed as hydration, concrete solidity freezes after mixing with water and settlement due to a chemical process called as hydration. The water responds with the cement which links the other constituents together, ultimately the materials creating like a stone robust. In word, the concrete is recycled more than several man made materials. So, the use of concrete material is mandatory. In the meantime shortages of aggregates are also prominently increased now-a-days. In this investigation, there are two locally available materials are used; they are coconut coir fibers and rice husk ash. The coconut fiber termed as coir, when dehydrated encloses cellulose, lignin, pentons' and fiery debris in fluctuating rate. In Asia, the development business is yet to understand the upsides of light weight concrete in elevated or high rise structures. Coconut fibers are not normally utilized as a part of development industry and are regularly dumped as farming waste.

In the present investigation, Portland cement is replaced by RHA along with addition of coconut coir fibers at various percentages to concrete, learning flexural behavior and its effect on a slab panel specimens of size 1.4m X 0.6m X0.05m, in comparison to Slabs with that of conventional concrete mix.

OBJECTIVES OF STUDY
The objective of the study is to possible use of Agricultural waste and Industrial waste to reduce the consumption of cement there by saving base of raw materials, power and surroundings. The attention of the current study is to examine the effectiveness of Rice Husk Ash [RHA] (5%, 10%, 20% & 30%) and Coconut Coir Fiber (0.5%, 1.0%, 1.5% & 2.0%).

- To creating accessible (supply) of materials in detailed quality and quantity at cost economy, and preserving the stability of supply.
- Saving in high inventory income and inventory cost.
- Conserving the flow of manufacture.
- To determine the strength properties, namely flexural strength behavior of different partial replacement and addition with RHA & CCF with comparison of normal concrete slab panel at 28days.
- The study Correlation to first crack load, width of cracking and spacing, deflection load and ultimate flexural load by the cause of extensive replacement and addition with RHA & CCF.

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- To determine the flexural behavior of slabs by two points loading using yield line theory for loading pattern in loading frame

LITERATURE REVIEW

P B Saktivel and A. Jagannathan [1]: The novelists of this research experimental work have made an endeavor to tentatively explore a ultimate flexural load of Ferro cement slabs. The size of Ferro cement slabs is 700mm* 200mm* 15mm (thickness). The reinforced slab is located with PVC by steel weld mesh, and results are also compared with GI – coated steel weld mesh with using slabs, by sighting the quantity of layers from 1 - 3. Standard Portland cement, locally accessible waterway sand and consumable water have been utilized as a part of arrangement of bond mortar, and the cement sand proportion of 1:2 and cement water proportion of 0.43 have been utilized as a part of agreement with ACI codes. The determination of Ferro cement slabs on flexural strength using four- point loading particularly fabricated flexural frame loading. The reinforced Ferro cement slabs have been elevated to finding crack pattern, crack width, the flexural load and maximum deflection using variable PVC and GI covered weld mesh layers (1-3). Higher the number of meshing layers from (1-3) initiated subsequently higher the load of flexure as well as development in ductility behavior of reinforced ferro-cement slab. At first crack the slabs deflection using PVC covered weld mesh is performing about 25% increases the slabs ductility behavior with GI covered weld mesh.

Randhira J. Phalake, Darshan G. Gaidankar [2]: The current investigations designates the outcomes of testing reinforced flat Ferro cement panels with wire mesh layer of different numbers. There are two, three and four number of layer of numbers are used. The size of reinforced slab panel is (550mm$\times$ 200mm) and thickness is 25mm. the number of meshing layer is changing reinforced with welded square mesh. The casting of slab panels with mix proportion of mortar is (1:1.75) and super plasticizer containing water cement ratio is (0.38), with quantity of total mass of cement is (1%). Various panels be present with L/D = 57(aspect ratio) and total volume of compound casted with steel fibers is (0.5%). The experimentation is done after 28 days curing period using under two point loading system in UTM machine. The experimental indications show that slabs with less number of layers of mesh showed greater flexural strength. In reinforcing mesh layers recycled Ferro cement slab panel depends on ultimate load and flexural load at first crack. The results demonstrate that integration of steel fibers long with addition in number of layers indicates to 58% higher in load carrying capacity and decreased deflection by 33%.

P Vassanthi [3]: The main aim of this research is to investigate the concrete performance in strength and flexural behavior for example deflection and load acting on slab panel of dimensions 1400mm $\times$ 1200mm $\times$ 100mm, having normal coarse aggregate of size 20mm using partial replacement of steel slab. For this project work, the grade of concrete M30 and M40 were adopted, experimental analysis is accompanied by slab panel casting for different replacement of coarse aggregate with proportion of steel slab at varying percentage (0%, 30%, 60% and 100%). The achieved outcomes have been investigate and compared with both M30 and M40 grade of concrete. Based on study it can be concluded that the workability of concrete decreases by 60% with increases in replacement level of steel slag. In equating with grade of concrete M30 and M40, the maximum strength is achieved for M40 compared to M30 grade of concrete. In M40 grade of concrete the maximum compressive strength 1065KN gained for 60% SSA and also in M30 grade of concrete the equivalent strength of 847KN. The involvement in the present study demonstrates that up to 60% of coarse total can be comprised of steel slag and the rest can be made up ordinary characteristic coarse total. However the genuine substance of steel slag relies on the elevation of cement and holding of total accessible for utilization of cement.

MATERIAL AND TESTING

This segment goes to detailed research of trail investigation that is done, including properties of various materials used and their mix extent. The purpose of interest of system for casting of specimens and their testing technique are in likewise illuminated.

To study the flexural behavior on material properties and strength parameters,

HARDENED CONCRETE

a. This slab panel specimen of size 1400mm*600mm*50mm were prepared.

Each of two specimens tested for 28 days.

b. To find the flexural strength behavior and compared the results with conventional slab panel by varying percentages of RHA and CCF.

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Fig. Slab Panels

Material and methods: In this experimentation, the locally available raw materials used and for binding depiction ordinary Portland cement (OPC) are included, for fine aggregate river sand, crushed stones for coarse aggregate, additional concrete constituent coconut coir fibers and partial replacement for cement rice husk ash are used. Potable water was used for curing and mixing during entire research work

Cement: The cement must progress suitable strength. For this research 53grade ordinary Portland cement, compatible to IS 12269-1989 was used. It must symbolize the suitable rheological performance. The physical properties of cement as showed in below table

Fine aggregate: For fine aggregate canal sand was used, comparable to IS 383-1970. To remove imported material, to use air dried sand, sieved, and earlier to mixing. The physical properties of fine aggregate as showed in below table

Coarse Aggregate: In present I nvestigation, broken or crushed stones with aggregate size 12.5mm down are considered. The experimental results are tabulated bellow confirming with IS 2386-1963 codes. The physical properties of coarse aggregate as showed in below table

Sl.no	**Physical assets**	Experimental results
1	Specific gravity	2.74
2	Bulk density for lose FA	1471 kg/m^3
3	Bulk density for compacted FA	1600 kg/m^3
4	Water absorption	0.2%
5	finesse modulus	3.40

Coconut Coir Fiber: Coconut fibers were composed from temples, houses and coconut industries to evaluate the properties. The physical properties of CCF as show in bellow table

Sl.no	**Physical assets**	Experimental results
1	Specific gravity	0.88
2	Water absorption	15%

Rice husk ash: In this research work, RHA or obtained from Rice mill industries. It's freely available from rice mill. The physical properties of RHA are tabulated in table

Sl.no	**Physical assets**	**Experimental results**
1	Specific gravity	1.70
2	appearance	Very fine powder
3	color	gray
4	odor	odorless

Reinforcement: Fe500 steel bars of diameter 10mm (longer and shorter span) were used as reinforcement with covering 25mm in slab panel.

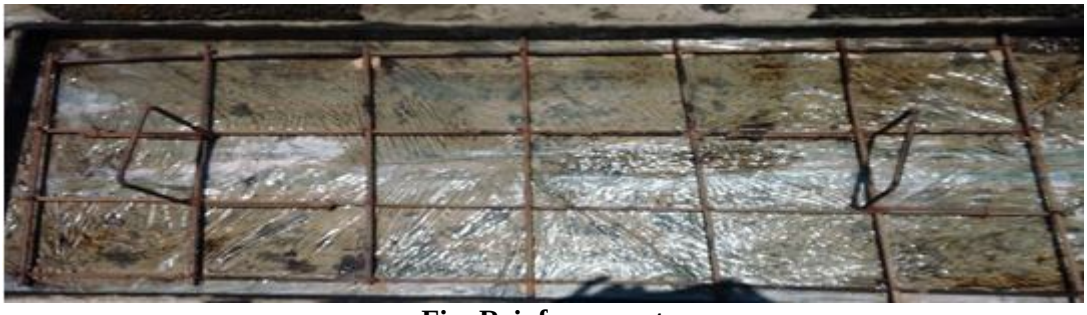

Fig: Reinforcement

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Water: Portable water free from salt was used for concrete casting, curing and mixing as per IS456-2000 recommendations.

Super plasticizers: In this present investigation, we use GLENIUM B233 supplied by BASF India Ltd. GLENIUM B233 is another admixture in view of altered poly carboxylic either.

GLENIUM B233 is free of chloride and low soluble base. It is compatible with a wide range of bond.

Concrete mix design: Calculation of mix proportion for the present research recommended an Indian standard guideline (IS10262:2009). Mix design calculation for M25 grade of concrete as showed in appendix. The mix design for both Rice Husk Ash and Coconut Coir Fiber concrete as showed in below table.

Mix Proportion for M25 Grade of Concrete

Designation	Cement (Kg/m^3)	Fine Aggregate (Kg/m^3)	Coarse Aggregate (Kg/m^3)	Water In Liter	Super Plasticizer In ML
NCC	350	753	1175	175	1400

Mix Proportion for Rice Husk Ash Concrete

Designation	Cement (Kg/m^3)	RHA (Kg/m^3)	Fine Aggregate (Kg/m^3)	Coarse Aggregate (Kg/m^3)	Water In Liter	Super Plasticizer In ML
AS1 (5%)	332	18	753	1175	175	1330
AS2 (10%)	315	35	753	1175	175	1260
AS3 (20%)	280	70	753	1175	175	1120
AS4 (30%)	245	105	753	1175	175	980

Mix Proportion for Coconut Coir Fiber concrete

Designation	Cement (Kg/m^3)	CCF (Kg/m^3)	Fine Aggregate (Kg/m^3)	Coarse Aggregate (Kg/m^3)	Water In Liter	Super Plasticizer In ML
BS1 (0.5%)	350	4.4	747	1163	175	1400
BS2 (1.0%)	350	8.8	742	1155	175	1400
BS3 (1.5%)	350	13.2	737	1147	175	1400
BS4 (2.0%)	350	17.6	731	1139	175	1400

Placing And Compaction

Flexural Load: Originally, the load was applied on any material, and the initial crack was visibly realized to naked eye, and the equivalent load at the time of development of first crack is what is designated as the "Initial crack load". With additional increase in load, this stiffness face of the sampling had on going cracking, which was monitored by crushing of the compression surface. And ultimate main crack at failure load was observed at the top middle face of the sample, the finite ultimate positions of the sample are termed as "Ultimate failure load".

Loading Frame: Testing of slabs are arranged in 500tonnes capability loading frame, which electrically functioned by hydraulic jack. By means of jack, uniformly distributed load on slabs are subjected at center.

Loading Frame

Procedure for testing: For testing, the slabs were simply supported and subjected to two point static loading system by using channel sections. Demec gauge pellets are pasted at the top most compression fiber, at the central of slab and the level of reinforcement of slab to conclude the lateral displacement. And also LVDT (linear variable differential transformer) to know the vertical deflection on slab panels. There are two LVDT are

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using during testing, one is setup for distance of L/3 (at support), and another one at center of slab panels. Then load was applied gradually by manual jack and readings were taken from the loading frame control panel, the initial crack was found by demec gauge and initial load by manual jack. And the procedure was continued until cracks were visible; the load at which the cracks started was noted.

Marking of Demec Gauge Pellets

LVDT at Center and support

Loading Frame Control Panel

Manual Jack

Placing of Channel Section

Cracking Growths and Modes of Failure: A crack seems at the bottom surfaces of the slabs when the tensile stresses exceed the modulus of rupture of concrete. The first crack appears at the middle of the slab and gradually develops through the width of the slab. The second crack forms at the right support of the slab consequently at the left support of the slab. Additional development of cracks occurs, on increasing the application of static load. Steel reinforced slabs show the flexural type of failure by the yielding of steel which is then monitored by crushing of concrete.

Cracking Behavior

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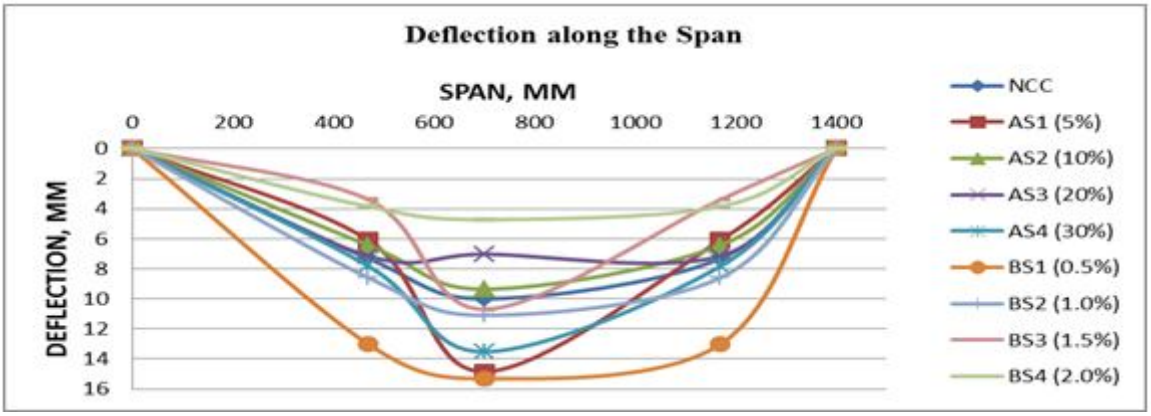
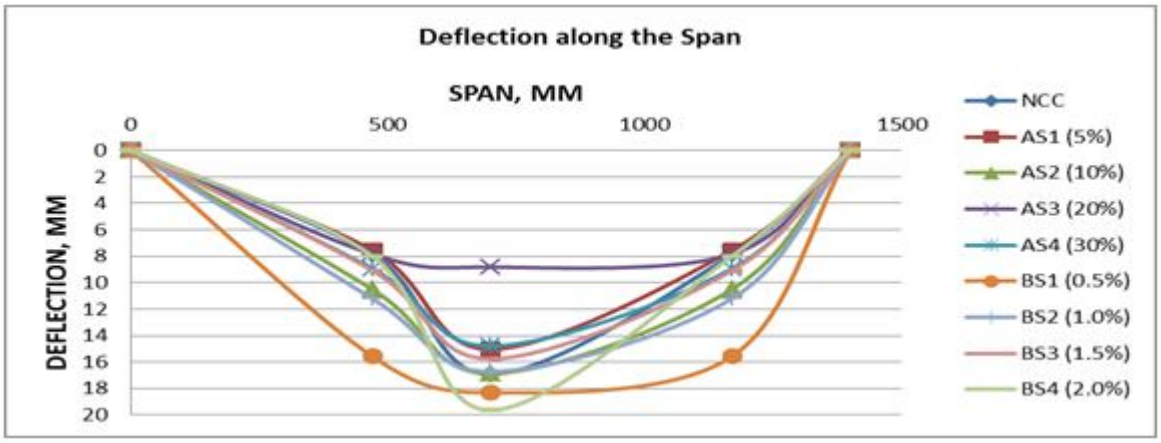
The Graph Plotted for Deflection along the Span for cracking load:



Line graph for Deflection along the Span of NCC, RHA and CCF Concrete

The Graph Plotted for Deflection along the Span for Ultimate load:



Line graph for Deflection along the Span of NCC, RHA and CCF Concrete

CONCLUSIONS

Based on the experimental results, the study carried out on the behavior of flexural load for RHA and CCF concrete, the following conclusions are established:

1. The behavior of flexural load in RHA concrete, the flexural load carrying capacity is to be decrease for 5%, 20% and 30% replacement. So that RHA concrete is not a better replacement for slabs.
2. The behavior of flexural load in CCF concrete, the results designates that there is a flexural load carrying capacity improvement with 0.5%, 1.0% and 1.5% of CCF concrete addition level. So, CCF concrete retains a number of better abilities that make durable and good building concrete attentions. So that it may be used in structural slabs for 0.5% to 1.5% addition levels.
3. Increase in percentage addition by coconut coir fibers increased flexural load. But, if CCF added more than 1.5%, then flexural load decreased.

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EFFICIENT SPEED CONTROL OF THREE PHASE INDUCTION MOTOR USING VECTOR CONTROL METHOD

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ABSTRACT
This paper deals with design and analysis of a 3-phase induction motor drive using Vector control Method on an integrated DSC (digital signal controller) system manufactured by Microchip. The system integrates into a single board the computational power of dsPIC30f2010 DSC with extra peripherals needed in vector control application, and therefore require minimal hardware development. The vector control system consists of a power circuit having a three –phase IGBT based bridge inverter feeding a three phase squirrel cage induction motor and the control circuits, which comprise of sensors(for sensing speed and current signals), interfacing circuits and control software (processed in DSC). The sensed speed and the sensed winding currents of the three phase are used as feedback signals for the closed loop control structure. Test results are presented for different load, various speeds with stator winding currents. On the developed vector control drive system.

Keywords: Digital Signal Controller, vector control, Induction Motor

I. INTRODUCTION
The motor control industry is a aggressive sector.Each industry to remain competitive must reduce costs but also has to answer to power consumption reduction and EMI radiation reduction issues imposed by governments and power lobbies. To preserve the environment and to reduce green house effect gas emission, governments around worldwide are introducing regulation requiring white good manufactures and industrial factories to produce more energy efficient appliances. This is reason why appliances designers and semiconductor suppliers are now interested by the design of low cost and energy efficient variable speed drives. DC motors are simple in control and offer fast dynamic response, High initial and maintenance costs of dc motors needs a substitute having all these advantage as well as capable of eliminating these problems. Three-phase squirrel cage induction motor is a good option due to its brushless robust structure and free from regular maintenance. Vector control mode of operation is defined as a control technique in which two equivalent control signals are produced to control torque and flux in decoupled manner. When three- phase squirrel cage induction motor is operated in vector control mode, its response improves considerably and it acts as a better substitute for the separately excited dc motor. In addition it can improve the motor's dynamic and steady state characteristics.[4]

In this investigation, an indirect vector control method is implemented. Three-phase squirrel cage induction motor is fed from a current controlled voltage source inverter. The current and speed signals are fed back to the closed loop control structure. The control algorithm is processed in real time using digital signal controller (DSC), namely dsPIC30f2010,This DSC has built in features like 16/32 bit timers, 6channels of 10 bit analog to digital converters, digital input and output units, 4 input capture ,1UART, 1 SPI, 1 I2C,6 PWM outputs along with central processing unit. Therefore, using such signal processors the hardware required for realizing a real time controller is reduced leading to improvement in reliability, yields enhanced operations, fewer system components, lower system cost and increased efficiency. The various graphs/waveforms are analyzed and studied on storage oscilloscope. The closed loop hardware control of the motor is developed and the results are studied and analyzed.

II. ANALYSIS OF CONTROL SCHEME
The purpose of the vector control scheme is to maintain the air-gap flux of AC Induction motor constant in order to achieve higher run-time efficiency.[10] The magnitude of stator flux is proportional to stator currents and finally controls the rotor currents. If stator current is kept constant the stator flux remains constant & motor torque will only depends upon slip frequency. However, when fast dynamic response and greater speed accuracy are needed, Thus closed-loop speed control methods are essential, but a precise feedback system must be used to sense the rotor speed and adjust the inverter frequency accordingly.[6][8]

The vector control method controls the frequency, amplitude and phase of motor drive voltage. The Key to Vector control is to generate a 3-phase stator voltage to control 3-phase stator currents. These 3-phase stator currents control the rotor flux linkage vector and finally control the rotor currents. The rotor current cannot be measured directly because the rotor is a steel cage and there are no direct electrical connections. Hence The measured parameters are Instantaneous stator phase currents, i_a, i_b, i_c, Rotor mechanical velocity and rotor

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electrical time constant. The stator currents, i_a, i_b, i_c can be controlled using co-ordinate transformation with the help of Clark transform, park transform, inverse park and inverse Clark transform methods.[1]

A.CLARKE TRANSFORM

The Clarke transform is to convert from a 3-axis system referenced to the stator of the motor to a 2-axis system also referenced to the stator. In this transform the i_s can be calculated from the 3-phase stator currents then decomposed into two components i_α along real axis, i_β along imaginary axis.which are stationary with reference to stator of the induction motor.[1][5]

$$i_\alpha = i_a ; \qquad i_\beta = \frac{i_a + 2i_b}{\sqrt{3}} \quad (1)$$

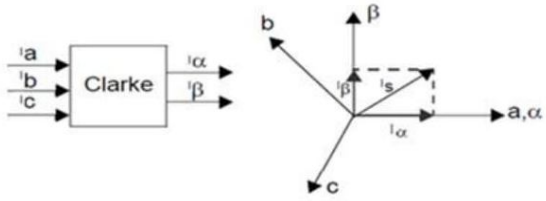

Figure.1 Clarke Transform for 2-phase stationary stator voltages.

B.PARK TRANSFORM

The next step is to transform into another 2-axis system that is rotating with the rotor flux. This transformation uses the Park Transform, This 2-axis rotating co-ordinate system is called the d-q axis. Where d-axis component is equivalent flux producing component, q-axis component is torque producing component. Under steady state conditions they are DC values. Now that we have these components represented as DC values you can control them independently with classic PI control loop.[1][5].

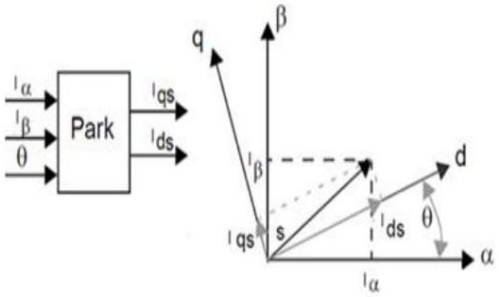

Figure.2. Park Transform for 2-phase stationary stator voltages to rotating rotor voltage.

$$i_{ds} = i_\alpha \cos\theta + i_\beta \sin\theta ; \text{ [2]} \qquad i_{qs} = -i_\alpha \sin\theta + i_\beta \cos\theta \text{ ; [3]}$$

C.INVERSE PARK TRANSFORMS

After the PI iteration, we have two voltage component vectors in the rotating d-q axis. it is required to transform from the 2-axis rotating d-q frame to the 2-axis stationary frame α-β.[5]

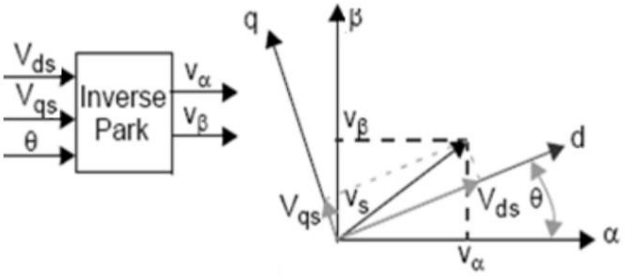

Figure.3. Inverse Park Transform for 2-phase rotating stator voltages to stationary stator voltage.

$$v_\alpha = v_{ds} \cos\theta - v_{qs} \sin\theta \text{ ; (4)} \qquad v_\beta = v_{ds} \sin\theta + v_{qs} \cos\theta \text{ (5)}$$

D.INVERSE CLARK TRANSFORM: The next step is to transform from the stationary 2-axis α-β frame to the stationary 3 axis, 3-phase reference frame of the stator voltages.[5]

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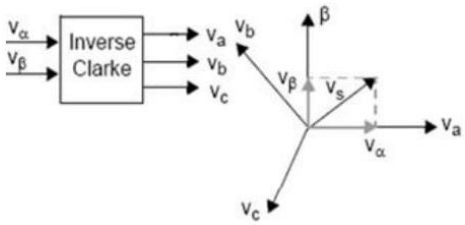

Figure.4. Inverse Clark Transform for 2-phase stationary stator voltages to 3-phase stator voltage.

$$v_a = v_\alpha; \qquad v_b = \frac{v_\alpha}{2} + \frac{2}{\sqrt{3}} v_\beta; \qquad v_c = \frac{v_\alpha}{2} - \frac{2}{\sqrt{3}} v_\beta \qquad (6)$$

III. CONFIGURATION OF THE PROPOSED SYSTEM

The speed control of induction methods is the most popular vector control method. The vector control method controls the frequency, amplitude and phase of motor drive voltage. The command and feedback signals are DC quantities and are proportional to the respective variables. The propose vector control scheme is to maintain the air gap flux of the AC Induction motor constant in order to achieve higher run time efficiency. The magnitude of stator flux is proportional to the stator currents and frequency. If the stator flux is remains constant and motor torque will only depend upon slip frequency. The frequency is computed with help of feedback signal as rotor mechanical speed. Figure5 shows the block diagram of the proposed vector control drive system. Which is implemented with system Harware and control software. Both the hardware and software implementation are explained in this section.[4]

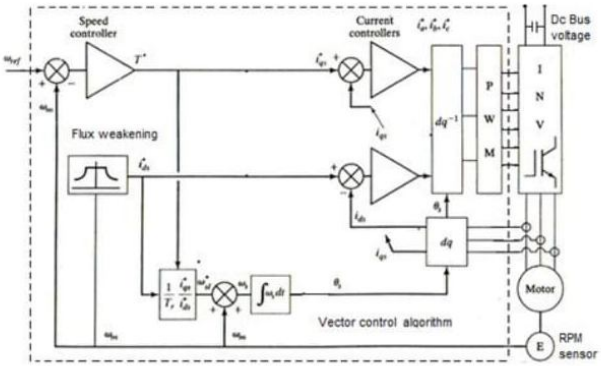

Figure 5 Block diagram of proposed method

A. SYSTEM HARDWARE

The hardware of the drive consists of three –phase IGBT based voltage source inverter, gate driver circuit, sensed speed and reference speed scaling circuits and the sensed current (using current transformer) and scaling circuits. The gate driver circuit consists of TLP250 driver chip. Each gate driver has an optical isolation in its initial stage to isolate the control circuit from the power circuit. Six gating signals achieved at the output of driver chips are applied between gate and emitter of IGBT's Sensed speed signal, reference speed signal and sensed current signals are scaled by their respective signal conditioning circuits in the acceptable range of 0-5v to fed to the ADC channels of DSC. Both sensed speed and reference speed signals are adjusted in range from 500 rpm to 1400 rpm.

B.CONTROL SOFTWARE

The modules implemented through software are the PI speed controller and limiter, Field weakening block, Estimator for i^*_{ds},$i^*_{qs}$and ω^*_{sl} , reference current generator and space vector modulation. The software has been developed in C high level language.

The basic idea of the indirect vector control algorithm is to decompose a stator current into flux and torque producing components. Both components can be controlled separately after decomposition. The structure of the motor controller is then as simple as that for a separately excited DC motor.

The basic structure of the indirect vector control algorithm of the AC-induction motor.

To perform indirect vector control algorithm and to complete following steps:

1. Measure the motor quantities (phase currents and rotor mechanical speed).
2. Transform them into the 2-phase system (α,β) using a Clarke transformation.

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3. Transform stator currents into the d,q reference frame using a Park transformation.
4. Calculate the rotor flux linkage vector magnitude and position angle.
5. The stator current torque (i_{qs}) and flux (i_{ds}) producing components are separately controlled.
6. Calculate the output stator voltage space vector using the decoupling block.
7. The stator voltage space vector is transformed by an inverse Park transformation back from the d,q reference frame into the two-phase system fixed with the stator.
8. Using the space vector modulation, the output three-phase voltage is generated.

The speed of the motor (ω_m) is compared with its reference value (ω_{ref}) and the error is processed in the proportional Integral (PI) speed controller . A limit is kept on the output of the PI speed controller depending on the maximum permissible winding current. The output of the PI speed controller after the limiter is considered as the reference torque and similarly the flux control signal is considered as the reference flux signal. These two signals are the main control signals for the vector controller[4].The controller calculates the d components (i_{ds})and the q components(i_{qs}) of the reference current signal (which are responsible for the torque control and field control respectively) and also the slip frequency signal in the synchronously rotating reference frame. These signals are converted into three phase reference currents (i_a, i_b, i_c)

To operate an induction motor in indirect vector controlled mode the winding current must be in the same pattern as these reference currents. The reference currents are fed into the pwm current controller along with sensed winding currents. For sensing currents, three currents are sensed using current transformer. The current error signals are amplified and used as modulating signals for the space vector modulation. Six driver PWM signals emanate from the output of the space vector modulation and these are fed to the gate driver circuit. Because of the operation of the current controller the winding currents follow the pattern of reference currents.

There are three control loops are required for a vector control algorithm.

The two-fast control loop executes two independent current control loops. They are direct –axis and quadrature-axis current (i_{ds}, i_{qs}) PI controllers. The direct-axis current (i_{ds}) controls rotor magnetizing flux.The quadrature-axis current (i_{qs}) corresponds to a motor torque.[4]

The reference for the flux producing direct axis component of the stator current i^*_{ds} is set by the field-weakening controller. The field weakening controller compute the rotor magnetizing current (i^*_{mr}) is a function of the rotor mechanical speed. Mathematically, the logic for computation of i^*_{mr} may be stated as follows: If speed of the rotor ($\omega_{m(n)}$) is less than the base speed of the squirrel cage induction motor. Then

$$i^*_{mr(n)} = I_m \quad (7)$$

If speed of the rotor ($\omega_{m(n)}$) is more than the base speed of the squirrel cage induction motor. Then

$$i^*_{mr(n)} = \frac{I_m K_f}{\omega_{m(n)}} \quad (8)$$

Where $i^*_{mr(n)}$ is the magnetizing current at nth instant and K_f is the flux constant.the value of K_f can be calculated by substitution of the base speed and magnetizing current magnitudes in equation (6)

The first fast routine calculates the d-axis current signal i^*_{ds} in the synchronously rotating reference frame aligned with the rotor field. This current is computed with help of rotor magnetizing current. This can be mathematically discretised is as follows.

$$i^*_{ds(n)} = i^*_{mr(n)} + T_r \frac{d i^*_{mr(n)}}{dt} \quad (9)$$

Where $i^*_{ds(n)}$ is the flux component of stator current (i_s) at the nth instant.; T_r is rotor time constant $T_r = \frac{L_r}{R_r} L_r$ is the rotor inductance ; R_r is the rotor resistance;[4]

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The second fast routine calculates the q-axis current control i^*_{qs} in the synchronously rotating reference frame aligned with the rotor field. This current can be calculated on basis of reference torque signal. The PI speed controller output sets a reference for the torque producing quadrature axis component of the stator current (i^*_{qs}).This mathematically can be discretised as follows

$$i^*_{qs(n)} = \frac{T^*}{K_m i^*_{mr(n)}} \qquad (10)$$

Where $K_m = \frac{3}{2}\left(\frac{p}{2}\right)\left[\frac{M}{(1+\sigma_r)}\right]$; $i^*_{qs(n)}$is the torque component of stator current (i_s) at the nth instant. P is the number of poles.; M is the magnetizing inductance.; σ_r the rotor leakage factor.;T^*= reference torque computed at nth instant.[4]

The third slow control loop executes speed controller and lower priority control task. The induction motor shaft rotational speed is controlled in a speed control loop. The speed signal is sensed by means of a RPM sensor. The RPM algorithm evaluates the output voltage of RPM signal. The actual motor speed (ω_m) is subtracted from the required (ω_{ref}) speed command and the difference error is input to the speed controller. The speed controller is implemented as a PI speed controller.The computation of the reference torque (T^*) is produced by speed controller routine is to compute reference torque depending upon the difference in the reference speed and rotor mechanical speed.[4]

In discretised format, the working logic of speed controller routine may be mathematically stated in discretised form as shown:

$$T_n = T_{(n-1)} + K_p\{\omega_{esl(n)} - \omega_{esl(n-1)}\} + k_i\omega_{esl(n)} \qquad (11)$$

Where K_p is the proportional gain constant; k_i is the integral gain constant; $\omega_{esl(n)}$ is the speed error at the nth instant and $\omega_{esl(n-1)}$ is the speed error at the (n-1) th instant.[4]

The output of the PI speed controller is limited through the limiter depending upon the maximum permissible winding current. After limiting, the reference torque signal is computed at the nth instant. The angular speed error $\omega_{sl} = \omega_{ref} - \omega_m$ to $i_{qs}{}^*$ (reference quadrature axis component of the stator current) is given by [7];

$$\omega_{ref} - \omega_m = \omega_{sl} = \frac{L_m}{\widehat{\varphi_r}}\frac{R_r}{L_r} i^*_{qs};$$

$$i^*_{qs} = \frac{\widehat{\varphi_r}}{L_m} \quad \frac{L_r}{R_r}(\omega_{ref} - \omega_m) = \frac{\widehat{\varphi_r}}{L_m} \quad \frac{L_r}{R_r}\omega^*_{sl}$$

$$\frac{i^*_{qs}}{i^*_{ds}T_r} - \omega^*_{sl} \qquad (12)$$

Which results the generation of the torque components of current i^*_{qs} from the speed control loop.The slip frequency ω^*_{sl} is generated from i^*_{qs}, i^*_{ds} in feed forward manner from equation 10. [4][7].The slip speed ω^*_{sl} is added to the rotor speed ω_m to obtain the stator frequency ω_s.This frequency is integrated with respect to time to produce the required angle θ_s. of the stator voltage relative to the rotor flux vector. This angle is to generate the unit vector signals (cos θ_s and sin θ_s) and to transform the stator currents (i_{ds}, and i_{qs}) to d-q reference frame.[7] Two independent current controller are used to regulate the i_{qs} and i_{ds} currents to their reference values. The compensated $i_{qs}$and i_{ds} errors are then inverse transformed into the stator a-b-c reference frame for obtaining switching signals for the inverter via space vector modulation PWM signals.[4] [7]

The various components of the space vectors are shown in figure 6. The $d^s - q^s$ axes are fixed on the stator, but the $d^r - q^r$ axes are fixed on the rotor and moving at speed ω_r. The synchronously rotating rotor vector axes $d^e - q^e$ are rotating at speed ω_e . which is ahead of the actual rotor mechanical position vector axes $d^r - q^r$ by positive slip angle θ_{sl} and corresponding to slip frequency ω_{sl}. The speed calculation of the rotor

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vector axes is given by $\omega_e = \omega_r + \omega_{sl}$,wecan write

$$\theta_e = \int \omega_e \, dt = \int (\omega_r + \omega_{sl}) dt = \theta_r + \theta_{sl} \quad (13)$$

The rotor vector position θ_e is not absolute, but is slipping with respect to the rotor at frequency ω_{sl}. For decoupling control , the stator flux oriented of current i_{ds} should be aligned on the d^s -axis , and the torque component of the current i_{qs} should be aligned on the q^s-axis. This method uses a feed forward scheme to generate ω^*_{sl} from i^*_{qs}, $i^*_{ds}$and T_r .[7]Where i^*_{qs} = reference torque producing current.;i^*_{ds} = reference flux producing current.; T_r .= rotor time constant (in msec)

IV EXPERIMENTAL SETUP AND RESULTS

The performances of the proposed method have been experimentally tested for different value of speed from 500 rpm to 1400 rpm for different value of load. The experimental results show the effectiveness of the proposed method. Even at low frequency operation, the speed control is realized under heavy load condition. Experimental results show that good speed control accuracy can be achieved by the proposed method. As it can be seen from fig 7 and 8 , for set rpm of 1200 and 600, the rpm of motor remains in the range of set rpm with an error of +/- 10 rpm . Hence, the accuracy of approximately 98% fig 9 and 10 shows steady state stator current response for the load as 1kg and 2kg . it shows that stator current remains constant for different value of speed at rated torque.[9][10]Fig 11, 12 and 13 shows the gate pulse , current waveform and inverter output voltage waveform.

Experimental results for variable load and set speed at 1200rpm

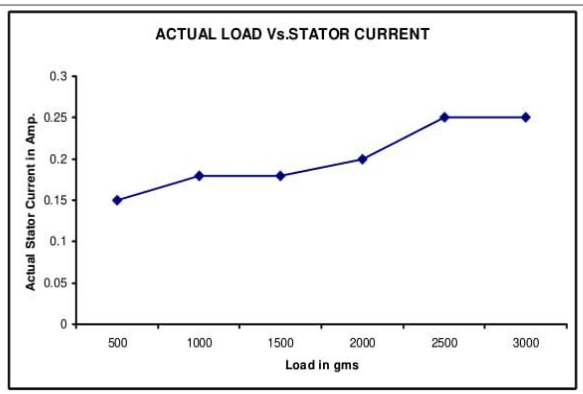

Figure. 7.-Charactristics of actual RPM vs. load for the set speed at 1200rpm

Experimental results for variable load and set speed at 600rpm

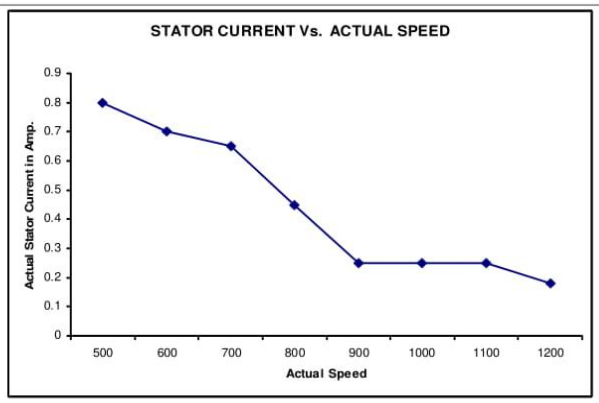

Figure.8-Charactristics of actual RPM vs. load for the set speed at 600rpm

Steady state stator current response for the load at 1 & 3Kg

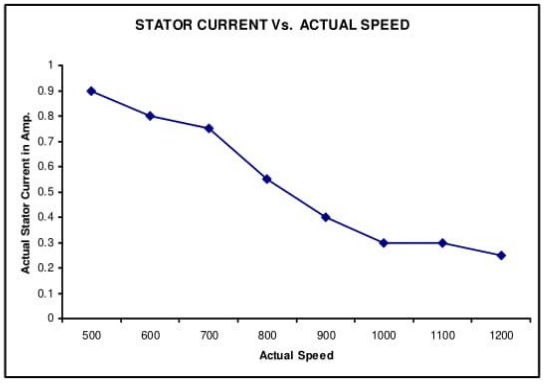

Figure.9.-Charactristics of stator current vs. speed for the rated torque at 1Kg

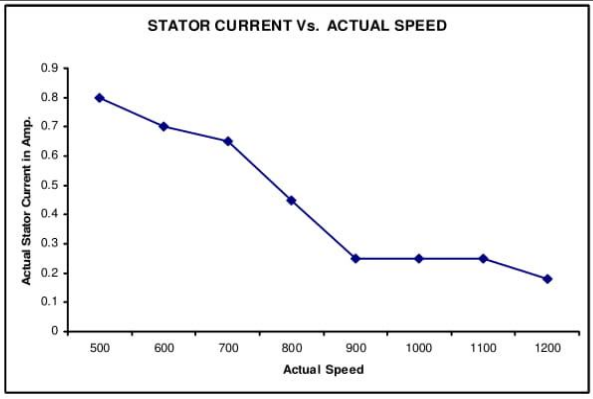

Figure.10.-Charactristics of stator current vs. speed for the rated torque at 3Kg

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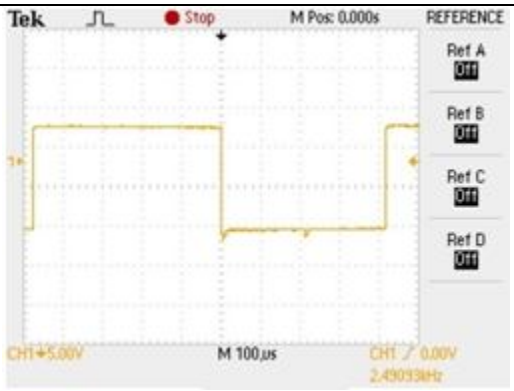

Figure.11. Gate pulse for 1200 rpm

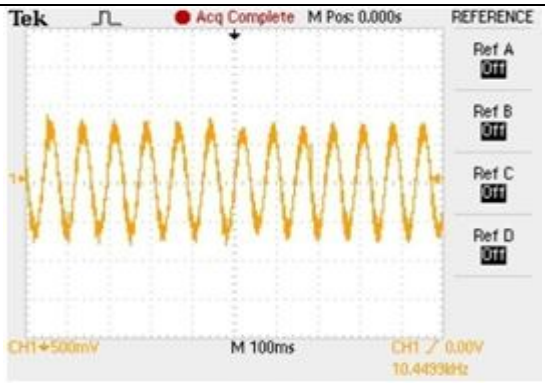

Figure .12.Current waveforms for the load of 3Kg at 1200 rpm

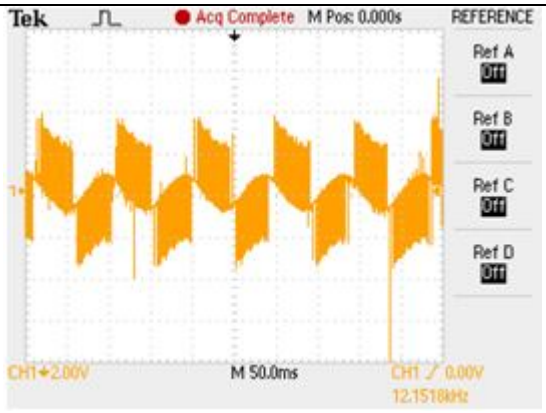

Figure .13. Inverter output line-line voltage waveforms for the load of 3 Kg at 1000rpm.

Figure .14.Photographs of Complete Setup

V. CONCLUSION

The paper describes the design of control stage and presents results obtained by motor. This type motor control is well justified in application requiring speed control with vector control method such as pumps, machine tools,mills etc. In this proposed method, range of speed control is from 500rpm to 1400 rpm .The performances of the proposed method have been experimentally tested for different value of speed for different value of load. The experiment results show the effectiveness of the proposed method. Even at low frequency of operation, the speed control is realized under heavy load condition. Experimental results show that good control accuracy can be achieved by the proposed method.

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HEXAPOD-3D RECONSTRUCTION

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ABSTRACT
Over the last two decades the research and development of legged locomotion robots has grown steadily. Legged systems present major advantages when compared with 'traditional' vehicles, because they allow locomotion in inaccessible terrain to vehicles with wheels and tracks. However, the robustness of legged robots, and especially their energy consumption, among other aspects, still lag behind mechanisms that use wheels and tracks. Therefore, in the present state of development, there are several aspects that need to be improved and optimized. Keeping these ideas in mind, this paper presents the review of using legged robots for research in the field of archeology and military purpose, in addition with ultrasound tools and techniques for mapping of various inaccessible areas.

Keywords: Inaccessible terrain, 3D mapping, ultrasound tools, compact.

I. INTRODUCTION
Robots independently can also operate under the control of a computer program such as can be directly operated by operator. Six-legged robots can be used as search and rescue robots, space robots and discover robots. In these fields, hexapod robots present opportunities as having small size and practical mobility. When viewed from this perspective, six legged walking robot can be easily scroll by produced algorithms in all types of terrain is an advantage. The acceptable number of legs and the ability to move provide more controlled balance to the robot when compared to the majority of multi-legged robots. While wheeled robots are faster on level ground than legged robots, hexapods are the fastest of the legged robots, as they have the optimum number of legs for walking speed - studies have shown that a larger number of legs do not increase walking speed. Hexapods are also superior to wheeled robots because wheeler robots need a continuous, even and most often a pre-constructed path.

Hexapod robots however can traverse uneven ground, step over obstacles and choose footholds to maximize stability and traction. Having maneuverable legs allows hexapods to turn around on the spot. In comparison to other multi-legged robots, hexapods have a higher degree of stability as there can be up to 5 legs in contact with the ground during walking. Also, the robots center of mass stays consistently within the tripod created by the leg movements, which also gives great stability. Hexapods also show robustness, because leg faults or loss can be managed by changing the walking mechanism. This redundancy of legs also makes it possible to use one or more legs as hands to perform dexterous tasks. Because of all of these benefits, hexapod robots are becoming more and more common, and it will be interesting to see what modifications robot cists come up with to further improve and develop their form and function. There are many terrain where the wheeled robot cannot go further, and cannot overcome the obstacle. However legged structure overcomes that hurdle and get away from

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it very easily and swiftly. The most efficient use of the Hexapod can be done in the rocky or sandy terrain where the wheels get struck the legged structure can easily be the alternative and Hexapod is the best choice in legged robot because it can easily stabilize the body on three legs. So when there is a time where some legs are not in contact with the ground the other three manage to balance the body.

OBJECTIVE OF STUDY

1. To understand the concept of 3D reconstruction.
2. To understand the Gait configuration of leg movement.
3. To study the benefits of use of Hexapod in Archeological purpose.

Three-dimensional (3D) mapping is an exciting new machine vision process with possible ramifications in a wide range of industries. Typically, 3D mapping requires the use of several machine vision or computer vision technologies working together, which makes it a complex application. 3D mapping can mean several different things based on the industry you're operating in. But regardless of what 3D mapping means to you, there are a variety of new applications emerging leverage the latest vision technology. 3D mapping can mean several different things based on the industry you're operating in. It can mean the profiling of an object in 3D. It can be used for wide-scale 3D virtualization from 2D and 3D imaging. Or, it can refer to the localization and mapping of real-world space.

Types of 3D mapping can be produced using passive 3D imaging techniques. This could include a stereo camera pair, detecting depth from focus, or through plenoptic methods of detecting light fields. There are many different ways to achieve 3D mapping capabilities. Each has their advantages and disadvantages, depending on the intended application, but all can reliably create 3D maps of the surrounding world or specific parts and locations. 3D mapping is still a relatively new machine vision technique, but it has great potential in a number of industries. It will only grow in use as 3D mapping becomes more sophisticated with the introduction of new technology and techniques.

Simple walking simple walking mainly consist two major dynamics. One is picking legs and the other is to push the ground backwards to move forward. So in simple walking initially Hexapod is headed towards one of the legs. Then one by one other than the diagonal one all legs are picked and moved forward from the mean by certain angle. After picking the pushing process begins and all other four legs simultaneously push the ground backwards and the hexapod gets the motion in forward direction. And this process continues to make the bot Walk. While pushing the ground the bot moves forward but for the forward displacement and the overall balancing of the hexapod the friction plays the important role and to gain much higher friction rubber pads were used in the Hexapod.

The best thing about the hexapod is its multi directionality. So if its headed toward leg 1 and wants to take a right turn than it will just simply rotate 30 degrees about its central axis and start moving along leg 2. If it wants to move at an angle of 120 degrees will just start move along leg 3 or leg 5.

Tripod Walking Tripod walking was the revolutionary algorithm of walking. This made the hexapod faster and smart walker. The whole concept of tripod walking was on the basis of balancing on three legs and maintaining equilateral triangle using alternate three legs. In this type of walking the hexapod moved on three legs at a time and at any time of walking the alternate three legs maintained equilateral triangle to avoid a lot amount of unwanted stress.

Obstacle Clearance The main motive of making the hexapod was to overcome obstacles comes in the way where the wheeled robots are helpless. Like in rocky surface the wheeled bot cannot pass over a rocks or even small stones and in desert or in sand the wheeled bots get struck and slip. Whereas Hexapod locomotion is based on picking and pushing mechanism and its extensive stability can easily conquer rocky and sandy terrains. Due to this aspect Hexapod can be used in defense and in military applications like mine detection and spying. It can be used in research and exploration in such areas where men cannot reach such as in volcanic research. This concept can also be used for exploration and sample testing in other planets and asteroids.

II. LITERATURE REVIEW

Kevin Lagaza, Anish Pandey (1) have performed on a Literature Review on Motion Planning of Hexapod Machines Using Different Soft Computing Methods. In this article, a detailed review analysis has been performed on various techniques employed to six-legged robots. As mentioned earlier, they exhibit significant advantages in a challenging environment and their stability during motion is well appreciated. The few points that have been observed are as follows: Most of the hexapod robot type designed walk with 3 DOF's legs. The

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issues that are addressed most often are: control schemes, design of the legs, gait generation, distribution of forces at the tip of feet, the static stability. Extensive work has been carried out in solving the motion control problem by employing artificial intelligence techniques, and many of them were directly applied to actual robots. Less soft computing techniques have dealt with the obstacle avoidance. Dinesh, Vivek Khokher (2) have performed on a Review on Design and Analysis of a Hexapod. This research is motivated by the need for mobile machining systems to remove humans from hazardous and inaccessible environments. The research analyzed the kinematics, dynamics, and stability requirements for mobile machining system based on hexapod walking robots. The major contributions of this dissertation are, model selection based on the House of quality was done. The structural parameters of a HWR were selected, the physical size of the robot was determined. A 3D virtual prototype robot system has been created CATIA V5.The design then exported to V-rep workbench through CATIA to simulate it in real time. V-rep simulation validated the design. Shaker Mahmud Khandaker, Ratul Acharjee (3) have performed on an Intelligent rescue Robot. This paper propose search and rescue robot that would be efficient in crawling through narrow holes and spaces over rough and unfriendly terrains. The walking algorithms used in the robot have been field tested properly and has an above average rate of efficiency when compared to other such robots in related fields. To control the spider-bot we have successfully made use of android UI and have implemented a navigation panel onto the user interface. In many accidents that need inspection of the ground, and in cases where it is impossible for a human being to properly look for any evidence that might help to save lives, the spider-bot can come in handy, and the functional algorithms implemented would be quite efficient in helping the robot move under extreme conditions. The robot has worked tremendously well in different speed scenarios and responded well to each of the cases, which was entirely possible for the six leg based design of the model, which has 3 servo motors each. It is hoped that small amount of modification to our proposed system will transform it into a fully functional and ready-to-use robot in real life scenario. Simon Cherlet, Pieter Maelegheer (4) have performed on developing an autonomous hexapod robot for environmental exploration. The goal of this masters' project has been successfully accomplished. The end result is the fully operational hexapod robot capable of walking straight with different gaits reaching top speeds of 10 cm/s, turning on the spot, walking in reverse, detecting ledges and obstacles and mounting slopes of up to 10_inclination with its body levelled out horizontally. The hexapod is thus endowed with the basic skill set to cope in predefined, not too challenging environments on its own. Chris Johnson (5) have performed on the Operational Strengths and Weaknesses of Military Night Vision Equipment. There are two main classes of night vision devices. Image intensification (I^2) systems enhance the lighting that is available within the existing environment. Infrared (IR) devices, in contrast, will typically use heat emissions to identify objects that cannot otherwise be detected using available light sources. Neither of these technologies can 'turn night into day'. Because of this drawbacks we use an ultrasound technology. Manuel Fernando Silva and JA Terrier Machado (6) have performed on a literature review on the optimization of legged robots. During recent years the interest in robotic systems able to move by means similar to those found in nature has grown steadily. Legged robots present significant advantages over wheeled and tracked vehicles because they allow locomotion in terrain inaccessible to these traditional vehicles, since they do not need a continuous support surface. This paper has presented a survey of several strategies, namely the mechatronic mimic of biological animals characteristics, the use of evolutionary computation for the optimization of the legged structure parameters, the adoption of good mechanical project rules, the optimization of power and energy-based indices and other complementary approaches.

III. METHODOLOGY

This section represents detailed project plan and its implementation. The following block diagram represent the proposal work of the project.

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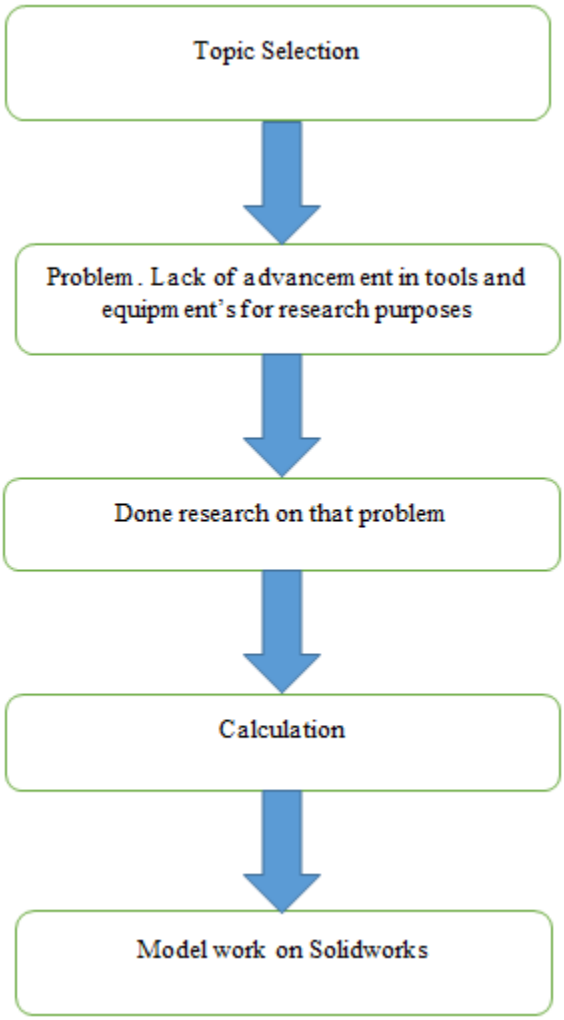

IV. CONCLUSION

The data was collected from various research papers and we can conclude that for better accuracy we use ultrasonic sensors for 3D mapping and for distance measurement, It can also be used for Military and archeology purposes. The Robot can walk using Tripod Wave and Ripple Gaits and can rotate. Using Raspberry PI and Arduino will help for better calculations and monitoring of movement. We plan to expand the user interface with a custom gait wizard in the future. Also connecting the Robot with Artificial Intelligence will help external control.

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DOOR LOCK SYSTEM USING RFID

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ABSTRACT
The RFID Door Lock is a lock that is simple to install and allows the user to easily lock and unlock doors. It will contain a RFID reader/writer and a magnetic door lock for simple use. All the user will need is an RFID tag to be able to unlock and lock the door. A LED will be used to let the user know when the door is in fact locked. The components included in the module are small and compact. Additionally, the door lock is simple and easy to install. It does not require the consumer to disassemble the door or doorframe as the door lock are merely attachments. This is also leaves the consumer with the option of using their original lock and key if they so choose. All in all, this RFID door lock should be a simple and cost effective upgrade to the average consumer's security and convenience.

Keywords: RFID tags and sensor; door lock system; stepper motor; LED; arduino

I. INTRODUCTION
The project that we will be working on is an RFID door lock that will be available to the general public at an affordable price. The goal of this project is to create a more convenient way to unlock your door than the traditional key. In the key's place is an RFID tag that will unlock the door by proximity. However, the improvements of this RFID door lock must outweigh the complications of implementation. The list of customer needs (in the Requirements and Specifications section) was constructed with that fundamental goal in mind. The design consists of two components. The first component is the actual door lock that must be installed in the doorframe. This will be controlled by a magnetic lock and will need to be powered. The second component is a relatively small module that you can install anywhere near the door. This module is responsible for the RFID sensing. It goes over the requirements and specifications determined for the RFID door lock. The requirements are inspired by surveys of various groups as well as personal interest. The specifications are designed in order to meet these requirements. These are created before the actual design of the RFID door lock had been created so the requirements and specifications may not exactly meet the final product. However, the final product is still designed with these ideas in mind. In the Functional Decomposition, the design of the final product is shown and explained. This also documents the tests and complications confronted throughout the design. The design is split into 5 modules which were tackled individually until finally bringing the whole product together. The necessity of each module is included.

A. Motivation
The motivation for doing this project was primarily an interest in undertaking a challenging project in an interesting area of research. The opportunity to learn about a new area of computing not covered in lectures was appealing. This area is possibly an area that. We might study at postgraduate level. Actually this was a challenging part which brought a keen interest to us to look into this topic.

B. Scope of the work
The RFID Door Lock is a very cheap and affordable design that allows convenience and security for users. The design is relatively small and easy enough to install with just a couple of screws. Of course there are additional features that can be added in order to improve the system as a whole. However, it is important to note the cost of the improvement should be taken into consideration. The following are a few ideas that can be implemented without adding much cost to the design as a whole. These are just a few of the ideas for the RFID Door Lock in which improvements can be made to further improve both the security and convenience of the product. The project will, have software and hardware work implementation. In future, the improved vision of micro controller will be more useful. In serial communication and Robotics everywhere we need Microcontroller to store program in it.

II. RELATED WORKS
In this paper, the proposed security system contains gate locking system using passive type of RFID. The system stores all the necessary information about the user. A new user is first registered with the system and the corresponding information is burn in RFID tag. This RFID tag will be accessible through the system. When registered users comes to the entry point, and put the tag into reader, the system checks whether it is registered user or imposter. If the user is registered one then the tab information is matched with the user information stored in system. The gate is open to entry of the user after successful authentication and close automatically

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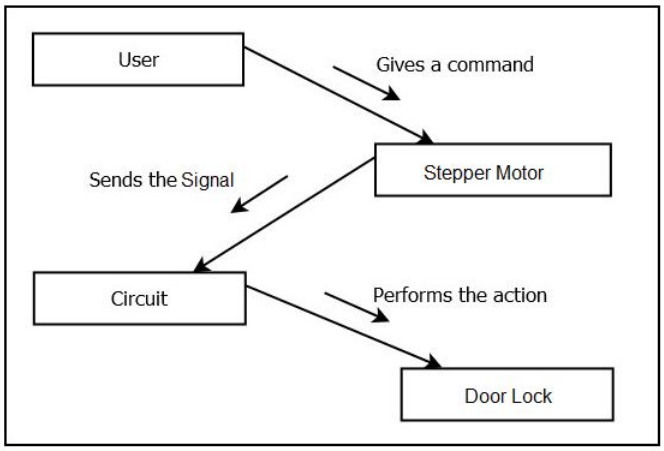
after a specified time interval. The principle target of this framework is to planned execute an advanced security framework which can convey in secured zone where just credible individual can be entered. We actualized a security framework containing entry way locking framework utilizing uninvolved sort of RFID which can actuate, confirm, and approve the client and open the entryway progressively for secure access. The upside of utilizing detached RFID is that it capacities without a battery and inactive labels are lighter and are more affordable than the dynamic labels. A concentrated framework deals with the controlling, exchange and activity errand. The entryway securing framework works ongoing as the entryway open immediately when client put their tag in contact of per user. The undertaking additionally points in planning a totally robotized security get to framework for residential land modern applications. Security is the greater worry for an individual or a firm. Perceiving the need of security we built up a mechanized security get to framework with easy to understand get to. Mechanization is the most much of the time spelled term in the field of gadgets. The long for computerization got numerous upsets the current advances. One among the innovations which had more prominent advancements is RF correspondences. The aftereffect of this is the RFID cards which transmit a one of a kind distinguishing proof number. This number transmitted by the RFID can be perused with the assistance of a RF per user. The confirmation to the house/business can be given in full or constrained relying upon the RFID cards. The choices like full access or constrained access are taken by an installed PC to which the RF per user is interfaced. The entryways of the house/business shape the yield module and are interfaced to the same locally available PC through a servo engine. This locally available PC comprises of number of info and yield ports. The installed PC is usually named as small scale controller. The information and yield port of the controller are interfaced with various information and yield modules relying upon the necessities. As it were miniaturized scale controller goes about as a correspondence medium for every one of the modules associated with the task. The gadget additionally comprises of graphical LCD which shows the data about entryways open and close.



The door lock circuit's design based on the electromagnetic principle. It will have the magnetic core and change to a magnet when power supply is feed to it. This magnet will act as a locking part of the door.

So, our contribution is that we want the system that will warn the user in case of theft. We have made a lot of changes into the existing system by sending a notification to the user. Also we are providing applications to open and close up the door lock.

III. SYSTEM DESIGN

Customer Needs assessment as stated before, the improvements must outweigh the complications of implementation. There has to be a reason to buy this door lock and replace their own door locks with it. That is why convenience and reliability are the first two customer needs. These are possibly the most important and apply to almost every engineering specification and do not require as much explanation as the other three. One of the more interesting requirements is the hassle-free installation. Of course the door lock will require minor assembly but the process of installation should not be overly complicated. The device should be a complex system simplified for the common consumer. Another important feature is the need for fail safes and overrides. In cases where the owner may lose their keys, the owner of the door lock should not be denied access to the door at any time. There should always be a way in that is only accessible to the customer. These needs are listed in Table 1.The requirements and specifications were generated with the customer needs as a basis. These specifications are listed in Table 1. To the left of the Engineering Specifications are the Customer Needs that

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each specification meets. The justification on right details the thinking and reasoning behind the specifications and how they fit the customer needs.

A. Hardware Specifications

1. 8051 Series Micro Controller:

- The Intel 8051 microcontroller is one of the most popular general purpose microcontrollers in use today.
- The Intel 8051 is an 8-bit microcontroller which means that most available operations are limited to 8 bits.8051 chips are used in a wide variety of control systems, telecom applications, robotics as well as in the automotive industry.
- By some estimations, 8051 family chips make up over 50% of the embedded chip market.

2. Power Supply

- A **power supply unit** (**PSU**) converts mains AC to low-voltage regulated DC power for the internal components of a computer.
- Modern personal computers universally use a switched-mode power supply.
- Some power supplies have a manual selector for input voltage, while others automatically adapt to the supply voltage.

3. Standard Rectifier

- Power Semiconductor Standard Recovery Diode and Rectifier units are usually include one or two diodes/rectifiers in different configurations.
- Desired features of these diodes/rectifiers can include low forward voltage, low thermal impedance, and both excellent surge and i2t* current ratings.
- Applications for Standard Recovery Diodes and Rectifiers include power supplies, motor control circuits, battery chargers, resistance welding circuits, or as a free-wheeling diode.

4. LM 7505 Regulator

- In electronics, a linear regulator is a system used to maintain a steady voltage.
- The resistance of the regulator varies in accordance with the load resulting in a constant output voltage. The regulating device is made to act like a variable resistor, continuously adjusting a voltage divider network to maintain a constant output voltage, and continually dissipating the difference between the input and regulated voltages as waste heat.
- By contrast, a switching regulator uses an active device that switches on and off to maintain an average value of output.
- Because the regulated voltage of a linear regulator must always be lower than input voltage, efficiency is limited and the input voltage must be high enough to always allow the active device to drop some voltage.

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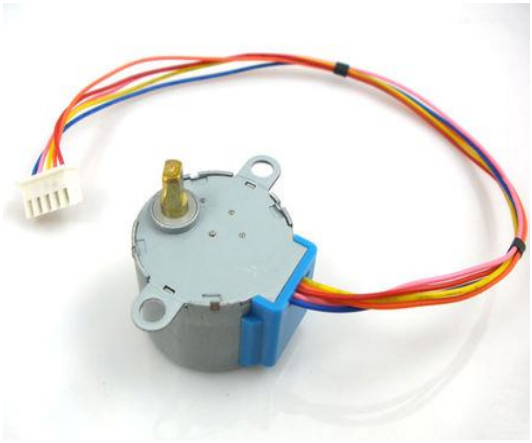
5. Stepper Motor

- A stepper motor is an electromechanical device which converts electrical pulses into discrete mechanical movements.
- The shaft or spindle of a stepper motor rotates in discrete step increments when electrical command pulses are applied to it in the proper sequence. The motors rotation has several direct relationships to these applied input pulses. The sequence of the applied pulses is directly related to the direction of motor shafts rotation.
- The speed of the motor shafts rotation is directly related to the frequency of the input pulses and the length of rotation is directly related to the number of input pulses applied.
- One of the most significant advantages of a stepper motor is its ability to be accurately controlled in an open loop system.
- Open loop control means no feedback information about position is needed.
- This type of control eliminates the need for expensive sensing and feedback devices such as optical encoders. Your position is known simply by keeping track of the input step pulses.



6. Transformer

- Selecting a suitable transformer is of great importance. The current rating &the secondary voltage of the transformer is a crucial factor.
- The current rating of the transformer depends upon the current required for the load to be driven.
- The input voltage to the 7805 IC should be at least 2V greater than the required 2V output, therefore it requires an input voltage at least close to 7V.
- So I chose a 6-0-6 transformer with current rating 500mA (Since $6*\sqrt{2} = 8.4V$).

7. Motor Driver

- The Arduino Motor Shield is based on the L298, which is a dual full-bridge driver designed to drive inductive loads such as relays, solenoids, DCand stepping motors.
- It lets you drive two DC motors with your Arduino board, controlling the speed and direction ofeach one independently. Youcan alsomeasure the motor current absorption of each motor, among other features.
- A motor controller is a device or group of devices that serves to govern in some predetermined manner the performance of an electric motor.
- A motor controller might include a manual or automatic means for starting and stopping the motor, selecting forward or reverse rotation, selecting and regulating the speed, regulating or limiting the torque, and protecting against overloads and faults.

8. RFID tags and sensors

- Radio-frequency identification (RFID) uses electromagnetic fields to automatically identify and track tags attached to objects. The tags contain electronically stored information.
- Passive tags collect energy from a nearby RFID reader's interrogating radio waves. Active tags have a local power source (such as a battery) and may operate hundreds of meters from the RFID reader. Unlike a barcode, the tags don't need to be within the line of sight of the reader, so it may be embedded in the tracked object. RFID is one method of automatic identification and data capture (AIDC).

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- RFID tags are used in many industries. For example, an RFID tag attached to an automobile during production can be used to track its progress through the assembly line; RFID-tagged pharmaceuticals can be tracked through warehouses; and implanting RFID microchips in livestock and pets enables positive identification of animals.
- Since RFID tags can be attached to cash, clothing, and possessions, or implanted in animals and people, the possibility of reading personally-linked information without consent has raised serious privacy concerns. These concerns resulted in standard specifications development addressing privacy and security issues. ISO/IEC 18000 and ISO/IEC 29167 use on-chip cryptography methods for un-traceability, tag and reader authentication, and over-the-air privacy.

B. Software Specifications

1. Embedded C / Assembly Language

- Embedded C is a set of language extensions for the C Programming language by the C Standards committee to address commonality issues that exist between C extensions for different embedded systems.
- Historically, embedded C programming requires nonstandard extensions to the C language in order to support exotic features such as fixed-point arithmetic, multiple distinct memory banks, and basic I/O operations.
- It includes a number of features not available in normal C, such as, fixed-point arithmetic, named address spaces, and basic I/O hardware addressing.
- Embedded C uses most of the syntax and semantics of standard C,e.g., main() function, variable definition, datatype declaration, conditional statements (if, switch, case), loops (while, for), functions, arrays and strings, structures and union, bit operations, macros, etc.

2. Arduino Language

- The open-source Arduino environment makes it easy to write code and upload it to the I/O board.
- The Arduino integrated development environment (IDE) is across-platform application written in Java, and derives from the IDE for the Processing programming language and the Wiring projects.
- It is designed to introduce programming to artists and other newcomers unfamiliar with software development.

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IV. FUNCTIONAL DECOMPOSITION

At its core, the RFID Door Lock will have 3 inputs and 2 outputs. Power is an important input and will supply the RFID Door Lock with the necessary voltage and currents to operate. It will be operated with 8.5V supply and will be drawn through an AC adapter. The second input is the RFID Sensor Input. This is where the RFID tag information will be entering the system. As for the signal whether or not to keep the door locked or unlock the door. These ideas are graphically represented in Figure 1 and Table 2.

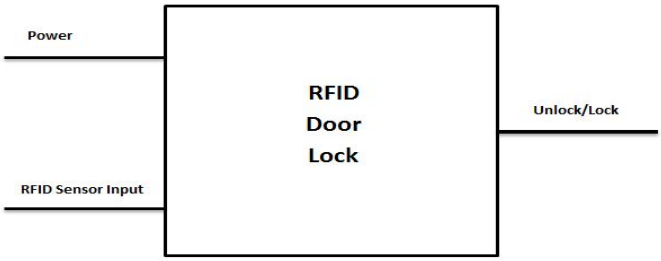

FIGURE 1: LEVEL 0 BLOCK DIAGRAM

Input	Description	Output	Description
Power	Supplies voltage to the RFID Door Lock and powers it for all functions.	Unlock/Lock	Will unlock the door or remain locked depending on the RFID tag and settings.
RFID Sensor Input	Scans for RFID tags and unlocks or remains locked depending on settings and RFID tag.		

TABLE-1: LEVEL 0 FUNCTIONALITY TABLE

The initial Level 1 decomposition, the RFID Door Lock can be broken down into 5 basic components. The RFID Input (the RFID tag) goes into an RFID sensor that will then be placed into the MCU(or Microcontroller).Based on the programming and the settings set by the User Control, the MCU will then send instructions to the Magnetic Relay and the LCD Module. Whatever is sent in to the LCD Module is outputted as the LCD Display and can be thought of as the actual LCD screen. After the Magnetic Relay receives in magnetic relay will then flip the circuit towards the Door Lock. The Door Lock will then output the Unlock/Lock signal. The Door Lock can be considered as the physical door lock in the doorframe. The power will be supplied to all of the blocks. Figure 2 displays this graphical. However, as the design began to be finalized, there was no longer a use for the magnetic relay and the user control was left out. These only complicated the installation process. Instead the completed level 1 block diagram uses a voltage regulator and an amplifier stage to power an electromagnetic lock. These components are much smaller and do not require disassembling strength of the door lock beyond the capabilities of the Arduino microcontroller.

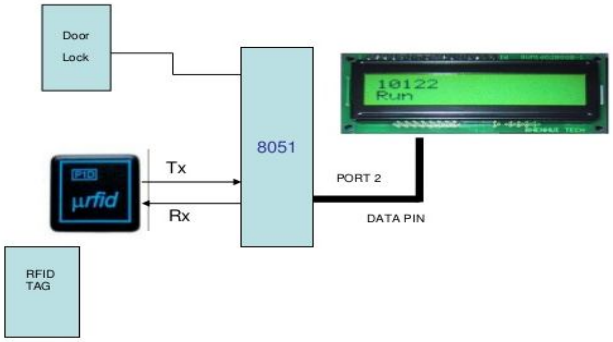

FIGURE-2: BLOCK DIAGRAM OF THE PROJECT

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ACKNOWLEDGMENT
We are pleased to present "AUTOMATED DOOR LOCK SYSTEM" project and take this opportunity to express our profound gratitude to all those people who helped us in the completion of this project.

We thank our college for providing us with excellent facilities that has helped us to complete and present this project. We would also like to thank the Staff Members and Laboratory Assistant's for permitting us to use computers in the Laboratory, As and when required.

We make our deepest gratitude towards our project guide for his valuable help and timely advised during the various phases in our project. We would also like to thank him for providing us with all proper facilities and support as the project Co-ordinator. We would like to thank him for his support, patience, and faith in our capabilities and for giving us flexibility in terms of working and reporting schedules.

We would like to thank all our colleagues for their undesired support and friendship making a college life enjoyable and memorable and family members who always stood beside us and provided the all most important moral support. Finally, we would like to thank everyone who has helped us directly or indirectly in the Project.

CONCLUSION
The RFID Door Lock is a very cheap and affordable design that allows convenience and security for users. However, it is important to note the cost of the improvement should be taken into consideration. The following are a few ideas that can be implemented without adding much cost to the design as a whole. These are just a few of the ideas for the RFID Door Lock in which improvements can be made to further improve both the security and convenience of the product. The first addition is strictly a change in the code. As of now, the RFID reader used is linked to the tag and card reader. However, either by adjusting the code or using a different RFID reader, one should be able to read the RFID code of the individual tags and cards. This will allow for more options in terms of how the user wants the security to be set up. By reading the specific RFID codes, you can change the accepted keys and also deny access for certain keys. Another additional addition code is responses to potential brute force. A common technique in which people use to hack digital door locks is using a variable RFID card that changes its pattern rapidly until it finds the correct pattern. To counter this, you can implement a response from the Arduino if the wrong RFID pattern is read more than X amount of times. For example, you can stop accepting any patterns after X amount of times or require a reset in order to unlock the door. An example of a physical improvement is adding the ability to run on 9V batteries. This gives albeit a limited amount of security in case of a power outage. Because of the inverting amplifier design, even when disconnected with the Arduino, the door lock has the ability stays locked. But in order for the door to stay locked, it still needs a power supply. If the door is powered by a 9V power supply when disconnected from the power supply, you can keep the door locked and that'll give the owners time to respond before they're house is left unprotected. With 9V batteries, Arduino should be capable of being powered as well allowing the correct RFID card to still unlock the door.

FUTURE SCOPE
For the next research work, the implementation of the prototype can be modified in the authentication. The authentication can be integrated by voice user recognizer. So, the security of the door automation system will be more unique and more interactive.

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PEER TO PEER FILE SHARING ANDROID APPLICATION

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ABSTRACT
Peer to Peer file sharing systems are discussed in a lot of academic research. Many Peer to Peer applications are available which work on the computer and mobile, such as Gnutella, Napster, Bittorent, and SymTorrent. File sharing causes a lot of the traffic on the network, thus some of the technology is used to reduce the traffic and find the files easily. Mobile devices are becoming multifunctional, so why not create a peer-to-peer file sharing system between the mobile devices. In this paper a Peer to Peer file sharing system between mobile devices is designed and implemented using Bluetooth as a communication protocol. The application allows J2ME and MIDP (Mobile Information Device Profile) enabled mobile devices to share and publish the files in the network over Bluetooth, search for specific types of files such as (music, picture, text, and program) and download them onto its local memory. It is possible to develop the system in the future, to add more features and the capacity to work on more than one operating system for mobiles. The application was implemented and tested successfully between more than two mobile devices using an emulator in Wireless toolkit. The application fulfils the basic requirements for peer-to-peer file sharing. In addition, the application was implemented on two Nokia devices successfully, except the downloading files did not work, which is because the operating system for Nokia devices is Symbian. As a result some libraries did not work. The application allows the user to share and search for any type of file within range of the Bluetooth.

INTRODUCTION
File sharing is the practice of distributing or providing access to digitally stored information, such as computer programs, multimedia (audio, images and video), documents, or electronic books. It may be implemented through a variety of ways. Android ly new mobile operating system developed by Google and the Open Handset Alliance. Officially released in October 2008, it has revolutionized mobile application development due to the fact that it is open source. It allows developers unparalleled freedoms to create varied and interesting applications. Based on the Java programming language, it is touted as being easy to pick up and master, whilst the underlying is a modified Linux kernel. Some of Android's biggest draws for developers include the relative simplicity of developing using Java syntax, which means quickly producing applications. Also, Android provides easy yet secure access to first and third party applications, allowing deeper integration between components in different programs, and encourages software sharing and reuse. The user interface can be built quickly and simply through XML or graphically, and once an application has been finished it can be submitted to Android market, a portal through which developers can make their creations available to Android users, either free or for profit. Cloud computing has been viewed in several forms. There has been no single view that has decidedly become the obvious candidate; however there are some common elements between them all. The most glaring of these is that it is a form of distributed computing, in that distinctly separate systems link together to form a cloud. Also, there is an idea of on-the-fly scalability, that machines can join and leave the cloud as required. One definition of cloud computing is that of a pool of computational resources, linked together to provide a greater processing power. These are projects which involve supporters installing software on computers at home, which connect, when idle, to their respective clouds over the internet and compute small parts of complex scientific calculations. Another use of the term is to provide some form of data syncing. One more idea of cloud computing is that of peer-to-peer systems. This form has been used for many years for file sharing, recently implemented for services such as Skype. These services reduce load on their servers by passing data directly from user to user.

Java is a general-purpose, concurrent, class-based, object-oriented computer programming language that is specifically designed to have as few implementation dependencies as possible. It is intended to let application developers "write once, run anywhere" (WORA), meaning that code that runs on one platform does not need to be recompiled to run on another. Java applications are typically compiled to byte code (class file) that can run on any Java virtual machine (JVM) regardless of computer architecture. Java is, as of 2012, one of the most popular programming languages in use, particularly for client-server web applications, with a reported 10 million users. Java was originally developed by James Gosling at Sun Microsystems (which has since merged into Oracle Corporation) and released in 1995 as a core component of Sun Micro systems' Java platform. The language derives much of its syntax from C and C++, but it has fewer low-level facilities than either of them. The aim of this project is to design and implement a file sharing application for Android based devices. This

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project will allow multiple users to share files to multiple devices. This project would provide a stable platform to enable collaboration through file sharing. To this end, files may be uploaded by one user and available to another, all simplified through an easy to use application on an Android device.

OBJECTIVES OF STUDY

1. Proposed System
2. Project Methodology
3. Future Scope

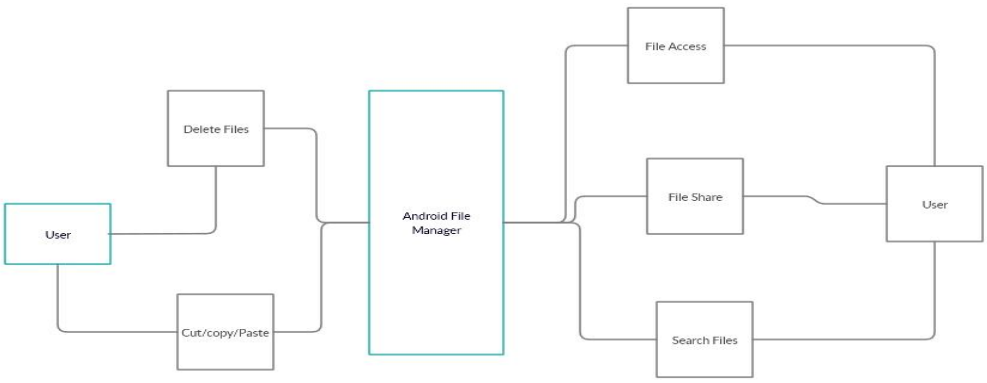
Proposed System

Here we combine two different Application like File Sharing App and file Manager App. we firstly create the file manager where we can easily create delete or rename the files. After that we integrated in that file sharing concept like shareit .So here we simply collabrate the two different concept in one application which is save the memory and time and also user friendly .This application is managing the data and connecting two device via wifi or wifi-direct and send the file consistent up to 2 MBPS. Android by delivering tons of great features that work well together to make your life easier in the long run. You'll see the usual features like moving, sharing and deleting the file s on your phone, as well as less common features like compressing files, and streaming files located in cloud storage. Of course you'll also find the ability to easily browse your files, and manage your files. Android File Manager delivers a great experience with all of the features you didn't realize that you wanted. From managing files, to storage, their features all work well together delivering a simple and easy to use application. This application provides security to our files and we transfer the files from one to another location. In this application we provide to play audios, videos, and see images. This is a beautiful application by which we make a life simpler by accessing this file manager. This application have provides access to all the files, folders etc from the mobile phone. The main features of the application are, we see all the folders that are hidden from the user by another application. So this project helps user too lot. This application shows how much memory are remains either in phone memory or other external memory. The application keeps the user files safe and secured. Application allows user to search a file over type in search box. Maintains the files in a categorized and in a structured manner. It avoids the data duplication which prevents re-writing the similar file. In this application we maintain the data in an efficient manner. We create a many text files, folder. We make easily portable of files from one place to another place. In this application we do very thing like share files from one device to another device. This device has its own audio player and video player. The main purpose of this application is to provide security of the data. This application is very user friendly.

Project Methodology

In Software engineering and systems engineering, a functional requirement defines a function of a system or its component. A function is described as a set of inputs, the behaviour, and outputs. Functional requirements may be calculations, technical details, data manipulation and processing and other specific functionality that define what a system is supposed to accomplish. Behavioural requirements describing all the cases where the system uses the functional requirements are captured in use cases. Functional requirements are supported by non-functional requirements which impose constraints on the design or implementation. As defined in requirements engineering, functional requirements specify panicular results of a system. This should be contrasted with non-functional requirements which specify overall characteristics such as oost and reliability. Functional requiremen. drive the application architecture of a system. while non-fimctional requirements thive the technical architecture of a system.

Data Flow Diagram



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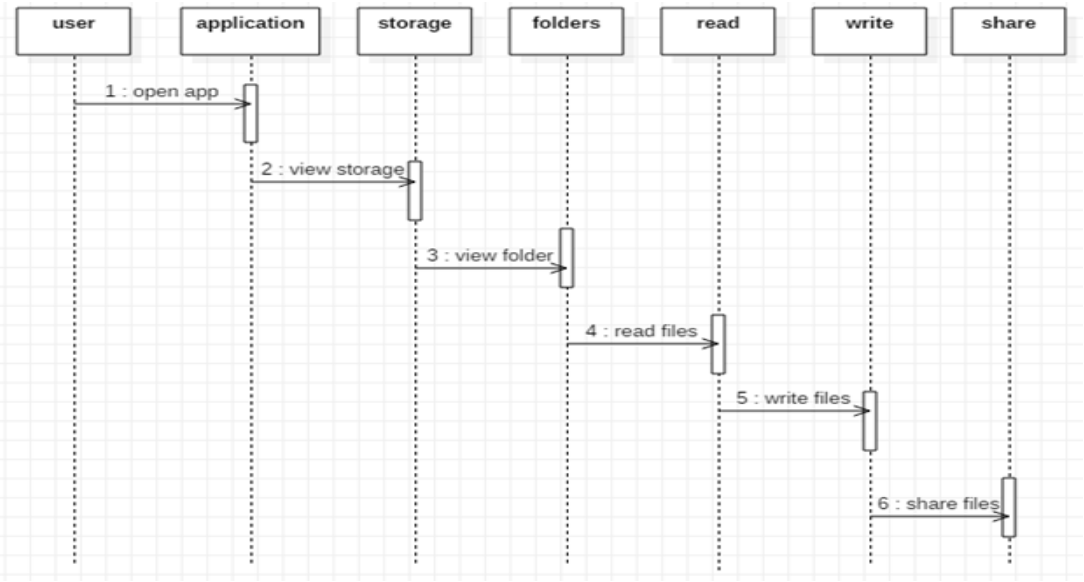
Future Scope

The main objective of this application is to provide security to user and it is very useful for easily manage or share file from one place to another place its scope in future is very useful for storing application data and provide a secure file transfer. In future we provide a extra security like face recognition and voice recognition system in file manager for improving the security. In the future the android file manager scope is too much. The new features is added like voice recognition we search file from voice so its very easy process for search the files.

The main features of the file manager is added in the future is its all the data is store in cloud. then the accessing of the file is very easy. In file manager face recognition is added the application is open by the face detection not by the password.

Sequence Diagram



CONCLUSION

The main focus of our project was to analyze file sharing, to study of ACO algorithm and to develop our file sharing application. We learned the different types of file sharing classes. We studied over ACO algorithm, reasons behind chosen this algorithm from others like Dijkstra etc. We also learned a lot from articles, journals and took the concept from them what we required. From methodology, we learned how to design a project, how to use project tools and also how to analyze data. It's a nice experience to learn so many things related with our project.

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PROTECTION, MONITORING, CONTROLLING AND LOAD SHARING OF 3-PHASE INDUCTION MOTOR USING IOT

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ABSTRACT
This paper presents a review of protection, monitoring, controlling and load sharing of 3-phase induction motor comparing different methods of implementation of this technique. Power is of main concern which needs to be monitored and controlled. The design contains Arduino connected to different sensors such as current and voltage measurement sensor, Wi-Fi module or monitoring and controlling a 3-phase induction motor problems. The design gives protection of induction motor from faults i.e. overcurrent, overvoltage, under-voltage and single phasing, monitoring for voltage and current, manual and automatic ways to control induction motor and load sharing also. Protection of these motors is very important because of inclusion in most of the industrial applications use induction from due to their high robustness, reliability, low cost, maintenance and high efficiency.

Keywords: Internet of things (IoT), voltage and current sensor, Wi-Fi module, contactor, relay, Arduino

INTRODUCTION
Within the advancement of electrical technology, the dc motors are broadly used in different industrial applications. After the innovation of ac motors particularly ac induction motors, the view of industries has changed due to the wide advantage of induction motors. An induction motor has two main parts- stationary part and rotating part. An induction machine is known as a rotating transformer since it works on the principle of transformer. The main advantages of the 3-phase induction motors are self-starting, rugged construction, good pf and low cost but without compromising the efficiency the speed cannot be controlled.

Different electrical faults may occur due to unbalanced 3-phase supply, over-voltage, under-voltage, over-current, single –phasing, mechanical faults: The mechanical faults occur due to broken rotor bar, air gap eccentricity, damage in bearing, rotor and stator winding failures.

To ensure the reliable operation of induction motors recent advancement techniques are used which include monitoring and controlling, automatically. Internet of Things (IoT) is the recent development to control and monitor the motor from remote location. This method provides easy control and reliability. The reliability of 3phase induction motor is obtained by continuous monitoring of electrical parameters. If any abnormal value of electrical factors is detected, the 3- phase induction motor is controlled automatically i.e. suddenly turns-off to reduce the various type of faults.

The aim of this paper is to make the control easy, fault detection, monitoring and load sharing. The technique is designed to allow easy use of a mobile phones to control industrial appliances like induction motor from any location. By using a mobile phone, the development of the control system will be carried out using android application. This will be communicating with Wi-Fi module, which in turn will control the device attached to microcontroller modules. When the action has been carried out, a response will be sent to the user by using application or site.

OBJECTIVES OF STUDY
1. To monitor and control an induction motor based on IoT for safer and economic data communication in industrial fields.
2. To start or stop the induction machine to avoid system failures by automatic and manual control methods.
3. To monitor and control the motors used in electric vehicles.

MOTOR PARAMETERS AND REFERENCES
The Parameters that are taken for protection of three phase Induction Motor are over-current protection, protection from unbalanced load, single-phasing fault protection, under-voltage protection and overvoltage protection. Motor reference values are taken as

Voltage=415V, Frequency=50Hz, Rated Current(I_s)=1.5A, RPM=1449, Power Factor=0.83, Rated Power=0.75KW.

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- **Overcurrent Protection**

The overcurrent protection helps to restrict or stop overcurrent flow to the motor above rated current of motor. Effects of overcurrent are heating motor winding and it may also damage motor winding. Causes of overcurrent are increase in load at motor side or decrease in power factor of motor which also decreases efficiency of motor.

- **Overvoltage protection**

Overvoltage protection helps to prevents over voltage at the motor terminal which prevents sudden increase speed of motor. Increase in voltage also leads to increase in current which leads to flow overcurrent and it may damage the winding of motor. Reason for overvoltage may be sudden removal of large load or due to fault in transformers.

- **Under-voltage protection**

Under-voltage protection leads to drop voltage at terminal side at limit set by the user. If the voltages go below limit the motor will lose its torque output capacity. In under-voltage condition occurs motor also run in unbalanced condition. The causes of under-voltage can be certain increasing in load or fault in line.

- **Single phasing fault**

A three phase motor runs on 3 phase supply due to which it runs in balance condition. If due to some fault a single phase gets disconnected due to which motor runs in unbalance condition and motor winding starts heating up which can damage the motor winding. The effect of single phasing in 3-phase induction motor is the motor runs with a decreased speed and it work with an uneven torque and delivered a hamming noise.

METHODOLOGY

The power supply is turn ON, the Arduino and all the interface components get the required supply. First the main supply pass to phase failure circuit which used to sense the phase failure, which sense the phase failure and open the power supply. Voltage sensor which sense the fault like over voltage and under voltage. Current sensor gives the current value of individual 3 phase induction motor. We have monitoring of 3 phase induction motor parameter like voltage, current, P.F., power. First we have connected individually every motor in connect switch as a contactor. And there in individual line fault occur so we have directly interconnected three induction motor for load sharing Arduino reads the data from various sensors and analyses according to the given instructions, Arduino reads the commands from internet and provides control signals to the relay via contactor, which will control the induction motor. The sensor information's are displayed visually in server. The Induction motor control is based on the sensed parameters and in manual mode the control is based on alert messages received from the web. The control is done by relay and contactor circuit. The motor is turn ON/OFF when abnormal value is detected.

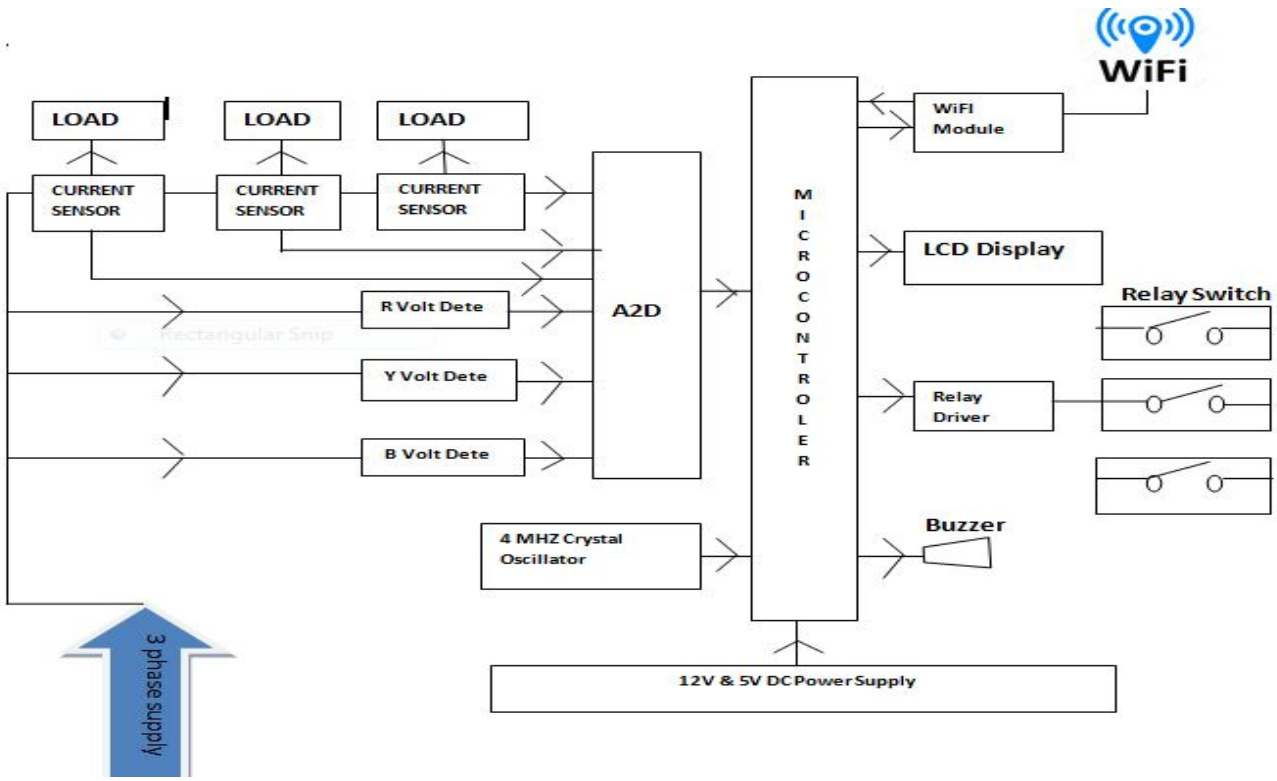

Fig-1: Block diagram

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COMPONENTS DESCRIPTION

- **Arduino**

Arduino is an open-source platform for prototyping projects used to build electronics. It comprises of both a programmable physical circuit board and a computer program or ide coordinates advancement environment running on your computer where you'll compose and transfer the code to the physical board. Arduino was gone for understudies without a foundation in gadgets and programming, however now, it is seen as an incredible device for individuals of all ability levels. The Arduino equipment and programming was intended for specialists, planners, specialists, programmers, amateurs, and anybody keen on making intelligent articles or conditions. The Arduino board began adjusting to the new needs and difficulties, separating it from straightforward 8-piece sheets to items for IoT applications, wearable, 3D printing, and installed conditions. Arduino can cooperate with catches, LEDs, engines, speakers, GPS units, cameras, the web, and even your advanced mobile phone or your TV.

- **Power supply**

Control supply is the circuit from which we get a craved de voltage to run the other circuits. The voltage we get from the most line is 230V AC but the other components of our circuit require 5V DC. Thus step-down transformer is utilized to induce 12V AC which is afterward changed over to 12V DC employing a rectifier. The yield of rectifier still contains a few swells indeed in spite of the fact that it could be a DC flag due to which it is called as Throbbing DC. To expel swell in output voltage the channel circuit is required. Here a capacitor is utilized. The 12V DC is appraised down to SV employing a positive voltage controller chip 705. In this way, a settled DC voltage of 5V is obtained.

- **LCD display**

In this work 16*2 LCD display is used for continuously display a data which is acquired from sensors. The display contains 16 pins. The supply of 5V is given across the Anode and cathode pins of LCD display. Pins 3, 4 and 5 are connecting to pot, for change the brightness of the LCD display. The LCD display contains 8data pins and 2 control pins. By programming the process, the data is continuously displayed in the LCD screen. To interface LCD display to Arduino, 4 data pins, 2 control pins and 2 supply wires (i.e. 5V and Ground) must be connect to Arduino. The processed data is displayed in the LCD display one by one. And also the additional requirement of smooth motor operation is displayed.

- **ESP8266 (WI-FI Module)**

ESP8266 could be a WI-FI Module, utilized for remote communication. It is interfaces with smaller scale controller (Arduino) by interfacing 5 pins. It needs two 3.3V supplies and one ground to function. Moreover, this module requires two delicate serial ports. The information obtained by the Arduino are prepared and send to server by utilizing ESP8266. ESP8266 require extra library record to function. By programming the microcontroller, the information is overhauled each moment. It has advantage over Bluetooth module the information is send to inaccessible areas. ESP8266 work depends upon the AT commands.

- **Relay**

The 5V relay is utilized within the proposed work. 5V transfer is straightforwardly associated to the Arduino. Pulse from the Arduino is given to relay, the yield of relay is the input of contactor. In case any unusual condition is identified by the Arduino from obtained information the command is given to Arduino to relay to open the contactor. In this work single pole single throw switch transfer is utilized. The transfer has the 5pins NO (normally open), NC (normally closed),5V, GND and common pin. There’s no require of outside itself, Arduino is given sufficient supply to relay. The relay is work on the guideline of electromagnetism, when supply is given to relay it act as an electromagnet and alter the state of the switch. The supply given to Arduino is autonomous of the supply which to be turn ON and OFF.

- **Contactor**

The 3phase supply is given to motor through the 3phase contactor. The contactors are basically control the motors in industry. It has three input and yield way; the supply is given to motor through the contactors. Contactor may be an electrically controlled switch, utilized for exchanging the motor circuit. Other than transfer contactor is specifically associated to the high load current. The state of the transfer may have utilized both regularly open and closed applications. The contactor has the capacity to decrease the arc. The rating of contactor depends upon the load current per contact. The exchanging of 3phase contactor depends upon activating pulse from the 5V relay. In the event that programming the Arduino depends on the smooth operation motor, the exchanging flag is given to contactor. The information procured by the controlled is prepared and compare with the typical esteem and any abnormal condition is detected at that point an opening and closing command is given to Arduino.

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CONCLUSION

In this project the concept of Internet of Things for early fault detection, monitoring, controlling and load sharing of 3 phase induction motor. The system has the capacity to combine different detected parameters in real time and improve accurate detection of different faults happen in motor. The monitoring of the motor system presents the estimation of different parameters specifically speed, p.f, supply voltage and motor current. Hence, compared to other conventional methods this system has more number of areas which enables alarm, alarm messages and fast controlling. The concept of IoT is displayed here for farther monitoring and controlling the motor. The information is additionally shown serially. The work is upgraded to additional areas for valuable control. The application of the system is required nowadays for each electrical system (i.e. EV vehicle and automation of industries where greater safety is required).The system has the particular advantage of less maintenance, simple and speedy controlling and getting to of information remotely. Test comes about confirm the possibility of the execution of the system.

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