

**Edited
Book**

Recent Advances in Engineering, Science and Technology

Dr. Vijaykumar H. Patil

- ▶ **Prof. Hemant T. Ingale**
- ▶ **Prof. Hemraj V. Dhande**
- ▶ **Prof. Nilesh Y. Chaudhari**
- ▶ **Prof. Vijay D. Chaudhari**
- ▶ **Prof. Mahesh H. Patil**
- ▶ **Prof. Kishor M. Mahajan**



Innovative Scientific Publication



GF's Godavari College of Engineering, Jalgaon. (MS)

*Edited E-Book
On*

Recent Advances in Engineering, Science & Technology

Editors

Dr. Vijaykumar H. Patil

Principal, GF's Godavari College of Engg., Jalgaon (M.S.)

Mr. Hemant T. Ingale

Head & Assistant Professor, Department of E&TC Engg. & Dean (Academics), GF's Godavari College of Engg., Jalgaon.

Mr. Vijay D. Chaudhari

Assistant Professor, Department of E&TC Engg. GF's Godavari College of Engg., Jalgaon.

Mr. Hemraj V. Dhande

Assistant Professor, Department of E&TC Engg. GF's Godavari College of Engg., Jalgaon

Mr. Nilesh Y. Chaudhary

Assistant professor, Department of Computer Engg. GF's Godavari College of Engg., Jalgaon

Mr. Kishor M. Mahajan

Assistant Professor, Department of Mechanical Engg. GF's Godavari College of Engg., Jalgaon

Mr. Mahesh H. Patil

Head & Assistant Professor, Department of Electrical Engg. GF's Godavari College of Engg., Jalgaon

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Pharmacy Management System

Aditi Khachane¹, Swati Sarode², Pragati Sarode³, Kunal Chaudhari⁴, Bhavana Zambre⁵

^{1,2,3,4}UG student, ⁵Assistant Professor,
^{1,2,3,4,5} Computer Engineering ,Godavari College of Engineering Jalgaon, India

aditikhachane2001@gmail.com¹, zambrebhavna@gmail.com⁵

Abstract – Pharmacy Management System application to help pharmacist to manage pharmacy in the systematic ways. Pharmacy Management System can make the work easier by giving the details of medicine when its name is entered. A computer gives the details of the medicine like rate of medicine, and expiry date of medicine. It becomes very difficult in big medical stores to handle the details of all the medicine manually, so by using this pharmacy management system. We can maintain the records of all the medicines. It is fed with the information whenever new medicine are brought and it is provided with expire date with search option. When we enter the name of medicine it gives the details of medicine. The technology platform in implementing this system uses visual studio programming environment with and Wamp control panel using MYSQL

Keywords-Pharmacy Management, MYSQL, PHP, Medicine, Pharmacist, Wamp.

I –INTRODUCTION

The Project named "Pharmacy Management System", Medical information system is a client/ server-based application. An Interactive application for managing both Stock and Billing which helps in maintaining the records of the medicine, the users and store details and also reduce the work of searching the medicine. The main aim of this application is to apply technology is supporting the pharmacist and the score to reduce the human effort on searching and automation of the billing. The project has been developed on the bad of "Stock managing and it's "billing process" being

presently used in the medical sex for storing and reeving the available information in the store. The user has to get his username and password from the admin by providing the name, address, phone no, id proof. And can go she access as the application. Without the username and password, be cannot get access to the application.

In this application we have four types of users who have their specified work to perform and while logging into the application he should be knowing his designation to log in, and in this we can manage all the stocks of the store and can manage it. In this admin and the manager are the two who have almost all the permissions to work

II. LITERATURE REVIEW

The pharmacy management inventories with dignity but this system makes it look easier. The drugs in the pharmacy store, expiry date, quantity of drugs available are fixed on the categories and their functions. [1]. A pharmacist has to order drugs to replenish the already diminishing stock. In addition, the ordering of drugs is being carried out manually. A major amount of time is taken for writing the order as the pharmacist needs to check through the stock balance and make an estimate of the amount to order based on Figures. As we know drugs are not supposed to be used after they have expired. This project work will notify the pharmacist about drugs that are near to expire, preventing those drugs from being sold and also providing a solution to the earliest problems



III - METHODOLOGY

The research method used for this work gives a description of how the pharmacy management system for Boink's project ks Pharmacy and stores, Gwarimpa Estate, Abuja will be developed. Therefore, the method used in the design and collections of information from various sources are as follows:

- Studying the present system in detail and the organizational style
- Knowing and understanding the input and output processes of the existing system A qualitative form of interview was conducted in the organization
- to understand the mode of operation of the old system, Primary data: This source has to do with the text book contacted for the development of this project.

IV- DESIGN

A data flow diagram (DFD) is a graphical representation of the "flow" of data through information systems. DFD's can also be used for the visualization of data processing (structured design).

A DFD also known as "bubble chart" has the purpose of clarifying system requirements and identifying major transformations. It shows the flow of data through a system. It is a graphical tool because it presents a picture. The DFD may be partitioned into levels that represent increasing information flow and functional detail. Four simple notations are used to complete a DFD.

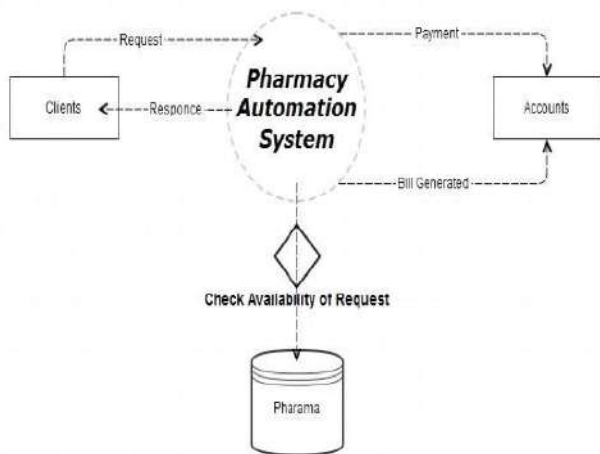


Fig 1. Pharmacy Management System

V-RESULT & DISCUSSION

The pharmacy management system is built for the sake of ensuring effective and clear data saving and manipulating as well as neat work on the pharmacy medical products.

This refers the pharmacy management system project highly minimize time and resource by which, searching the medicine data you can get the data in quickest time. And almost the resources are wise used since most actions are done on the pharmacy system. Some of the resources minimized include paper, manpower and related things. The other thing is for storing data in secure way.

VI - CONCLUSION

This project has made us aware of the immense capabilities and the various uses of PHP, CSS, MySQL and Apache server both individually and combined. We have raised one step further in terms of Designing and developing a combined management system of both Stock managing and Billing Automation which can be opted for any of the related stores. It has been opted to provide Updated Notification to the Employee and the Owner of the store.

It is vital importance that the software must have the right type of modularity and openness so that it is manageable, maintainable and upgradeable. The hardware should be reliable, available and cost efficient for the necessary performance capacity.

Here we conclude that the Pharmacy Management System is developed to satisfy the complete needs of medical store for their necessary usage.

In future in addition to through email system, we are planning to tie up with SMS Gateway System to notify through SMS alert to the students and alumni members.

ACKNOWLEDGMENT

The success and final outcome of this project required a lot of guidance and assistance from many people and we are extremely privileged to have got this all along the completion of our project. All that we have done is only due to such supervision and assistance and we would not forgot to thank them. We are grateful for the invaluable motivation and guidance of our Guide, Prof. Bhavana Zambare (Guide), who has always been a source of inspiration and encouragement for us. She has



been an outstanding caring person and guide as well. We express our sincere gratitude for her priceless cooperation and support throughout the work. She has always been ready to help and guide us in the ups and downs and her sympathetic comments reminders and assurance has been a source of inspiration for us. We would like to express our special gratitude Mr. Nilesh Wani (Head of Computer Engineering) for providing a motivational ambiance in the completion of our work. We are so thankful to his kind nature and nourishing attitude. We would like to acknowledge the support and encouragement of all faculty members our fellows and all who directly and indirectly supported for the completion of this project.

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Review: Stock Market Prediction Using Machine Learning

Gaurav Sanjay Sonar¹, Rushikesh Umesh Chaudhari², Neha Mohan Kolte³,
Chetana Bhatu Patil⁴, Prof. Nilesh Choudhary⁵

^{1,2,3,4} UG students, ⁵ Asstt. Prof.
^{1,2,3,4,5} Computer Engg dept, GF's Godavari CoE, Jalgaon

*gauravsanjaysonar81@gmail.com*¹, *cont.nilesh@gmail.com*⁵

Abstract – Portfolios, securities, stock market forecasts, risk management, debt management are all important pillars of the financial world. These pillars rely heavily on adequate and accurate forecasting. Today, however, with market volatility and the rise of electronic trading platforms, trade analysis and forecasts must range from seconds in advance to days or months of data available and in course of treatment. These problems can affect individuals and their financial situation on a small scale, and can negatively affect a country's financial situation on a larger scale. Stock traders turn to expert advisors rather than fundamental analysis to predict stock prices and help them make instant investment decisions. One of the main goals of a trader is to predict the price of a stock so that he can sell the stock before the price goes down or buy the stock before the price goes up.

Keywords- Securities, Market forecasts, financial Management

I- INTRODUCTION

Since its inception, online financial communities have gained increasing attention as an effective source of market analysis. We propose to use the most complete experimental data to date for the evaluation. Stock market analysis is one of the interesting fields of study. Many investors are involved in the stock market and they all want to know more about the future of the market in order to make more successful investments. Effective market predictions can help investors with trading recommendations or can be used as part of an automated trading age

nt.

Sometimes forecasting systems indirectly help traders by providing additional information, such as the future direction of the market. For example. If the direction of the selected stock is expected to be "up" within 24 hours, buying the stock will be a profitable trading action.

In the settlement of current system users, sharing details is a very time-consuming process.

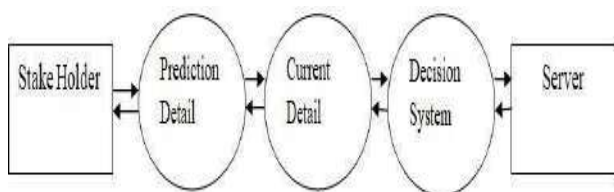
So to overcome this process, we are going to develop an app to make it easier. We cover processes such as daily checkout sites and review stock information. Stock Market which deals with stock market information. Company and user details are also kept in this system. Register your company in this system administrator.

Whenever required Admin updates company information such as shares as needed. Administrators view business listings and send messages to all users. A user performs two actions, such as buying or selling shares of a company. In this system, two concepts of automation and prediction are used to improve the performance of the system. Using automation using user-set stock prices, stocks can be bought and sold automatically.

Forecasting concepts work with virtual and real-time forecasts. By using virtual forecasts, we can predict the future price of a stock.

II. LITERATURE REVIEW

Here are several theories available when it comes to predicting future stock prices. In the past, several articles have studied artificial neural networks (ANN)



applied to the financial field. Alberto Fernández, Sergio Gómez (2005) [Application of heuristics using ANNs to find the efficient frontier of a portfolio in their paper. They used a generalized form of the mean-variance model. They concluded that neural networks offered better solutions than other heuristics.

Chi-Ming Len et al (2006) apply recurrent neural networks to the portfolio selection problem using the Var model. Yung-Keun Kwon et al (2007) used a hybrid neurogenesis system for stocks in their empirical study. They proposed a single hidden layer RNN for prediction. A genetic algorithm optimizes the weights applied to the network. Po-Chang Ko and Ping-Chen Lin (2008) proposed neural networks for portfolio selection in the Taiwanese stock market.

Their work noted the effectiveness of their method. Freitas et al. (2009) Predicting Short-Term Investment Returns Using Neural Networks. They conducted their study on a large dataset of the Brazilian stock market. They reveal that their framework outperforms traditional mean-spread models in the context of short-term investing.

Zhao-Rong Lai et al (2018) proposed a radial basis function for portfolio selection. They tested the data on six benchmark datasets, showing that their proposed work achieves superior performance and risk control. In their RBF network, they used AICTR (Adaptive Input and Composite Trend Representation). According to their findings, this particular method works very quickly. In their paper, Jinho Lee et al (2019) present the application of a deep Q network that can predict the stock market using images of stock charts.

Nhi N.Y. Vo et al. (2019) prepare a deep learning network for socially responsible portfolio optimization

III- METHODOLOGY

The research methodology used for this work describes how the project will be developed. Therefore, the methodology used in the design and collection of information from various sources is as follows:

organization

the existing system .System operation, main data: This source is linked to the manual contacted for the development of this project..



IV- DESIGN

A data flow diagram (DFD) is a graphical representation of the "flow" of data through an information system. DFD can also be used for visual data processing. The DFD, also known as a "bubble chart", is designed to clarify system requirements and identify major transitions.

It is a graphical tool because it presents a picture. The DFD may be partitioned into levels that represent increasing information flow and functional detail. Four simple notations are used to complete a DFD.

V- RESULT & DISCUSSION

The use of machine learning for stock market forecasting aims to ensure efficient and clear preservation and manipulation of data and orderly stock market forecasting work. refers to this project greatly reduces time and resources, by searching the inventory, you can get the data in the shortest time.

Almost all the resources are put to good use as most of the actions are performed using this proposed system. Some minimized resources include paper, human resources and related items. Another thing is to store data securely.

VI-CONCLUSION

Our prediction system is share details of current market and history of share market. The prediction system will predict proposed rate for shares.

- Prediction details and current details will provide to decision making system. Input to that decision



making system is our stored prediction details. Decision making system takes the decision that either we have to sale the share or we have to purchase it.

- By using machine learning algorithms for trading, we can identify the patterns in the market, assess the investment risks, and analyze the sentiments of the people.

ACKNOWLEDGMENT

The success and end result of this project required a lot of advice and help from many people, and we were very lucky to have them after our project was completed.

Everything we do is inseparable from such guidance and help, and we will never forget to thank them. We are very grateful to our guides, teachers for their motivation and invaluable advice. Nilesh Choudhary (project guide), who was a constant source of inspiration and encouragement for us. He is also a caring person and a great guide. We express our sincere gratitude to him for his valuable collaboration and support throughout the work. He was always ready to help and guide us through our ups and downs, and his compassionate comments, reminders and reassurances were a constant source of inspiration. Our special thanks, sir. Nilesh Wani (HOD) provided a motivating atmosphere to do our job. We are so grateful for his caring nature and nurturing attitude. We would like to thank all faculty, staff and fellows and all those who have directly and indirectly supported the realization of this project for their support and encouragement..

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Virtualization Security Issues In Cloud Computing: Review

Gayatri Chaudhari¹, Leena R. Waghulde², Rajesh R. Waghulde³

¹UG student, ^{2,3} Assistant Professor
KCES's COEM, Jalgaon, India, 411044,

gayatrichaudhari277@gmail.com

Abstract –Identification of the main challenges and security issues of virtualization in cloud computing environments are the purposes of this seminar or study.. It reviews the alleviation techniques for improving the security of cloud virtualization systems. Virtualization can be defined as fundamental technology for cloud computing. This is the reason for which, any cloud proneness and threats affect virtualization. To find out the proneness and risks of virtualization in cloud computing this study, the systematic literature review is performed and to identify threats, and attacks result from those proneness. Furthermore, we discover and analyze the effective mitigation techniques which are used to protect, secure, and manage virtualization environments. In this study proneness are identified, explained, and classified into six proposed classes. Furthermore, main virtualization threats and attacks are defined according to exploited proneness in a cloud environment.

Keywords- Challenge, Cloud, Computing, Security, Taxonomy, Virtualization

I. INTRODUCTION

It is an interesting covenant that has plenty of scope for innovations and development. To begin with, a unique architecture is required to bring cloud computing and virtualization are together. It could be a development that maps to the qualities of the Computing Cell[1] and, this computing cells is known for its consistent need for finer as well as sophisticated software infrastructure, that is paired with intricate characteristics like encryption,

third party authentication, efficient and reliable network segmentation, and data management . In the cloud All these improvements need to be provided across all channels [2 Virtualization and cloud can bring to light a hybrid IT system, which is a challenge and a big problem today [3].

II. LITERATURE REVIEW

Virtualization was initial recognized in the 1960s to panel huge, mainframe hardware for enhanced hardware consumption. Today, computers based on x86architecture are faced with the same problems of firmness and under exploitation that mainframes faced in the 1960s. VM ware made-up virtualization for the x86platform in the 1990s to deal with under consumption and further issues, overcoming a lot of challenges in the procedure Virtualization was first executed more than 30 years ago by IBM as a way to rationally separation mainframe computers into split virtual machines[1].

Mainframes were able to "multitask" by running several programmes and processes at once because to these divisions. Mainframes were developed for partitioning as a technique to fully impact the investment because they were exclusive resources at the time. For the 1980s and 1990s, when client-server requests and affordably priced x86 servers and desktops led to dispersed computing, virtualization was effectively abandoned.

x86 servers became the de facto industry standard thanks to the widespread adoption of Windows and the introduction of Linux as server operating systems in the 1990s. The development in x86 server and desktop formation led to new IT framework and equipped provocations.



III. METHODOLOGY

A virtualization architecture is a conceptual model. This model specifies the arrangement and interrelationships of the particular components. This components are involved in delivering a virtual rather than physical-version of something, such as an operating system (OS), a server, a storage device or network resources [4]. Virtualization is commonly hypervisor-based. The hypervisor isolates operating systems and applications from the primary computer hardware so the host machine can run numerous virtual machines (VM) as guests that contribute to the system's physical figure out resources, such as processor cycles, memory room network bandwidth and many more [5].

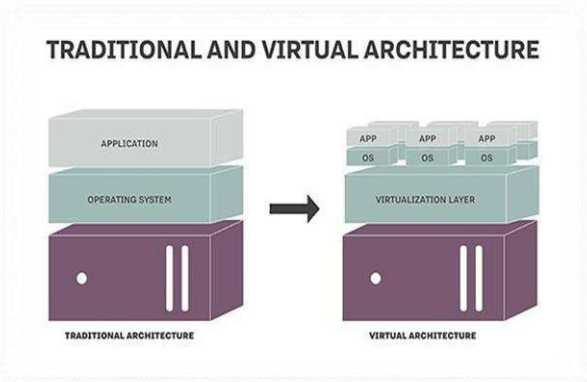


Fig 1: Fig 1 shows how one hardware system runs one application through one operating system and in virtual architecture the same hardware can run multiple number of application.

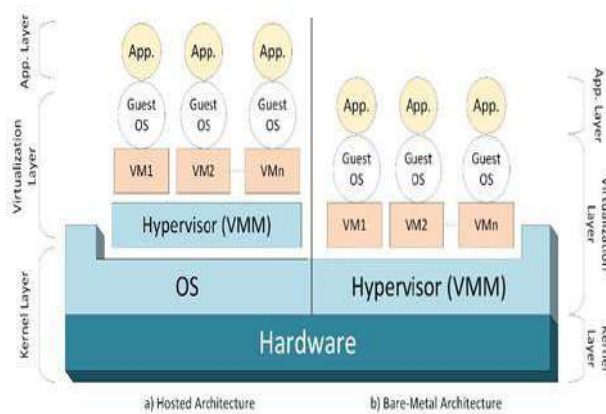


Fig 2: explains the virtual architecture in two forms

- i) Hosted architecture
- ii) Bare-metal architecture

This fig 2 explains how the arrangement of operating system makes the difference in hardware.

IV. ISSUES IN VIRTUALIZATION

Virtualization is an innovative technology. Virtualizations is significantly expanding in the Information Technology industry. It provides numerous logical assets on a single server. Various benefits that can be provided by the virtualization are hardware utilization, resources protection, remote access, and other resources. This technique gives organizations and people an opportunity to improve the use of hardware by increasing the number of tasks that one machine can handle. So there is a need to make this technology safe and secure.

Some of the issues are mentioned below-

- Virtualization Characteristics Related Issues
- Infrastructure Issues
- Access And Communication Security Issues
- Data Security Issues
- Control And Monitoring Issues

V. SECURITY THREATS AND ATTACKS

1. VM Hopping / Guest Jumping:-

An attacker is maliciously getting access to different virtual machines belonging to other customers. The attacker can monitor the target VM's resource consumption, and affect VM's reliability, availability, and secrecy.

2. Malicious Insider:-

An attacker is maliciously getting access to different virtual machines belonging to other customers. He can scrutinize the target VM's resource exploitation and affect VM's integrity, availability, And secrecy.

3. Malicious VM Image:-

A consumer may use a VM image that contains malevolent code to create own VM. This image makes the whole system exposed to attack.

4. VM Escape:-

An invader gets access to the hypervisor and escapes from its control. An infected VM can completely bypass the seclusion between the VMs and the host. Consequently, can get privileges to entrance the assets shared, with other VMs.

5. Hyper-Jacking/VM Based Root kit :-

Hyper-jacking attack inserts VM-based root kits to control the entire virtual environment.

6. Virtual Memory Leak:-



A system failure may occur between the allocation and deal location of the shared memory area in the hypervisor, which may lead to virtual memory leaks.

VI. INSTANCES

There are a variety of accomplishment levels of virtualization in cloud computing. Let us see what they are. It is not sufficient these days to utilize just a single software in computing. Nowadays the professionals seem to examine their software and program across various platforms. However, there are challenges here because of wide-ranging constraints. This gives ascend to the concept of virtualization. Virtualization lets the users generate several platform instances, which could be various applications and operating systems. Virtualization is not a new concept. Actually, It has been there in survival since the year 1960; however, it is only now, thanks to the cloud-based systems, that there has been a lot of consideration given to the accomplishment of virtualization in cloud computing. Virtualization is the capacity that lets you run numerous instances of the computer system using the similar set of hardware.

- Instruction Set Architecture Level
- Hardware Abstraction Level
- Operating system level
- Library level
- Application level

VII. APPLICATION

1. Resource optimization :-

Today's endeavor level computer assets are so powerful that they often have surplus capacity. By virtualizing the hardware and allocating parts of it based on the genuine needs of users and applications, the existing computing power, storage room and network bandwidth can be used much more effectively. Computers no longer need to be at leisure or performing below their capabilities because there are fewer connected users, or because the hosted appliance happens to be less demanding than the server can handle. Virtual machines offer software developers secluded, guarded, test environments. Rather than purchasing devoted physical hardware, virtual machines can be shaped on the existing hardware. Because each virtual machine is autonomous and isolated from all the other servers, programmers can sprint software without having to be anxious about upsetting other applications, or external components upsetting the implementation of their code

2. Automatically Protect Applications from Server Failure :

Server virtualization provides a way to execute redundancy devoid of purchasing additional hardware. Redundancy, in the sense of running the same appliance on numerous servers, is a safety gauge: if for any cause a server fails, another server running the same appliance takes over, thereby minimizing the disruption in service

3. Easily Migrate Workloads as Needs Change :-

Migration refers to shifting a server surroundings from one place to another. With most virtualization solutions it is probable to move a virtual machine from one physical machine in the surroundings to another. With physical servers this was formerly possible only if both physical machines ran on the same hardware, operating system and processor. In the virtual world, a server can be migrated among physical hosts with entirely different hardware configurations. Migration is generally used to advancedependability and availability: in case of hardware breakdown the guest system can be stimulated to a healthy server with limited downtime, if any. It is also helpful if a virtual machine needs to extent beyond the physical capabilities of the present host and must be relocated to physical hardware with enhanced performance.

VIII. ADVANTAGES AND DISADVANTAGES

A) Advantages

1. It Is Cheaper
2. It Keeps Cost Predictable
3. It Offers A Better Uptime
4. It Reduces The Workload
5. It Allows For Faster Deployment Of Resources

B) Dis-advantages

1. It Can Have A High Cost Of Implementation
2. It Still Has Limitations
3. It Creates A Security Risk
4. It Creates An Availability Issue
5. It Creates Scalability Issue

IX. CONCLUSIONS

Virtualization is a grand policy to prerequisite, scale, and get used to IT infrastructure as requirements change. Virtualization will eventually enable us to reduce the set of premises tools required for IT operations. Most organizations in the upcoming future will locally prerequisite only Wi-Fi access points (APs), Ethernet switches (mostly like 10 Gbps) to interrelate and power APs, as well as to put into operation local traffic-management policies, and what used to be a



router but which now actually just a WAN interface device with hardly any router functions like addressing and security.

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Online Birth Certification System

Harshada Kshirsagar¹, Prathmesh Kharche², Ashwini Chaudhari³, Bhavana Zambare⁴

^{1,2,3,4}UG student, ⁵Assistant Professor,
^{1,2,3,4,5}Computer Engineering, Godavari College of Engineering Jalgaon, India,

harshuu2016@gmail.com¹, zambrebhavna@gmail.com⁴

Abstract –Online Birth Certificate System maintains a good record of date of birth of people. This system helps admin to view data of date of birth of people who reside in country. The main objective of “Online Birth Certificate System” project is to providing easier registration of date of birth and gets certificate of birth online which save lots of time. Births registration plays a very important role in planning of various government schemes. All the important information like place of birth date, place of birth and vital particular at the time of Births are required in various places so this project helps to maintain all these records at one place which is useful for government as well as people. The purpose of developing Online Birth certificate system is to computerized the tradition way of birth registration. Another purpose for developing this application is to generate the report automatically. In Online Birth Certificate System, we use PHP and MySQL Database

take more time to calculate the date of birth report. In the existing system, all the information which is maintained by this computerized system is manually maintained in number of papers and files. It is very easy to add the information on paper at first time manually. But it’s very hard anyone have to update or search any record.

Disadvantage of Existing System:

- **Not user friendly:** The present system not user friendly because data is not stored in structure and proper format.
- **Manual Control:** All report calculation is done manually so there is a chance of error.
- **Lots of paper work:** Visitors maintain in the register so lots of paper require storing details.
- **Time consuming**

I. INTRODUCTION

Online Birth Certificate System maintains a good record of date of birth of people. This system helps admin to view data of date of birth of people who reside in country. The main objective of “Online Birth Certificate System” project is to providing easier registration of date of birth and gets certificate of birth online which save lots of time.

In Online Birth Certificate System, we use PHP and MySQL Database.

Existing System

In present all birth certificate system work done on the paper. The whole year data is stored in the registers. We can’t generate reports as per our requirements because it

Need of System

There is a need of computerized system for cabs services because

- It’s very hard to maintain the records in files
- Time consuming.
- Misplacing of data occurs at sometimes.
- To minimize hard work.
- Fast access to data.
- To get all the information at just one click.

II. LITERATURE REVIEW

System analysis will be performed to determine if it is feasible to design information based on policies and



plans of the organization and on user requirements and to eliminate the weaknesses of the present system.

- The new system should be cost effective.
- To augment management, improve productivity and services.
- To enhance user / system interface.
- To improve information, qualify and usability.
- To upgrade systems reliability, availability, flexibility and growth potential.

Feasibility Study

A feasibility analysis is undertaken to determine the possibility or probability of either improving the existing system or developing a completely new system. It helps to obtain an overview of the problem and to get rough assessment of whether feasible solution exists. There are three aspects in feasibility study portion of the preliminary investigation.

- 1) Operational feasibility
- 2) Technical feasibility
- 3) Economical feasibility

III. OPERATING ENVIRONMENT

1. Software Requirements:

- Technology : Open Source
- Front end : PHP
- Back end : MySQL
- Operating system : WINDOWS XP

2. Tool & Technologies Used:

- MySQL
- XAMPP (Apache Server)
- Notepad ++

Modules:

This project has two modules i.e. admin and user.

Admin Module

1. Home: In this section, admin can briefly view the total number of new application, total verified application and total rejected application.

2. Birth Application: In this section, admin view the application details and they have also right to change application status according to current status.

3. Reports: In this section admin can view the application details in a particular period.

4. Search: In this section, admin can search application with the help of customer application

Admin can also update his profile, change the password and recover the password.

User Module

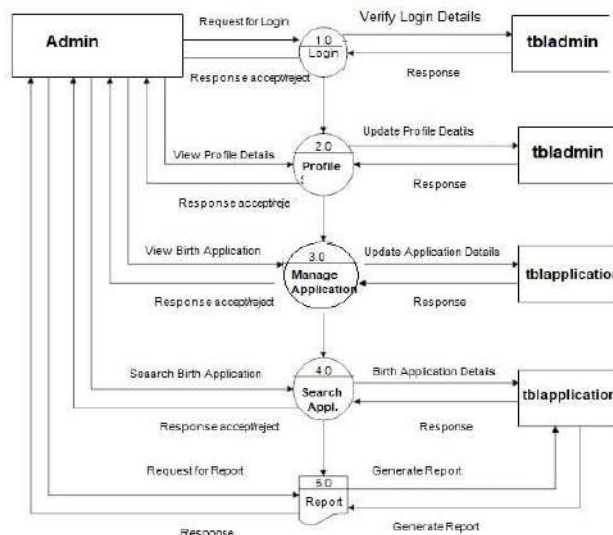
1. Home Page: In this section, user can view welcome page of web application.

2. Birth Reg Form: In this section, user can fill the form of birth certificate and see the status of his/her application.

3. Certificate: In this section user can take print of verified certificate. User can also update his profile, change the password and recover the password

IV. DESIGN

System design is the solution to the creation of a new system. This phase is composed of several modules. This phase focuses on the detailed implementation of the feasible system, Its emphasis on translating design specifications to performance specification. It also specifies how the database is to be built for storing and retrieving data.



V. RESULT & TESTING

Software testing is a critical element of software quality assurance and represents the ultimate review of specification, design and code generation. It is a process of executing a program with a primary objective of finding errors. Testing gives the guarantee that the



software doesn't fail and runs according to its specifications and in the way the end user expects. This can be done by various software testing techniques which provide a systematic guidance for designing tests that exercise the internal logic of software components and exercise the input and output domains of the program to uncover error in program function, behavior and performance.

The following software testing techniques were used in order to uncover errors in the system:

1. White Box testing
2. Black Box testing
3. Validation testing
4. GUI testing

VI. CONCLUSION

This Application provides a computerized version of Birth Certificate which helps admin to view data of date of birth of people who reside in country. It makes entire process online and can generate reports. It has a facility of user's login where user can fill the application details and send to admin. The Application was designed in such a way that future changes can be done easily.

The following conclusions can be deduced from the development of the project.

- Automation of the entire system improves the productivity.
- It provides a friendly graphical user interface which proves to be better when compared to the existing system.
- It gives appropriate access to the authorized users depending on their permissions.
- It effectively overcomes the delay in communications.
- Updating of information becomes so easier.
- System security, data security and reliability are the striking features.
- The System has adequate scope for modification in future if it is necessary.

ACKNOWLEDGMENT

The success and final outcome of this project required a lot of guidance and assistance from many people and

we are extremely privileged to have got this all along the completion of our project. All that we have done is only due to such supervision and assistance and we would not forget to thank them. We are grateful for the invaluable motivation and guidance of our Guide, Prof. Jayshree Patil (Guide), who has always been a source of inspiration and encouragement for us. She has been an outstanding caring person and guide as well. We express our sincere gratitude for her priceless cooperation and support throughout the work. We would like to express our special gratitude Mr. Nilesh Wani (Head of Computer Engineering) for providing a motivational ambience in the completion of our work. We are so thankful to his kind nature and nourishing attitude. faculty members our fellows and all who directly and indirectly supported for the completion of this project.

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Hybrid Based Authentic Wireless Electrical Vehicle Charging Station

Chattar Dipti¹, Jadhav Priyanka², Vaishnav Shriram³, Wanve Sandip⁴

^{1,2,3,4}UG Student, Department of Electronics Engineering, Amrutvahini College of Engineering, Sangamner, Maharashtra, India

sandipwanve2011@gmail.com

Abstract –Global warming has led to the large adoption of Electric Vehicles (EVs) which appear to be the best replacement for IC engines. Due to the increased number of EVs on the road, charging vehicles with conventional fossil fuel-based grids is not economical and efficient. Thus, a renewable energy-based charging station finds immense potential and control for electric vehicle charging. This project describes the solar and wind energy-based charging mechanism (SWCM) to generate the power for charging the battery packs of electric vehicles (EVs).

Keywords- electric vehicle, power station solar-wind hybrid, PIC Controller, Transformer Transmitter and Receiver Coils

I -INTRODUCTION

Electric vehicles have now hit the road worldwide and are slowly growing in numbers. Apart from environmental benefits electric vehicles have also proven helpful in reducing cost of travel by replacing fuel by electricity which is way cheaper. However electric vehicles have 2 major disadvantages: 1. Long charging time – 1-3 hours required for charging 2. Non availability of power for charging stations in off city and remote areas. Well here we develop an EV charging system that solves both these problems with a unique innovative solution. This EV charging system delivers following benefits: 1. Wireless charging of vehicles without any wires 2. No need to stop for charging,

vehicle charges while moving 3. Solar power for keeping the charging system going 4. No external power supply needed coil integrated in road to avoid wear and tear The system makes use of a solar panel, battery, transformer, regulator circuitry, copper coils, AC to DC converter, at mega controller and LCD display to develop the system. The system demonstrates how electric vehicles can be charged while moving on road, eliminating the need to stop for charging.

II- LITERATURE REVIEW

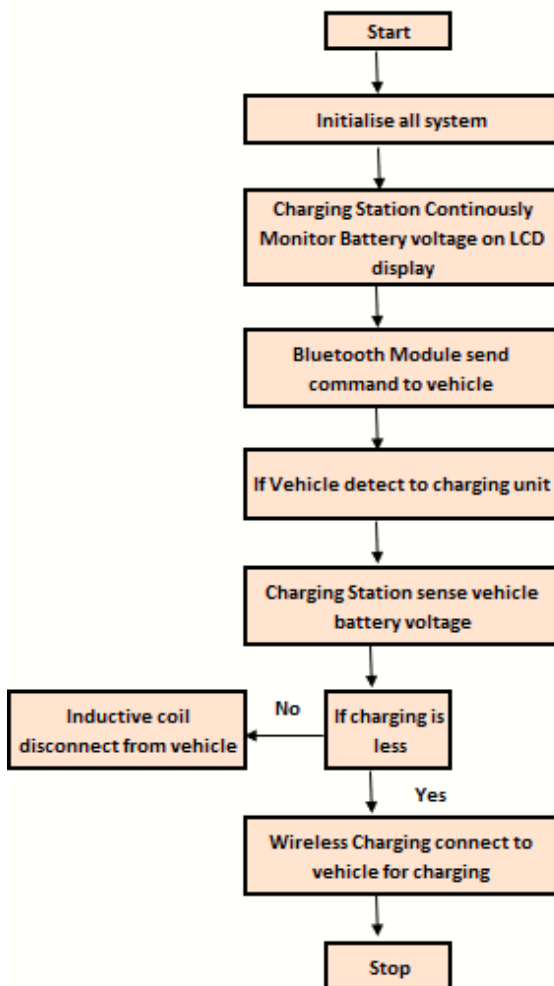
This paper describes the solar and wind energy-based charging mechanism (SWCM) to generate the power for charging the battery packs of electric vehicles (EVs). The renewable charging station consists of both the solar photovoltaic (PV) modules and a wind generator. The SWCM immensely reduce the requirement of fossil fuels to generate electricity which results in greatly reduced CO₂ and CO related emissions. The renewable sources such as wind and solar has been modelled using single diode model and an analytical modelling has been done for wind energy generation. The simulation model has been developed in MATLAB Simulink for the proposed SWCM. The I-V and PV characteristics of the solar panel have been studied under various irradiance levels and different parameters of wind turbine has been studied under two different loading (1 kW and 3 kW) conditions.

In this paper, a new recharging mechanism for electric vehicles is proposed using solar and wind energy. The



usage of EV is directly affected by the present charging technique. Recharging stations are necessary for longer drive vehicles and it is commonly used in few countries. The traveling distance depends on the capacity of energy storage present in the vehicle. The recharging stations are needed for long distance travel. In this paper, we have introduced a new hybrid renewable charging mechanism for EVs. A simulation model has been developed using MATLAB-Simulink and the performance of solar and wind energy has been studied. Various parameters of the solar module have been verified under different irradiation level. The SG has been studied under different loading condition. Finally, the hourly load of EV versus generated electricity has been analyzed. From the output generated by the hybrid system,

III - FLOWCHART (SOFTWARE)



IV- CHARGING COST

Table -1 Charging cost of EV

Sr. No	Driving condition	Section efficiency	QEV1 (kWh)
1	Only Ev1 charging at 10km/h	65.3%	0.45
2	Only EV1 charging	55.6%	0.74
3	EV1 and EV2 at close distance	61.1%	0.55
4	Ev1 and Ev2 keep away	65.5%	1.01

Table 2. EV Charging Standards

Levels	Maximum power rating (kW)	Maximum current rating (A)
IEC STANDARD		
AC Charging		
Level 1	3-7	18
Level 2	8-16	36
Level 3	70-140	280
DC Charging	90-110	360
SAE STANDARD		
AC Charging		
Level 1	10	20
Level 2	15	60
Level 3	25	90
DC Charging		
Level 1	75	85
Level 2	300	360

V-CONCLUSION

Electric vehicles are expected to be one of the inevitable of our close future. Moreover, they will be preferred more than internal combustion engine vehicles. However, as a first step, the charging time of the electric vehicles should be shortened, and they should be able to make longer distances. That is the reason for the expected dissemination of the fast-charging stations. In order to minimize and manage the negative effects of this new load potential on the grid, usage of the local energy resources



is inevitable. With the prevalence of the smart grid systems that composed of dispersed production and micro grids, also the electric vehicles should be able to benefit from these sources effectively. In this study, a hybrid fast-charging system that is supplied by local renewable energy resources rather than the grid is examined. The analysis is conducted with real weather station data. It is expected that these systems will become more widespread and applicable to the development of fast-charging stations. The PV system and battery technologies are also important to increase the implementation of this type of system. For further studies, new systems that allow the energy flow between the electric vehicles and therefore, minimizing the dimensions of the charging stations may be considered as an option.

At last, we are concluding that this approach reduces the pollution and increase the usage of EVs as a result creating pollution free environment.

VI-ACKNOWLEDGMENT

It is indeed a matter of great pleasure and proud privilege to be able to present this project on “**Hybrid based authentic wireless electrical vehicle charging station**”

We would like to take this opportunity to express our respect and deep gratitude to our guide Prof. V.S.Phatangare for giving all necessary guidance required for this project, apart from being constant source of inspiration and motivation. It was our privilege to have worked under them. We are also thankful to H.O.D. Dr. S.S.Gundal for the regular guidance, cooperation, encouragement and kind help. We thank our beloved Principal Dr. M.A.Venkatesh, for his continued support and encouragement and motivating us. We would like to tender our sincere thanks the staff members for their co-operation. We are highly obligated to our entire friends, whose contribution intellectually and materially in the words and deeds for preparation of this project. Really it is highly impossible to repay the debt of all the people who have directly or indirectly helped us for performing the project.

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IOT Based Smart Aquarium Management System

Rahane Vibhusha¹, Pawase Supriya², Pawase Kalyani³, Ingale Kalyani⁴

^{1,2,3,4} Department of Electronics Engineering,
Amruthvahini College of Engineering, Sangamner, India

vibhusharahane93@gmail.com

Abstract – In day to day life, every people have fish as their pets in our house. The fishes have been fed by the aquarist in the aquarium tank which needs a proper setup for maintenance. The problems faced are change in water quality, maintain water level, maintaining temperature. Therefore, it is necessary to monitor physical parameter and water condition. So this project proposes a system which is equipped sensor to be operated in real time.

It performs temperature monitoring water ph level detection water renewal operation. An IOT Based Smart Aquarium Management system is implemented to monitor and deliver the status of the aquarium to user mobile application. Thus, intelligent smart aquarium management system has been implemented so that fish is neither over nor underfed and there reducing the manual effort required in the maintenance of the aquarium.

Keywords- Aquarium, Internet of Things, Fish Feeding, Turbidity sensor, Ultrasonic sensor, Mobile application.

I -I.INTRODUCTION

In day today's life there is a steady increase in fish keepers. It seems to be very difficult for aquarist to look after the aquarium. The aquarium should be maintained properly to make the life of fish so healthy. In this smart aquarium system it makes the aquarist to manually monitor and control the parameter of an aquarium like fish feeding, temperature, oxygen motor, ph level, turbidity etc.

We came up with our project namely IOT Based Smart Aquarium Management System. It is a low-cost system with better efficiency. It can be placed in any aquarium to replace the manual maintenance procedure by its automatically process. All of these animals require

special care and sometimes humans cannot attend to their needs .They needs specific condition like a temperature range, pH, suitable oxygen and CO2 levels normally aquariums have oxygen pumps, heaters and filters. This project is design to decrease the labor time and can be controlled from anywhere, such as mobile phone or PC etc.

II- LITERATURE REVIEW

Generally, Aquarist not able to feed fish when they are not in home [1]. The reason which lead to poor water quality of fish pot, which are the helpful for the fish properties. The author [2] have implemented an IOT Based system that is implemented to monitor and deliver the status of aquarium to users' mobile application. It contains water quality management in which it monitor the physical variation in the aquarium. The system will perform operations like temperature, turbidity, level control. The authors of [3] have mentioned that the aqua-culturist track the pond conditions and takes necessary step in time domain. The perform fish feeding, temperature, level monitoring, recharge of water in aquariums. Here the fish feeding is performed 3-5 times a day and recharge of water is regulated based on water condition. The author of[4] have presented smart electronic system for pond management in fresh water aquaculture. The system regulate the hydro biological parameters which plays vital role in fish growth. The author [5] has proposed an embedded system using wireless network application and water quality assessment for large scale aquaculture all these system are interlinked to central unit for monitoring using mobile application. The proposed does not include how the system responds when abnormal conditions are detected.



III - METHODOLOGY

- Block Diagram

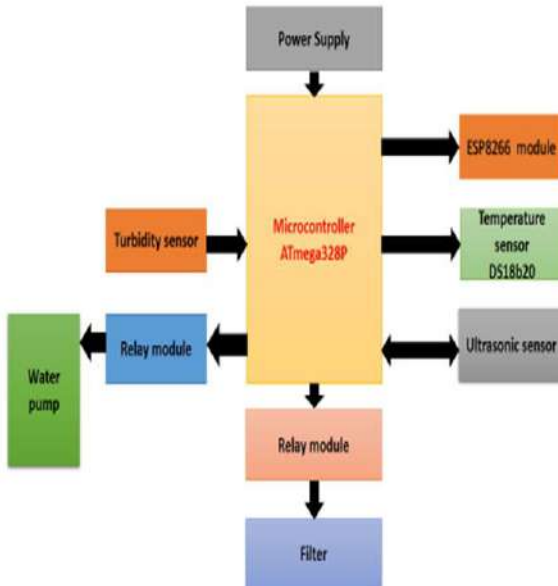


Fig 1: Block Diagram of Smart Aquarium Management System Using IOT

- Circuit Diagram

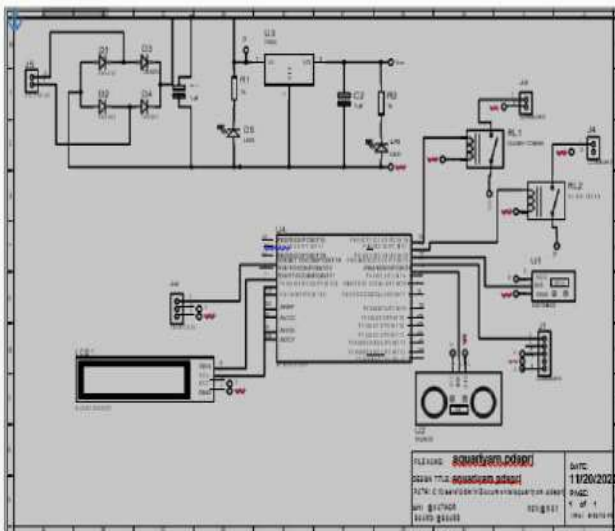


Fig 2: Circuit Diagram of Smart Aquarium Management System

- Hardware Details:

A. TEMPERATURE SENSOR:

Temperature sensor DS18B20 is used to detect the temperature of the water in aquarium. It has 12 bit ADC. It interfaced to Nod MCU digital input. One wire bus used for communication between sensors an Node MCU.



B. RELAY MODULE:

A relay is electrically operated switches that electron opens and close the circuit network. Open contact indicate normally open(NO) and closed contact normally closed(NC)when the relay is not powered when input pin is ground, No open and NC will be closed. When input pin is NOT grounded NO is close and NC is opened.



C. TURBIDITY SENSOR:

It used to assess the turbidity content in water, the turbidity content in water, this sensor observes the suspended particles in water. The water turbidity level increase as the amount of total suspended solids (TSS) in water increases.



Fig 4: Water Temperature, Water Level and Water PH Result of LCD

• **FLOW CHART:**

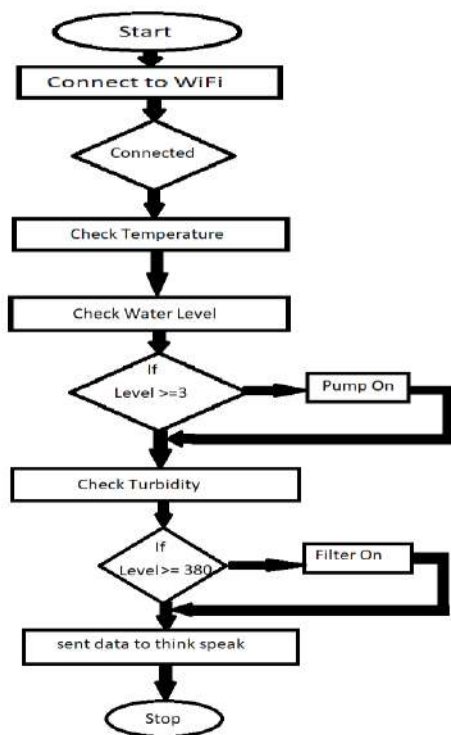


Fig 3: Flow Chart of Smart Aquarium Management System

IV- RESULT & DISCUSSION

Result:

For final construction of hardware software code we completed this project and result are explained in this chapter. In this project we monitor the water temperature, water level and water PH. We can display the result on LCD as well as things Speak.

Some result of our project are given below:



Fig 5: Water Level, Water Temperature and Water Ph Observed On Things Speak

V -DISCUSSION

In now a day's understanding human beings life style and their hobby the smart aquarium kit is easy way of presence the hobby. In this project study, discovered caring for a home aquarium is largely motivated by aesthetic reasons. In this system we use many components like as temperature sensor, water level sensor, PH sensor, Relay, Ultrasonic sensor, Servo motor, Humidity sensor.

In that water level maintain by the water level sensor, when the water level decrease then the buzzer is on, that's way due to buzzer it is easy to maintain the water level. Water turbidity also maintained by this system its is in the form of 0 to 1024 value of the set the arduino but the normal water turbidity value is 600-700. So that time water level is normal. Also this system maintain the temperature also, when the temperature decreases or increases that time buzzer is on. In this system all level maintain automatic or by the IOT platform.



V- CONCLUSION

The main aim of this project is to monitor the fish tank. It helps to the owner in the home or company to manage and handle the fish feeding presence in automatically without the need of humans and it will save the time and the efforts of the human being. This project achieves the more benefits like as simplicity, efficiency, time and cost saving. In this project to create a system that could automatically take care of fish and the ability to control the devices remotely over the IOT system. By using IOT platform to check the water level and the maintain temperature and water turbidity. In this project it is give the healthy environment to the fishes.

This project is easily implemented for the life of aquarist are more comfortable. This project system can be accessed remotely or automatically using mobile phones. The main and the important point of that system is its work well and it easily implemented on any Aquarium. The data monitored by the sensors is uploaded to the IOT platform (Things Speaks).

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Integration of DPFC and Fuzzy Logic Controller Based Grid Hybrid System for Enhanced Performance

K. Harinath Reddy¹, Y. Sai Anusha², M. Naga Sai Manogna³, M. Raghavendra⁴,
S.M.D Idrees⁵

¹Assistant Professor, Electrical and Electronics Engineering, Annamacharya Institute of Technology and Sciences, Rajampet

^{2,3,4,5}UG Student, Electrical and Electronics Engineering, Annamacharya Institutes of Technology and Sciences, Rajampet

Saianushayerrajennugari@gmail.com

Abstract- The main aim of this project is to introduce a framework for the design and modelling of a photovoltaic (PV)-wind hybrid system and its control strategies. The purpose of these control techniques is to regulate continuous changes in the operational requirements of the hybrid system. Currently, in power system networks, the distribution of energy plays a major role in maintaining power reliability in distribution systems. In this project, the proposed hybrid system was incorporated with a combined PV and wind energy system. Maximum power point tracking (MPPT) methods have been proposed to achieve maximum efficiency from the designed system. In addition, this project focused on improving the stability of the hybrid system. To improve the power quality and transient stability of the proposed system, here introducing a novel control strategy called the distributed power flow controller (DPFC) implementation with a fuzzy logic controller. The control technique was developed using signals from the system parameters, that is, voltage and current. The proposed system with controllers was simulated in MATLAB/Simulink and the results were compared

Keywords- Distributed Power Flow Controller, Fuzzy logic controller, grid interconnected, Lion Optimization Algorithm, PV.

Electricity needs are growing more and more each day because of all the pollution and greenhouse gas emissions caused by using traditional power sources, like gas, coal, and nuclear power. But to solve these problems, we need to use more renewable energy sources, which are much more environmentally friendly and don't produce much pollution. Some of the best renewable energy sources are solar, wind, and hydro power. They all need very little maintenance, and they're relatively inexpensive to use.

Renewable energy systems are systems that don't use traditional, nonrenewable sources of energy like coal, oil, and gas. Wind and solar energy systems are especially important because they are easy to use, can be accessed from environmental resources, and are very efficient. Some renewable energy systems are hybrid systems, which use both solar power (from PV systems) and wind power (from wind turbines). Weather can have a big impact on how much energy wind turbines produce, so wind systems are often paired with solar systems that have special techniques to keep the energy produced stable. MPPT means "maximum power point tracking." This is when a wind turbine is set up to automatically adjust its speed to match the frequency and rates of the electric power grid. This is important because if the wind turbine is mismatched, it could potentially produce too much power and damage the grid. To do this, we connected

I -I.INTRODUCTION



the solar system to an inverter. The inverter used a basic PWM technique to match the grid signals and reference points. Electric power networks are really big and complicated, so this was a big help.

When someone asks for help carrying a heavy load, the person helping may feel like they're being overloaded. But the power system will still try to keep the recurrence at the standard value and will also try to keep everyone in the power system happy.

II - GRID INTERCONNECTED NETWORK

A normal micro grid system is shown in fig.1. A micro grid combines wind and solar energy sources. A Bidirectional battery bank was also deployed to increase the power system's dependability. The PV, wind, and battery systems in this instance are connected at the DC bus, and an inverter is used to connect them to the grid system. This inverter's function is to maintain synchronization between the hybrid system and the grid. The various loads were run by the suggested hybrid system.

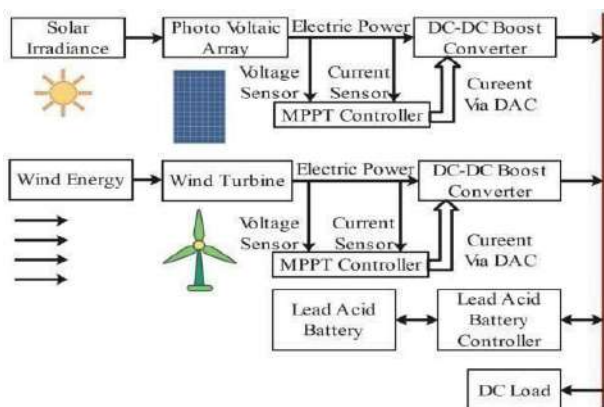


Fig.1 Schematic diagram of micro grid system.

A. PV SOLAR SYSTEM

Because of its availability in nature, dependability, and affordability, the solar energy system has played a significant part in the history of renewable energy compared to other disrupted energy sources. Solar cells use the photon effect of the sun's irradiance to produce electrical energy. Electric current flows initially from solar cells and is afterwards turned into PV voltage with the aid of an analogue electric circuit. Temperature and sun irradiation both affect how much DC voltage is achieved. An MPPT-based DC-DC boost converter is developed in order to acquire a constant DC voltage from the solar system. The MPPT's goal is to follow the solar system's maximum power. These cells were arranged in series and parallel to meet the required

voltage and current ratings.

The DC-DC boost converter terms are as follows:

1. DC input voltage is 150V
2. DC output voltage is 350V
3. Switching frequency is upto 100KHZ
4. Inductance is 5mH
5. Capacitance is 100 μ F
6. IGBT has 1200V/100A.

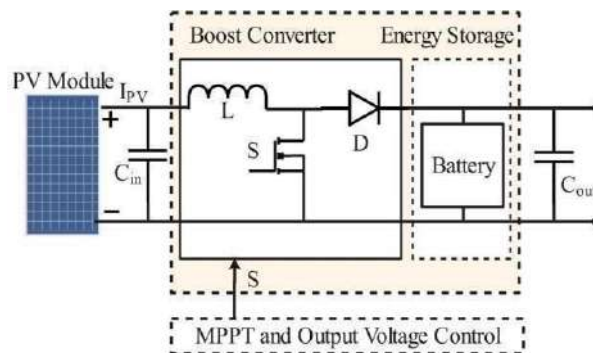


Fig.2. Power converter used PV system

B. WIND ENERGY SYSTEM

Another important factor in this unbalanced energy system is wind turbines. Due to the two-stage energy conversion process used by wind in nature, wind speed is first converted to mechanical energy by turbine blades and then to electrical energy by an electrical generator. The wind turbine also includes a gearbox system to change a low-speed shaft into a high-speed shaft along with these parts. In order to increase reliability, a pitch angle controller was used to spin the wind blades in response to the wind's direction. A wind vane was used to gauge the wind's velocity as it approached the wind turbine. The structure of a general wind turbine system with a conventional generator is shown in Fig. 3 shows the typical layout of wind turbine system using a traditional generator...

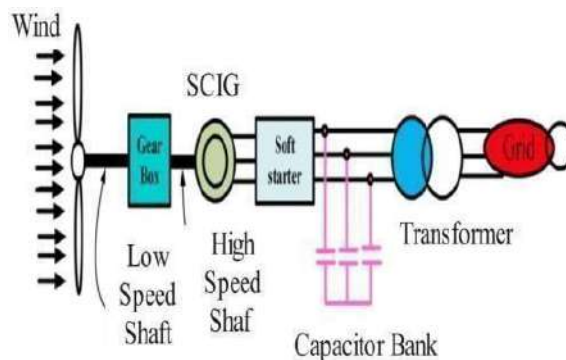


Fig.3. SCIG wind turbine.



The power generated by the wind turbine system is expressed in the mathematical modelling of the wind energy system as in the equation (1).

$$P_{mech} = \frac{1}{2} C_p (\lambda, \beta) \rho A v^3 \quad (1)$$

The two types of generators that are readily available in the market are Induction generator and a Synchronous generator. In this instance, the wind turbine produced electricity using a squirrel-type induction generator. To synchronize with the AC grid, an AC-DC-AC converter was employed

C. PERTURB AND OBSERVE MPPT ALGORITHM

Many different research and technology sectors experience optimization issues on a regular basis. Due to the real and realistic nature of the goal function or model boundaries, such problems can occasionally be exceedingly complex. A goal function subjected to complex, nonlinear characteristics with significant parity and/or parity limits is minimized or maximized in a typical optimization problem. In the P&O method, the structure monitors changes in the array voltage before determining how the output power has changed. A flowchart representation using P&O and MPPT algorithm is shown in figure 4.

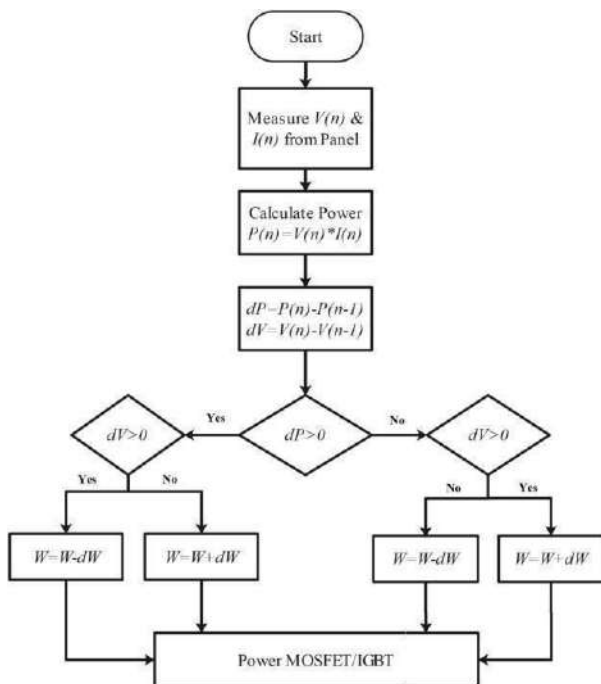


Fig.4. P&O approach representation in a flowchart.

The voltage and current of the PV panel are measured, and the PV power is calculated in the flowchart. Instantaneous PV power was used to gauge the obtained Photo Voltaic power. The necessary reference current signal is measured as a result of these findings. This cycle was continually repeated. This Perturb and Observe technique's primary drawback is, it cannot be used to account for ongoing changes in environmental factors like irradiance and sunlight. To produce a better output, the current output is continually compared to the prior output. Because of its complexity, optimization methods are a good choice for solving the controller design. An optimal solution for high complexity designs is on the horizon thanks to a well-established branch of research called electronic design using optimization algorithms. The MPPT algorithm (perturb and observe) in this paper shows how the solar panels track their maximum output.

D. INVERTER CONTROL DIAGRAM

A device used to enhance power quality is the distributed power flow controller (DPFC). According to Fig. 5, it comprises of an a-shunt converter and a two-converter series converter. Voltage harmonic compensation is provided by a series converter, and current harmonic correction for load and micro grid is provided by a shunt converter. This inverter control diagram was created using a double loop of current controllers. In this instance, the inner loop contributes to the system's increased transient stability, while the outer loop also known as proportional resonant controller's helps to manage the steady state error of the current comparator.

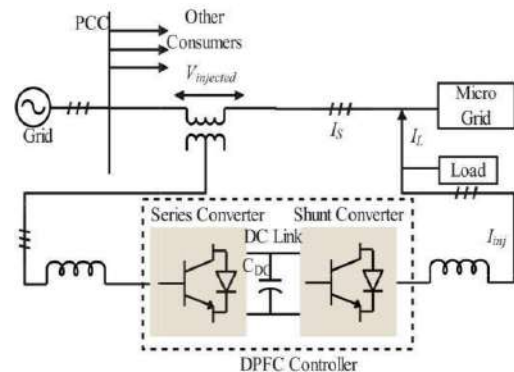


Fig.5. Designed DPFC controller block diagram.

The DPFC terms are as follows:

1. DC link capacitance C_{DC} is $220 \mu F$
2. DC link Voltage is $640 V$



- Carrier frequency is 2.08 KHZ

I. FUZZY LOGIC CONTROLLER

An entirely digital logic-based mathematical system called a fuzzy control system. In fuzzy logic, the controlling process can be carried out in four stages: fuzzification, membership function, rule-based creation, and defuzzification. In the process of fuzzification, the analogue input is transformed into fuzzy sets, and the input and output are expressed graphically using the membership function (i.e., triangular membership function). A rule-based formation can be used to express the relationship between the input and output. An if then statement is used to explain the rules in this situation, as seen in Fig. 7.

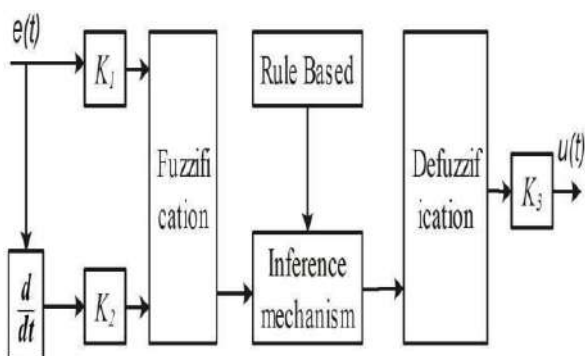


Fig.7. Fuzzy Logic based DPFC block diagram

The number of participants in the group determines the number of rules that are formed. Fuzzy logic's inputs connected to digital operators (AND or OR). Using the defuzzification procedure, the output of the fuzzy set is expressed as a crisp value. The centroid was picked as the defuzzification method in this instance.

I. SIMULATION MODEL AND RESULTS

In the MATLAB/SIMULINK environment, the LOA approach is built into the model of the framework depicted in Fig. 9. Two separate case studies were used to model and evaluate the proposed grid-interfaced hybrid system with a DPFC controller.

Solar system specifications are as follows:

- Maximum Power is of 100W and voltage and current at maximum power is 18.7V and 5.35A respectively.
- Open circuit voltage is 22.32V and short circuit current is 5.65A
- No. Of panels and strings used are 10 and 1 respectively.
- Cells of the string are 10 and the type of cell used is PolyCrystalline Silicon.

Wind turbine specifications are as follows:

- Rated power output and peak power output are 5000W and 6800W respectively.
- Rated voltage is 415V and cut-in speed, Nominal wind speed and cut-out speed are 2, 8 and 18 rpm respectively.
- Rated rotor speed is 250 rpm and generator efficiency are 0.95.
- Noise level is <30db and no. of blades used are 3.
- Diameter of rotor is 3600 and C_p 0.18

A. CASE 1: ENHANCEMENT OF POWER QUALITY IN

A HYBRID SYSTEM USING FUZZY AND LOAD BASED AND DPFC CONTROLLER

In this figure, the grid's corrected output voltage is displayed, and it's shown that the voltage distortions have an impact on the proposed grid-connected system. The adjusted voltage is then monitored at the grid side.

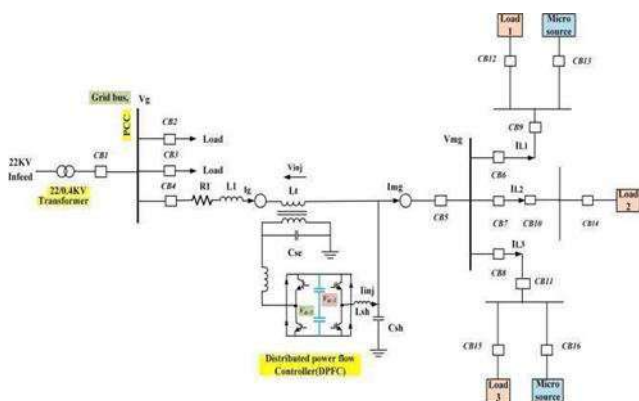


Fig.8- The designed MATLAB/Simulink System.

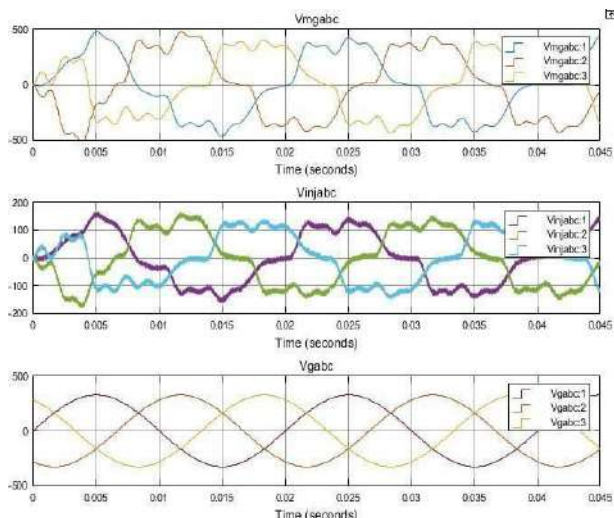


Fig.10. Output Waveforms for Injected voltage, adjusted microgrid voltage and distorted grid voltage.

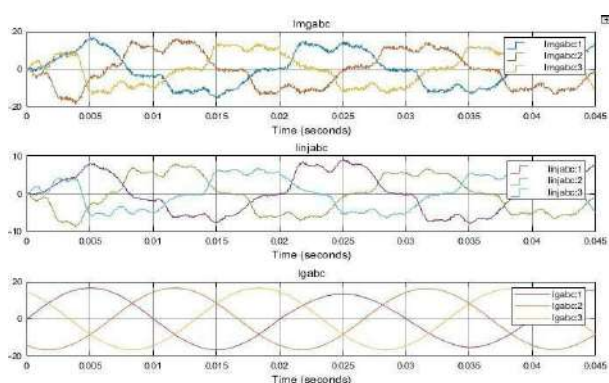


Fig.11. Output waveforms for uncompensated micro gridcurrent, injected current, and compensated grid current.

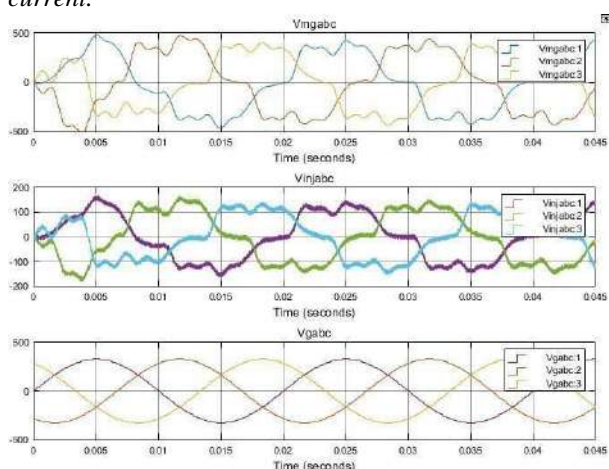


Fig.12. Output waveforms for distorted micro grid voltage, injected voltage, and compensated grid voltage.

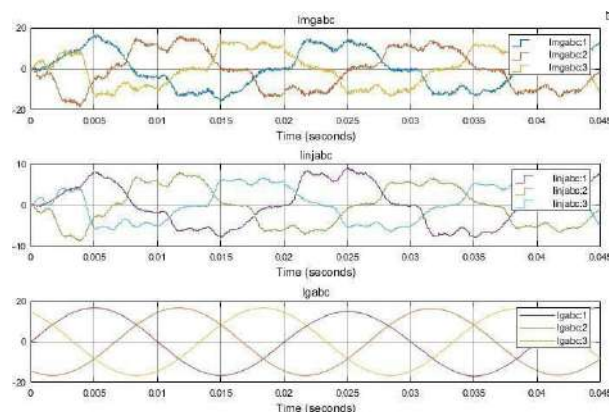


Fig.13. Output waveforms for uncompensated micro gridcurrent, injected current, and compensated grid current.

In Figure 11 the DPFC shunt converter is injecting current at fundamental and third order frequencies, and the current caused by the unbalanced load is shown too.

The DPFC controller corrected the harmonic distortion of the grid current caused by non-linear and unbalanced loads.

The above figures 12 and 13 shows the output waveforms for compensated micro grid, injected and grid voltage and current respectively by using fuzzy logic controller.

Comparison of %THD under different controllers are listed as follows:

1. DPFC with PI controller optimization technique has 8.34%
2. DPFC with Fuzzy logic controller has 3.92%

B. CASE2: ENHANCEMENT OF TRANSIENT STABILITY IN A HYBRID SYSTEM USING FUZZY AND LOAD-BASED DPFC CONTROLLERS

In order to increase the stability of the hybrid system, the proposed hybrid system converter control diagram was put to the test employing both fuzzy and LOA controllers. System parameter changes, load changes, or supply changes are the main reasons of stability issues. The stability of the generators' voltage, rotor speed, reactive power, and rotor angle were all tested

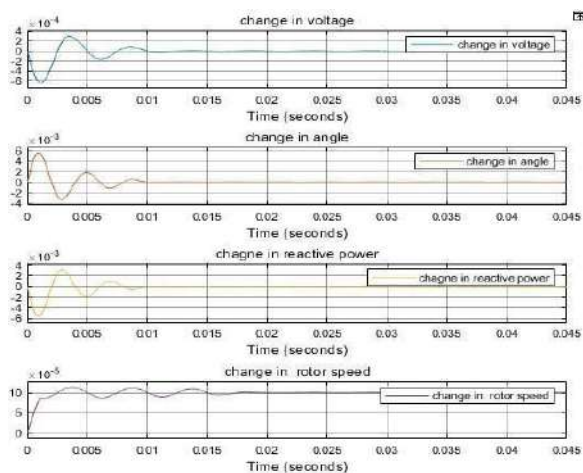


Fig.14. Output waveforms Using PI controller for transient stability

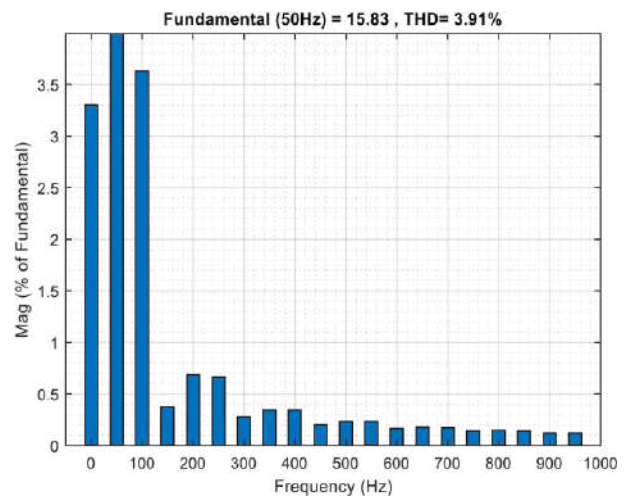


Fig.17. Total harmonic distortions using fuzzy logic Controller

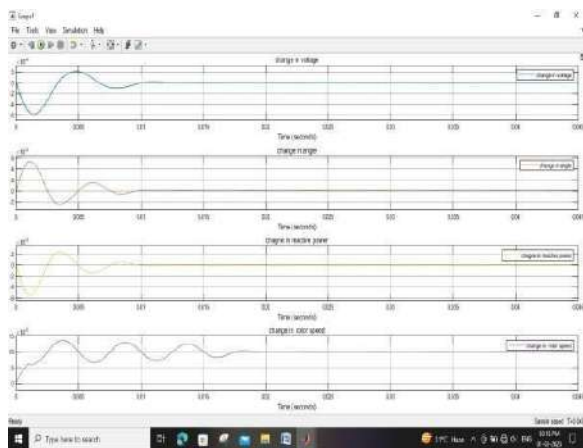


Fig.15. Output waveforms using fuzzy logic controller for transient stability

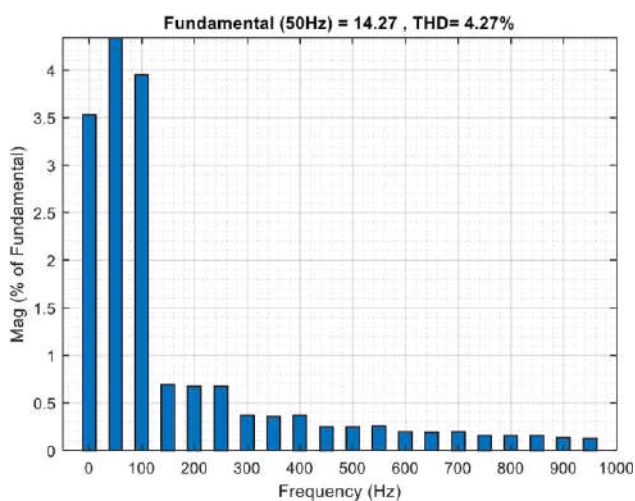


Fig.16. Total harmonic distortions using PI controller

The DPFC controllers used in the hybrid system were controlled by a standard PI controller. The load current's THD was 4.27%. To improve THD, the hybrid system's controllers were tuned using fuzzy logic controllers. The THD for any electrically engineered system must be less than 5% in accordance with IEEE 519-1992 standards. As a result, the fuzzy controllers' overall harmonic distortions are 3.92%.

The simulation results in Figure 14 and 15 show how changes in load, system parameters, and generating conditions can affect voltage stability in a micro grid system. Changes in rotor angle deviations, reactive power, and rotor speed deviations all cause the system to become less stable. The improvement in Transient Stability can be observed by comparing the graphs of PI Controller and Fuzzy Logic Controller based on their settling time.

VI- CONCLUSION

This project is proposing a new control strategy for a hybrid power system that will improve reliability, power quality, and transient stability. In addition, an MPPT controller was also implemented to improve the performance of the system. However, the proposed strategy is based on a fuzzy logic controller (FLC) to evaluate the accurate parameters of the DPFC. The series and shunt controls of the DPFC were then tuned using fuzzy logic control and a PI controller to improve power quality problems and the transient stability of voltage, reactive power, rotor speed, and angle. The



effectiveness of the proposed method was evaluated using MATLAB and SIMULINK software.

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Fault Diagnosis in Transformer by using DWT Approach

Patil Bhushan Prataprao¹, Dr. Shah Paresh Jaychand²

¹Research Scholar, Patil Bhushan Prataprao

SSBT's College of Engineering and, Technology Bambhori, Dist: Jalgaon -425001(MS). INDIA bhushan.rcpit@gmail.com

²Dr. Shah Paresh Jaychand

Shri Balaji Institute of Technology and Management, Betul, Madhya Pradesh, INDIA pjshahj@yahoo.com

Abstract –The magnetizing inrush current of the power transformer is a significant challenge to be successfully identified by the differential protection relay. In this paper, an approach based on wavelet coefficients for differentiating between internal fault currents and inrush currents in power transformers is proposed. The method of feature extraction based on discrete wavelet transforms that relies on wave shape recognition criteria generated from instantaneous differential currents. This paper proposes a decision technique algorithm used wavelet coefficients as a discriminating function. Two peak values corresponding to the $|d5|$ level following the fault instant are used to discriminate the cases studied. Discrimination of internal fault from magnetizing inrush current by considering different behavior of the differential current under fault and inrush current conditions is proposed. The detection method based on Wavelet Transform can provide information to predict fault ahead in time so as that necessary corrective action are taken to prevent outages and reduce down time. The experimental results show that accurate differentiation can be achieved by quantifying the extracted features, the method works consistently, quick and appropriate for different types of the power transformer.

Keywords- Transformer differential protection, inrush currents, wavelet transform, detail coefficients.

I -INTRODUCTION

Today's world of technology, the power transformer is one of the important links in a power system. Without it, the present power utilities would not at all be feasible [5], [16]. Differential relays are prone to maloperation in the presence of transformer inrush currents. Inrush

currents result from transients in transformer magnetic flux. The conventional approach uses the second harmonic component of differential currents to restrain operation of differential relay to avoid tripping during magnetizing inrush conditions [4]. Harmonic restraint methods may not be adequate to prevent differential element operation for unique cases with very low harmonic content in the operating current. Modern methods for differentiating inrush current from fault current, may be required to ensure security without sacrificing fast and dependable operations when energizing a faulted transformer. In the modern power system, high performance relays are required, especially in terms of operating speed. Magnetizing inrush also exhibit a characteristic of peaked wave, which is caused by asymmetric saturation of transformer core. Identifying magnetizing inrush by these characteristics opens a new avenue of research for improving the operating speed of relays [15].

II. LITERATURE REVIEW

The presence of second harmonic component in the magnetizing inrush current can no longer be used as a means to discriminate between magnetizing inrush current and internal fault, since the second harmonic component may also be introduced during internal fault due to variety of other factors such as current transformer saturation or presence of a shunt capacitor etc [4],[13]. Transformer protection includes transformer inductance during saturation, flux calculated from the integral of voltage, and the differential current. New methods have been adopted which include ANN, and fuzzy logic. Also, some techniques have been adopted to identify the magnetizing inrush and internal faults [16], [12]. A wavelet-based signal processing technique is an



effective tool for power system transient's analysis and feature extraction [4]. Wavelet-based method can use to identify inrush current and internal faults. The second harmonic component is used as a characteristics component of the asymmetrical magnetization peculiar to the inrush. At first, the wavelet transform concept is used. The property of multi resolution in time and frequency provided by wavelets is described, which allows accurate time

location of transient components while simultaneously retaining information about fundamental frequency and its lower order harmonics, which facilitates the detection of transformer inrush currents. The technique detects the inrush currents by extracting the wavelet components contained in the line currents using data window less than half power frequency cycle. The results prove that the proposed technique is able to offer the desired responses and could be used as a fast, reliable method to discriminate between inrush magnetizing and power frequency faults [8] In the experiments different faults were done on both primary and secondary windings of transformer. Method is independent of setting any threshold for discrimination amongst these. A discriminating function and feature extraction is defined in terms of difference of two-peak amplitude of wavelet coefficients in a specific band.

III. METHODOLOGY

The wavelet transforms associated with fast electromagnetic transients are typically no periodic signals, which contain both high-frequency oscillations and localized impulses superimposed on the power frequency and its harmonics. If signals are altered in a localized time instant, the entire frequency spectrum can be affected. To reduce the effect of non-periodic signals on the DFT, the short-time Fourier transform (STFT) is used. It assumes local periodicity within a continuously translated time window. Fig.1 illustrates the implementation procedure of a Discrete WT (DWT), in which S is the original signal; LPF and HPF are the low-pass and high pass filters respectively. At the first stage an original signal is divided in to two halves of the frequency bandwidth, and sent to both LPF and HPF. Then the output of LPF is further cut in half of the frequency bandwidth and then sent to the second stage, this procedure is repeated until the signal is decomposed to a pre-defined certain level. If the original signal were being sampled at F_s Hz, the highest frequency that the signal could contain, from Nyquist's theorem, would be $F_s/2$ Hz. This frequency would be seen at the output of

the high pass filter, which is the first detail 1; similarly, the band of frequencies between $F_s/4$ and $F_s/8$ would be captured in detail 2, and so on. The sampling frequency in this paper is taken to be 10 kHz and Table I shows the frequency levels of the wavelet function coefficients.

Table

Decomposition Level	Frequency Components, Hz
D1	5000-2500
D2	2500-1250
D3	1250-625
D4	625-312.5
D5	312.5-156.25
A5	0-156.25

No.1

Frequency levels of wavelet functions coefficients

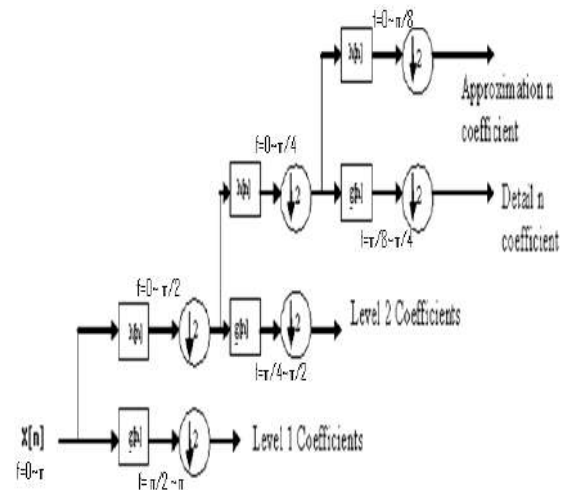


Fig No. 1 Implementation of DWT

III- POWER SYSTEM CONFIGURATION

The electric power system in this study was implemented using MATLAB/Simulink blocks; the single-line diagram and Matlab/Simulink Model are illustrated in Fig.2 and Fig.2 respectively. It comprises,



an 11 kV, 50 Hz, three-phase voltage source connected to a three phase, two winding, Y/Y power transformer with grounded neutral, rated capacity of 20 MVA and rated voltages of 11/33 kV. Different power system conditions are simulated such as energizing conditions, internal faults at the power transformer terminals, taking into account the various possible situations.

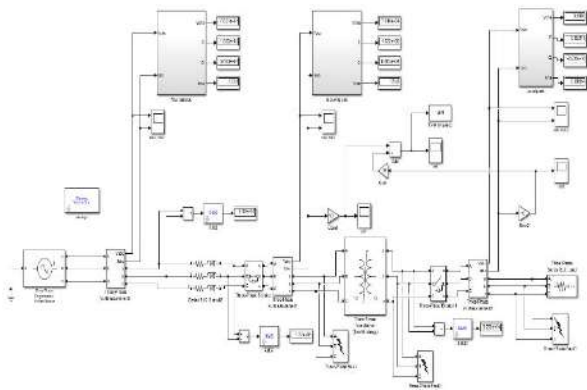


Fig.2. MATLAB /Simulink Model of the proposed system

V- RESULT & DISCUSSION

Figure 3.1 shows the differential current (represented as `_Signal'`) due to inter-turn short circuit of 4% winding near to neutral in primary winding, with their detailed coefficients from Wavelet Transform up to D5 level. Here, the daub- 4-mother wavelet is used to obtain the desired wavelet coefficients. In figure 3.1, the respective signal and its $|d5|$ is shown in the next consecutive figures. These figures illustrates usefulness and accuracy of proposed algorithms in classifying the inter turn fault and inrush currents of a transformer. At the bottom of this figure absolute value of $d5$ is given. The detailed description and interpretation of fig. 3.1 is given below [17]-

a) Original Differential current signal is captured with data acquisition system discussed previously, and represented as `_Signal'` in the figure 3.1. The fault is initiated at sample number 557 (Approx.) and it is marked as `_x'` in figure.

b) In the fig. 3.1, the absolute value of $|d5|$ as shown in figure, the first two consecutive peak values after the fault instant are the good approximations for the initial slope changes in the fault and inrush current.

c) The absolute value of the coefficients of $d5$ waveform is shown at the bottom of this figure. In this, A and B are the amplitudes of first two peaks following the disturbance. The fig. 3.1, It is seen that for inter-turn

fault $A > B$. In the event of $A > B$ trip command can be issued in quarter cycle.

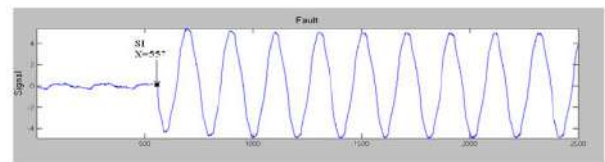
d) The features used for diagnosis normally are seen in the high frequency range and not in lower frequency.

e) In the fig. 3.1, it is obvious that the amplitudes of wavelet coefficients in D5 are larger than that of D1-D4. Many wavelets were tried as an analyzing wavelet, but finally Daubochies 4 (Db4) gave encouraging and distinguishing features, magnitude of two consecutive peaks A and B, follows the same relation i.e. $A > B$.

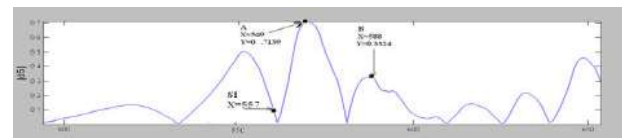
f) In the fig. 3.2, Inrush current exhibits different behavior or feature than the fault current, though their amplitudes are comparable. Inrush current starts with low slope and increase rapidly afterwards.

g) The acquired inrush current signal is decomposed into five levels. No peaking was observed at the starting instant in d1-d2 level, as appeared in inter-turn fault. But high frequency oscillations can be noted in these levels, as high slope follows the low slope in inrush current.

h) In the fig. 3.2, the $d5$ and $|d5|$, the consecutive peaks A and B can be obtained and compared. For inrush, it can be noted that $A < B$.

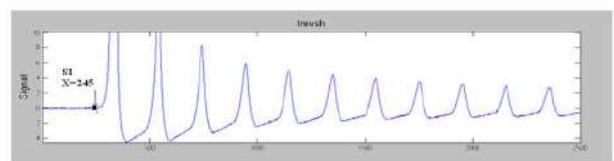


(a)

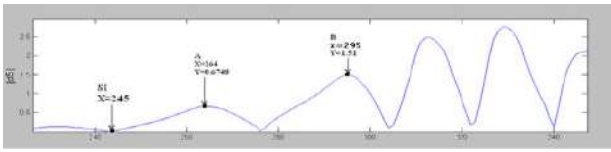


(b)

Fig No. 3.1 DWT decomposition of differential fault current (a) Fault current signal (b) $|d5|$ coefficients



(a)



(b)

Fig No. 3.2: DWT decomposition of Inrush current (a) Inrush current signal (b) $|d5|$ coefficients

To validate the proposed technique methodology three cases of internal faults are presented: line-to-ground, line-to-line, and three line-to-ground, the algorithm was implemented using MATLAB

Case 1: Inrush Magnetizing current

To achieve the magnetizing inrush current condition, the transformer is starting with no-load in secondary, then the transformer switching on the inrush current will flow in transformer depending on magnetizing characteristic of the tested transformer, the inrush level is about 10-times of the steady-state. The inrush current transient condition is seen like a spike train. These trains in sharp spikes happen instantly following the inception of fault time. This difference in wave form can be used effectively as important feature to make discriminate with the internal faults. The results of simulation, for transformer no-load, is given in Figure 4. From Figure 4 the transient cycle takes time to settle and also the amplitude of about 6 times of the rated current. The inrush current analysis utilizing DWT for extracting the differential current signal (S) shown in figure 5. From the analysis result, it's clear the level of D4 and D5 coefficients were forms the nominal value of steady-state current where they used in this study for discriminating the inrush current from the internal faults. DWT decomposition of differential Inrush magnetizing current (a) Fault current signal (b) $|d5|$ coefficients shown in figure 6.

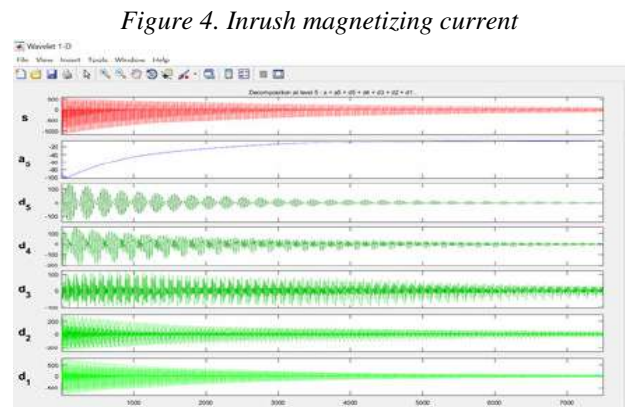
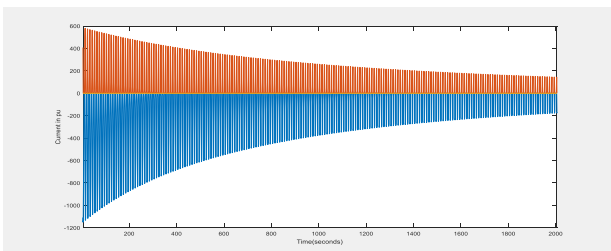


Figure 4. Inrush magnetizing current

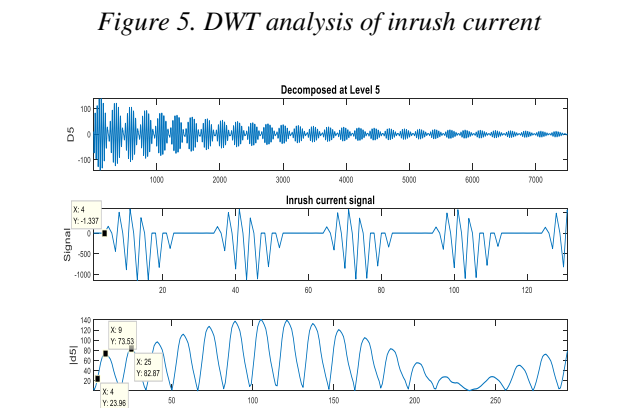


Figure 5. DWT analysis of inrush current

Figure 6. DWT decomposition of differential Inrush magnetizing current (a) Fault current signal (b) $|d5|$ coefficients

Case 2: Single-Phase to ground Fault

To achieve fault condition the test carried out by connected one of the phases to ground (phase a). Figure 7 shows the single line to ground fault (internal fault), the differential current will flow in the protection relay. The differential current analysis-based DWT for three phases are shown in Figure 8, DWT decomposition of differential SLG internal fault current (a) Fault current signal (b) $|d5|$ coefficients shown in figure 6. During the single phase to ground fault condition, the transient condition with high frequency is generated in the fault current. The Transient spike occurrence and then decay rapidly is noticed in about a cycle and less than in the inrush current condition duration time.

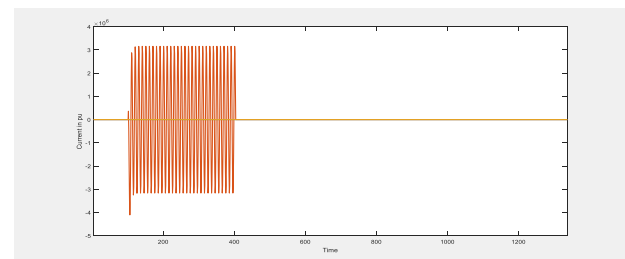


Figure 7. SLG internal fault

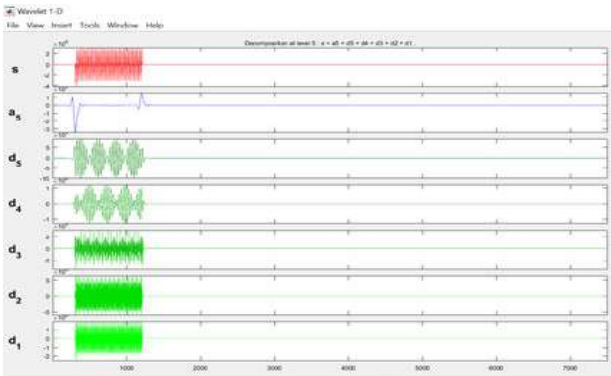


Figure 8. SLG fault DWT analysis

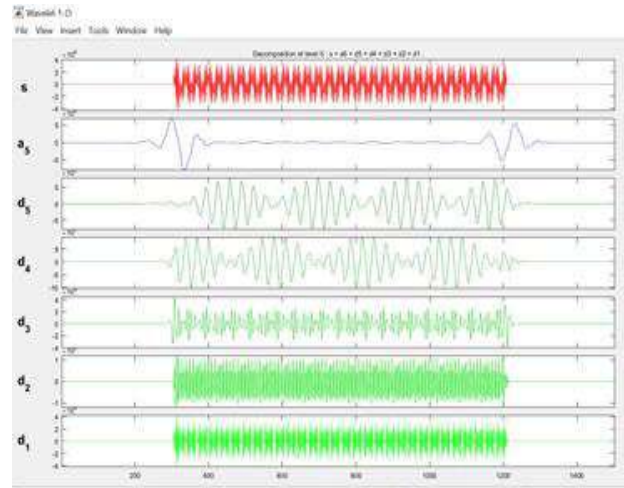


Figure 11. LL fault DWT analysis

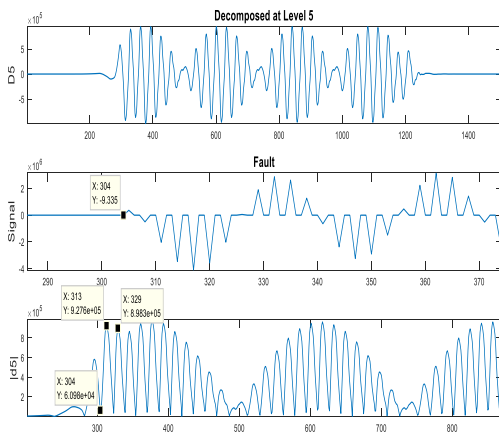


Figure 9. DWT decomposition of differential SLG internal fault current (a) Fault current signal (b) $|d5|$ coefficients

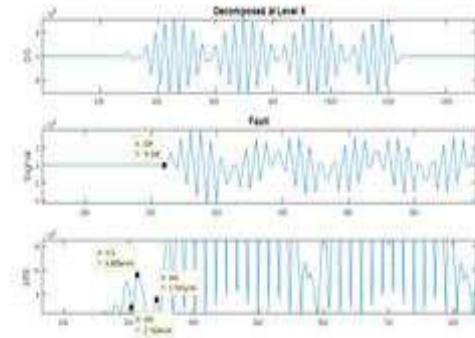


Figure 12. DWT decomposition of differential LL fault current (a) Fault current signal (b) $|d5|$ coefficients

Case 3: Line to Line Fault:

The test carried out through Connecting two phases phase “a and phase b” as shown in Figure 10. The fault current will flow in the differential path of the differential relay. The differential current analysis-based on DWT for the three-phase is shown in Figure 11. DWT decomposition of differential LL fault current (a) Fault current signal (b) $|d5|$ coefficients Figure 12.

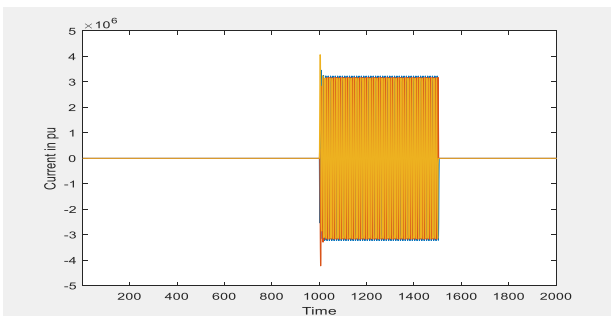


Figure 10. LL internal fault

VI- CONCLUSION

The DWT method is appropriate approach for waveform analysis. For the purpose of differentiating between internal fault currents and magnetizing inrush currents, a new algorithm technique was put forth. The harmonic restraint differential relay, which was employed in the prior method, requires at least one cycle to operate for internal faults, whereas DWT identifies an internal fault immediately after the fault inception. A new approach presents the discrimination depends on two peak values corresponding to the $|d5|$ level following the fault instant is new method for discrimination of internal fault from magnetizing inrush current by considering different behavior of the differential current under fault and inrush current conditions is proposed. The differential current due to inrush current begins with a low slope and then its slope is raised. But differential current due to fault begins with a higher slope and then its slope decreases. A larger slope in the time domain shows that there are higher frequencies in the frequency domain, as criterion compare the two peak values, hence no



threshold settings are necessary in this algorithm. Experimental results for inrush and also faults approved the scheme provides an adequate in achievement into discrimination. The practical results showed that they matched the results obtained from the simulation analysis for inrush current case and fault current cases.

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Rough Terrain Vehicle of Rocker Bogie Mechanism

R.V. Pingale¹, T.S. Bhoir², Y.M. Mali³, M.C. Mhatre⁴, M.S. Bhadane⁵

^{1,2,3,4} Students, ⁵Professor Mechanical Engineering, Lokmanya Tilak College of Engineering, Koparkhairane, India
*rahulpingale52@gmail.com*¹

Abstract –Rocker bogie are important for conducting in-situ scientific analysis of objectives that are separated by many meters to tens of kilometers. Current mobility designs are complex, using many wheels or legs. They are open to mechanical failure caused by the harsh environment on Mars. A four wheeled rover capable of traversing rough terrain using an efficient high degree of mobility suspension system. The primary mechanical feature of the rocker bogie design is its drive train simplicity, which is accomplished by using only two motors for mobility. Both motors are located inside the body where thermal variation is kept to a minimum, increasing reliability and efficiency. Four wheels are used because there are few obstacles on natural terrain that require both front wheels of the rover to climb simultaneously. A series of mobility experiments in the agriculture land, rough roads, inclined, stairs and obstacles surfaces concluded that rocker bogie can achieve some distance traverses on field.

Keywords: Rocker bogie; Wheel type mobile robot; Stair climbing; Rover

I-INTRODUCTION

Over the past decade, the rocker-bogie suspension design has become a proven mobility application known for its superior vehicle stability and obstacle-climbing capability. Following several technology and research rover implementations, the system was successfully flown as part of Mars Pathfinder's Sojourner rover. When the Mars Exploration Rover (MER) Project was first proposed, the use of a rocker-bogie suspension was the obvious choice due to its extensive heritage. The challenge posed by MER was to design a lightweight rocker-bogie suspension that would permit the mobility to stow within the limited space available and deploy into a configuration that the rover could then safely use to egress from the lander and explore

the Martian surface. When building a robot you'd like it to be as simple as possible. In most cases you'd never need a suspension system, but there were several instances when a suspension system cannot be avoided. The term "bogie" refers to the links that have a drive wheel at each end. Bogies were commonly used as load wheels in the tracks of army tanks as idlers distributing the load over the terrain. Bogies were also quite commonly used on the trailers of semi-trailer trucks. Both applications now prefer trailing arm suspensions. The rocker-bogie design has no springs or stub axles for each wheel, allowing the rover to climb over obstacles, such as rocks, that are up to twice the wheel's diameter in size while keeping all six wheels on the ground. As with any suspension system, the tilt stability is limited by the height of the center of gravity.

II-LITERATURE REVIEW

The concept of our research work is to create a rocker-bogie drive system based on those of NASA. NASA developed the rocker-bogie suspension system for their rovers and was implemented in the Mars Pathfinder's and Sojourner rover. The rocker-bogie suspension system passively keeps all six wheels on the robot in contact with the ground even on uneven surfaces. This creates for great traction and maneuverability (Harrington & Voorhees). The rocker-bogie suspension mechanism which was currently NASA's approved design for wheeled mobile robots, mainly because it had study or resilient capabilities to deal with obstacles and because it uniformly distributes the payload over its 6 wheels at all times. It also can be used for other purposes to operate in rough roads and to climb the steps. It was having lots of advantages but one of the major disadvantages is the rotation of the mechanism when and where is required. The rotation can be possible by providing individual motors to individual wheels which causes arise in cost and complicity in design. Here an attempt was made to modify the existing design by incorporating a gear type steering mechanism which will be operated by a single motor which simplifies the design as well as the total cost and



operating cost of the mechanism. In this work the proposed steering mechanism was designed and the modeling was done in CATIA (V-5) and the same was analyzed for static analysis for the proposed torque condition of the motor in ANSYS. All the results in the analysis were analyzed for static analysis.

The researchers discuss the concept and parameter design of a Robust Stair Climbing Compliant Modular Robot, capable of tackling stairs with overhangs. Modifying the geometry of the periphery of the wheels of our robot helps in tackling overhangs. Along with establishing a concept design, robust design parameters were set to minimize performance variation. The Grey-based Taguchi Method was adopted for providing an optimal setting for the design parameters of the robot. The robot prototype was shown to have successfully scaled stairs of varying dimensions, with overhang, thus corroborating the analysis performed.

An analysis method to make the rocker bogie mechanism can climb up a stair was achieved in the work. The east coast of Malaysia faced a massive flood from heavy downpour, leading to huge flood damage and caused irreparable loss to life and property. The flood carries the debris, soil and trees along their path, damaging the road and building structure, leaving the road become uneven. This situation gives difficulty to task force bearing aids during the post disaster management. The research paper proposed an intelligent inclined motion control of an amphibious vehicle while moving on uneven terrain surface.

The research paper deals with the designing and modeling of stair climbing robot based on the well-known rocker bogie mechanism in Ansys rigid body dynamics module. The robots often suffer from undesired phenomenon slip, sticking and floating while climbing steps and stairs, which may cause instability of the mobile robot. The Taguchi method was used to chosen as an optimization tool to make trajectory of center of mass close to straight line while all wheels keep in contact with ground during climbing stairs. Taguchi method was adopted due to its simplicity and cost effectiveness both in formulating the objective function and satisfying multiple constraints simultaneously. In the Optimization, Seven kinematic parameters of rocker bogie mechanism were optimized which include four link lengths (l_1, l_2, l_3) and three wheel radius (R_1, R_2, R_3). The kinematic Model of proposed mechanism was built and it was simulated in ANSYS Rigid body dynamics. Three different shapes of typical stairs were selected as user conditions to determine a robust optimal solution. The result obtained shows the variation of center of mass position with time, variation of velocity of joint with time, variation of force with time. It was basically a suspension arrangement used in mechanical robotic vehicles used specifically for space exploration. The rocker-bogie suspension based rovers has been successfully introduced for the Mars Pathfinder and Mars Exploration Rover (MER) and Mars Science Laboratory (MSL) missions conducted by apex space exploration agencies throughout the world. The proposed suspension system was currently the most favored design for every space exploration company indulge in the business

of space research. The motive the research initiation was to understand mechanical design and its advantages of Rocker-bogie suspension system in order to find suitability to implement it in conventional loading vehicles to enhance their efficiency and also to cut down the maintenance related expenses of conventional suspension systems.

The world market of mobile robotics was expected to increase substantially in the next 20 year, surpassing the market of industrial robotics in terms of units and sales. Important fields of application are homeland security, surveillance, demining, reconnaissance in dangerous situations, and agriculture. The design of the locomotion systems of mobile robots for unstructured environments was generally complex, particularly when they were required to move on uneven or soft terrains, or to climb obstacles. The three main categories of locomotion systems (wheeled – W, tracked – T and legged – L) and the four hybrid categories that can be derived by combining these main locomotion systems were discussed with reference to maximum speed, obstacle-crossing capability, step/stair climbing capability, slope climbing capability, walking capability on soft terrains, walking capability on uneven terrains, energy efficiency, mechanical complexity, control complexity and technology readiness. The current and future trends of mobile robotics were discussed.

The optimization of a particular suspension system known as the “rocker-bogie” for our Mars Rover. This type of mechanism has been used on most of the rovers on Mars and has proved to be a simple and elegant design. A Genetic Algorithm was implemented and used to optimize the geometry and kinematics of the rover’s wheel suspension system subject to the defined performance metrics. This work shows the effectiveness of the optimization of a rocker-bogie suspension system using a Genetic Algorithm. It also reveals that the resulting system meets all constraints and that significantly reduces the error of individual performance metrics and the overall system. It was shown that the overall fitness of the rover suspension system can be increased by an average of 28% after 100 iterations compared to an initial guess. All performance metrics defined were improved significantly throughout the optimization. The method can be applied to different types of rovers in order to optimize the wheel suspension mechanism’s geometry.

III-DESIGN OF ROCKER BOGIE

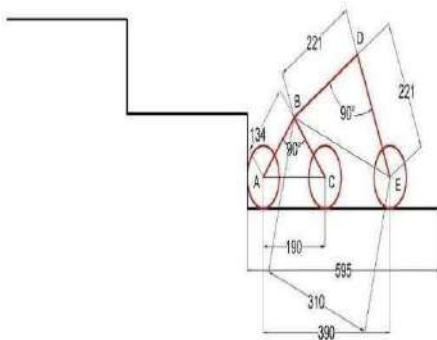
The important factor in manufacturing of rocker bogie mechanism is to determine the dimensions of rocker and bogie linkages and angles between them. The lengths and angles of this mechanism can be changed as per requirement. In the work aim is to manufacture the rocker bogie mechanism which can overcome the obstacles of 150 mm height (like stones, wooden blocks) and can climb over stairs of height 150 mm. Also another target is to climb any surface at an angle of 45°. To achieve the above targets we had design the rocker-bogie model by assuming stair height 150 mm and length 370 mm.

Using Pythagoras theorem, find the dimensions of the model. It have both angles of linkages are 90°.



A. Design calculation

The objective of the research work is stair climbing. To achieve proper stair climbing the dimensions of linkages should be proper. Assume the stair height and length 200 mm and 500 mm respectively. To climb stairs with higher stability, it is required that only one pair of wheel should be in rising position at a time. Hence to find dimension of bogie linkages, first pair of wheels should be placed at horizontal position means at the end of the rising as shown in Fig.1. And second pair should be placed just before the start of rising. There should be some distance between



vertical edge of stair and second pair of wheel to striking of wheels.

Fig. 1. Cad drawing for first triangle

Now, need to obtain the distance between first and second wheel through CAD software (190 mm). Considering the right angled triangle ABC, Using Pythagoras in ΔABC (Fig. 2.) assume lengths AB and BC is x.

$$AC^2 = AB^2 + BC^2$$

$$200^2 = x^2 + x^2$$

$$200^2 =$$

$$2x^2 \quad x =$$

$$145 \text{ mm}$$

Hence, $AB = BC = 134 \text{ mm}$ (Fig. 2.)

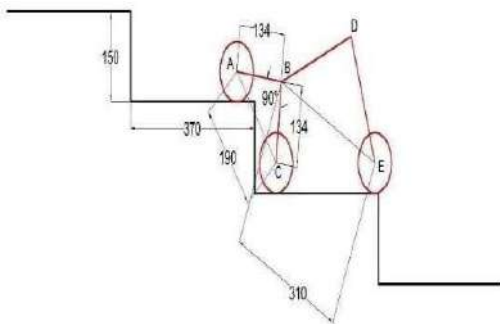


Fig. 2. Cad drawing for second triangle

Similarly, to find dimensions for rocker linkages first two wheel pairs should be placed at horizontal position. Third wheel pair should nearly complete its rising before starting of rising of first pair of wheel. By placing wheel in such manner we obtained dimension of link BC (311mm).

Now consider ΔBDE (Fig.

$$3.), BE^2 = BD^2 + DE^2$$

$$285^2 = 2y^2$$

$$y = 251 \text{ mm}$$

Hence, $BD = DE = 251 \text{ mm}$ (Fig. 3.)

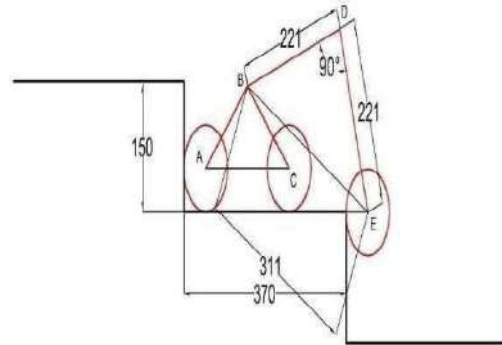


Fig. 3. CAD drawing of both triangles

By considering all these lengths and angles we have drawn whole mechanism. Above Fig. 3, shows all dimensions of robot. We take acrylic width is 100 mm suitable for drilling 15 mm diameter holes.

B. Drawing

After the calculation of triangle dimension using CAD software 2D drawing is prepared as per calculated dimension and same drawing views are shown in Fig. 4.

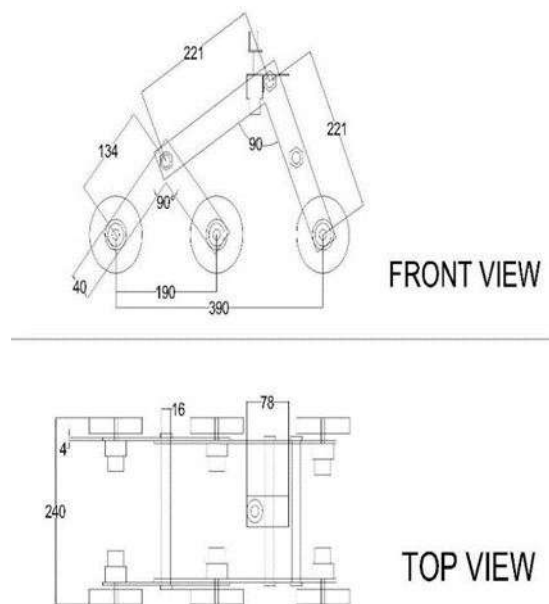


Fig. 4. 2D Drawing of Rocker Bogie Mechanism



C. Design & Selection of Wheel

Design of wheel is required at velocity up to 0.5 m/s. Assume speed is 60 - 100 rpm motor. Using velocity relation velocity is calculated for assumed speed. Using calculated velocity value need to find out diameter of wheel is 40 mm. Hence we select the wheel of 100 mm diameter (standard wheel).

Selection of rubber thread bonded to the wheel makes it light weight and durable, provides excellent traction, friction. These plastic wheels (as shown in Fig. 5.) offer a low cost solution that is durable enough for a combat robot yet still light enough to be practical. For robot used six wheels.

- Wheel Diameter: 100 mm
- Wheel Width : 20 mm
- Shaft Diameter : 6mm



Fig. 5. Photo Image of Rubber Wheel

D. Selection of acceleration for robot

For a typical robot on flat terrain, it's needed to take acceleration about half of maximum velocity. Maximum velocity of robot is 0.5 m/s. Hence the acceleration of robot will be 0.5/2 means 0.25 m/s². This means it would take 2 seconds to reach maximum speed. If robot is going up inclines (as per Equ. No.1) or through rough terrain, you will need a higher acceleration due to countering gravity. We needed to climb the angle upto 45°. Hence,

Acceleration of inclines

$$9.81 * \sin(\text{angle of inclination}) * \pi$$

$$= \frac{\quad}{180} \quad (1)$$

$$= 0.121 \text{ m/s}^2$$

Total Acceleration = 0.25+0.121 = 0.371 m/s²

IV-PERFORMANCE AT DIFFERENT CONDITIONS

As per the ground level experimentation by rocker bogie manufactured; tested found that the performance satisfactory below are the result are shown see fig. 6- 10 on different obstacle and different surfaces.

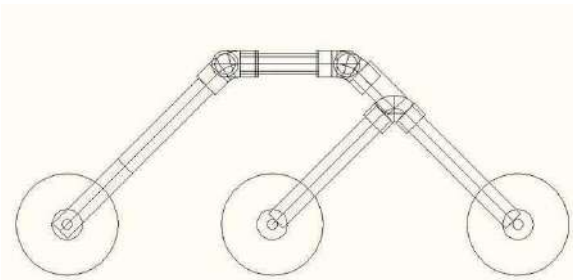


Fig. 6. Photo image of on rough surface

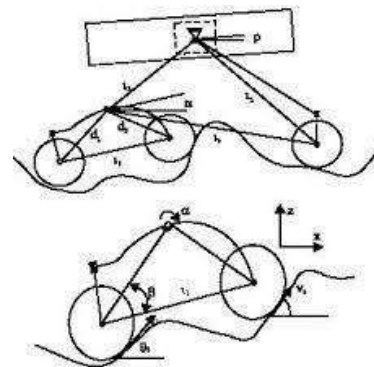


Fig. 7. Rocker Bogie Mechanism Suspension System



Fig. 8. Photo image of on angle surface about 75° inclination

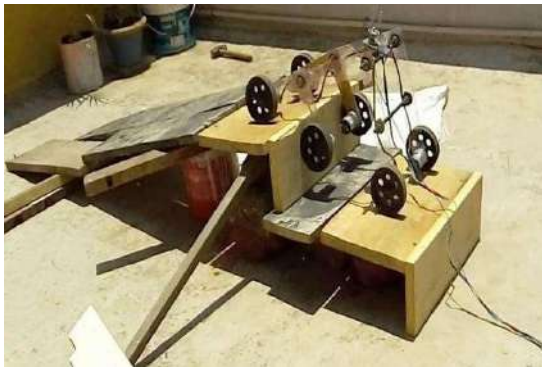


Fig. 9. Photo image stair Climbing

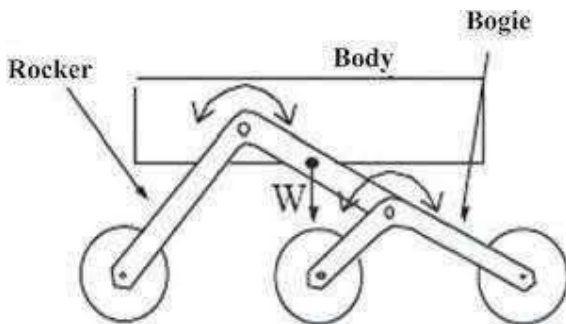


Fig 10 - Photo image in Farm with AV recording through IP web cam

V-CONCLUSION

This work shows how rocker bogie system works on different surfaces. As per the different weight acting on link determines torque applied on it. By assuming accurate stair dimensions, accurately dimensioned rocker bogie can climb the stair with great stability. The design and manufactured model can climb the angle up to 45° . Also we tested for the Web cam with AV recording mounted on rocker bogie system and found satisfactorily performance obtains during this test camera has rotated around 360° . During stair climbing test for length less than 375 mm (15 inch) system cannot climb the stair. It can be possible to develop new models of rocker bogie which can climb the stairs having low length.

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Electricity Generation Using Gym Equipment

Venu Sonu Firke¹, Ashish Nitin Khachane², Bhushan Somnath Patil³, Jayesh Dattatray Pawar⁴
Gaurav Sanjay Shimpi⁵, Ganesh Suresh Mahale⁶

¹PG student, Research Scholar, Professor, GF'S Godavari Collage of Engineering and Polytechnic, Jalgaon, INDIA, 425001,

^{2,3,4,5,6} Diploma student, , GF'S Godavari Collage Of Engineering And Polytechnic Jalgaon India , 425001,

venufirake20@gmail.com¹, aashishkhachane3@gmail.com²

Abstract: The world is facing energy crisis with the difference in demand and supply and limited number of natural resources .Energy is essential for driving and enhancing the life cycle .Renewable Energy technologies are crucial in generation of power now and tomorrow, solar, wind, tidal m, biomass energy have all been proposed as non-conventional energy sources of generation .human power might exploited renewable energy. In which pull up machine aims at harnessing the mechanical energy of machine converted into electrical energy using generator base system and to use it power light bulb cell phone and battery. The kinetic energy from fly wheel it supply to dc generator. By means of gear the power is store in lead acid battery. The result of project shows that how electrical energy can be generating from gym equipment.

Keywords- By simply pull up machine can generate human power electricity with the help of pulley, inverter, and battery.

INTRODUCTION

Increasing Energy crisis or increasing price rate of electricity, due to overconsumption by over population. Due to over population, delay in commissioning of power plant, wastage of energy. Sometimes bottle necks at oil refineries and port facilities restrict fuel supply (1). The project intension to build straight forward human power generator from pull down machine. This project well help to scientist & engineers to develop

engineering skills while learning efficient way of generating zero pollution electricity In this project the kinetic energy produce by the gym exercise machine is a very imaginative & limit less source accessible . When people doing physical workout pull up machine, pulley rotates due to up down movement of weight the pulley rotates & move the shaft of dynamo.

LITERATURE REVIEW

Roshan ojha et al. [11], the use of human-power in more efficient manner for generation has been possible due to modern technology. Pull up pull down power is an excellent source of energy, 95 percentage of the exertion put into pull up pull down power converted into energy. Pull up pull down power is the transfer of energy from a human source through the use of rack and pinion system. This technology is most commonly used for gym center. Whenever the person is allowed to pass over the gym pull up pull down. As the spring are attached to gym equipment, they get compressed and the rack, which is attached to, the bottom of the rod moves down reciprocating motion of rack in to rotary with certain RPM these shafts are connected through a chain drive to the dynamos, which converts the mechanical energy into electrical energy. Pull up pull down power is the transfer of energy from a human source through the use of rack an pinion system. This technology is most commonly used for gym centre or house less commonly gym power is used to power agricultural and hand tools and even to generated electricity. Mandhup Kumar and Mundada [14], investigated and worked on energy harvesting on gym equipment due to the increase in demand of energy in the world and need of renewable source of energy and its development. The



concept is “The average human generates around 100 watts in an average day. Depending on the person's activity, weight, and metabolism, a person's power can be slightly higher or lower. A typical American consumes about 2500 kilocalories of energy in a day. Assuming no weight gain or loss, this also means that 2500 kilo calories are used by the body in a day. With 2500 kilocalories of energy, the body is able to function properly. This allows to do everyday activities such as reading, jogging, sleeping, etc.”

M. Musharraf et al. [15], A theoretical model of Energy Generating Gymsnasiums System (EGGS) is proposed in this paper which will contribute its share in renewable energy sector. People of modern society are conscious about their health and adopt gymnasium exercises in order to achieve their desired fitness level. Gymnasium is a place where people physically operate many machines by applying force on the machines. The idea behind smart EGGS is that the human expended energy on machines in a gymnasium should be converted into electrical energy. Electrical energy harvested by using smart EGGS will be clean, renewable and sustainable. Research proposed for smart EGGS suggest that human being is also a source of renewable energy and chemical energy possessed by humans can be converted into electrical energy. EGGS will be very beneficial for the countries that are facing severe energy crises. Total output of all the gymnasium machines will give a sufficient amount of electrical energy needed by the gymnasium electrical appliances. The excessive electrical energy can be sold back to utility.

Sourabh Borchate [13], In day to day life human being suffering from the health problems and stress. Another problem faced by the world is difference between energy generation and energy consumption. We can examine some aspects in our observation to save energy. Like to run on treadmill power supply is given for ease of running and for showing the parameters. But what about our human power, that is going to waste. To store that energy into electric energy the mechanism of treadmill will be develop such that the rotary motion of roller transforms energy to the generator by coupled it with belt. By this type of arrangement the health problems and energy problems can be solved. The stored energy can be used for various purpose and we not only save the energy required for treadmill but also generates the energy from using treadmill. A treadmill is a device basically used for running and to loss calories. Now a day because of business of human being in their day to day work, they feel tired to go for run. But health problems occurred due to stressful life and obesity occurs in many of them. For ease of running and to know the how much calories burn and for running at same place treadmill was developed. Treadmill provides a moving platform with a wide conveyor belt (track), driven by an electric motor. The belt moves to the roller,

requiring the user to walk or run at a speed matching that of the belt. The rate at which the belt moves is the rate of walking or running. Thus, the speed of running may be controlled and measured by using controller and sensors provided. The more expensive, heavy duty versions are motor driven (usually driven by an electric motor). And manual treadmills without motor are less expensive but require more human efforts for moving the belt on roller. In most of the gym premises expensive and motor driven treadmill used.

PROBLEM STATEMENT

The energy problem – The main source of energy to generate electricity is from fossil fuel but this are limited storage in nature. More uses of fossil fuel increasing pollution & global warming effect on the environment to tackle the pollution increasing temperature of environment , we realize that nonrenewable energy source repositories are running low as the utilization is excessively. The encompassing wellsprings of vitality are accessible in huge amount & the innovation is enhancing to extricate this energy proficiently.

Concept of green gym – In an exercise center individual, often performs control & redundant developments. Micro gym additionally utilizes vitality effective human dynamo curved machine which are equipped for charging batteries to control on inverter to deliver up to 120 Volts for ac.

METHODOLOGY

Every year the consumption of electricity rise in by 12 % but the production rate of electricity is less, resulting load shedding & price increasing day by day. Is time to raise awareness between people of renewable energy source rather than conventional source? Our research core idea is to use gym machine properly ton generate power from kinetic energy that would otherwise lost in gym & also to transform the human body calories into green power.

The average human generate around 100 Watts in an average day it depends on the weight & metabolism of individual who consumes daily calories. The project aims to construct and manufacture an entirely unique generation system that fuses both form and function and a cost-effective & convenient solution. The methodology of project is follow

- At the first firm frame of the setup is build which is also called as the body of the setup which contends of all the major component of the modal.



- Pulley are mounted on the shaft of proper dimentation and the shaft is inserted inside the bearing which then is supported in the
- Driver pulley is attached on the shaft and smaller pulley (driven) is attached in the dynamo
- Dynamo along with pulley is supported on the frame is connected to the driver pulley
- All the electrical connection are attached through the dynamo via electrical wires
- The output from the Dynamo is being tested in varies loading condition and average power is calculated.
- The AC output from the dynamo need to be converted to the suitable DC output, which is done by using rectifier circuit.
- The output from the circuit is extended by using extenuation circuit and connected to 12 V battery.
- The output from the battery id gained by output circuit at 12V.
- While performing the exercise the weight is lifted by handle their by rotating main shaft which is then connected to the dynamo in order to produce electrical current which can be used immediately or can be stored in the battery.

DESIGN

- Pulleys are mounted on the shaft of proper dimentation and the shaft is inserted inside the bearing which then is supported in the
- Driver pulley is attached on the shaft and smaller pulley (driven) is attached in the dynamo
- Dynamo along with pulley is supported on the frame is connected to the driver pulley
- All the electrical connection are attached through the dynamo via electrical wires
- The output from the Dynamo is being tested in varies loading condition and average power is calculated.
- The AC output from the dynamo need to be converted to the suitable DC output, which is done by using rectifier circuit.
- The output from the circuit is extended by using extenuation circuit and connected to 12 V battery.
- The output from the battery id gained by output circuit at 12V.
- While performing the exercise the weight is lifted by handle their by rotating main shaft which is then connected to the dynamo in order to produce electrical current which can be used immediately or can be stored in the battery.

A) Elements to proposed design

1. Frame
2. Handle
3. Shaft
4. Driver and driven pulley
5. Dead weights
6. Chain pulley

B) Component use for power generation

1. Battery
2. D.C generator
3. Electrical circuit
4. Pulleys

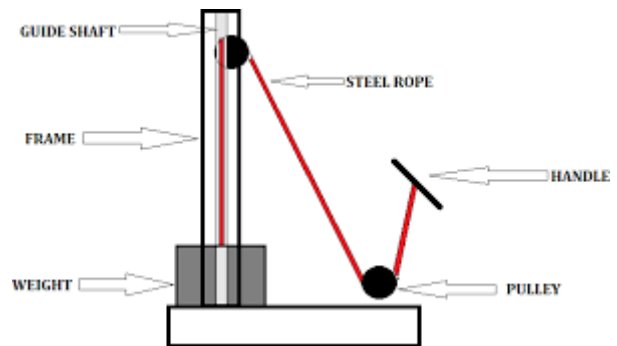


Fig. Gym Equipment

RESULT

Power calculation

Average a man can produce a power of approx. 100watt in a day from single exercise equipment

1 day = 100 watt

30 day = 30*100 watt = 3kw/watt

With the amount of 3-kw/watt power 0.3 ceiling fan can run approx. 08 hrs. in a day for whole month

Appliance	watts	No	Hours	Watt* hours	Units/ day
Ceiling fan	100	3	8	-	2.40

We construct innovative gym equipment for getting electricity .By the help of dynamo, capacitor bank, rectifier circuit, LED lamp. We successfully take 12v



output supply & it is utile to light 3V&5V to cell phones charging. When machine is not in use to main supply is use top charge capacitor bank .So, a capacitor bank also charges while exercise machine is not in use. So, provide continuous supply.

ADVANTAGES, DISADVANTAGES AND APPLICATIONS

Advantages:

1. It is clean and eco-friendly energy.
2. Dual benefit system.
3. Maintenance is not complicated.
4. It does not require any fossil fuel.
5. It does not produce harmful effect on environment.

Disadvantages:

1. Comparatively Less amount of power will be generated.
2. Mechanical moving parts are more so, a chance of mechanical loss is more.
3. Weight of the model is very high so difficult to transport.
4. Initial investment is high.

Applications:

1. Power generation using gym pulling can be used in most of places such as home, Colleges, School and Gym centre.
2. It is can be used for glowing plenty of lights, charging electrical devices and can also be stored in battery which can be used for multiple purpose.
3. It can be used in public parks.

CONCLUSION

The power generation gym equipment will convert human efforts into electrical energy which otherwise gets wasted. We propose and a put into effect innovative exercise equipment to generate electrical power for the house application. This design and implement an innovative exercise equipment to generate electrical power for the house appliances. If all the equipment in the fitness center are fabricated with power generating unit, we can generate more power. If will be very helpful for the rural areas. In this day where the world is challenged to be more responsible sourcing of electricity power. If additional design and study of this concept

proves it effective in energy use reduction, localized energy delivery and sustainability education, it could productive with effort.

ACKNOWLEDGMENT

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Study of Green Supply Chain Management Practices and Key Factors in Chemical and Pipe Industries of Jargon District

P.S.Bajaj¹, Dr. S. P. Shekhawat²

1, Mechanical Engineering, Research Scholar, prashantsbajaj@gmail.com

2, Mechanical Engineering, Professor G.H.Raisoni Institute Of Engineering and Business Management.,Jalgao

prashantsbajaj@gmail.com¹, spshekhawat@rediffmail.com²

Abstract -Small Scale industries (SSI)has a particularly significant impact on the environment. This enforce the world to look for the eco-friendly industrial management system. This give the loop to shift for change in supply chain management from start to end customer. Green supply chain management is essential and needed for industrial in each region. Based on the literature review and the survey a model is to be built and propositions regarding GSCM to be formulated. The activities namely Green sourcing, Green Procurement, Green Warehousing Green Distribution, Green Packaging, Green Transportation are studied. The findings of the survey work are focused to the difficulties of small scale industries for not adopting the GSCM. Research. The limitation of work is to small scale industries especially chemical and pipe manufacturing industries in rural region. Practical implications. It evaluates their professed Green Supply Chain Management (GSCM) performance, difficulties and practices adopted and willingness to promote the same. Lean and green waste emerging from Small Scale industries (SSI) was identified; methods for waste reduction were suggested and aware to prohibit the use of hazardous substances. This practices will help the researcher to implement the GSCM to SSI. The work is carried out on survey based by preparing the questionnaires' for the implementation of GSCM to Small Scale Industries.
Keywords:- GSCM, SSI, environment, waste, green future

I. INTRODUCTION

Safety of Environment is the major issue and Green supply chain management (GSCM) is emerging trend to save the environmental to some extent. It is an organizational concept to facilitate organizational

performance and effectiveness by reducing risk to our environmental and refining the ecological competence. Throughout the world organisation are striving hard to develop new ways for enhancing their performance (C. Mohan,2015). The Supply chain management is collaborated with environment and made a green revolution for the large industries which implemented GSCM. The implementation leads them to better performance and competitive advantages. GSCM has attracted extensive research interest for business practices (Ahi, P. & Searcy, C., 2015). Many research shows the effect of GSCM on organizational performance, but the majority of these studies have limited to large corporations and paid very less attention toward Small Medium and Micro Industries / Enterprises (Ahi, P. & Searcy, C., 2015; Mafini, C. & Muposhi, A., 2017; Mitra, S. & Datta, P.P., 2014).Small and Medium Scale Contribute more in the employment and economic growth (Cant, M.C. & Wiid, J.A., 2013). In India small SSI – Small scale industries play an important role in contributing 40% in economy and 45 to 50 % in employment (Hariharan Ganeshan, Dr. P. Suresh,2015). Most of the SSL and Medium scale industries (MSI) involve in the manufacturing sector and these are the major challenges to protect the environment (Urban, B. & Naidoo, R., 2012). With the ever-growing concern on environmental sustainability, the challenges confronting SMEs in the manufacturing sector are becoming more amplified. By adding green in supply chain provides innovative business opportunities in product innovation (Kirkwood, J. & Walton, S., 2010, Mohanty, R.P. & Prakash, A., 2014). Thus, this study aims subsidize and discourse the break in operational skills of manufacturingand in other area of chemical and pipe industries. The GSCM influence can increase SSL financial performance and even green the environment.



II. LITERATURE REVIEW

Safety of Environment is the major issue and Green supply chain management (GSCM) is emerging trend to save the environmental to some extent. It is an organizational concept to facilitate organizational performance and effectiveness by reducing risk to our environmental and refining the ecological competence. Throughout the world organisation are striving hard to develop new ways for enhancing their performance [1, 2]. The Supply chain management is collaborated with environment and made a green revolution for the large industries which implemented GSCM. The implementation leads them to better performance and competitive advantages. GSCM has attracted extensive research interest for business practices[3].

Many research shows the effect of GSCM on organizational performance, but the majority of these studies have limited to large corporations and paid very less attention toward Small Medium and Micro Industries / Enterprises [3-5]. Small and Medium Scale Contribute more in the employment and economic growth [6]. In India small SSI – Small scale industries play an important role in contributing 40% in economy and 45 to 50 % in employment [7].

Most of the SSL and Medium scale industries (MSI) involve in the manufacturing sector and these are the major challenges to protect the environment [8]. With the ever-growing concern on environmental sustainability, the challenges confronting SMEs in the manufacturing sector are becoming more amplified. By adding green in supply chain provides innovative business opportunities in product innovation [9-10]. Thus, this study aims subsidize and discourse the break in operational skills of manufacturing and in other area of chemical and pipe industries. The GSCM influence can increase SSL financial performance and even green the environment.

Indian is becoming the manufacturing hub and Indian government is giving more pleasure to the new entrepreneur. The government scheme opens the new dimension for the SSI and MSI industries to work and earn. There is a need of educating this new and exciting SI and MSI for protecting the environment. According [10] managing production cost and improving performance is difficult for the SSI and MSI. Due to this the failure of SSI and MSI is more. Thus this intend the SSI and MSI to implement GSCM in practices. Number of authors implemented GSCM in SSI to give them a support to survive in this global world. [11-14]. as environmental awareness are more concerns in government and across business spectrum. SSI and MSI

are much lagging behind in the implementation of these activities [15]. The emphasis is greater on manufacturing SSI and MSI, who impact more on environment than other industries, like retail and services [16]. That's why it is necessary to investigate and motivate manufacturing SSI and MSI to explore innovative business strategies that will benefit to them as well as to all stakeholders.

Green Supply Chain Management

i. Green Purchasing

It is an ecological buying resource that confirm the ecological need of the product. The selection of the material for the product should be in such a way that it should minimize the waste and stimulate the remanufacturing [17]. Green purchasing defined by [18] as an environmentally oriented purchasing activity based on the purchase of products or materials that meet the concern of the environment in terms of reduction of wastage, promotion of recycling, reuse, resource reduction and substitution of materials. From literature several drivers of green purchasing are identifies as environmental collaboration, top management commitment, regulatory pressure, environmental investment and customer pressure [19,20].

ii. Green Design

Green design concerned with the sustainable design of the product. In the Product life cycle the company has to make the complete consideration of quantity and quality of the product [21-22]. It is the most important process of the sustainable product [23]. By adopting the green design methods and practices leads to more ecological and sustainable design of product. It is full challenging step of GSCM. As it has to face many challenges like costing, durability and many more.

iii. Green Manufacturing

As the design is complete the raw material is transformed into finished product. This is the process where waste are formed. The important moto is to decrease the energy level and increase the profit level by reducing the scrap [21-22]. It mainly focus on the green material and production technology. It is the ability of the organization to adopt green techniques to reduce the negative effects of production process on environment.

iv. Green distribution and packaging



It is defined as the transportation between dealers and consumers with lowest feasible effect on nature. This also steps in minimizing the timing of storing, order processing, packaging and transporting [7,21-22]. Packaging of the product to most effective and environment friendly way is needed.

v. Green Marketing

In this global world of information technology, green marketing of products gives the branding image of most effective way than other.

vi. Reverse logistics

Logistics are the flow of goods from source to destination for satisfying the customer demand. There are many faces of Reverse logistics, consumer's returns, marketing returns assets returns, damage returns, return avoidance, gate-keeping and many other types of issues. With good reverse logistics management system customers become happy and this build the long-term relationship with its consumers [24,25]. Reverse logistics has the objective of recycling, reusing, repairing or remanufacturing and careful disposal of products as well as materials[26].

III STUDY REGION

The sector taken under consideration is chemical and pipe industries in rural region. The Research findings are (i) To what extent the management of SSI and MSI aware of implementing GSCM. (ii) Waste and Logistic management, (iii) How to implement it.

Factors affecting Green Supply Chain implementation:

In this global world the organizations entered into competition and each one desired to earn more profit. The benefits can be earning with positive image by implementing the GSCM. The factors that affect GSCM in the manufacturing industries, are lack of awareness of the practicable financial advantages of green supply chain; lack of knowledge and expertise involving Green Supply Chain; high price of the environmental applications; lack of learning capability to evaluate and understand green supply chain; improvident recycling and reusing of wastes; unwilling to implement the rules; lack of organization commitment. Following factors affect the most for implementing the GSCM Local environmental regulations - Lack of awareness in the society - Improper organization structure - Transportation price - Lack of administration commitment - Unwilling to modify business strategies -

Industries are unwilling to change their old plans and data. [25-31]

Green supply chain management practices

GSCM practices involves green manufacturing, green logistics and procurement. The practices minimize the total impact of industrial activity along product life cycle [32,33]. The implementation of the practices is increasing now a day because of the pressure from the stakeholder, Government, frequent audits, performance evaluation and competition in the market. The adoption of GSCM practices redirects the functional areas of the organization. as illustrated in Table 1.

TABLE 1: The implications of GSCM on business functions. [34-36]

GSCM Practice	Impact
Green manufacturing or operations function	Focus on profitability by using environmentally friendly operations. Produce durable products from design to disposal by decreasing ecological damage. Consider input costs in terms of regulations, energy use and disposal. Use eco-friendly materials, procedures and processes and minimise emissions. Use lean manufacturing to incorporate green goals into productive outcomes. Production methods, tools and techniques must satisfy environmental requirements and market needs. Research and development should explore new sustainable ways of extracting raw materials and new methods to minimise energy generation.
Green marketing or sales function	Enhance consumer awareness of green products. Satisfy consumer needs for green products in a green manner to ensure business credibility. Create a balance between profitability and environmental concern. Having good environmental credentials provides a competitive advantage. Portray an environmentally friendly business image through green marketing communications.
Green procurement	Seek suppliers with green production processes to offset environmental risk.



Choose suppliers with good waste management systems. Select suppliers committed to sound environmental performance.

Green logistics
Limit carbon emissions linked to the transportation of goods. Use biofuels as fuel alternatives and greener technologies.

General management or Human resources function
Communicate green business strategies to staff for effective goal attainment. Use green workplace, corporate culture and reward systems to encourage green activities. Employ experts in environmental development to implement environmentally friendly systems. Design business strategies to address environmental issues that satisfy stakeholder expectations. Foster a green organisational culture through employee training and development.

Finance or information technology function
Emphasise sustainability reporting in line with the triple-bottom-line concept and auditing systems. Institute green accounting policies and use an integrated eco-information system. Use advanced cutting-edge technology to move to a paperless administrative environment. Get up-to-date information about new environmentally friendly technology.

The fig. 1 shows the frame work of the study and implementation of the GSCM. Even TQM also play a vital role in encouraging the firms to implement GSCM. The framework listed above shows that the external drivers act as primary motivators and internal drivers as stronger motivator and supply chain capabilities as catalyst or mechanism for higher level implementation. The organization must understand the importance of internal drivers. [7] shows the framework model of implementing the GSCM and Lean management system to SSI. The model shows in fig. 2. Gives the advantage that the management has possibilities for considering cost versus performance enhancement as their priority. It need great determination and knowledge to implement the model of GSCM. The involvement of management and leadership skills will make it easier. According to [7] it is more effective model for SSI in India.

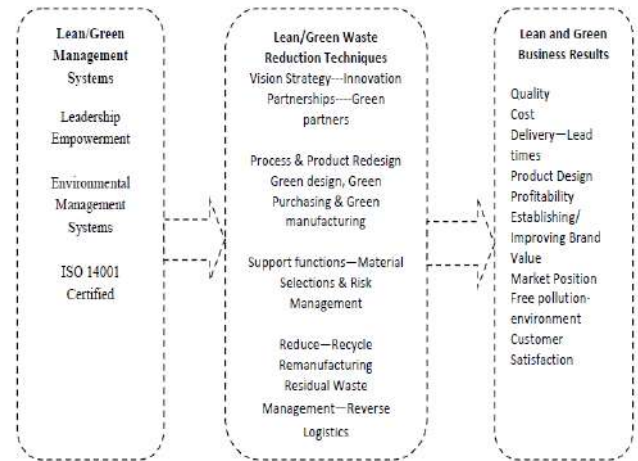


Fig.2. GSCM implementation model for SSI

IV- CONCLUSION

Small scale Industries need more sustainable development. In future more SSI will be established if the government make the law for the use of GSCM then this can be the biggest achievement in the GSCM practices. Workshop and conferences need to be taken for SSI to update their knowledge regarding the GSCM/TQM/Lean manufacturing etc. Funding from the government to implement the concept and spreading it in detail to the industries is needed. The chemical and pipe industries (only small scale industries) are lagging behind regarding this topic as they are not encouraging to implement such system in their plant. Their waste is hazardous and if the waste management is practiced their then there will be more energy saving. There are models shown in the literature of the article mentioned above which gives some view regarding the implementation and practices of GSCM. The model shown in fig.2 can be used for initial implementation of the GSCM in SSI.

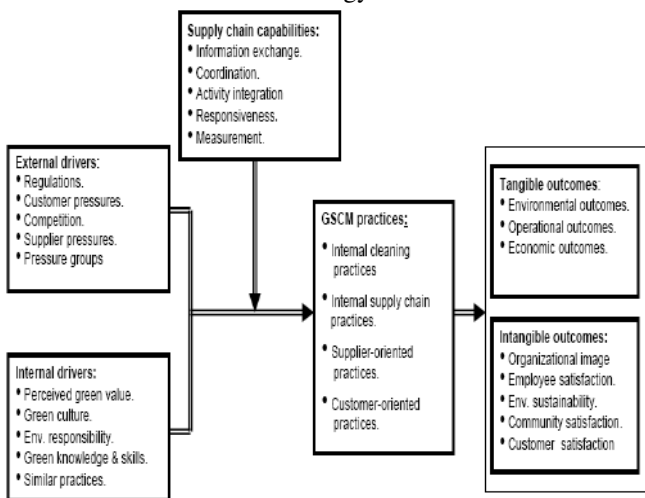


Fig 1. Conceptual Framework of the study [37]



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Door Lock Open Using Fingerprint Sensor

Vaibhav P Bari¹, Rahul C Maheshri², Rahul D Sarode³, Sujit A Patil⁴, Sachin Maheshri

^{1,2,3,4} UG Students, ⁵ Assistant Professor

^{1,2,3,4,5} Department of Electrical Engineering, GF's Godavari college of Engineering, Jalgaon, Maharashtra, India
vaibhavbari856@gmail.com

Abstract –In this project, we have established a smart door lock system using a fingerprint sensor to open and close the door. We used Arduino Uno microcontroller and fingerprint sensor, ATMEL328 driver IC to drive the dc solenoid lock with the door lock. When the fingerprint match then only the door open or close who has authorized person only can open the door If any unauthorized person trying to open the door means they can't open the door because the fingerprint sensor never accepts the fingerprint there is no response from the microcontroller side.

Keywords: Door lock, ArduinoUno microcontroller, Fingerprint, unauthorized person

I. INTRODUCTION

This project is solving the problem about security of unauthorized people intruding in our cabin, home, shops or offices. Security issues can be fixed using outdated locks but there is always risk of someone opening the lock even without breaking it with the use of matching key. Using these kinds of locks also create problem if we lose keys and also we have to carry keys along with us always. Again, using patterns in the locks can increase security but again it can be opened if somehow the PINs or patterns are known. So, leaving every system in this project we will implement a system using biometrics. In case of biometrics, the pattern which will be used as key will be single. Here, to implement the project we will use fingerprint as the key. This arduino project will make use of different devices for the execution of the security lock where there will be different features to increase the security level.

II. LITERATURE REVIEW

The most normally used system for locking the door is a lock and a physical key [1]. The entire process is a manual one .If the key is lost, improper or stolen, then the

entire locking mechanism located [2]. This problem with the physical keys strengthens when it comes to big

corporations where workers are needed to carry some keys for different doors [3] . Apart from the extra. The most commonly used system for locking and unlocking the door is a lock and a physical key. The entire process is a mechanical one. If the key is lost misplaced or stolen, then the entire locking mechanism has placed [4] This problem with the physical keys intensifies when it comes to big companies where employees are needed to carry several keys for different doors [5].

III. METHODOLOGY

The core part of our project is the microcontroller Atmega328.It has a oscillator frequency of 20 MHz .It has RISC construction. .A fingerprint sensor R303A is interfaced to the microcontroller.

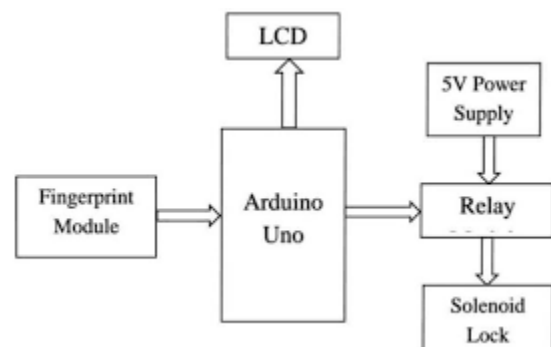


Fig. 1. Fingerprint based automatic door lock system

One motor is used for operating the door of the vehicle and the other one is meant for thieving part.It helps to make troubleshooting easier. An alarm circuit is provided to warn about an unauthorized use. A keypad is provided to select the mode for the fingerprint sensor.



IV. RESULT & DISCUSSION

First of all user is asked to enroll his fingerprint .After registration the user's identification is done .If the person is authorized, the door automatically opens. After some time the door automatically closes. This system focuses on the use of fingerprints for door opening and closing. The fingerprint recognition software enables fingerprints of valid owner of the house or shop to be enrolled in a database. It also used vehicles. Before any user can use the vehicle, his/her fingerprint image is matched against the fingerprints in the database while users with no match in the database are prevented from using the vehicle. A microcontroller stores the data equivalent of fingerprint of the master user. Comparison between this enrolled fingerprint and the fingerprint of the person who is about to use the vehicle is done by the microcontroller. If both the fingerprints are identical control circuitry of the microcontroller sends appropriate signals to the motor relays operating the door of the vehicle.

V. CONCLUSION

Fingerprint door locks are great security for home or business. It provides great security by providing restrictions to unwanted access. This device increases level of security by adding unique biological features of authorized person. For anyone who wants more security to their homes, fingerprint based door lock system are best choice.

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Smart Energy Meter by Using IOT

Sachin Maheshri¹, Akshay Kumbhar², Gaurav Mahajan³, Vishal More⁴, Dnyaneshwar Shirsale⁵

¹ Assistant Professor ^{2,3,4,5} UG students

^{1,2,3,4,5} Department of Electrical Engineering, GF's Godavari college of Engineering, Jalgaon, Maharashtra, India)
kumbharakshay004@gmail.com2, gauravmahajan4050@gmail.com3, 1995morevishal@gmail.com4
shirsanikhil024@gmail.com5

Abstract – During the ongoing time period the need of power i.e., electricity is growing exponentially due to the rapid usage of various technologies present around us. Due to this it has been a matter of worry for the developing and developed countries for need of rapid power outages. Solution for this was inferred as buyers and individuals to monitor their daily usage in their respective places. The project emphasizes on Smart Metering to ensure a cleaner and efficient transmission of power depending upon one's use and to provide a sustainable development. The meters used since the starting of era don't provide enough data for the buyer to be aware of the usage and what to or how to monitor the usage. Smart Meter helps the buyers to monitor them time to time usage and to remotely access their respective loads from anywhere. This project helps in obtaining a newer form of approach to the buyers to help them reduce the cost of usage of power and to help in sustainable development. In addition, we have implemented an IoT system to monitor the use of each load so that the user can track daily energy consumption with the appropriate load.

Keywords: Smart energy meter, IoT, Advanced Metering infrastructure

I INTRODUCTION

Energy conservation is the important needs in these days. Increasing the demand for energy consumption their energy monitoring will be taking important role hence it is considering as the research focusing on both electricity consumer and provider. This paper provides the ability to get the electricity bill, electricity providing days, and the previous bill also. Using the Internet of Things technology, the transferring data is very easy to see for both the providers and consumers and even easy to make

payment of electricity bill and to keep the continuation process and discontinuous process easily. The energy meter is a device that measures the amount of electrical energy consumed or produced by homes, shops, or machines. The energy meter is either a mechanical or electronic measuring device that measures the electrical energy consumed. The amount of the consumption power for three-phase system appears either on a mechanical rotary record number or on a digital screen. Electric power meters manufacturers are still trying their continuous research to provide a developed model of meters that are more accurate, cheaper and parallel to the technological progress made in modern smart homes. Smart meters are designed to provide many features when compared to mechanical meters such as self-monitoring, remote sensing, two ways communication, expanded control and increased consumer choices. Digital meters and smart meters have recently appeared, despite this, the electromechanical meters are still widely distributed in the residential areas in Iraq and some Arab countries, which have recently been trying to replace them with smart energy meters. However, the development of microprocessors and the advent of low-cost processors lead to the development of conventional electricity meters. Because electronic devices are free of moving parts, many problems can be avoided, such as the changing may be occurred by the consumers and avoiding mechanical errors such as fault of friction, incorrect magnitude of flux, creep, sensitivity, temperature effects, speed error, connection errors, and changes in disc resistance etc. Therefore, digital meters are less affected by the problems mentioned above and are more accurate than conventional meters. There are different models of smart meters but the basic functions are similar. The smart meters use a communications network to provide the distribution companies with frequent meter Smart Energy Meter By Using Iot readings daily. Smart meters can inform your electrical distribution company of any electrical failure you have in real time, allowing



distribution company to address the problem as soon as possible.

II. LITERATURE REVIEW

Smart meters are being introduced in many power systems world-wide to provide real time power consumption and price information to consumers. Smart Meters are electronic measurement devices used by utilities to communicate information for billing customers and operating their electric systems. The combination of the electronic meters with two-way communications technology for information, monitor, and control is commonly referred to as Advanced Metering infrastructure (AMI). Previous systems, which utilized one-way communications to collect meter data, were referred to as AMR (Automated Meter Reading) Systems. AMI has developed over time, from its roots as a metering reading substitute (AMR) to today's two-way communication and data system. This paper proposes the use of smart meters in distributed generation which is still more advanced than the existing methods providing efficient transmission and evacuation of power. The smart meters known today are simply automated reading units, or ARU, capable of computing the power consumption and cost for the consumption in accordance to the time of the day, and day of the week. On other hand, the advanced metering infrastructure, or AMI, is a system of utility meters that measure the consumption and provide the information to the utility companies, as well as the consumers interested in keeping the usage costs low, or wanting to supply the electricity back to the grid [1]. As for the energy efficiency issues of smart metering devices, since most smart metering devices adopted wireless communications such as Zig-Bee and Wireless Sensor Network (WSN) based on IEEE802.15.4.

III. METHODOLOGY

As per our project we have made a block diagram of the proposed system. The heart of our project is microcontroller, we have chosen ESP 8266 based ESP 12E 32bit microcontroller and have embedded Wi-Fi inbuilt. All the peripheral like current sensor, for the current sensing or the monitoring energy consumed by the consumer is sensed by the electronic readymade digital metre which is readily available in the market. We get data from that energy metre to microcontroller. The voltage sensor continuously monitoring the input voltage which is to be in prescribed range that is one 190 VAC to 230 VAC below or beyond this voltage the system will shut down the load out going from the energy metre. Two sensors are to be included in our

project which is magnetic sensor, magnetic sensor is based on the Hall Effect fundamental and easily detect the magnetism or the electromagnet which is attacking to the controller. The second one is the main cabinet seal, it is made by a loop of wire if anyone tries to break the cabinet or open the cabinet the loop wire is opened or braked, microcontroller gets information that somebody try to open the cabinet. Cloud is operating the energy metre for turn off and get the real time reading from the microcontroller.

IV. FUTURE SCOPE

As we have already included all facilities and sensors which fulfill all needs of smart and advance energy meter, it has very little margin to do more. But in new era there is communication/ data transmission system which can be transmitted through high voltage lines, if this is implemented, we do not need WI-FI network, electricity board have their own system to handle or store data base of all these things. Also, in addition we can include GSM modem so SMS feature also be work but it required an initial cost and a SIM card



Fig 1. Real project model

V. CONCLUSION

Intelligent energy meter is easy to install and beneficial for both energy provider and consumer. Using this meter can reduce the manual efforts to take the readings from the energy meter which is cost effective. This system also helps the users to be aware of their energy consumption. Since there is need to utilize energy in better and efficient way. Using this project we can reduce the manual Efforts to take the readings from the energy Meter which is cost effective solution. Reduces man power. It is user friendly and we can enhance this Project in which an electricity department can send message to the consumer



about the billing information. all the features to be taken into account for designing an efficient energy billing system. The present project incorporates these features to address the problems faced by both the consumers and the distribution companies.

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Design and Control Logic Development for Auto Mains Failure System between Electric Board and Diesel Generator

Devashish Shrinivas Patil¹, Mayur Ravindra Chopade², Mohit Gajanan Lokhande³, Vivek Sarangdhar Narkhede⁴, Shaikh Samir Shaikh Nasir⁵, Amit Mhaskar⁶

^{1,2,3,4,5} UG Students, ⁶Assistant Professor

^{1,2,3,4,5,6} Electrical Engg dept, GF's Godavari College of Engineering, Jalgaon 425003

¹patildevashish2204@gmail.com ⁶ amitmhaskar89@gmail.com

Abstract – Electricity is an essential commodity in our day-to-day life, electricity forms the basics of any developing country or a developed country. Electricity is required in Domestic, industrial and commercial purposes. Thus, electricity is very important. Failure in electricity supply or interruption in the supply has many adverse effects on Electrical equipment and Control systems. The purpose of this project is to design and build a system that is called Automatic Main Failure (AMF) System which can automatically allow switching from Mains power supply to Diesel Generator power supply. Depending upon the Control unit, there are three main types of AMF units 1) by using Microcontroller in AFM unit itself, 2) by using PLC (Programmable Logic Control) programming for control action & 3) with the help of Relay Mechanism. In this paper a Relay based system is described for control action. Elements which are used they are voltage sensor (PFD), Miniature Circuit Breaker. The system is continuously monitoring the voltage level from the mains. If the voltage is dropped below the allowed level, this system will switch the Load to Generator (Auxiliary supply) and switch back to the Mains when the voltage is back to nominal required normal level. An interlocking of both the MCB is done to avoid any mal operation of switching of MCB. Some delay is also introduced in the system to avoid the transient condition fault in which the source will not have to shift. Continuity of supply to load is achieved with the help of AMF unit control.

Keywords: auto mains failure, diesel generator, PLC, MCB, AMF

I. INTRODUCTION

The main idea of this project work is to highlight the economic impact of excessive diesel consumption of Diesel Generators (DGs), reliability issues, lack of flexibility of operation, inadequate sizing of DGs, overworking of Diesel Generators (DG) owing to the negligent attitude of the electricians, improper location of DGs in the electrical layouts, operation with load limitation as constraints and in turn develop an amicable solution to resolve such issues. These critical problems are addressed in this project by designing an Automatic Mains Failure scheme (AMF) for practical implementation with proper sizing of DG taking into consideration the present connected loads, optimum location for DG with due considerations for connected loads, short circuit rating, rated thermal rating and neutral sizing of all cables and conductors associated with this captive power plant. An extensive work is carried out to study the connected loads in order to arrive at proper sizing of the DG set in order to totally remove the load constraints and to ensure economical, reliable and uninterrupted operation of the Generator. Presently, the DG sets are manually switched on in the event of Mains failure. Number of Generators and capacity of the



Generator need to be manually brought into operation will have to be based on prevailing load requirements at the instant of power failure. Hence the need for an AMF control panel is implemented.

First phase of our project is oriented toward the development of an AMF circuit and fabrication of a demo unit as per the designed AMF circuit. Subsequently the AMF unit is put into operation by interfacing with a laboratory alternator and utility mains supply. The sequence of various operations is practically tested at the laboratory level.

As a second phase, a practical circuit is developed for real time interfacing with a load and utility supply.

The third phase is to study and incorporate an overall real time practical circuit, for automatic starting of DG set, monitoring all the required mechanical parameters of associated Diesel Engine with necessary interlocks, in this project work. This project ensures the removal of stress on manual switching of Generators when the mains supply fails.

II. FUNCTIONAL DETAIL

1. Double Pole MCB

MCB is an automatically operated electromechanical switch that is specially designed to protect an electrical circuit from damage caused by the excess current in case of an overload or short circuit condition. The basic function of MCB is to interrupt current flow in the circuit after a fault is detected. It breaks the contact of the circuit from supply if the supply current exceeds the rated current of MCB.

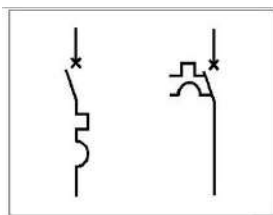


Fig. Double Pole MCB

2. Voltage Monitoring Device

It is an electro mechanical device used in power system engineering to protect a load from damage due to failure in any of the phases supplying power to the load. It automatically cuts off the load from supply if one of the individual phases becomes faulty. A Voltage Monitoring Device is particularly important component in many assembly plants using the mains power supply. A

significant reduction in value due to uneven load conditions will cause serious problems.

Voltage Monitoring Device will operate in following conditions;

- Phase Failure system
- Under voltage protection
- Over voltage protection
- Phase Reversal

3. Programmable Logic Control (PLC)

A programmable logic controller (PLC) or programmable controller is an industrial computer that has been ruggedized and adapted for the control of manufacturing processes, such as assembly lines, machines, robotic devices, or any activity that requires high reliability, ease of programming, and process fault diagnosis.

PLCs can range from small modular devices with tens of inputs and outputs (I/O), in a housing integral with the processor, to large rack-mounted modular devices with thousands of I/O, and which are often networked to other PLC and SCADA systems.

They can be designed for many arrangements of digital and analog I/O, extended temperature ranges, immunity to electrical noise, and resistance to vibration and impact. Programs to control machine operation are typically stored in battery-backed-up or non-volatile memory.

4. Uninterrupted Power Supply (UPS)

An uninterruptible power supply or uninterruptible power source (UPS) is an electrical apparatus that provides emergency power to a load when the input power source or mains power fails. A UPS differs from an auxiliary or emergency power system or standby generator in that it will provide near-instantaneous protection from input power interruptions, by supplying energy stored in batteries, supercapacitors, or flywheels. The on-battery run-time of most uninterruptible power sources is relatively short (only a few minutes) but sufficient to start a standby power source or properly shut down the protected equipment. It is a type of continual power system.

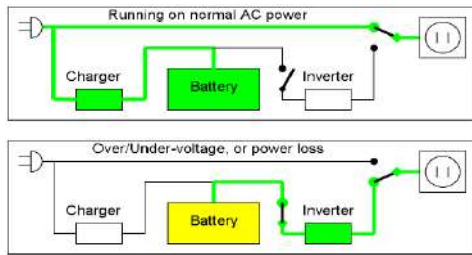
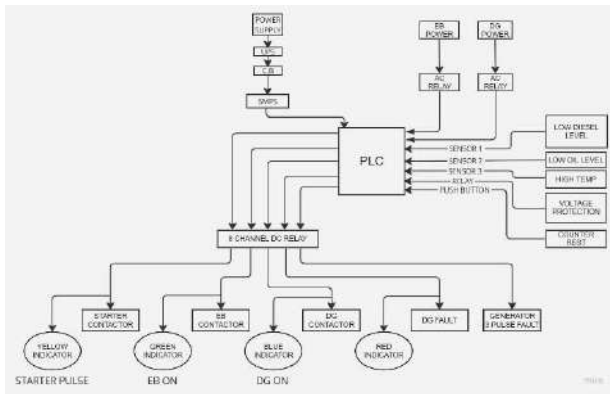


Fig. UPS

III. FLOWCHART



IV. METHODOLOGY

- In case of Mains supply failure AMF Panels send a start command to DG after a set time delay.
- When DG comes to generate its rated voltage i.e., it satisfactorily starts then after a set time delay AMF panel does changeover of Mains source to DG source via Contactor/Motorized changeover/ ACB / Motorized MCCB.
- When Mains supply restores then changeover takes place instantly and AMF panel changes source back to Mains supply.
- It sends close command to DG after set time.

V. RESULT & DISCUSSION

The AMF was interfaced with utility and DG set. The utility supply was switched off and AMF unit was found automatically cut in and power supply was restarted to the connected load, through DG set. And it switches from utility to EB supply to DG supply. With the use of this system a wastage of can be attained with automatic changeover from DG to utility supply. The DG receives pulse to start automatically when the utility supply is disconnected from the load. In this case for understanding we just shown in the form of indicators

the change of supply to load that is from EB to DG or DG to EB.

With the use of proposed system, a large amount of energy wastage in the D.G sets can be solved. The energy wastage is very crucial when the D.G set gets heated up with continuous usage. When the situations of long run power failure occur, the D.G has to work continuously with a large amount of energy wastage in the form of heat in the present-day system, where as in the proposed system, the idea of multiple generators are entertained.

VI. CONCLUSION

Auto mains failure panel with generator starting/shut down facility has been designed to help man reduce the stress and loss of time associated with the starting and shutting down of the alternative sources of supply (generator). It will automatically switch the source when the voltage is lower than required value. And supply of electricity is obtained.

AMF panel is very significant in the present world, where uninterrupted power supplies are at most needed. There are many drawbacks for the AMF panel that is used nowadays. The generator and AMF panel is usually kept at a distance from the control room due to safety factors. It is a main disadvantage that the present-day AMF panel can't be controlled from the control room. Since in the proposed system, a remote relay unit which works as same as PLC based is added, the panel can be controlled from a distance. Moreover, the fuel level in the Generator can also be seen from a distance. The fuel level is sensed by a sensor which is one of the features incorporated in a relay, which is cheap, easily available and there are no risks for the occurrence of sparks unlike the resistive sensor used now.

The power supply systems are subjected to frequent faults, which can be identified using the designed AMF panel. An alarm sound will be produced in the case of occurrence of a fault or if the utility supply fails and the load will be disconnected from the power supply in order to protect the load from damage and to provide continuous supply.

Hardware modeling will be helpful in order to validate the results completely before adopting the newly introduced system into action. The proposed idea solves the disadvantages of the present system and moreover it is an innovative concept in the field of energy conservation. The proposed system is unavoidable in the present era having crucial energy crisis.



ACKNOWLEDGMENT

The success and final outcome of this project required a lot of guidance and assistance from many people and we are extremely privileged to have got this all along the completion of our project. All that we have done is only due to such supervision and assistance and we would not forget to thank them. We are grateful for the invaluable motivation and guidance of our Guide, Prof. Amit Mhaskar, who has always been a source of inspiration and encouragement for us. He has been an outstanding caring person and guide as well. We express our sincere gratitude for his priceless cooperation and support throughout the work. He has always been ready to help and guide us in the ups and downs and her sympathetic comments reminders and assurance has been a source of inspiration for us. We would like to express our special gratitude Prof. Mahesh. H. Patil (Head of Electrical Engineering) for providing a motivational ambience in the completion of our work. We are so thankful to his kind nature and nourishing attitude. We would like to acknowledge the support and encouragement of all faculty members our fellows and all who directly and indirectly supported for the completion of this project.

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Automatic Curtain Mover

Prof. Atul A. Barhate¹, Narendra Mahajan², Harshal Pardeshi³, Shashikant Yeole⁴,
Purnima Sabale⁵

²UG student, GF's Godavari College of Engineering, Jalgaon, India, 425001, narendramahajan1508@gmail.com

³UG student, GF's Godavari College of Engineering, Jalgaon, India, 425001, pardeshiharshal6@gmail.com

⁴UG student, GF's Godavari College of Engineering, Jalgaon, India, 425001, Yevaleshashikant20@gmail.com

⁵UG student, GF's Godavari College of Engineering, Jalgaon, India, 425001, purnimasabale@gmail.com

Abstract – An automated home system that uses an Arduino Nano and Bluetooth module to move curtains automatically is intended to be convenient, energy-efficient, and to provide the user greater control. Users are able to manage their curtains from a distance using a mobile device or specialised remote control by incorporating an Arduino Nano as the control unit and a Bluetooth module for wireless connection.

The system provides a user-friendly interface that makes it simple for users to open, close, or move their curtains. It makes curtains in big or difficult-to-reach windows particularly handy since it removes the need for human manipulation. The Bluetooth module makes sure that the mobile device and Arduino Nano can communicate reliably and quickly.

Key words: remote control, Arduino nano, energy efficiency, Bluetooth, automated, Curtain Mover.

I. INTRODUCTION

An innovative technology called the Automatic Curtain Mover was created to automate the movement of curtains in both home and business settings. This project uses the Arduino Nano microcontroller board to its full potential to offer an affordable and effective curtain automation solution. This system enables users to easily manage the opening and shutting of curtains with the push of a button or in accordance with predetermined schedules by integrating numerous components such as a stepper motor, motor driver, limit switches, and push buttons.

Convenience and energy efficiency are crucial in today's hectic society. Particularly in big settings or when there are several curtains involved, traditional manual curtain operation can be time-consuming and cumbersome. Additionally, if curtains are left open or closed for long periods of time, unneeded energy is wasted. These issues are addressed by the Automatic Curtain Mover, which

offers a simple and automatic method of controlling curtains.

The tiny and adaptable microcontroller board known as the Arduino Nano lies at the heart of the system's design. This board serves as the main controller, taking input from the Bluetooth module and sending precise commands to the motor driver, which in turn drives the stepper motor. The technology guarantees precise detection of the open and closed states by carefully positioning limit switches at the ends of the curtain track.

The automatic curtain mover system aims to provide a straightforward and seamless way to operate curtains. By integrating elements such as stepper motors, motor drivers, Bluetooth module, and the Arduino Nano, curtains may be automatically opened or closed with the help of a Bluetooth module, which will be managed by a mobile device. This automation not only increases convenience but also helps save energy by allowing clients to regulate the temperature and natural light in their rooms to their preferences.

II. LITERATURE REVIEW

The promise to improve convenience, energy efficiency, and home security has made automated curtain movement a hot topic in recent years. The goal of this literature review is to examine recent advancements and current research in the area of automatic curtain movers. We may learn more about the many methods, tools, and approaches used in this field by studying pertinent papers.

M. Shrivastava et al. (2016)'s "Automated Curtain Control System using Microcontroller": This research shows a microcontroller-based curtain control system.



Based on user inputs and predetermined timetables, the system automates curtain movement using an Arduino board. The writers use sensors to identify obstructions and modify the movement of the curtain accordingly. The study shows how automation may increase comfort and energy efficiency.

According to C. Huang et al. (2017)'s "Design and Implementation of Automatic Curtain Opening and Closing System Based on Voice Recognition": The automated curtain movement controlled by speech is the subject of this study. The authors suggest a method for hands-free control of curtains that makes use of speech recognition technologies. The technology offers a user-friendly and practical solution for curtain automation by fusing voice instructions with microcontrollers and motor drivers.

Jain et al. (2018)'s "Smart Curtain Control System using Internet of Things (IoT)" This study investigates how curtain control systems may be integrated with the Internet of Things (IoT). The authors suggest an Internet of Things (IoT)-based architecture that enables users to operate drapes remotely using a smartphone app. The technology combines sensors, microcontrollers, and cloud connectivity to allow scheduling and real-time curtain control from any location.

S. Rathod et al.'s "Automated Curtain Control Using Image Processing" (2019): An image processing-based curtain control system is presented in this study. The writers use a camera to take pictures and then analyse them to find curtain-moving human motions. To accomplish precise and quick control, the system uses microcontrollers and machine learning algorithms.

N. Shah et al.'s "Energy-Efficient Curtain Automation System Using Light Sensors" (2020): The authors of this study suggest a light-sensor-based curtain automation system that is energy-efficient. The technology optimises natural illumination and uses less energy by automatically adjusting the curtain position based on ambient light levels. The study emphasises the potential for energy savings and user comfort provided by automated intelligent curtains.

R. Singh et al.'s "Automated Curtain Control Using Wireless Sensor Networks" (2021): The automation of curtains using wireless sensor networks (WSNs) is the main topic of this study. The authors offer a system that makes use of WSNs to gather data on user preferences and ambient variables. Then, based on the data gathered, the curtains are automatically altered, offering a smooth and adaptable control system.

A variety of techniques and technologies are used in the field of automatic curtain movers, according to a

literature review. To achieve automation and improved functionality, researchers have investigated microcontroller-based systems, speech recognition, IoT integration, image processing, light sensors, and wireless sensor networks. These studies show how automatic curtain control systems have the ability to enhance user experience, convenience, and energy savings. To develop the field of automatic curtain movers, more research might concentrate on sophisticated control algorithms, energy-saving strategies, and seamless connection with smart home ecosystems.[2,3].

III. METHODOLOGY

To enable remote control of curtains using a mobile device through Bluetooth, the automated curtain mover uses an Arduino Nano, a motor driver, and an HC-05 Bluetooth module. Here is a general description of how it operates:

Hardware Setup:

The Arduino Nano serves as the system's brain, managing the motor driver and taking instructions from the Bluetooth module.

Motor Driver: The motor driver, such as the L298N, is connected to the Arduino Nano and provides the necessary power and control signals to drive the DC motor responsible for moving the curtains.

HC-05 Bluetooth Module: The HC-05 Bluetooth module enables wireless communication between the mobile device and the Arduino Nano. It receives commands from the mobile app and sends them to the Arduino for execution.

Mobile App and Bluetooth Connection:

Connect to the HC-05 Bluetooth module by installing the Arduino Blue Control app on a smartphone.

Step 1: Connect your mobile device to the HC 05 by entering the password "1234"

Step 2: Launch the programme and press the Refresh key as seen in the below Fig.

Step 3: Now that the list has been accessed, you may look for "HC - 05" and select it.

Step 4: At this point, the Pop Up with the text "Device Connected" is visible.

Step 5: Select the Option for Arrow Keys.

Step 6: You may now click the arrows to move the curtain. The mobile app will feature buttons or controls to provide the Arduino Nano certain instructions.

Circuit Diagram:-

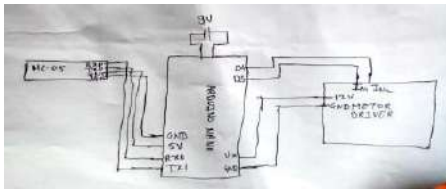
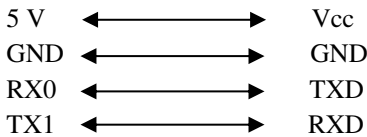


Fig. 1

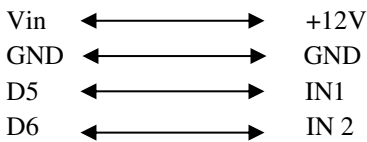
Connection of Arduino Nano with HC 05 Bluetooth Module:

Arduino Nano HC 05 Bluetooth Module



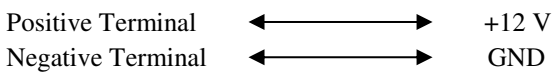
3.2.2 Connection of Arduino Nano with L298N Motor Drive :

Arduino Nano L298N Motor Drive



Connection of DC Motor with L298N Motor Drive:

DC Motor L298N Motor Drive



Thus, all connections are done to run the Automatic Curtain Mover. Above connections are also shown in pictorial form to make clear sense.

Actual Model :-



V. RESULT & DISCUSSION

The Arduino and Bluetooth-based automatic curtain-moving system was successfully developed and put to the test. Through Bluetooth connectivity, the method permitted remote control of curtains using a mobile smartphone. The HC-05 Bluetooth module enabled wireless connection between the mobile app and the Arduino, which was controlled by an Arduino Nano. The

L298N or another motor driver was in charge of adjusting the curtains' movements.

The technology operated efficiently and dependably, successfully opening and shutting the curtains in response to directions from the mobile app. The mobile device and Arduino's Bluetooth connection proved reliable and responsive, enabling fast command execution.

Using Arduino and Bluetooth to construct the automatic curtain mover has a number of benefits and enhancement potentials.

1. Convenience and Ease of Use: The system offers an easy method for remotely controlling curtains, obviating the requirement for manual operation. Users' everyday routines would be more convenient because they can easily operate the curtains from anywhere within Bluetooth range.

2. Flexibility and Customization: The mechanism enables curtain motions to be modified. Depending on their preferences or particular lighting and privacy needs, users can open or close the curtains partially or completely.

3. Integration with Smart Home Systems: The system may be included into already-installed smart home configurations, allowing for the centralised control of several devices via a single mobile app or voice commands. The possibilities of the home's automation are further improved by this connection.

4. Energy Efficiency: The technology encourages energy efficiency by automating curtain motions. Users may schedule the curtains to open during the day to maximise the use of natural light while minimising the demand for artificial illumination. In a similar vein, drawing the curtains at night offers insulation and solitude while also helping to save electricity.

Safety and Security: The system may provide advantages in terms of safety and security. Users may set the curtains to open and close at certain periods to give the appearance that the house is occupied even while they are gone. This might act as a deterrent to potential trespassers.

6. Possibility of Expansion: The established system has the potential to be improved and expanded. To automate curtain motions depending on environmental factors or user presence, additional sensors, such as light sensors or motion detectors, can be included. Integration with other home automation protocols, such Wi-Fi or Zigbee, can



offer more control choices and a wider range of compatibility.

VI. CONCLUSION

In conclusion, the use of Bluetooth and Arduino to construct an automatic curtain mover offers a wide range of advantages and developments in the field of home automation. The technology enables automated curtain movement and remote control, enhancing user convenience, energy efficiency, and security.

A flawless wireless connection is created between the curtain mover and a mobile device or remote control thanks to the integration of the Arduino Nano and HC-05 Bluetooth module. This brings a new level of ease to consumers' daily lives by allowing them to control their curtains from anywhere within Bluetooth range.

By enabling users to arrange curtain movements in accordance with ambient illumination levels, the automatic curtain mover system also enhances energy efficiency. Maximising the use of natural light during the daytime reduces the demand for artificial lighting and lowers energy usage. On the other hand, drawing the curtains at night improves insulation and seclusion, helping to save energy.

ACKNOWLEDGMENT

We would like to express our sincere gratitude and appreciation to our research paper guide, **Prof. Atul. A. Barhate** for their unwavering support, guidance, and encouragement during the process of writing this research paper. Without their expertise and timely feedback, we wouldn't have been able to achieve the success we currently have. We are thankful for their patience as well as valuable advice throughout this project.

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LoRa Based Automatic Water Level Controller

Tejas Pravin Bhopale ¹, Mrs. Komal Prakash Patil ², Kiran Laxman Patil ³,
Jeevan Nivrutti Mahajan ⁴, Mrs. Savita Shahaji Rathod ⁵, Assit. Prof. Atul Barhate ⁶

¹⁻⁵ UG student, Dept. of Electrical Engineering, Godavari foundation's Godavari college of engineering, Jalgaon, Maharashtra, India.

⁶ Assistant Professor, Dept. of Electrical Engineering, Godavari foundation's Godavari college of engineering, Jalgaon, Maharashtra India.
tejbhopale@gmail.com

Abstract -The drinking water crisis in India is reaching alarming proportions. It might very soon attain the nature of global crisis. Hence it is of extreme importance to preserve water. In home-based water tank, the one problem is very common to us that the control of water level of overhead tank, as a result the wastage of water is increasing day by day. But we all know water is very precious to us. This problem can be controlled by a wireless electronic circuit consists with some cheap electronic components that circuit is called 'Lora Based Automatic Water Level Controller'. As the water level rises or falls, ultrasonic sensor measures the water level of the transmitter circuit send different signals through the LoRa transmitter to the receiver circuit. Another LoRa module of receiver circuit receive a signal form transmitter circuit and the relay operates the water pump. So, when the water level is maximum, the relay turns the pump OFF and when the water level is minimum, the relay turns ON the pump. Automatic water level controller reduces the water wastage due to overflow from tanks and also ensures that water in the tank is always available to use. Also reduces human involvement in turning ON and OFF the pump, as this process is made entirely automatic and wireless. So, the main objective of this paper is to design and develop an automatic water level controller to maintain the outlet process of the water level at its desired level. The paper also focuses on the need of the people to install automatic water level controller to avoid wastage of water.

Key words: Arduino UNO, Ultrasonic sensor, OLED display, LoRa-Ra 02 module, Relay

I. INTRODUCTION

The total amount of water available on Earth has been estimated at 1.4 billion cubic kilo-meters, enough

to cover the planet with a layer of about 3 km. About 95% of the Earth's water is in the oceans, which is unfit for human consumption. About 4% is locked in the polar ice caps, and the rest 1% constitutes all fresh water found in rivers, streams and lakes which is suitable for our consumption. A study estimated that a person in India consumes an average of 135 liters per day' this consumption would rise by 40% by the year 2025. This signifies the need to preserve our fresh water resources.

This signifies the need to preserve our fresh water resources. Many houses make use of supplementary water tank to store water that is collected from rain water or water pumped from well or underground. At present, water meters are used to calculate the amount of water used at homes. This doesn't provide an efficient method of monitoring the water usage. The water is wasted at each and every outlet knowingly or unknowingly which adds up to huge amount in the end. Efficient management of the water used at homes is very much necessary as, about 50% of water supplied to the cities gets wasted through its improper usage. Water management is only possible, if the user is aware of the quantity of water he uses and the quantity available to him.

Water is essential in every hour of our lives. Hardly anyone keeps in track of the level of water in the overhead tanks. Consequently, automatic controlling involves designing a control system to function with minimal or no human interference. The idea can be implicitly used to ascertain and control the level of



water in overhead tanks and prevent the wastage. In this LoRa based automatic water level controller project, the water level is being measured by using ultrasonic sensors and wirelessly operate the water pump. The objective of the project is to measure the level of water in the tank and operate water pump as per requirement of water tank.

“LoRa based water level controller” project, the water level is being measured by using ultrasonic sensors. Initially, the tank is considered to be empty. The motor pump is automatically turned ON when the water level becomes low and turned OFF when the tank is full.

II. OBJECTIVES

There are some objectives need to be achieved in order to accomplish this project. These objectives will act as a guide and will restrict the system to be implemented for certain situations:

1. To develop water level control system to control the water level in the tank.
2. To check the level of water in the tank. Depending on the water level, the motor switches ON when the water level goes below a predetermined level or the motor switches OFF when the tank is full.
3. To display the water level and other important data on a OLED Display.
4. To monitor the level of water in the tank. If the level inside the tank is low, the motor turns ON. Similarly, if the tank is full, the motor turns OFF.
5. Entire operation is wireless and automatic.

III. METHODOLOGY

i. SOFTWARE REQUIREMENT

A System Requirements Specification (SRS) (also known as a Software Requirements Specify or of a system or software application. It includes a variety of elements that attempts to define cation) is a document or set of documentation that describes the features and behave the intended functionality required. The Arduino Integrated Development Environment (IDE) is a cross-platform application (for Windows, MAC OS, Linux). The source code for the IDE is released under the GNU (General Public License) version 2. The Arduino IDE supports the languages C and C++ using special rules of code structuring. The Arduino IDE supplies a software library from the Wiring project, which provides many common input and output procedures. User-written code only requires two basic

functions, for starting the sketch and the main program loop, that are compiled and linked with a program stub main() into an executable cyclic executive program with the GNU tool chain, also included with the IDE distribution.

ii. HARDWARE REQUIREMENTS

Hardware requirement analysis is to define and analysis a complete set of functional, operational, performance, interface, quality factors, design, criticality and test requirements. Water Level uses the Arduino board along with the ultrasonic sensors and LoRa.

iii. COMPONENTS LIST

Table 3.1 Components list

Components	Specification	Quantity
Arduino	UNO	2
Ultrasonic Sensor	HC-SR04	1
Switch	DPDT	2
Battery	9 Volt	1
LoRa Module	Ra-02/SX1278 868MHZ	2
OLED Display	0.96" I2C OLED Display	1
RELAY Module	230AC /30A	1

iv. COMPONENTS DESCRIPTION

a) ARDUINO

Arduino UNO has the micro-controller ATmega328 embedded in it. It has 14 digital I/O pins out of which 6 provide PWR output. It is an open-source and provides prototype platform. It also has a 16MHX crystal oscillator attached to it. In addition to the above features, it also has an USB connection, a power jack, an ICSP, header and reset button. It has everything to support a micro-controller. It can simply be connected to a computer using an USB cable or power it with an AC or a DC adapter or a battery.



Fig.3.1 Arduino UNO / Microcontroller

b) ULTRASONIC SENSOR

It is basically a distance sensor and is used for detecting the distance. It has two ultrasonic transmitters namely the receiver and the control circuit. The transmitter emits a high frequency ultrasonic sound wave which bounces off from any solid object and receiver receives it as an echo. The echo is then processed by the control circuit to calculate the time and the difference between the transmitter and receiver signal. This time can subsequently be used to measure the distance between the sensor and the reflecting object. It has an ultrasonic frequency of 40 KHz and accuracy.



Fig.3.2 HCSR-04 Ultrasonic Sensors

c) RELAY

In order to isolate two circuits electrically and to connect them magnetically relays are used. They are very useful in switching from one circuit to another when they are completely separated. The relays comprise of an input and an output section. The input section has a coil which produces magnetic field when a small voltage from an electrical circuit is applied. This applied voltage is known as the operating voltage.



Fig.3.3 Electronic Relay

d) LoRa MODULE

Ra-02 is a wireless transmission module based on SEMTECH's SX1278 wireless transceiver. It adopts advanced LoRa spread spectrum technology, with a communication distance of 10,000 meters. It has a

strong ability of anti-jamming and has the function of air wake-up Consumption. The SX1278 RF module is mainly used for long-range spread spectrum communication, and it can resist Minimizing current consumption. The SX1278 has a high sensitivity of -148 dBm with a power output of +20 dBm, and a long transmission distance and high reliability. At the same time, compared with the traditional modulation technology, LoRa™ modulation technology has obvious advantages in anti-blocking and selection, which solves the problem that the traditional design scheme cannot consider the distance, interference and power consumption at the same time.



Fig.3.4 LoRa Ra- 02 SX1278

a) BLOCK DIAGRAM

When the circuit is switched on, the ultrasonic sensor transmits the generated sound signal to the bottom of the water tank which is the target and whose water level is to be measured. The signal after touching the base of the tank is reflected back and is received by the receiver of the ultrasonic sensor. The time taken through the entire journey of the transmitted signal is recorded. The output obtained is the required distance.

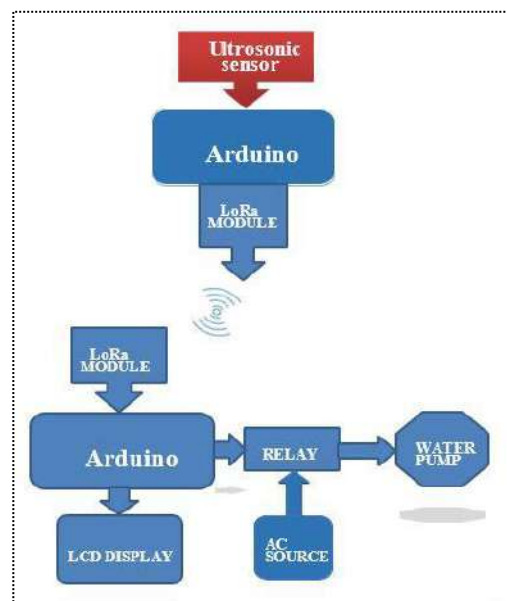


Fig.3.5 Block Diagram



b) DATA FLOW DIAGRAM

A Data Flow Diagram (DFD) is a graphical representation of the “flow” of data through an information system. DFD can also be used for the visualization of data processing. Automatic water level indicator and controller system uses ultrasonic sensor at high level at the top of the water tank. If measured level is below the threshold level of 2cm then the tank becomes empty then OLED display shows “1”, water pump will automatically be switched ON. Henceforth, When the water reaches a particular level of the OLED display indicates “6”, which will automatically pump OFF and which will indicating the tank is full.

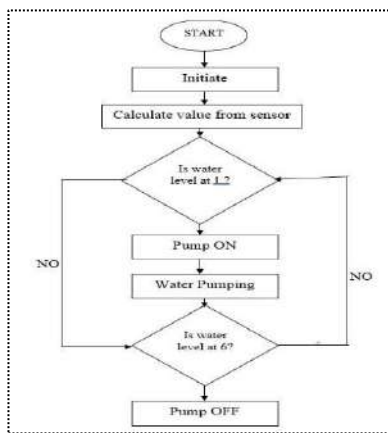
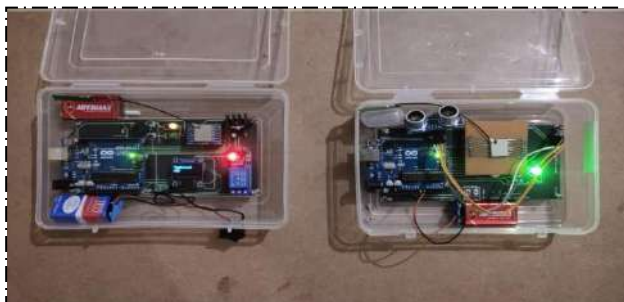


Figure 3.6 Data flow Diagram

This chapter contains the block diagram and data flow diagram (DFD) of the proposed system showing the interface and the intermediate results. The Fig. 4.2 shows the water level 1 representation by the ultrasonic sensor and the Arduino interface. When the sensors detect water level 1, it helps in automatically turning the pump ON.

IV. RESULT

A LoRa-based Automatic water level controller uses the Long Range (LoRa) wireless technology to



communicate between the water level sensors (Transmitter node) and the controller (Receiver node) and display the water level in terms of percentage from

0 to 100 % also water pump ON and OFF condition. The LoRa wireless technology is ideal for remote monitoring and control applications like water level monitoring, as it provides long-range communication capabilities and low power consumption. It allows the water level data to be transmitted wirelessly over long distances, which makes it ideal for applications where the water tank is located in a difficult to access area. The LoRa-based water level controller provides a convenient and reliable way to maintain the water level in a tank without the need for constant monitoring and manual adjustments.

V. CONCLUSION

Automation of the various components around us has been widely increased to reduce human intervention and save time. The water tank overflows as the height of water in the tank cannot be randomly guessed. This leads to extra energy consumption, which is a high concern

Figure 5.1 Prototype

in the present. People also need to wait and stop doing their other activities until the tank is full. Hence, here is an idea which senses and indicates the water level so that the pump can be switched off on appropriate time and save water, electricity and time as well. Therefore “Automatic Water Level Controller Using LoRa” project can definitely be useful on a large-scale basis due to minimum requirement of man power and also the installation process being easier making more compatible for everyone to use.

VI. FUTURE SCOPE

The automatic water level indicator and controller using Arduino project can also be installed with pH sensors which will help to regulate the acidity or alkalinity of the water. It should use remotely by using mobile application.

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Smart Medicine Box Using Raspberry Pi

Neha dhake¹, Nayana Chaudhari², Sayali Ravate³, Sawapnil Shele⁴, Hemraj.V.Dhande⁵

^{1,2,3,4}UG students,⁵Assistant Professor

^{1,2,3,4,5}Department of Electronics & TeleCommunication Engg., GF's Godavari College Of Engineering, Jalgaon, Maharashtra

hellonehaa1211@gmail.com¹, chaudharinayana05@gmail.com², sayliravate2000@gmail.com³,
swpanil29497@gmail.com⁴, hemraj99@gmail.com⁵

Abstract: A smart medicine box using raspberry is an innovative and technologically advanced solution designed to enhance medication management and improve patient adherence to prescribed regimens. It combines traditional pill containers with intelligent features, leveraging modern technologies such as Raspberry pi connectivity, sensors, and data analytics.

The smart medicine box is equipped with compartments that can hold different medications, each with its own monitoring system. The system records medication intake, tracks pill inventory, and provides reminders for scheduled doses.

Keywords- Pill box, raspberry pi 3, Buzzer, LED, Resistor.

I. INTRODUCTION

Our project is to build a raspberry pi based smart medicine box. Our smart medicine box is designed for people who need to take medications or vitamin supplements regularly, as well as for nurses who care for older adults or patients.

The smart medicine box is like a special container that can be programmed by nurses or users to set how many pills should be taken and at what time each day. It has seven smaller compartments inside, so information can be set for seven different pills. Once the pill quantity and serving time are set, the medicine box will remind users or patients to take their pills using sounds and lights. There is a display on each compartment that shows the exact number of pills that need to be taken.

Compared to traditional pillboxes where users or nurses have to fill the box every day or week, our smart

medicine box reduces the burden of constantly refilling pills for patients or users.

Furthermore, the smart medicine box can be synchronized with a mobile application or connected to a cloud-based platform, allowing patients, caregivers, and healthcare providers to remotely monitor medication adherence and receive real-time updates. The application may offer additional features, such as medication information, personalized reminders, and the ability to request refills.

By integrating technology into medication management, the smart medicine box aims to reduce medication errors, prevent missed doses, and improve overall treatment outcomes. It promotes patient medication regimens, and enhances communication between patients and healthcare providers.

II. LITERATURE SURVEY

According to the World Health Organization, more than 80% of people above the age of 60 are prescribed medicines that need to be taken 2-4 times a day. With the rise in cardiovascular diseases and diabetes among this age group, regular administration of medication has become necessary [1]. However, among these individuals, 40-60% face issues related to forgetting to take their medicines at the right time.

Currently, the common techniques used in the market for medication reminders include normal alarms along with a pill box [2]. However, this method does not address concerns related to overdosing or taking the wrong dosage. It only reminds the patient to take the medication. The clock in the smart medicine box



generates an alarm after a certain amount of time has passed. However, it does not provide timely alerts to remind the user to refill the pillbox, which often leads to interruptions in therapy [4].

To address this issue, the pillbox can be designed to sense the slots where the pills are placed using either Load Sensing or Light-based sensing methods [5]. The advantage of slot-based sensing is that it allows for individual monitoring of each slot, which can detect problems related to overdosing or incorrect dosages.

Researchers have conducted surveys and comparisons between different sensing modes analytically and practically to determine the most effective method for sensing the slots in the pillbox [6].

III. METHODOLOGY

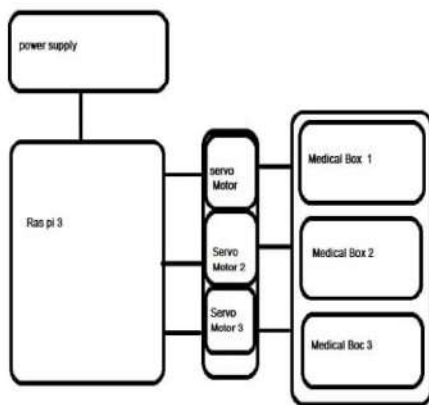


Fig.No.01- Block Diagram

We found different pillbox products available in the market. The cheapest one was the traditional pillbox, which had seven boxes for each day of the week. This pillbox usually cost around 200 INR. However, users had to load the pills into the boxes every week. We also found another type of pillbox that had a sound reminder and could remind the user to take medicine at a specified time. However, users still had to put different kinds of pills in the same box and reload the boxes every week. Additionally, it could only remind the user to take pills once a day. The average cost of this type of pillbox was about 1000 INR. Therefore, we thought it was necessary to build a cheap and functional smart medicine box that could provide more convenience for the user. We then defined the specifications of our device based on the user's needs. From the cited literature, the research proposed the idea of a Smart Medicine Box that would adapt the features of time tracking and alarm triggering. Furthermore, compared to the existing system, it would remind the user to take

medicine not once per day but three times per day, and the user would not need to refill the box every week.

IV- HARDWARE DESCRIPTION

RASPBERRY PI BOARD

The Raspberry pi is a small computer that is about the size of a credit card. It was created by the Raspberry pi Foundation in the UK to encourage the teaching of basic computer science in schools. There are two models available: Model A has 256MB of RAM, one USB port, and no network connection, while Model B has 512MB of RAM, two USB ports, and an Ethernet port.

The Raspberry pi can run different operating systems, with Pi OS being the main one. It supports programming languages like Python, BBC BASIC, C, and Perl. The Raspberry pi operates in the open source ecosystem, meaning it runs Linux and supports open source software.

The Raspberry pi Foundation actively contributes to the development of the Linux kernel and other open source projects.



Fig.No.02- Raspberry pi 3

BUZZER

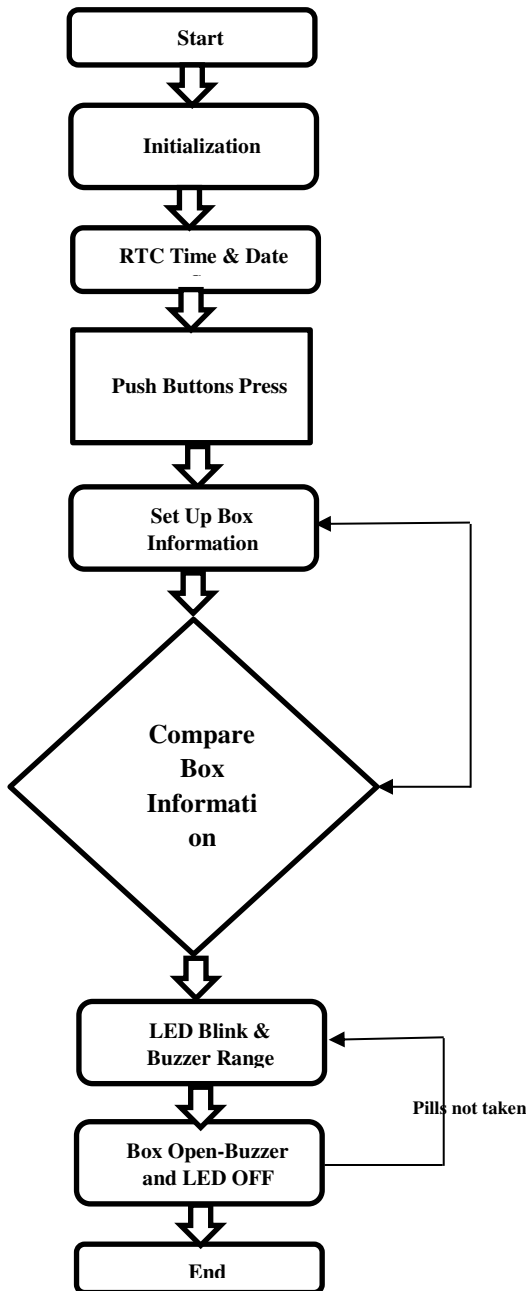
A buzzer is a device that produces sound or alerts. We use a compact magnetic audio indicator buzzer that is only 9.6mm in size. It is used to provide audio signals or alerts when needed.

LED

An LED (Light Emitting Diode) is a small electronic component that emits light when an electric current passes through it. LEDs are used as light sources and are commonly found in various electronic devices. In our case, we use three LEDs to indicate the status of three different pill boxes.



V. FLOWCHART



VI. WORKING

After programming the pill box, the pill box is on via to supply. is that the 5V, is given to the raspberry pi connector point. Then raspberry pi is on and blink to LED that indicate the raspberry pi is on or our pill box is now working. so that in the schedule time, medicine is required to the person, then morning time medicine box will indicate LED and buzzer will produce sound. so that person is knowing the medicine time is going on. Then this schedule will follow to that person in day or night also.

VII. RESULT

Simplify the explanation, a solution to this problem involves the creation of a high-tech medicine box known as the smart medicine box. Using raspberry pi.. This box is designed to help manage medication and make it easier for people to take their prescribed medicines correctly.



Fig.No.03- Final Result

IX. CONCLUSION

The smart medicine box enhances efficiency by reducing the need for human intervention. It achieves the desired outcome by dispensing medicines according to the user's requirements. This eliminates the need for people to wait in long lines to obtain their medicines, making the process much easier and more convenient. Furthermore, through learning about the various instruments involved in the smart medicine box, we have gained a better understanding of how it operates and performs. This increased knowledge has improved our understanding of how to effectively utilize and maximize the benefits of the smart medicine box.

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Vehicle Monitoring and Safety Driving

Pramod Dhamadhikari ¹, Shubhangi More ², Kalpesh Chaudhary ³,
Manisha Patil ⁴, Prof. V.D. Chaudhari ⁵

^{1,2,3,4} UG student, ⁵ Assistant Professor, Dept. of Electronics & Telecommunication Engineering,
Godavari college of engineering, Jalgaon, Maharashtra, India.

shubhanginimore1999@gmail.com¹, vinuda.chaudhari@gmail.com⁵

Abstract — Accidents are major issues these days. There are 2 basic reasons: Several accidents occur due to rash driving caused by drunken drivers. The second kind of accident occurs due to the sleepy-eyed condition of the person driving while driving long distances in the dark while not taking correct sleep. The eye blink sensor monitors the sleep state of a person and alerts the driver using a buzzer when an uncommon sleep state is detected. Accidents because of the associate degree alcoholic state of the person can be controlled and prevented with the assistance of an Alcohol sensing element assembled on a steering wheel. Accidents may be detected employing a vibration sensing element and a vehicle can be located by a GPS module. Accident alerts are then sent to the rescue team.

Keywords: Raspberry pi, Eyeblink sensor, Alcohol sensor, GPS, GSM, Accident, Location, Drowsy, Vehicle safety.

I-INTRODUCTION

One of the main reasons for the cause of accidents in this modern world is due to carelessness of drivers. Many statistics say that most of the accidents are caused by drivers either due to consumption of alcohol or due to drowsiness of the driver. There are many technologies available in order to overcome those incidents. IoT is trending technology implemented in various sectors now-a-days. By this method we can monitor the current status of anything from anywhere through internet. Using various sensors we can monitor the details of the driver. From the output of these

sensors the owner of the vehicle can monitor the current condition of the driver. Arduino is used to process the details from the sensors. Then this information is transmitted to the webpage by visiting the particular webpage anyone can know the condition of the driver at present.

II- LITERATURE REVIEW

[1] 2012, Sawant Supriya C, Dr. Bombale U. L., Patil T.B proposed a paper on “An Intelligent Vehicle Control and Monitoring Using Arm”. In this paper ARM 7 microcontroller is used where programming is a tedious process when compared to arduino programming. ARM uses more memory and it is complex to operate for this small specific application hence it is costlier than arduino. In [2] 2013, K.U.G.S. Darshana, M.D.Y. Fernando, S.S. Jayawadena, S.K.K. Wickramanayake proposed a paper on “Intelligent Driver Monitoring System”. This method uses biophysiological data of the driver such as brain wave patterns, respiratory dynamics and heart rate variations. This intrusive nature of these systems reduces its usability in real time. In [3] 2012, Girma S. Tewelde proposed a paper on “Sensor and Network Technology for Intelligent Transportation Systems”. This paper reviews the technology deployed to support intelligent transportation systems with the aim to reduce cost and power consumption with wireless sensor networks. This has a disadvantage of using video technology for capturing eye movements and sign of fatigue which is being a time consuming process and also of more cost. In [4] 2016, Tariq Jamil, Iftaquaruddin Mohammed and Medhat H. Awadalla proposed a paper on “Design and



implementation of an eye blinking detector system for accident prevention'. In this paper Drowsiness of the driver is found from the image processing technique by the images captured from the camera placed at the dash board of the car. It has slow success rate at night times, this act as a major disadvantage this includes high cost. In [5] 2016, Duy Tran, Eyosiyas Tadesse ,Weihua Sheng, Yuge Sun, Meiqin Liu and Senlin Zhang proposed a paper on "A Driver Assistance Framework based on Driver Drowsiness Detection. In this, they use webcam for detection of drowsiness of the driver. It consists of three sections. Facial expression feature analysis, steering wheel feature analysis and feature level integration. Implementation of this method is costly as it uses webcam for image processing. In [6] 2015, Dimil Jose, Sanath Prasad, V. G. Sridhar proposed a paper on "Intelligent Vehicle Monitoring Using Global Positioning System and Cloud Computing". In this paper status of the vehicle is monitored and alcohol consumption of the driver is detected and the information is transmitted through Zigbee which can be used only for short range. Add Literature review of the earlier papers in your work area here. Citations should be mentioned clearly.

III. METHODOLOGY

The accident prevention and detection system are used to detect and prevent road accidents. The accidents are caused due to the drowsy condition of the driver or due to the consumption of alcohol. This system makes use of various sensors and control units, along with some prevention mechanisms to make the system a complete one.

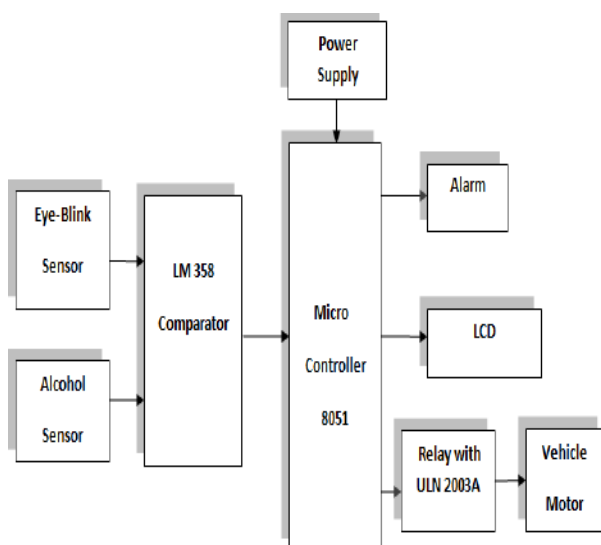


Fig 1: System Block Diagram

The process of operating the above block diagram is explained as follows: This project involves the measuring of eye wink using an IR sensing element. The IR transmitter transmits the infrared rays whereas the receiver receives the infrared rays back to the sensing element. If the eye is closed then the output of the IR receiver would be 1, else, the IR receiver output is 0, to grasp whether the eye is in closing or in gap position. The output is provided to Arduino UNO for alert indication. An associate measuring component placed on the driver's forehead measures the lean angle of the drivers in all directions. If the lean angle exceeds a precise threshold range, this output is given to the Arduino to indicate the buzzer. In conjunction with drowsiness detection, alcohol is also detected which restricts the driver to start the vehicle by an engine locking system. The location finding system which makes it a complete system for accident detection which makes use of GSM and GLOBAL POSITIONING SYSTEM systems for location identification and messaging system. The message will be automatically sent to the registered mobile numbers including the police station and ambulance numbers when a driver meets an accident.

A. Monitoring Eye Movement:- We can determine whether he/she is sleeping or not by continuously watching the eye movement of a person. The eye is illuminated by an IR LED, that is steam-powered by the +5V power supply and also the mirrored light is recorded by an IR photodiode present inside the sensing element. The IR photodiode converts this reflected light into an associated electrical signal and given to Op-Amp. The Arduino drives the buzzer according to the output of Op-Amp.



Fig 2: Eyeblink sensor module of our system

B. Alcohol Detection with Engine Locking:- Drunken state of the driver is detected using an alcohol sensor which is generally used for the detection of alcohol concentration from the breath of the person driving the vehicle. It works like a common breath analyzer. It is



very sensitive and also can give fast responses. Based on the alcohol concentration in-breath, the sensor provides an analog output. This sensor consists of SnO₂, which is the most sensitive material. The conductivity of SnO₂ is lower in the clean air. So if there is a presence of alcohol in the air, then the conductivity increases the accident rate. The sensing element will be placed on the steering wheel. This data will be logged and sent to Arduino which stops the engine according to the allowed threshold value of alcohol concentration.



Fig 3: MQ3 Alcohol sensor of our system

C. Location Identification using GPS Location identification:- can be done using the Global positioning system which will be attached to the vehicle. On the detection of an accident, the GLOBAL POSITIONING SYSTEM will trigger and the current location of the vehicle along with the latitude and longitude will be sent to the registered mobile numbers. In this way, a person related to the driver will get the message as soon as the accident happens and can save the person's life with an immediate rescue.

D. Accident Alert using GSM:- Sometimes an accident occurs at a remote location where medical help is not provided within the required amount of time and many lives are lost. To avoid this, we fixed a transmitter in the vehicle, which continuously sends the signal to the nearest receiver station. If a sudden accident occurs, the transmitter stops working and the receiver station does not receive any signal. A help message would be sent to the nearest station with the help of the GSM module. So the accident location can be predicted between two stations and medical help can be provided as exact locations with longitudinal and latitearetraced.

E.Alerting the Driver:- A buzzer is used here to alert the driver if the driver is entering into the drowsy or sleepy state. Thus, this system will make sure that if accidentally a person sleeps or feels drowsy while driving the vehicle buzzer will ring alerting the driver.

IV. DESIGN

Within the conventional non-automated driving task the overall control-loop of driver-vehicle can be mainly characterized by the control behaviour of the driver, which not only includes the driving style, but in particular also the factors based on the experience and the age of the drivers. Typical features can be identified using lateral vehicle control, for example. Instead of alternative approaches, e.g. neural networks or fuzzy logic, a control theoretical driver model is used, that has been multiple verified amongst others in recently ongoing studies [Büyükyildiz et al. 2015]. Furthermore the description through transfer functions (cf. eq. 1-3) allows online parameter identification for real time adaptation applications. As a basis the lateral driver model [Apel 1997, Henze et al. 2004] is considered, divided into a level of information processing and a level of control-technical elements. The control-theoretical model level is subdivided into a feedforward (anticipation) and feedback (compensation) component (fig. 2). Fig. 2. Description of Driver-Vehicle Control Model In the feedforward control mode (anticipation), the driver model sets a steering wheel angle based on the road curvature $\ddot{\varphi} = 1/q$ (eq. 1). In the feedback control mode (compensation), an additional steering $\Delta\varphi$ of the actual course from the target course predicted at the prediction time TP is considered (eq. 2). From the viewpoint of human control behaviour, the main driver parameters to be set are the gain factor VMR (ratio of the steering angle and the deviation between the actual course and the target course) as well as the prediction time Tp.

V. RESULT & DISCUSSION

In this paper, a driver monitoring system using sensors is made. Details such as alcohol consumption and drowsiness of the driver are detected and information is sent to the particular web.

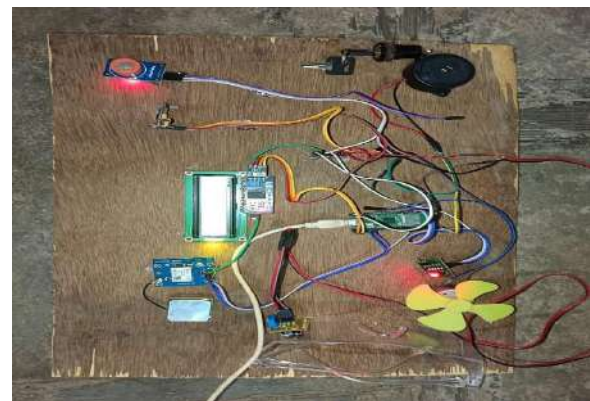


Fig 5: Result Model of our system



the Notification message with the IoT implementation. Several studies show that, most of the accidents are caused due to mistakes made by the drivers. We use simple and modern technique which can be implemented in the vehicles in order to minimize the number of accidents. Monitoring of vehicles also becomes easy for the owner as the details can be connected from anywhere at any time.

VI- CONCLUSION

An effective solution is provided to develop the intelligent system for vehicles which will monitor alcohol consumption concentration of the driver of the vehicle and will send this data to the base unit, by using a hardware platform consisting of Alcohol sensor MQ3, Arduino, GSM and GLOBAL POSITIONING SYSTEM module. The system is highly reliable and cost-effective. To realize the system, all traffic police stations need to install dedicated electronic units. Installation of eye blink sensor and alcohol sensor has to be made compulsory for each and every vehicle. Adaption of this system will provide safer transportation and would reduce the increasing number of accidents caused due to the ignorance of drivers. Data collected would be used by government organizations and can take strict actions on a global level.

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Bus Monitoring and Theft Detection Using Raspberry Pi

Sayed wasim¹, Bhagyashri mandawade², Bhagyashiri choudhari³, Krutika walzade⁴, Ishwar S. Jadhav⁵, V. D. Chaudhari⁶

^{1,2,3,4} UG student, ⁵ Assistant Professor, Dept. of Electronics & Telecommunication Engineering, Godavari college of engineering, Jalgaon, Maharashtra, India.

*bvmandawade25@gmail.com*²

Abstract: The main objective of the project is to introduce an innovative and facile device that could be installed in bus stops that would facilitate the users with the bus location, bus vacancy and ticket booking. The user will be able to receive information of the bus routes according to his destination. This system would effectively reduce the average time a passenger has to wait in a bus stop. It also omits the inconvenience caused during payment as the money will get detected from the RFID. As the system is user-friendly it would encourage more citizens to use public transport which would ultimately contribute to the development of the state and reduces road traffic and toxic vehicle emission. The project also uses screen displays that could be placed in bus stops which would display the bus routes, bus timings and vacancies. This display is designed using raspberry pi which is a credit-card sized computer which is used to access the entire system. This would help the passenger to get the bus information such as timings, vacancies and locations.

1. INTRODUCTION

The most important asset of man today is time. It happens many a times that people wait in queues for a long time and ultimately miss out on their desired bus and the next choice bus arrives at a few streets away from their current location. If passengers had an easy way to see which bus is near to their location and approximate time it would take to reach the stop, in real-time, they could make a more accurate, informed decision of whether or not to wait at the stop. The GPS and GSM based Real Time Bus Monitoring system will provide pedestrians Convenience. Not only would the

GPS and GSM based Real Time Bus Monitoring system be a new product for Best Transportation, it would also be an improvement to the transportation service already addressing the dissatisfaction with current wait times of the buses. If we have a mobile device that can provide bus arrival information with bus tracking based on the users current location, and suggest alternative bus route to the same destination, it will definitely help the user to manage their time properly. Users can decide if they have to keep waiting at their bus stop or go across a few streets to wait for another bus instead. In case there is only one bus going from users current location to their desired destination, then this application will show the approximate time the bus will take to reach the users place. In this way the user does not have to unnecessarily stand at the bus stop. In addition, user can determine whether they have to run or walk to the bus stops when they are near to the potential bus stops. Recent advances in automatic vehicle location (AVL) systems based on the global positioning system (GPS) have provided the transit industry and public transport enterprises with tools to monitor and control the operation of their vehicles and manage their fleets in an efficient and cost effective way

II - LITERATURE REVIEW

In countries like Japan and Mauritius, GPS Tracking systems have gained importance in the last decade. In the metro cities of India like Mumbai, Delhi, Bangalore, Chennai, Kolkata etc. successful implementation of such a system is yet to be done.



There are currently five major systems that people and businesses can use for tracking purposes[1].

The first system is provided by IslandCommunications Limited (Pioneer in GPSTechnology in Mauritius) and is called Exact[2]. It is a device which when equipped with a SIM card can be used for vehicle or any other asset tracking.

Another existing GPS tracking system is the Garmin Nuvi_215/205 series, a device sold by Naveo GPS solutions in Mauritius. This devices main functionality is for navigation purposes since it comes with a detailed map of Mauritius. However for GPS tracking, there is the passive mode option which records all positions of the device and the user will need to load the tracks from the device to a computer which has the appropriate software to view the map. There is only recorded tracking which is possible on this system.

The third system is called Geo tab [3,4]. It is a system which consists of a small device which needs to be connected to the battery of a vehicle and the device will transmit data to a web based application through which an individual will be able to see the device live and also the past tracks of the device. There is the option of Geo fence which allows an individual to be alerted by email and SMS if in case the device leaves a particular zone.

One track is the fourth system identified and it is the GPS tracking solution outsourced by a Mauritian representative of Oner Alarm, a China based company. This system is mainly for vehicle tracking and it comes up with a GPS tracking device and a web based system with a server (which needs to be bought for all functionalities). Oner track provides live tracking, SMS/Email alerts, SOS Panic button, speeding alerts and the user can also request for its position via SMS. The last system identified, and perhaps the most popular in the past few months in Mumbai is BESTs Bus Tracking System [5].

In this system passengers are able to access the position, speed and expected arrival time of A/C buses by sending a code number, specific to each bus stop, via SMS to 56060. This SMS reaches an intermediate server; the server stores the current information of all A/C buses currently on route and responds to the sender with details. It also uses a GSM module[6]. But according to various articles in the leading English newspaper Hindustan Times, BESTs new bus tracking system fails to impress city commuters. The launch of this new service is eyewash. The commuters complained that the code number is not displayed on most of the bus stop poles and shelters.

III -EXISTING SYSTEM

Our aim is to create an application on a mobile device which provides information with bus arrival time prediction. The calculation of the prediction is done on the server side and then the processed data are retrieved and presented on the users mobile device with the help of built-in Google MapsView display. This application system that can determine the distance of the users and the bus stops a timing device can tell when the bus should arrive to that bus stop a map interface can that shows the potential bus stops a bus route adviser can give choices to users a bus travelling timer a get off notification a real time map marker Occupancy inside the busDriver name Bus number.

IV-PROBLEM STATEMENT

Determination of the distance between users and bus stops

With the integrated GPS receiver, users current location can be identified appropriately. User will send the message that will contain bus number, source name and destination name. According to the longitude and latitude we will determine the current position of the bus and based on that we will calculate how much time it will take to reach a particular spot.

Prediction of the bus arrival time

Details about the users current status, such as location, time, are gathered and sent to the server for analysis. Arrival Prediction algorithms are applied and arrival times are then derived from the bus route schedules and the simulation set of data.

Google Maps Interface

A Google Maps based view will be displayed on the interface. It is the core of this application and basic map control functions are provided, such as zooming, panning and mode changing. Moreover, bus stops details are provided to users on the map.

Bus Travelling Timer

It is a timing function that can record the time taken for a particular trip of the user, which the data, such as actual bus arrival time, time taken between stops, can be viewed as a reference for future trips.

Scope Of This project

In this paper we have designed and implemented a bus tracking device that will make bus journeys much more facile and comfortable that provides the passengers with



the essential information regarding the public buses. This will ultimately pave way for a larger crowd to use public transport and hence there will be less pollution. In this project we have used a low-budget prototype which can be further implemented by processing the payments to the RFID tags using Paytm rather than recharging it at bus stops which makes it much more convenient

V-METHODOLOGY

SYSTEM IMPLEMENTATION FLOW

Raspberry Pi is a credit-card-sized single board computer developed in the UK by Raspberry Pi foundation with the intention of stimulating the teaching of basic computer science in schools.

Transmitter

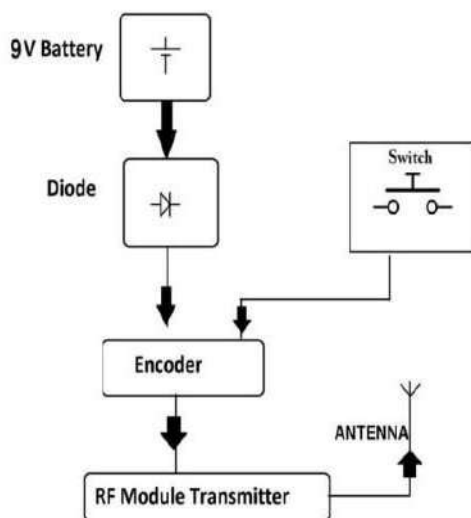
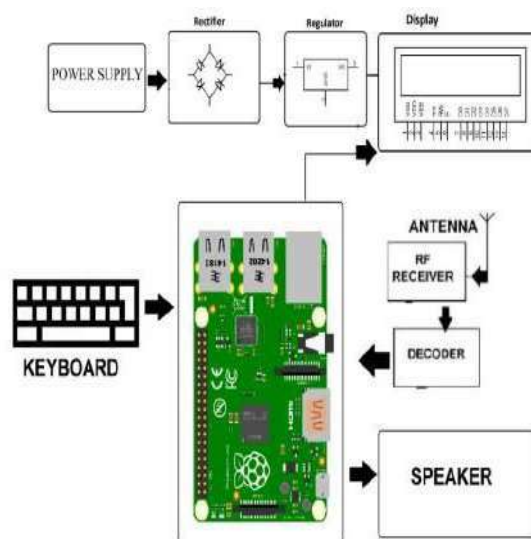


Fig. System Block Diagram

6.1 HARDWARE

a) RASPBERRY PI BOARD

It has two models; Model A has 256 Mb RAM, one USB port and no network connection. Model B has 512 Mb RAM, 2 USB ports and an Ethernet port. The foundation provides Debian and Arch Linux ARM distributions and also Python as the main programming language, with the support for BBC BASIC, C and Perl



b) MCP3204

The Microchip Technology Inc. MCP3204/3208 devices are successive approximation 12-bit Analog-to-Digital (A/D) Converters with on-board sample and hold circuitry. The MCP3204 is programmable to provide two pseudo-differential input pairs or four single-ended inputs. The MCP3208 is programmable to provide four pseudo-differential input pairs or eight single-ended inputs. The Raspberry Pi is used for the programming purpose. The GPS is used for the positioning of the bus; the availability of the seats is calculated and then the vacant seat count is displayed. The GPS is used for tracking the systems; the input of GPS is given to the Raspberry Pi board for programming. The ADC is used for the analog-to-digital conversion. The IR sensor is used for detecting the person in the bus and the vacant seats in the system. The 2 keys are applied for the tracking, i.e., S1 and S2. The keys are incremented using the tag and the output is displayed on the system.

c) Radio Frequency Id

Tracking using RFID based technology Fig 2. Radio Frequency Identification (RFID) is used to track and detect or identify tags that are attached to the objects automatically using electromagnetic fields. Information that is stored electronically is stored in the tag. Electromagnetic signals are sent by the readers to the tags and its response is read.

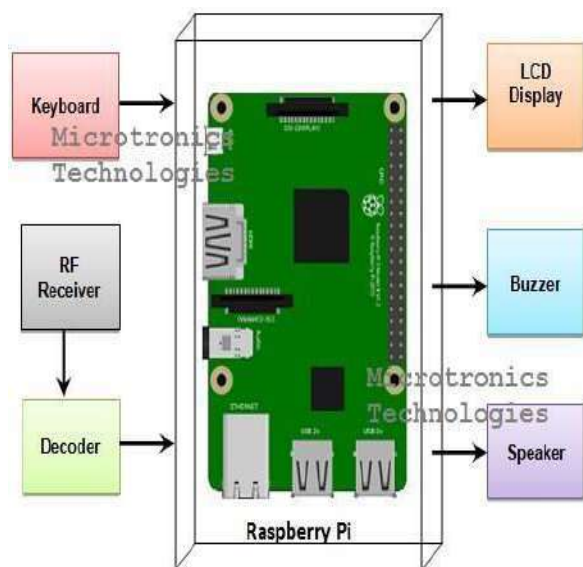
d) L.D.R Sensor

Photoresistors, also known as light dependent resistors (LDR), are light sensitive devices most often used to indicate the presence or absence of light, or to measure the light intensity. In the dark, their resistance is very



high, sometimes up to 1 MΩ, but when the LDR sensor is exposed to light, the resistance drops dramatically, even down to a few ohms, depending on the light intensity. LDRs have a sensitivity that varies with the wavelength of the light applied and are nonlinear devices. They are used in many applications, but this light sensing function is often performed by other devices such as photodiodes and phototransistors. Some countries have banned LDRs made of lead or cadmium over environmental safety concerns.

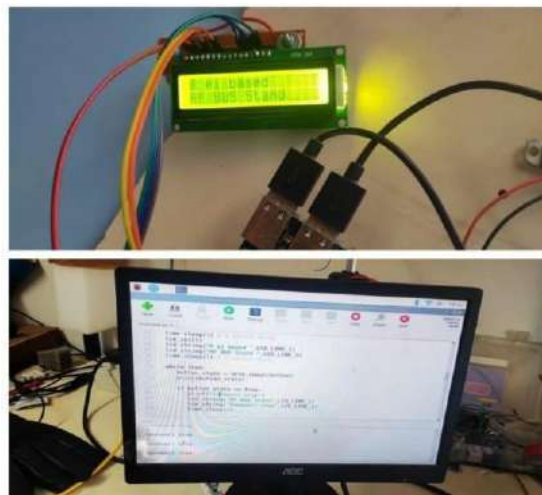
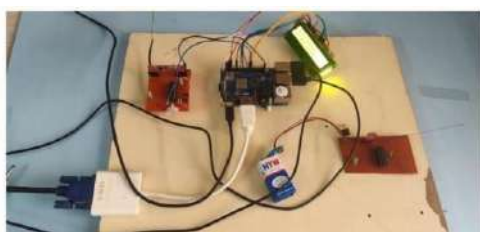
- **Hardware Specifications**



6.2 SOFTWARE

Python 3 compiler
Programming Language: Python

RESULT AND DISCUSSION



CONCLUSION AND FUTURE SCOPE

Conclusion

In This Project, Improved Technique Of The Bus Tracking Is Proposed. The System Proposes The Alert System And It Efficiently Track The Bus And IR Sensor Is Used For Detecting The Vacant Seats. An In-Vehicle Device A Server And A Smartphone Application Are Used For The Vehicle Tracking System, In This Work, The In- Vehicle Device Is Composed Of A Microcontroller Are GPS Module To Acquire The Vehicle Location Information And Transmit It To A Server Through GPS Network. On The Other End, The Web Interface Written In Php Is Implemented To Directly Connected To Database with The Implementation Of The Project A Complete Track Of The Busses Can Be Kept Around The City Through The Web Application. The Application Will Be Hosted On The University's Web Server Which Will Reduce The Cost Of Subscription Charges Provided For The Tracking Services. This Will Also Protect The Integrity Of The Location Data Of The Busses As The Servers Will Be Accessible Only Through The Local Domain's Network.

Future scope

The main goal of the proposed work is to improve the Bus Tracking system by adding the necessary features to our project, like projecting accurate bus timings, presenting correct bus numbers and by adding a GPS tracker into it for accurate locations.

For future enhancement, we can develop a vehicle monitoring system using GPS & GSM module with high speed processor. The system can be installed in buses, cars and trucks, this project is having a wide scope . Along with this we can create a bus ticketing



system where the user can actually buy a digital ticket just like the UTS app in the Mumbai railways. In which the app takes the current location of the user, asks for the destination, and calculates the fare. We will also provide a payment option from various third-party apps such as Paytm, PayPal, etc.

We can generalize the project to common man where he can implement the hardware part to the personal vehicles which will help them to track their location after it has been stolen; it will also police. We can also extend it to private travel agencies to track their bus.

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Fire Fighting Robot Using Raspberry Pico

Darpan Chaudhari¹, Hitesh Chaudhari², Pravin Kumar Barela³, Sonal Naphade⁴, Mahesh N. Patil⁵

^{1,2,3,4}UG students, ⁵Assistant Professor

^{1,2,3,4,5}Department of Electronics & TeleCommunication Engg., GF's Godavari College Of Engineering, Jalgaon, Maharashtra

*darpanchaudhari121@gmail.com*¹

Abstract: It's necessary and very dangerous work to fight against flames. The implementation of this project is automatized as well as manualized. This project uses ARM7. In sectors such as nuclear power plants, petroleum refineries, gas tanks, chemical plants and other large-scale industries, the majority of fire incidents occurs, which results to complex situations. More number of people have lost their lives because of such incidents. We are mounting a Wi-fi module (Node MCU) for mobile communication and many other sensors to detect the fire and smoke. We use the BLYNK/TCP terminal program for mobile control of the robot. The size of the robot is around 20 cm long and 10 cm tall, capable of carrying an extinguisher (gas). 12V 1.3Ampere hours of battery power. Keil M Vision 4, Flash Magic and Embedded C are the applications used for this project.

Keywords:- Fire Fighter Robo, Rpi, Flame sensor, Gas sensor, Wi-Fi module, DC motor

I. INTRODUCTION

The robot presented here is an embedded device in real time. C language is the software used to implement this type of robots. During automatic mode the robot tracks the environment to detect fire accidents. This robot uses IR sensors and output of this electrical sensors is fed to amplifier transistor. This signal is later fed into the microcontroller's INpin. When a fire is observed, the microcontroller drives the motors and triggers the actuators. A water reservoir is mounted on the frame which has 10rpm DC pump motor. The water reservoir is attached to the hose and the end of which is placed on the robot's head. The water is sprayed to the flames in order to eliminate the fire. This paper also shows us how a robot is voice controlled. The robot is operated through the speech system. The commands are given to the robot in order to make them operated. The advantage of this type of robot is, hand free operation and fast data input. Disadvantage is the robot is affected by the environmental or external noise. The tank robot is made of a mixture of

acrylic, plastic, aluminum and iron. There are two servo motors for each wheel, two DC motors for two flame extinguishing fans, there are many other sensors like ultrasonic, compass, flame thermal array and many other. The robot is switched on by the sound and a sound activator circuit is mounted on it. The audio activation circuit consists of a Dual Tone Multi Frequency receiver and transmitter. Microcontroller AVR ATmega16 receives data from a sound activation circuit, an infrared and photodiode circuit as a white detector, a micro switch sensor as a furniture detector, UVTRON and TPA81 as flame detectors and thermal detectors, CMPS03 as navigation detectors, SRF04 as ultrasonic sensors. Microcontroller processes signal inputs and delivers signal outputs to the servo motor (GWS S03 4.8V) on the front-left wheel and the front-right wheel, and the DC motor to spin the fan to extinguish the flame

II. LITERATURE REVIEW

The tank robot is made of a mixture of acrylic, plastic, aluminum and iron. There are two servo motors for each wheel, two DC motors for two flame extinguishing fans, there are many other sensors like ultrasonic, compass, flame thermal array and many other. The robot is switched on by the sound and a sound activator circuit is mounted on it [1,2]. The audio activation circuit consists of a Dual Tone Multi Frequency receiver and transmitter. Microcontroller AVR ATmega16 receives data from a sound activation circuit, an infrared and photodiode circuit as a white detector, a micro switch sensor as a furniture detector, UVTRON and TPA81 as flame detectors and thermal detectors, CMPS03 as navigation detectors, SRF04 as ultrasonic sensors [3,4]. Microcontroller processes signal inputs and delivers signal outputs to the servo motor (GWS S03 4.8V) on the front-left wheel and the front-right wheel, and the DC motor to spin the fan to extinguish the flame. There are 2 types of remote



controllers in this project namely ultramobile personal computer and the other is Joystick personal platform[5,6]. Though these are 2 different platforms their architectures are identical. The entire remote control system and the rescue robot is installed at the fire station. The communication between the controller and the robot starts with the use of fire station. Since fast data transmission is required ,separate wireless channels are used[7,8]. These separate wireless channels also offers low signal interference. This robot is mainly mounted with a camera for visual display a LED to guide the evacuation path and different other sensors to measure the intensity of gases which are poisonous in the atmosphere. The information's are gathered and will be sent to the user using channels which are wireless[9,10,11]. This robot plays a very important role in performing rescue operations. For easy transportation and portable size UMPC type is used and joystick type is used for stable manipulations This paper deals with the AVR-based firefighting robot. Infrared waves are not apparent to human eyes. So an infrared sensor is used. This is a tiny circuit which is used to send or receive the radio signals on range of the carrier frequencies. GSM is a data communication device for sending and receiving Radio Frequency signals wirelessly, which requires a wireless carrier sim card for its operation. The GSM requires a supply of DC voltage which is of 5V[12,13]. The radio frequency transmitter takes the help of antennae and transforms electrical signal to electromagnetic signal. The antenna which are used here are wired loop antenna. A decoder is used to separate the address and also to convert it serial to parallel. The main of this project is ,it will detect the location's address where the incident got occurred. Since a buzzer is mounted on it , it alerts the people who are surrounded in that particular place[14,15,16]. The robot basically displays the location and it sends the message to the fire brigade.

.III. METHODOLOGY

In this model we are using raspberry pico along with RF receiver and transmitter. The software used in this model is Keil μ Vision IDE and C language is used for programming. In this we are using remote controller to control the direction of the fire fighting system. Water spraying nozzle is also controlled by using the remote controller Fire sensor (IR receiver) is used to detect the fire which are placed in all three directions (i.e, left, right and centre) of the robot. The software used in this model is Arduino IDE. In this model we are using Atmega 328p micro-controller. We can extinguish the fire automatically by pumping water with the help of 5V

water pump.

BLOCK DIAGRAM

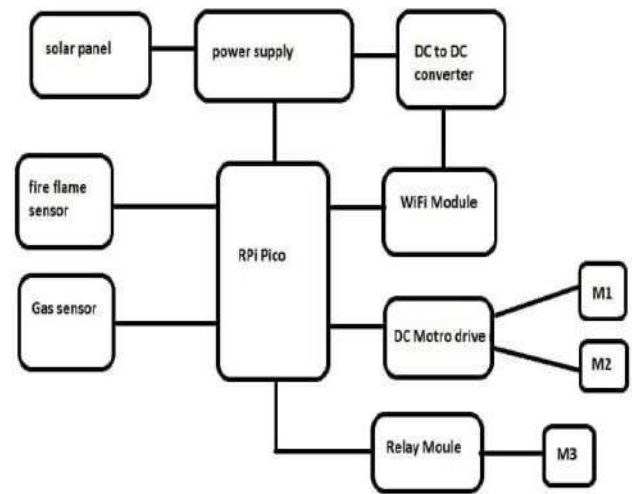


Fig.No1. Block diagram

HARDWARE

rpi pico The Pico W board is the same size as the standard Pico, but the three SWD (Serial Wire Debug) pins have been moved in from the edge to make room for a silver

square housing the Infineon CYW43439 wireless LAN chip. On the specifications front, apart from the addition of onboard Wi-Fi, the Pico W is identical to the standard Pico model.

Digital output (Do) This sensor is mainly designed for detecting as well as responding to the occurrence of a fireor flame It detects the fire with

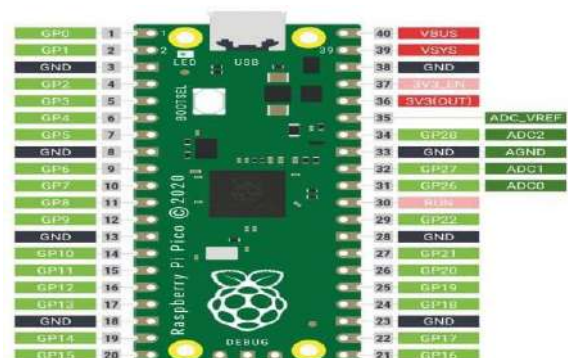


Fig.no2 rpi pico

Wi-Fi Module

Wi-Fi modules or Wi-Fi microcontrollers are sed to send



and receive data over Wi-Fi. They can also accept



2 General-purpose input/output (16 GPIO)

3. Inter-Integrated Circuit (I²C) serial communication protocol



commands over the Wi-Fi. Wi-Fi modules are used for communications between devices. They are most commonly used in the field of Internet of Things. ESP8266 is the most widely used Wi-Fi module. It is a low-cost microchip with a full TCP/IP stack and microcontroller capability, produced by Espressio Systems. This small module allows microcontrollers to connect to a Wi-Fi network and make simple TCP/IP connections.

ESP8226 comes with the capabilities of :-

1.2.4 Ghz Wi-Fi

4. Analog-to-digital conversion (10-bit ADC)

5.It runs at operating voltage of 3V and can handle maximum voltage of around 3.6V. It

6.can be easily interfaced with microcontrollers board via Serial Prt. There are numerous breakout boards available based on ESP8266 Wifi Module

like ESP8266 NodeMCU V3. Because of its compact size, its most importantly used in autonomous project.

DC Motor:

A DC Motor is a type of electric motor that converts DC electrical power to mechanical power i.e. a DC supply is converted to rotation or movement. Although motor gives 500 RPM at 12V, motor runs smoothly from 4V to 12V and gives the wide range of RPM, and

Fig no.6

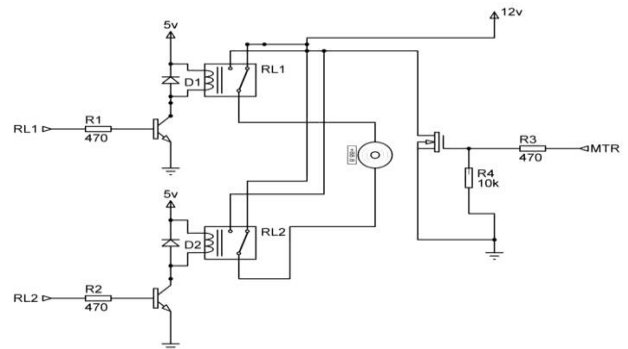


Fig .No7. DC Motor Drive circuit diagram



Water Pump

We can use this water pump as a water spray for extinguishing the fire. when fire is detected, robot turns into that direction and water is sprinkled on the fire from water pump.



Fig.no9 water pump

A pump is used to move fluids by using forces like air. Air moves forward from the way because the moving element starts to move. Generally, these are activated with electric motors that drive a compressor. Thus, a partial vacuum can be created because of the water movement, later it is filled with additional air. When the water hits the rotating impeller, energy of the impeller is transferred to the water, forcing the water out (centrifugal force). The water is displaced outward, and more water can now enter the suction side of the pump to replace the displaced water.

DC Motor Drive

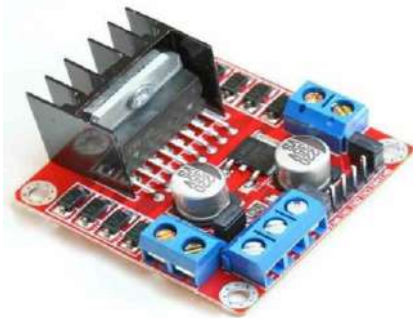


Fig .no10. DC Motor Drive

The DC motor drive is a type of amplifier or power modulator that integrate between the controller and a DC motor. It takes the low current and then converts it into a high current which is appropriate for the motor. DC drive converts an Alternating Current (AC) into Direct Current (DC) to run a DC motor. DC motor drivers used? We use motor drivers to give high power to the motor by using a small voltage signal from a microcontroller or a control system. If the microprocessor transmits a HIGH input to the motor driver, The driver will rotate the motor in one direction keeping the one pin as HIGH and one pin as

LOW.

IV. RESULT & DISCUSSION

Robotic firefighting systems are designed witcertain tasks in mind. These includanalyzing andlocating fires, conducting search and rescue, monitoring hazardous variables and the primary task of fire control and suppression. Use of this system • Military & defense, and public safety are the trending sectors where the deployment of firefighting robots is increasing

- Commercial Building.
- Residential Building.
- Agricultural. Military & Defense

Initialization Of Robo

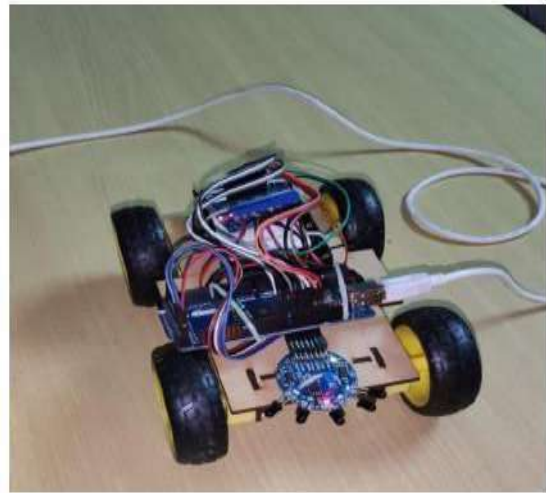


Fig.no12. Initialization

Detection of fire by robot

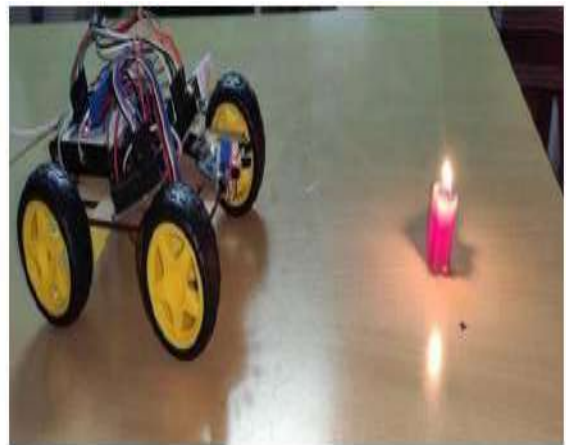


Fig no.13. Fire detection, Movement of robot towards fire detected object



V. CONCLUSION

As per the sketch of design and enforcement of a firefighting device that moves towards the fire and pumps out gas to extinguish the fire is presented in this project. The project explained how to interface ARM7 with different components. The system may be useful for accompanying fire fighters and preventing an outbreak. This is an one of the ample opportunity to automation. It will be used in the location or sites where it is impossible to reach or dangerous for humans.

VI FUTURE SCOPE

As part of the future scope, it is possible to use the Raspberry pi combination with a camera mounted on it for surveillance and to know the path of motion as well.

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Android Speech Recognition Notice Board using Wi-Fi, GSM Module

Kalpesh Patil¹, Mayuri bhavsar², Sonam mali³, Devendra Patil⁴, H.T. Ingle⁵

^{1,2,3,4}UG students,⁵Assistant Professor

^{1,2,3,4,5}Department of Electronics & TeleCommunication Engg., GF's Godavari College Of Engineering, Jalgaon,

kalpeshpatil0222@gmail.com¹, hetui@rediffmail.com²

Abstract: We normally use a simple static LED display screen to convey a message. Earlier, when we want to display large data, we used to change message for every few instances. Now scrolling displays are more preferred to static. By using a pre-programmed controller, we can make LED display in scrolling way. We can also make LED to adoptable by using IOT, so that changing message and intensity of display can be easily done by using android application over internet. Simple Outdoor LED Message Moving or Scrolling Sign Board, Electronic projects using LED Stroller Generator for outdoor digital signs, Marketable LED sign board with Message scrolling are the examples of the scrolling LED display.

In our project we are using esp8266 base microcontroller with embedded Wi-Fi. Four 8x8 led matrix are to be driven by using popular driver IC MAX7219. An android application is to be develop for controlling display parameters over internet. Also we are using speech output module (aPR33A3) to produce voice notifications.

I. INTRODUCTION

We normally use a simple static LED display screen to convey a message. Earlier, when we want to display large data, we used to change message for every few instances. Now scrolling displays are more preferred to static. By using a pre-programmed controller, we can make LED display in scrolling way. We can also make LED to adoptable by using PC controller based system. Simple Outdoor LED Message Moving or Scrolling

Sign Board, Electronic projects using LED Stroller Generator for outdoor digital signs, Marketable LED sign board with Message scrolling are the examples of the scrolling LED display.

II. LITERATURE SURVEY

An extensive literature survey has been carried out on different techniques that have been implemented for the lighting system till date. In [1], the authors describe about automated lighting system with visitor counters. This System needs no manual operation for switching ON / OFF when a person enters or exits from a room. The PIR Sensors with the IR transmitter and receiver are placed at the entrance of the room doors in such a way that the sensor senses a person entering / exiting the room. This can also be done by using a laser. A Microcontroller is a circuit which helps in controlling the lights and fans in a room and keeps track of number of persons / visitors entered or exit from the room. When a person enters into the room then the counter is incremented by one and the lights in the room will be switched ON and when a person leaves the room then the counter is decremented by one. The lights will only be switched OFF until all the persons in the room go out and the room is unoccupied. A display also shows the total number of persons inside the room. But the limitation is that the room doors should not be wide enough as two or more people should not be allowed to enter at the same time.

Sensor Technology [2] is also used for the same objective of conserving energy. For instance, vacancy



Sensor allows direct replacement of standard wall switches. Using passive infrared technology (PIR), these sensors combine occupancy detection and voltage switching in a single package. These units automatically turn off lights after a room or an area is vacant for 5 - 10 minutes. The ceiling mount sensors also use passive infrared technology which detects vacancy and turn OFF lights automatically. These sensors are mounted to the ceiling. They have a 180 degree and a 360 degree field of view and can cover up to 1000 square feet of area. But sensor technology also comes with drawbacks. For instance, sensors are more expensive and are likely to break. Moreover, sensors can sense objects / people to a limited range i.e. one sensor might not cover a full room and also it requires lot of additional wiring in case of wired sensors.

In [3], the authors depict a new system of energy saving and control of street lights. This application is built on handling the streetlights more economically and can be operated without any difficulty. Instead of using the usual ON / OFF system, a default light intensity level of 50% is maintained for the lamps by using a digitally controlled power regulator circuit. Traffic is sensed at each pole and a signal is sent to the master control station, which in turn sends command signal to the local pole circuit and the light intensity level is raised to 100% only in the section of the road where traffic is sensed. Thus, a considerable amount of energy is saved, without compromising the lighting requirement and can be maintained with ease. The system is based on the Zigbee networking technology. This system again uses a sensor which is placed near each streetlight. The hardware of the sensor allows it to detect the traffic intensity level and thereby direct the information to the Zigbee end device which is again unique for every lamp pole.

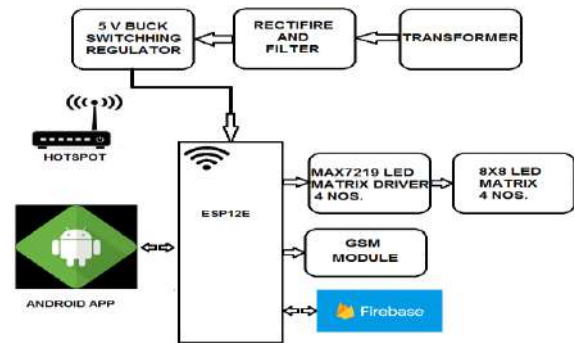
III.METHODOLOGY

LED scrolling message display matrix can be made to work, by connecting all the anodes and cathodes are connected to the MAX7219 led matrix driver IC. Every column contains 'N' LED's so that the total current flowing through the column is the sum of current flowing through each LED. The current flowing through each LED is 20mA and the total current is N*20mA .The matrix driver is capable to provide this current with programmable resistor selection and gives constant current output for led's.

Microcontroller provides the data, clock and chip select control signals to the driver. Microcontroller provides

the data sequence to driver data pin. And as these ic's are cascaded data out of first driver is for data in for second driver IC. Clock and CS signal remain parallel to each matrix driver IC.

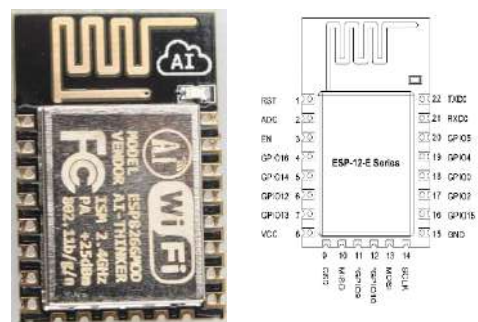
BLOCK DIAGRAM



ESP-12E:-

Taking all these considerations we have chosen “ESP8266 based ESP-12E” microcontroller with embedded WIFI.

ESP-12E is a low power consumption of the UART-Wi-Fi module, with very competitive prices in the industry and ultra-low power consumption technology, designed specifically for mobile devices and IOT applications, user's physical device can be connected to a Wi-Fi wireless network, Internet or intranet communication and networking capabilities. ESP-07 the use of small ceramic antenna package can support IPEX interface. Users have a variety of installation options.



Features:-

- 802.11 b/g/n protocol
- Wi-Fi Direct (P2P), soft-AP
- Integrated TCP/IP protocol stack
- +19.5dBm output power in 802.11b mode
- Power down leakage current of < 10uA
- Integrated low power 32-bit MCU
- SDIO 2.0, SPI, UART
- STBC, 1x1 MIMO, 2x1 MIMO



- A-MPDU & A-MSDU aggregation & 0.4µs guard interval
 - Wake up and transmit packets in < 2ms
 - Standby power consumption of < 1.0mW (DTIM3)
- MAX7219**

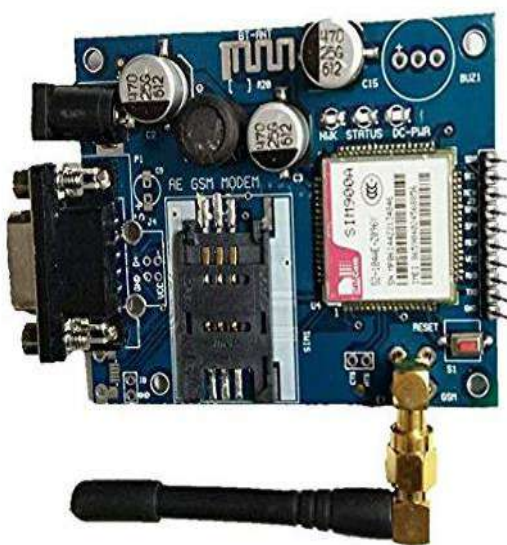
The MAX7219 is compact, serial input/output common-cathode display drivers that interface microprocessors (μ Ps) to 7-segment numeric LED displays of up to 8 digits, bar-graph displays, or 64 individual LEDs. Included on-chip are a BCD code-B decoder, multiplex scan circuitry, segment and digit drivers, and an 8x8 static RAM that stores each digit. Only one external resistor is required to set the segment current for all LEDs. The MAX7221 is compatible with SPI™, QSPI™, and MICROWIRE™, and has slew-rate-limited segment drivers to reduce EMI.

A convenient 4-wire serial interface connects to all common μ Ps. Individual digits may be addressed and updated without rewriting the entire display. The MAX7219/MAX7221 also allow the user to select code-B decoding or no-decode for each digit.

The devices include a 150 μ A low-power shutdown mode, analog and digital brightness control, a scan-limit register that allows the user to display from 1 to 8 digits, and a test mode that forces all LEDs on.

GSM Module

A GSM module or a GPRS module is a chip or circuit that will be used to establish communication between a mobile device or a computing machine and a GSM or GPRS system. The modem (modulator-demodulator) is a critical part here.



IV- SYSTEM REQUIREMENTS

COMPONENT COSTING

These modules consist of a GSM module or GPRS modem powered by a power supply circuit and communication interfaces (like RS-232, USB 2.0, and others) for computers.

A GSM modem can be a dedicated modem device with a serial, USB, or Bluetooth connection, or it can be a mobile phone that provides GSM modem capabilities.

A GSM module or GPRS modules are similar to modems, but there's one difference: A GSM/GPRS Modem is external equipment, whereas the GSM/GPRS module is a module that can be integrated within the equipment. It is an embedded piece of hardware.

A GSM mobile, on the other hand, is a complete system in itself with embedded processors that are dedicated to providing an interface between the user and the mobile network.



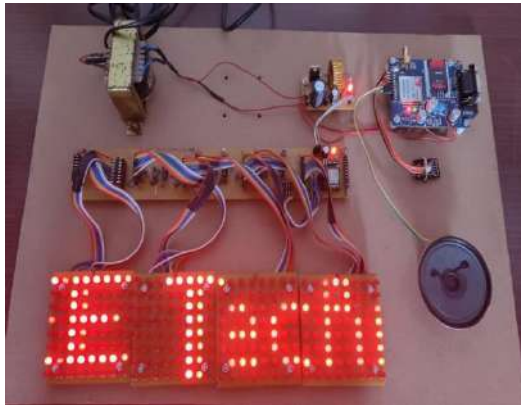
ARDUINO IDE:-

Arduino is an open-source platform used for building electronics projects. Arduino consists of both a physical programmable circuit board (often referred to as a microcontroller) and a piece of software, or IDE (Integrated Development Environment) that runs on our computer, used to write and upload computer code to the physical board.

The Arduino platform has become quite popular with people just starting out with electronics, and for good reason. Unlike most previous programmable circuit boards, the Arduino does not need a separate piece of hardware (called a programmer) in order to load new code onto the board we can simply use a USB cable. Additionally, the Arduino IDE uses a simplified version of C++, making it easier to learn to program. Finally, Arduino provides a standard form factor that breaks out the functions of the micro-controller into a more accessible package.



V. RESULT



VI. CONCLUSION

This project explains how to control the display of characters on an 8×8 LED moving message display using the SPI port of the ESP8266. A four-unit 8×8 matrix display is controlled by only 3 GPIO and cascaded MAX7219. The APIs provided in this application note facilitate easy implementation for displaying characters on an 8×8 LED matrix. The scroll and variable intensity display modes are supported. The display message and the moving rate can be easily changed. The software is written to decouple these functions, thus enabling combinations of these modes as per our requirements. All of the printable ASCII characters (ASCII code 0×20 to 0×7E) are supported. Android application facilitate complete control over internet.

VII. FUTURE SCOPE

One can make this display board using RGB led so animated and colorful messages can be scroll. Here

we made four matrices and connected in cascade we can increase number of matrix to be use in this project.

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