Conference Proceedings of

National Conference on Recent Trends in Engineering & Technology

NCRTET - 2022

30th April, 2022 | AITRC Vita

Loknete Hon. Hanmantrao Patil Charitable Trust's

ADARSH INSTITUTE OF TECHNOLOGY & RESEARCH CENTRE, VITA

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FORWARD

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NCRTET-22 is a National Conference Organised by Research and Development cell of Adarsh Institute of Technology and Research Centre, Vita. NCRTET – 22 aims at bringing academicians, professional engineers, research scholars, and students of UG, PG and Diploma on a common platform to share new ideas, experiences, and knowledge in emerging areas of Electronics engineering, Mechanical engineering, Electrical engineering, Computer Science engineering and Civil engineering. The conference will ignite the minds of the participants and delegates for undertaking collaborative research for updating technical know-how to stay in tune with the recent advances. The technical programme consists of peer-review paper presentations and key note lecture.

We would like to thank all participants who will present their academic and research works in NCRTET-2022 and especially to our distinguished guests and keynote speakers for their collaboration and contribution for the success of the conference. We would like to thank Hon. Miss Pooja Patil Director of AITRC Vita and Dr. D. K. Mahadik Principal of AITRC Vita for the guidance and support to NCRTET-2022

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ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

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National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

A Review Paper on IoT Based Covid-19 Patient Health Monitoring in Quarantine

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Abstract: In today's scenario, with the covid-19 cases on the rise this project seems to effectively provide a cost effective and accurate solution for the diagnosis of the coronavirus among the public. This design and implementation of an IOT based project that is capable of recording the users vital such as Heart rate, SpO2, temperature all of which serve as important indicates of coronavirus. Once recorded the sensors then send the data over to the Arduino microcontroller which in turns pushes it to private cloud server using gsm module where in the data can be used for various analysis. The project helps us to restrict the virus by introducing viable monitoring methods which can serve replacements to the traditional and more expensive alternatives.

Keywords*:* IOT Web Server, GSM Module, Pulse Oximeter, Temperature Sensor, Blood Pressure Sensor, Arduino UNO Microcontroller, LCD Display.

I. INTRODUCTION

The numbers of COVID-19 cases in the world are still on the rise and the only logical way to tackle the problem. The virus has greatly caused economic and social disruption. Now days on the platform of COVID we require Special Covid 19 Quarantine centers setup in order to treat covid patients. The Internet of Things is considered now as one of the feasible solutions for any remote value tracking especially in the field of health monitoring. Internet of Things (IOT) development brings new opportunities in many applications, including smart cities and smart healthcare. Currently, the primary usage of the IoT in healthcare can be categorized as remote monitoring and real-time health systems. Health is always a major concern in every growth the human race is advancing in terms of technology. The system monitors patient heartbeat, temperature and BP using a heartbeat sensor, temperature sensor and BP Sensor respectively. Patient health parameters, along with patient location, are uploaded on a regular basis on to a centralized command and control center on cloud using either the patient's mobile phone or an integral GSM SIM card.

II. LITERATURE REVIEW

I. TRACKING THE COVIDZONES THROUGH GEO-FENCING TECHNIQUE

Because of the outbreak of Covid 19, the entire world is thinking of new strategies, preventive measures to safeguard the human life from the widespread of the pandemic. The areas where people are affected are marked as containment zones and people are not allowed to exit out of those areas. Similarly, new people are not allowed to enter inside those areas. Hence, the purpose of this paper is to propose a methodology to track the Covid zones, to enhance and tighten the security measures. A geo-fence is created for the containment zone. The person who enters or exits out of that particular zone will be monitored and alert message will be sent to that person's mobile. Purpose Geo fencing and tracking of Covid zones to monitor the people and alerting on mobile.

II. END TO END DEEP LEARNING FRAMEWORK FOR COVID-19 DETECTION AND MONITORING

The main objective of the proposed framework is to bridge the current gap between current technologies and healthcare systems. The wireless body area network, cloud computing, fog computing, and clinical decision support system are integrated to provide a comprehensive and complete model for disease detection and monitoring. By monitoring a person with COVID-19 in real time, physicians can guide patients with the right decisions. The proposed framework has three main layers (i.e., a patient layer, cloud layer, and hospital layer). In the patient layer, the patient is tracked through a set of wearable sensors and a mobile app. In the cloud layer, a fog network architecture is proposed to solve the issues of storage and data transmission. In the hospital layer, we propose a convolutional neural network-based deep learning model for COVID-19 detection based on patient's X-ray scan images and transfer learning.

1. Bridging the gap between the current context of technologies and health systems
2. Patient x-ray scan information using CNN based deep learning model to predict state of ar

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III. IoT BASED SYSTEM FOR COVID-19 INDOOR SAFETY MONITORING

In this paper, we introduce an affordable IoT-based solution aiming to increase COVID-19 indoor safety, covering several relevant aspects: 1) contactless temperature sensing 2) mask detection 3) social distancing check. Contactless temperature sensing subsystem relies on Arduino Uno using infrared sensor or thermal camera, while mask detection and social distancing check are performed by leveraging computer vision techniques on camera-equipped Raspberry Pi.
IoT based solution to provide indoor safety through social distancing, mask detection and temperature sensing contact less.

III. PROPOSED WORK

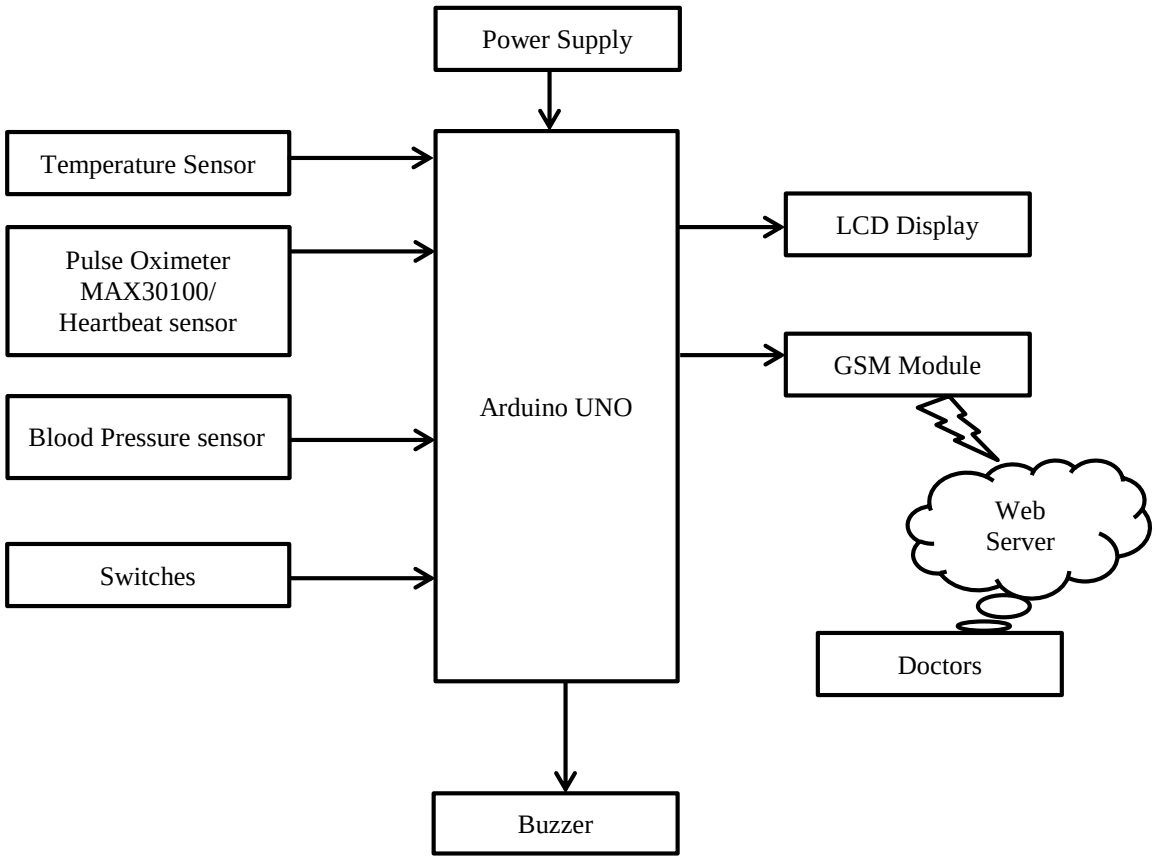

Fig.1: Block diagram of system

This Project is the design and implementation of a patient health monitoring system .Figure1 shows block diagram of our system. All sensors interface with Arduino UNO Microcontroller. Temperature sense patient body temperature. Blood pressure sensor sense pulse rate as well as BP of patient. And these different types of sensors sense different parameter of patient body and this data send to Microcontroller, Microcontroller process on this received data and display on LCD display. As well as upload data over IoT. Here GSM module is use to access internet. If patient needs any medical help we can assist the patient by pressing the help button attached to the system. The request for emergency medical assistance is send to respective authorities and doctors. And hence with this system we can provide a proper treatment as soon as possible. This all system needs a 5v power supply. This system gives alert also send alerts for higher and lower values so if patient heartbeat and blood pressure both are above or below of certain value system send alert over internet, So with the help of this system we can keep a track on patients body conditions if they need any help.

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A. Arduino UNO:

It is one of the most famous open-source microcontroller boards based on ATmega328p. The Arduino UNO has 20 I/O pins, 14 digital I/O pins, and six analog I/O pins. We used the Arduino UNO because the pin configuration of this module fulfills the requirements of our system and is the main controller of the system. This microcontroller is programmable using an Arduino IDE. In this system, it plays a crucial role and works as an interface between the sensors and the other IoT gadgets. Figure shows the model of the Arduino Uno.

Fig.2: Arduino Uno

B. GSM Module:

The module offers GPRS/GSM technology for wireless communication with the uses of a mobile sim. It uses a 900 and 1800 MHz frequency band and allows users to receive/send mobile calls and SMS. GSM/GPRS module is a miniature GSM modem, which can be integrated into a great number of IoT projects. This module is controlled by AT commands. Command mode helps the developers to change the default setting according to their requirements

Fig. 3: GSM Module

C. Blood oxygen & Heartbeat monitor with MAX30100 Pulse Oximeter:

The MAX30100 is a Pulse Oximetery and heart rate monitor sensor. MAX30100 is a sensor that can measure blood oxygen saturation level and pulse rate in BPM. In a human body, ordinary SpO2 values range from 90 to 100%. This sensor combines two LEDs, a photo detector, optimized optics, and low-noise analog flag handling to identify beat oximetery and heart rate signals, hence it is suitable for system.

IARJSET

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Fig.4: Pulse Oximeter (MAX30100)

D. LCD Display:

A 16*2 LCD means it can display 16 characters per line and there are such lines. Each character in this LCD is displayed in a 5*7 pixel matrix. The 16*2 Intelligent Alphanumeric Dot Matrix display is capable of displaying 224 different characters and symbols. This LCD has two register, namely, command and data. The LCD 16*2 is broadly used in devices.

Fig.5 : LCD Display

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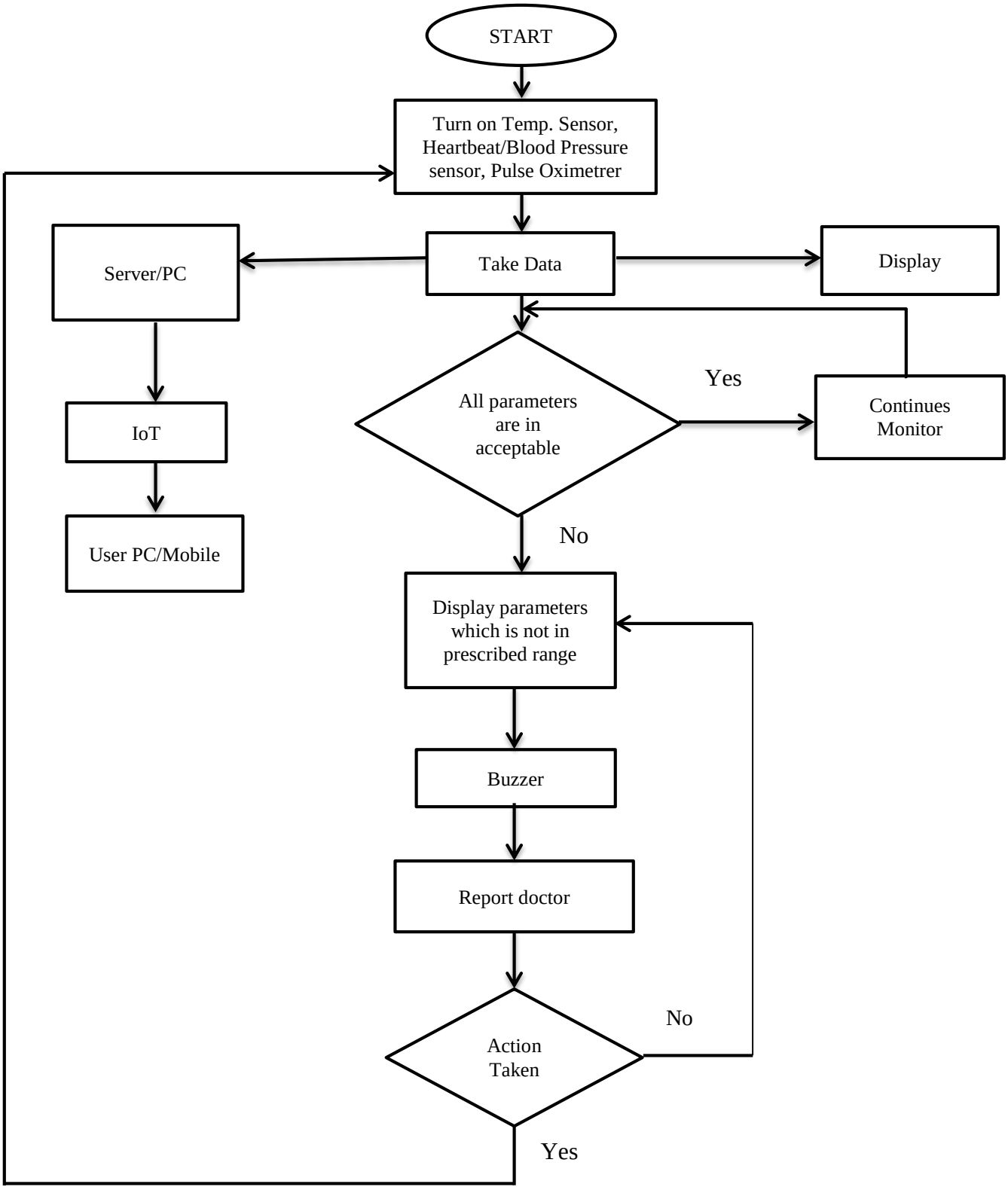
Vol. 9, Special Issue 1, April 2022

FLOW CHART



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V. CONCLUSION

This system is installed at the patient's side and continuously disseminates the patient's health data over the Internet so that the doctors can remotely monitor the patients and can meet the desired patient immediately when needed. The project serves the purpose of reducing the risk of exposure in healthcare workers. This is also expected to reduce the growing demand for PPE (Personal Protective Equipment) and logistics. The Quarantine period for traditional routine examination has been reduced and most importantly, health can be monitored and disease can be diagnosed by any doctor at any distant. In this paper, an IoT based health monitoring system was developed. The system monitored the body temperature, pulse rate, and oxygen level in the blood which are also displayed on an LCD.

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ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

Enhanced Fog Detection and Free Space Segmentation for Car Navigation

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Abstract: Free space detection is a primary task for car navigation. Unfortunately, classical approaches have difficulties in adverse weather conditions, in particular in daytime fog. In this paper, a solution is proposed thanks to a contrast restoration approach on images grabbed by an in-vehicle camera. The proposed method improves the state of the art in several ways. First, the segmentation of the fog region of interest is better segmented thanks to the computation of shortest routes maps. Second, the fog density as well as the position of the horizon line are jointly computed. Then, the method restores the contrast of the road by only assuming that the road is flat and, at the same time, detects the vertical objects. Finally, a segmentation of the connected component in front of the vehicle gives the free space area. An experimental validation was carried out to foresee the effectiveness of the method. Different results are shown on sample images extracted from video sequences acquired from an in-vehicle camera. The proposed method is complementary to existing free space area detection methods relying on color segmentation and stereovision.Free space detection is a primary task for car navigation. Unfortunately, classical approaches have difficulties in adverse weather conditions, in particular in daytime fog. In this paper, a solution is proposed thanks to a contrast restoration approach on images grabbed by an in-vehicle camera. The proposed method improves the state of the art in several ways. First, the segmentation of the fog region of interest is better segmented thanks to the computation of shortest routes maps. Second, the fog density as well as the position of the horizon line are jointly computed. Then, the method restores the contrast of the road by only assuming that the road is flat and, at the same time, detects the vertical objects. Finally, a segmentation of the connected component in front of the vehicle gives the free space area. An experimental validation was carried out to foresee the effectiveness of the method. Different results are shown on sample images extracted from video sequences acquired from an invehicle camera. The proposed method is complementary to existing free space area detection methods relying on color segmentation and stereovision.

Keywords*:* Real-time video dehazing, image dehazing, restoration, contrast enhancement, airlight estimation, transmission maps, gamma correction, depth maps.

I. INTRODUCTION

Recently there has been going intrest in the analysis of video affected by weather phenomenon. Haze removal (Dehazing) is highly desired in consumer, computer vision application, from working normally, such as intelligent vehicles, outdoor objective recognition, and mostely in the field of digital photography techonology. Recording videos and capturing images has become popular lifestyle. However, it is a challenge for professional photographer to capture high quality video in low-light level and foggy environment. Hence the process of removing haze can significantly increases the visibility of scene and correct the shift caused by the airlight. Video captured in poor environmental condition fails to present visual effectively. It can be classified into two categories, namely enhancement-based approach and restoration based approach. More precisely, the enhancement-based approach attempts to enhance the visibility of hazy images without considering the reasons for image degradation, Dehazing is the process of removing haze from video and enhancing the video quality so; the main object of our technique is to enhance the poor visibility of the video, which applicable in the field of public safety, traffic accident analysis, crime forensics, remote sensing area and military surveillance. The three main objectives of video enhancement techniques are, to explore the hidden details in the video; the effect such as flickering and uneven exposure should be avoided; the video should be temporally consistent. To achieve all this objectives we propose a contrast enhancement algorithm. Contrast Enhancement commonly used for surveillance applications because the viewing environment is outside the control of the observer. By using this method, unexpected flickers are effectively eliminated. Optical scattering produces an unnecessary exposure on a video and image which known as ‘airlight’.It happens because of light coming from the source (sun) is scattered to words the observer. The airlight is firstly estimated in given input scenes (video, image).To compute the scene depth there are several approaches for example scene depths are estimated from two or more image and video which are captured in different environmental and weather conditions. For this we divide an input scene into multiply blocks and then estimate the optimal transmission for that block’s. So, the contrast of image and video increased. Finally we apply gamma correction technique which is used to optimize the usage of bits encoding an image and video. It is an effective tool for manipulating the histogram of an image that is either over an under exposed. In addition to manual control, gamma correction can be also automatically adjusted to compensate for change

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

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in the scene. In analog video system, gamma correction is performed with analog circuitry and is adjusted manually. With digital video system, gamma correction can be provided using mathematical operations in a digital circuitry. In summary, our work makes the following three main contributions:

• We develop a novel method for image dehazing which can make hidden details perceptually noticeable while avoiding inducing visual artifacts and also compares result from previous traditional method.

• We introduce Video dehazing technique which clears the video already saved in the database.

• We extend our method to several practical applications, such as Real-time video dehazing, video denoising and clear video and attempt reconstruction.

Thus we dehaze an image and video using contrast enhancement algorithm from hazy video and image to achieve haze free image and video which is clearly visible for human eyes and greatly impact the accuracy of the message and visual perception. The experimental results demonstrate the superior consistency of subjective and objective evaluation of the proposed method.

II. LITERATURE REVIEW

Hautière · J.-P. Tarel · R. Brémond · D. Aubert Université proposed to detect the free space area in foggy road scenes thanks to a contrast restoration approach. First, the method estimates simultaneously the density of fog and the position of the horizon line in the image, which improves drastically the state of the art in this area. A highly effective fog ROI segmentation method based on geodesic maps computation is proposed as well as a novel joint fog density and horizon line estimation process. Thanks to a simple contrast restoration method, the proposed method is then able to restore the contrast of the road and at the same time to segment the vertical objects. Indeed, these objects are falsely restored and in this way easily segmented. An experimental validation allows figuring out the potential of the method. Results on sample images extracted from video sequences acquired from an in-vehicle camera are shown and discussed. In the future, we would like to integrate these works in prototypes and test intensively the method, so as to identify some eventual new problems which could appear

Rahul Singh, Someet Singh and Navjot Kaur proposed a Techniques of Vehicle Detection in Fog It is a great challenge to detect vehicles under various foggy climatic scenarios. Surrounding objects such as pedestrians, trucks, trees and bicycles distract the sys-tem and cause the results to deviate from the actual scenario. LiDAR are often used to detect objects and find distance, whereas a vision based detection is responsible for real object verification and final classi-fication. As compared with others, the benefit of this approach is to utilize the structural information to help vision based techniques for vehicle detection and classification. In this approach we are using low cost LiDAR model which is made up of the combination of a camera and a laser. It is accurate and of low cost as compared to the LiDAR.

The vehicle detection in fogg The present study proposes an intelligent vision based technique that utilizes real time video data to detect vehicles at an intersection in foggy weather condition and on the basis of these data, decisions can be made on traffic green light splits. The data gathered by the system can also be used for vehicle tracking, counting and classification in the future. The method may reduce traffic congestion and time wasted when waiting for a green light on an empty road. While simulations show that the proposed algorithm works well on the live feed considered in the study, further studies need to be conducted in different geographical areas with different traffic densities at distinct times to determine the efficacy of the system in general.

Dominique Gruyer, Olivier Orfila, Homayoun Najjaran and Sebastien GlaserSensors presented methods and systems from the scientific literature related to fog detection and visibility enhancement in foggy conditions that appeared over the past ten years. In the next period, the main focus of the automotive companies will be the development of autonomous vehicles, and visibility requirements in bad weather conditions will be of high importance. The actual methods from the state of the art are based on image processing, optical power measurements, or based on different sensors, some of them already available on actual commercial vehicles but used for different functionalities. The image processing methods are based on cameras, which are devices that have a lot of advantages such as freedom of implementing different algorithms, versatility, or costs, but on the other hand, the results obtained from such a system can be erroneous due to blindness caused by other traffic participants, environment, or weather. Methods based on image processing can be applied for low fog conditions; if fog becomes denser, the system is not able to give any valid output. Some methods presented in the literature work only in day conditions, making them unusable for automotive applications that require systems able to offer reliable results in real time and complex scenarios

III. METHODOLOGY

Methodology is presented in this section.

In this paper we proposed a methodology that improves the visibility of haze image and video. The Methodology uses the depth estimation concept to restore the degraded image and video. The input image and video which are captured in the outdor scenes subjected to atmospheric troubles such as haze, fog and heavy rain etc. In order to identify the color temperature and the contrast levels the input image and video is converted into the two individual inputs such as white balance input and contrast

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enhancement. White balance basically means color balance. It is a function that gives the camera reflection to 'true white'. Since white light is sum of all other colors. The camera will then display all colors correctly. Contrast enhancement process is used to make image and video features more clear. Contrast manipulation involves a scene in oredr to increase the contrast. These two individual image and video are then applied to depth estimation process a depth estimation method based on geometric and edge information is proposed. This method first creates three kinds of depth templates, and a vanishing point detection algorithm based on road extraction is provided to perform the sub-regional depth assignment to the images involves various segments such as finding the weight maps of individual image and video (for both white balance and contrast enhancement), normalization of weight maps and application of pyradmids.A gamma correction factor has been applied to the depth estimation process in order to improve visibility which is perfect scene to human eye. The gamma correction enhance contrast level of the image and video and hence even in the high atmospheric troubles we get a visually perfect image and video. Finally we obtain a haze free image and video which clearly visible for human eye and greatly impact the accuracy of the message and visual perception.

Depth Estimation Process

Chromatic weight map controls the saturation gain in image and video, the Salience weight maps defines the quality whuch contributes to degress of conspicuousness with respect to the neighdorhood region. The output pf each weight maps are normalized (change the range of pixel intensity value), and then applied to Gaussian pyramid of length five. The image and video is a data structure designed to support efficient scaled convolution through reduced image and video representation. It consist of a sequence of copies of an original image and video in which both sample density and resolution are described in regular steps. The Laplacian pyramid has been described as a data structure composed of band pass copies of an image and video that is well suited for scaled image and video analysis. But the pyramid may also be viewed as an image and video transformation, or code. The pyramid nodes are then considered code elements, and the equivalent weight function are sampling function that give node values when convolved with the image and video. The proposed block biagram shows different blocks like, white balance input, contrast enhancement, depth estimation, gamma correction and transmission map.

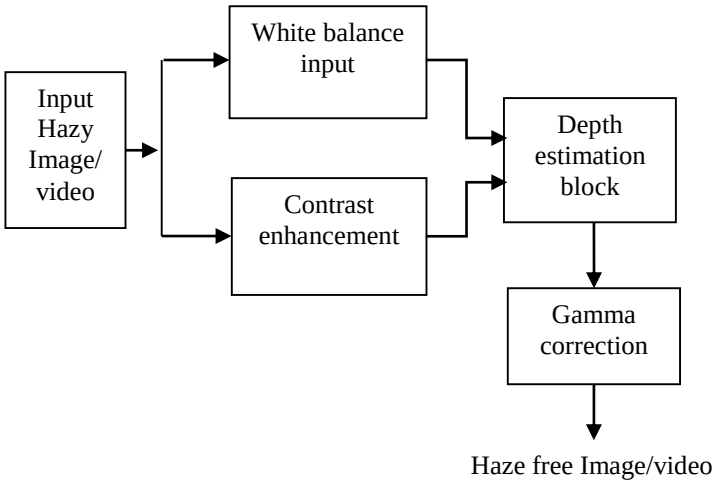

Figure 1: General Block Diagram of Video Deahzing

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

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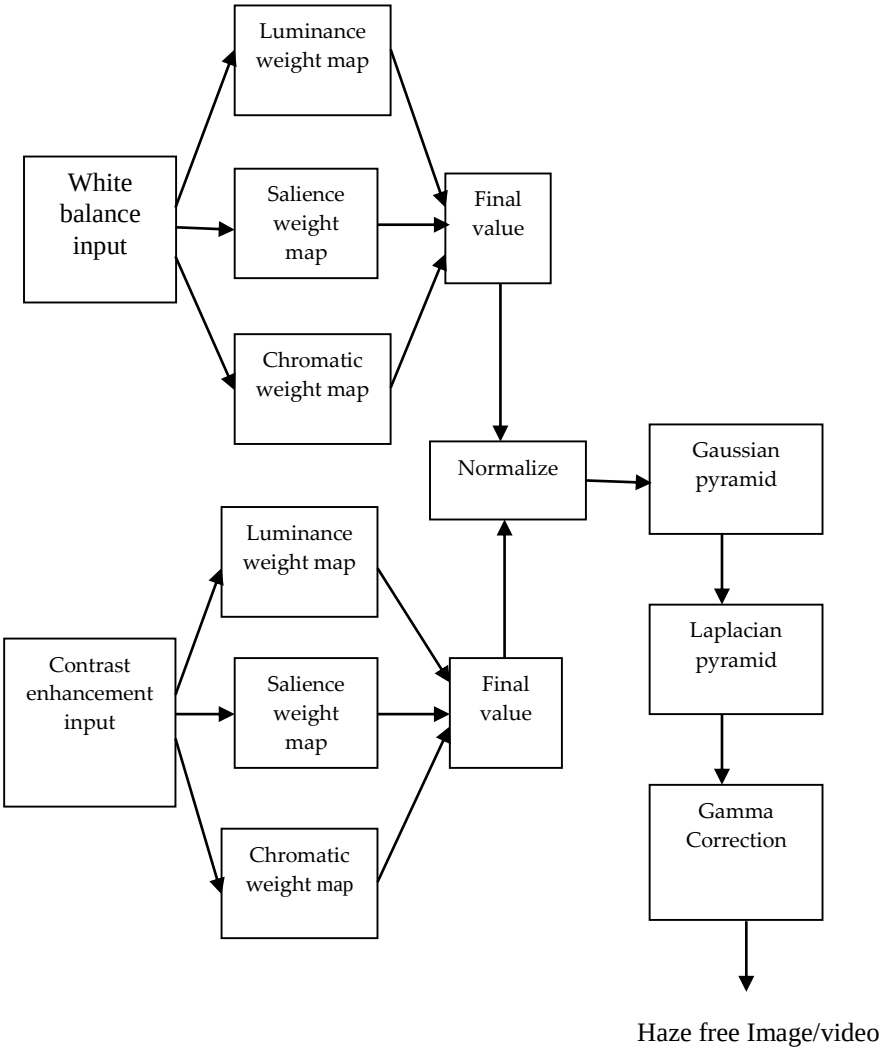

Figure 2: Depth Estimation Process

IV. RESULT ANALYSIS AND DISCUSSION

Quality Parameters

To analze or compare the result we check some quality parameters as follows:

1. PSNR
2. MSE
3. Elapsed Time

PSNR (Peak Signal to Noise Ratio)

The PSNR is most commonly used as a measure of quality of reconstruction of lossy compression codec's (e.g., for image compression). The signal in this case is the original data, and the noise is the error introduced by compression. When comparing compression codec's it is used as an approximation to human perception of reconstruction quality, therefore in some cases one reconstruction may appear to be closer to the original than another, even though it has a lower PSNR (a higher PSNR would normally indicate that the reconstruction is of higher quality).

MSE (Mean Square Error)

Mean Square Error (MSE) ,is the cumulative squared error between the compressed and the original image. Where I(x,y) is the

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original image, I'(x,y) is the approximated version (which is actually the decompressed image) and M,N are the dimensions of the images. A lower value for MSE means lesser error.

Elapsed Time

Elapsed time is the total required time required to process on the hazy scene captured in different environmental conditions. Scalar double representing the time elapsed between tic and toc commands, in seconds. 'toc' reads the elapsed time from the stopwatch timer started by the 'tic' function. The function reads the internal time at the execution of the toc command, and displays the elapsed time since the most recent call to the tic function that had no output, in seconds.

Actual Implementation of results

The performance of the proposed image dehazing algorithmis evaluated on various test images. In this section, we use test images, which have complicated depth structuresras and transmission map. Thus, we provide the results of the dehazing algorithm only.In Fig. 5.1, we see that the proposed algorithm removes haze from the input image and reconstruct the ſne details of foggy flower clearly.

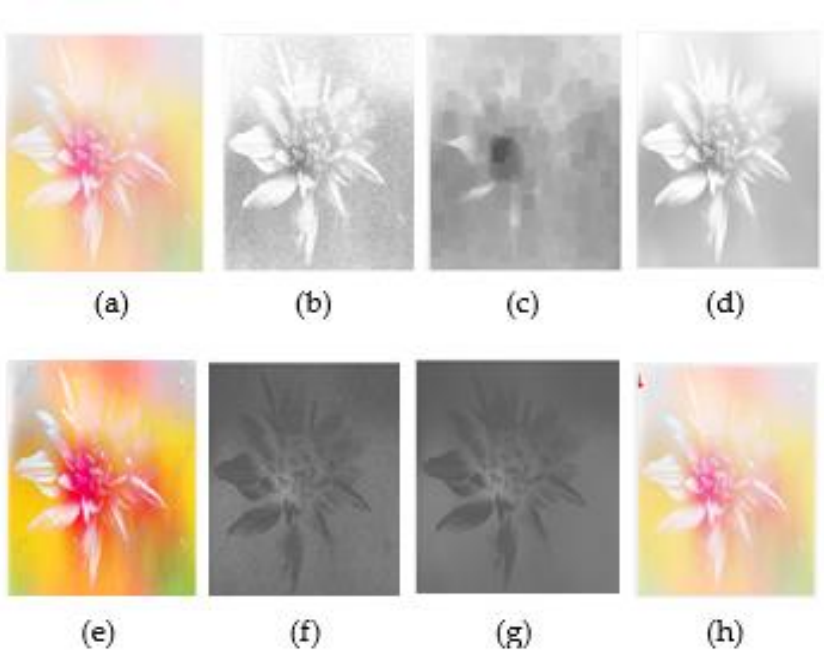

Figure 3. Some of the dehazing results

The sample hazy input image (a), Depth map-1 (b), Depth map-2 (c), Depth map- 3 (d), The Dehazed image (e), Transmission map -1 (f), Transmission map -2 (g), Position of atmospheric light (h).

Another analysis of contrast enhancement based dehazing algorithm shows the result taken for the foggy forest. Hence we have comparative results that show how the dehazing algorithm is more effective than traditional algorithms.

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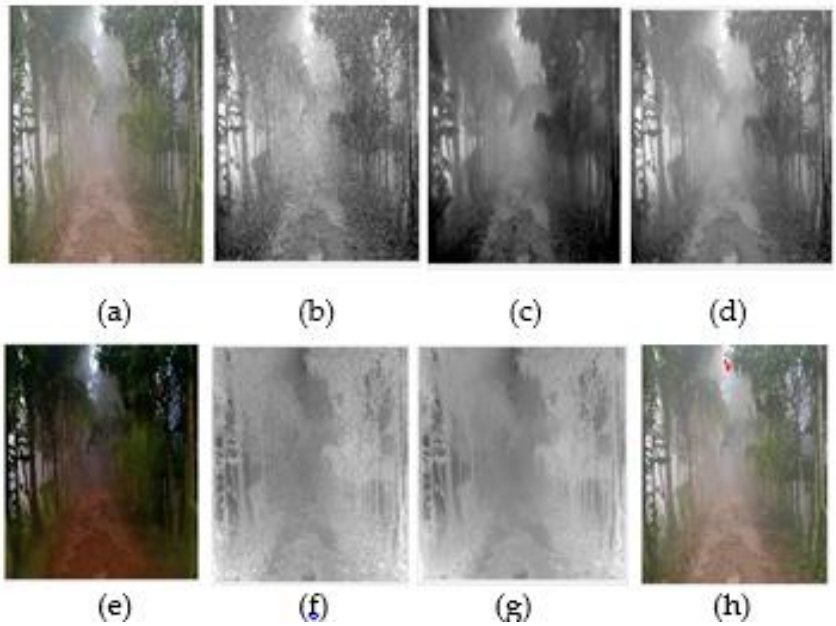

Figure 4. Some of the dehazing results

The sample hazy input image (a), Depth map-1 (b), Depth map-2 (c), Depth map- 3 (d), The Dehazed image (e), Transmission map -1 (f), Transmission map -2 (g), Position of atmospheric light (h).

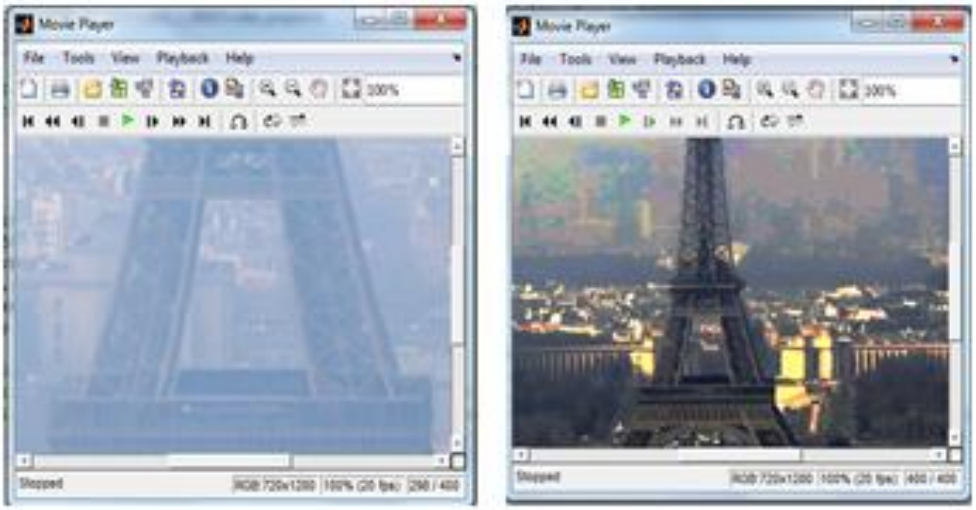

Figure 5. Dehazing result for Video

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

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Adarsh Institute of Technology & Research Centre, Vita, India

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Figure 6. Dehazing result for Car navigation

V. CONCLUSION

Analysis of Video and Image affected by weather phenomenon and environmental conditions (nothing but Haze), an algorithm is proposed as, 'Contrast Enhancement'. Contrast enhancement is a process that makes the video and image features stand out more clearly by making optimal use of the colours available on the display or output device. This algorithm is applied to the Image and video and then we moving towards the Real-time video, which can be used in surveillance system, in the field of Public safety. Video and Image quality can be clear by estimating the airlight. Then, the depth estimation process is used to identify the depth information of given input. Finally gamma correction technique is used to clear the quality or visual perception of image and video. Hence finally we have a result of pure, clear image and video which is visible to human eye.

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IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

Voice Controlled Wheel Chair Using Arduino

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Assistance professor, Electronics and Telecommunication, AITRC, Vita, India[4]

Abstract:.Physically challenged persons those who are suffering through different physical disabilities face many challenging problems in their day to day life for commutating from one place to another and even sometimes they need to have to be dependent on other person to move from one place to another. There have been many significant efforts over the past few years to develop smart wheel chair platforms that could enable the person for its ease of operation without any ambiguity. The main aim of our paper is to develop the smart wheel chair to make the life easier of physically challenged persons. This voice controlled smart wheel chair comes with enhanced features like electric powered, voice control, line follower with obstacle avoidance etc. The smart wheel chair control unit consists of Arduino microcontroller with , GPS module, ultrasonic sensor as obstacle detector and motor driving circuit for controlling motor's speed. For example when the user says "forward" then chair will move in forward direction and when we says "backward" then the chair will move in backward direction. Technically the wheelchair is integrated with an ultrasonic sensor for obstacle detection, voice recognition circuit to recognize the voice,a microcontroller which can be programmed supporting this hardware components.

Keywords*:* Voice control, Arduino, Ultrasonic sensor, Smart wheelchair.

I. INTRODUCTION

A smart wheel chair is a wheel chair which moves with the help of navigational controls and an electric motor instead of moving it using man power. The navigational controls are usually controlled with the help of a small joystick placed near to the arm rest, chin operated joysticks, head switches, eye blinks etc. that offers different operations to the wheel chair. Most of the physically disabled person uses traditional wheelchairs. They are operated by hands or by a second person if patient is unable to drive it. This is very difficult for that person if another person is not there for support. In that case there is always requirement of a second person. Thus the patients have to be dependent on another person. What will happen if wheelchair starts moving with audio input like forward, backward, left and right? The disabled person can move anywhere he wants without the help of second person and independently. There will be no need to use hands for moving the wheelchair. We are trying to implement this concept through our project "Smart wheelchair". The name itself indicates the meaning the wheelchair which is intelligent. This wheelchair takes commands from user and according to that it moves in required direction. The person who is unable to move chair by hands can move this wheelchair just by giving the commands. This is the boon for paralyzed people. Hence using this chair, the patient can go anywhere independently. This is economical and fully automated. Hence physically disabled people can use this wheelchair easily and live their life happily. In this paper, the design of a Smart wheelchair is presented. The main motivation for this design came through the feedback from personal experiences of several colleagues as well as rehabilitation centers of the local hospitals that many elderly patients are unable to use the electronic wheelchairs. This is primarily due to the fact that the types of illnesses common in this group of patients render damages to the motor system of the body affecting mostly arms and feet. Hence, using a joystick type control of an electronic wheelchair is almost impossible. It was however noticed that the speech remains mostly un-altered for these patients and hence it is used in this work to be the main controlling agent for the motion of the wheelchair . Many individuals have weak upper limbs or find the manual mode of operating too tiring. Hence it is desirable to provide them with a motorized smart wheelchair that can be controlled by voice recognition system. Since the motorized wheelchair can move at affair speed with minimum efforts.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

II. LITERATURE REVIEW

1.Wheelchair for physically and mentally disabled persons : This paper specifies about development of wheelchair that can be controlled by voice eye or joystick according to the severity of disability of handicapped person. It also features an alert system which analyzes the patient's physical conditions such as heart rate, temperature, etc. and informs the doctors about the same. This research paper focuses on the problems of handicapped person and tries to solve them in possible way. The limitation is that it has to be developed seperatly for each individual specified to its severity which increases its cost and time.

2.Solar powered wheelchair : This paper focuses on development of solar based wheelchair which helps in reducing the running cost of wheelchair. It is specially designed for hemi pelagic users to control the wheelchair efficientaly. The control of the wheelchair can be transferred to either side to facilitate the user. The wheelchair has considerable advantage but still limits from the factor that it has longer battery charging time and less ability to climb up the slope.

3.Design and implementation of an electric wheelchair : This paper specifies about high costing of the electric wheelchair and modifying the present electric wheelchairs to make it affordable to the common people. It put emphasizes on the utilization of resources available locally to reduce the cost of wheelchair. It uses set of DC gear motor PIC microcontroller and bridge module for controlling the movement of wheelchair. The limitation of this research is that cost of the wheelchair is still high for the poor people to afford it.

4.Manual Wheelchairs : These are the type of devices that help a person to move him without any assistance of battery. There are three types of manual wheelchairs namely self-propelled, attendant propelled, and wheelbase. A single-arm drive enables the user to turn either left or right while the two-armed drive enables user to move forward or backward on a straight line. Another type of wheelchair commonly used is a lever-drive wheelchair. This type of chair enables the user to move forward by pumping the lever back and forth .

5.Star climbing wheelchair : The stair-climbing wheelchair exists at present can be grouped into 3 categories: - continuous stair climbing wheelchair, intermittent-stair climbing wheelchair and auxiliary stair climbing wheelchair. Continuous stair climbing wheelchair has only one set of supporting device, the wheelchair relies on this supporting device for continuous motions. In Intermittent stair climbing wheelchair the process of climbing stairs of is similar to the people climbing up and down stairs, it is also called walking stair climbing wheelchair. Intermittent stair climbing wheelchair is one of the supporting devices that elevate the wheelchair and other set of support system. In auxiliary stair climbing wheelchair, the attachments rely on another device installed on the wheelchair and it needs assistance to help realize the function of climbing stairs. Stair lift requires wide stair way which is very expensive [4]

6.EMG based EMG measures electrical currents that are generated in muscles during its contraction. A muscle fiber contracts when it receives an action potential. The EMG observed is the sum of all the action potentials that occur around the electrode site. In almost all cases, muscle contraction causes an increase in the overall amplitude of the EMG. EMG signals can be used for a variety of applications including clinical applications, HCI and interactive computer gaming. They are easy to acquire and of relatively high magnitude than other bio-signals. On the other hand, EMG signals are easily susceptible to noise. EMG signals contain complicated types of noise that are caused by inherent equipment noise, electromagnetic radiation, motion artifacts, and the interaction of different tissues. Hence preprocessing is necessary to filter unwanted noise in EMG. The EMG signals also have different signatures depending on age, muscle development, motor unit paths, skin fat layer, and gesture styles. The external appearances of two individuals' gestures might look identical, but the characteristic EMG signals are different [9]. C. EOG base

7.Pediatric Wheelchair : These types of wheelchair provide a key-enabling technology to young children who would be unable to navigate independently in their environment. Standard powered wheelchairs are still heavily dependent on the cognitive capabilities of users. Unfortunately, this excludes disabled users who lack the required problem-solving and spatial skills, particularly young children. For these children to be denied powered mobility is a crucial set-back; exploration is important for their cognitive, emotional and psychosocial development [3]

8.Brain Actuated Wheelchair using Brain Wave Sensor : There is billions of interconnected neuron in human brain. The way, neurons are connected to each other depicts the various thought processes and emotional states. This pattern of neurons connection keeps on changing according to the human thought & process different electrical signals. For sensing these electrical signals, brain wave sensor is used that convert the data into packets- which are transmitted through bluetooth medium. Level analyzer unit (LAU) is used to receive raw data. The extraction and processing of the signal is done using Matlab platform. The control commands are transmitted to the robotic module to process. With this entire system, any robot can be moved according to the human thoughts and it can be turned by blink muscle contraction. By using this brainwave concept executed in wheelchair the handicap can easily controls wheel chair [20

IARJSET

ISSN (Online) 2393-8021
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International Advanced Research Journal in Science, Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

III. METHODOLOGY

Block Diagram:

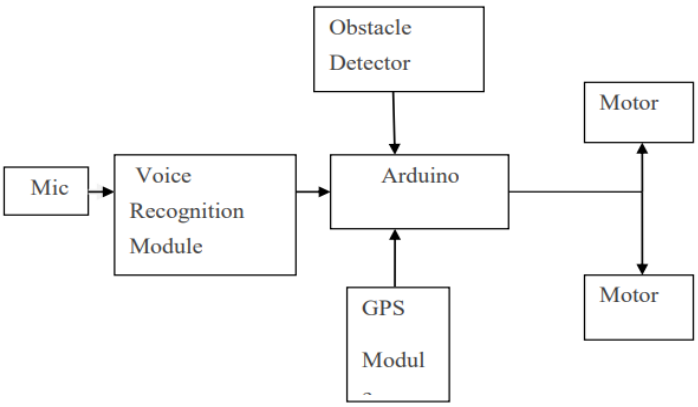

Fig. Block diagram of voice controlled wheel chair

Voice recognition system

Firstly voice recognition module means a system for computer analysis of the human voice, especially for the purposes of interpreting words and phrases or identifying an individual voice. Here we have to use a voice recognition module to detect and convert detected voice command into binary signal.

Voice Input

Spell voice input for further processing is the first step of voice recognition. As the proposed system for voice recognition is based on voice of person with physically challenged person to move inside the home without any difficulty.

Input is taken through microphone. speech signal is processed with the help of visual basic software and is transfer to the microcontroller. It converts these instructions into certain commands that can be recognized by the motors. This controls the movement and direction of wheelchair through motor driver. Microcontroller decides the operation of the two DC motors depending upon the given instructions.

Firstly, voice module is trained with 4 commands. After that the voice command is send by the user. The microcontroller is used to check the signal associated with this command and compare it with the stored commands and performs the task related to this command.

When the voice is detected, the wheelchair can be controlled to move in that direction by giving commands to the wheelchair. These commands are transferred to the wheelchair using electrical signals which are used to drive the left or right motor of the wheelchair.

IARJSET

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International Advanced Research Journal in Science, Engineering and Technology

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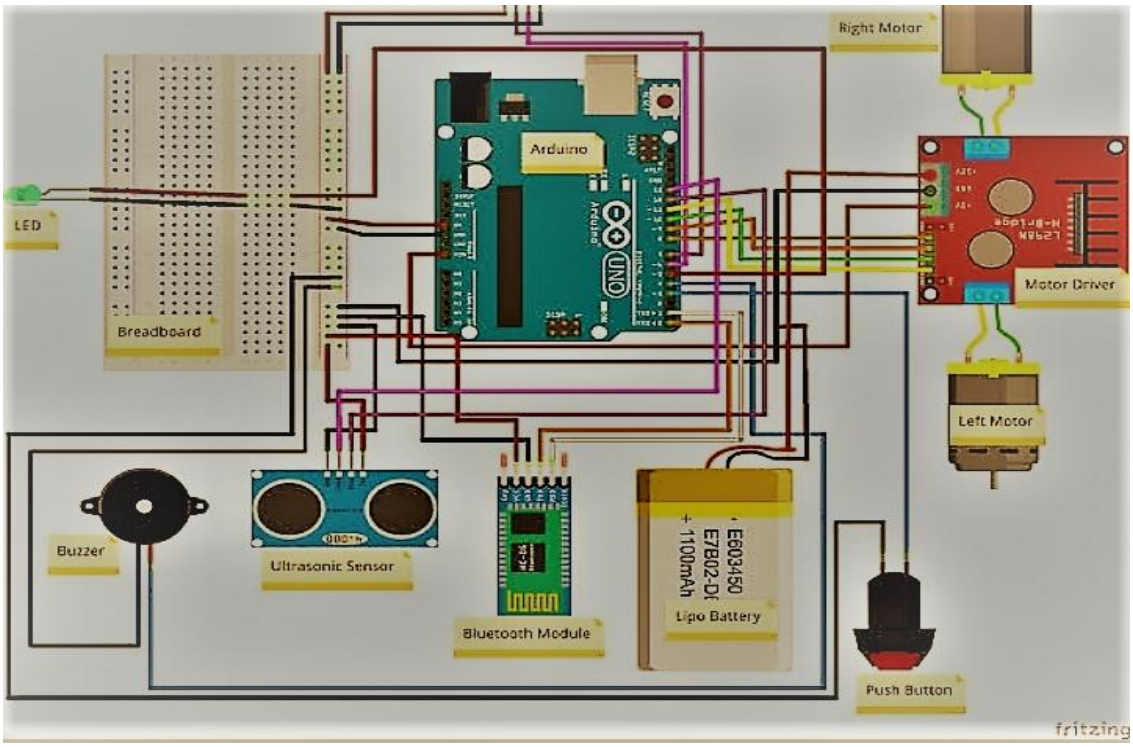
IV. RESULT

The "Voice Recognition based smart wheelchair" prototype is successfully developed. Priority based overriding of control is also fully operational and working.The implemented software is uploaded on the Arduino board then the prototype is checked using voice module. The proper interfacing of all components according to the circuit diagram gives us hardware circuitry for prototype wheelchair with voice control.The hardware and software implementation is done properly.

The motors are used in are of 12V rating and 60 RPM speed.Using the voice recognition module , user can control the movement of chair by sending the voice commands such as forward, backward, and left and right.Ultrasonic sensor helps to know any obstacle comes in the path while moving and gives signal. GPS module tracks the location and sends signal. Motor drivers used for driving purpose of both the DC motors.Wheelchair is integrated with voice so that handicapped people who cannot walk , who does not have hands can move chair by voice commands through mic.

This wheelchair brought happiness in lot of lives by making their life easier.



V. CONCLUSION

This paper presents a summary of current state of the art smart wheelchairs. Various techniques are available to operate and control the wheel mechanism of wheelchair. Some of operating techniques of wheelchairs have been explained here. This information is gathered to promote awareness of status of existing type of smart powered wheelchair so that the improvement can be incorporated in it.

Our proposed wheelchair provides a safe and reliable system with presence of GPS module and obstacle detector It provides an easily accessible and variety of functionalities. In this paper , we developed wheelchair system which includes ultrasonic sensor to automatically track the paths to provided and also detects the obstacles in between the track along with a little intelligence of taking proper care to avoid the accidental mishaps, where we got the desired results.

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IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

Automatic Unauthorized Parking Detector with SMS Notification to Traffic Police and Owner

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Abstract: India has huge population, there are huge numbers of vehicles present in India. These leads to traffic jam are one of the key issues due to unauthorized parking in the jam or public place. Likewise in the city most of the streets traffic jams exist because of the illegal parking on parking on the roads. To avoid these kinds of traffic problems, we have developed a project which is help to detect the vehicles in the restricted zone. It can be resolved by identifying the vehicle parked in no parking area and send a notification to the nearby traffic police booth regarding unauthorized parking with use of implemented of raspberry pi and RFID reader to classify and identify illegal parked vehicles based on camera picture live parking area. These pictures send a notification to traffic police and owner.

Keywords*:* Raspberry Pi, Restricted Area, Vehicles, ATMEGA328, RFID Tag, RFID Reader, Camera

I. INTRODUCTION

In the modern world everywhere, we can see the different technology for different purpose. To using the proper technology, it is very easy to make our lives easier. The parking system also need the automation like another field. The increased population and growth of private vehicles is not available easily cause of this some people choose the way of restricted area which is illegal. The vehicles which are parked in restricted area is not only illegal but also this is the major causes of traffic jam. The traffic jam waste our energy as well as our valuable time. The concept is identifying for reducing the traffic jam and remove the burden on traffic management.

The main inspiration behind this project was to secure the parking area and reduce system loss in parking lot. The aim of this reduces the traffic jam and generated a penalty if the vehicle parked in restricted area. In this project we can identify the illegal parked vehicle and send a SMS notification to the nearest traffic police booth and collect the penalty from owner's bank account once the penalty is recovered from owner's bank account the SMS can be send to the registered mobile number.

II. LITERATURE REVIEW

1. In today's life time act as every important role everyone is running behind the time because everyone has to do more tasks in less time and everyone knows the value of time but also its bitter truth. The average Indian span their 90 to 120 min of time in traffic jam and one of the main reasons of traffic jam is parking of vehicles on non- prohibited areas because day by day vehicles are increasing on rapid speed and us country is ranked on 6th position in world on using cars but areas are less and everyone is not capable to pay reserved parking so most of people move towards road to park their vehicles, but it effects on other peoples because when a person parks their vehicles on the road.it become congested and get less space for driving vehicles. Sometime vehicles are parked on one lane road and if some vehicles come behind the parked car, he has to wait for the driver to remove his vehicle. other thing is to tow the parked vehicles from illegal area the traffic police have to search each lane of roads to find the vehicles. So, to solve these problems we are developing a system that facilitates the traffic police to easily search the illegal parked vehicles and avoid congestion on road and can make E-Chalan to make discipline. The problem of illegal parking is not simulated for traffic police only, many organizations, Apartments, Schools, Courts and many private Companies too. The system also helps the organizations to avoid the illegal parking in front of their gate. The hardware is based on Raspberry pi 3, some ultrasonic sensors, camera, servo motor etc. Since the entire process of sensing the vehicles are automated it reduces the possibility of human error substantially. Also, the system has a feature to take real time image as well as address of vehicles which well be sent to traffic police so he can the command to the subordinates to capture the vehicle.

2. With decreasing costs of high-quality surveillance systems, human activity detection and tracking has become increasingly practical. Accordingly, automated systems have been designed for numerous detection tasks, but the task of detecting illegally parked vehicles has been left largely to the human operators of surveillance systems. We propose a methodology for detecting this event in real time by applying a novel image projection that reduces the dimensionality of the data and, thus, reduces the computational complexity of the segmentation and tracking processes. After event detection, we invert the transformation to recover the original appearance of the vehicle and to allow for further processing that may require 2-D data. We evaluate the performance of our algorithm using the I-LIDS vehicle detection challenge datasets as well as videos

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

we have taken ourselves. These videos test the algorithm in a variety of outdoor conditions, including night time video and instances of sudden changes in weather.

3. This paper proposes a cost-effective vision-based outdoor illegal parking detection system, icon Park, to automatize the detection of illegally parked vehicles by providing real-time notification regarding the occurrences and locations of illegal parking cases, thereby improving effectiveness of parking rules and regulations enforcement. The icon Park is implemented on a Raspberry Pi with the use of Convolutional Neural Network as the classifier to identify illegally parked vehicles based on live parking lot image retrieved via an IP camera. The system has been implemented at a university parking lot to detect illegal parking events. Evaluation results show that our proposed system is capable of detecting illegally parked vehicles with precision rate of 1.00 and recall rate of 0.94, implying that the detection is robust against changes in light intensity and the presence of shadow effects under different weather condition, attributed to the superiority offered by CNN.

III. METHODOLOGY

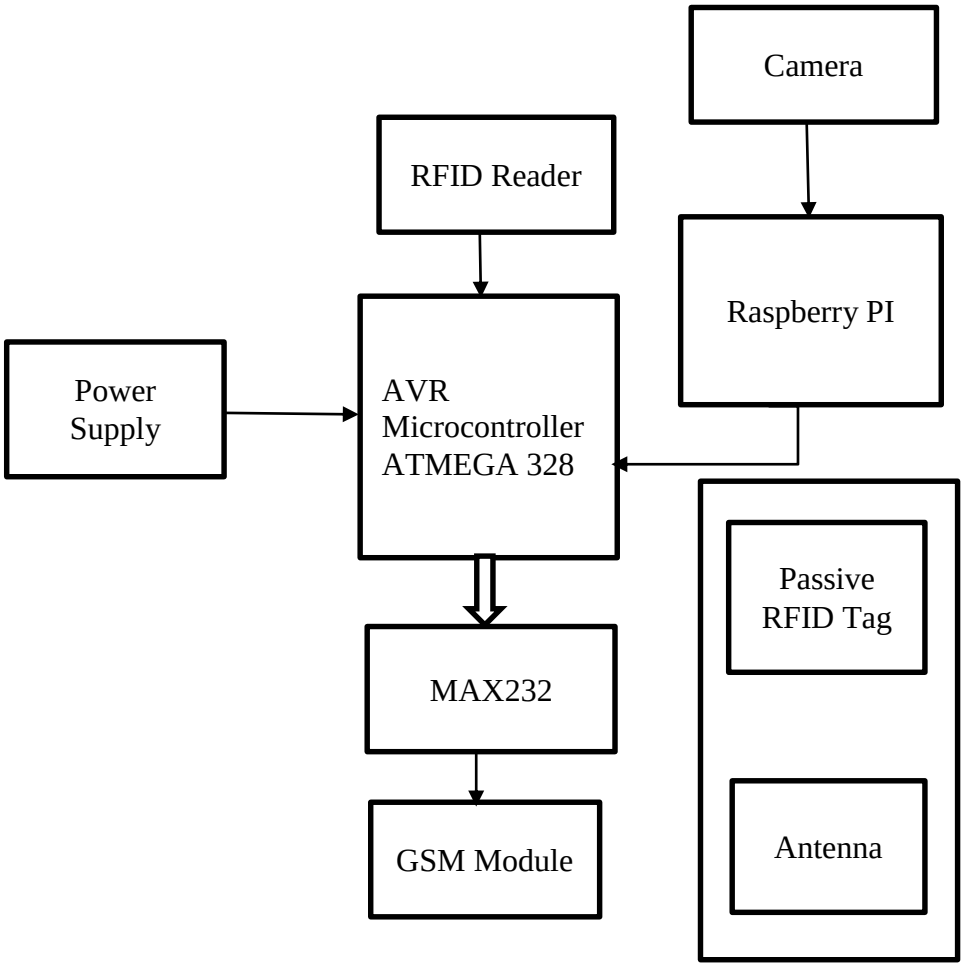

Fig1. Block diagram of Automatic Unauthorized Parking Detector with SMS Notification to Traffic Police and Owner

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

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Flowchart:

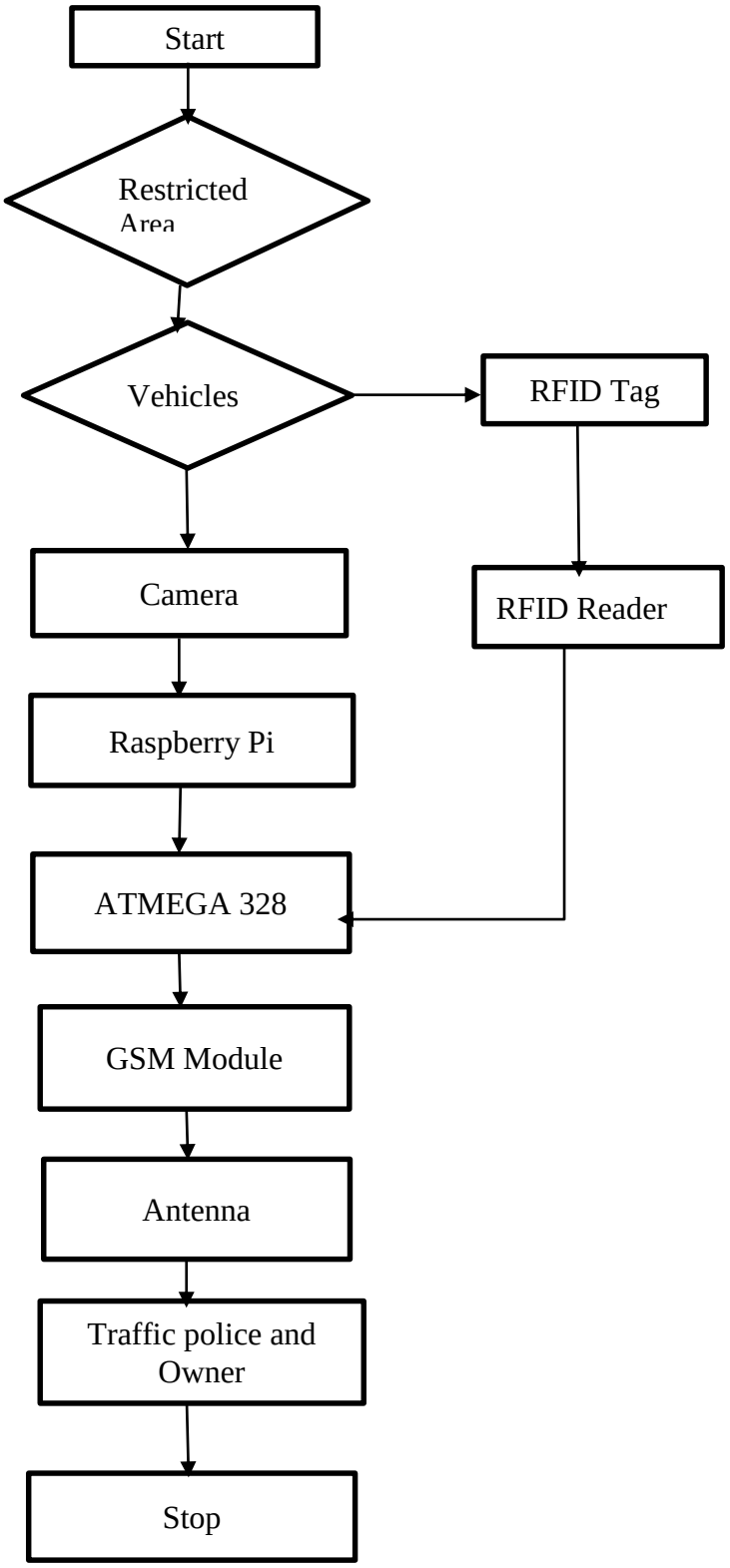

Fig2. Flowchart of Automatic Unauthorized Parking Detector with SMS Notification to Traffic Police and Owner

IARJSET

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International Advanced Research Journal in Science, Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

Step1: RFID Reader read the RFID Tags:

When vehicle in parked in no parking area then the RFID reader reads the RFID Tag. This sends to ATMEGA328.

Step2: The camera clicks a real time image:

When a vehicle does not have a RFID tag then the camera clicks the image and send it to raspberry pi. the raspberry pi performs a image processing then processed image send to a ATMEGA328 microcontroller.

Step3: Microcontroller receives the signals:

Microcontroller receive these two data from RFID reader and Raspberry pi. Then these two received data send to MAX232.

Step4: MAX232 work as a communicator:

MAX232 are communicate between microcontroller and GSM Module. This IC converts CMOS logic level to RS232 logic levels during the process of serial communication.

Step5: GSM Module send a information to traffic police through antenna:

GSM Module receives the signal from MAX232 and send it to traffic police using antenna through GSM module.

Step6: Traffic police take an action:

When GSM Module send a SMS to traffic police then from owners account the fine is cut automatically and send SMS notification to owner.

Hardware And Software Used:

1. AVR ATMEGA328 MICROCONTROLLER:

The ATmega328 is a single-chip microcontroller created by Atmel in the megaAVR family (later Microchip Technology acquired Atmel in 2016). It has a modified Harvard architecture 8-bit RISC processor core. The Atmel 8-bit AVR RISC-based microcontroller combines 32 KB ISP flash memory with read-while-write capabilities, 1 KB EEPROM, 2 KB SRAM, 23 general-purpose I/O lines, 32 general-purpose working registers, 3 flexible timer/counters with compare modes, internal and external interrupts, serial programmable USART, a byte-oriented 2-wire serial interface, SPI serial port, 6-channel 10-bit A/D converter (8 channels in TQFP and QFN/MLF packages), programmable watchdog timer with internal oscillator, and 5 software-selectable power-saving modes. The device operates between 1.8 and 5.5 volts. The device achieves throughput approaching 1 MIPS/MHz

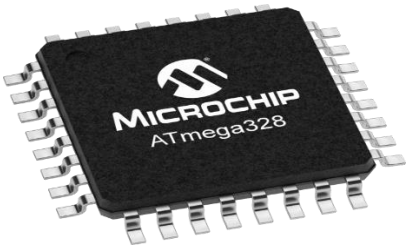

Fig3: AVR ATMEGA328 MICROCONTROLLER

2. RASPBERRY PI:

Model 3B+ was launched with a fast 1.4 GHz processor and three times faster gigabit Ethernet (throughput limited to ca. 300 Mb by the internal USB 2.0 connection) or 2.4 / 5 GHz dual-band Wi-Fi (100 Mb / s). Other options are: Power over Ethernet (Po E), USB boot and network boot (an SD card is no longer required) The Raspberry Pi 3+ uses a Broad com BCM2837B0 So C with a 1.4 GHz 64-bit quad-core ARM Cortex-A53 processor, with 512 KB shared L2 cache. This was suggested to be highly dependent upon task threading and instruction set use. Benchmarks showed the Raspberry Pi 3 to be approximately 80% faster than the Raspberry Pi 2 in parallelized tasks. Overclocking for 3b+ model is Pi 3; has advanced features which includes it has inbuilt wi-fi module which reduce the need of additional wi-fi module. In system information the CPU speed will appear as 1200 MHz When idling, speed lowers to 600 MHz Raspberry pi 3b+ has 1gb RAM. The Raspberry Pi 3B+ includes dual-band Wi-Fi, Bluetooth 4.2, and Gigabit Ethernet, USB 2.0

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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compatibility. Raspberry pi 3 can be connected to or used with USB mouse and Keyboard and any monitor or display which has HDMI input port.SD card can be used for storage in raspberry pi. It has 40 I/O pins and divided into two modes. First is the board mode and other is SMP mode. We have used SMP because this mode provides more of numbers input output pi.

Fig4: Raspberry Pi

3. GSM Module:

GSM stands for Global System for Mobiles. This is a world-wide standard for digital cellular telephony, or as most people know them Digital Mobile Telephones. GSM was created by the Europeans, and originally meant "Groupe Special Mobile", but this didn't translate well, so the now common more globally appealing name was adopted. GSM provides recommendations, not requirements. The GSM specifications define the functions and interface requirements in detail but do not address the hardware. The reason for this is to limit the designers as little as possible but still to make it possible for the operators to buy equipment from different suppliers. The GSM network is divided into three major systems: the switching system (SS), the base station system (BSS), and the operation and support system (OSS).

Fig5: GSM Module

4. Camera:

We have used INTEX IT-306 WC camera which have frame rates up to 30fps. It is 30Mega Pixel's camera with 1/7 CMOS sensor. It has night vision so we can take image of vehicles at night to. It has features such as video recording, motion detection, plug and play, adjustable brightness and sharpness. Resolution of this camera is 3280 x 2460. This camera will be stuck at the top of hollow tube which will rotate 360 degrees with the help of motor.

Fig6: Camera

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ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

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Software Used:

Programming Language: Embedded C

CONCLUSION

By publishing this paper, we would like to share our idea to traffic police department and government concern to minimize the traffic issue. We will believe that this project concept is very useful to the reduces the traffic problem and collect automatic penalty from respective person.

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IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

Advanced Irrigation System Using Solenoid Valve and Sensors

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Abstract: Agriculture plays a vital role in the Indian economy. Over 70% of the rural households depend on agriculture as it contributes about 17% to the total GDP. The irrigation agriculture helped to enhance agricultural production and ensured more income to the Indian Farmers. Rainfall and water availability has huge regional imbalance in India. Competing demand for water is increasing rapidly, over exploitation of surface water leading to some drainage problems, Irregulation of electricity and Irrigation efficiency is very poor. Due to these issues farmer suffer. To overcome all these problem we have designed a system named Advanced Irrigation System Using Solenoid Valve and Sensors. This advanced irrigation system is a farmer-friendly irrigation system, which is completely automated. This system runs without intervention of humans. The system design also has the features of which make the system wireless with the help of GSM. This project provides better services to the farmer. In this system rain sensor, temperature sensor, soil moisture sensor, humidity sensor, electrochemical sensor and voltage sensor are used. Pump is used to suck the water from well. To control the solenoid valve Arduino kit is used. As well as water sucking capacity of soil is fulfill that time sensor send signal to Arduino to turn off the valve and with the help of GSM valve operate automatically. This system keeps your lawn and landscape beautiful and healthy. It also helps in reducing the amount of water getting waste. Thus this irrigation system is used for automatic irrigation, best time complexity and non-intervention of humans.

Keyword: Arduino, GSM, Sensors, Solenoid valve, Agriculture.

I. INTRODUCTION

Agriculture depends upon various factors such as quality of soil, water content, pH value and sunlight. All these quantities should be provided in a specific quantity to ensure the proper growth of the plant in the soil. So, the water content and water flow is automated and controlled using this project.

The rainfall in our country depends on monsoons. Rainfall controls agriculture, but the agriculture is said to be “the gambling of monsoon” as the monsoon rainfall are uncertain, irregular and uneven or unequal. So irrigation is essential for agriculture.

The importance of irrigation is high in India where the agriculture industry is one of the top in the country and agriculture is dependent on rainfall. This possesses a problem of uneven and uncertain water in soil. We use an Arduino UNO controller along with Soil moisture sensor, Temperature sensor, Humidity sensor, Electrochemical sensor, Rain sensor, Voltage sensor, Solenoid valve, Battery backup, dc water pump and GSM module to solve our problems.

The soil moisture sensor consists of two leads that are used to measure volume of water content in soil. These leads allow the current to pass through the soil and in return calculate the resistance value to measure the moisture level. If there is more water in soil then soil will conduct more electricity, means less resistance value along with high level of moisture. In the same manner if there is less water in soil then soil will conduct less electricity, means high resistance value along with low level of moisture.

In India, agriculture plays an important role for development in food production. In our country, agriculture depends on the monsoon which is seasonal and uneven distribution. There is a high cost of lying down wells, canal and tanks. Tubewells have lowered the groundwater table. Insufficient rain can ruin the crops. Many relays on Diesel pumping for irrigation which is costly. Soil, seed, manure, insects, crop damage, these are some major problems that could occur in farming.

In our traditional agriculture our presence is needed at field at time of irrigation. But in our project, we don’t need human intervention. We avoid human intervention by using solenoid valve which replaces the traditional valve and by using GSM module we can ON/OFF the motor from home. Sometimes due to over irrigation or lack of irrigation crops die, but through this project we can avoid this condition by using soil moisture sensor, humidity sensor, rain sensor, and temperature sensor. We can also know the pH of soil, the minerals in soil with the help of electrochemical sensor.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

II. METHODOLOGY

The explanation of block diagram advance irrigation system is as follows:

In advance irrigation total operation carried out with the help of mobile phones. In our system we are using GSM, Arduino, relay driver and solenoid valve to form the circuit. GSM used for global communication, Arduino used for controlling action, relay driver used to give corrective action i.e. either ON/OFF.

In this system suppose we send message to pump for turning ON the pump that GSM used in pump circuit receives that message and send to the Arduino and Arduino send message to the relay circuit, with help of relay circuit corrective action is take place. During turning on the pump we have to take one precaution that is nothing but before going to start pump we have to start valve.

Suppose in running condition water from well will get empty that time level sensor turn down and pump will OFF automatically. As we on solenoid valve then water flow in the corresponding plot of farm.

In this way this is simple useful and user friendly system using GSM, Arduino and relay circuit.

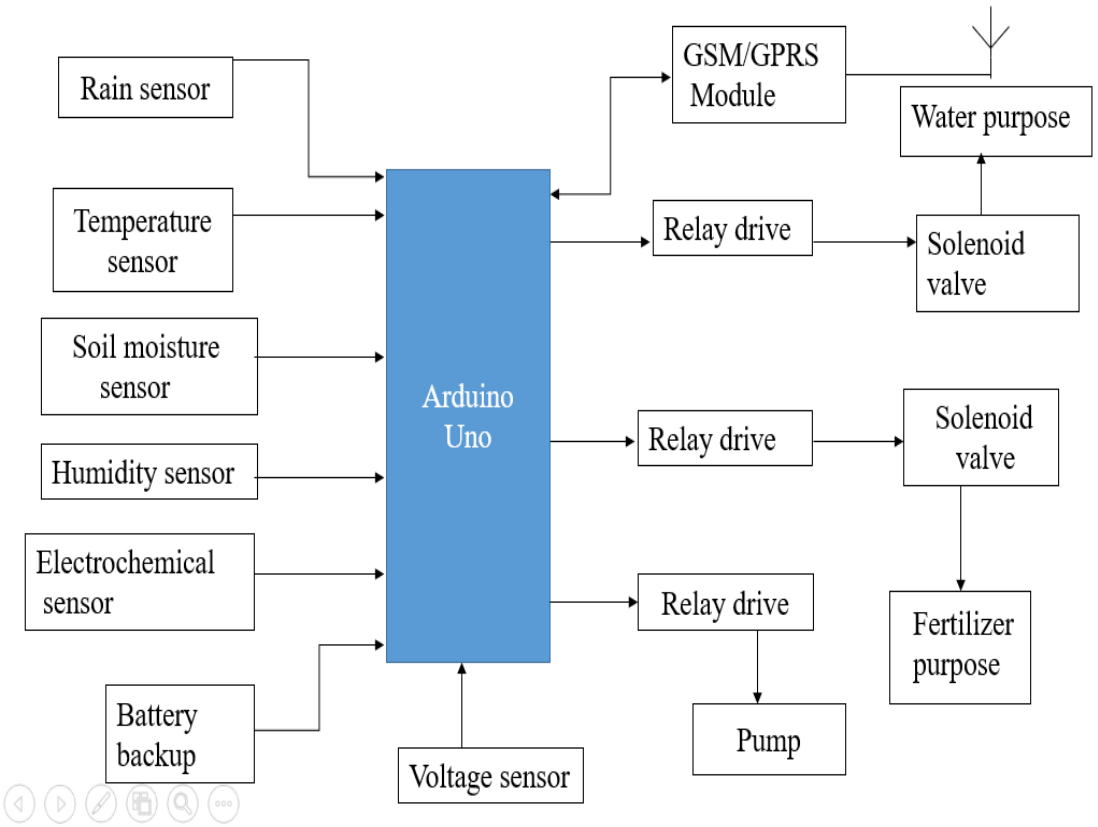

Fig. Block diagram of Advanced Irrigation Sytem

Hardware and Software to be used

Hardware

1. Arduino UNO
2. GSM Module
3. Solenoid valve
4. Soil moisture sensor
5. Humidity sensor
6. Temperature sensor
7. Electrochemical sensor
8. Rain sensor
9. Voltage sensor

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

Software

Arduino UNO

III. RESULT

The aim of this project to develop a system to track a broad area with the help of GSM model attached to microcontroller for remote communication. The sensors used to stay updated on soil conditions according to environment and solenoid valve regulate the flow of water. Following are the images of the implemented project.

Fig. a. Solenoid Valve

Fig. b. Connection of Solenoid Valve

Fig. c. Solenoid Valves

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

IV. CONCLUSION

In the case of traditional irrigation System water saving is not considered and human intervention is required. Traditional Irrigation is a time consuming process. To solve all issues we are presenting a system named Advanced Irrigation System Using Solenoid Valve and Sensors. This system allow irrigation of field without human intervention. This system is feasible and cost effective for optimizing water resources for agricultural production. It avoid the problem of large spatial difference of soil moisture and lagging irrigation decision.

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IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

Design & Fabrication of Air Pollution Detector

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Abstract: Air pollution can have devastating effects on the environment and human health due to the release of lethal gases from elevated levels of breathable particulate matter in vehicle exhaust, factories, and the atmosphere. It has a negative impact on ecosystems, human health and climate change. Therefore, it is necessary to monitor the level of pollutants in the atmosphere. In this article, we developed an Arduino microcontroller-based air quality monitoring system to measure various atmospheric parameters. Carbon monoxide, temperature, humidity, and methane with suitable sensors. The measurements were based on parts per million (PPM) metrics and the data was collected via a sensor-based LCD / serial monitor for analysis of the results. Both graphical and numerical forms of the results give users a better understanding of the levels of pollutants in the air so they can take the necessary actions.

Keywords: Arduino UNO; Pollution; Poisonous Gas**;** Sensors; Pollution Monitoring

I. INTRODUCTION

Air is an essential element for human life, which contains gases such as nitrogen (N2), oxygen (O2), carbon dioxide (CO2), carbon monoxide (CO) and some very rare . Any change in the natural composition of the air can be harmful to human health. Air pollution has become one of the main threats to modern civilization and is the fourth leading risk factor for premature death in the world. This pollution both hinders economic development and causes a lot of human suffering. The main source of air pollution in all major cities is vehicular traffic and the second major source remains industry. Vehicles pollute the environment and lead to respiratory complications such as asthma, lung cancer, skin rashes, stroke and heart disease. Due to this decline in air quality, urban living has become a major cause of concern worldwide. Air pollution is increasing due to a number of human activities and its monitoring is of vital importance to mitigate some control measures. A recent Indian study found that about 40% of school children had poor lung conditions among the 2,000 surveyed school children aged 814 across all parts of India. Several cities across India are considered among the most polluted in the world. According to the

World Health Organization (WHO), every year around the world millions of deaths are caused by air pollution . The National Air Quality Monitoring Program (NAMP) also does not provide guidelines for reducing deaths . Smart cities provide smart technology to ensure quality of life. Therefore, to achieve sustainability and provide safe living, governments are developing smart cities. Here, the proposed system has been developed using commercially available high-precision sensors to measure specific pollutants and atmospheric parameters. Sensors are used to detect various pollutants in the atmosphere, temperature and relative humidity. Data from all sensors is read by the Arduino based microcontroller and processed before being displayed on the local display unit.

System Setup

This system consists of hardware and software. Arduino IDE software is required to program the sensor connected to the Arduino. It shows a simple block diagram of the monitoring system developed.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

II. LITERATURE REVIEVE

Jyothi K N, Et . al.[1] Presented an article titled `` Air Quality Monitoring System` This article introduces the research on sensor MQ135 which can detect NH3, NOx, alcohol, benzene**,** smoke, CO2 and some other gases. So it is a perfect gas sensor for our air quality monitoring project. This system is used to send gases like benzene, alcohol, smoke, etc. using MQ135 gas sensor**.** to monitor the atmosphere of the environment using the Arduino microcontroller.

Priti Rane et , al .[2] Presenting the paper titled "IOT-Based Air Pollution Monitoring System" This paper introduces the research of an IOT-based air pollution monitoring system, an air quality monitoring system on a web server using the Internet and triggering an alarm when the air quality drops - above a certain level, **i.e.** when there are quantities of harmful gases present in the air such as CO2, smoke, alcohol, benzene, NH3, NOx and LPG.

Md. Zakir Hossain et, al .[3] Presented a paper titled "Arduino-Based Real-Time Pollution and Air Quality Monitoring System**".** This paper presents a study on the design of an Arduino-based air quality monitoring detection system in relation to hardware and connectivity and finally **a** collection of sensor data via Arduino code**.** To get real-time air pollution data (in PPM), we made measurements using our custom sensor detector in different pollution scenarios

.

Raju Kannadasan et, al. [4] Present an article with a title. "Design of a low-cost air quality monitoring system using Arduino**".** This paper presents the research work of the system operating reliably in all experimental settings**.** With this system, a mobile application that can be easily deployed to monitor air quality across the spectrum can be developed, thereby improving the health of the population**.**

Poonam Pal et ,al [5] Introducing the paper titled **"**IOT-Based Air Pollution Monitoring System Using Arduino"**.** This paper introduces the research project of air environment monitoring system using Arduino microcontroller, proposed IoT technology to improve air quality**.** The use of IoT technology improves the monitoring of various aspects of the environment**,** such as the air quality monitoring problem proposed in this paper.

Wei Ying Yi et al [6] Presenting the paper titled "Investigation of air pollution monitoring system based on wireless sensor network". This paper presents the research work on air pollution as a serious environmental problem due to its far-reaching impacts on public health, the global environment and the global economy. Urban air pollution tends to be unevenly distributed, creating a need for pollution monitoring with high spatial-temporal resolution, which conventional air pollution monitoring systems cannot. provided due to data limitations and scalability of systems. Using advanced sensor technology, microelectromechanical systems (MEMS) and wireless sensor networks (WSNs), researchers are advancing the concept of a next-generation air pollution monitoring system. "TNGAPMS"**;** to the limit and has made great progress.

Snehal Sirsikar et , al. [7] Presented a paper titled "Review of Air Pollution Monitoring System`**.** This paper introduces the work of **.** Air pollution monitoring by wireless sensor network**.** has several advantages over traditional environments.Wireless sensor networks have their own advantages**,** such as low cost, easy setup**,** and providing real-time pollution data. appropriate stratification and management**,** but if the system can segment pollution levels by area**,** it can be better monitored and can provide better solutions.

Pramod Sharma et , al . [8] Presenting a paper titled "Research on IOT Based Air Pollution Monitoring System" This paper presents research on air quality **as** a fundamental issue that clearly affects human well-being**.** Air quality data **is** accumulated remotely from control stations that come with an assortment of steam weather sensors. These data are studied and used as one element of an obsessive estimate of pollution using an accurate machine-to-machine organization**.**

Marin Berov Marinov, et al [9] Presenting article an titled **"**Air Quality Monitoring System **"** This paper presents the research work of In this paper, the design of a virtual air quality monitoring system has been discuss**.** The system was designed and built using a tin dioxide gas sensor, an integrated sensor**, a** portable modular DAQ**,** and Lab VIEW graphical software**.** The virtual system developed is portable and affordable because it is small and cheap

Trentham Rao et, al. [10] Presented a paper titled "Air Pollution Monitoring Using Wireless Sensor Networks: A Comprehensive Review `. This paper affords researched paintings of Air pollutants is evolving as a extreme environmental subject because of its great effect at the well being of the human beings usual surroundings and additionally on the worldwide economy. Conventional air pollutants structures aren't capable of offer air pollutants facts of excessive spatiotemporal decision because of no scalability and confined facts availability. Air pollutants is majorly contributed with the aid of using the industries and vehicle vehicles. Hence there's a want to research and increase real-time, non-stop air pollutants tracking structures of low price and **power** efficient. There is a want of presenting new techniques in destiny to lessen Air pollutants with the aid of using introducing the right controlling mechanisms. In the prevailing review**,** numerous troubles and demanding situations confronted with the aid of using the researchers for the duration of the implementation of the present structures have been presented.

III. CONCLUSION

In this article, our team has designed and manufactured a system simply to measure the data of air pollution of various gases in the various sectors as measured in the house, measuring quality outdoor gas and for other applications. The system is designed to measure and display data on the LCD screen.

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IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

Design and Development of Automatic Head Light (Upper and Dipper) Assistant for Driver

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Abstract*:* The purpose of our project is to minimizing the problems of road accident in night. According high beam output will be selected when no other traffic is present and will turn low beams output will be selected when the vehicle is in a well it urban area. The main reason behind accidents is the improper focus of headlight is not at proper position. If asked one should always mention that the time that the right driving is very cumbersome due to dazzling light problem frequency dipping of headlight by manual means that often cause fatigue to the driver particular at the time of peak traffic. Automatic upper dipper is the latest convenience in today's cars. This eliminate the need for the driver to manually switch off the dipper beam in most driver situation. The automatic upper dipper system reacts like the human eye to heading of incoming vehicle and independency turn upper beam to dipper beam when needed such a system offers both safety and conveniences. To overcome this manual dipping problems and automatic mechanism which notifies the upcoming vehicles that, their headlights is affecting our eyes and according to their response our smart light assistant circuit decides whether our headlight should be in dipper mode or upper modes.

Keywords*:* Automatic Head Light, Smart Assistant, Upper and Dipper.

I. INTRODUCTION

The requirement of headlight is very common during night travel , driver safety & assistant system plays on important role in automobile industry. The accident rate is increasing year by year. In 2012 world accident report india ranked first which is over 1,30,000 death annually by over taking china most of the accidents are happened in inght due to glaring effect to eyes due to upper mode of headlight of coming vehicle. Adaptive headlight plays and important role during night travel.The same headlight which assists the driver better vision during night travel is also responsible for many accidents that are being caused. The driver has the control of headlight which can be switched from high beam (bright) To low beam (dim). The headlight has to be adjusted according to the light requriment by the driver. During pitch black conditions where there are no other sources of headlight, high beam is used to on all other cases, low beam preffered. But in a two way traffic there are vehicles plying on both sides of the road so when the bright light from the headlight of a vehicle coming from the opposite direction falls on a person, it glares beam of a certain amount of time. While driving a car in night a problem like many drivers do not dip the headlamps of their vehicles in night while approaching. The switching operation is used to dip the head light which may distract the concentration. Automatic upper dipper is the latest convenience in today's cars. This eliminate the need for the driver to manually switch on or switch off the dipper beam in most driving situations. The automatic upper dipper system reacts like the human eye to headlight of incoming vehicles and independently turns upper beam to dipper beam when needed. Such a system offers both safety and convenience.

II. LITERATURE REVIEW

G.M. Pushpanjali, et al.[1] Presented a paper titled, 'Automatic Headlight Dipper with Respect to Upcoming Vehicles Response' Sensing the opposite vehicles bright headlights automatically and after giving them a notification and according to their response whether they dipps their headlight or not our circuit decides whether our headlight should be in upper mode or dipper mode. The extent to which glare is a problem for night driving is not easily quantified. In the fig.2 the statistical data of accidental report of Asia due to troxler effect or glaring effect. By using this circuit our driving will result in smooth and happy driving with negligible risk of accidents.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

Abhishek Vaishnav, et al.[2] Presented a paper titled, 'Automatic Dipping System for Vehicles Headlight' Newer and better technologies always come with time and it will help in reducing the manual labor and difficulties in the sectors where it is made use. And in our case, the auto dipper can perform a great deal in reducing the manual efforts and fatigue of drivers in dipping the headlamp frequently while driving through highways full of moving vehicles. However, vehicles employed with automatic dippers are not very often seen in our cities and it may be due to lack of information about the system and also because of giving dedication to the people saying that it is not at all practicable in our highways. Yes, of course it has got some drawbacks like that one which is most common, when we drive the vehicle fitted with automatic dippers on a road in which different types of vehicles and hence varying light intensities cause frequent flickering of the headlight. And also the operation of the system eliminated or reduced by devising newer methods and technologies. The one nowadays available is only useful in highways and straight width roads. Truly speaking, auto dippers are devices, which will attain more and more importance in the forthcoming years. In short, it is a device with a very bright future. The number of vehicles and the condition of the roads are improving very fast and the day is near, when the driving regulation, nature of traffic etc., are growing up to the levels which is already there in countries like America who successfully using auto dippers in their highways. An auto dipper could play a crucial role in shifting the headlights from driving beam to meeting beam and vice versa. This will improve visibility by minimizing glare, a major cause of momentary loss of vision. The realization of the ultimate goal of total road safety through creating ideal visibility conditions is dependent on efforts in all other related areas mentioned above. Glower during driving is a serious problem for drivers. This is caused due to the sudden exposure of our eyes to a very bright light; the bright headlights of vehicles in this case. This causes a temporary blindness called the Troxler effect. Eventually, this becomes the major reason for night accidents. The driver should actually turn down the bright lights immediately to avoid glare to the other person which is not happening. Hence, is the idea for the design and development of a prototype circuit called the automatic headlight dimmer. It gives the driver to use high beam light when required. But is automatically switches the headlight to low beam when it senses a vehicle approaching from the opposite side. The circuit consists of simple and economical components which can be easily installed. The working and implementation of the prototype are discussed in detail. The effects of bright light on the human eye are also studied. Thus, the implementation of this device in every vehicle in future will not only avoid accidents but also provide a safe and a comfortable driving.

P. F. Alcantarilla, et al.[3] Presented a paper titled, 'Automatic LightBeam Controller for driver assistance' In this paper, we have presented a night-time detection computer system for driving assistance. On the one hand, the system performance is satisfactory for head lights (detection range up to 300–500 m) but on the other hand, the performance for tail lights (detection range up to 50–80 m) must be improved. One advantage of the system is that works in realtime conditions. The computation time spent on processing one input frame depends on its road scene complexity and the number of blobs. In average the processing frame rate is close to 20 fps, which satisfies real-time demands. The classification mistakes between vehicles and road signs, are very low (PD = 0.9458, PFA = 0.0659), and can be improved considering more distinctive invariant features and increasing the size of the training and test data. The results are encouraging, and we plan to include some improvements to the current implementation. More work must be done in the classification process in order to increase the accuracy of the classifier. Special attention is devoted in the classifier trying to incorporate new invariant parameters such as the Gaussian curvature or one and second order derivatives. In addition, multi-scale top-hat transformations can help in the halo detection at far distances. In order to achieve a more reliable distance estimation, some parame ters such as the blob size, distance between blobs and the relative growth/shrinking in the the image can be fused to obtain a better estimation. As a future idea, a red filter is going to be introduced into the system in order to increase tail lights detection range up to 400 m.

Aslam Musthafa R,et al.[4] Presented a paper titled, 'Automatic Headlight Beam Controller' Automatic head light beam controller had been designed using LDR sensing technique. Thus, the system device automatically switches the headlight to low beam when it senses a vehicle approaching from the opposite side using Light Dependent Resistor (LDR) sensor. Glare during driving is a severe problem for drivers and therefore caused by the sudden exposure of our eyes to a very bright light of the headlights of vehicles. This causes a temporary blindness called the Troxler effect. Eventually this has become the reason for accidents occurring at night and also during bad conditions such as rainy or foggy conditions. The driver should have turned down the bright lights immediately to avoid glare to the other person, however they find it difficult to do. Hence, the idea for the design and development of a prototype circuit called the automatically switches the headlight to low beam when it senses a vehicle approaching from the opposite side. Thus, the implementation of this device in every vehicle does not only avoid accidents but also provides a safe and comfortable driving.

PROBLEM STATEMENT

Motorists face a huge problem due to high beam light which falls directly onto their eyes when driving at night or confused conditions. There is medical effect associated with these phenomena. This effect includes temporary blindness, glare, fading effect of image and something causing accident leading to many lives. This effect contributes to a terminology known as troxler effect. Troxler effect is used to describe a kind of temporary blindness. It is otherwise known as the „fading effect". A study shows that if our eyes are exposed to a very bright light source of around 10,000 lumens, we experience a glare. This glare is produced due to over exposure of the rods and cones inside our eye. Even after the source of glare is removed, an after-image

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

remains in our eye that create a blind spot. This phenomenon is called troxler effect. This means that the driver‟s reaction time is increased by 1.4 seconds. For example, let us assume a motorist travelling at 60 miles per hour takes 0.5 seconds to react to a hazard and will stop within 41 feet. Due to troxler effect, the same person travelling under the same conditions will take 0.9 seconds longer to react and hence will come to a complete halt only at 123 feet. There is a huge difference of 82 feet. This is more than enough to cause a disaster on the road. This troxler effect is across all the ages. Anyone exposed to sudden bright light experience this troxler effect. Hence there is a need to design and construct a prototype of this device that automatically dims the headlights for on-coming vehicles using light dependent resistor sensing technique help to solve this problem.

III. METHODOLOGY

OBJECTIVE

1. To Develope a smart automatically send signal to opposite direction passing vehicle to switch it's own vehicle headlight on dipper mode.
2. To Maintain cost low of our project so that all vehicles this system will install in our vehicles.

DETAILS OF HEADLIGHT OF VEHICLE

Headlight of vehicle is composed of two filaments, one for high beam and another for low beam as shown in fig. 3. In this the intensity of high beam is about 1200 lumens whose range is 70 m and intensity of low beam is 700 lumens whose range is nearly equal to 25 m. In India requirement of light is essential from 6 pm to 5 am and the conversion of high beam to low beam is done by manually. Usually headlights of vehicles area of two types halogen and xenon bulb.

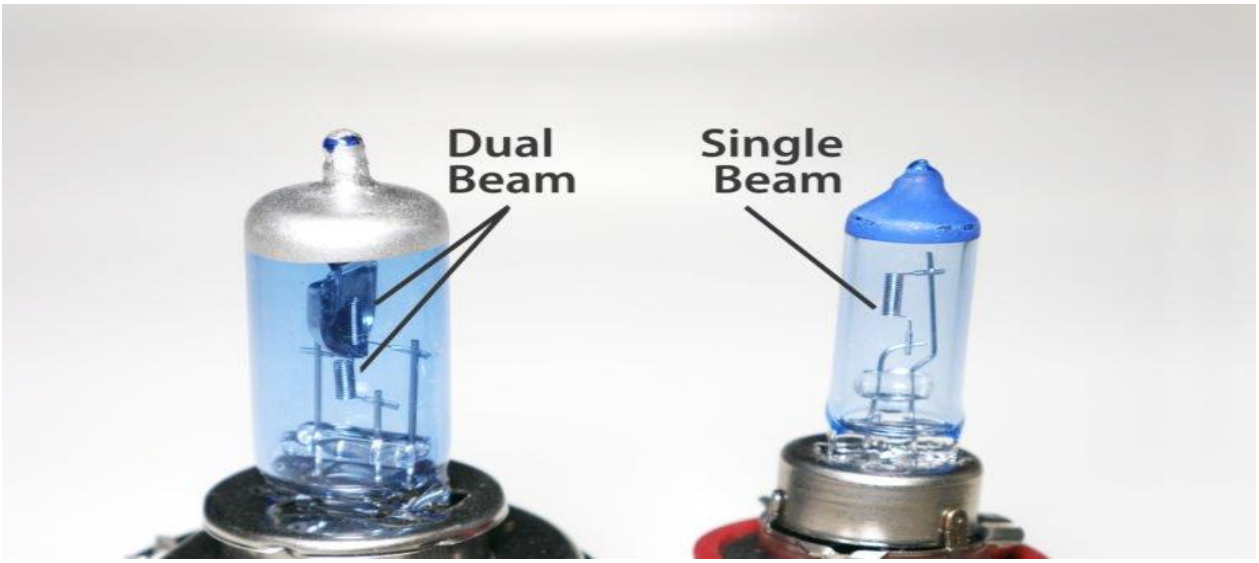

Fig.1 Head Lamps (Dual beam & Single beam)

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Fig 2. Head Light

CIRCUIT DEVELOPMENT

A. **Headlamps**

A headlamp is a lamp attached to the front of a vehicle to light the road ahead. Headlight is a synonym for headlamp. Headlamp performance has steadily improved throughout the automobile age, spurred by the great disparity between daytime and nighttime traffic fatalities: the US National Highway Traffic Safety Administration states that nearly half of all trafficrelated fatalities occur in the dark, despite only 25% of traffic traveling during darkness. Fig. 4. Circuit Diagram for dipper Controller.

B. **Battery**

A supply of 12 volts is required for the circuit. It is taken from the vehicle's battery box. This is preferred for two reasons. First, it is a constant DC supply and second, there is no need for introducing a separate electrical supply source.

C. **LDR**-1,2 It is nothing but a photo sensor or photo resistor i.e. when the light falls on these LDR's then the resistance of the circuit changes accordingly with the change in intensity of the light.

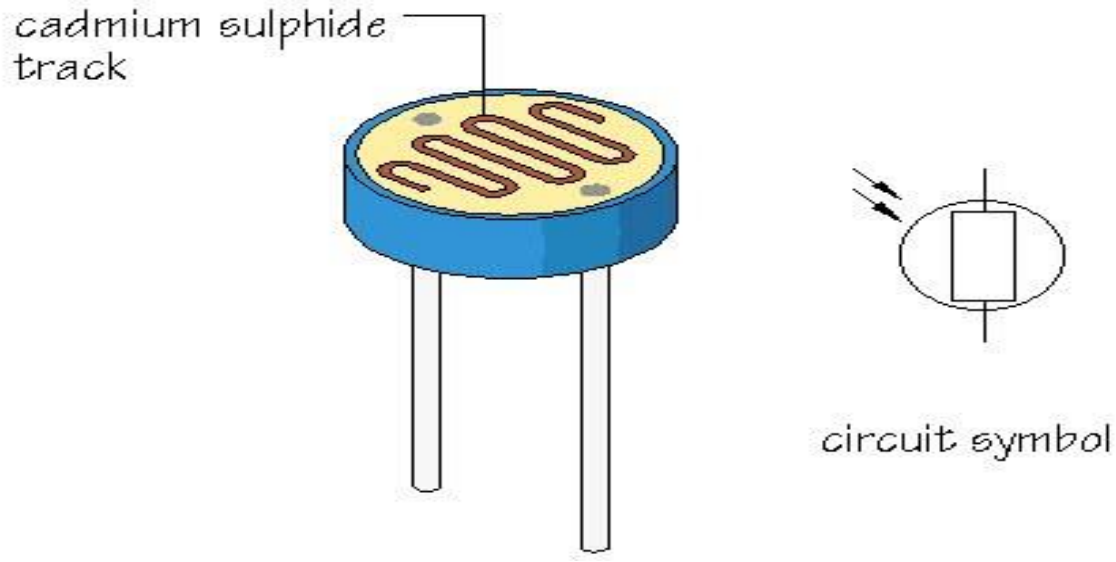

Fig 3. Light Dependent Resistor (LDR)

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IV. RESULT AND ANALYSIS

PRINCIPLE

The basic principle of our circuit is, the various intensities of light i.e. high beam or low beam of headlight falling on the opposite vehicles headlight and the basic general idea of manual dipping and this same idea is converted into electronic format with this circuit.

WORKING

The circuit diagrams is divided into two parts 1 & 2. Now in , Part -1 circuit is used for automatic headlight dipping. So let us see its working and problem according to us. Now let us consider that our vehicle is compatible with . Suppose we are driving a vehicle at night and a vehicle is approaching towards us and its headlight is in upper mode this circuit i.e. its intensity is very sharp and it is straight direction which strikes drivers eye directly. Now according to this circuit and its function is to dipp our vehicle. own vehicles headlight in dipper mode due to this we can't see anything because of glaring or troxler effect by upcoming Consider two vehicles (a) & (b) where vehicle (a) is approaching towards vehicle(b) In which intensity of the vehicle (b) is very high i.e. it is in upper mode. If vehicle (a) want to notify vehicle(b) that , his headlights intensity is affecting to the driver of vehicle (a) then vehicle(a) makes upper-dipper switch /rod up down 3-4 times then vehicle(b) gets notified that he should make his headlight in dipper mode. We do same thing when we are driving. This is what happening currently in India. This is the principle of our circuit which is based on the current phenomena of indication. Now exactly what our circuit does is mentioned here, consider a truck is coming towards our car. Headlights of truck is in upper mode then the LDR 1 is activitated which is mounted on the glass of car where our eye sight is maximum focused and this LDR is responsible for the headlight to make it in upper – dipper modes consequently 3-4 times. Then if trucks headlight goes in dipper mode after giving this notification then the LDR is activitated which is mounted on the bumper of the car, so our headlights also goes in dipper mode . If the headlights of truck are in upper mode even after giving notification to truck then our headlights should be in upper mode because if our headlights becomes dipper then it will dangerous for our car which results to accident.

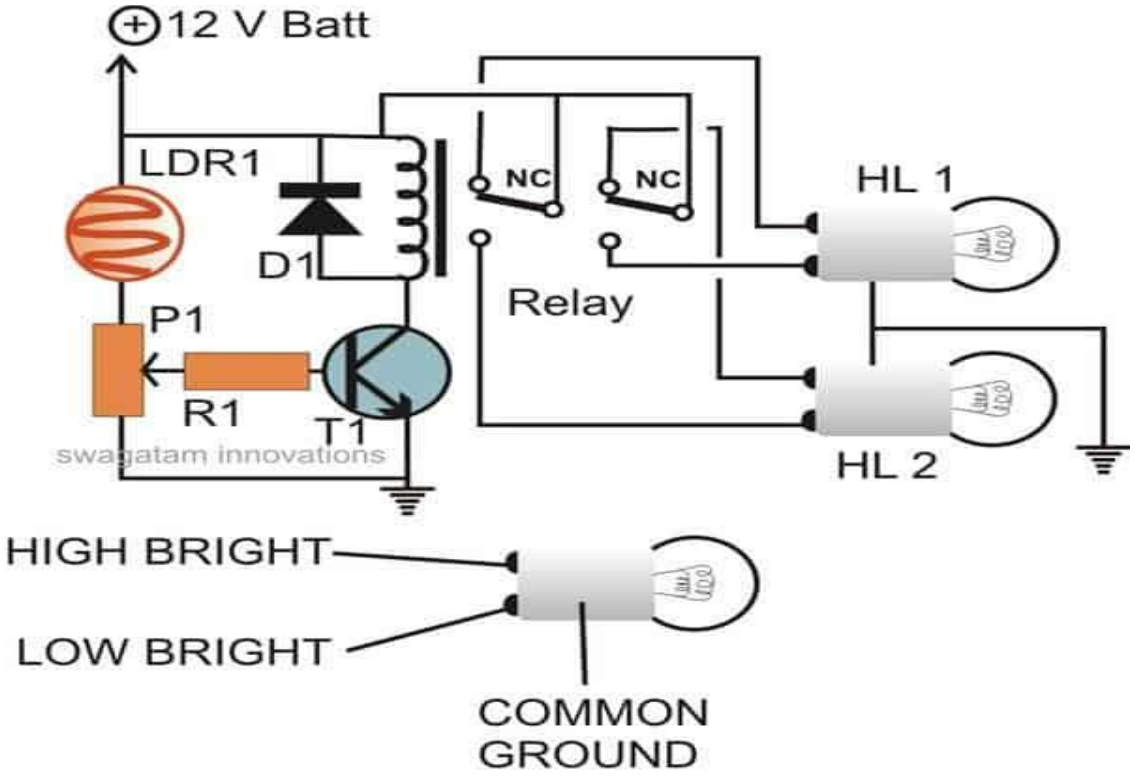

Fig.4 Circuit diagram for dipper controller

IARJSET

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V. CONCLUSION

Automatic head light beam controller had been designed using LDR sensing technique. Thus, the system device automatically switches the head to low beam when it senses a vehicle approaching from the opposite side using Light Dependent Resistor (LDR) sensor. Newer and better technologies always come with time and it will help in reducing the manual labor and difficulties. The installation of this safety system in each vehicle give safety at night driving, increase comfort level of driver and decrease the road accidents.

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Vol. 9, Special Issue 1, April 2022

Design and Development of Sand Sieving Machine – a Review

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Abstract: This paper presents of the concept design and development of sand sieving machine, mainly based on constructional product. We have designed this machine easily operatable and every task has been performed very fast and effective performance, mainly make sure that the product at a low average cost. Every construction of building required ingredient sand is used at different stages sieve is a device for separating wanted element from unwanted material or particle size distribution of various stages in construction. In this machine rod connected form crank is attached main shaft of motor to which the slider crank mechanism is directly attached, its used for sieving operation. Sieving of sand is carried out using rectangular mesh which is inclined at certain angle. This causes a relative motion between the particles and sieve. The manufacturing process and material selection process have also been described. This design best concept of sand sieving machine in terms of efficiency, energy and brief many benefits is positive and very good continued. In our project the process will takes place automatically.

Keywords*:* Design, Fabrication, Sand separator machine, Constructional purpose.

I. INTRODUCTION

Sieving machine is generally designed to reduce the time factor as well as the human efforts involved in this process. In the present sand sieving method, the sample is subjected to reciprocating (horizontal) movement in accordance with chosen method. Sand needed to filtered and separated from unwanted particles, stones and other large particals. The main problem identified in this process is the unavailability of different sizes of sand in this project method. It because of market survey to fulfill customer demand and to create a new design with new feature. This project focus on design & fabrication of the mechanical part of machine and system at low cost. This sieving machine different body structure and mechanical system needs to concern some other criteria such as strength and design. This machine providing manual workers for sieving operation we motivate to provide ac motor operate automatic sieving machine. Which separate the unwanted particles is designed. The main motive our research paper is good performance of sieving operation at low cost.

II. LITERATURE REVIEW

P. R. Gajbhiye, et al. [1] In this research study the failure problems encountered of mild steel by imposing load on it. Thus the low cost and simple design motor operated sand filter machine is fabricated. To reduce the human efforts. In construction of buildings sand as an important ingredient sand is used in different stages in construction in right form foundation to the finishing work. The sand is need to separated properly for various stages of construction i.e. Plaster work sand this sand is very fine. Conventionally screening is normally used fix screening or machine. This manual process takes lot of time and cost of laborious and also observed that conventional machine prove no or little help as sand needed to be manually transported and material handling takes place twice to get different size of sand .

This process cared manually. Sieving of sand carried out rectangular mesh which is inclined at certain angle. This cause of relative motion between particles and sieve. Depending on their size the particle either pass through sieving surface. There is different machines are used in this process. In our project this process takes place automatically. This reduce time and cost of labours.

A.K. Nachimuthu, et al. [2] In this research study, a sieve is a device for separating wanted particles from unwanted partials. The particle size distribution of sample, using required sieve net. The mild steel failure problem by loads where successfully addressed by applying by Taguchi Method. A Taguchi orthogonal array this signal to noise ratio and analysis of various used

for optimization of welding parameter. This project focused in design and development of parts of machine. To achieve the project machine body and this system needs to strength and safety. The normal size of openings usually between cross wire of a testing sieve frame.

MIDTHUR A SALAMN KHAN, et al. [3] This sand sieving machine design the output efficiency of normal working process. The machine is small it proves to work under high production of sand under normal condition. It needs to filtered form unwanted particles like stones, metallic parts and leaves. In this project, automatic sand sieving machine separates the wanted particle to unwanted particle. The main concept is the reduce human efforts involved in filtering process during the construction work the project is more concentrated on safety as well as improved efficiency.

Dipak. U. Adhapure, et al. [4] This paper presents the concept of design and fabrication of multipurpose sieving machine mainly design for construction based companies. The project up to now after research different types of sand sieving machine to select best improving factor to make more efficacy and easily operatable. Then required material selected by the market serve although fabrication process. According to research this type of sand sieving machine more efficiency and easily operatable which can help to unskilled labour. The advantage is obtaining the easy separation of unwanted particles to mesh and reduction cost, human efforts, increasing efficiency and production rate.

Alan Biju, et al. [5] After review the different papers it was found no specific solution to separate different size of required sand. Thus an evaluate solution in the form of simple sand sieving machine was design and fabrication. The main conclusion is improving quality of required sand, reduce human effort and improve efficiency. It can use for small construction company. A main advantage of easy to operate and can be easily performed it is very useful and compact in size. Unskilled labour can be operates this machine and it is reduce human efforts, time and cost.

III. PROBLEM STATEMENT

- Sometimes in construction company required at low cost sieve machine that are best performance and easy to operate.
- Traditional method required more man power for filtered sand process.
- Traditional method is more time consumed for the filtering and Seperating.
- Traditional method gives low efficiency and less amount filtered in long time.
- Modern sand sieving machine required high skill labour.

IV. WORKING PRINCIPLE

This machine works on the principal of single slider crank mechanism. This working principle mainly depends on converting the rotational motion into reciprocating motion provided by the ac motor of sand sieving machine. This project fabricated with the using parts like a motor,crank and connecting rod, bearing, sieve frame and base frame. Design of the sieve machine is based on material selection as well as to work safe and more efficient. Here crank is attached to the motor shaft and connecting rod arrangement. The sieving frame fixed with connecting rod in order to move the reciprocating motion. The sieve frame is placed inside the rail track and machine is started. When frame moves or slides separate the particles of required size of the mesh sieve net. Then sieving process is performed the filtered sand is collected separately in another side.

V. METHODOLOGY

- Problem identification
- Get title project and meeting with guide
- Identifications of components
- Detailed designing of components
- Material selection of components
- Collection of material and parts of final project
- Fabrication
- Result

IARJSET

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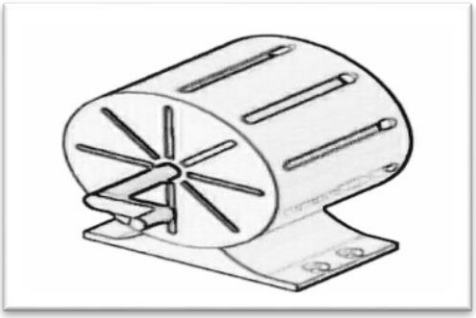
VI. COMPONENT

Components used in sand sieving machine:

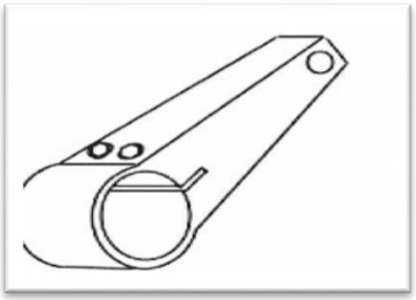
1. Motor
2. Crank
3. Connecting Rod
4. Bearing
5. Sieve Net
6. Base Frame

1. **Motor:** An electric motor is an electrical machine that converts electrical energy into mechanical energy. We are using motor in this project 1/12 HP single phase ac motor. This motor specification is 220-240V and 6000 rpm are required speed control by using resistor.



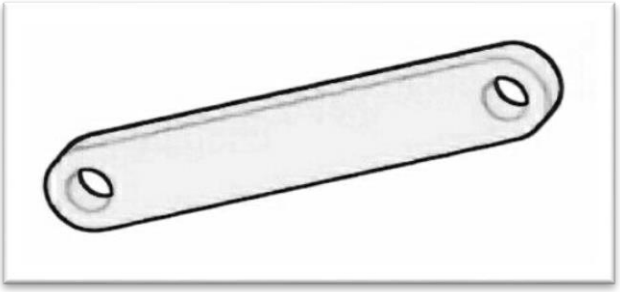
Picture1. Motor

2. **Crank:** A crank is an arm attached at a right angle to a rotating shaft by which circular motion received from the shaft. When combined with a connecting rod and its length using in this project is 55mm. Then crank material use by iron.



Picture2. Crank

3. **Connecting Rod:** Connecting rod connect the sieve net and crank. It converts the rotating motion of the crank into the reciprocating motion of the sieve frame. Its length is 155mm and same material using by crank.



Picture3. Connecting Rod

IARJSET

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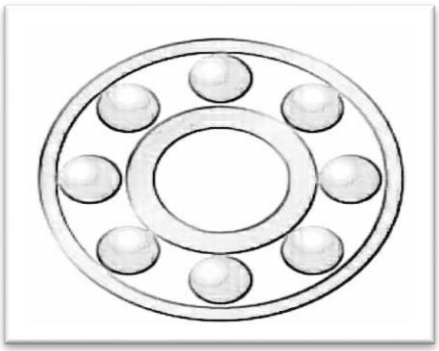
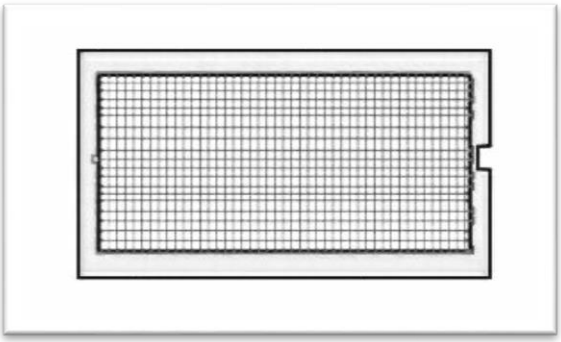
4. **Bearing:** They support and guide components which turn relative to one another. They transmit forces and moving to the rolling guideways. Sieve net frame is mounted on ball bearing by size using is 3cm. Bearing material using in this project is stainless steel.



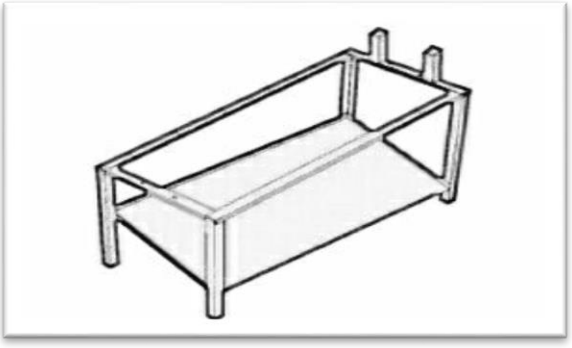
Picture4. Bearing

5. **Sieve Net:** For sieving process different method is practice from the very past, almost every procedure includes mesh or net of small holes (varying diameter as how fine the sand is required). Sieving net mounted on the main frame. Its length is 2*1.5 feet.



Picture 5. Sieve Net

6. **Base Frame:** Frame provides structural integrity and stability of a machine. It has required efficiency to hold all of the loads of machine. In this project required length is 3.5*1.5*2 feet and all frame material using by the iron.



Picture 6. Base Frame

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VII. SCOPE FOR THE FUTURE WORK

The project can be made for higher capacity by improving efficiency as the design aspects based on required material size and the mesh sieving frame can be changed required grain size. The machine can be operated using electrical motor also reduce the time. The machine is easy to operate and anyone with a little knowledge also can operate it.

VIII. CONCLUSION

In this research concluding the project of research different type of sand sieving machine was conceptualized to make it improve efficiency, and effective performance at low cost. Then required material selection by the market survey although the fabrication process. We have design product with intention of replacement of existing product and crate the automated machine. To reduce the time consumption, human efforts, labour cost and force.

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IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

Design and Fabrication of Automatic Potato Peeling Machine

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ABSTRACT: Peeling of vegetables and fruits is one of the most frequent procedures even at domestic purposes or at hotels. Manual peeling is peeling the vegetables with hand tool is hard and time consuming process. Also it required more man power for large scale peeling process And it has a quite chances of injury during peeling process. Mechanization of processing operations will play a vital role in removing the negative attributes of the traditional processing techniques and promote timely large scale production with desired quality. This paper shows the chronological development of mechanical peeling and also highlights on new concept of potato peeler which would be the basic requirement for large scale potato peeling applications. The purpose of our paper is to design and fabricate the potato peeling machine. This gives full satisfaction to large scale as well as small scale potato peeling requirement with advance safety of consumer. It is aimed at providing a base for the commercial production of a peeling machine, using locally available raw materials at a relatively low cost.

Key wards: Potato peeling, Peeling Efficiency, Abrasive particles

I. INTRODUCTION

Potato is a very rich source of starch. It also contains phosphorous, calcium, iron and some vitamins. Apart from this potatoes are used for the purpose of making vegetables& gravy. They are dry out in the form of slices, sticks,cubes, to impact better shelf life.Potato is may be the most popular food and widely consumed items in the Indian diet. That's why production of potatoes in India is large. It grown all over the country.Uttar Pradesh, West Bengal, Gujrat, Madhya Pradesh, Punjab, Bihar & Assam, is the states which produce largequantity of potatoes in India.(Director of Economics & statistics, government of India 2011-12) India ranks fourth in area and third in global potato production . The production is around 8% of the world's total production. (Anonymous,2011) Pelling of vegetables and fruits like apple, Potato is one of the most recurrent process even the house hold purpose as well as hotels.So there is need to find solution to make peeling process easy, which required less time for work completion and required less manpower. Some researchers did invented potato peeling machines as follows.

1. Simple round swivelling rod with knife blade.
   - In 1800s, discovered by Loncashire.
2. Y-Peeler,Rex-Peeler, Yoke Peeler or sped Peeler.
   - 1947, Invented by Al feel NEWECZERZAI of Davos Switzeland.
3. Straight Peeler, Swivell Peels,
   - In 1953, Invented by JONAS PEELAR (Sweeden).

But it all peelers are manual operated, and manual peeling is toughest and time consuming process.It also cause for loss of vitamins and becomes dirty with atmospheric air. This has need to invent the machine which peels the vegetable and fruits with less human efforts, with accuracy and within less time. The process involved in this machine is make helpful for reducing all barriers.

II. LITERATURE REVIEW

VIJAY K. SINGH Testing and evaluation of Pedal operated potato peeler. Thus this work It consists of two number of perforated stainless steel drums during rotation take away skin of potatoes as in manual peeler. The main part of the peeler is an abrasive drum, made of stainless steel sheet. The inside surface of the drum has protrusion. To develop the protrusions, the stainless steel sheet was bent into a cylindrical shape and it was punched from one side with a die at a fixed spacing. It was then

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filed to flatten the sharp points developed from Punching to ensure smoother peeling of the potatoes. The drum is fixed on a parallel shaft supported by two ball bearings fixed over a frame of size 1200 x400 x 800mm. For loading and unloading the unpeeled and peeled potatoes, respectively, an inlet and outlet have been provided. The abrasive peeling takes place due to the movement of the potatoes inside the turning drum. The drum is rotated by pedals. A water spraying unit of galvanized iron (GI) pipe having nozzles to take away peels from the drum and simultaneously wash the peeled potatoes.The capacity and peeling efficiency of the machine were 144 kg/h and 83%, respectively. The machine capacity and peeling efficiency were highly affected by weight of potato per batch and operational time of the machine. For maximum capacity (144 kg/h) and peeling efficiency (85.8%), the weight of potato per batch and operational time were 6 kg and 2.5 min, respectively. The operational cost of the machine wars. 74.77/h.

Mayank A. Gaodi1, A.P. Datey, G.S. Pariyal, A.Nakhate, S.Burnure, G.G.Wadode Design and fabrication of potato peeling machine This project deals with durability assessment for development of potato peeling machine. Peeling of vegetables and fruits is one of the most frequent operations even at house hold purposes or at hotels. Manual peeling is peeling the vegetables with hand tool is toughest and time consuming process. It also causes for the loss of vitamins and become dirty with the atmospheric air. This has need to the invention of a machine which peels the vegetables with less human effort and less time. The processes involved in this project are designing of potato peeling machine. This project will be developing based on research from product in marketing. This project required to focusing only a peeling potato for home kitchen facilities. production capacity per batch is 10 kg &requred space is 81 x 46 x89 cm.

S.santhoshkumar Design and fabrication of potato peel Remover machine. A Peeling machine composed with cylindrical container which abrasive material is fitted inside both sides of cylinder as like wall, which increase peeling efficiency of machine. Here, for peeling purpose one peeling tool is used in centre of electric drill motor which knew as hard plastic brush. Thus, after switch on the machine peeling tool started rotating and generates centrifugal force which cause for gives motion to the potatoes by medium of water. In rotating condition potatoes make frictional force between the peeling tool and abrasive wall and there peeling force is generated. After that peeling process is completed 90% within 1 minute at every and each round.

The machine consists following parts:

1. Cylindrical vessel
2. Tripod stand
3. Plastic brush
4. Electric motor.
5. Top cover.

III. PROBLEM STATEMENT

For peeling the potato chips, this traditional methods are used which consume the time and which require more ma power for peeling the potato in large scale quality.

Picture.1 Existing Method

For avoiding this problem this machine make useful which reduce time required less space as well as less man power.

IARJSET

ISSN (Online) 2393-8021
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IV. METHODOLOGY

1. Study of various peeling mechanisms.
2. We developed a design for peeling.
3. Material selection for frames, drum, disc plate, gear, pulley, shaft.
4. Design of belt, gear, shaft.
5. Selection of motor.
6. Drawing 2D &3D CatiaV5.
7. Fabrication and testing of the machine.

V. MATERIAL, METHOD, AND COMPONENTS

1. Design theory and principle:

The machine is design for peeling process of potatoes. The peeling action is done with rotating to the disc, which mount on the rotating shaft. the main shaft is powered by the electric motor which connect by the pulley and 'V'-belt.

2. Design and construction:

The potato peeling machine consist cylindrical drum, circular disc, main shaft, pulley, electric motor, 'V'-belt, M.S frame.

2.1 Cylindrical drum as main body:

Cylindrical drum is main component of the machine which have cylindrical shape with flat round bottom. Inside surface of the drum is coated with abrasive particles. Generally Emery particles be at the top lid is providing which rest on flanges. It prevents potatoes from falling outside. A sufficient size port is provided at one side for removing peeled potatoes. Stainless steel is (304) material is used for drum; because of it has high corrosion resistance rate.

Picture.2. Cylindrical Drum

2.2 Circular disc:

The circular disc is fit on the rotating shaft, which upper side is covered with small plates which set in 45 degree inclined position. It is made by stainless steel (304). The design of disc is such that when revolving, the complete surface of the potato is rubbed on both side wall of the cylindrical drum, which coated with abrasive particles. Generally Emery particles are used. The inner surface of drum is coated with abrasive particle for achieve best peeling efficiency.

Picture.3.Circular Disc

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

2.3 Drive for circular disc:

For peeling process, the machine that converts electric energy into mechanical work is called motor. A single phase induction motor with 1 HP power,50Hz frequency and 1440rpm speed which converts into 450rpm is used in this a apparatus.

Picture.4. AC Motor

2.4 Water inlet and water drain:

Water inlet connection is provided at top right side of cylindrical drum through which water spray on potatoes for Smoothen peeling operation. At the bottom of the drum there provision is made for draining water with potato skin. Water drain has large enough space to prevent any chance of it is being blocked with potato skin.

Picture.5.Water Inlet

2.5 Pulley and 'V'-belt:

A pulley is a wheel which fit to one end of shaft is that designed for absorbing the movement of motor by V-belt. Mild steel material is choosing for this purpose. The pulley would be subjected to tension forces from the belt as well as the torque and speed variation from electric motor

picture.6. Pulley and 'V'-belt

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

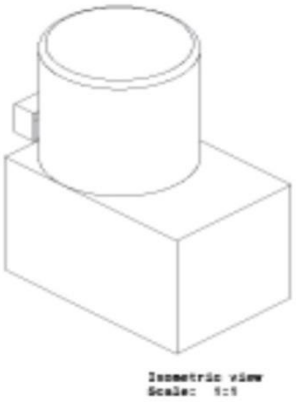
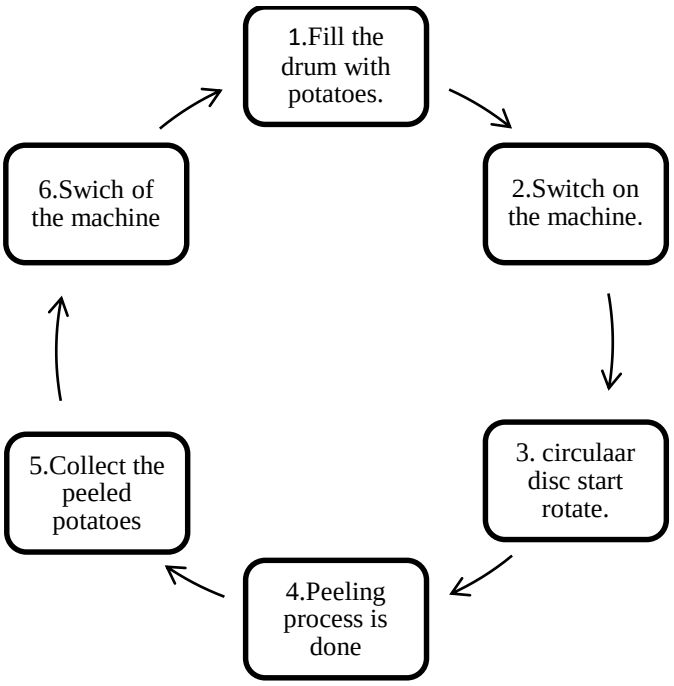


Fig.1.Schematic diagram of potato peeler

VI. WORKING

Below block diagram shows overview of working:



For peeling process, main component is cylindrical drum, which mount on the shaft that which gives rotation to the circular plate. Fill the drum with potatoes according its capacity and close the door.
The mechanism of this peeling machine is less complex. The motor transmits power to the rotating disc which rest on the shaft, through a V-belt and pulley arrangement, during which the motor rotates at a speed of 1440 rpm, which gets reduced to 450 rpm

at the driven side. Rotating disc surface is covered with inclined plates and drum surface being coated with abrasive particle (Emery) surface for the peeling action to be possible. Potato is filled to the drum, and therefore the disc rotates at the underside and force is developed, which make the potato to return involved with the drum surface, which remains stationary, making possible the peeling action. A clearance of 10 mm is provided between the stationary drum and rotating disc for waste removal.

VII. CONCLUSION

At the conclusion of an exhaustive literature study construction and testing, a acceptable potato peeling machine with effectiveness of 90% was fabricated with the to be had raw materials and techniques. we started functioning on design methodology which emphasize the genuine working stages we be supposed to follow to inclusive the project model includes survey of manufacturing of parts, assembly & testing. The look of the included peeling machine relies on the technical idea of the mixture of all the methods in one, which helps in lessening of manpower and satisfies the necessity for household, industries. The machine is easy to work, safe and simple to repair. The technology is reasonable and less expensive in comparison to existing peeling machines. It's low transparency. Hence the machine was a successful one.

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IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

Design, Manufacturing and Analysis of Mono Leaf Spring for Light Weight Vehicle by Using Composite Material

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Abstract*:* Weight reduction and performance enhancement of leaf spring can be achieved by employing better material, design and manufacturing process. The main aim of this paper is to suggest the best composite material for design and manufacturing of composite leaf spring. The conventional leaf spring contributes more amount of weight to the vehicle as compared to the composite leaf spring. Static design and analysis of a 3-D model has been performed using CATIA V5 R20 and ANSYS 12.0. Composite leaf spring manufactured using hand lay-up method. The particular design is made specifically for light weight vehicle. The composition of E-glass fibre and Epoxy resin material is the better way to reduce the weight by increasing the strength.

Key words: Leaf spring, E-glass/Epoxy composite, stresses, ANSYS 12.0, CATIA V5 R20

I. INTRODUCTION

In the present scenario, to optimize the utilization of energy, weight reduction became one of the main focus of automobile. Leaf springs are mainly used in suspension system to absorb shock loads in automobile like light motor vehicles, heavy duty trucks & in rail system. It carries brake torque, driving torque in addition to shock absorbing. Weight reduction can be achieved by the introduction of better material.Leaf spring is made of E-glass fibre and Epoxy resin provides improved fuel efficiency as well as comfortable level of riding. Excellent corrosion resistance feature of the glass fibre composite leaf spring contribute to replace steel leaf spring.The leaf spring accounts for 10-20% of the un-sprung weight. The composite material made it possible to reduce the weights without any reduction of the load carrying capacity.

A composite is a structural material that consists of two or more combined constituents that are combined at a microscopic level and are not soluble in each other.It consists two phases that make up a composite are Matrix and Reinforcement. Usually matrix is a ductile or tough material and reinforcing materials are stronger with low densities which can be ceramic or polymer. The advanced composite materials has high specific strength and high specific modulus.

II. LITERATURE REVIEW

S.A. Gebremeskel [1] studied leaf spring to reduce its weight. E glass-epoxy material was used to increase the strength and to reduce the weight of the spring under static loading conditions.C. Subramanian et al.[2] injection moulded 20% glass fibre reinforced polypropylene leaf springs were considered for the joint strength evaluation. Servo hydraulic test facility is utilized to evaluate the static and fatigue performance of the bolted joint. B.R. Kumar [3] modeled a leaf spring using different composite materials having same mechanical and geometrical properties as that of steel spring. Composite leaf spring has shown nearly 88.4% lower weight as compared to the conventional steel leaf spring. P. Saini [4] used glass fiber reinforced polymer material instead of conventional steel and described design and analysis of composite leaf spring. In this research work, weight saving and stresses of conventional and composite leaf spring were compared.M. Raghavedra et al.[5]Compared to mono steel leaf spring the laminated composite mono leaf spring is found to have 47% lesser stresses, 25%~65% higher stiffness, 27%~67% higher frequency and weight reduction of 73%~80% is achieved. Based on the results, it was inferred that carbon/epoxy laminated composite mono leaf spring has superior strength and stiffness. Ravi Kumar V et al. [6] for E glass/ epoxy & Jute-E glass epoxy maximum stress and displacements are within the limit. Compared to the weight of steel leaf spring 62% and 72% weight reduction is possible for E-glass epoxy and natural fibre mono leaf composite springs respectively without effecting the load carrying capacity. Natural fibre composite is having equal strengths as e-glass epoxy with further weight reduction by 28%. M.M. Shokrieh [7] employed ANSYS software to verify the existing experimental and analytical solutions for the deflections and stresses. J.P. Hou et al. [8] studied three designs of eye-end attachment of leaf spring and performed finite element analysis

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

and static testing.T.N.V.Ashok Kumar et al. [9] have studied static and dynamic analysis of steel leaf spring and laminated composite multi leaf spring, the objective is to compare displacement, deflection and weight saving of composite leaf spring with that of steel leaf spring. ParkheRavindra et al. [10]have described design and analysis of composite mono leaf spring. Static analysis of a 3-D model has been performed using ANSYS 12.0. Compared to mono steel leaf spring the laminated composite mono leaf spring is found lesser stresses and weight reduction of 22.5% is achieved.

III. MATERIALS AND METHODS

Parameter selection and manufacturing

Table 1 shows the specifications of a steel leaf spring of a Bolero SUV vehicle. The single leaf spring isanalysed, as it is the prime element in suspension type of springs. However, the whole set of steel leaf spring is replaced with mono composite leaf spring. The dimensions of steel leaf spring and composite mono leaf spring were obtained by theoretical design are as shown in Table 1.

TABLE I SPECIFICATION OF STEEL LEAF SPRING AND COMPOSITE LEAF SPRING

Parameters	**Steel Leaf Spring** (From Manufacturer)	**Composite Leaf Spring** (Designed)
Material	Steel-56Si1.8Mn70	50% E glass-epoxy
Length(mm)	1016	1016
Thickness(mm)	11	23
Width(mm)	23	134
Weight of Leaf Spring(kg)	6	3.5

E-glass fibres is selected for the manufacturing of composite leaf spring as it has low cost compared to carbon/graphite fibres and has high chemical resistance and high strength.The E glass-epoxy composite material with 50% fibre volume is selected for the composite leaf spring. Leaf spring is manufactured with using hand lay-up method. 12 layers of glass fibre each having thickness 1mm and 11 layers of epoxy each having thickness of 1mm is used in hand lay-up method. After the lay-up was finished, it was kept for 24 hours at room temperature. After the fabrication sharp edged are removed by using grinding machine.

Finite Element Analysis

The dimensions of composite leaf spring are taken as per Table 1 and model is developed in CATIA and tested on ANSYS for static loading conditions. The load is uniformly distributed and the load of 10750 N is applied on leaf spring model.

The finite element analysis was carried out for composite mono leaf spring as well as for mono steel leaf spring. From the analysis, total deformation and equivalent stress is determined and shown in Figure 1 to 4.

Equivalent Stress

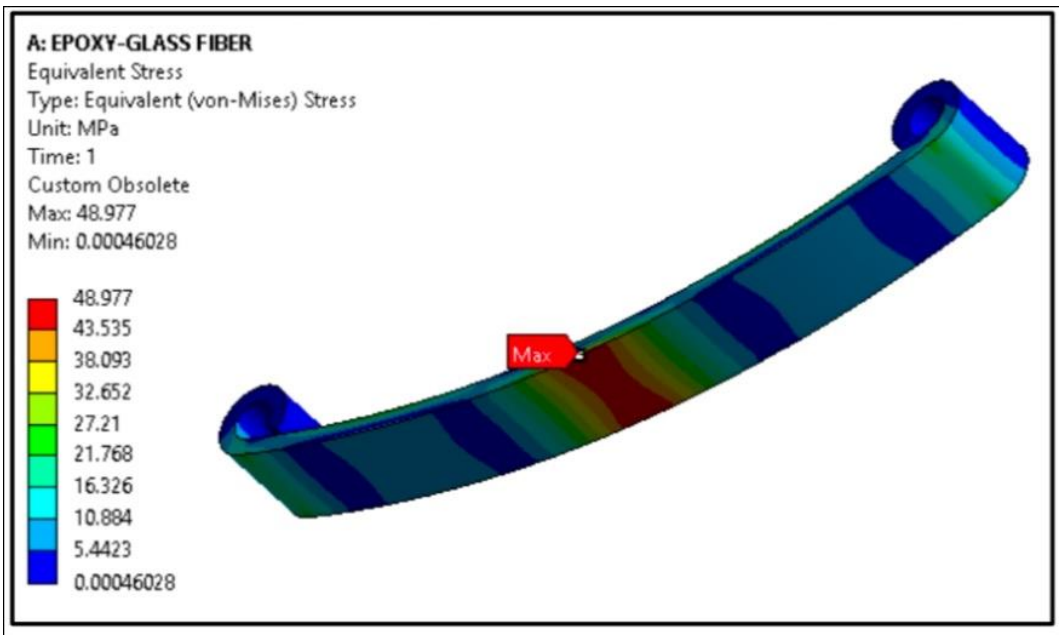

Fig. 1Equivalent Stress-Composite Leaf Spring

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

Fig. 2 Equivalent Stress-Steel Spring

From Figure 1 & 2, it is observed that the maximum stress value is considerably reduced in the composite mono leaf spring as compared to steel leaf spring.

Total Deformation

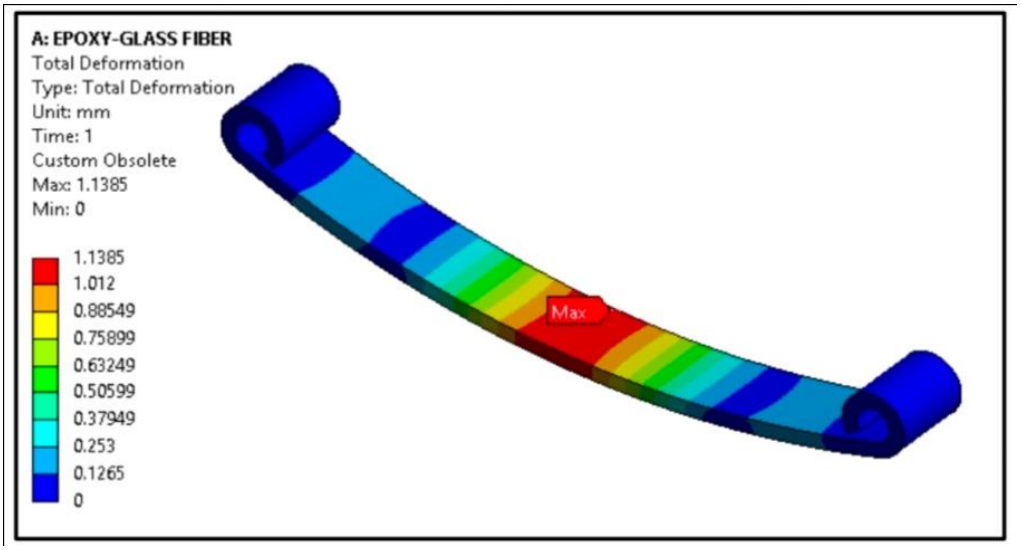

Fig. 3 Total Deformation-Composite Leaf Spring

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

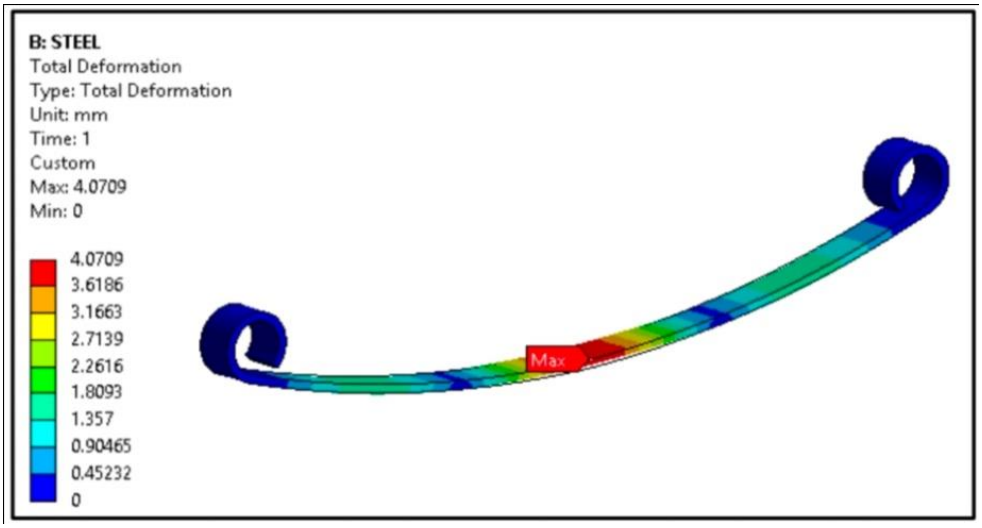

Fig. 4 Total Deformation-Steel Spring

From Figure 3 & 4, it indicates that the maximum deformation occurs at the centre of both the springs. However the deformation of the composite mono leaf spring was less than the steel leaf spring.
Table 2 shows the comparative analysis of steel leaf spring and composite mono leaf spring with respect to equivalent stresses and total deformation.

TABLE III COMPARISON WITH RESPECT TO TOTAL DEFORMATION AND STRESS EQUIVALENT

Parameter	Steel Leaf Spring	Composite Leaf Spring	% reduction
Equivalent Stress(MPa)	430.66	48.977	88.62
Total Deformation(mm)	4.0709	1.1385	72.03

From Table 2, it is concluded that the equivalent stresses and total deformation are considerably reduced by using composite mono leaf spring.

IV. CONCLUSION

A comparative study has been made between composite leaf spring and steel leaf spring with respect to weight and strength. The results of steel leaf spring and composite leaf spring compared in finite element analysis method. Results are observed to be good with the finite element model. Hence the results are validated. The maximum equivalent stress and reduction in the total deformation of composite leaf spring was observed as 88.62% and 72.03% respectively. The weight of the manufactured composite leaf spring is reduced considerably about 76% as compared to conventional steel leaf spring. Thus, E glass-epoxy composite mono leaf spring performance has shown superior strength, stiffness and lesser weight compared to the existing steel leaf spring and the objective of reducing the weight of leaf spring is achieved. This particular design is made specifically for light weight four wheeler vehicles and its prototype is also produced using hand lay-up method. The present study recommends investigation of fatigue behaviour, superior manufacturing technique especially for the eye end of composite mono leaf spring and dynamic analysis of the composite mono leaf spring since only the static loading case is considered here.

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IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

Review on Compound Technique in Helical Coil Heat Exchanger

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Abstract: Helical coil heat exchangers are one of the most common equipment found in many industrial applications. Helical coils are effective as heat exchangers because the coils increase the amount of surface area in contact with the substance to be heated or cooled. Additional surface area increases the rate of heat transfer. This paper deals with the review on heat transfer enhancement method of the helical coiled tube with Compound Techniques of various correlations with specific data. Generally, there are two techniques in Compound Technique i.e. Active Technique and Passive Technique. The effect of bubble injection, conical and spiral coil, flower baffle plate, tube-in-tube helical coil and geometrical parameters on heat transfer coefficient in helical heat exchangers was studied.

Keywords*:* Helical Coil, Heat Exchanger, Compound technique, Effectiveness, Heat transfer rate

I. INTRODUCTION

Basically, Heat exchangers are used to transfer heat .The heat transfer is done between solid object and a fluid, or between two or more fluids. Many types of heat exchanger are used in various installations, for example in process industries, HVAC systems, food processing, refrigeration, compact heat exchanger nuclear power plant, air conditioning etc. To get efficient way of heat transfer from one fluid to another we construct Heat Exchangers. The augmentation in heat exchanger can be done using three techniques, which are active, passive and compound technique. The techniques which require external forces are called active technique, e.g. electric field and surface vibration. The techniques which require fluid additives or special surface geometries are known as passive technique. Whereas when we add any two above mentioned techniques it is called as compound technique.

Classification of heat transfer enhancement techniques are:

1) Passive Techniques: The passive techniques are those which do not required external power source. Relatively they use this technique from the system by itself which eventually leads to an increase in fluid pressure drop. They usually use surface or geometrical modifications to the flow channel by additional devices. They encourage higher heat transfer coefficients by disturbing the existing flow behaviour excepting for extended surfaces.
   Heat transfer enhancement by these techniques can be accomplished by using;
   i. Treated Surfaces: Such surfaces have a fine scale alteration to their finish or coating which may be continuous or discontinuous. They are primarily used for boiling and condensing duties.
   ii. Rough surfaces: These are the surface modifications that promote turbulence in the flow field in the wall region, primarily in single phase flows, without increase in heat transfer surface area.
   iii. Extended surfaces: They provide effective heat transfer enlargement. The newer developments have led to modified finned surfaces that also tend to improve the heat transfer coefficients by disturbing the flow field in addition to increasing the surface area.
   iv. Displaced enhancement devices: These are the inserts that are used primarily in confined forced convection, and they improve energy transport indirectly at the heat exchange surface by displacing the fluid the heated or cooled surface of the duct with bulk fluid from the core flow.
   v. Swirl flow devices: They produce and superimpose swirl flow or secondary recirculation on the axial flow in a channel. These include helical strip or cored screw type tube inserts,
   vi. twisted tapes. They can be used for single phase and two-phase flows.
   vii. Coiled tubes: These lead to relatively more compact heat exchangers. It produces secondary flows and vortices which promote higher heat transfer coefficients in single phase flows as well as in most regions of boiling.
   viii. Surface tension devices: These consist of wicking or grooved surfaces, which direct and improve the flow of liquid to boiling surfaces and from condensing surfaces.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

ix. Additives for liquids: These include the addition of solid particles, soluble trace additives and gas bubbles in single phase flows and trace additives which usually depress the surface tension of the liquid for boiling systems.

x. Additives for gases: These include liquid droplets or solid particles, which are introduced in single-phase gas flows either as dilute phase (gas-solid suspensions) or as dense phase (fluidized beds).

2) Active Techniques: In these cases, external power is used to facilitate the desired flow modification and the concomitant improvement in the rate of heat transfer.
Augmentation of heat transfer by this method can be achieved by:

i. Mechanical Aids: Such instruments stir the fluid by mechanical means or by rotating the surface. These include rotating tube heat exchangers and scrapped surface heat and mass exchangers. Surface vibration: They have been applied in single phase flows to obtain higher heat transfer coefficients.

ii. Fluid vibration: These are primarily used in single phase flows and are considered to be perhaps the most practical type of vibration enhancement technique.

iii. Electrostatic fields: It can be in the form of electric or magnetic fields or a combination of the two from dc or ac sources, which can be applied in heat exchange systems involving dielectric fluids. Depending on the application, it can also produce greater bulk mixing and induce forced convection or electromagnetic pumping to enhance heat transfer.

iv. Injection: Such a technique is used in single phase flow and pertains to the method of injecting the same or a different fluid into the main bulk fluid either through a porous heat transfer interface or upstream of the heat transfer section.

v. Suction: It involves either vapour removal through a porous heated surface in nucleate or film boiling, or fluid withdrawal through a porous heated surface in single phase flow.

vi. Jet impingement: It involves the direction of heating or cooling fluid perpendicularly or obliquely to the heat transfer surface.

3) Compound Techniques: When any two or more of these techniques are employed simultaneously to obtain enhancement in heat transfer that is greater than that produced by either of them when used individually, is termed as compound enhancement. This technique involves complex design and hence has limited applications.

II. LITERATURE REVIEW

Jamshidi [1] This paper described the experimentation of heat transfer rate in shell and in coiled tube heat exchanger. In this work different pitch of helical coil was experimentally analysis with varying flow rate. In this experiment the helical coils were made up of copper having 12.7mm outer diameter and 9mm inner diameter. All the graph shows that by increasing shell side flow rate increase nusselt number. By increasing coil pitch will also increase overall heat transfer coefficient.

Ferng and lin [2] This paper describes about the numerical investigation of helical coil tube heat exchanger for different dean number and pitch size. They found that the nusselt number would slightly decrease by decreasing pitch size. CFD method is used for investigation purpose only.

J. S. Jayakumar [3] In this paper he worked on thermal hydraulic characteristics of airwater two-phase flowsin helical pipe. The CFD analysis is done by changing inlet void fraction for a given flow velocity. The use of constant values for the thermal and transport properties of heat transport medium results in prediction of inaccurate heat transfer coefficients. Heat transfer characteristics of the heat exchanger with helical coil are also studied using the CFD code. The CFD predictions match reasonably well with the experimental results within experimental error limits. Based on the results a correlation was developed to calculate the inside heat transfer coefficient of the helical coil.

Saket A Patel [4] In this paper they increase the helix angle coil side and shell side to increase the rate of heat exchanger and because of increasing helix angle pressure drop occurs. The optimum condition for increasing overall heat transfer coefficient in helical coil heat exchanger is obtained 2 degree Of helix angle. The CFD is done to understand the characteristics of helical coil heat exchange.

Ahmad Zarei [5] In this paper the work is experimentally studied the heat transfer augmentation using bubble injection in cold thermal energy storage system application using a helical coil heat exchange. An immersed helical coil heat exchanger in a water storage tank was used for cooling, which was the evaporator of the compression refrigeration cycle. The bubbles are injected into the storage tank by using an air pump through a spiral coil.

M. Vivekanandan [6] The Paper gives the objective of the invention to increase the resident time of coolant in the shell side of the helical coil heat exchanger by using flower baffle plates. CFD results have error percentage of 15% and it is good in agreement with experimental results.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

Sreejith K [7] Presented a paper titled, 'Experimental Investigation of a Helical Coil Heat Exchanger'. This Paper describes the helical coil heat exchanger showed increase in the heat transfer rate, effectiveness and overall heat transfer coefficient over the straight tube heat exchanger on all mass flow rates and operating conditions.

M. N. Tagare [8] Presented a paper titled, 'Experimental Study on Helical Coil Heat Exchanger'. In this paper it is observed that, once cold-water mass flow rate is constant and hot water mass flow rate is increased the overall heat transfer constant will increase. And in this paper it is observed that, once cold water mass flow rate is constant and hot water mass flow rate is increased the overall heat transfer constant will increase and the effectiveness of helical coil heat exchanger gradually increases as flow rate of hot water increases.

Lazova M [9] Presented a paper titled, 'Experimental investigation of a helical coil heat exchanger operating at sub-and supercritical state in a small-scale solar orc installations'. In this Paper an experimental study was conducted to evaluate the performance of the helical coil heat exchanger at sub- and supercritical operating conditions for ORC applications. For all set of these measurements the inlet temperature of the heating fluid was kept constant at 95 °C.

Afzal A AD [10] Presented a paper titled, 'Experimental investigation of thermal performance of engine coolant oil and water in helical coil heat exchanger'. In this paper an experimental thermal analysis of water and engine coolant oil in a helical coil tube and shell heat exchanger is studied.

III. CONCLUDING REMARK

The following conclusions may be achieved from the literature review:
The study shows that helical coil heat exchanger is having better performance than the straight tube heat exchanger. • In comparison with Parallel Flow type Counter Flow type provides the better outlet temperature.
• It is inferred that the heat transfer rates and other thermal properties of the helical coil heat exchanger are comparatively higher than that of a straight tube heat exchanger.
• The helical tube permits the water to be in contact for larger period of time in order that there is an enhanced heat transfer compared to that of straight tube.
• With increase in dean number effectiveness of heat exchanger decreases.
• Using Compound techniques (Active and Passive) we can enhance over all heat transfer rate.

IV. OBJECTIVE

From the literature papers, it is seen that the heat transfer rate of straight tube heat exchanger is less in parallel flow as well as counter flow as compared to helical coil type heat exchanger. Also we can enhance heat transfer rate by compound technique. So, the objective of present work is to use compound technique in heat exchanger for enhancing the heat transfer rate.

Sr. No.	Paper's Name	Author Name	Techniques / Methods	Advantages	Disadvantages
1	Experimental analysis of heat transfer enhancement in shell and helical tube heat exchangers	N. Jamshidi, et al.	Taguchi Method	Increase in Overall heat transfer coefficient achieved by highest level of the coil diameter, coil pitch, hot and cold water flow rates.	As coil pitch increases, tube side Nusselt number decreases and tube side flow rate affects this variation.
2	Research and application of flue gas waste heat recovery in co -generation based on absorption heat-exchange	Feng Li, et al	Absorption Heat Exchanger	The system has advantages like energy saving, environmental protection and economics.	It has low heating efficiency, high exhaust gas temperature and great irreversible loss heat transferring.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

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3	Helically Coiled Heat Exchangers	J. S. Jayakumar	Single Phase Flow & Two Phase Flow	Nusselt number found highest on the outer side of the coil. Increase in pipe diameter with inlet velocity constant gives the increase the higher heat transfer coefficient & lower pressure drop.	Due to the oscillation motion of the fluid particles inside the pipe causes fluctuations in heat transfer rate.
4	CFD analysis of heat transfer enhancement in helical coil heat exchanger by varying helix angle	Saket A Patel, et al	Varying Helix Angle	It is observed that pressure drop decrease with increase in helix angle.	It is observed that, increase in helix angle will decrease the heat transfer rate of coil, heat transfer rate of shell and also effiectiveness.
5	Experimental investigation of the heat transfer from the helical coil heat exchanger using bubble injection for cold thermal energy storage system	Ahmad Zarei, et al	Air Bubble Injection	Heat Transfer rate increased using bubble injection.	It is observed that, increase in number of bubble holes does not always result in increased heat transfer.
6	Experimental and CFD investigation of helical coil heat exchanger with flower baffle	M. Vivekanandan, et al	Flower Baffle Plate	It is observed that, the invention utilized to improve the heat transfer efficiency of helical coil heat exchanger and it is also reduce the pressure drop and fouling in heat exchanger.	CFD results are compares with experimental result with a15% error.
7	Experimental Investigation of a Helical Coil Heat Exchanger	Sreejith K, et al	Parallel Flow Arrangement	With keeping the cold mass flow rate constant & increase in hot mass flow rate, the heat transfer coefficient & effectiveness is increased.	It is observed that, the increase in inlet temperature the effectiveness & overall heat transfer coefficient.
8	Experimental Study on Helical Coil Heat Exchanger	M. N. Tagare, et al	Counter Flow Arrangement	It is observed that, with constant cold water mass flow rate & increase in the hot water mass flow rate overall heat transfer rate increases.	It is observed that, the hot water mass flow rate is greatly affects the effectiveness of heat exchanger.
9	Experimental Investigation Of A Helical Coil	Lazova M, et al	Sub & supercritical conditions	At supercritical condition, it gives better the heat transfer.	Heat transfer rate is lower at subcritical condition.

	Heat Exchanger Operating At Sub- And Supercritical State In A Small-Scale Solar Orc Installations				
10	Experimental Investigation of Thermal Performance of Engine Coolant Oil and Water in Helical Coil Heat Exchanger	Asif Afzal, et al.	Parallel Flow & Counter Flow Arrangement	Irrespective flow rate & counter flow condition gives highest heat transfer coefficient.	Engine coolant oil requires more pumping work.

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IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

Wet Waste Compost Generation Machine – A Review

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Abstract: India is getting buried under mounds of garbage as the country has been generating more than 1.50 lakh metric tons of wet waste every day. Even through government is taking efforts to keep the country clean, still more than 20 thousand metric tons of waste is not collected through the waste collection channel and hence it is exposed the environment without processing it. The amount of waste exposed to environment is creating several pollutions and resulting in the machine for management of waste through compost for households and agriculture. The objectives are to overcome the previous existing composting problems and to design a composting machine with certain parameters such as process time, easy to use, compact, odourless, rapid composting and power saving.

Keywords*:* wet waste, compost, composting machine, odourless.

I. INTRODUCTION

The wet waste management is one of the basic and traditional process to be handled carefully by every country for sustainable development. The statistics of India in waste of food are not even satisfactory as around 10 to 20 Crores people go to sleep without getting food and on the other hand the huge amount of food is wasted due to mismanagement of the food. The waste production from kitchen can be collected for processing to convert it into compost. There is double advantage if we convert the wet waste to compost. Amount of wet waste can be reduced and produced compost may sell at good cost. Waste treatment plants are located at remote places. The waste is collected from household are shifted to location of plant which is outside of the city. At the processing unit, waste is converted to organic fertilizer which is useful for farmers in the farms.

Composting is of two types Aerobic and Anaerobic composting but we are taking about the aerobic composting process in this case our organic material is decomposed with the help of microorganism (liquid culture) in the present of oxygen and that is called compost. Basically, we are taking about the compost not fertilizer, because fertilizer is uses in the growth of plant there is no connection to increase the fertility rate of soil. But the main working principal of compost is to increase the growth of soil and make our soil more fertile and healthy of people is not aware about the compost they use only fertilizer. But compost make the soil healthy and strong for improving the yielding. That's why compost is important for soil, compost is affordable as compare to fertilizer. We can easily convent our daily wet waste in compost for using in soil growth.

In the composting process some important parameter affecting the performance of composting like Temperature, C/N ratio, Moisture, pH esteem. In these process of making compost temperature is the main factor for get proper compost, for best quality of compost their minimum temperature is 15 and maximum is 70 degree we can increase or decrease according to our requirement. If temperature increase above the 70 degree then our decomposing bacteria is died due to high temperature. In this process C/N ratio is related to composting of carbon and nitrogen present in compost, the good quality of compose prepares under the composition of 30:1 C/N ratio.

When wet waste is added to it , moisture is there, due to which the heater turns ON and the composting gets heated. Due to this, the water content in the wet waste is evaporated and it goes out atmosphere as water vapor through the exhaust system. As any wet waste contains 70-80% water content we achieve 70- 80% volume reduction at this stage itself. At same time, our special microorganisms (liquid culture) then decompose the wet waste into compost, and this happens within 24 hours. That is how we achieve 85-90% volume reduction.

II. LITERATURE REVIEW

Ahammad Vazim K. A., et al.[1] Presented a paper titled, 'Design and Fabrication of a Novel Low Cost Food Waste Composting System with Accelerating Process Technology' This paper presents researched work of designed and developed "A Small capacity composting machine for household domestic food waste." It's affect various parameters like temperature, moisture, carbon-nitrogen ratio, pH value, material selection criteria and its properties were studied. This literatures study aims

to maintain optimal values of all the factors mentioned above, achieving rapid composting of food waste within 30 hours time span. Furthermore, compactness, portability, aesthetic design, affordability is taken into consideration.

Swapnesh H. Bhaisare, et al. [2] Presented a paper titled, **'**The OrganicCompost Machine and Factors Effecting Performance of Composting: A Review,' in this paper literature says that every day Metropolitan cities generatemore and more waste and this is overloading our municipal systems, systematic management of waste is big problem. Composting is known and easy process oforganic waste management. It is a biological conversion self-heating, which generates desired end products such as substrates for cultivation of mushroom, bio-gas and fertilizers. The proper maintenance of temperature and humidity in pulverized organic waste will increase the process of bio-degradation. The literatures study is done to evaluate the performance of compost machine. The proper management of temperature and humidity is important. The literatures aim is to decrease unscientific land filling, segregation of waste and to increase quality of compostor manure.

Priyanka Lokhande, et al.[3] Presented a paper titled, 'Automatic Waste Food Composting Using Solar Energy' In this research paper literatute concludes the gas level detection of each waste materials, discusses dumping and separating each type of wastages by using motor. Also, it describes a sophisticated technique for sorting the waste based on low-power controller of microcontroller which uses gas sensors to separate the compost and raw wastes to garbage management system. The method reduces the consumption of natural resources and lowers the ultimate waste disposal needs. The literatures result of this work explains that a Microcontroller based Automatic Waste Management Sorting Unit provided an efficient system for sorting wastes into various component.

Gaurav Chiplunkar, et al. [4] Presented a paper titled, **'**Design of Kitchen Waste Composting Machine: A Smart Approach,' in this paper literature says that -In INDIA, approximately 50% Biodegradable Waste is generated in total MSW composition and now the numbers is increasing. So literature have come up with idea SMART Composting Machine. Design of machine is such that every day literature can process 10 to 15 kg of organic waste. The paper is about processing daily Food Waste in such a way that litrature will get Fertilizer as product. In this process Organic waste is going to get crushed in semi-powder form and then it will go under continuous mixing and heating process. The process is as follows; Only Food Waste (No Plastic) as input. Waste material will go into a vessel having shaft inside and blades are attached to it. The Motor will run for some time and material get crushed into semi-powder form. After some time material will go into homogeneous mixing process at slow speed. Now Heating will get ON. As it a biological process it must gone through heating at 60 Degree Celsius for certain time. Continuous Moisture sensing and Heating sensing is going on. Once all Parameters reached to SET POINT, Heating and Motor will turn OFF. The machine design is automatic and compact in size. This machine processes all types of waste includes in organic waste. This satisfies 3R principle: Reduce, Recycle and Reuse..!!

Swati Kedar Nadgaundi, et al.[5] Presented a paper titled, 'Wet Waste Composter.' This paper presents the design of a composting machine, which is based on a micro-controller platform. This system enables the composting process to take place under the ideal conditions so as to reach maturity in a perfect time. The literatures machine is designed around a PIC16F micro-controller chip, and consists of some simple hardware components. Hence, a very compact, rapid and more importantly cost-effective solution is achieved for the control of the two important parameters, especially the temperature and air-flow, of interest in the composting process. Outcome of tests show that this system provides notably good levels of autonomous control, and can be easily improved into a network-controlled system. The main purpose of the litrature is to introduce a new design of prototype of an automatic composter.

Shoaib Kazi, et al.[6] Presented a paper titled, 'Design and Development of Small Capacity Composting Machine for Domestic Wet Waste: A Review' According to this paper literature have designed and developed "A Small capacity composting machine for household domestic food waste." Various parameters like temperature, moisture, carbon-nitrogen ratio, pH value, material selection criteria and its properties were studied. This literatures study aims to maintain optimal values of all the factors mentioned above, achieving rapid composting of food waste within 30 hours time span. Furthermore, compactness, portability, aesthetic design, affordability is taken into consideration.

Karthigayan Gunasegaran, et al.[7] Presented a paper titled, 'Economical Smart Composting Machines to Manage Food Waste', Alleviate Environmental Degradation and Combat Climate Change on Penang Hill.' In this paper literature says that Food waste is a pressing worldwide concern that has often been regulated by various composting systems as alternative waste management methods. Mechanized in-vessel composting in the form of the Malaysian-invented and designed ESFWC machine has proven to be a successful economical and sustainable composting system. It reduces costs, GHG emissions, energy, resources, and labour, while still generating a value-added product that further facilitates the environmentally sustainable growth of urban green spaces. For these reasons and the success of past implementation of the ESFWC in significantly contributing to reducing food waste and returning balanced organic content and moisture compost, the ESFWC is proposed as a matchless addition to Penang Hill, which is open to such a solution, to locally manage food waste and conserve the beauty, history, and natural environment of this iconic Malaysian treasure.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

Shubhdeep Singh Matharu, et al.[8] Presented a paper titled, 'Design And Development Of Organic Waste Compost Machine' In this paper literature says that waste management is part of planning for sustainable development. When the produced waste is so huge and spared over Crores of houses, it is very difficult to effectively collect the waste. Any small mismanagement of this waste results in huge loss to environment by means of pollution. Authors have presented the design of machine for waste processing through compost. The literatures developed machine will be suitable for housing societies in India to process the solid waste. The literatures machine will not only results in reduction of economic burden on government but can develop a module for earning of societies through sell of organic fertilizers. These fertilizers are useful for Indian Agriculture sector.

Modupe Stella Ayilara, et al. [9] Presented a paper titled, 'Waste Management through Composting: Challenges and Potentials'. In this paper literature says that improper waste management is a common practice which is not safe and can be replaced with safer waste management method such as composting. The world is tending towards improving environmental and human health. As a form of organic fertilizer, composting can play a significant role in achieving this goal. Focus on composting will cause a shift in the use of chemical fertilizer in favor of compost. This shift will invariably promote environmental and human health by reducing the number of toxic chemicals released into the environment. In the present state, a lot of awareness still needs to be done concerning the potentials of this technology for its full acceptance by farmers. Concerning the improvement technologies, some recommendations are hereby suggested to aid its improvement. Due to the large nutrients contained in composts, it is recommended that mono nutrients should be extracted from composts. Many times, when pre-planting soil analysis is conducted, there may be a deficiency of one nutrient. The extraction of mono fertilizers from the compound fertilizer form of compost will go a long way in preventing the over-application of nutrients that are not needed. In addition, organisms that are capable of degrading complex degradable materials can be made available to farmers as inoculum to hasten slow composting processes. More researches should also be conducted to discover the odor trapping mechanism to solve the problem of air pollution associated with compost production. There should be provision for CO2 trapping to prevent the release of greenhouse gases from composting.

Manish Kumar, et al.[10] Presented a paper titled,' Paper on Compost Machine.This paper here presents the systematic and detailed study of the work performed by the literature on the process and working principal of Automatic compost Machine. In present time the problem of waste management is big deal for people so literature need a technology to manage the waste in proper direction, and the compost machine is one of them. Compost machine convert the food waste into fertilizer which is useful for increase fertility rate of soil and give a strong product. Basically, the machine is fully automatic, there is lot of operation occurs inside with the help of component and converts the waste in useful product. According to literature there is lot of benefit of people from this compost machine, people easily biodegrade his waste and use after making fertilizer or either they can sell the product, another one is machine help to decreased pollution in our area. Machine is converted the wet waste in specific time that is 24 hours maximum. And he says that we can also collect our product in 22 hour and 20 hours but within 24 hour we can take maximum benefit from the compost for our soil. Inside the machine humidity sensor and temperature sensor present which is help to sense the term and humidity which is provide definite temp and moisture and then special microorganism start decomposing the waste into compost and this happen in 24 hours.

III. METHODOLOGY

Compost machine is a semi-automatic, first of all we can insert our wet waste in the shredder which is dividing all the big wet waste components into small one and the process is continuing further. Waste is reaches in chamber where heater is present outside the container, the work of heater is to dry our compost according to make proper and dry compost normally waste has 75 to 85 percent moisture that is not good for making better compost. After this process waste is going further and touched with mixing blade which is mounted on the shaft so blade is mixed all the waste in proper manner. After 22 to 24 hours, we can collect our compost and used in farming and increase the fertility as well as health of soil. The composting machine consists of a composting container made from Stainless steel. A feeding hopper which is fitted on above the shredder over the composting container. This U shaped container consists of a heater. Heat is produced by a heater and it is regulated by a thermostat, which heats up the entire container. A 30 mm diameter shaft will pass through the center of the composting container in a horizontal direction and will span through the actual length of the composting container inside, on which a mixer its design like that of a shaft is being driven by a geared motor with an average output speed of 12 to 15 rpm.

IV. SCOPE FOR THE FUTURE WORK

1. Use of solar powered machine
2. Using computer science and programming, app can be developed for assistance like IOT

3. Trying use boiler instead of electric heater and nanofluid(Enhanced thermal properties) to it to increase the efficiency of heating process.
4. Adding safety features as a switch door sensor that stopes the blades when the machine door is open to prevent any accident.
5. Installing more powerful heater to raise the temperature faster.

V. CONCLUSION

1. Composting of the wet waste is an eco-friendly method rather than directly disposing the waste into earth surface this method is useful to convert organic waste to fertilizer and that would otherwise have been land filled with the wet waste.
2. Compost process has a lot of benefits like – reduced landfill space, decrease contamination of water and earth surface, reduce discharge of methane gas, reduce air pollution, increase reuse of materials and which can be carried out with low initial and operating costs.
3. The composting machine helps for getting the good compost and reduced the cost which is required for degradation and segregation, etc. The flexibility is machine increased and also the volume of wet waste is increased. Also the quality of the compost which is generated in the machine depends upon factors like moisture content, pH, temperature, time etc.

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IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

Stress and Strength Evaluation of Double Lap Adhesive Joint

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Abstract: An adhesive is a substance which when applied to the surfaces of materials binds that surfaces together and resists separation. The strength of the adhesive joints under impact loads has become more important because of their huge use to the aircraft and automobile industries. In industries, adhesives are used to join the dissimilar or same material. But when those joined material comes under use, it may rupture or may not rupture. It depends on the how much load has been applied on the joint, type of adhesive material used for joining and the contact area of the two material. Joint failures contribute major cause of machinery breakdown resulting in costly down time. To prevent that, we should know the strength of the adhesive joint for that two particular material.

Keywords*:* Adhesive Joints. Strength, Loading, Stress

I. INTRODUCTION

Joint failure is one of the main causes of interruption of rotating or stationary machinery operation. This generally leads to unscheduled shut down thereby increasing the cost of operations. One of the major concerns in adhesive joint is the noticing of the rupture initiation and strength of joint before it develops into a failure of material. The ability to achieve strength of adhesive joint is essential to the optimal maintenance of whole system with respect to cost and productivity.

An adhesive is a substance which when applied to the surfaces of materials attach that surfaces together and resists separation. The strength of the adhesive joints under impact loads has become more important because of their huge use to the aircraft and automobile industries. In industries, adhesives are used to join the different or same material. But when those joined material comes under use, it may rupture or may not rupture. It depends on the how much load has been applied on the joint, type of adhesive material used for joining and the contact area of the two material. Joint failures contribute major cause of machinery breakdown resulting in costly down time. To prevent that, we should know the strength of the adhesive joint for that two particular material.

The stress dissemination in both the adhesive layer and adherends are necessary to be analysed to determine the material properties. Adhesive joint cannot tolerate misalignment, it need precise alignment between two materials. The continuation in use of two material develops stress on the joint which may cause initiation in rupture of the joint. So it becomes necessary to study the stress and strength of adhesive joint to improve its stability.

Following are the applications of adhesive joints:-

1. It is widely used in aircraft industry.
2. It is widely used in automobile industry.
3. It is widely used in space industry.
4. It is used for vehicle structure performance.
5. The mechanism of adhesive joints helps to reduce stress concentration found in bolted, riveted and welded joints.
6. Shock and impact characteristics of the joints are improved.
7. Adhesive joints allow sufficient mechanical compliance in parts subjected to thermal distortion.

II. LITERATURE REVIEW

Research has been conducted on very vast scale in adhesive joint analysis. The influence of loading with material properties and geometries and their response in the form of displacements and strength are also studied by the researchers.

Design and Analysis of Hybrid Lap Joint using Clinging Tintur- Mr. Somesh.P.Patil1, Prof.C.R.Patil2, Prof. Tushar Hingwe3 [1]- This paper dealing with investigations of adhesive layer characteristics and it is a part of our continuous research on adhesively bonded joints. Previous experimental analysis has shown that bonding of different adherend materials using the same adhesive leads to the different behaviour of adhesive. This outcome is more evident in numerical modeling of adhesively bonded joints, especially in bonding of adherends of higher yield strength. To understand how adhesives work, it is necessary to understand their mechanical properties and the chemistry used to create those properties. The object of present investigation is

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

therefore to research cohesive and adhesive characteristics of chosen structural adhesives in correlation with adherend materials to be bonded. In particular, two- component structural epoxy adhesive and aluminium as adherend material have been tested.

Analysis of adhesive-bonded single-lap joint with an interfacial crack and a void .Alireza Chadegani, Romesh C. Batra [2] We use the first-order shear deformation plate theory (FSDT) to analyze stresses in two layers bonded together with an adhesive as recommended by the ASTM D3165 standard, excluding that we also include a void within the adhesive. Depending upon the number of notches and voids, the specimen is divided into several regions. Assuming that a plane strain state of deformation prevails in the specimen, we write the balance of forces and moments for each section and impose the continuity of displacements, forces and moments at the interfaces between the adjoining sections. By taking the Laplace transform of the resulting ordinary differential equations we get a system of simultaneous linear algebraic equations that can be easily solved. The inverse transform of the solution of the algebraic equations provides stresses and displacements in the adhesive and the substrates, which are found to agree well with those obtained by the finite element method (FEM). It is also found that the order of the stress singularity at the corner of the free surface of the adhesive and the substrate, and the strain energy release rate computed from the solution of the problem with the FSDT agree well with those determined from the solution of the problem by the FEM. We note that the computational effort required to analyze the problem with the FSDT is considerably less than that needed to solve the problem by the FEM.

Standard finite element techniques for efficient stress analysis of adhesive joints[3] D. Castagnetti .The paper documents ongoing research in the field of stress analysis of adhesive bonded joints and aims at developing efficient and accurate finite element techniques for the simplified calculation of adhesive stresses. Goal of the research is to avoid the major limitations of existing methods, in particular their dependency on special elements or procedures not supported by general purpose analysis packages. Two simplified computational methods, relying on standard modelling tools and regular finite elements are explored and compared with the outcome of theoretical solutions retrieved from the literature and with the results of full, computationally intensive, finite element analyses. Both methods reproduce the adherends by means of structural elements (beams or plates) and the adhesive by a single layer of solid elements (plane-stress or bricks). The difference between the two methods resides in the thickness and in the elastic properties given to the adhesive layer. In one case, the adhesive thickness is extended up to the midplane of the adherends and its elastic modulus is proportionally increased. In the other case, the adhesive layer is maintained at its true properties and the connection to the adherends is enforced by standard kinematic restrictions. The benchmark analyses start from 2D single lap joints and are then extended to 3D configurations, including a wall-bonded square bracket undergoing cantilever loading. One of the two simplified methods investigated provides accurate results with minimal computational effort for both 2D and 3D configurations.

Stress Analysis of Adhesive Bonding of Urea Granulator Fluidization Bed A. Nor a, M. Afendi b, M.S. Abdul Majid c A.R. Abdullah [4] . Stress analysis of adhesive bonding of urea granulator fluidization bed was performed by using finite element method. The main objective of this project is to develop an alternative joining technique for urea granulator fluidizationbed by using adhesive bonding. The problem can solve by using commercial finite element package ANSYS version 13.0. T-joint and double T-joint are the main adhesive joints which will be focused in this project. The stresses on stainless steel plate can reduce by increasing the thickness of adhesive as demonstrated in numerical analysis results. Different thickness of adhesive will allow different value of maximum von Mises stress. It shows that greater thickness resulted in higher maximum. This analysis proves that increasing the adhesive thickness will reduces the joint strength because stress was concentrated more on the adhesive interfaces. The adhesive bonding on T-joint is stronger than other design of joint because it need lower stress. It followed by first design of double T-joint and second design of double T-joint.

Design of adhesive joints based on peak elastic stresses L. Goglio a,, M. Rossetto a , E. Dragoni[5] the paper is focused on the static strength of adhesively bonded structural joints and seeks a simple calculation rule that can assist the designer in everyday engineering practice. The work encompasses three steps. In the first step, an experimental campaign is carried out on an assortment of customized bonded joints (single lap and T-peel) made of steel strips bonded by an acrylic structural adhesive. The dimensions of the joints are chosen so as to produce a wide range of combinations of shear and peel stresses in the adhesive layer. In the second step, the stress analysis of the joints is performed by means of a sandwich model that describes the variability of shear and peel stresses over the overlap length but disregards the stress singularities at the corners. In the third step, a design rule is inferred by noting that, in a chart having as axes the peak values of the peel and shear components in the adhesive at failure, the points—calculated for each joint at the 2% (deviation from linearity) proof load—define a limit zone. The inferred design rule is that the adhesive withstands the load if the representative point of the stress state lies inside this zone. For the tested case, the envelope of the limit zone has an approximately rectangular shape. This criterion predicts the failure load of the joints far better than the simplistic approach based on the nominal stress calculated as the ratio of the load to the bonded area. The paper also discusses the response which is obtained by applying, to the same experimental data, the traditional calculation based on the mean stress (force to area ratio), and the more sophisticated approach based on the stress intensity factor, which accounts for the singularity of the stress field. Applied to our experimental data, the performance of both has been disappointing.

Problem statement

Joint failure is one of the main causes of interruption of rotating or stationary machinery operation. This generally leads to unscheduled shut down thereby increasing the cost of operations. One of the major concerns in adhesive joint is the detection

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

of the rupture initiation and toughness of joint before it develops into a failure of material. The ability to achieve strength of adhesive joint is essential to the optimal maintenance of whole system with respect to cost and productivity.

Objective

1. To determine deformation of adhesive joint and stresses developed in the joint of a structure or a machine component while it is being designed.
2. To study different types of adhesive materials.
3. To find stresses induced in aluminum lap joint.
4. To design and develop experimental set-up for the impact analysis of stress and strength of double lap adhesive joint.
5. To analyze stress developed in the double lap adhesive joint by FEA.

IV. METHODOLOGY

1. Adhesive joint fails because of manufacturing errors, improper assembly, overloading, operation, or because of too harsh an environment. However, even if a adhesive joint is perfectly made, assembled etc., it will eventually fail due to fatigue of the joint. It is necessary to detect the strength to avoid failure and for effective maintenance planning.
2. Use of the adhesive joint under loading develops stresses in the joint and causes initiation of rupture. As load goes on increasing, stresses and consequently rupture initiation goes on increasing and it get distributed along whole overlapping length. So it is necessary to find out the stress distribution and rupture initiation.
3. Early detection of the stresses and rupture in the joint, therefore, is crucial for the prevention of damage to the system.
4. Overlapping length is a common feature of all adhesive joint. It should be perfectly attached by the two material. There should not be any unbalance between the two adherents. They must be attached to each other face to face.
5. Materials can also be joined by bolt, rivet and welded joint. But it increases the weight of the joint. It can be overcome by using adhesive. Adhesive reduces the weight of the joint as compared with the joint made by bolt, rivet and weld. It will be too much beneficial for the system
6. Joint made by adhesive also reduces the space occupied in the system as compared to other joints.
7. Sudden high tensile loading may cause the failure of the adhesive joint.
8. Double lap adhesive joint of a typical size are used in automobile and aircraft industry for joining similar or dissimilar material. A system could be seriously affected due to defaults occur in adhesive joint.

Material to be selected

There are two adherends (specimens) and adhesive is required for the joining. Material selected for adherend is steel and adhesive is epoxy resin.

Steels are alloy of iron and carbon, widely used in construction and other applications because of their high tensile strengths and low costs. Epoxy resins are low molecular weight pre-polymers or higher molecular weight polymers which normally contain at least two epoxide groups. The epoxide group is also sometimes referred to as a glycidyl or oxirane group.Strain gauges and two U-shaped jigs with two pins are also used.

Advantages of adhesive joint

- The mechanism of adhesion helps to reduce stress concentration found in bolted, riveted and welded joints.
- Shock and impact characteristics of the joints are improved
- Dissimilar materials, such as metals, plastics, wood, and ceramics can be joined
- Adhesive joints allow sufficient mechanical compliance in parts subjected to thermal distortion.
- Adhesives can be contoured and formed in various

Finite element analysis

In the present study, stress distribution in double lap adhesive joint is obtained as,
Load = 100N (from both way in opposite direction).
Material Properties:
Modulus of elasticity (E) = 206 GPa
Poisson's ratio = 0.3
Density = 7.843 × 103 kg/m3

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ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

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Vol. 9, Special Issue 1, April 2022

Parameters selected for analysis:
Length of adherends are 90mm, 100mm and 110mm.
Width of adherends are 10mm, 15mm and 20mm.
Length of adhesive layer are 25mm, 27mm and 30mm.
To obtain the stresses developed in the double lap adhesive joint under loading condition, analysis is carried out taking 100N load on both side in opposite direction.

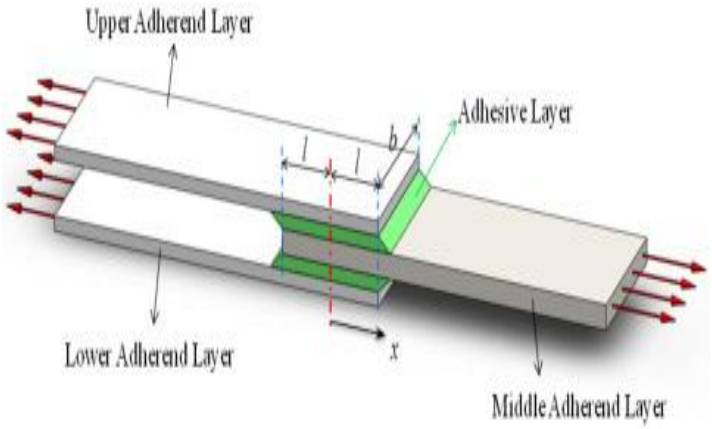

Fig. 1 Parameters used in ANSYS Analysis.

ANSYS analysis

ANSYS analysis is used to determine deformation of adhesive joint and stresses developed in the joint of a structure or a machine component while it is being designed. It also can be a starting point for another or more detail analysis.

ANSYS analysis is carried out on double lap adhesive joint for different adherends of 90mm, 100mm and 110mm. Overlapping length of adhesive layer and width of the adherends are varied for each total length of adherends. Overlapping length of adhesive layer and width of the adherends are taken as 25mm, 27mm and 30mm and 15mm, 20mm and 25mm respectively. Deformation in length of double lap adhesive layer can be obtained. Here the load applied from both the direction is balanced and it is taken as 100N. According to fig. load applied from left hand direction is divided into two parts. It is each 50N on both adherends and on right hand side direction, it is acting 100N on single adherend. Forces acting on both the directions are tensile in nature.

Steps in analysis:

Preferences

- Structural

Preprocessor

- Element Type-Add/Edit/Delete-Solid-SOLID186-Close

-Material Properties- Material Models-Structural-Linear-Elastic-Isotropic-

EX- 206 GPa

PRXY-0.3

-Material Properties- Material Models-Structural-Density-7.843 × 10^3 kg/m^3

Modeling- Model of double lap joint is prepared with different length of adherends, overlapping length of adhesive layer and width of adherends.

Meshing-Free meshing is carried out with tetrahedron element.

Solution- Analysis type - Modal

- Analysis options- Mode Extraction method- Block Lanczos
- Number of modes to extract-10
- Number of modes to expand-10- click OK.

- Define loads- Apply – Structural- Displacement – On area – Select left most area- Select All DOFs-Displacement value= 0 and Click OK.

Solve- Current analysis

Time/Hist Postprocessor – Add – Select different parameter – Click on list results.

IARJSET

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IV. RESULT

Cases of stress obtained:

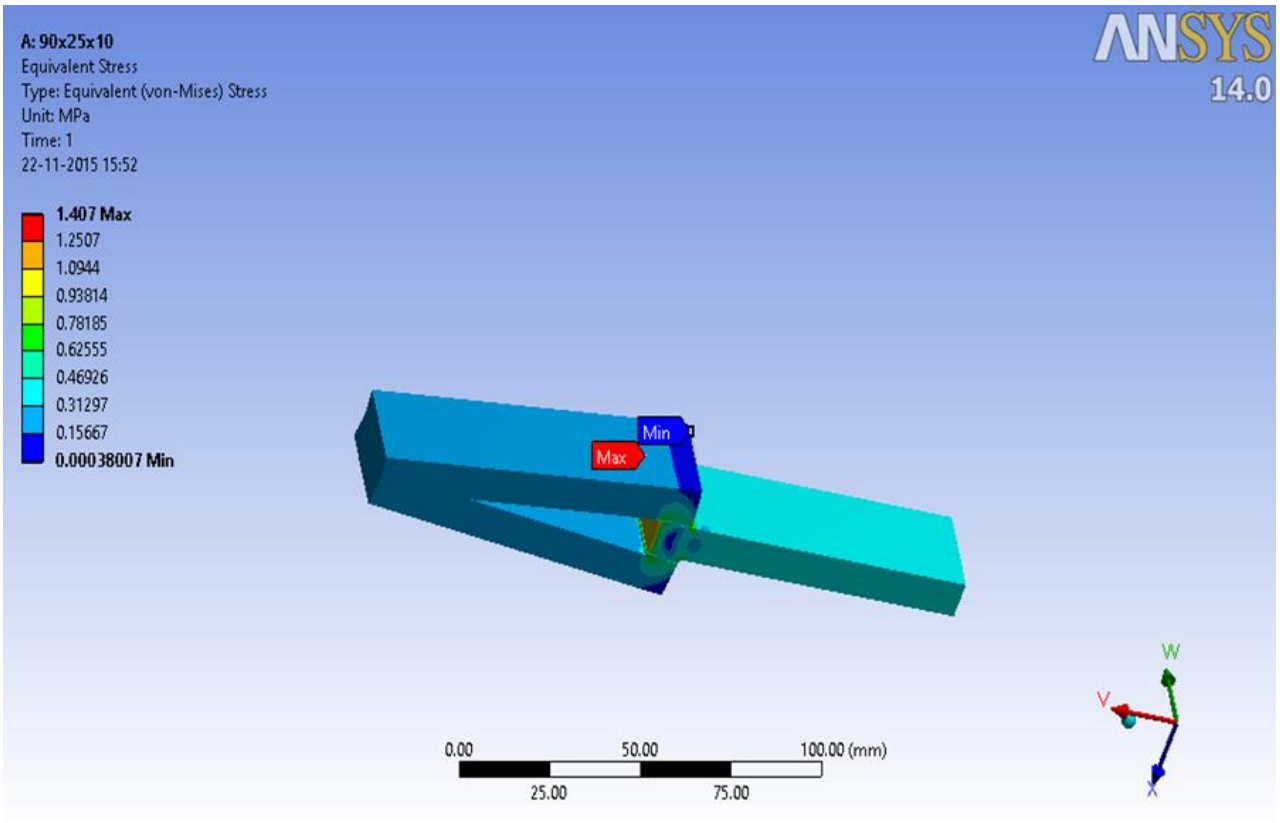

Fig. 2 Case 1.90×25×10

IARJSET

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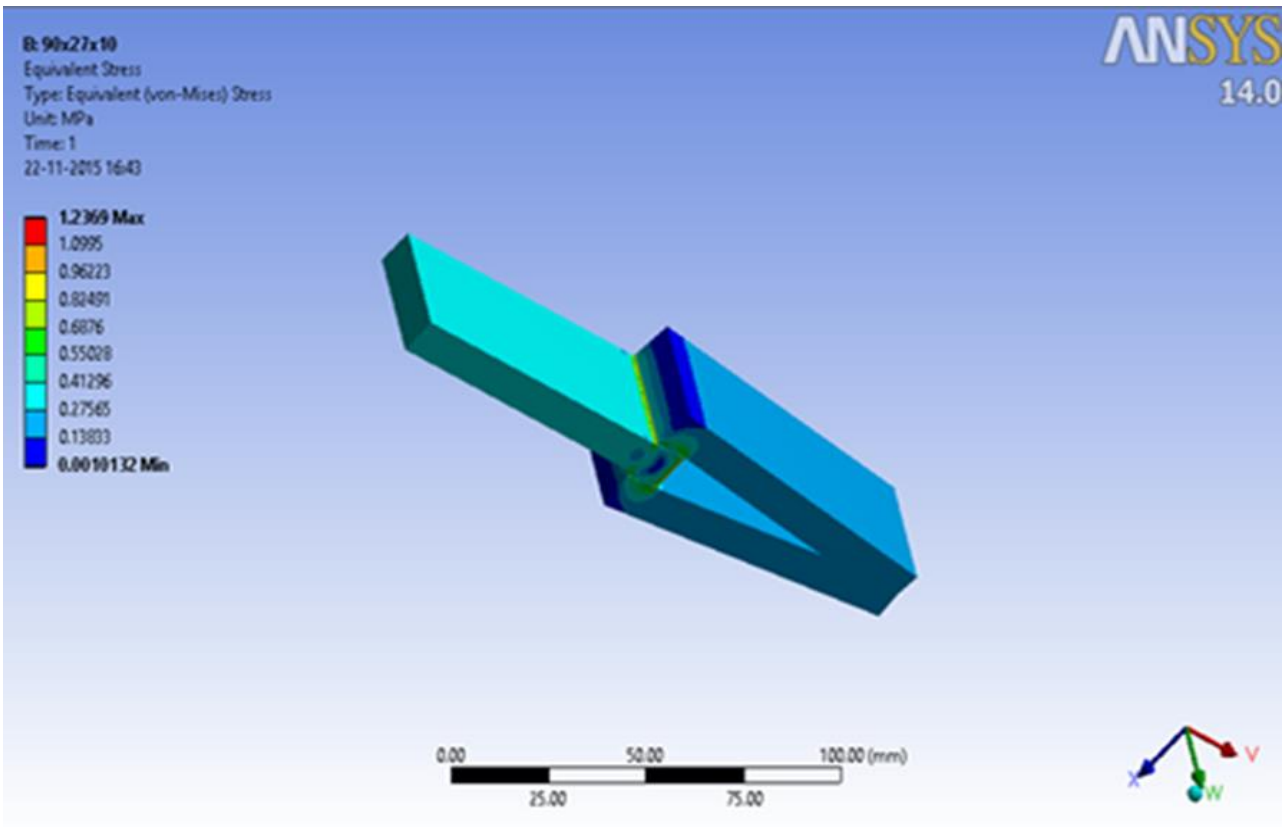

Fig.3 Case 2.90×27×10

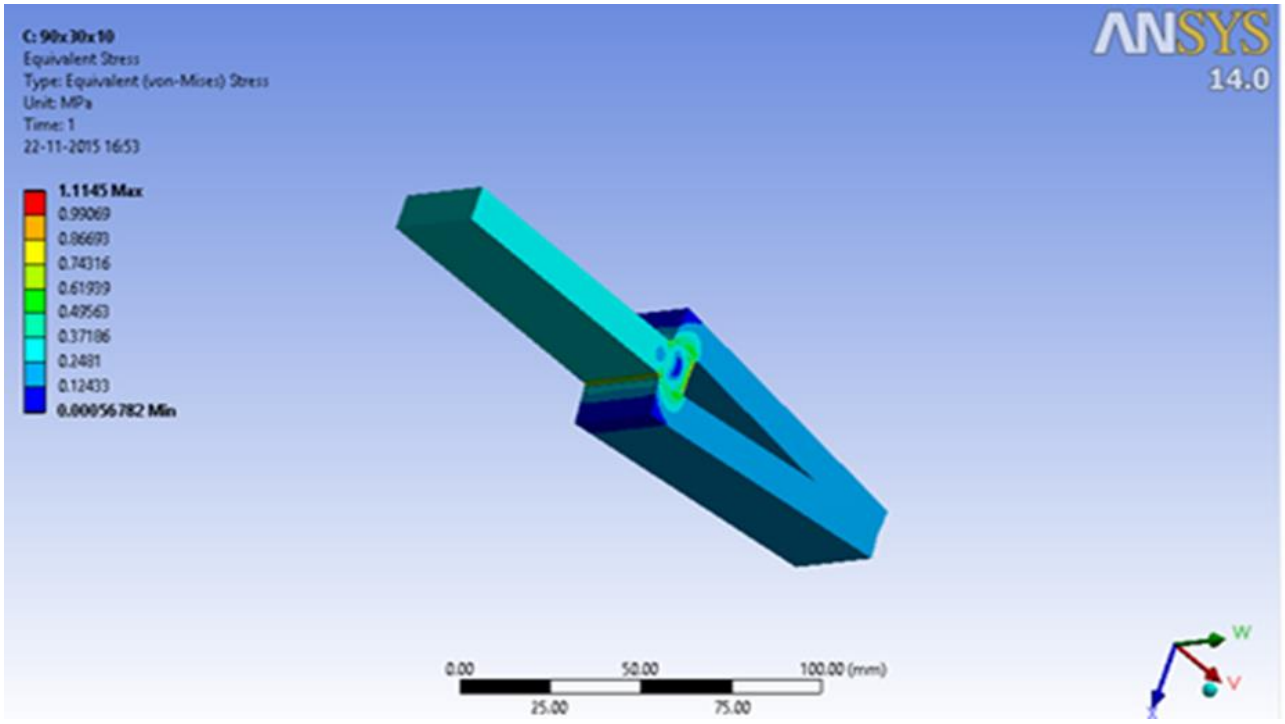

Fig.4 Case 3. 90×30×10

IARJSET

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ISSN (Print) 2394-1588

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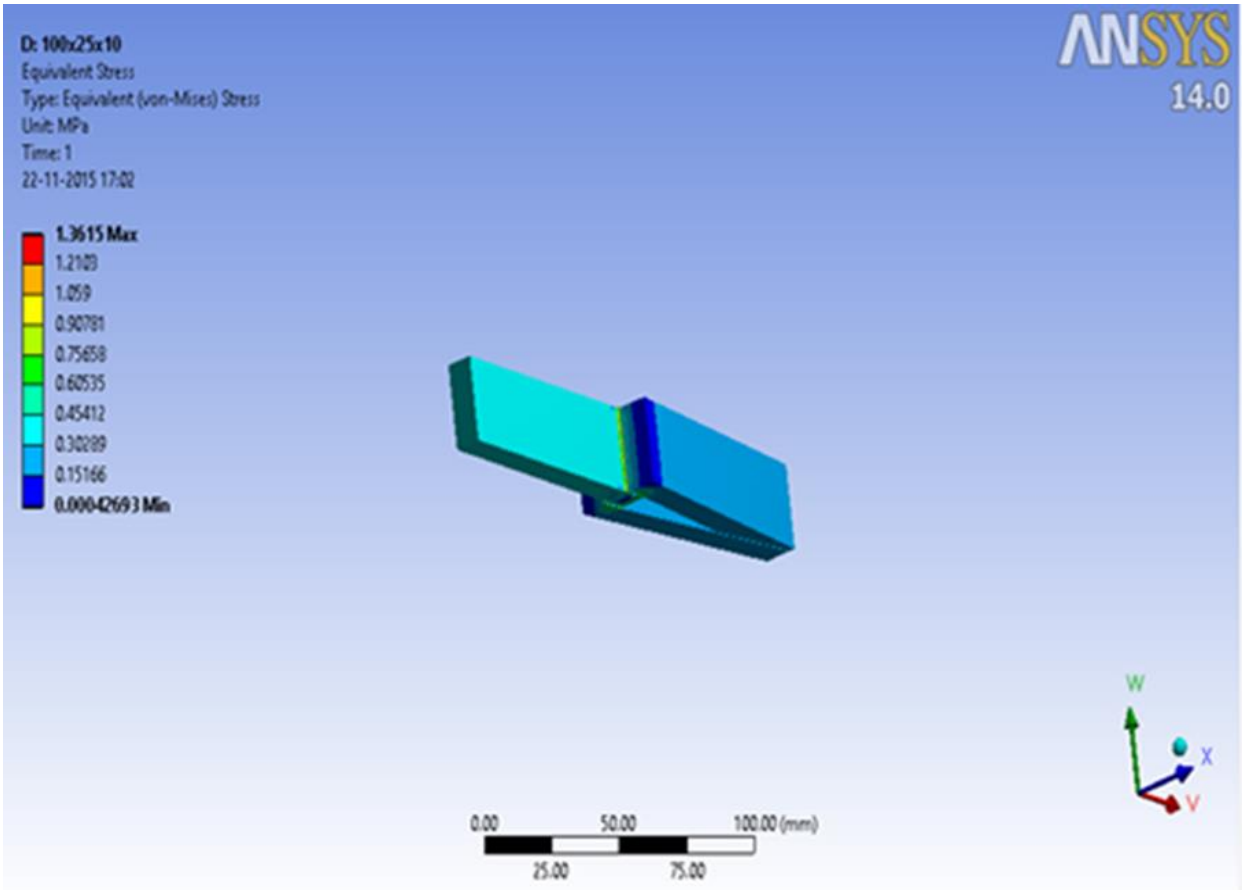

Fig.5 Case 4. 100×25×10

Case E	Specification of joint	Total deformation of joint (mm)	Stress (MPa)
1	90*25*10	0.00379	1.407
2	90*27*10	0.00350	1.236
3	90*30*10	0.00314	1.114
4	100*25*10	0.00423	1.361
5	100*27*10	0.00391	1.301
6	100*30*10	0.00351	1.120
7	110*25*10	0.00468	1.363
8	110*27*10	0.00415	1.203
9	110*30*10	0.00388	1.158
10	90*25*15	0.00126	0.732
11	90*27*15	0.00116	0.645
12	90*30*15	0.00104	0.580
13	100*25*15	0.00141	0.708
14	100*27*15	0.00130	0.678
15	100*30*15	0.00117	0.584
16	110*25*15	0.00156	0.766
17	110*27*15	0.00144	0.646
18	110*30*15	0.00129	0.605
19	90*25*20	0.00065	0.645
20	90*27*20	0.00059	0.562

IARJSET

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21	90*30*20	0.00053	0.497
22	100*25*20	0.00072	0.619
23	100*27*20	0.00066	0.578
24	100*30*20	0.00060	0.502
25	110*25*20	0.00080	0.608
26	110*27*20	0.00074	0.568
27	110*30*20	0.00066	0.498

V. CONCLUSION

The ANSYS program was successfully carried out which can be used to determine the total deformation and stresses developed in double lap adhesive joint.
The double lap adhesive joint of 90×30×20 is most suitable.
This joint gives the minimum deformation of joint 0.00053mm and minimum stress developed 0.497 MPa.
The change in the joint structure results in the change of deformation and stresses.
The ANASYS analysis proves to be a simple& cost effective method in the judgment of good double lap adhesive joint.

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IARJSET

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ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

AI Based Virtual Quiz Using Hand Gesture Recognition Technique

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Abstract: The ability to efficiently interface with machines has dramatically evolved hand gesture recognition systems in recent years. Mankind is trying to integrate the missing human gestures into current technology by searching for and developing alternatives to multi-touch technology that does not require touching the screen. This study shows a computer-based application for hand gesture recognition. The camera took a picture with the help of the interface. At least once, the system is trained for each type of count hand gesture (1, 2, 3, and 4). Then it receives the test gesture that the system is trying to recognize. The main goal of human-computer interaction (HCI) gesture recognition research is to develop a system that can recognize and communicate with specific human gestures.

Keywords*:* Python, Hand Gesture Recognition.

I. INTRODUCTION

Hand gesture recognition using vision-based technologies, as we all know, is an important aspect of human-computer interaction (HCI). The keyboard and mouse have become increasingly important in human-computer interaction in recent decades. As a result of the rise of technology and coding, new types of HCI solutions are required. Speech recognition and gesture recognition are two technologies that have received a lot of interest in the field of human-computer interaction.
A gesture can be a visual representation of a physical movement or a statement of emotion. It is made up of various body and hand gestures. In our project, hand gestures are used to answer questions in the quiz game. Throughout this assignment, we will utilise a variety of hand gestures to convey various responses to the questions. As a result,

II. BACKGROUND

Hand gestures are one of the most intuitive and natural ways for humans to communicate with computers, and they've been widely embraced in a variety of HCI applications. When faced with a complicated background, lighting change, and occlusion in real-world circumstances, however, it remains a difficult task. To address these issues, a two-stage hand gesture identification system is suggested in this study. Hand segmentation and detection is the foundation of a gesture recognition system. Which has a large influence on the performance of the overall gesture recognition algorithm. The main purpose of hand detection is to localize the human hand for a given image and hand segmentation aims to separate the human from the background.

III. SYSTEM ARCHITECTURE

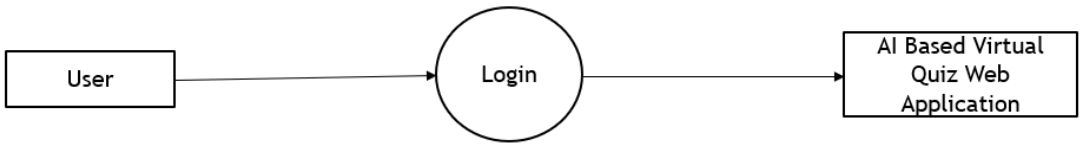

Fig.1.Components of quiz system

IARJSET

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Vol. 9, Special Issue 1, April 2022

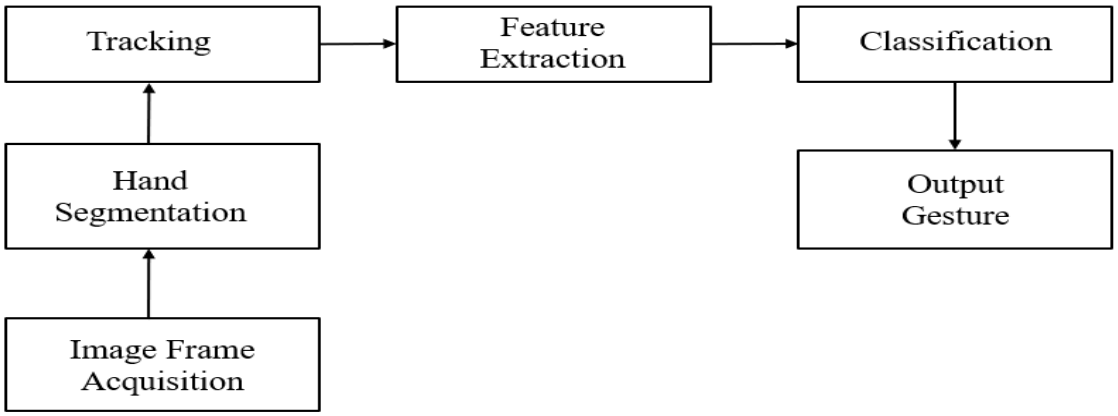

Fig.2. The stage of hand gesture recognition and converting to final answer

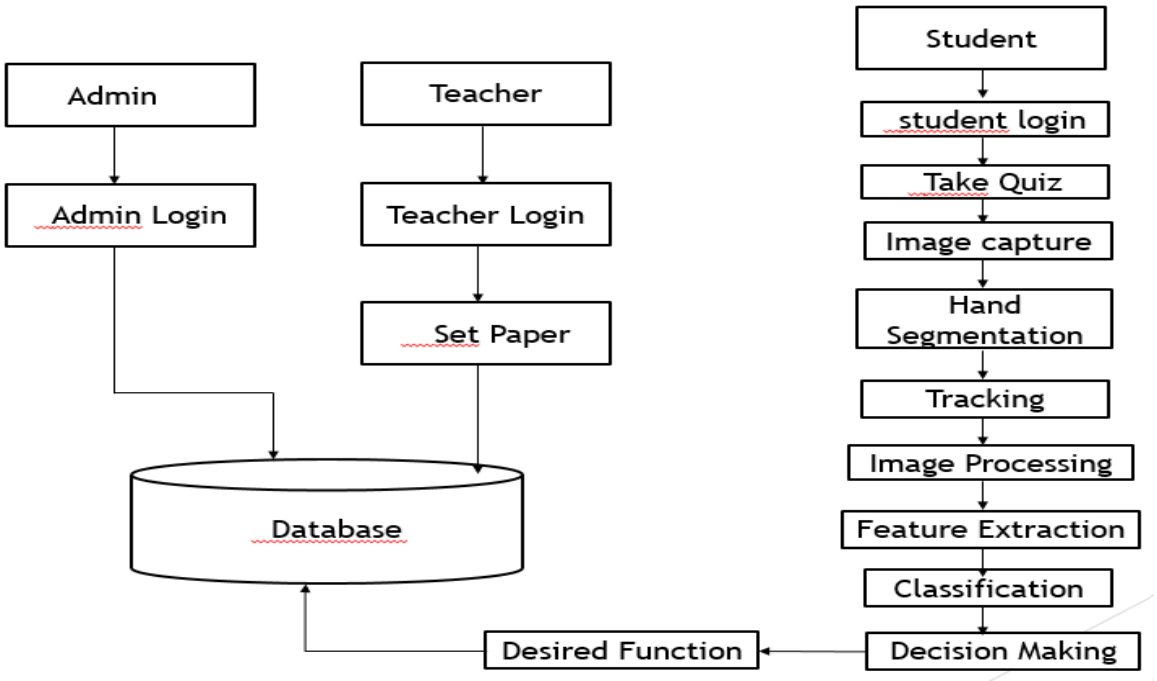

Fig.3.The stage of hand gesture

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

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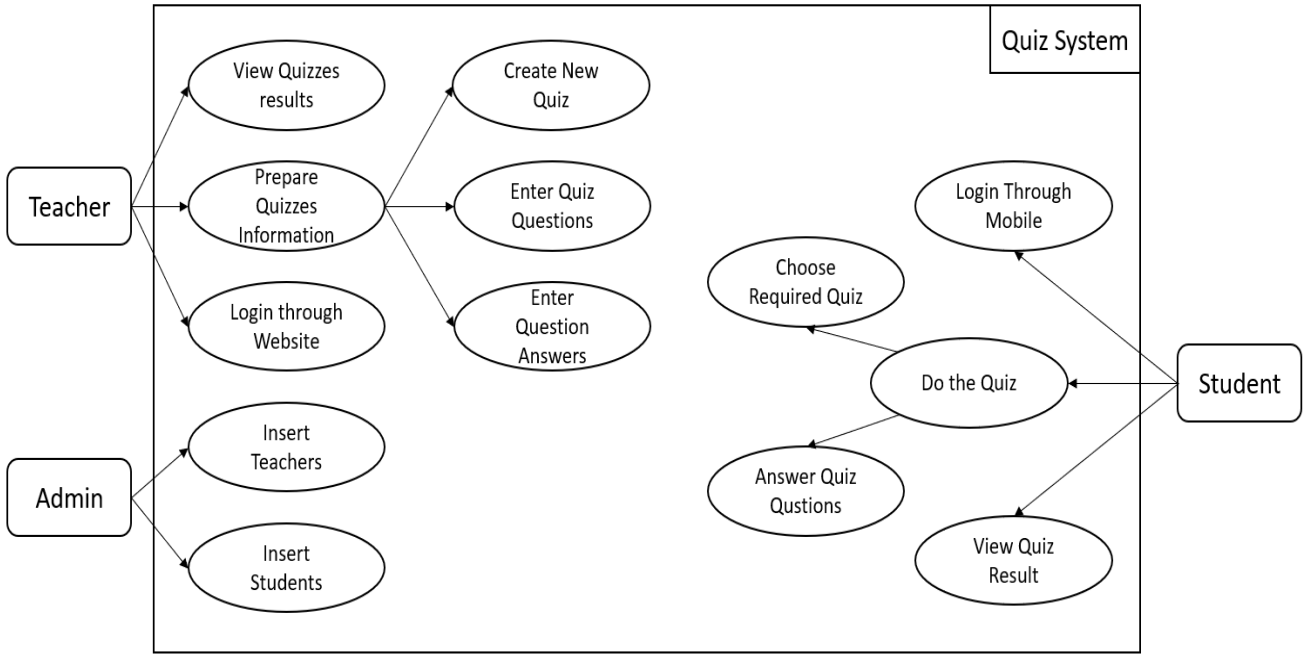

Fig.4.The main steps of hand gesture recognition and processing to perform final answer

IV. CONCLUSION

Gestures make it easier to depict something, make a presentation more appealing, and deliver a message quickly, and so on. Nonverbal communication is communicated through gestures. It can provide information in a variety of ways, including auditory, visual, and silent. It is frequently used as a substitute for verbal communication.

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ISSN (Online) 2393-8021
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National Conference on Recent Trends in Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

Cloud Based College Automation System with Alumni Interaction

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Abstract: A Cloud Based College Automation System with Alumni Interaction is a webbased application which helps the institutions to track old students and to track them for future. At the same time, it helps the alumni to communicate with the institution, may be a school, or college or a university and with the old batch mates. Because of their vast potential, the alumni network is becoming increasingly important in the development of the institution, benefiting both the institution and the students. Being an alumni member of a college or institution has many advantages, including (keeping a person informed about events organised by the Institution and when some important events will be held in the Institution.) Another advantage is the ease with which information about a former student can be obtained, as well as the ease with which other members of the alumni community can be located. Students and alumni are able to communicate with one another.

Keywords*:* Cloud Database, Java Script, HTML, CSS

I. INTRODUCTION

Because of their vast potential, which benefits both the institution and the students, the alumni network is becoming increasingly important in the development of the institution. Being an alumni member of a college or institution has many advantages, including keeping a person informed about the Institution's events and when importantevents will take place. Another advantage is that information about a former student can be obtained quickly, and other members of the alumni community can be found without difficulty. Students and alumni have access to each other's information.

II. LITERATURE SURVEY

A. Existing System

The existing system is a computerised system, but it is time-delayed because it is maintained in individual databases, i.e. in excel sheets. It's also difficult to keep track of everything in Excel sheets. They must search all of the records if they are looking for a specific record. It does not allow multiple users to access the system, nor does it have different user privileges. As a result, the system is not available to all of the company's employees.

B. Limitations in Existing System

The current system is not fully computerised and relies on manual entry and processing of student and staff data. There isn't a centralised database management system in place. There is no easy way to get to a specific student's file. The database is difficult to navigate for the student.

C. Proposed System

The proposed system is a computerised system that is maintained in centralised databases, making it a very fast process in automated forms. Furthermore, all records are kept in an online system database, making it very easyto access and retrieve data from the database. They can easily search all of the records if they are looking for something specific. It has different user privileges and allows multiple users to access it. As a result, the system is available to all of the company's employees.

D. Advantages over Existing System

It's a fully automated system that manages the college's database. This system allows for database maintenance to be centralised. This system allows you to quickly access a specific alumni account or all of his or her information. This system allows students to easily navigate through the application for more information while maintaining the highest level of security.

IARJSET

ISSN (Online) 2393-8021
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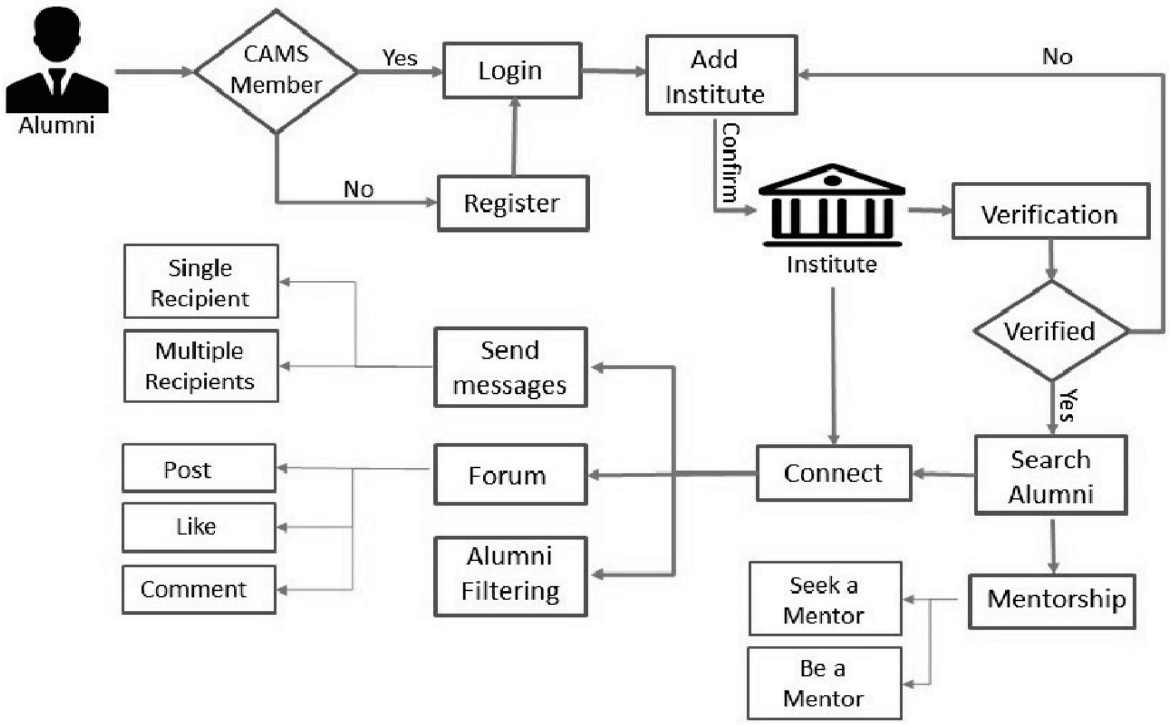
III. METHODOLOGY

As this is a complete online website, there are three technics -Frontend, Backend & Database

A. Frontend means the design of the website or the designing interface of the web application. Programing languages coming under Frontend: - HTML, CSS & Java Script.

B. Backend means server side programming; it communicates the client interface with the database and the Logic control. Programing languages coming under Backend: - Php, JavaScript, etc. Also Bootstrap and CSS are used for Design purpose

C. Database Means Storing Data of Web Application:- Technology Under Database Is Cloud



IV. MODULAR DESCRIPTION

There Are Three Modules of System This Are Following

- ADMIN
- STUDENT
- ALUMNI

Admin:-

This module helps us to register user. The contents are id, name, Address, contact no, mail id, password. After registration admin can add the results to the search engines. Here We can update, delete, maintain this form.

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Sub Modules :-

- Send invitation to alumni.
- Update student details.
- Search user details.
- View student details.
- Maintain user details.
- Post update information.

Update Student Details:

In this module admin can update the details of the student like student name, password, address, contact number, mail id, register number, department name. These details stored in database. In this module admin can also update the details of the alumni like student name, password, address, contact number, mail id, register number, year of passing, designation. These details stored in database.

Search User Details:

In this module can search the details of the students and alumni. It displays student name, address, contact no, email-id and password. It also displays alumni name, address, year of passing, designation, contact number, email-id and password.

View User Details:

In this sub module we can view the entire details of the students or alumni are registered.

Maintain User Details:

In this module admin can maintain student and alumni details regularly.

Student Module:

This module helps us to register and after registration it helps us to search different information regarding the college.

Sub modules:

- Update user details.
- Search details.
- View student details.

Update user details:

In this sub module we can update the details of the user like student name, gender, address, contact no, mail id. And we store these details in database.

Search College information:

In this sub module we can search the details of the college information and the user can select college information as their wish.

View student details:

In this sub module we can view the details of the colleges and the information about the colleges.

ALUMNI MODULE:

- Update user details.
- Search friend details.
- View student details.

Update user details:

In this sub module we can update the details of the user like alumni name, year of passing , address, contact no, mail id designation and we store these details in database.

Search Friend details:

In this sub module we can search the details of the friend information and the user can select friend information as their wish.

View college details:

In this sub module we can view the details of the college information about the college.

IARJSET

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Post details:

In this module we can post information(events, other technical activities) to the site.

V. CONCLUSION

A great interaction between the pass out student and the college can be maintained by using this system. A good networking between current students and alumni can be developed, and by using this system, students can clear their doubts in any area, and alumni students can share their knowledge, materials, and anything else. If the Department needs information about alumni in an emergency, they can easily obtain it using this system.

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IARJSET

ISSN (Online) 2393-8021
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Vol. 9, Special Issue 1, April 2022

Multi-Vendors Grocery Delivery Woo-commerce System

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Abstract: Wasting food is a common problem in our society. Remaining food waste management crucial since it can improve our environmental and economic sustainability. We have identified the use of technology to reduce food waste management and built web application that allows restaurants and hotels to share their remaining food to needy peoples. Nowadays online ordering system play a vital role in everyone's life. An online ordering system can be defined as software that allows customer to view and order multiple item over the internet. The main objective of an online store is to ensure customer and vendor satisfaction. Instead of a customer being confined to restaurants, super markets around their home or one that only attracts nearby residents. Customers can now discover new online store. So we built a web application where consumers can purchase all groceries products instead of going to offline shops. We implemented a website for online which allows customer and sellers to order and sell multiple categories in food, groceries and also remaining foods from hotel or restaurants for donating to needy peoples on the same platform.

Keywords*:* Groceries shop, remaining food wastage management, web application, storage, database.

I. INTRODUCTION

This project is used to manage wastage foods and grocery related items in a useful way. Every day the people are wasting lots of foods. So, we have to reduce that food wastage problem through online as well we can buy or sell food and grocery items in this web site. If anyone have wastage foods, they are entering their food quantity details and their address in that application and then the admin maintains the details of food donator. Also people sell the grocery items in that application. The donator/vendor can create the account and whenever they are having wastage food and grocery item, they can login and give request to the admin. And the admin also maintains the buyer (orphanage, poor people.) details too. After the admin view the donator/vendor request and give the alert message like time to come and collect the food or grocery items. And the admin collects food or grocery items from donator/vendor through their nearby agent then provide to nearest customer/orphanages or poor people. After receiving the food or grocery item from the agent by admin and give alert message to that donator/vendor. If the donator/vendor needs any detail about the customer/orphanage with helping thought they can give request to the admin and collect the customer/orphanage details. This project is food redistribution is an enormously successful social innovation that tackles food waste and food poverty. This project also useful for all grocery shop workers. This project is very useful for grocery shoppers. The user's details are maintained confidential because it maintains a separate account for each user.

II. WORKFLOW AND METHODOLOGY

1. Admin:

An administrator evaluates ecommerce transaction and provides support to nearly all associate activities. They intend to monitor all product information, site issues and resolve them. Let your employees take up the duties while you are engaged in fundamental things. Running a large-scale marketplace is much easier when delegating certain duties to your staff members. The Multi-Vendor platform allows registering employees and set different levels of access to the admin panel. For instance, your web designer can work on the look-and-feel of the marketplace while sales guys add products and process orders.

2. Staff:

After the admin staff have all the rights. Staff members manage the update of customer, vendors and delivery boy. Staff member notify admin to new updates related to customer, vendor and delivery boy. Staff members do not have rights to operate customer, vendor and delivery boy status they only watch their activities properly and give all info to admin.

3. Customer:

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

A customer is an individual or business that purchase another company's goods or services. If customer want to purchase some product they want to create there account and fill all details correctly. Customer purchase any product in any time. If customer want to delete order they have rights to delete order in specific time. Customer have choice to online or offline transaction.

4. Vendor:

A vendor sells products or services to another company or individual. If vendor want to sell their product vendor create her account and add the full details related to products. For selling these product vendor want approval from the admin, so vendor send the request for admin to approve her request. When admin accept the request or approve the request vendor have right to sell their product. When products are sell admin give her there margin. If any case admin reject the request of vendor then vendor could not sell their product.

5. Delivery Boy:

Admins or staff member selects the delivery boy and create her account. Deliver a wide variety of items to different addresses and through different routes. Follow routes and time schedule. Load, unload, prepare, inspect and operate a delivery vehicle. Ask for feedback on provided services and resolve client's complaints. Collect the all payment give update to staff members and admin.

III. RESULT

For remaining food and groceries products we are successfully build an online website to sell and purchase the product in same platform. We try to overcome the retailers and customer problems to go so many offline shops for sell and purchase the product. We successfully built the website where remaining foods as well as groceries products are easily sell and purchase on the same time.

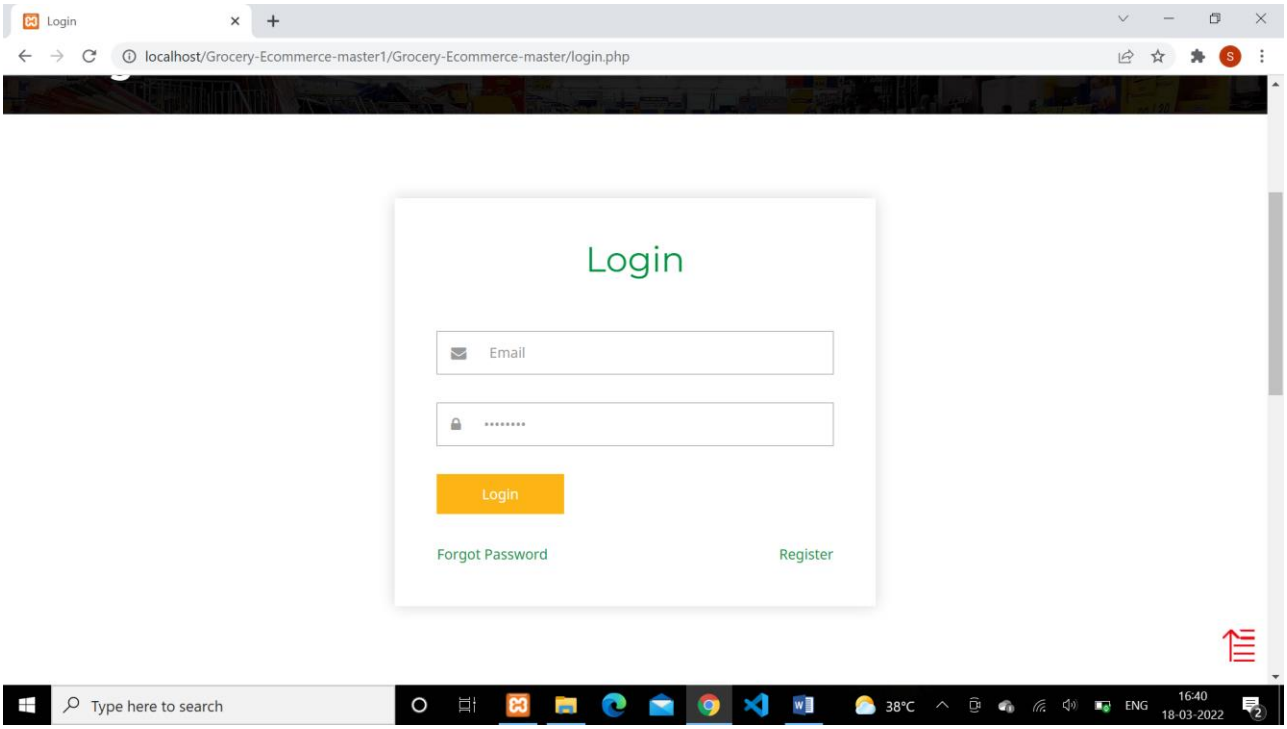

Fig 1 : Customer Login Page

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

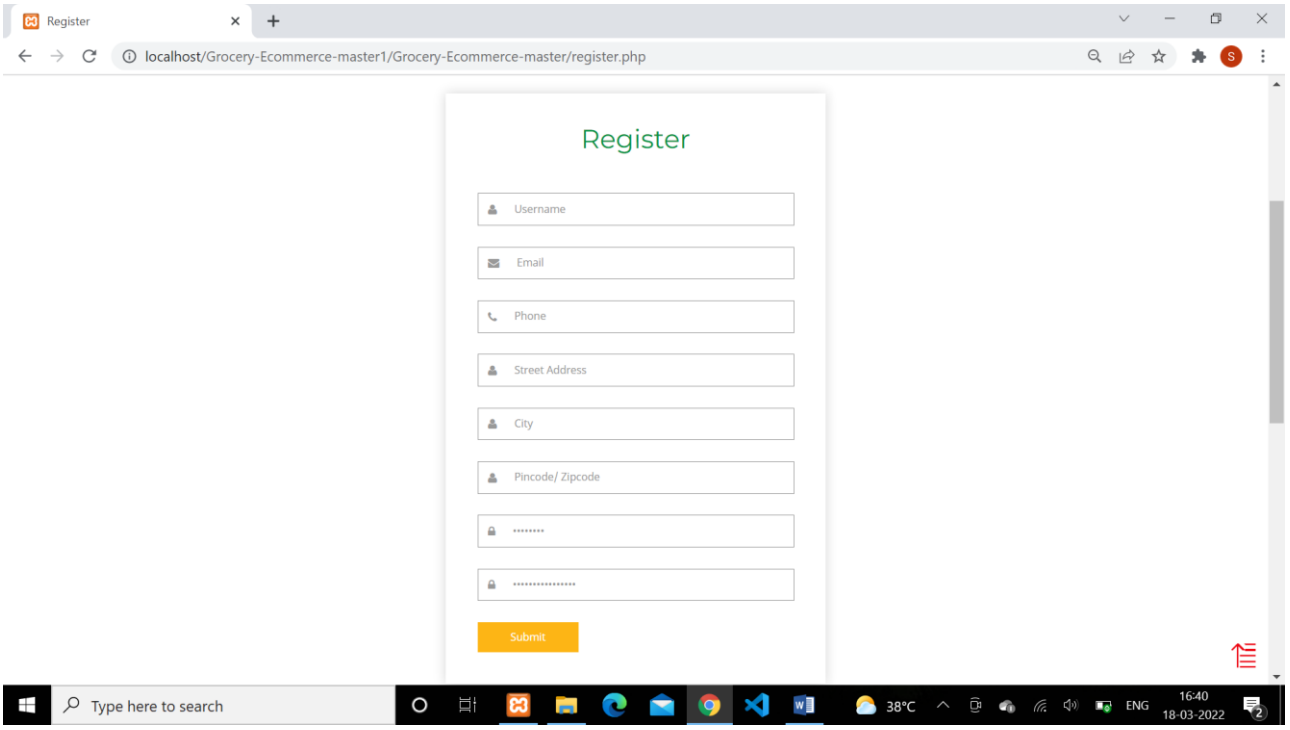

Fig 2 : Customer Registration Form

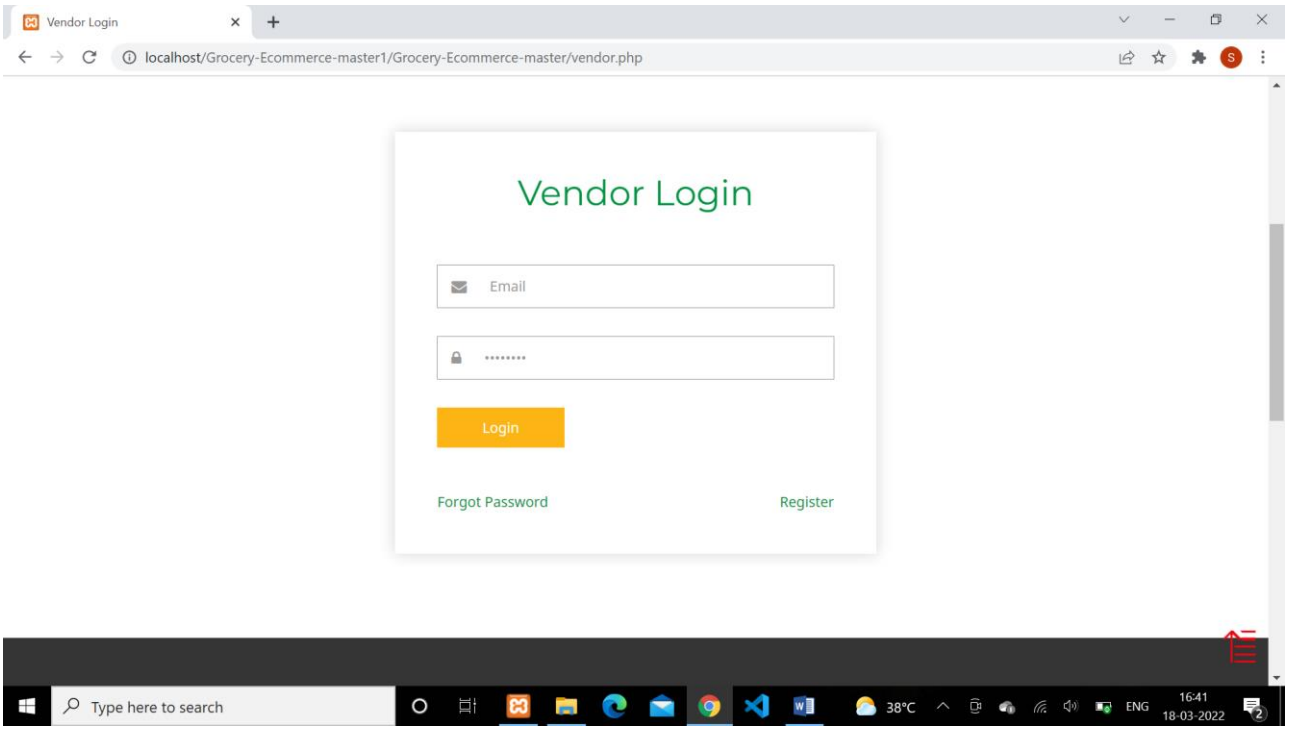

Fig 3 : Vendor Login Page

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

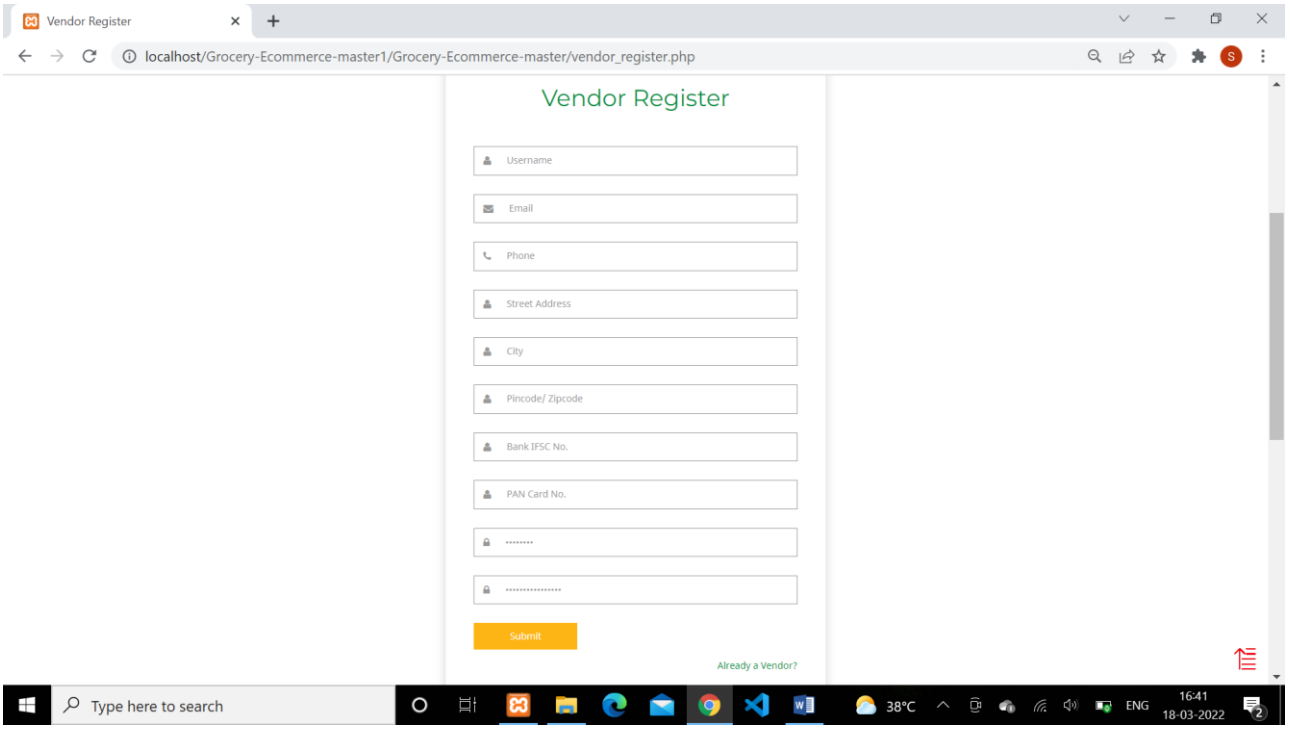

Fig 4 : Vendor Registration Form

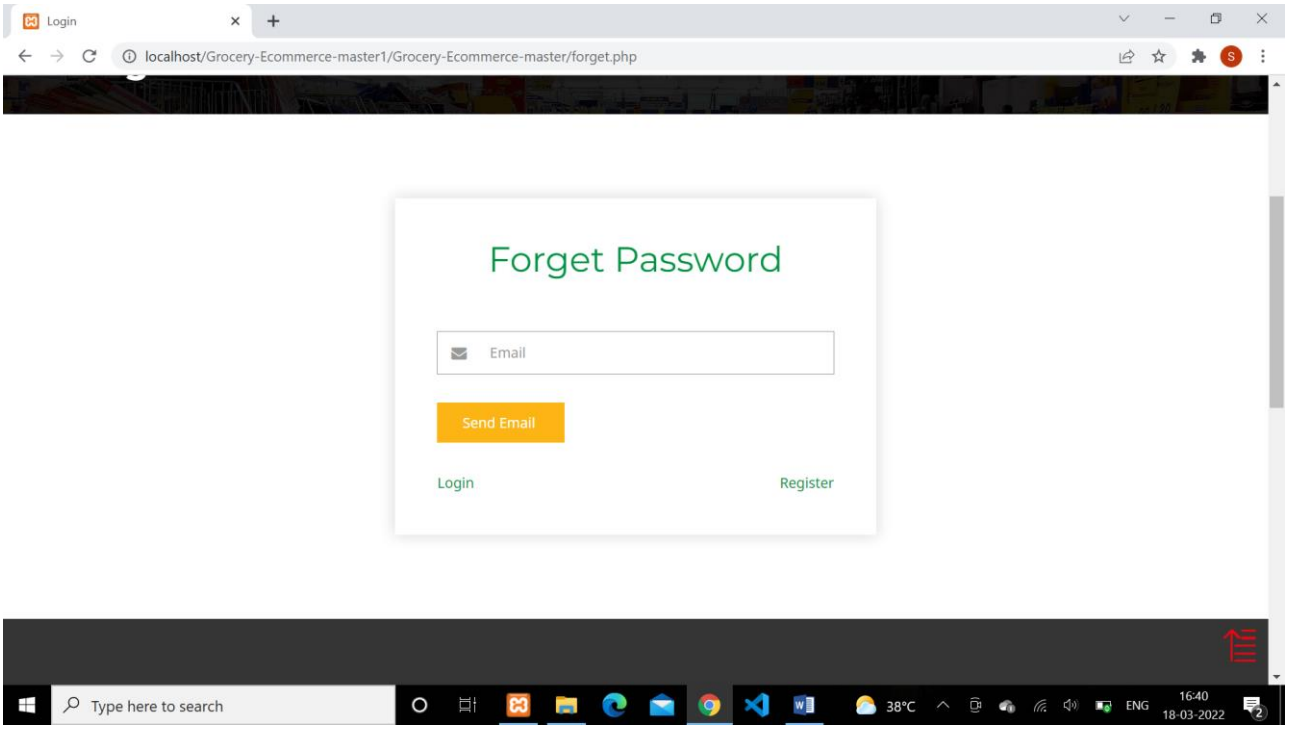

Fig 5 : Password Reset Form

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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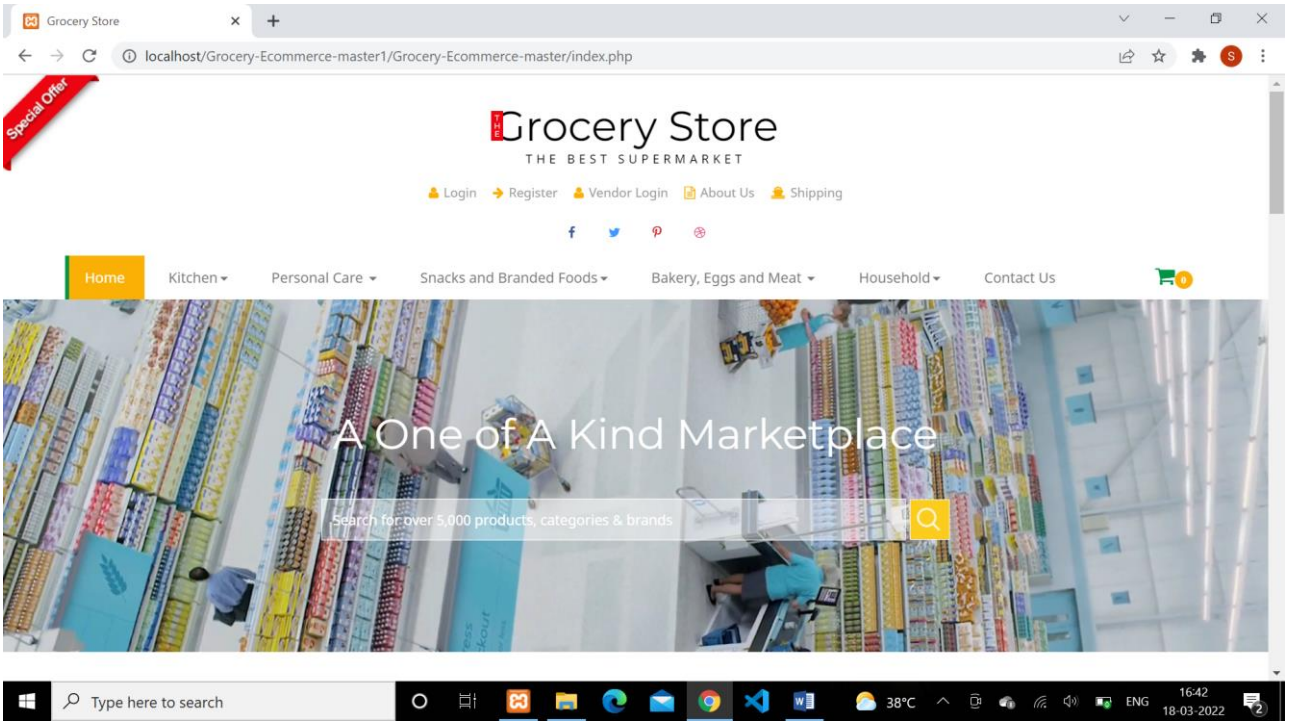

Fig 6 : Home Page

IV. ADVANTAGES

- Save the times of consumers and sellers.
- Remaining food in hotels and restaurants used in good way.
- This website used to overcome wastage of remaining food to giving needy peoples.
- Using this website people buy all groceries related product in one shop and save the time to go so many shops for buying the product.

V. CONCLUSION

Recently many studies were developed various application on web browser. This paper present “Multi-Vendors Grocery Delivery Woo-ecommerce System”. Our study has investigated the problem of remaining food wastage in restaurants and hotels that has many serious side effects economically and socially. Also we are investigated now day peoples like to buy products online and food is most important part of humans. We build a website where consumers buy all groceries product and also remaining foods in hotels and restaurants. Our proposed solution should reduce remaining food wastage and also provide good quality of groceries product in same platforms. This work is initial step toward remaining food wastage management also purchase good quality of groceries product and save the time and energy of consumers and retailers/sellers.

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IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

Speech and Emotion Recognition using Machine Learning

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Abstract: Speech emotion recognition (SER), the best python project. The best example of SER is seen at call centers. If you have noticed, call centers employees never talk in the same manner, their way of pitching/talking to the customers changes with customers. SER is tough because emotions are subjective and annotating audio is challenging. we will use the libraries librosa, soundfile, and sklearn (among others) to build a model using an MLPClassifier. This will be able to recognize emotion from sound files. We will load the data, extract features from it, then split the dataset into training and testing sets. Then, we'll initialize an MLPClassifier and train the model. Finally, we'll calculate the accuracy of our model.

Keywords*:* SER**,** MLPclassifier, soundfile, sklerarn,

I. INTRODUCTION

Emotions play an important role in human communication and can be observed in different channels such as speech and facial expressions. In fact, affective information is a fundamental component of human and machine communication [7]. Every day, every minute we communicate with Humans. Speech is a fast and best normal way of communication. Emotion helps us to understand the feelings like Happy, sad, fear, disgust, anger, surprise. Emotion is Mediator of feelings emotion display the information about mental state of human. This system presence the information of emotion detection from voice. system can take the voice and processing on it and recognize the emotion. The human voice can be characterized by pitch, timbre, loudness, and vocal tone. to recognize emotions in speech and classify them in 6 emotion output classes namely angry, fear, disgust, happy, sad and neutral. So, knowledge related to emotion is used by an emotion recognition system in such a way that there is an improvement in communication between machine and human [8]. people used speech as a means of communication or the way a listener is conveyed by voice or expression. But the idea of machine learning and various methods are necessary for the recognition of speech in the matter of interaction with machines [2]. With a voice as a bio-metric through use and significance, speech has become an important part of speech development. we attempted to explain a variety of speech and emotion recognition techniques and comparisons between several methods based on existing algorithms and mostly speech-based methods [4]. We have listed and distinguished speaking technologies that are focused on specifications, databases, classification, feature extraction, enhancement, segmentation and process of Speech Emotion recognition [5].

II. WORKFLOW AND METHODOLOGY

1 **Emotion and classification: -**

This section is concerned with defining the term emotion, presenting it different models. Also, for recognizing emotions, there are several techniques and inputs that can be used. A brief description of all of the techniques is presented here.

1.2 Definition

Emotion is one of the most difficult concepts to define in psychology. In everyday speech, emotion is any relatively brief conscious experience characterized by intense mental activity and a high degree of pleasure or displeasure Emotion is often entwined with temperament, mood, personality, motivation, and disposition. In psychology, emotion is frequently defined as a complex state of feeling that results in physical and psychological changes. These changes influence thought and behaviour.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

2. Speech emotion recognition (SER) system

2.1 Block diagram

Our SER system consists of main steps. Collection of sample voice. The second features that is formed by extracting the features. As the next step, we tried to determine which features are most relevant to differentiate each emotion. These features are introduced to machine learning classifier for recognition. This process is described in Figure 1

2.2. Feature extraction: -

various types of features have been proposed such as mel-frequency cepstral coefficients (MFCCs), and prosodic features, linear predictive cepstral coefficients (LPCCs), and perceptual linear predictive coefficients (PLPs) to achieves better consequence in human emotion recognition. MFCC are commonly use as features in speech recognition system, such as the systems, which can automatically recognize numbers spoken into a telephone. MFCCs are also increasingly finding uses in music information retrieval applications such as genre classification, audio similarity measures, etc.

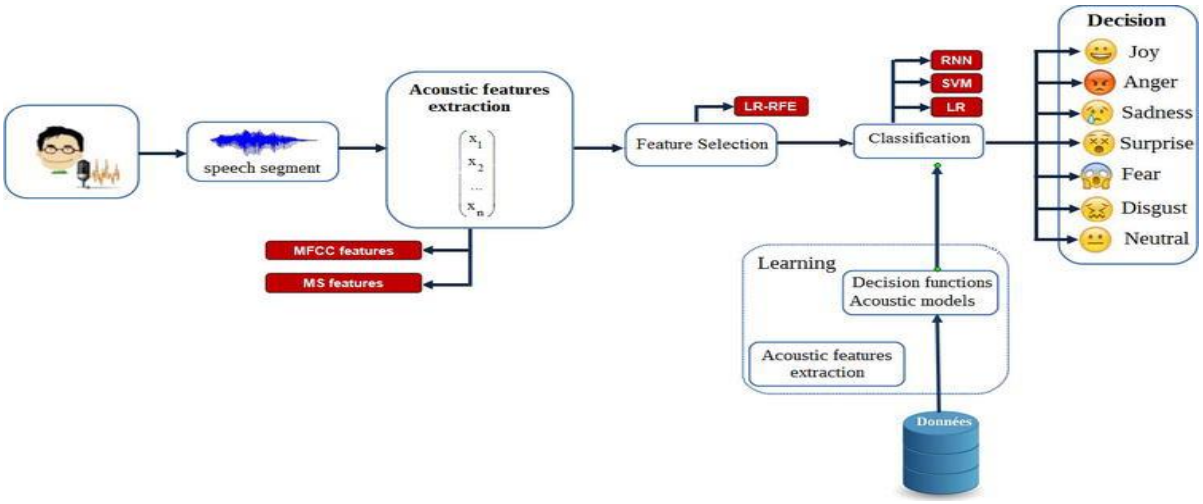

Figure 1. Block diagram of the proposed system.

Define a function extract feature to extract the mfcc, chroma, and mel features from a sound file. This function takes 4 parameters- the file name and three Boolean parameters for the three features:

mfcc: Mel Frequency Cepstral Coefficient, represents the short-term power spectrum of a sound
chroma: Pertains to the 12 different pitch classes
mel: Mel Spectrogram Frequency

Open the sound file with sound file. Sound File using with-as so it's automatically closed once we're done. Read from it and call it X. Also, get the sample rate. If chroma is True, get the Short-Time Fourier Transform of X. Let result be an empty numpy array. Now, for each feature of the three, if it exists, make a call to the corresponding function from librosa. Feature (eg- librosa.feature.mfcc for mfcc), and get the mean value.
Call the function hstack() from numpy with result and the feature value, and store this in result. hstack() stacks arrays in sequence horizontally (in a columnar fashion). Then, return the result.

.3. RAVDESS dataset: -

define a dictionary to hold numbers and the emotions available in the RAVDESS dataset, and a list to hold those we want- calm, happy, fearful, disgust. The RAVDESS is a validated multimodal database of emotional speech and song.

load the data with a function load_data() – this takes in the relative size of the test set as parameter. x and y are empty lists; we'll use the glob() function from the glob module to get all the pathnames for the sound files in our dataset.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

The pattern we use for this is: "D:\\DataFlair\\ravdess data\\Actor_\\.wav". So, for each such path, get the basename of the file, the emotion by splitting the name around '-' and extracting the third value:

Using our emotions dictionary, this number is turned into an emotion, and our function checks whether this emotion is in our list of observed emotions; if not, it continues to the next file. It makes a call to extract feature and stores what is returned in 'feature'. Then, it appends the feature to x and the emotion to y. So, the list x holds the features and y holds the emotions. We call the function train_test_split with these, the test size, and a random state value, and return that. to split the dataset into training and testing sets! Let's keep the test set 25% of everything and use the load_data function for this. Now, let's initialize an MLPClassifier. This is a Multi-layer Perceptron Classifier; it optimizes the log-loss function using LBFGS or stochastic gradient descent. Unlike SVM or Naive Bayes, the MLPClassifier has an internal neural network for the purpose of classification. This is a feedforward ANN model.

Let's predict the values for the test set. This gives us y_pred (the predicted emotions for the features in the test set). To calculate the accuracy of our model, we'll call up the accuracy score() function we imported from sklearn. Finally, we'll round the accuracy to 2 decimal places and print it out.

III. RESULT

The experiments are based on a well-known Speech Database, and the recognition accuracy reaches 65% in the best case.

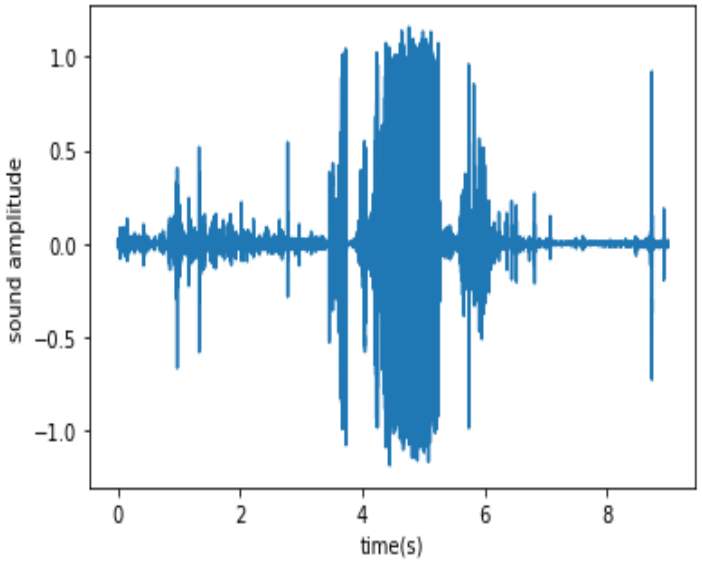

Figure 2 Original voice

In Speech Emotion Recognition the original Voice is the speech with unwanted noise or speech has no accuracy. fig2 shows the original voice of speech. this graph shows also noise in the speech. Each voice has display different frequency. With different graph.

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ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

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Vol. 9, Special Issue 1, April 2022

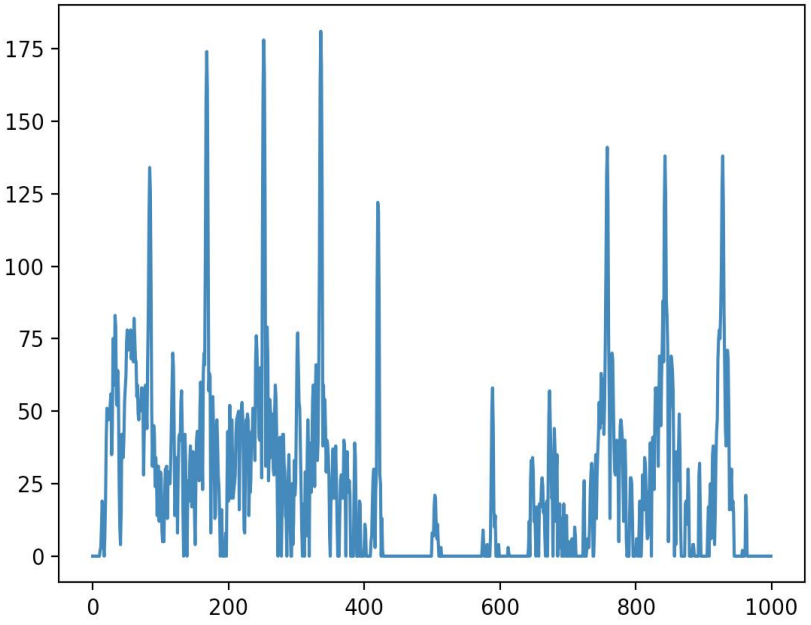

Figure 3 Pitch estimation plot

Pitch is the fundamental period of the speech signal. fig3 shows a pitch detection algorithm is an algorithm designed to estimate the pitch or fundamental frequency of a quasiperiodic or oscillating signal, usually a digital recording of speech or a musical note or tone. This can be done in the time domain, the frequency domain, or both.

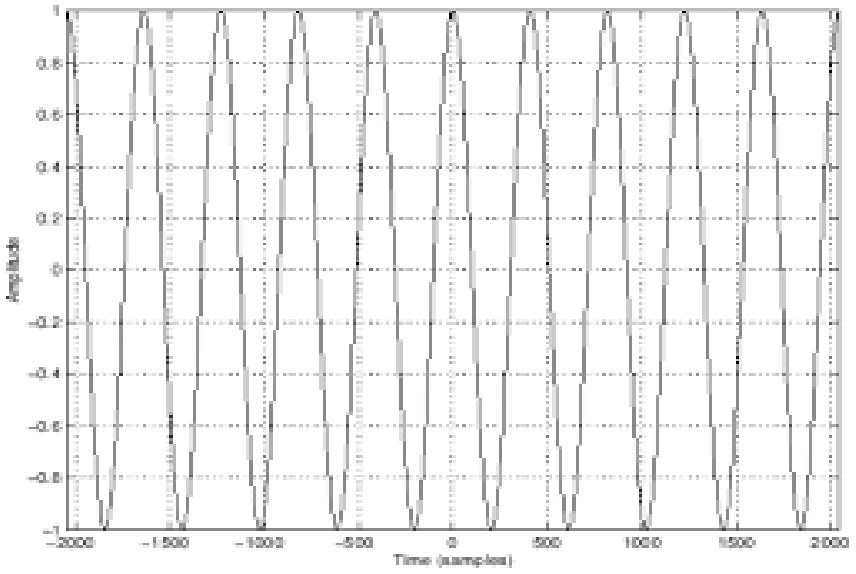

Figure 4 Effect of Windowing

Windowing reduces the amplitude of the discontinuities at the boundaries of each finite sequences acquired by the digitizer. for example, fig4 shows windowing to demonstrate what happens when we turn an infinite-duration signal into finite-duration signal windowing.

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ISSN (Print) 2394-1588

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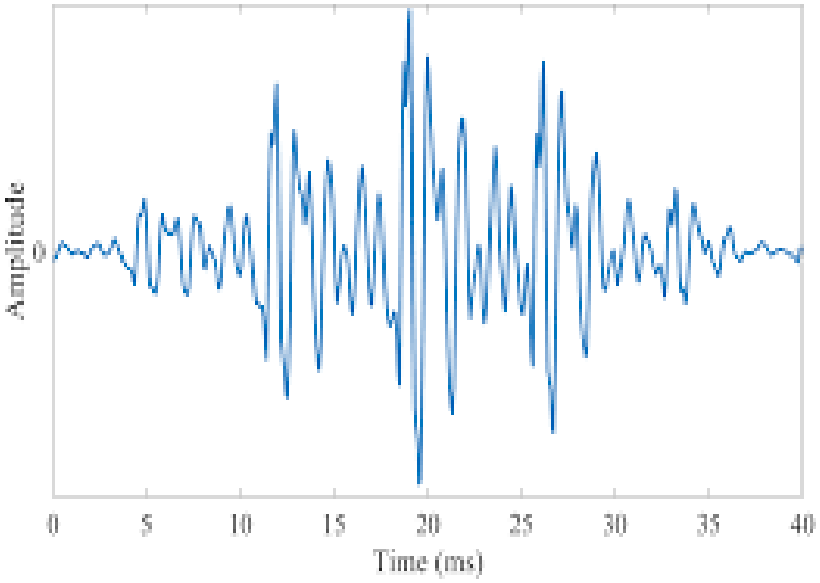

Figure 5 Spectrogram plot of the second derivative of MFCC

In Speech and Emotion Recognition MFCC feature are use for to recognize the emotion of the voice.it helps to recognize the accuracy of speech. MFCC Feature finds the accuracy of speech up to 65%. Spectrum analysis is a tool for the detection of periodicity in a frequency spectrum. the graph (fig5) shows the accuracy of voice or speech.

IV. ADVANTAGES

- Obtaining feedback
- Security at Airports, Malls, Schools etc.
- To help Autistic people Recognition
- To recognize Deepfakes
- To use for hospitalized patients
- To use for entertainment

V. CONCLUSION AND FUTURE WORK

In this Speech and Emotion Recognition paper, we study about the various speeches and emotion.to recognize emotion using different types of speeches. speech dataset with six different emotion states which are angry, fear, disgust, happy, sad and neutral respectively. We also compare or check its performance in terms of classifier, features, recognition rate, and datasets. By using the information of the time and the frequency domain, we train small set of data. Also, we compare the accuracy of emotion of emotion and find out the accuracy changes from highest 66.67% to the lowest 22%. In fact, we study how to classifiers and features impact recognition accuracy of emotions in speech.

Future scope of Speech and Emotion Recognition To detect emotion and recognition grow every year according to market size it will be grow from USD 23.6 billion in 2022 to USD 43.3 billion by 2027. It means Annual growth rate of 12.9% during the forecast period.to increase accuracy of speech emotion detection and wide scope in many areas like human computer interaction, biometric security etc.

IARJSET

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ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

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Student Feedback System

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IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

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Abstract: Student feedback System is the web based Student feedback system used for collecting feedback from the students and provides the automatic generation of a feedback which is given by students. Students first need to create the account by hitting the sign up button after that the process of the sign in will give the user to fill feedback form by hitting the feedback button and after that the standard form displayed that form is necessary to give the feedback .Which takes less time to give feedback and easy to use In student feedback system project security is also maintain that is the result of feedback is only visible to Authentic user or Admin. The Student Feedback System is a system used to improve performance of college. This system is used to come out some failure to success. Responses of students are collected by the student feedback system and will be used only for the purposes of quality enhancement. The aim of Student Feedback System is to save time and energy of staff in academic departments and to allow a minimum level of statistical analysis of the data across the College. All the feedback given by the student is stored in database without loss of energy and time and these feedbacks are visible to the authentic user and can be handled by the authentic user. He has the rights of reading and modifying this data (delete the data from the database)

I. INTRODUCTION

What does mean by a feedback system, actually the feedback system is the system which is used to collect responses. In the older days there is also a feedback system. The older feedback system is actually works on the basis of the pen and paper. These pen and paper increases the expenses as well as takes so much time of people. So the older system leads to increase in expenses which is not a good thing at all. The older feedback system is not convenient. The older System is system which takes lot of time and energy.

How older system system taken so much time and energy?

Eg. For giving a feedback everyone need a paper with only paper we cannot give a feedback so we need a pen to write a feedback on a paper. The process of giving feedback takes the time by giving paper taking out pens then opening the pen and to be ready to give a feedback this process does not stops until the teacher or the person who will collect the paper one by one because of this time consumption increased with the time consumption the energy usage also increased.

How the energy consumption increased actually?

Eg. Everybody needs energy to do a piece of work. We know that the energy is required to do a work so for giving a feedback we also needs an energy. If we have to give a feedback in a short time we uses our energy to thing and write it is necessary to give feedback by thinking and writing. This process doesn't stops here, after utilization of energy of a student, there is also loss of energy for who is collecting the paper of feedback from each student by one by one. This examples shows the loss of energy while giving the feedback.

To overcome to this situation we invented the Student Feedback System**.** The Student Feedback System is a management information system for education establishments to manage student data. Student Feedback System is a conventional way of giving feedback. The student feedback system is the system which takes less time to do a piece of work and also it takes less energy. The student feedback system is the efficient feedback system than the older. How the system takes less time?

Eg-As we know that everyone is living in a new age of technology so everybody have a knowledge of new technology. So everybody having a mobiles due to this everybody having a speed of typing. The Student Feedback System takes less time to give feedback by creating account and sign in , after sign in we can select the feedback option then simply answering the questions the feedback is easily stored in the database.

How system takes less energy?

Eg- After giving the feedback the person who is collecting the feedback is assigned to student feedback system. The work of taking and storing is given to feedback system and the database which takes less time as compared to old feedback system who needs person to collect the feedback from the student one by one.

So the new Students feedback system is more convenient than older one.

What is the need of feedback system?

The student feedback system is the intermediate between the student and college, faculty. It is a way of improving by knowing the things that they don't have or the things that they have and having improvement in it. After taking the feedback from the student they starts working on improvement.

II. LITERATURE REVIEW

A.Existing System

IARJSET

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ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

In the existing system the feedback is done by manual process by using the pen and paper basis. In the existing system students can give feedback about the about the how is the college by using paper and pen. After giving feedback by every student Papers are collected by the teacher and calculate the overall count. After that those all grade report is viewed by the principal which is given by the teacher or head of department. Hence estimating the performance of lecturers and giving counseling to college staff. So, the existing system is carries more time to do a piece of work for this reason. The Student Feedback

System is implemented. This is the major advantage of the existing system for giving feedback about the Lecturers and viewing report of lecturers.

B.Summary

In Existing System the feedback is done by the manual process. In the Existing System students can give the feedback about the college and campus ,faculty by using paper and pen.
After giving feedback by every student papers are collected by HOD's and calculates the overall feedback report and looks how they given a feedback actually.

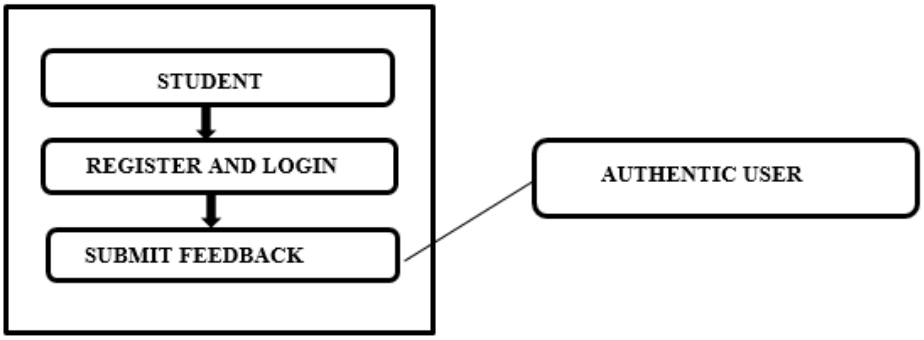
After that those all feedback report is viewed by the principal which is given by HOD's.

III. WORK FLOW AND METHODOLOGY

The student feedback system is management information system for an education establishment to manage the data of the student.Which is used to improve the performance of the college. It is the system that provides the proper feedback regarding faculty in collage, how their behavior with student and how the college is actually for the student, with the help of feedback given by the students they can improve their college to became the best.
The main functionality in system is-

Student login-Student can create account and login and can able to give a feedback.

Authentic user-has right to read data and delete user and users data.



IV.RESULT

A. Student Registration Page
The students will visit the registration page by clicking sign up button. After that Students will have to complete the registration with valid username and password to create account.

IARJSET

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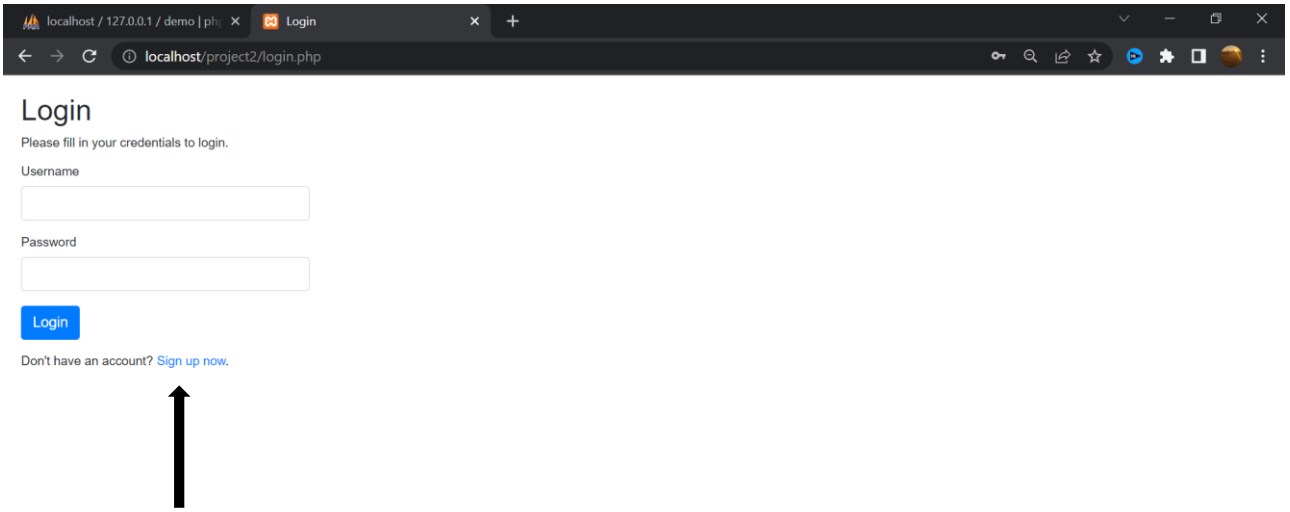
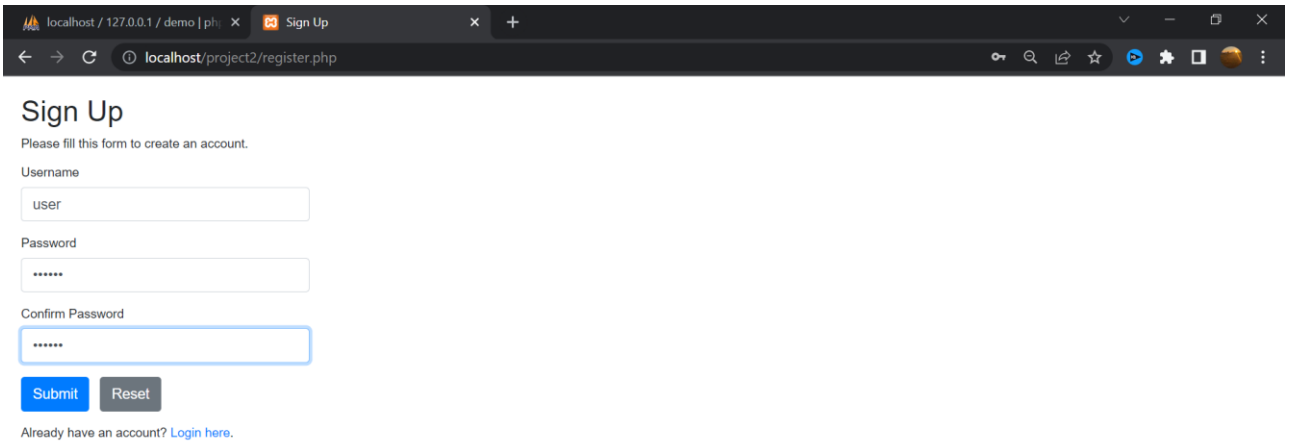
Vol. 9, Special Issue 1, April 2022





B.Student Login Page

Once the Student logged in the page will display three options reset your password, sign out of your account, student feedback

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ISSN (Print) 2394-1588

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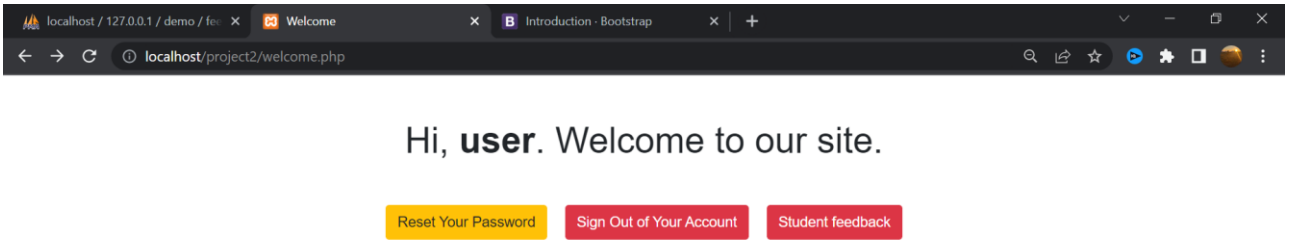
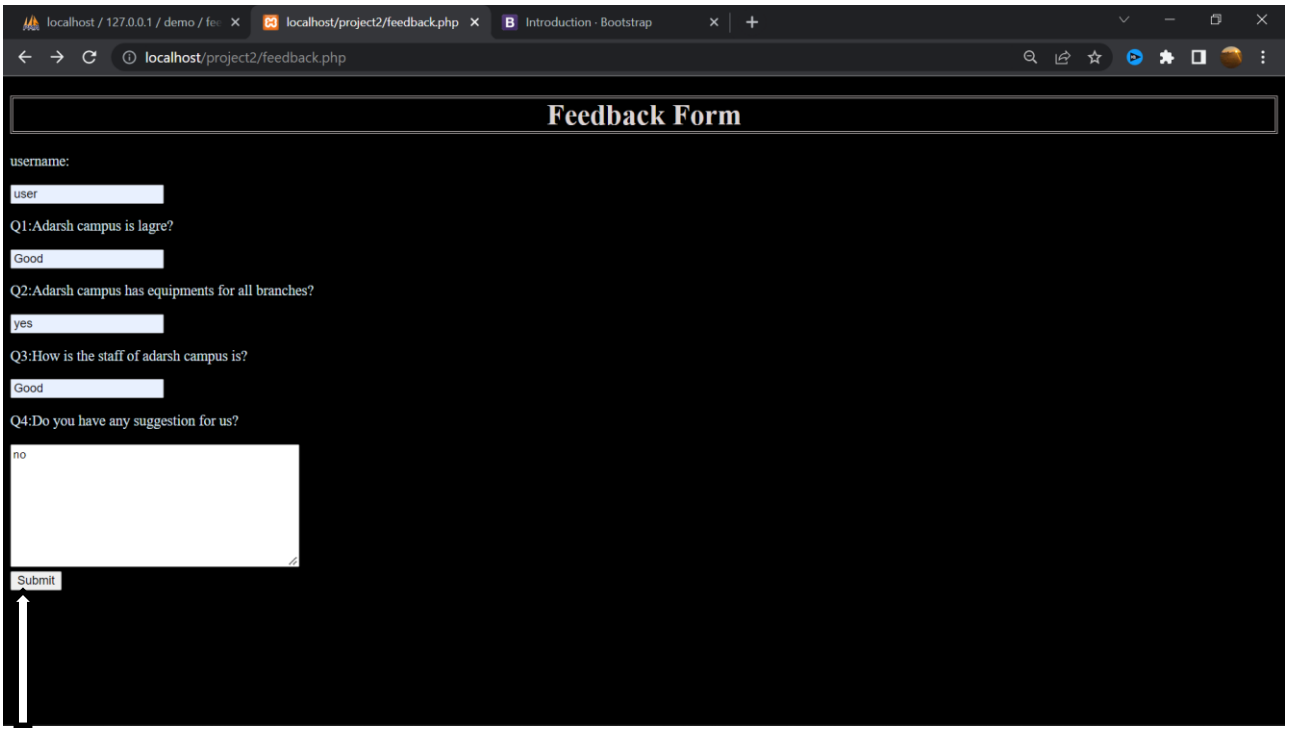
Vol. 9, Special Issue 1, April 2022



C.Student Feedback form
Students will fill the feedback form.



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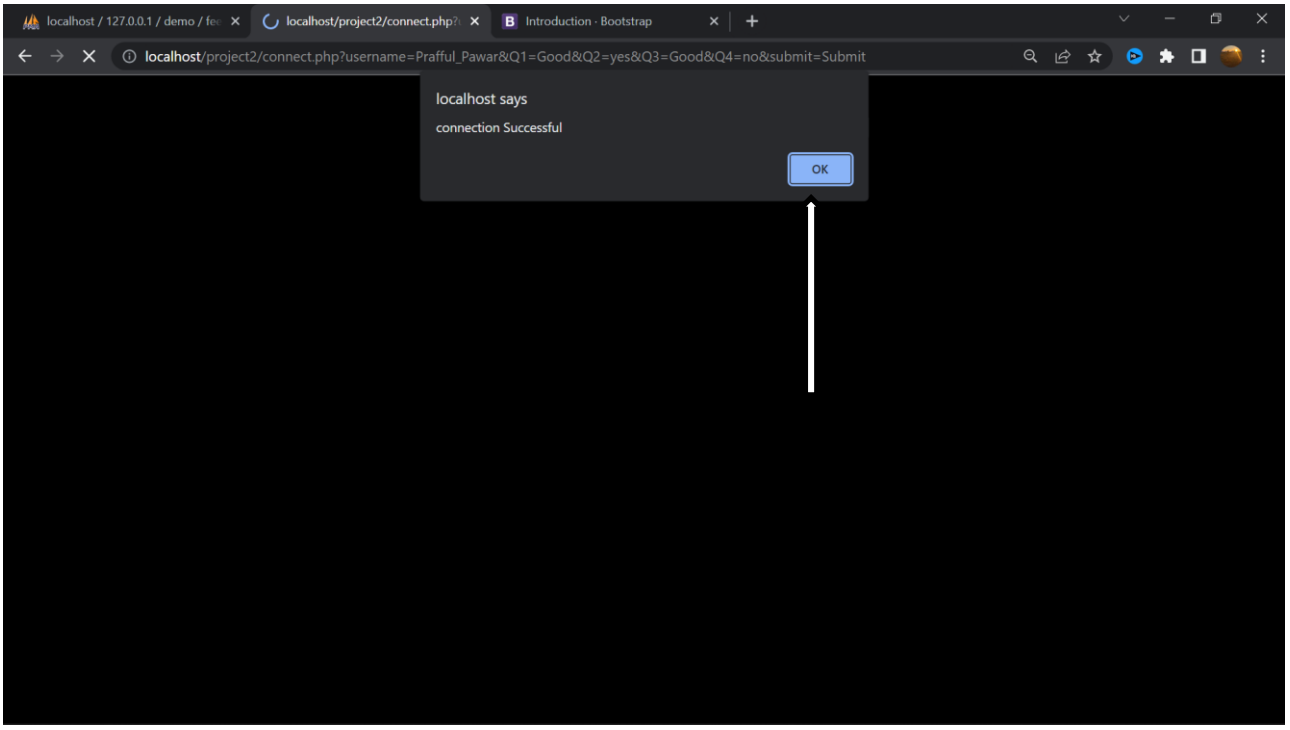
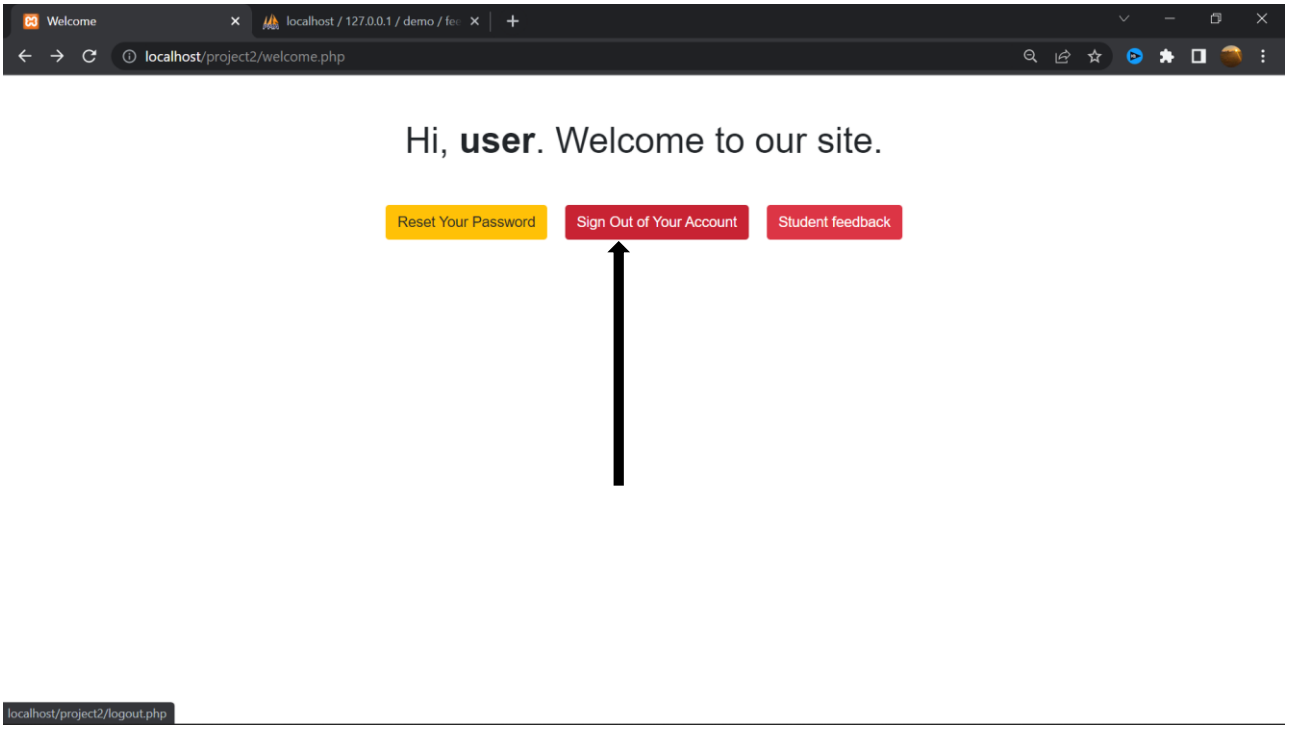


D.Student log out page
After submitting the feedback of perticular subject he/she can logout with his/her account.



localhost/project2/logout.php

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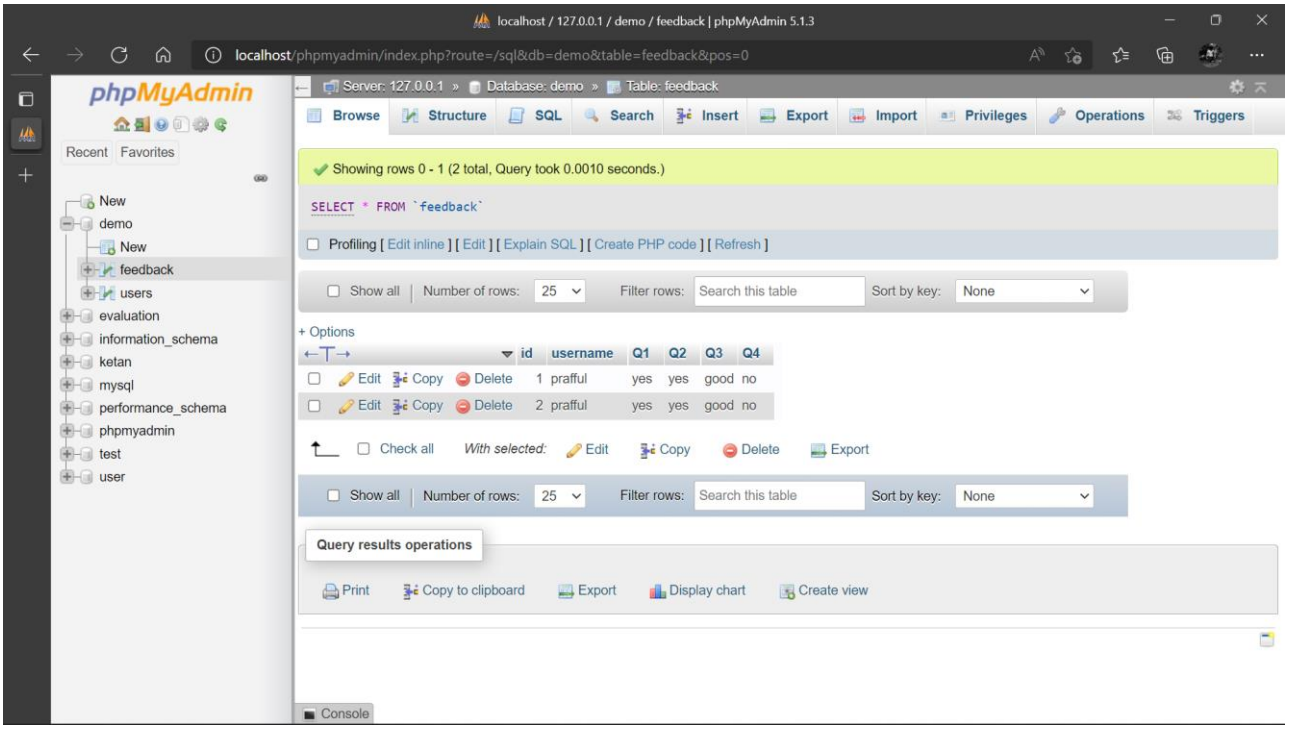
F.Feedback Review page



V.CONCLUSION

The conventional system to collect and analyse the student feedback is more monotonous and Time consuming process.With the Student Feedback System, we can easily collect the **students feedback** system generated by students itself. i.e. feedback collection is very simple & interesting. And feedback repor**t** will be made available directly to the host.And it saves time and energy

VI. FUTURE SCOPE

Due to the lack of time, design part is not created to attractively. Further enhancement can be made in designing the screen or various page. Some extra forms can also be added for the better result of feedback details. Also the more modules can be faculty page, etc. This feedback system is also recreated as a Android based feedback system in which each student can give their feedback on their own Android by receiving one time password which will be unique and it will be generated by admin of the system.

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ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

Behavioural study of High-Rise RCC Structure with Steel Outrigger and Belt truss by Linear and Non-linear Analysis

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Abstract: Outriggers are interior lateral structural systems provided to improve the overturning stiffness and strength of high-rise buildings. It is a lateral load resisting system that is located within the building. The whole system consists of a core structure connected to the perimeter columns of the building by means of structural members called outriggers**.** In conjunction with the composite structures, this system is very effective when used especially in tall buildings. Parameter comparison of high rise RCC structure with steel outriggers and belt truss system provided at various positions along with the height of structure using Linear and Non- Linear Analysis is the main scope of this research. The key parameters discussed in this paper include lateral deflection, story drifts and, base shear. Nine different models are prepared for different positions of the outrigger system and results have been compared. Seismic loads are considered as per IS 1893- 2016 part - 1. The modeling and analysis are performed using finite element software ETABS 15.2.2-2016.

Keywords: Time History Analysis, Outrigger Structural System, Belt truss

I. INTRODUCTION

High rise structures are designed to improve building overturning stiffness and strength by connecting outriggers to the building core to distant columns and outriggers are nothing but rigid horizontal structure. Outriggers have been used in tall, narrow buildings for nearly half a century, but the design principle used for millennia. Both the core and perimeter systems together with the outrigger control the behavior of the whole building. This is performed by the positive interaction between the core and the perimeter system through outriggers. The explanation of outrigger behavior is simple: because outriggers act as stiff-arm engaging outer columns. When the structure is subjected to horizontal loading, shear wall and outrigger trusses will rotate and its rotation induces a tension-compression couple in the outer columns acting in opposing to the movement. As a result, is a type of restoring moment acting on the core at that level. Analysis and Design of a complete core and outrigger system are quite completed as relative stiffness of each element responsible for the distribution of forces between the core and the outrigger system. So, it is difficult to arbitrarily assign overturning forces to the core and the outrigger column. It is certain that bringing perimeter structural elements together with the core as one lateral load resisting system then it will reduce core overturning moment, but not effective in reducing core horizontal shear forces. (See figure 1 and 2)

In fact, shear in the core can actually increase at outrigger stories due to horizontal forces couple acting on it. Belt, such as trusses or walls encircling the building, add further complexity. Belt truss can improve lateral system efficiency. The structures with outriggers connected individual mega column, belt truss can transfer more gravity load to the mega column to minimize net uplift. Reinforcement or the column splices can be used to reduce tension and stiffness reduction associated with concrete in net tension. Belt truss can further enhance overall building stiffness through virtual or direct outrigger behavior provided high in-plane shear Stiffness, As well as increasing tower torsional stiffness for both mega column and tube building. Belt working with the mega column can also create a secondary lateral load resisting system in seismic resisting technology.

A core and outrigger system is frequently selected for lateral load resisting system of all tall or slender building where the overturning moment is large compared to shear, and where overall building flexural deformations are major contributors to lateral deflection such as story drift. In that case, building drift and core wind moments reduced due to outriggers. The outrigger system is a very efficient and cost-effective solution to reduce building accelerations, because of the increased stiffness they provide, which improves occupant comfort during high winds.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

II. OBJECTIVES

1. To study the behavior of high rise RCC building structure provided with steel outriggers along with belt truss system subjected to seismic forces.
2. To study the parameters such as lateral displacement, story drift, base shear with steel outriggers with X-type and V-type bracing systems of high rise RCC structure using by linear and non-linear methods of analysis as per the guidelines of IS 1893-2016.
3. To compare the reduction in displacement with the increase in base shear for the increase in the number of outriggers.

III. METHODOLOGY

The model considered for this study is a 139m high rise reinforced concrete building frame. The Plan area of the Structure is 42m x 42m with columns spaced at 6m from the center to center. The height of the bottom story is 4m and all other floors are of height 3m considered as typical floors. Shear wall thickness is considered as 300 mm over the entire height. Beams 300mm wide and 750 mm deep, column 450 mm x 600 mm, the thickness of slab 200mm and Grade 40 (Mix – M40) concrete and steel Outriggers of steel tube section of size 400 x 400x 25mm of is considered throughout the height of the building.

The study is performed for seismic zones V as per IS 1893 (Part1): 2016. The Importance factor is considered 1.5 for the structure. The analyses are based upon the assumptions that the outriggers are pinned attached to the core; Neglecting soil-structure interactions (fixed supports) for all columns and core. The Linear and Non-Linear analyses are carried out using ETABS software. The plan and elevation of the structure as shown in the figure below (fig 3 & 4)

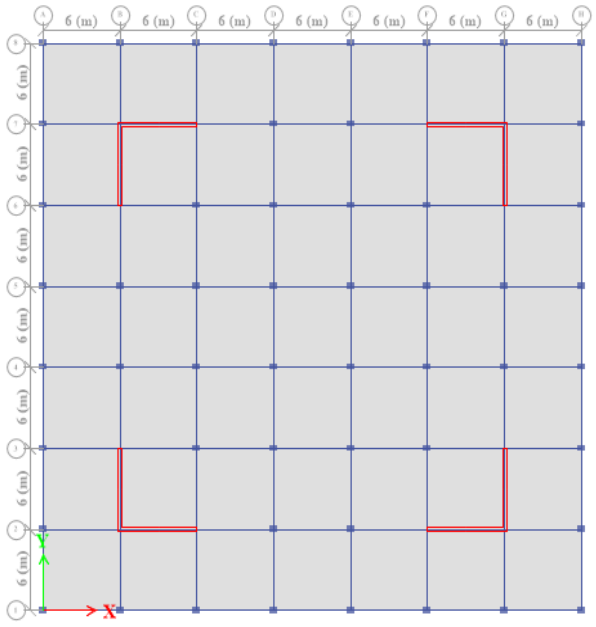

Fig-3 Plan of G+45 Stories Conventional Building.

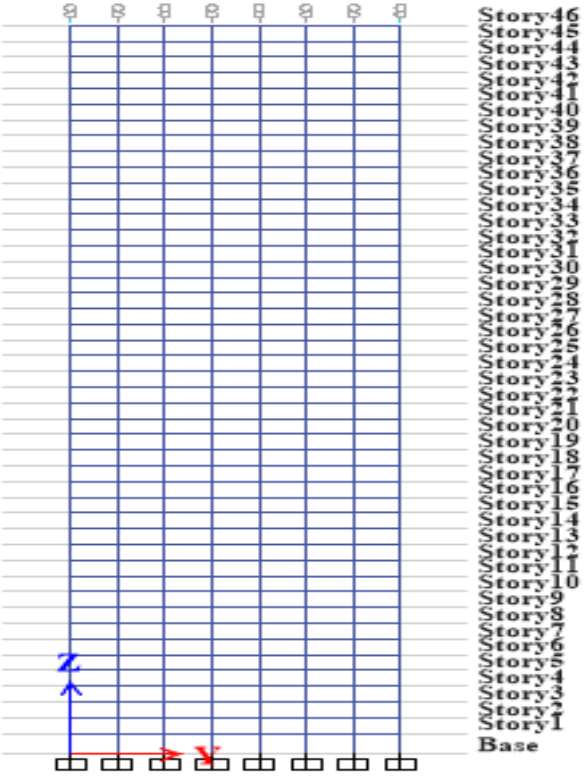

Fig- 4 Elevation of G+45 Storied Conventional Building.

IARJSET

ISSN (Online) 2393-8021
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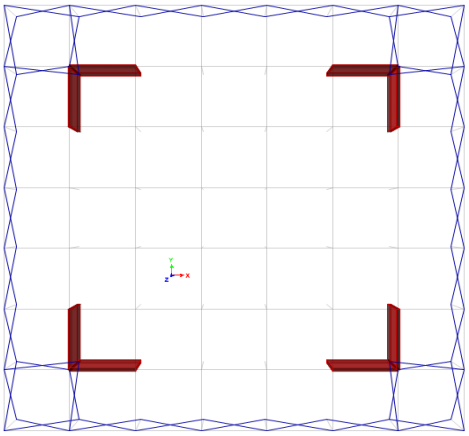

Figure 5 Details of Outriggers in perspective view.

Event name: Imperial Valley

Year of occurrence: 1979

Magnitude: 6.53

Peak ground acceleration: 0.45

Recording station: Array 06-01

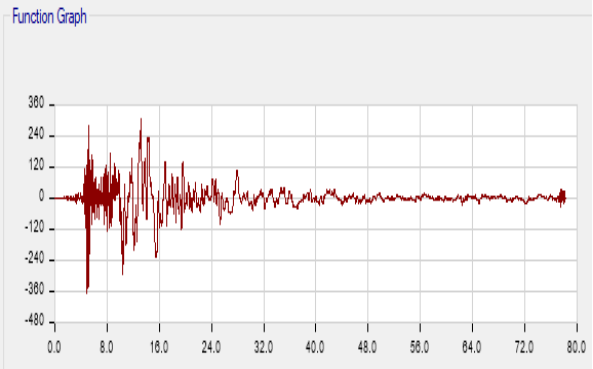

Figure 6 Imperial Valley ground acceleration

Different Arrangements of Outriggers

The models that are selected for the study are listed as follows,

1. Conventional frame model without outriggers.
2. Model with V-type braced outriggers located at the top story.
3. Model with X-type braced outriggers located at the top story.
4. Model with V -type braced outriggers located at the top, 15^{th} and 31^{st} story. (top, $1/3^{rd}$, $2/3^{rd}$)
5. Model with X-type braced outriggers located at the top, 15^{th} and 31^{st} story. (top, $1/3^{rd}$, $2/3^{rd}$)
6. Model with V-type braced outriggers located at the top, 36^{th}, 27^{th}, 18^{th}, 9^{th} story. (top, $1/5^{th}$,$2/5^{th}$,$3/5^{th}$, $4/5^{th}$)
7. Model with X-type braced outriggers located at the top, 36th, 27th, 18th, 9th story. (top, $1/5^{th}$,$2/5^{th}$,$3/5^{th}$, $4/5^{th}$)
8. Model with V-type braced outriggers located at the top, 39^{th}, 33^{rd},26^{th}, 20^{th}, 13^{th}, 6^{th} story. (top, $1/7^{th}$, $2/7^{th}$, $3/7^{th}$, $4/7^{th}$, $5/7^{th}$, $6/7^{th}$)
9. Model with X-type braced outriggers located at the top, 39^{th}, 33^{rd}, 26^{th}, 20^{th}, 13^{th}, 6^{th} story (top, $1/7^{th}$, $2/7^{th}$, $3/7^{th}$, $4/7^{th}$, $5/7^{th}$, $6/7^{th}$)

IARJSET

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IV. RESULT AND DISCUSSION

1. Lateral displacements:

Maximum roof displacement is one of the most important criteria for locating outrigger–belt truss system optimally. Story displacement is the absolute value of displacement of that story under the action of lateral force. The maximum displacement of all models at the top story and percentage reduction in displacements as compared to conventional building using linear and Non-linear analysis are given below table 1 and respectively.

2. Story Drift:

Story drift is the difference of displacement between two consecutive stories dived by the height of that story. The maximum story drift of all models at the top story and percentage reduction in the drift as compared to conventional building using linear and Non-Linear analysis are given below table 2 and 5 respectively.

3. Base shear:

Base shear is the maximum expected lateral force that will occur due to earthquake ground motion at the base of a building structure. Base shear of all the models is computed from the linear and non-linear method of Analysis are shown below in table 3 and table 6 respectively.

Table 1 Maximum lateral displacement by linear Dynamic Analysis

Model No	Maximum displacement at top story (mm)	Percentage reduction (%)
Model 1	279.793	-
Model 2	274.936	1.73%
Model 3	275.202	1.64%
Model 4	251.381	10.15%
Model 5	250.529	10.45%
Model 6	234.675	16.12%
Model 7	238.68	14.69%
Model 8	228.571	18.31%
Model 9	228.125	18.47%

Table 2 Maximum Lateral Displacement by Non-linear Time-History Analysis

Model No	Reduction in Drift at top storey	Percentage reduction (%)
Model 1	0.001455	-
Model 2	0.001262	13.26%
Model 3	0.001279	12.09%
Model 4	0.001205	17.18%
Model 5	0.001216	16.42%
Model 6	0.001171	19.52%
Model 7	0.001167	19.79%
Model 8	0.00113	22.34%
Model 9	0.001129	22.40%

From the graph given below, it is observed that the displacement of RCC structure provided with an outrigger system with X braces along with belt trusses at the top, 39th, 33rd, 26th, 20th, 13th, and the 6th story is reduced by 18.47% as compared to the conventional building. Further, the value obtained for responses such as story drift at the top story is reduced by 22.40 % for the same model concerning the conventional building structure. As compared to X braced outrigger and belt

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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truss system V braced outriggers having the same response in displacement and drift is observed. It is observed that increment in base shear is very small by using outriggers and belt trusses than the conventional building, which is only 4.98 %. As the structure is RCC building and outriggers are of steel material the increase in base shear is very less because the dead weight of reinforced concrete is more than steel. No significant change in the base shear values are observed as the weight of outriggers is far less compared to the building structure.

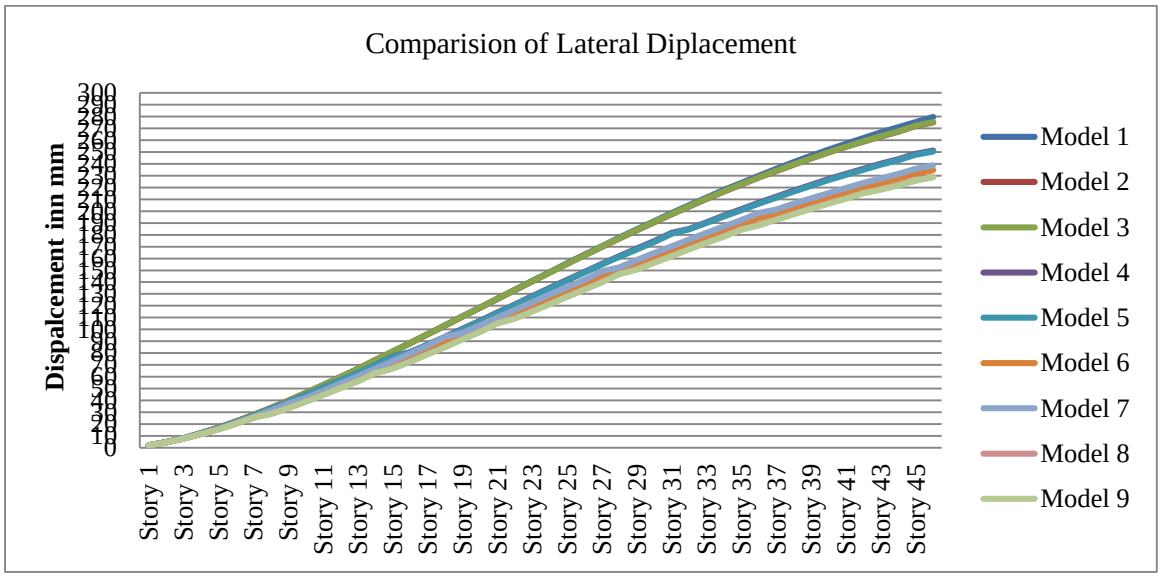

Fig 7: Comparison of lateral displacement (Linear Dynamic Analysis)

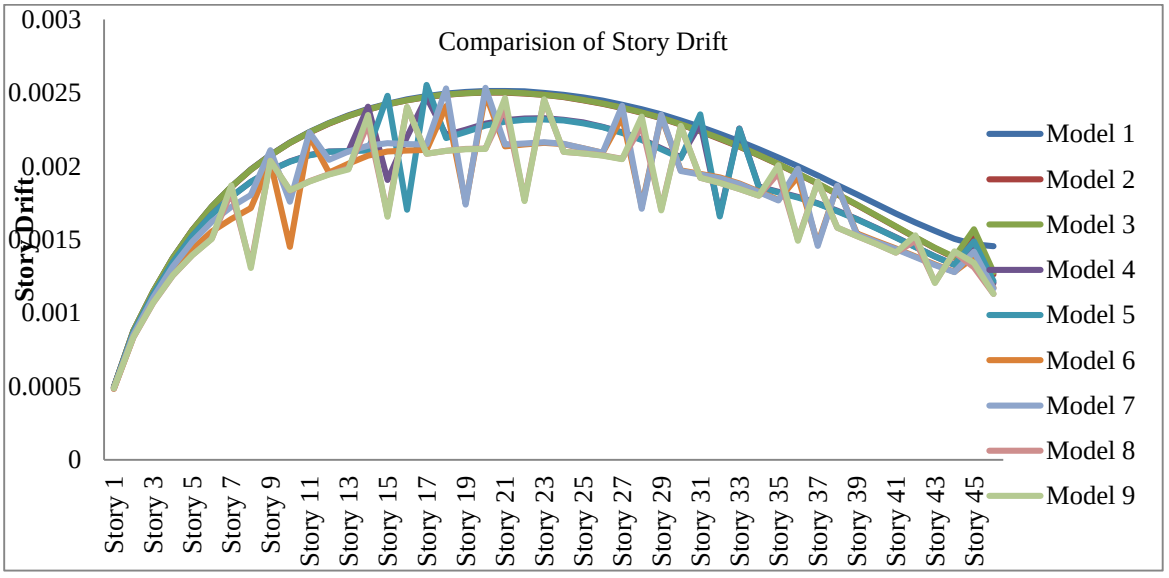

Fig 8: Comparison of Story Drift (Linear Dynamic Analysis)

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

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Table 3 Maximum Base shear from linear Dynamic Analysis

Model No	Maximum base shear (KN)
Model 1	18310.144
Model 2	18334.427
Model 3	18348.539
Model 4	18382.993
Model 5	18425.329
Model 6	18508.710
Model 7	18494.652
Model 8	19088.646
Model 9	19222.333

Table 4 Maximum Lateral Displacement by Non-linear Time-History Analysis

Model No	Maximum displacement at top storey (mm)	Percentage reduction (%)
Model 1	324.738	-
Model 2	321.165	1.00%
Model 3	321.291	0.95%
Model 4	304.51	6.12%
Model 5	304.468	6.14%
Model 6	291.651	10.01%
Model 7	291.759	10.01%
Model 8	277.636	14.41%
Model 9	277.538	14.44%

The results obtained by Non-linear time history analysis are shown in the graph below, it is observed that the displacement of RCC structure provided with outrigger system with X braces along with belt trusses at the top 39th,33rd, 26th, 20th, 13th, 6th stories is reduced by 14.44% as compared to conventional building. Further, the value obtained for responses such as story drift at the top story is reduced by 17.46 % for the same model concerning the conventional building. As compared to X braced outrigger and belt truss system V braced outriggers having the same response in displacement and drift is observed. It is observed that increment in base shear is very small by using outriggers and belt trusses than the conventional building, As the structure is RCC building and outriggers are of steel material the increase in base shear is very less because the dead weight of reinforced concrete is more than steel. No significant change in the base shear values are observed as the weight of outriggers is far less compared to the building structure.

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Table 5 Reduction in Drift by Non –Linear Time History Analysis

Model No	Reduction in Drift at top storey	Percentage reduction (%)
Model 1	0.001678	-
Model 2	0.001512	9.98%
Model 3	0.001513	9.83%
Model 4	0.001484	11.56%
Model 5	0.001484	11.56%
Model 6	0.001450	13.59%
Model 7	0.001448	13.71%
Model 8	0.001385	17.46%
Model 9	0.001385	17.46%

Table 6 Maximum Base shear from Non-linear Time-History Analysis

Model No	Maximum base shear (KN)
Model 1	17418.519
Model 2	17426.404
Model 3	17430.986
Model 4	17442.173
Model 5	17455.919
Model 6	17457.942
Model 7	17480.159
Model 8	17473.711
Model 9	17505.785

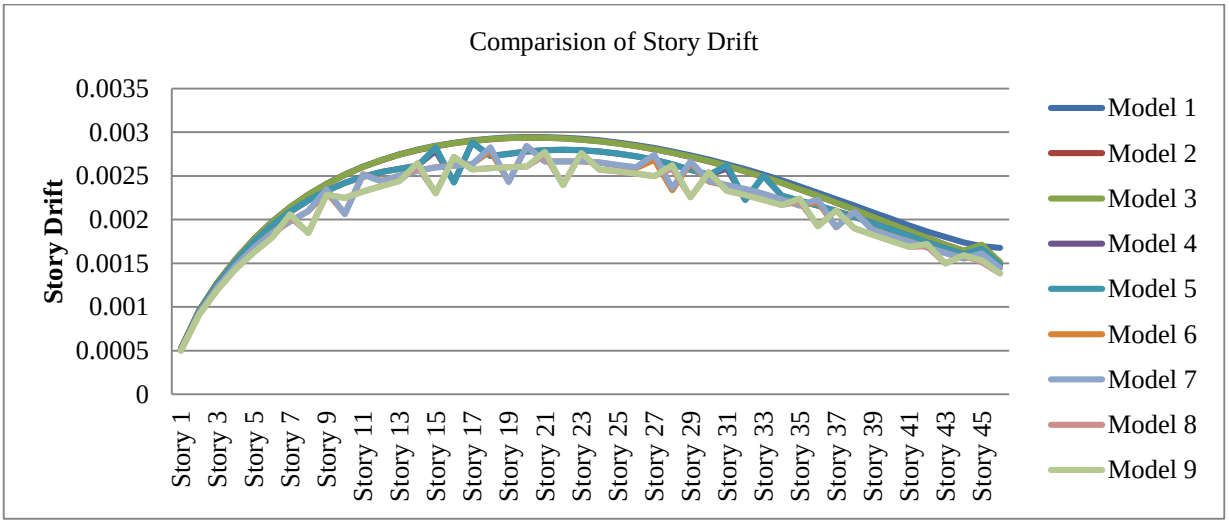

Fig 18: Comparison of Story Drift (Linear Dynamic Analysis

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ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

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V. CONCLUSION

This paper focuses on the seismic behaviour of tall structure with outriggers and belt truss system using Linear dynamic and Non-Linear Time History Analysis from which the following conclusion can be drawn based on the above result:

1. From the linear and non-linear analysis of the RCC building provided with the outrigger systems using X and V type bracing, it is observed that both types of outrigger system having the nearly same response and X braced system is barely effective than V type bracings as are giving minimum displacement and drift values.
2. In the linear dynamic analysis of the RCC building, provided with an outrigger system with X type bracings, the lateral displacement and top story drift get reduced by 18.47% and 22.40% respectively compared to the values obtained from the analysis of conventional RCC building. However, in the non-linear method of analysis, lateral displacement and top story drift get reduced by 14.44% and 17.46% respectively compared to the values obtained from the analysis of conventional RCC building.
3. The complete comparative analysis reveals that to know the behaviour of the tall structure under earthquake loadings, time history analysis must be performed as it gives more response to time history analysis as compared to Linear Dynamic Analysis.

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ISSN (Print) 2394-1588

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Vol. 9, Special Issue 1, April 2022

Morphometric Analysis for Geo-Hydrological Studies Using Geo-Spatial Technology - A Case Study of Panchganga River Basin, Maharashtra, India

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Abstract: Any hydrological investigation must start with a morphometric analysis of the basin, which will serve as a basis for planning an optimum use of the natural resources of the basin. The study of geomorphology is the study of the origin and evolution of the features or attributes of the earth surface caused by physical and chemical processes. Geomorphological characteristics describes linear, areal, and relief characteristics of the watershed area. In present paper the geohydrological study of the panchaganga river basin is studied for the morphometric analysis. This has been achieved through the use of digital elevation models (DEMs), such as SatGEM (USGS, Denver, Colorado, USA) or ASTER (USGS, Denver, Colorado, USA) products. and QGIS 3.16.4. The study shows the variation in stream numbers from 1 to 7 order. In this study, the Panchganga basin of Maharashtra, India was considered for morphometric evaluation. It was evaluated under linear, areal and relief aspects based on Shuttle Radar Topography Mission (SRTM) digital elevation model (DEM) and QGIS 3.6. This task deals primarily with morphometric parameters, such as stream order, stream length, bifurcation ratio, drainage density, stream frequency, texture ratio, elongation ratio, circularity ratio, and form factor ratio, among others. According to the results, the Panchganga watershed contains 7th order trunk streams, 8652 streams in total, a length of 6468.17 km, and a mean bifurcation ratio of 4.40. The areal aspect showed that basin area was 2489 Km2, Circulation ratio was 0.19, and the form factor was 0.27, elongation ratio 0.58 and drainage density 2.60. Relief aspect of the Panchganga watershed revealed that relief ratio 5.09, absolute relief 938, ruggedness number 1.28. From the results, it can be seen that the Panchganga watershed has dendric drainage pattern, highly eroded, and elongated in shape. The watershed also exposed the immediate need to conserve natural resources in order to sustainably provide livelihoods for the people living in it.

Keywords*:* Geomorphology characteristics, Morphometric parameters, Watershed.

I. INTRODUCTION

Currently, the world's population has been increasing and has come at the expense of freshwater availability, which is one of the most pressing issues in society. As a result of the rapid population growth, urbanization, and climate change, as well as the irregular frequency and intensity of rainfall, it has become increasingly difficult to plan for appropriate water management and storage. Consequently, evaluating water resources is increasingly important since they are instrumental in sustaining livelihoods and economic development worldwide. Thus, considering this, morphometric analysis is necessary for managing and understanding the hydrological characteristics of river basins, and their results are integral to making management and planning decisions regarding water resources.

The science of geomorphology studies the origin and evolution of topographic features and attributes, caused by physical or chemical processes that operate on the surface of the earth. It is concerned with the variation in earth's surface from past to present and its causes. In contrast, Morphometry involves measuring and analyzing the configuration of the Earth's surface, as well as the shape and dimensions of its landforms.

In addition to drainage morphometric analysis, watershed modelling, run-off modeling, watershed delineation, groundwater prospect mapping, and geotechnical investigation are prerequisites.Quantifiable sets of geomorphologic parameters characterise the watershed's linear, areal, and relief characteristics. Each set of connections offers helpful tools for studying the nature and behaviour of stream networks.

In recent years, the use of satellite data and Geographical Information System (GIS) tools has been successful in generating appropriate data on the spatial changes in drainage features, which provide insight into hydrologic conditions and thus for watershed management (Das and Mukherjee, 2005; Vittala et al., 2004). Remote sensing and GIS techniques

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

are increasingly often utilised to examine various topographical and morphometric aspects of drainage basins and watersheds because they provide a flexible environment and a strong tool for manipulating and analysing spatial data.

Different geomorphological parameters of drainage basins, including drainage networks, catchment divides, slope gradient and aspect, and upstream flow contributing areas, have been extracted using digital elevation models (DEMs) such as those from the Shuttle Radar Topography Mission (SRTM) or the ASTER GDEM product (USGS, Denver, Colorado, USA) (e.g. Mark 1984, Tarboton 1997).

The use of Shuttle Radar Topographic Mission (SRTM) data in GIS-based watershed evaluations has provided a precise, quick, and low-cost method of studying hydrological systems (Farr and Kobrick 2000; Grohmann et al. 2007).

In the present paper, we discuss the results of our studies on the spatial variation in drainage characteristics of the seventh order sub-basins of the Panchganga River from the point of watershed management which is an integrated approach of GIS, remote sensing and DEM has been used for generation and interpretation of drainage parameters for water resource management of Panchganga Watershed. The watershed chosen for this project is a vital supply of water for agricultural and home use in the area.

II. STUDY AREA

The Panchganga River is one of the important rivers of India located in Maharashtra and is one of the principal tributary of the Krishna River system. The Panchaganga river originates from Prayag Sangam located near the Chikhali village, Tal-Karveer, Dist. Kolhapur and eventually it ends up at Narsobawadi. Panchaganga river is incorporated with sub river basins of Kasari, Garvaali, Jambhali, Saraswati, Kumbhi, Dhamni, Tulshi, and Bhogavati. The watershed area falls under the Kolhapur district of western Maharashtra, India.

The Panchaganga river basin extends between 00 00’ 0” to 00 5’ 58” north latitudes and 740 1’ 24” to 740 10’ 37” east longitudes. The total watershed area of the study area region is 2489 Sq kms and the elevation lies between 447m to 938m. Length of the longest river of the study watershed area is 181.204 km.

The Panchaganga river basin is the 7th order river and shows well developed dendritic to sub-dendritic type drainage pattern. The study area is covered by Deccan volcanic basalt of Upper Cretaceous to Lower Eocene age and comprises black and red soil, which is highly fertile and important for agricultural purpose and the average annual rainfall in the area is 4,800 mm and temperature ranges between 100C and 400C.

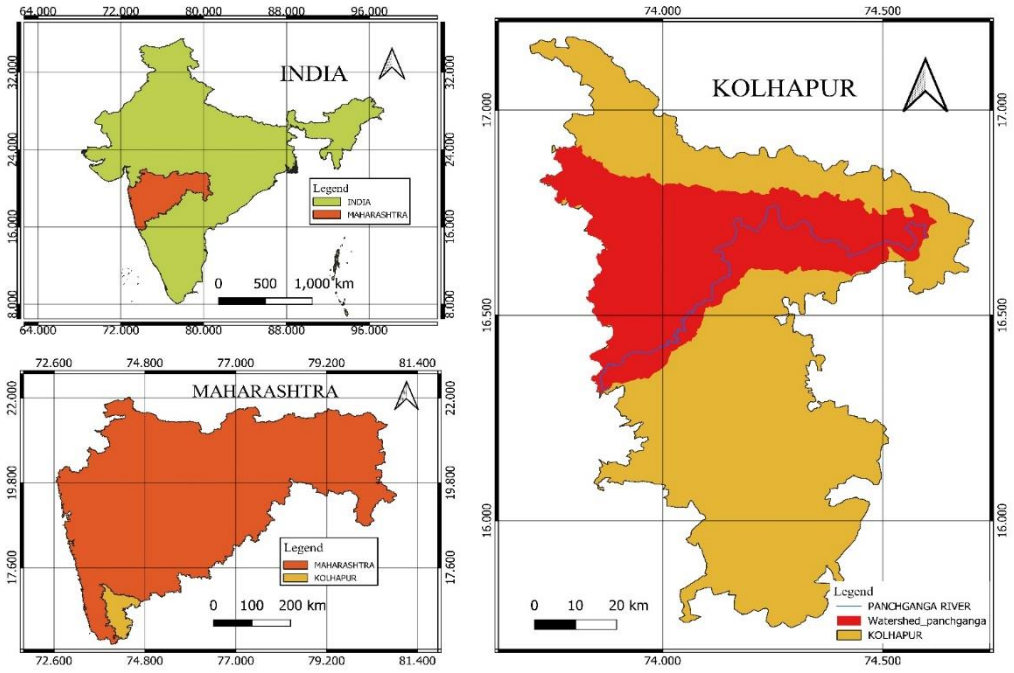

fig. (a) map showing location of the panchaganga river basin in maharashtra, india.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

III. MATERIALS AND METHODOLOGY

A couple of survey of India (SOI) toposheets E43T9_47H9, E43T13_47H13, E43T14_47H14, E43T15_47H15, E43U1_47L1, E43U2_47L2, E43U3_47L3, E43U6_47L5, E43U6_47L6, E43U9_47L9, E43U10_47L10 of 1:50,000 scale were used for the purpose of georeferencing in QGIS-3.16. With the help of QGIS-3.16Digitization work was completed for basin morphometry analysis utilising both toposheet and DEM. Using QGIS-3.16, morphometric metrics such as linear, areal, and relief aspects were computed. A digital elevation model (DEM) was created using data from the Shuttle Radar Topography Mission (SRTM 30 m). Lineament maps often depict faults, joints, or borders between stratigraphic strata and are thought to be possible sites for ground water percolation

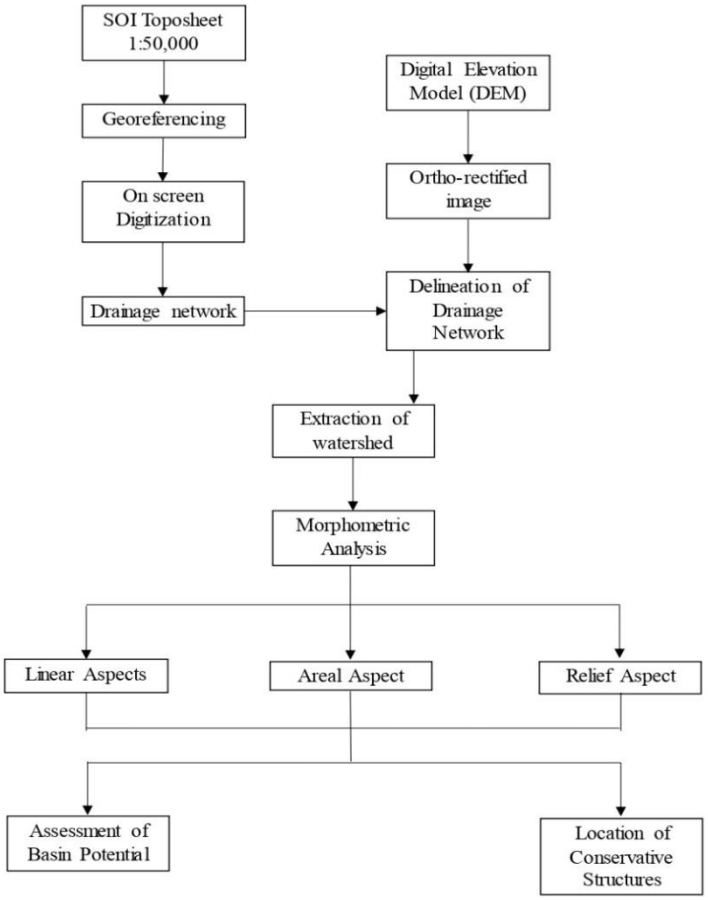

Fig. (b) methodology adopted in the present study.

IV. RESULT AND DISCUSSION

By using SRTM-DEM of 30m x 30m spatial resolution and Survey of India topographical maps No E43T9_47H9, E43T13_47H13, E43T14_47H14, E43T15_47H15, E43U1_47L1, E43U2_47L2, E43U3_47L3, E43U6_47L5, E43U6_47L6, E43U9_47L9, E43U10_47L10 of 1:50,000 scale, the morphometric analysis of panchaganga watershed was carried out. The lengths of the streams, areas of the watershed were measured by using QGIS-3.16 software. Horton (1945), Strahler (1953), Chorley (1957), Schumm (1956), Strahler (1956, 1968), Miller (1953), and Horton (1932) were used to study the linear aspects, whereas Schumm (1956), Strahler (1956, 1968), Miller (1953), and Horton (1932) were used to study the areal aspects (2004).

The Wentworth (1930) method was used to do an average slope analysis of the watershed region. The total basin area is 2489.00km^2 .The drainage pattern of panchaganga watershed is dendric in nature, highly eroded and elongated in shape. In the present study 26 morphometric parameters were estimated for identifying characteristics of watershed. Stream order is calculated using Strahler's method (1964) and other hydrological tool in QGIS 3.16 and other parameters like stream

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

number, stream length, bifurcation ratio, elongation ratio etc. The geomorphic characteristics of a drainage basin confirms to Horton's (1932) 'Laws of stream number', which state that number of of stream segments is maximum in first order stream and decreases as stream order increases.

1) Linear Aspects of the basin:

a. Stream Order (Su)

The first step in analyzing the watershed is to order streams numerically. The stream ordering systems were first proposed by Horton (1945), but Strahler (1952) modified this ordering system. Using the Strahler stream ordering method (Table 1), researchers have observed that maximum frequency is in the case of first-order streams. They also noticed that stream frequency decreases as stream order increases. According to Strahler (1964), the amount of for every particular order's stream segment is less than for the next lower order, but more than for the next higher order [14]. [Rohit Kumar Arya. Int. Journal of Engineering Research and Application, ISSN: 2248-9622, Vol. 7, Issue 6, (Part -1) June 2017, pp.08-17]

b. Stream number (Nu)

The stream number refers to the total number of stream segments in each order (Nu). The number of streams of order u is referred to as Nu. The numbers of stream segments in each order, according to Horton (1945), form an inverse geometric sequence with the order number. Stream number (Nu) supports Horton's law in this basin, indicating that stream number decreases as stream order increases.

[Rohit Kumar Arya. Int. Journal of Engineering Research and Application, ISSN: 2248-9622, Vol. 7, Issue 6, (Part -1) June 2017, pp.08-17]

c. Stream length (Lu)

To calculate the length of a stream, Horton suggested the law. One of the most important hydrological properties of the basin may be the stream length. It exposes the features of surface runoff. Smaller streams have areas with steeper slopes and finer textures. The longer the length, the flatter the gradient (Singh 1997). The first order stream often has the longest overall length of stream segments, which reduces as the stream order rises (Horton, 1945). For a given watershed, the total number of streams of different orders is counted. The length of these streams is calculated from the mouth to the drainage division line. In this measurement, GIS software comes in handy.

[Snehakumari Journal of Engineering Research and Application, ISSN : 2248-9622 Vol. 9,Issue 2 (Series -II) Feb 2019, pp 39-51 , Morphometry Analysis Using SAGA GIS: A Case Study of Watershed – 63 of Narmada River, Gujarat, India.]

d. Stream length ratio (Ri)

The length ratio is defined as the ratio of the mean (Lu) of segments of order (u) to the mean (Lu-1) of segments of the next lower order (Lu-1), which tends to be constant throughout a basin's consecutive orders (Horton, 1945). The mean length of stream segments in each of a basin's consecutive orders tends to approximate a direct geometric series, with stream lengths increasing as stream order increases.

The stream length ratio of the study area has been found to ranges from 0.196 to 3.464. The change in the stream length ratio of streams of different orders could be attributed to differences in the basin's slope and terrain.

[Rohit Kumar Arya. Int. Journal of Engineering Research and Application ,ISSN : 2248-9622, Vol. 7, Issue 6, (Part -1) June 2017, pp.08-17]

e. Mean stream Length (Lsm)

A drainage network's mean stream length (Lsm) reveals a drainage network's characteristic size and the surfaces that contribute to it (Strahler, 1964). The mean stream length is calculated by dividing the total stream lengths by the number of stream segments.

Strahler (1964) wrote that the Lsm is closely related to the size and morphology of drainage networks and their abutting surfaces. The Lsm values differ with respect to different basins, as they are directly proportional to them.

f. Bifurcation ratio (Rb)

The bifurcation ratio is the ratio between the numbers of streams in one order (Nu) to the next higher order (Nu+1). The bifurcation ratio was explored by Horton (1945) as a relief and dissertation index. Except where the significant geological control predominate, Strahler (1957) established that the bifurcation ratio has a restricted range of variance between regions or environments.

The Rb isn't the same from one order to the next, as can be seen. The geological and lithological evolution of the drainage basin is responsible for these abnormalities (Strahler, 1964).

The watersheds with lower Rb values have seen fewer structural disturbances (Strahler, 1964), and the drainage pattern has not been changed as a result of these disturbances (Nag, 1998). Higher bifurcation ratios, on the other hand, imply a developed topography by a considerable change in frequency between successive orders (Sreedevi et al., 2004). In the present study the bifurcation ratio has been shown to vary from 2 to 5.5 showing considerable fluctuation in frequencies between successive orders and a mature topography, while the lower values

[Pareta and Pareta /International Journal of Remote Sensing and GIS, Volume 1, Issue 1, 2012, 47-62]

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

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g. Mean bifurcation ratio (Lum)

The arithmetic mean of bifurcation ratios of all orders is known as the mean bifurcation ratio. In the present study the mean bifurcation ratio has been found to 4.40 which means that the watershed falls under normal basin category (Strahler, 1957).

[Rohit Kumar Arya. Int. Journal of Engineering Research and Application ISSN : 2248-9622, Vol. 7, Issue 6, (Part -1) June 2017, pp.08-17 Morphometric Analysis of a semi-arid region using GIS]

Table No. (1) Morphometric analysis of the Panchaganga River basin

Stream Order (Su)	Stream Number (Nu)	Stream length (Lu)	Bifurcation Ratio (Rb)	Mean Stream Length (Lu/Nu)	Stream Length ratio (Lu/Nu)
I	6557	3820.92	4.09	0.58	2.77
II	1603	1378.37	4.03	0.86	2.34
III	398	589.65	5.31	1.48	2.13
IV	75	276.79	5.00	3.69	1.25
V	15	220.69	5.00	14.71	2.54
VI	3	86.88	3.00	28.96	0.92
VII	1	94.87	NA	94.87	NA

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

Table No. (2) Morphometric parameters of the Panchaganga River basin

PARAMETERS	RESULTS	FORMULAE	REF.
Stream Order	7	Hierarchical Rank	Strahler (1952)
Stream Number (Nu)	8652	(Nu) Nu = N1+N2+ ...Nn	Horton (1945)
Stream Length (Lu) (Km)	6468.17	Lu = L1+L2 ..... Ln	
Stream Length Ratio (Lur)	11.950	see Table 1	
Mean Stream Length Ratio (Lurm)	1.992	see Table 1	
Bifurcation Ratio (Rb)	3-5.31	see Table1	
Mean Bifurcation Ratio (Rbm)	4.40	see Table1	
Basin Area (A) (Km2)	2489.00	GIS Software Analysis	
Basin Perimeter (P) (Km)	406.7456739	GIS Software Analysis	
Relative Perimeter (Pr) (Km)	6.12	Pr = A / P	Schumm (1956)
Stream Frequency (Fs)	3.48	Fs = Nu / A	Horton (1932)
Drainage Density (Dd) (km/km2)	2.60	Dd = Lu / A	Horton (1932)
Drainage Intesity (Di)	1.34	Di = Fs / Dd	Faniran (1968)
Maximum Elevation	938	GIS Software Analysis	
Elevation at Outlet	447	GIS Software Analysis	
Length of Main channel (Cl)	181.204	GIS Software Analysis	
Length of Basin (Lb)	96.43	GIS Software Analysis	
Watershed Relief (H)	491.00	H = Z - z	Strahler (1952)
Relief Ratio (Rhl)	5.09	Rhl = H / Lb	Schumm (1956)
Absolute Relief (Ra) m	938.00	GIS Software Analysis	
Dissection Index (Dis)	0.52	Dis = H / Ra	Singh & Dubey (1994)
Ruggedness Index (Rn)	1.28	Rn = Dd * (H / 1000)	Patton & Baker (1976)
Melton Ruggedness Index (MRn)	9.84	MRn = H / A^0.5	Melton (1965)
Watershed slope (Sw)	2.71	Sw = H / Lb	
Elongation Ratio (Re)	0.58	$Re = 2 / Lb * (A / \pi)^{0.5}$	Schumm (1956)
Form Factor (Rf)	0.27	$Ff = A / Lb_2$	Horton (1932)
Circularity Ratio (Rc)	0.19	$Rc = 12.57 * (A / P_2)$	Miller (1953)
Constant of Channel Maintainance (Kms2/Km)	0.38	C = 1 / Dd	Schumm (1956)
Length of Overland flow (Lg) Kms	0.19	Lg = A / 2 * Lu	Horton (1945)
Infiltration Number (If)	9.03	If = Fs * Dd	Faniran (1968)
Drainage Texture (Dt)	21.27	Dt = Nu / P	Horton (1945)
Compactness Coe. (Cc)	2.32	$Cc = 0.2841 * P / A^{0.5}$	Gravelius (1914)
Slope (S)	0.003	S = (Z * (Ctl/H)) / (10 * A)	Wenthworth's (1930)
Time of Concentration	34.86		

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

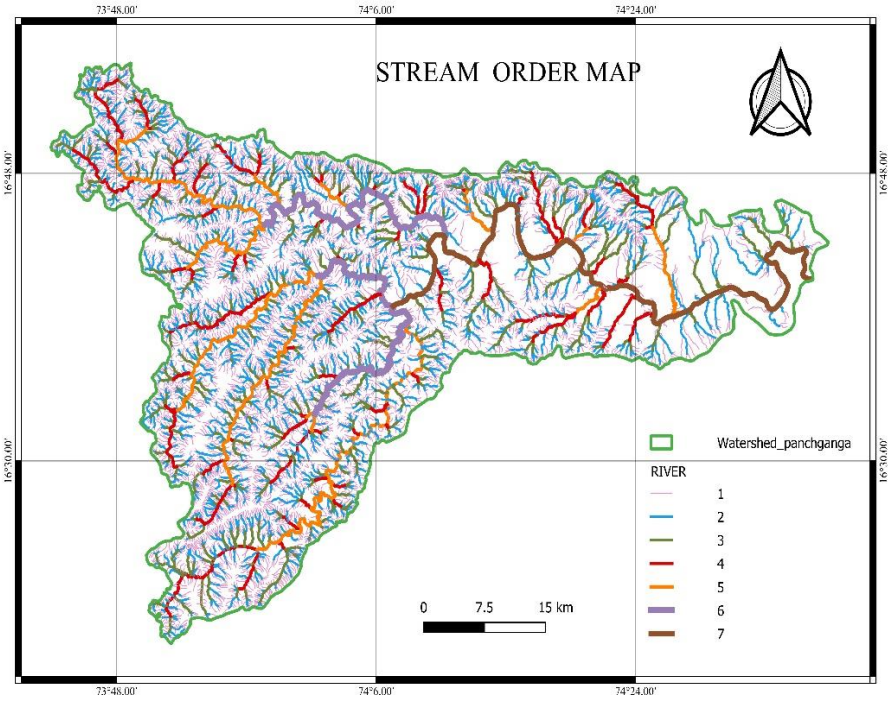

Fig. (c) Drainage map of Panchaganga river catchment

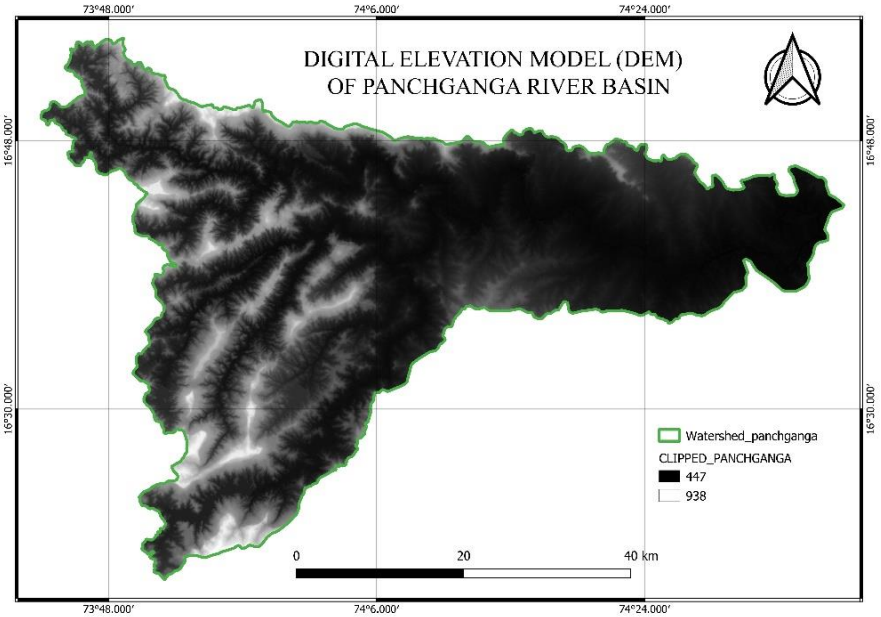

Fig. (d) Digital Elevation Model (DEM) of Panchaganga river catchment

2) Areal Aspects of the basin:

a) Basin area

As like other morphometric parameters, basin area of panchaganga river is also an important parameter. An impressive relation was set up between the total panchaganga river basin areas and the total stream length. The area of entire basin is 2489 sq.km. If a basin size is small it is likely that rainwater will reach the main channel more rapidly than in a larger basin, where the water has much further to travel (Waugh, 1996). Basin area is supposed to be the direct outcome of drainage development in a particular basin.
[https://www.researchgate.net/publication/318814855_Morphometric_Investigation_of_Morna_River_Basin_Maharashtra_India_using_Geospatial_Techniques]

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

b) Basin perimeter

The perimeter of a basin is the watershed's outside limit that defines its boundaries. It is a watershed size and shape indicator that is measured along the split between watersheds. basin perimeter by using QGIS 3.16 software, which is 406.7456 Kms

[International Journal of Remote Sensing and GIS, Volume 1, Issue 1, 2012, 47-62 , Quantitative Geomorphological Analysis of a Watershed of Ravi River Basin, H.P. India Dr Kuldeep Pareta a,* and Upasana Pareta]

c) Stream frequency (Fs)

Lithological characteristics have a direct relationship with the stream frequency. Stream Frequency refers to the number of stream segments per unit area. High stream frequency occurs in the regions of impermeable subsoil and steep gradients. When the stream frequency is higher, faster is the surface run off and hence needs less time for infiltration. Moderate stream frequency found in panchaganga river basin is 3.48 km2 . The rate of stream frequency (Fs) for the basin shows positive association with the drainage density value of the area which points the increase in stream numbers with respect to increase in density.

[https://www.researchgate.net/publication/318814855_Morphometric_Investigation_of_Morna_River_Basin_Maharashtra_India_using_Geospatial_Techniques]

d) Drainage density (Dd)

Drainage density means the length of stream per unit of the watershed. Factors affiliated to density are climate, type of rocks, infiltration capacity, vegetation cover and drainage density have no important correlation with surface roughness. Low drainage leads to weak or impervious subsurface material, scant flora, and hilly relief, while strong drainage leads to fine drainage texture.

A low drainage density denotes permeable sub surface strata and course drainage is a feature which usually measures value less than 5.0. Drainage density24 is the ratio of total channel segment length cumulated for all order within a basin to the basin area that is expressed in terms of Km/Km2 . To study the analysis of landform, the drainage density is a significant quantitative expression. Although there are many functions which are used as an indirect indicative to explain, those variables as well as the morphogenesis of landform are climate, lithology, structures and relief history of a region. Authors have estimated the drainage density of panchaganga river basin as 2.60 km / km2

[https://www.researchgate.net/publication/318814855_Morphometric_Investigation_of_Morna_River_Basin_Maharashtra_India_using_Geospatial_Techniques]

e) Drainage intensity (Di)

The drainage intensity is defined by Faniran (1968) as the proportion of stream frequency to drainage density. According to this research, the watershed has a drainage intensity of 1.34. Because of the low drainage intensity, drainage density and stream frequency have little (if any) effect on the extent to which the surface has been depressed by denudation agents. Surface runoff is not promptly cleared from the watershed due to these low levels of drainage density, stream frequency, and drainage intensity, leaving it vulnerable to flooding, gully erosion, and landslides.

[ISSN 2277–9051, International Journal of Remote Sensing and GIS, Volume 1, Issue 1, 2012, 47-62].

f) Form factor

A drainage basin's Rf is defined as the ratio of the basin's area (A) to the square of its length (L) (Lb2). The basic metrics of area, perimeter, and length can be used to index the geometry of a basin (Singh, 1998). 0.785 is the form factor of a completely round basin. The basin will be longer if the form factor is lower.

The panchganga river has 0.27 form factor shows less values of form factor and it indicates elongated shape of panchganga river.

g) Circulatory ratio

Circulatory ratio is most likely the shape predicted based on stream flow in the sub basin. lesser the value of circulatory ratio indicates basin youth stage; medium value shows its mature stage and higher value indicates its old stage of life cycle. Panchganga basin have circulatory ratio of 0.19, it comes in mature stage of development.

h) Elongation ratio

As given by Schum[32], elongation ratio is illustrated as the ratio of diameter of a circle having same area as of the basin and maximum basin length. The value of the Re varies considerably between 0.6 and 1.0 depending on the climatic and geological conditions of the area; those with values close to the highest, i.e. 1.0, are associated with typical low relief, while those with values of 0.6 and nearby are associated with high relief and steep slopes (Strahler 1964). The values are grouped in all in three categories: circular (value greater than 0.9), oval (value are in between 0.8 to 0.9)and elongated (value lesser than 0.8). The elongation ratio of current study area is 0.57 which comes in a category of elongated.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

i) Texture ratio

According to Schumm (1965), texture ratio is an important factor in the drainage morphometric analysis which is depending on the underlying infiltration capacity and relief aspect of the terrain.it is expressed as the ratio of first order stream and perimeter of basin and it depends on the underlying lithology, infiltration capacity and relief aspects of the terrain. In the present study of panchganga watershed is 21.27 and it categorized higher the nature of watershed.

j) Constant of channel maintenance

As a feature of landforms, Schumm (1956) employed the inverse of drainage density, often known as the constant of channel maintenance. The channel maintenance constant denotes the proportional size of landform units in a drainage basin and has a genetic significance (Strahler, 1957). The maintenance cost of channel for watershed is 0.38.

3) Relief Aspects of the basin:

a) Relative relief (Rhp)

Relief within a basin or area is referred to as an 'amplitude of relief' or 'local relief', which is the height difference between the highest and the lowest points (maximum difference in height between two points) of that basin or area. SRTM data are used in this study to calculate watershed values.

b) Dissection Index

The dissection index is defined as the ratio between the relative relief of a basin and its absolute relief, which always varies between zero (no dissection) and one (vertical cliff at sea shore). One of the factors that affects drainage density is landscape dissection (Montgomery and Dietrich, 1994). In the landform development cycle, the dissection index value increases as the result of differential cutting of once smooth land surface. This, in turn, implies that due to irregularities, more dissection occurs resulting in a plain surface.

c) Relief Ratio (Rhl)

The distance between the highest point of a watershed and its lowest point is called the total relief of the river basin. The relief ratio is the proportion of a basin's overall relief to its longest dimension parallel to its major drainage line (Schumm, 1956). This study area has a value of 5.09

d) Ruggedness Number (Rn)

The roughness number calculated by Strahler (1968) is the product of basin relief and drainage density. The steepness of the slope is combined with the length of the slope. The Tundah watershed has a roughness number of 1.28 as a result of these calculations. Watersheds with low ruggedness values are less prone to soil erosion and have inherent structural complexity in relation to relief and drainage density.

e) Maximum elevation

The highest point on the watershed is known as the basin's maximum height. It's 938 metres, according to Arc GIS software.
[Rohit Kumar Arya. Int. Journal of Engineering Research and Application ,ISSN : 2248-9622, Vol. 7, Issue 6, (Part -1) June 2017, pp.08-17]

f) Elevation at outlet

Height of the basin mouth is the lowest point of elevation on the watershed or the outlet of the watershed. It is determined in Arc GIS software and has been found to be 447m
[Rohit Kumar Arya. Int. Journal of Engineering Research and Application ,ISSN : 2248-9622, Vol. 7, Issue 6, (Part -1) June 2017, pp.08-17]

g) Interrelationship between various morphometric parameters

The relationship between drainage density v/s bifurcation ratio and stream frequency v/s bifurcation ratio are used by (Bhagwat et al., 2013), Al Samy (In: AlSaud, 2009) to assess the sub-basins for flood estimation and recharge potential (Fig. (e) 1 and 2)

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

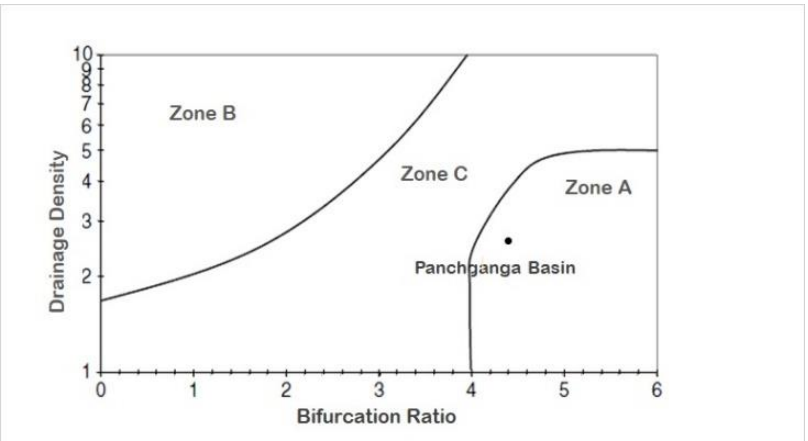

Fig (e) 1. Plot between Bifurcation ratio v/s Drainage Density Plot of bifurcation ratio v/s drainage density for the sub-basins located in different agro climatic zones (Field boundaries after Al Shamy, In: Al Saud, 2009).

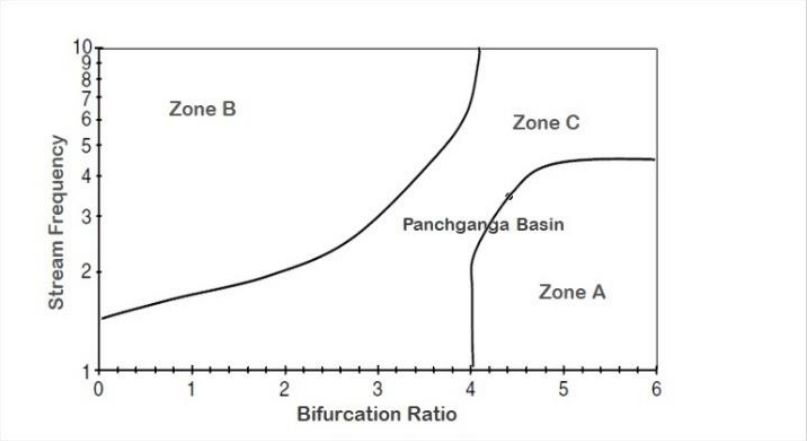

Fig (e) 2. Plot of Bifurcation ratio v/s drainage frequency for the sub-basins located in different agro climatic zones (Field boundaries after Al Shamy, In: Al Saud, 2009).

Zone A: Low flood probability and high recharge property,

Zone B: High flood probability and low recharge property,

Zone C: Moderate to high flood property and moderate recharge property.

On the basis of bifurcation ratio, Drainage density and Stream frequency Panchaganga River Basin lies under "Zone C". This implies that, Panchagnaga River basin have Moderate to high flood property and moderate recharge property.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

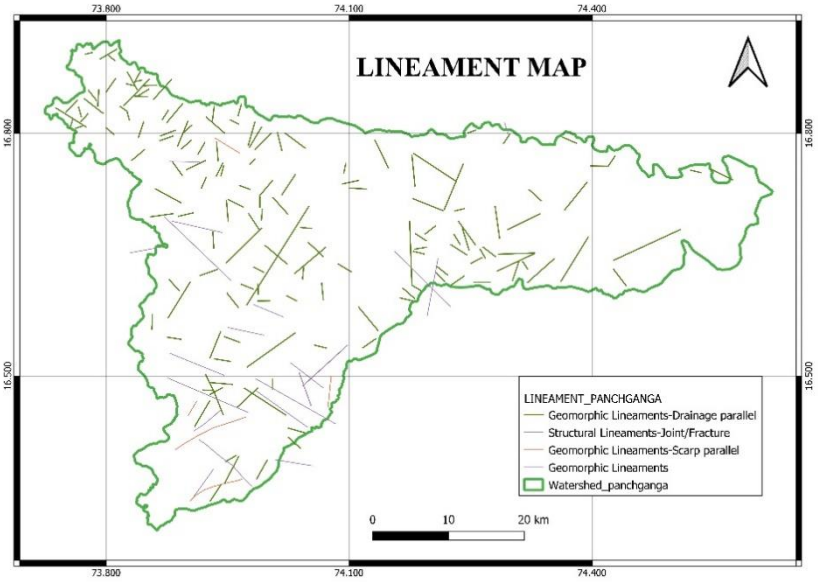

Fig. (f) Lineament Map of Panchaganga river catchment

V. CONCLUSION

As a result of the above study, it is concluded that Panchaganga River lies in ZONE C (fig.no.e.1&2) which indicates Moderate to high flood property and moderate recharge property, thus Panchaganga River faces perennial flooding and chronic drought, resulting in water resources issues and artificial ground water recharge is a viable and attractive solution. Additionally, potential sites for conservative structure are needed to control flooding. It has been determined that percolation occurs on hard-rock terrain at joints, lineaments, or faults, and locations where lineaments intersect are potential sites for artificial recharge. The extent of drainage and morphometric characteristics of a basin are potential indicators of its response to hydrology. Percolation is also affected by fluctuating ground water levels, soil cover thickness, land use, and rainfall patterns in a basin. To identify a potential area for recharge, all of these parameters need to be considered, and the multicriteria approach allows us to identify suitable areas.

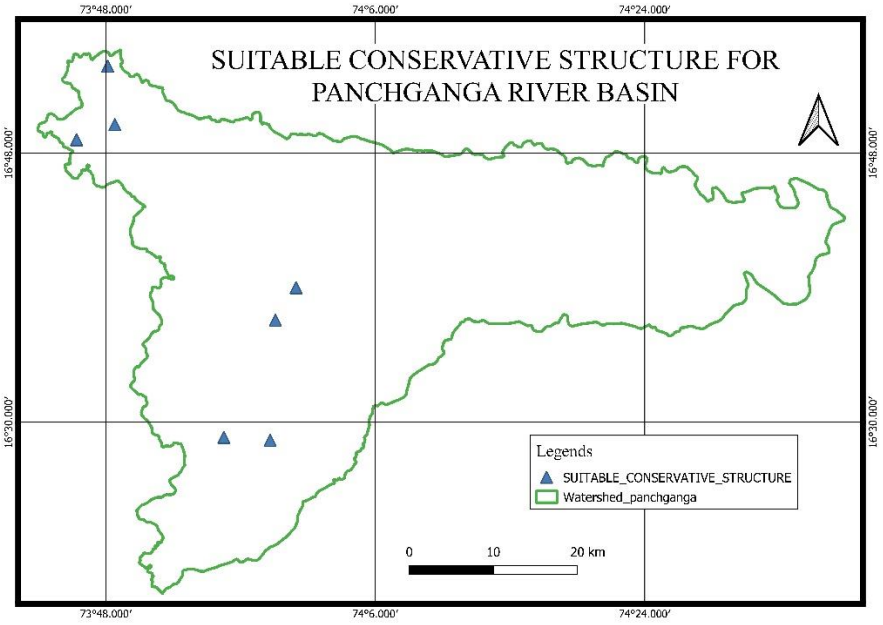

Fig. (g) Suitable Conservative Structure locations for Panchaganga river basin

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

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Vol. 9, Special Issue 1, April 2022

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International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

Experimental Performance on Steel Fibre Reinforced Meta-kaolin Concrete

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Abstract: This paper describes the experimental study of fibre reinforced cement concrete in addition of metakaolin by using M-sand.In the present study experimental investigation was done by using M60 mix in addition of metakaolin 5%-25% and crimped steel fiber 2%-10% having aspect ratio 85.and also study of effect of FRMC on properties of fresh concrete including workability,temperature,dry density,compressive strength.

Keywords: M60Concrete,Crimpedsteefiber,Metakaolin,Temperature,wet Density

I. INTRODUCTION

Cement concrete is the most widely used material for various constructions. Properly designed and prepared concrete results in good strength and durable properties. Even such well- designed and prepared cement concrete mix under controlled conditions also have certain limitations, because of which above properties of concrete are found to be inadequate for special situation and for certain special structures. The main ingredient in the conventional concrete is Portland cement. The amount of cement production emits approximately equal amount of carbon dioxide into the atmosphere. Availability of mineral admixtures marked opening of a new era for designing concrete mix of higher and higher strength. As a result , the use of new mineral admixture has considerably increased within the concrete industry. For attaining a high strength and durable concrete for major applications in the constructions such as high-rise mineral are must to improve the performance of concrete. Meta-kaolin is new mineral admixture , whose potential is not fully utilized. Moreover only limited meta-kaolin have been carried out in India on the for the development of high strength concrete. Several experimental investigations studies use of metakaoline have been carried out to study the workability, mechanical and durability characteristics.

II. RESEARCH SIGNIFICANCE

In this research experimental investigation was done by replacing partial weight of cement to the metakaolin and crimped steel fiber with the variation of mk 5%-25% and steel fiber 2%-10%. and also the study of different properties of concrete which influenced by SFRMC. This property includes workability, density, compressive strength, temperature.

III. EXPERIMENTAL PROGRAMME

The test materials used for this investigation given-
Cement-Ultratech 53 OPC cement has been used for casting. All properties of cement are tested by IS12269:1987.Having specific gravity 3.15,fineness is 3.75%,standard consistency 29%,initial setting time 135min,fina setting time 240min and compressive strength after 28days 69.5MPa
Aggregates-Coarse Aggregate were used in this experimental work 20mm and 10mm.These tested by referring IS 383:1970.The 20mm C.A having specific gravity 2.74,Fineness modulus 7.25,particle shape has rounded and water absorption 0.4% and same 10mm C.A tested having specific gravity 2.74,fineness modulus6.872,particle shape has angular, water absorption 0.5%.
Fine Aggregate(Crushed sand)-It tested by referring IS 383:1970(Zone-2).The particle shape rounded,fineness modulus 2.97,silt content 1.9%, specific gravity 2.8,water absorption 1.1%.
Superplaseticizer-MYK arment Superplast used for increasing workability and other strength properties of MMFRC. Water-Portable water available in laboratory having pH value lies between 6-8 and water should be free from organic impurities used for casting also curing.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

Metakaolin- It is the chemical which used for present experimental study.This obtained from Golden micro chemicals,Thane. Crimped steel fiber-ISO9001:2008 certified steel fibers confirming to ASTM A820 M04 Type1 standard are used for this research. Which having 0.70mm diameter,aspect ratio 85 and modulus of elasticity 200GPa

IV. THEORY

Workability-

Workability of Concrete is a broad and subjective term describing how easily freshly mixed concrete can be mixed, placed, consolidated, and finished with minimal loss of homogeneity. In present study of SFRMC the workability is determined by using slump cone test. The slump test is the widely used for finding the workability of fresh concreteThe Slump test indicates the behavior of a compacted concrete under the action of gravitional forces.The test is carried out with mould called as slump cone. during testing time slump cone placed on horizontal and non absorbent surface filled in 3 layers & each layer being tamped by 25 times with tamping rod.

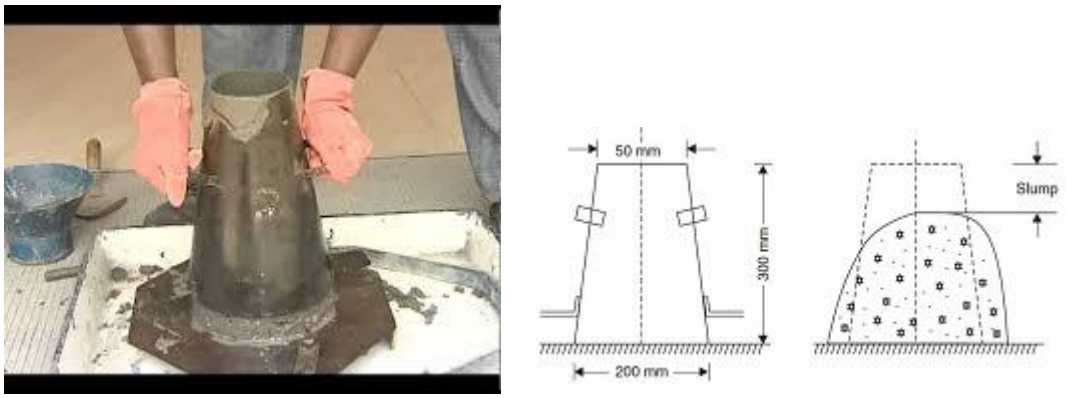

Fig.1 Slump Cone Test

Temperature-

The temperature of FRMC is measured by using thermometer during the casting of concrete specimen. Density of concrete specimen depends on weight of casted specimen and its volume. The wet density is evaluated after casting specimen means its wet weight and dry density is measured after the curing period means dry weight.

Compressive strength-

Compressive strengths are usually reported in relationship to a specific technical standardCubes are casted for this test having size of 15cmX15cmX15cm.This test is conducted after 28 days.

V. RESULT

workability-

TABLE III

Series	Metakoline(%)		Slump (mm)
NC+MK	5.0		15.90
	10		18.70
	15		21.00
	20		22.60
	25		24.00
NC+MK+SF	Metakoline (%)	Steel Fibre (%)	Slump (mm)
	5.0	2.0	25.00
	10	4.0	24.70
	15	6.0	23.30
	20	8.0	21.90
	25	10	20.00

IARJSET

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International Advanced Research Journal in Science, Engineering and Technology

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Temperature-

TABLE IVI

series	Metakoline(%)		Temperature(^{0}C)
NC+MK	5.0		28.5
	10		27.5
	15		27
	20		26
	25		25.5
NC+MK+SF	Metakoline (%)	Steel Fibre (%)	Temperature(^{0}C)
	5.0	2.0	28.5
	10	4.0	28
	15	6.0	27
	20	8.0	26.5
	25	10	26

Compressive Strength-

TABLE VII

series	Metakoline (%)		compressive strength (MPa)
NC+MK	5.0		67.28
	10		67.87
	15		68.16
	20		68.30
	25		68.75
NC+MK+SF	Metakoline (%)	Steel Fibre (%)	compressive strength (MPa)
	5.0	2.0	68.06
	10	4.0	65.24
	15	6.0	65.12
	20	8.0	64.72
	25	10	64.08

Wet density & Dry density-

TABLE VIV

series	Metakoline(%)	Steel Fibre (%)	Wet density (Kg/m3)	Dry density (Kg/m3)
NC+MK+SF	5.0	2.0	2618.33	2615.41
	10	4.0	2642.39	2640.30
	15	6.0	2662.94	2660.80
	20	8.0	2689.15	2686.91
	25	10	2698.26	2695.45

IARJSET

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ISSN (Print) 2394-1588

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Vol. 9, Special Issue 1, April 2022

VI. CONCLUSION

Slump of SFRMC rises in addition of Metakaolin. But decreases in addition of Steel fiber at certain stage. Compressive Strength of SFRMC increased with Addition of Meta-kaolin & Temperature of SFRMC goes on decreasing in addition of meta-Kaolin. Wet density of SFRMC goes on increasing with the addition of MK & SF

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IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

Flexural Behaviour of Steel I-Beam Bounded With Different Fibre Reinforced Polymer Sheets

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Abstract: Conventional strengthening technique for huge steel structures depends on enlarging the original steel section by welding additional elements such as steel plates or channels. In this conventional strengthening technique the dead load of the enlarged section becomes larger which may result in a reduction in its effectiveness and the added steel plates are also susceptible to corrosion if structure is situated in a corrosive environment. Also this technique requires heavy lifting equipment during the erection process. Due to these reasons considerable amount of research has been directed to the use of Fiber Reinforced Polymer (FRP) Materials for strengthening and retrofitting of steel structures as FRP sheets are being used extensively from past two decades to rehabilitate concrete structures.

Keywords*:* Fibre Reinforced Sheet, Steel I-Beam, CFRP, BFRP, Araldite.

I. INTRODUCTION

Fiber Reinforced Polymer (FRP) sheets had been extensively used to rehabilitate concrete structures. This has allowed increase in the strength and ductility of these structures.FRP sheets are high resistance against corrosion and chemical attacks. Steel plates can also be adhesively bonded but bonding is less attractive for steel plates due to their heavy weight and inflexibility in shape. These uses of FRP sheets to upgrade the resistance of steel structures have recently been studied. FRP sheets are formed by embedding continuous fibers in a polymeric resin matrix which binds the fibers together. For attachment of FRP sheets use Araldite Epoxy Resins .Common fibers used in FRP sheet include carbon, glass, and basalt fibers while common resins are epoxy, polyester, and vinyl ester resins. The most widely used FRP composites are glass fiber-reinforced polymer (GFRP) composites and carbon fiber reinforced polymer (CFRP) composites, while basalt fiber-reinforced polymer (BFRP) composites are less frequently used. Fiber Reinforced Polymer (FRP) materials for strengthening and retrofitting of steel structures as FRP sheets are being used extensively from past two decades to rehabilitate concrete structures. Advantage of using CFRP is its high tensile strength and stiffness compared with its low self-weight. The outstanding properties of composite materials such as high strength, high elastic modulus, light weight and good durability have made them a suitable alternative for steel plates in strengthening work. Fiber -reinforced polymer (FRP) composites are formed by embedding continuous fibers in a polymeric resin matrix which binds the fibers together. Common fibers used in FRP composites include carbon, glass, and basalt fibers while common resins are epoxy, polyester, and vinyl ester resins. The most widely used FRP composites are glass fiber-reinforced polymer (GFRP) composites and carbon fiber reinforced polymer (CFRP) composites, while basalt fiber-reinforced polymer (BFRP) composites are less frequently . In this technique, corrosion of steel is reduced if the structure is situated in corrosive environment. The various benefits of using FRP in strengthening process of structures it has become essential to study the flexural behavior of structural members, especially of steel structures, by making use of FRPs. Therefore, in this project work flexural behavior of the steel I–beams will be performed using different types of FRP sheets namely carbon fiber and basalt fiber. Fiber Reinforced Polymer (FRP) sheets had been extensively used to rehabilitate concrete structures. This has allowed increase in the strength and ductility of these structures.FRP sheets are high resistance against corrosion and chemical attacks. Steel plates can also be adhesively bonded but bonding is less attractive for steel plates due to their heavy weight and inflexibility in shape. These uses of FRP sheets to upgrade the resistance of steel structures have recently been studied.

FRP sheets are formed by embedding continuous fibers in a polymeric resin matrix which binds the fibers together. For attachment of FRP sheets use Araldite Epoxy Resins .Common fibers used in FRP sheet include carbon, glass, and basalt fibers while common resins are epoxy, polyester, and vinyl ester resins. The most widely used FRP composites are glass fiber-reinforced polymer (GFRP) composites and carbon fiber reinforced polymer (CFRP) composites, while basalt fiber-reinforced polymer (BFRP) composites are less frequently used. Fiber Reinforced Polymer (FRP) materials for strengthening and retrofitting of steel structures as FRP sheets are being used extensively from past two decades to rehabilitate concrete structures. Advantage of using CFRP is its high tensile strength and stiffness compared with its low self-weight. The outstanding properties of composite materials such as high strength, high elastic modulus, light weight and good durability have made them a suitable alternative for steel plates in strengthening work.

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Fiber-reinforced polymer (FRP) composites are formed by embedding continuous fibers in a polymeric resin matrix which binds the fibers together. Common fibers used in FRP composites include carbon, glass, and basalt fibers while common resins are epoxy, polyester, and vinyl ester resins. The most widely used FRP composites are glass fiber-reinforced polymer (GFRP) composites and carbon fiber reinforced polymer (CFRP) composites, while basalt fiber-reinforced polymer (BFRP) composites are less frequently.

II .METHODOLOGY

A. EXPERIMENT WORK :

For the experimentation steel I-beam of total depth 100 mm, flange width of 50 mm, thickness of flange 4 mm and thickness of web 3 mm has been taken as shown in Fig.1 These beams were tested under four point bending test using Universal Testing Machine (1000KN capacity).

Locally available steel I beams were used to study the flexural behaviour bonded with and without FRP sheets. A beam section was chosen such that there will not be any local buckling and vertical stiffness. Basalt fibre sheets (BFS) having Young's modulus of 110GPa, tensile strength of 4500MPa, poisons ratio of 0.2 and Carbon fiber sheets (CFS) having Young' smodulus of 200 GPa, tensile strength of 5500 MPa, passions ratio of 0.5 have been used for strengthening the I-beams having length of 1100 mm.The most widely used epoxy resin namely "araldite", available as resin and hardener in separate packages has been used. Before to the bonding of the BF Sand CFS, the flanges of the beams roughened using sand paper to ensure rust free surface and to achieve proper bonding between steel beam and fibre sheet so as to avoid early de- bonding failure at the time of testing. The fiber sheets were cut into strips of width equal to the flange width of the beams (i.e.50mm). The Araldite epoxy resin AW106 and hardener HV953 are then mixed thoroughly(in proportion 1:1) till a uniform colour to the mixture is obtained. The uniform mixture of resin and hardener so obtained was then applied to the flange of I–beam. The strip so FBF Sand CFS were immediately bonded to the flange of steel I–beam using a hard roller to ensure the constant thickness of the epoxy coat along the bonding length and also to eliminate the presence of air pockets in between fiber strip sand steel surface. Two different parameters were considered for bonding fibre strips. First beam was bonded with fibre strip on tension flange only while other beam was bonded with fibre strip on tension as well as compression flange to study the flexural behavior.

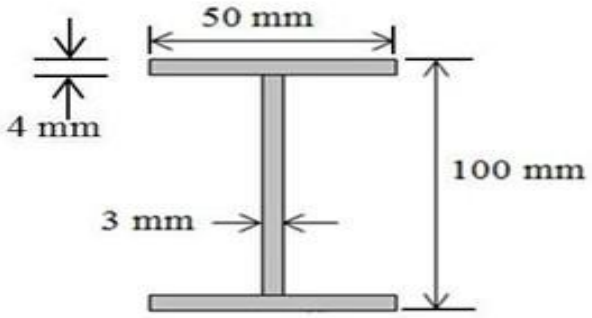

Fig-1.Crossectional Details Of The I-Beam.

Fig-2. Basalt Fibre Sheet.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

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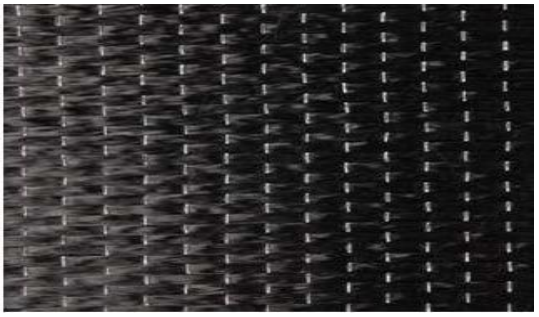

Fig-3. Carbon Fibre Sheet Sheet

B. **Testsetup :**

The control beam and the beams bonded with strips of carbon fiber sheet and basalt fiber sheet on different flanges were tested in four point bending test on universal testing machine (1000kN capacity) with two equally spaced concentrated loads as shown in Fig4.

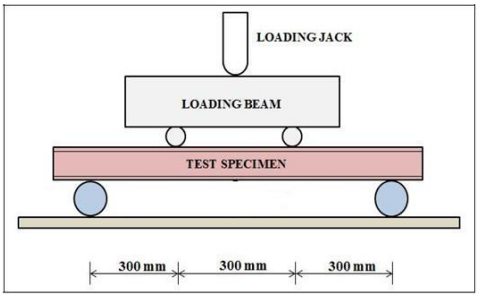

Fig-4. Test Setup

The load was transferred from the jack to the main specimen by using a loading beam. The middle of the loading beam was subjected to jack pressure from which the load was transferred to the test specimen through two point loads as shown in Fig.4

III. RESULT AND DISCUSSION:

From result table and Load vs. Deflection graph in Fig.5 we can say that load carrying capacity of 1st control beam is 47.1 kN. Beam showed elastic behavior up to 44 kN and then reached to yield point. Beam carried load of 47. 1kN and then failure occurred with deflection of 3.21 mm. Similarly from fig.2 shows load vs. deflection graph for 2nd control beam, which carried load of 46.5 kN and failed with deflection of 3.02 mm. From results obtained duringthe flexural test of control beams, we can consider average load carrying capacity of beam as 46 to 47kN.

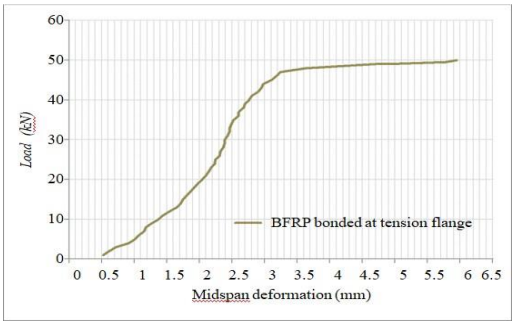

Fig-5. Load vs. Deformation graph for 1st control beam.

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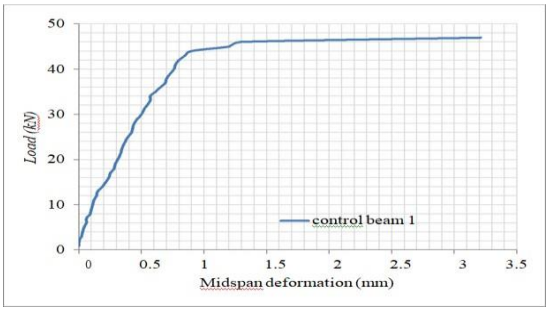

Fig-6. Load vs. Deformation graph for 2ndcontrol beam**.**

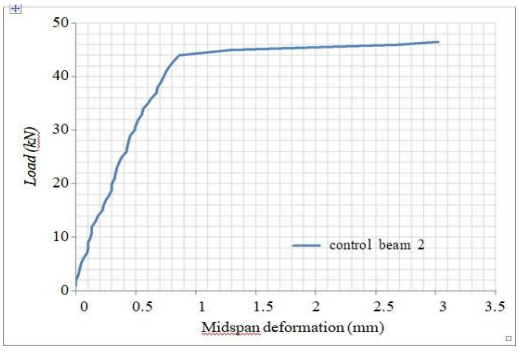

Fig-7. Load vs. Deformation graph for beam bonded with BFRP at tension flange.

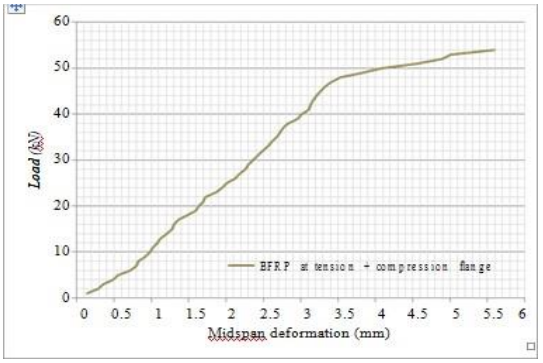

Fig-8. Load vs. Deformation graph for beam bonded with BFRP attension and comp. Flange.

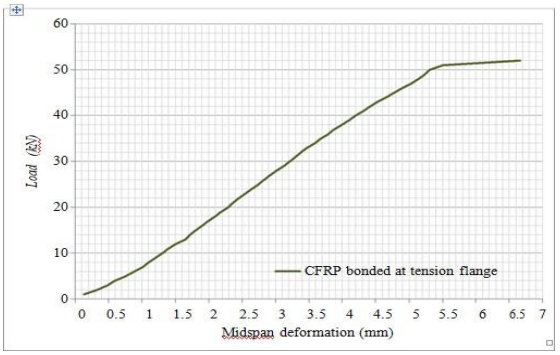

Fig-9. Load vs. Deformation graph for beam bonded with CFRP at tension flange.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

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Fig-10.Load vs. Deformation graph for beam bonded with CFRP attention and comp. Flange.

From result tables and graphical presentation ofbeams bonded with BFRP we can observe that when BFRP was bonded at only tension flange, beam carried load of 50 kN and when BFRP was bonded at both the flanges, beam carried load of 54 kN. If the results are compared with control beam we can surely say that bonding of BFRP sheet affected increment in load carrying capacity. The elastic behavior of beam also seen to be increased than that of control beams which may have caused more deflection than control beam.

Fig9. Shows load vs. deformation graph ofbeam bonded with CFRP only at tension flange.

A beam carried load of 52kN and had deflection of 6.66 mm. When similar beam was then bonded with CFRP on both the flanges, it carried load of 56 kN and had deflection of 5.79 kN. Load vs. deformation graph for CFRP bonded on both flanges as shown in Fig.10 Elastic response of both CFRP bonded beams is found to be extended. For better understanding and comparison these plots are combined together as shown in fig11and fig12.

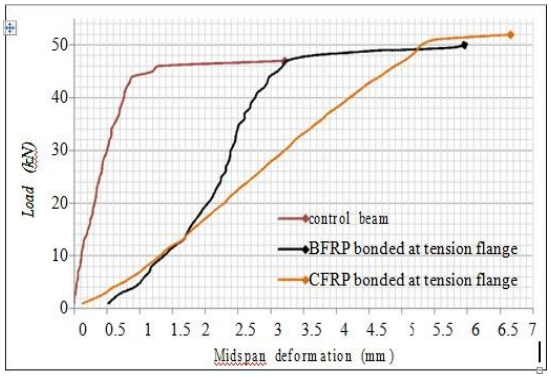

Fig-11.Comparative Load vs. deflection plot for beams bonded with FRPS (attension flange).

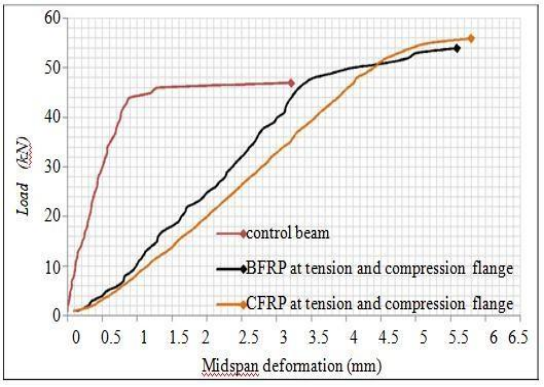

Fig-12.Comparative Load vs. deflection plot for beams bonded with FRPS (at both the flanges).

From the combined graphs (fig.11 and fig.12), it is observed that all the strengthened beams shows better strength compared to control beam. However, CFRP bonded beam indicates more load carrying capacity as compared with the beam bonded with BFRP sheet. The elastic response of strengthened beams is also observed to be increased over the

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

control beam. The Yield points of strengthened beams also indicated relatively higher magnitude of load than that of control beam. From the load vs deflection curve it is observed that the flexural behaviour of both the beams bonded with BFRP and CFRP sheet is somewhat similar in nature. Also, it can be said that bonding of FRP sheets on compression flange of beam in addition to tension flange definitely contribute to increased load carrying capacity of the steel beam.

IV. CONCLUSION

Referring various experimental as well as mathematical studies it has been clear that the bonding of steel structures with different types of FRP is a relevant technique to strength then the existing steel structures. Various conclusions that can be drawn for the experimentation are listed below;

1) Bonding of FRP sheets on the flanges of the steel beam causes increment in elastic behavior of beam and ultimately gives higher yield point value.
2) Load carrying capacity of beam having depth 125mm found to be equal (i.e. 56kN) to that of beamof 100 mm depth which was bonded with CFRPon both the flanges. Thus, it is possible to use smaller steel sections after bonding with FRP sheets as an alternative equivalent section for larger sections.
3) The load carrying capacity of the strengthened beam (BFRP bonded at tension flange) is found to be increased by 6.5% than that of control beam.
4) Beam bonded with BFRP at both the flanges carried load of 54 kN and it shows increment of load carrying capacity by 10.70%.
5) CFRP bonding at tension flange increased load carrying capacity of beam by 8.51%.
6) Beam bonded with CFRP at tension as well as compression flange mentioned increment of load carrying capacity by 20%.

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IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

Development of ecofriendly concrete Paver Block

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Abstract: This experimental investigation deals with the utilization of fly ash as a substitute for cement and fine aggregate in high-grade concrete. Fly ash is collected, characterized, and added for the manufacture of concrete tiles and paver blocks in different percentages, replacing conventional materials such as cement and sand. Compressive, flexural, water absorption, and even durability tests are conducted for paver blocks and the optimum percentage of fly ash for each parameter is obtained. A wet transverse strength test and water absorption test are conducted to evaluate the suitability of fly ash addition in concrete tiles. The addition of fly ash shows substantial improvement in strength and durability properties. Suitable recommendations are given in favor of concrete tiles and paver blocks with fly ash, enabling paving with sustainable construction and reduced environmental degradation.

Keywords: Fly ash, Waste Foundry sand, innovative paver blocks

I. INTRODUCTION

Industrialization and urbanization are two continuous phenomena that are unabated all over the world. Their negative impact on the global environment has resulted in the depletion of natural resources due to the rapid growth of the construction indus- try. Overexploitation of mineral resources is harming the environment, causing deficiencies, endangering society, and advancing toward an unsustainable future. Also, the disposal, management, and utilization of industrial waste produced are of utmost importance. A major concern is the production of enormous quantities of fly ash due from coal-based power generation around the world, but mostly in developing nations. The industrial world produces huge quantities of fly ash, which is a waste from thermal power plants and that needs to be disposed of safely, otherwise it can have disastrous consequences. Disposal of fly ash is a major issue in India due to the scarcity of land, pollution of ground water due to leaching, and health issues faced by people living near dump sites. All these adverse situations that have emerged due to the generation of fly ash are the cause of severe concerns to environmentalists all across the globe.

The production of fly ash in India is approximately 200 million tons per year, and currently only 56% of this is utilized, therefore a significant improvement is needed. The effective utilization of fly ash is restricted to the manufacture of bricks, use in pavements, and fly ash-based pozzolanic cement production. Fly ash can be effectively used in concrete paver blocks and concrete tiles, replacing conventional construction materials such as cement and fine aggregate. Concrete tiles and paver blocks are used for various purposes like paving of approaches, paths, parking places, and footpaths. Paver blocks may also find their application in roadways as precast pavements. The increasing costs of construction and building materials, and the need to meet sustainable development, mean that alternative construction meth- ods, techniques, and materials are being used extensively to replace old conventional methods. So as to enhance and improvise the applications of concrete tiles and paver blocks, proper knowledge and understanding of the behavior of the pro- ducts produced, many of which are produced indigenously, is essential.

Society's expanding reliance on sand has resulted in its depletion, causing real difficulties in construction area which need to be addressed. The studies involving fly ash utilization as a fine aggregate substitution in concrete are inadequate.

II. OBJECTIVE

1) To preparing mix designs for different percentages of fly ash as a replacement for cement and fine aggregate and evaluating the compressive strength, flexural strength, water absorption, and durability aspects for paver blocks.
2) To investigate the suitability of fly ash as an innovative green construction method will be recommended for road construction purposes.

III. EXPERIMENTAL WORK

1. Materials used

Portland slag cement, which is most commonly used in the region, was used for the study complying with IS 455. Its specific

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

gravity was 2.87 having initial and final setting times of 70 minutes and 480 minutes, respectively. For fine aggregate, natural sand was used, having a maximum size of 4.75 mm. Its specific gravity was 2.72, conforming to Zone-III, and having a fineness modulus of 2.313. Coarse aggregates used in this study were of 10 mm nominal size, having a specific gravity of 2.72. Both aggregates comply with IS 383. The grading of both fine and coarse aggregates and their mixture is shown in Table 1.

Fly ash is classified into two types for use as a mineral admixture as per ASTM C 618. These are: (1) class 'F' fly ash and (2) class 'C' fly ash. The major distinction between these classes is the percentages of silica, alumina, and iron and calcium content. Fly ash from two sources was used for present study. Class F flyash procured from a local source was used in the manufacturing of tiles and paver blocks.

2. Mix design

Generally, for the manufacture of precast concrete paver blocks, dry, low slump mixes are needed. Mix design was done for control mix of M40 grade concrete using IS10262, as per the specifications given by IS 15658 for medium traffic condition, which provided a mix proportion of 1:2.25:2.25 with a water cement ratio of 0.40 and superplasticizer "Conplast SP430 G8 (FOSROC)" con- forming to IS 9103. In this study, two types of replacement were done, cement replacement and fine aggregate replacement, where the percentage of fly ash varied from 0% to 40%, at intervals of 10%. The proportion of both coarse and fine aggre- gate was 50%. The details of concrete mixes with replacement of sand and cement for paver blocks are presented in Tables 1 and 2, respectively.

Table 1 Particle size distribution of aggregates and their mixture.

Sieve size (mm)	Fine aggregate	Coarse aggregate	Mixture
20	100	100	100
10	100	26.08	63.04
4.75	100	2.52	51.26
2.36	98.5	0	49.25
1.18	92.5	0	46.25
0.6	58.9	0	29.95
0.3	16.3	0	8.15
0.15	2.9	0	1.45

Table 2 Proportion of fresh concrete mixture for sand replacement with fly ash.

Mixture no.	Cement (kg/m3)	Fly ash (%)	Fly ash (kg/m3)	W/C ratio	Sand (kg/m3)	Coarse aggregate (kg/m3)	Super plasticizer (%)
SR-0	416.0	0	0	0.4	936.50	936.5	0.5
SR-10	416.0	10	93.65	0.4	842.85	936.5	1.0
SR-20	416.0	20	187.30	0.4	749.20	936.5	1.1
SR-30	416.0	30	280.95	0.4	655.55	936.5	1.15
SR-40	416.0	40	374.60	0.4	561.90	936.5	1.2

For casting of tiles, Portland pozzolana cement conforming to IS 1489was used. The proportions of 1:2:4 (cement: fine aggregate: coarse aggregate) was adopted as standard mix with a water cement ratio of 0.5. Casting of the tiles was done using a suitable rubber mould of required thickness and surface area by vibration table.

Manufacturing of paver blocks and tiles

Cement, sand, coarse aggregate, water, and superplasticizer were mixed thoroughly in the concrete mixer. Then it was filled in rubber paver moulds different shapes and different thicknesses. All the filled paver moulds were vibrated using a table vibrator. After casting, all the specimens were finished with a steel trowel and were kept for 24 hours. After 24 hours they were demoulded from the paver moulds and kept in a water tank for curing. For replacement of cement and sand with fly ash the same procedure was repeated. The sizes and specifications of paver blocks are shown in Table 4. Cast paver blocks are shown in Fig. 1.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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Table3 Proportion of fresh concrete mixture for cement replacement with fly ash.

Mixture no.	Cement (kg/m3Þ	Fly ash (%)	Fly ash (kg/m3)	W/C ratio	Sand (kg/m3)	Coarse aggregate (kg/m3)	Superplasticizer (%)
CR-0	416.0	0	0	0.4	936.5	936.5	0.5
CR-10	374.4	10	41.6	0.4	936.5	936.5	1.15
CR-20	332.8	20	83.2	0.4	936.5	936.5	1.2
CR-30	291.2	30	124.8	0.4	936.5	936.5	1.
CR-40	249.6.0	40	166.4	0.4	936.5	936.5	1.2

Table 4 Paver block details.

SI no.	Shape	Thickness (mm)	Plan area (m2Þ	Length (cm)	Width (cm)
1	Zig zag I	80	0.046	30	15
2	Dumbbell Zig	60	0.033	22.5	12.5
3	zag Pentagon	60	0.036	26.5	11
4	Rectangle	60	0.046	30	15
5	Rectangular	80	0.041	24	20

Test methods

After curing, the paver blocks and tiles were subjected to various testing to deter- mine their strength parameters. The tests were performed following the relevant Indian standards. For paver blocks, compressive strength, flexural strength, water absorption, and durability tests were performed following IS 15658. For con- crete tiles, wet transverse strength and water absorption tests were performed fol- lowing IS 1237.

The compressive strength of paver blocks was determined at 7 and 28 days using a universal testing machine (UTM) as per IS 15658. The average strength of four samples at 28 days was taken as the apparent compressive strength of the paver block. The apparent compressive strength of paver block was multiplied with the correction factor as described in IS 15658 to obtain the paver block compressive strength. The flexural strength of paver blocks for control mix and for different percentages of sand and cement replacement with fly ash were done as per IS 15658, implementing a three-point bending test. The arrangements for compressive strength and flexural strength test for paver block are shown in Figs. 3 and4, respectively. For water absorption, the specimens were immersed in water for 24 hours. Saturated weight was considered and oven dried weight was taken after keeping it in the oven at a temperature of 107◦C 6 7◦C.

A freeze thaw test was done to determine the durability aspects of the paver blocks. First the specimens were oven dried for 24 hours and the dry weights of the specimens were noted. Then the specimens were completely immersed in 3% sodium chloride solution for 24 hours at a temperature of 23◦C 6 3◦C. After 24 hours saturation, the specimens were subjected to continuous freeze thaw cycles, with one freeze thaw cycle taking 24 hours. The cycle consists of 16 6 1 hour of freezing at a temperature of 215◦C 6 2◦C, followed by 8 6 1 hour of thawing at a temperature of 23◦C 6 3◦C. After completion of 50 cycles, the specimens were washed with 3% sodium chloride solution to remove spalled particles from the specimen. These spalled particles were filtered and dried. The dry weight of the spalled particles was noted. This was defined as weight loss and is expressed as a percentage of the initial dry weight of the specimen. The freezing chamber is shown in Fig.5 and thawing chamber in Fig. 6. Procedure given in IS 1237.

Test results for sand replacement with fly ash

Paver blocks were tested for compressive strength, flexural strength, water absorption, and freeze thaw for M40 grade with different shapes and thicknesses. The shape of the paver blocks considered for compressive strength were zig zag (60 mm),

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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zig zag (80 mm), I (60 mm), dumbbell (60 mm), rectangle (60 mm), and pentagon(80 mm).

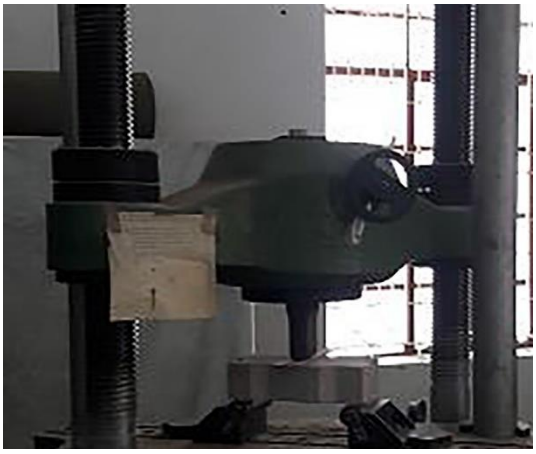

Figure 1 Cast paver blocks

Figure 4 Flexural strength test set up.

IV. RESULTS AND DISCUSSION

To analyze the effects of fly ash as a replacement for cement and sand in a higher grade of concrete, concrete tiles and paver blocks were cast and tested for different strength parameters. The analysis of the test results is given below.

Figure 5 Sample inside the freezing chamber.

Figure 6 Sample inside the thawing chamber.

Compressive strength

The 7 and 28 day compressive strengths of paver blocks containing fly ash as a sand replacement material are presented in Figs. 8 and 9, respectively. It is observed that 7 and 28 day compressive strength of all the paver blocks containing fly ash up to 30% is more than the compressive strength of paver blocks without fly ash. When sand is replaced with 10% fly ash, 14.51%, 5.05%, 29.03%, 1.64%, 29.60%, and 23.82% increases in strength are noticed for zig zag (60 mm), zig zag (80 mm), I shape (60 mm), pentagon (80 mm), dumbbell (60 mm), and rectangle (60 mm) shapes, respectively. Seven-day compressive strength of paver blocks for all shapes are more than the required target strength with up to 30% sand replacement. That means earlier strength gain is more than that of getting later strength in replacement of sand with fly ash. The maximum compressive strength for all the shapes is noted at 10% replacement of cement with fly ash. Based on the results of this study, the optimum percent of fly ash to be added to enhance the compressive strength is 30%, as the 28-day compressive strength of paver blocks having 30% fly ash for all shapes and thicknesses is above the target strength of 44.13 MPa.

IARJSET

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ISSN (Print) 2394-1588

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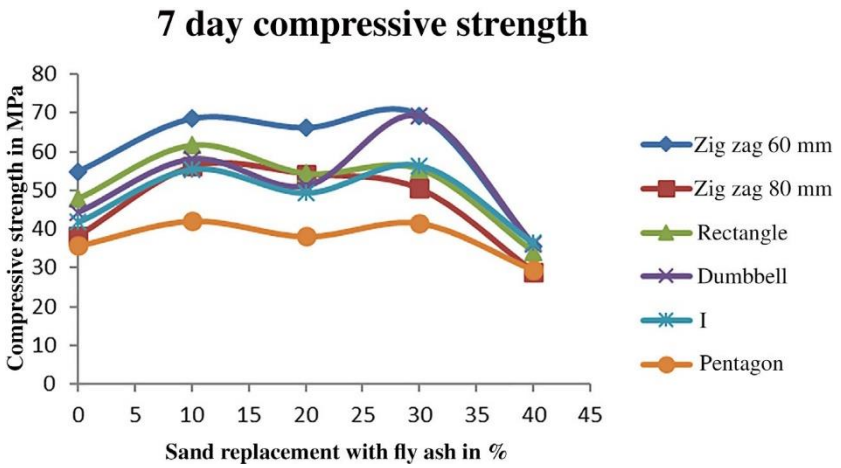

Figure 8 Sand replacement with fly ash versus 7-day compressive strength of paver block.

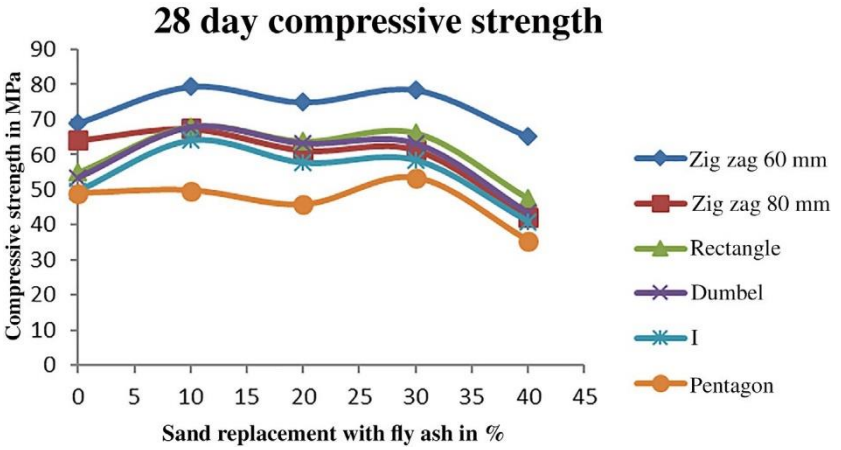

Figure 9 Sand replacement with fly ash versus 28-day compressive strength of paver block.

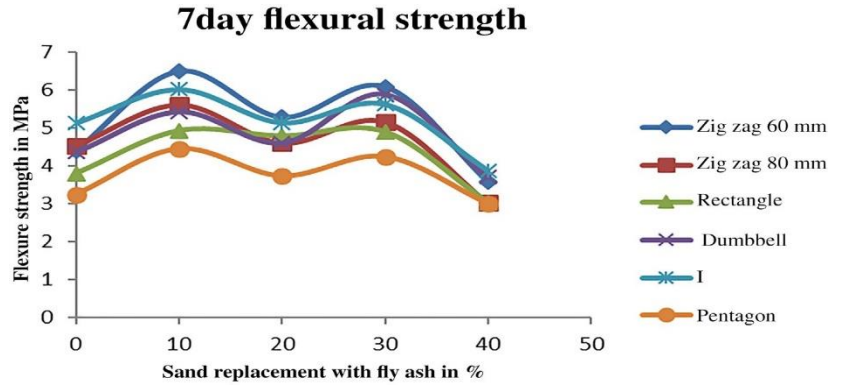

Figure 10 Sand replacement with fly ash versus 7-day flexural strength of paver block.

IARJSET

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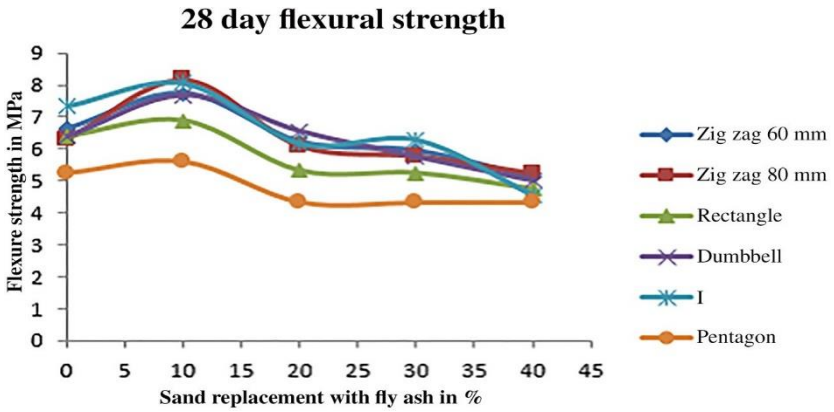

Figure 11 Sand replacement with fly ash versus 28-day flexural strength of paver block.

Flexural strength

The effects of sand replacement with fly ash on 7- and 28-day flexural strength of concrete paver blocks are presented in Figs. 30.10 and 30.11, respectively. It is observed from Fig. 30.10 that 7-day flexural strength increases as sand replacement increases up to 30%, and after that it decreases. However, 28-day flexural strength increases up to 10% replacement, and after that it decreases as the percentage of replacement increases. Although there is a decrease in flexural strength at 28 days after 10% replacement of sand, it is more than the required flexural strength, that is,

$0.7\sqrt{(fck)}=54.43$ MPa as per IS 456.

Water absorption

Water absorption of paver blocks for sand replacement with fly ash for different shapes and different thicknesses is presented in Fig. 30.12. From Fig. 30.12 it is observed that water absorption of paver block for all shapes with 10% 30% fly ash is less than the water absorption for concrete tiles. For 40% sand replacement, water absorption for all the shapes of paver blocks is greater than the water absorption percentages at 0% sand replacement, however it is less than the prescribed limit, that is, 6% as mentioned in IS 15658. Water absorption being related to the pore system of hardened concrete proves that the incorporation of fly ash up to 30% fills maximum pores of the hardened concrete, making the paver blocks less porous.

Freeze—thaw durability

The durability of the paver blocks for different percentages of sand replacement were tested by a freeze thaw test as per IS 15658. The test results are shown in Fig. 30.13. The maximum weight loss of blocks was 0.36% for 30% sand replacement, whereas the minimum percentage of weight loss of 0.085 occurred at 0% sand replacement. As per IS 15658, the weight loss after test cycles should not be more than 1% of the initial weight. Thus the specimens are considered to satisfy the durability aspects.

Test results for cement replacement with fly ash

Paver blocks were tested for compressive strength, flexural strength, and water absorption for M40 grade concrete with different shapes and thicknesses. The shapes of the paver blocks considered for compressive strength are zig zag (60 mm), zig zag (80 mm), I (60 mm), and dumbbell (60 mm).

IARJSET

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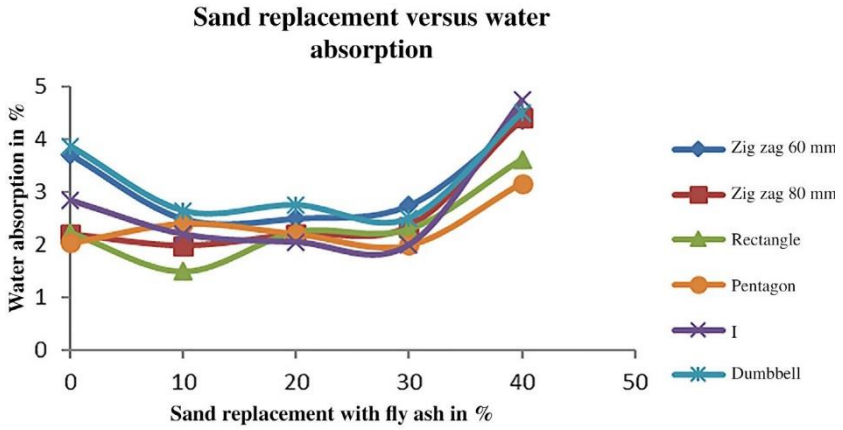

Figure 12 Sand replacement with fly ash versus water absorption of paver block.

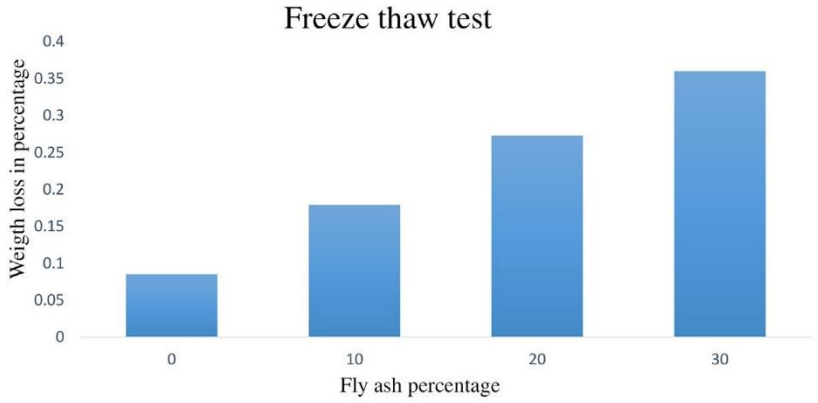

Figure 13 Sand replacement with fly ash versus weight loss due to the freeze—thaw cycle.

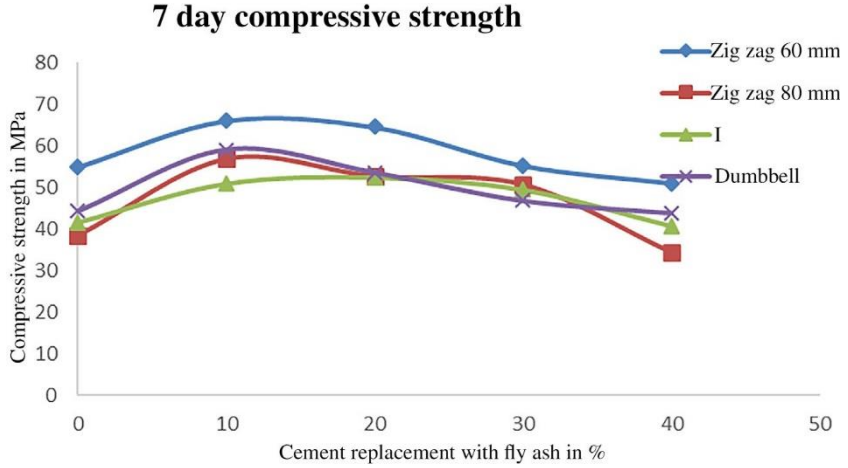

Figure 14 Cement replacement with fly ash versus 7-day compressive strength.

Compressive strength

Figs. 14 and 15 manifest the effect of fly ash on 7 and 28day compressive strength of paver block when cement is replaced with fly ash. It is observed that the compressive strength of paver blocks for all shapes and thicknesses at 7 and 28 days is increased as a percentage of cement replacement increases up to 10%. For 20% and 30% replacement of cement, the compressive strength is more than control concrete. Seven days' compressive strength of paver block for all shapes is more than the required target strength with up to 30% sand replacement. That means the earlier strength gain is more than that of the later strength in replacement of cement with fly ash. For 40% replacement of cement with fly ash, 7 and 28 days'

IARJSET

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strengths are less than 0% replacement of cement but 28-day strength at 40% replacement is more than the required target strength of paver block.

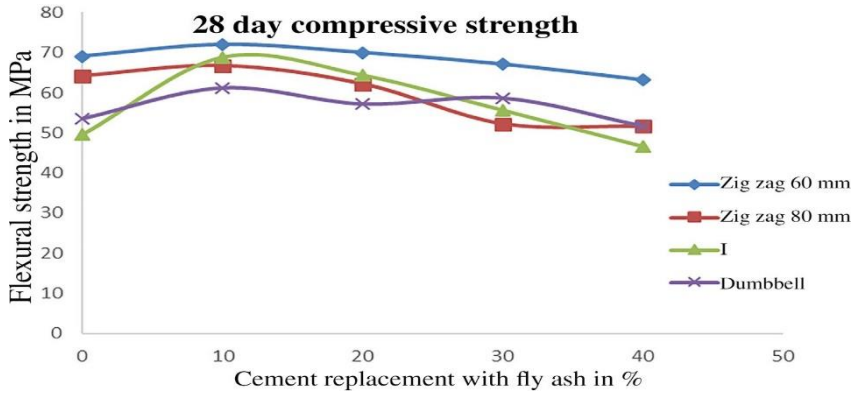

Figure 15 Cement replacement with fly ash versus 28-day compressive strength.

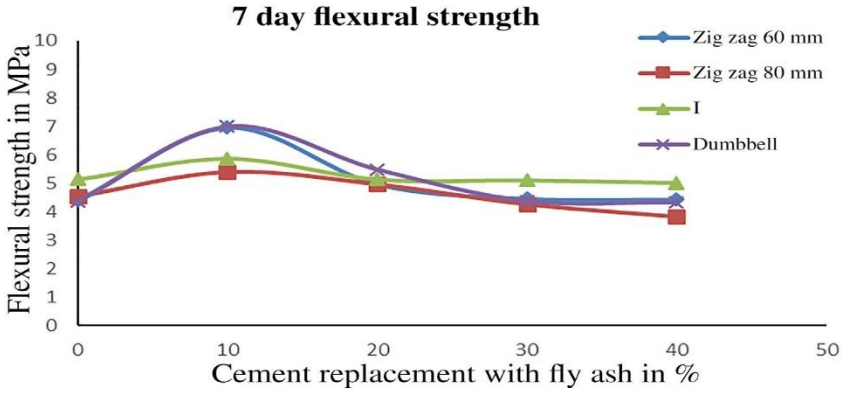

Figure 16 Cement replacement with fly ash versus 7-day flexural strength.

Flexural strength

Seven- and 28-day flexural strengths of paver blocks for cement replacement with fly ash are presented in Figs. 30.16 and 30.17, respectively. Maximum 7-day flexural strength is observed at 10% replacement of cement with fly ash. For 20% replace- ment, the 7-day strength is greater than the strength of paver blocks having 0% fly ash. For 30% and 40% replacements, the strength is almost equal to the strength for control concrete. For 28-day flexural strength, the maximum value is obtained at a 10% cement replacement. The 28-day strength of paver blocks up to 40% cement replacement fulfills the minimum strength requirement, that is, 4.43 MPa.

Water absorption

Fig. 30.18 shows the water absorption of paver blocks for cement replacement with fly ash. It is observed that water absorption for all shapes is less than the maximum prescribed limit of 6% as per IS 15658. Maximum enhancement in water absorption occurred at 10% replacement of cement. The water absorption for paver blocks having fly ash up to 40% is less than the water absorption of paver blocks having 0% fly ash. This signifies that the application of fly ash as a substitute for cement reduces the porosity of the paver blocks.

V. CONCLUSION

An experimental investigation was carried out to examine the effect of the addition of fly ash in concrete tiles and paver blocks. Strength and durability parameters were studied to recommend the use of fly ash-based tiles and paver blocks, promis- ing a green construction material. The conclusions are as follows:

- When fly ash is utilized as a substitute material for fine aggregate and cement, the maxi- mum strength parameters are obtained at a 10% replacement level.
- The paver blocks possess the required flexural strength and compressive strength up to 30% substitution of fine

aggregate and cement with fly ash.

- Application of fly ash enhances the water absorption property of paver blocks significantly. This, in turn, indicates that the porosity of paver blocks is decreased with the inclusion of fly ash, hence promising the possibility of forming less micro cracks.
- The maximum weight for a freeze—thaw test is 0.36% at 30% replacement of sand, which is still below the permissible limit of 1%. This signifies that paver blocks having sand replaced with fly ash up to 30% possess the necessary strength to withstand weathering due to freeze and thaw action.
- The application of fly ash has effectively enhanced the water absorption for 10% substitution of fine aggregate and cement. For concrete tiles with 20% and 30% fly ash, the water absorption is well within the prescribed limit.

It can be concluded that paver blocks with 30% fly ash both as a cement and sand replacement material can be used in footpaths, parking areas, kerbs, etc. providing a new and sustainable construction method.

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IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

Experimentally Investigation of Bamboo as a Steel Reinforcement in Beam

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Abstract: This paper is the comparison of cost, shear, flexural strength and tensile strength of bamboo reinforcement with regularly used steel reinforcement. This research is undertaken to investigate the feasibility of bamboo reinforced concrete and if it can replace Stee reinforced concrete for future construction. Recently global warming is the major issue on which we want to focus generally in construction steel reinforcement is used but we know that the production of steel is very harmful for nature. The cost of steel is very high. So that the middle class people are unable to use steel reinforcement. The construction industry is mainly depending on cost of project. The cost of project is mainly depends upon factors such as labour cost and material cost. So for reducing the cost of project we can replace the material such as we can use bamboo as reinforcement. Bamboo is effective material for construction due to its low cost, high strength, earthquake resistance, light weight etc. By replacing this we can achieve our main objective. That cost effective construction and we can also encourage the use of natural product by which we reduce the pollution impact on nature. In this study the concrete beam with conventional steel reinforcement have been casted and tested for its Flexural Strength, modules of elasticity deflection and crack pattern. The beam which were casted and tested at 28 day, with the help of experimental results obtained the Comparison and the analysis is carried out for the conventional steel reinforced beam over the bamboo reinforced beam. By the test results and analysis, it is found that bamboo can be used as an alternative for steel reinforcement and can be brought to use.

Keywords: Bamboo reinforcement, concrete Bram, cost effective, Flexural strength, Tensile strength, double shear, crask pottern and Deflection, light weight, Earthquake resistance.

I. INTRODUCTION

Recently global warming is the major issue on which we want to focus, generally in construction steel reinforcement is very harmful to nature. The cost of steel is very high so that the middle class people are unable to use steel reinforcement. So for reducing the cost of project we can replace the material such as we can use bamboo as reinforcement. Bamboo is effective material for construction due to its low cost,high strength, earthquake resistant, lightweight etc. By replacing this we can achieve our main objective that cost effective construction and we can also encourage the use of natural products by which we reduce the pollution on nature. By conducting the various tests and analyzing the result we can use the bamboo reinforcement in various structural elements.In the present scenario, there are many projects being undertaken based on ‘low cost building’, ‘rapid construction’ and ‘increasing the strength of the structure’. The main motive behind the low cost building projects is that it happens to be only a dream to the middle order populace. As it is already known, concrete is weak in tension and strong in compression. Reinforcement is provided to strengthen the concrete in tension. This was suggested by Joseph Monier, who introduce the concept of reinforcement. The reason behind the successof steel being used as reinforcement is that the physical properties of both steel and concrete cope up. The main disadvantage in steel, is that, its production is one of the most polluting and hazardous. To tackle this sustainable solution must be provided. Thus as a responsible engineer following the ethics of engineering, it is our fare most duty to do our best not to confront mother nature. Thus we suggest the replacement of steel reinforcement of steel reinforcement with eco- friendly bamboo.

In present study tensile strength and elongation corresponding to the yielding of bamboo sticks with and without nodes were determined experimentally with the help of Universal Testing Machine (UTM), in order to check the flexibility to use bamboo sticks as reinforcement in place of steel bars for low housing option. Since the present study is experimental in nature therefore six beams each of size 700 x 150 x 150 mm is casting, out of which three beams are reinforced with bamboo sticks and remaining three beams are reinforced steel bar. In each case spacing as well as number of steel bars/bamboo sticks is suitably provided based on the design as per IS-456:2000. The beams are tested in flexure under two equal concentrated loads each applied at the one third point of the beam with the help of hydraulic jack.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

II. LITERATURE REVIEW

Following are some literatures and references by which the objective of the dissertation works how been decided.

1) Suresh Bhalla et al – In paper named "Bamboo as Green Alternative of Concrete and Steel for Modern Structures". In this paper shows that through structural analysis and design principle it is demonstrated as to how modern engineered structures can be real possibility using bamboo. In this proposed structure provide an alternative environment friendly construction for steel industrial shed.

2) N. Thangam et al – In paper name "Bamboo as a Building Material" shows in this paper investigated the various physical and mechanical properties of bamboo. In details, they found that the properties caries with their type diameter, age, length. In this paper various investigated carried out suggest that bamboo is good as a building material given its high strength and less cost.

3) Mr. Nitin Kumr et al – In paper named "Bamboo as Construction Material" In this paper studies has been carried out on the basic properties and an processing of bamboo into various kinds of composite products. In this paper discussed about properties like tensile strength, compressive strength, elastic modulus, shrinkage, higher resistance.

4) Bhosale Mahesh et al – In this paper studied that the Comparison of cost double shear, flexural strength and tensile strength of bamboo reinforcement with regularly used steel reinforcement. In this result shows that bamboo gain almost same flexural strength, compared to steel reinforced concrete. Bamboo can be used in the member wear load intensity is less such as roof slab or parking area, sunshed.

5) Anurag Nayak et al – In paper named "The replacement of Steel as Bamboo Reinforcement" , In this paper studied that the effect of replacement of steel reinforcement by bamboo reinforcement designed one way slab with providing beam and discussed selection preparation criteria of bamboo, also construction principles designing of slab and beam, column, footing. And the result shows that structures reinforced with bamboo as reinforcement is found cheaper than that of with steel reinforcement.

6) R. Pandi et al – In paper named "An experimental study on replacement of steel with bamboo as reinforcement" , We studied thathow bamboo is economical, eco -friendly material like cement, sand, coarse aggregate, steel. Next to specimen (Beam – 750 x 150 x 150 mm) preparation, curing of beam testing of specimen (1) Tensile test (2) Double shear test (3) Flexural strength and then comparison of flexural strength of steel reinforced beam and Bamboo reinforced beam and get result that Bamboo reinforced concrete has attained flexural strength almost on par with steel reinforced concrete and also Bamboo on using as reinforcement in concrete deflects more due to low density.

7) I.K.Khan et al – In this paper named "Performance of Bamboo Reinforced Concrete Beam" from this we studied that, Experimental work of steel reinforced and bamboo reinforced beam, As the work was experimental in nature concrete beam reinforced with bamboo sticks as well steel bars were cost and tested under to concentrated load with the help of hydraulic jack and steel reinforced concrete beam were tested to compare the result obtained for the bamboo reinforced concrete beam and from test result was found that tensile strength of bamboo is approximately one half that of mild steel and the modulus of elasticity is approximately one third that of mild steel. The load carrying capacity of the bamboo reinforced beam using square cross section was higher than bamboo reinforced beam with triangular and circular cross section based on the limited no of test was conducted that bamboo may be used as substitute of steel reinforcement beam.

III. EXPERIMENTAL SETUP

We have done an experimental study on the steel reinforced concrete with bamboo reinforced Concrete.

MATERIAL COLLECTION: Material were collected for both steel reinforced and Bamboo Reinforced concrete Material needed for reinforcement Cement Concrete are cement, fine aggregate, coarse aggregate, steel rod, bamboo and water.

CEMENT: Cement is a binder a substance that sets and hardens and can bind other material together. The cement used in this experimental work is " ACC (OPC- 53 GRADE)"

STEEL: Steel is a vital component as it provides the required tensile strength to remforced concrete. It is preferred to any other tensile material because it's physical properties are mateneel with those of concrete. Fe 500 is used conforming to IS 456-2000.

FINE AGGREGATE: It is defined by size, being finer than gravel and coarser than silt. Sand can also refer to a textural class of soil or soil type; ie A Soil containing more than 8.5% sand-sized particles.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

COARSE AGGREGATE: Aggregates are the most mined materials in the world. Aggregates are components of composite morterial such as Concrete and asphalt concrete, The aggregate serves as reinforcement to add strength to the overall composite matenal

BAMBOO: Bamboo being an eco-friendly material, comes with a surprisingly good tensile cupacity. It grows from 30 cm to 1 m per day in standard 25°C to 50°C.

It is easily available in large quantities in countries like India. After seasoning process bamboo can be used as a replacement to steel reinforcement.

WATER: Water is an important ingradient of concrete as it actively participats in the chemical reaction with cement.

IV. SPECIMEN PREPARATION

The beam were designed to take a load of about 100 KN having dimensions 750 mm in length, 150 mm in breadth, 150 mm in depth and cover of 20 mm.

The reinforcement was provided according to the provisions adopted in Sp34, Bars of 12 mm (2 Nos), 10 mm (2 Nos) and stirrups of 8 mm (6 Nos) at a spacing of 150 mm are used in each beam.

The larger diameter 12 mm bars are placed in the bottom row to resist the deflection effects. The M25 grade concrete was prepared by hand mixing with the help of wooden mould, the beam is casted using casted beam is then unmolded and was cured for 28 days 3 Samples of each material are taken.

Fig. 1 Casting of Specimen

TESTING OF SPECIMEN

We have to compare those steel as well as Bamboo reinforcement with the help of Tensile Strength double shear and flexural strength.

i. **Tensile Test:** Tensile test of bamboo is carried out for to find the limit of proportionality, yield strength, young's modulus of elasticity and elongation in the rod steel as test is used for the bamboo for reinforcement.

IARJSET

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International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

Table No 1 - Tensile Strength of Specimen

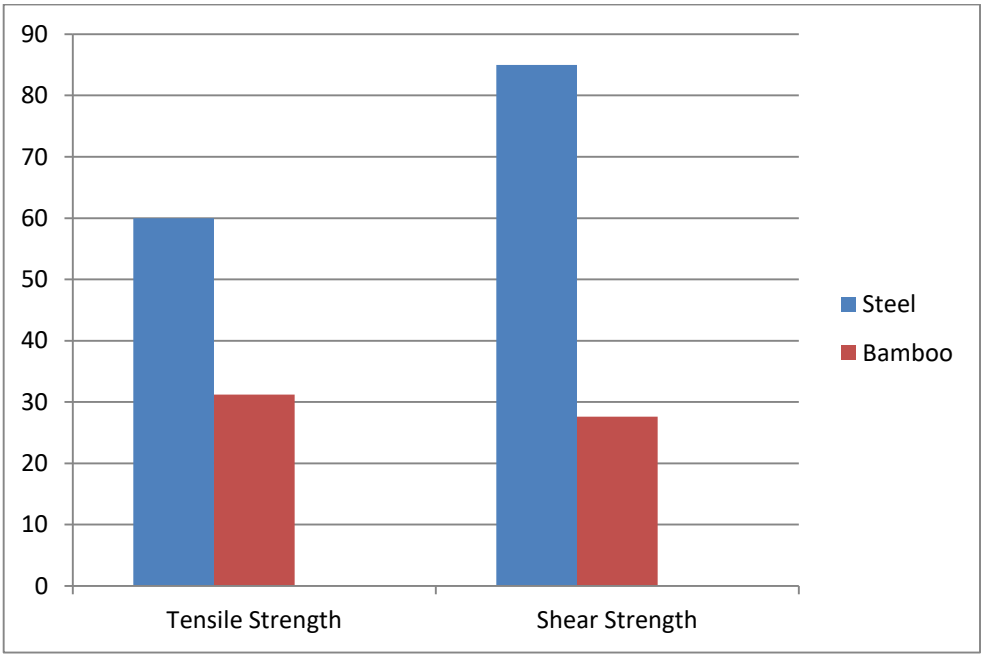
Sr.No	Specimen Type	Breaking Load in KN	Tensile Stress in N/mm2
1	Steel	60.00	510.08
2	Bamboo	31.22	290.60

ii. **Double Shear test:** Double shear test on bamboo to find the Shear Strength in bamboo in the jointed ared to resist the failure (12mm).

Table No 2 - Shear Strength of Specimen

Sr.No	Specimen Type	Breaking Load
1	Steel	85
2	Bamboo	27.58

Fig. 2 Comparison between Steel and Bamboo by Breaking Load in KN



iii. Flexural strength Test

All the beams are tested into Flexural strength by the Universal Testing Machine with a Capacity of 1000 KN.The beams where Supported by simply Supported over a span of 750 mm the load were applied by 1/5th of its span.The load is applied continued until the deflection became excessive and readings were noted at first crand paint and the ultimate load.

While testing it was noted that Bamboo reinforced Beam produced initial cracks without any cracking noise and their crack widths were small when compared to the steel reinforced Beams

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

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Vol. 9, Special Issue 1, April 2022

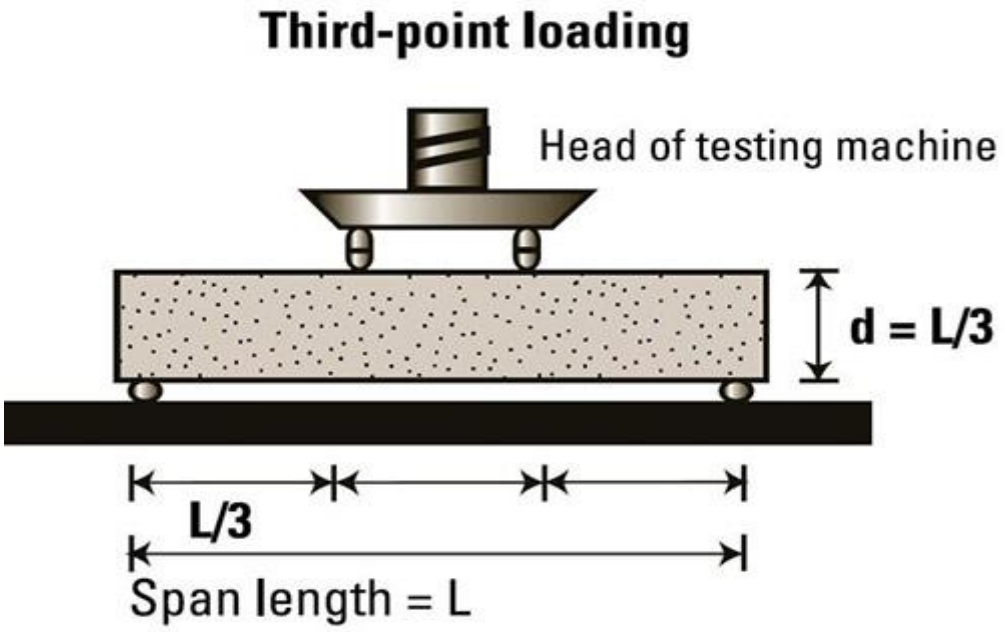

Fig. 2 Flexural Strength test

V. RESULT

As per the test results. It is inferred that,

- Compared to steel tensile and double shear results were low for bamboo (50% almost).
- When compared to steel, bamboo had high flexibility in nature and it deflection more.
- Bamboo reinforced Concrete has attained flexural strength almost on par with steel reinforced concrete.

VI. CONCLUSION

Bamboo on using as reinforcement in concrete deflects more due to low density but it attains flexural strength almost equivalent to steel reinforced concrete. When we use bamboo as a replacement of steel bamboo gain almost some flexural strength compared to steel reinforced concrete.Bamboo can be used in the members where load intensity is less such as Roof slab of parking area, public toilets,Sunshades,watchman cabin,etc.

FUTURE WORK

The bamboo reinforced beam specimens is to be taken after 28 days of curing and should be tested for its Flexural Strength, Deflection, Crack Pattern, and Modulus of Elasticity.

Finally results obtained should compared and analyzed with conventional steel reinforced concrete beam.

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4) 'Replacement of steel by bamboo reinforcement', Anurag Nayak, Arrehant S Bajaj, Abhishek Jain, Apoorv Khandelwal, Hirdesh Tiwari.
5) 'Bamboo as a building material' Suchampa Bagchi, R.Rashmi Mano, N.Thangam
6) 'A case study on bamboo as green building material' Ayesha Syeda, Borvallya Shrujal, Jayeshkumar
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IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

To Study The Effectiveness of Waste Foundry Sand and Crushed Sand as a Partial Replacement for Natural Sand in Concrete.

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Abstract: According to present and future scope of the consumption of concrete. The information regarding with foundry sand and crushed sand is explained by a various investigation, research on recycling of waste foundry sand in the producer of brick. Clay is a elite present of soil was used. The obtained substance showed high sponginess due to oxidation of pesticide-free matter. Moreover this type of Grist has properties that very greatly. Investigation is solidity and performance of concrete Viz. resistance capacity, flexural strength and permeability of hardened concrete. With there produce economical concrete by blending various ratios of aggregate and foundry sand. It is eco friendly or reduce disposal and pollution problems. Onward implementation of manufactured sand of reliable development.

Keywords : elite **,** sponginess, Grist, reliable, flexural strength.

I. INTRODUCTION

India is developing country. In world India is second largest country in manufacturing of cement, China is first and U.S.A is third. India has near about 350 million tone of production volume. hina has near about cement manufacturing volume of 2300 million tones. Cement manufacturing volume of U.S.A is 77.80 million tones. As India is developing country hence there is scope for vast scope in construction and it becomes 1st largest country in utilization and production of cement. The worldwide utilization of natural sand is very high, due to the considerable use of concrete or mortar. In imprecise, the stipulation of natural sand is slightly high in utilization expanding countries to compensate the expeditious infrastructure extension, in this circumstances expanding country like India facing scarcity in good attribute natural sand. Particularly in India, natural sand pledge are being exhaust and stimulated deliberate intimidate to environment as well as the society. Rising extraction of natural sand from river beds facing many problems, decline water detain sand strata, immeasurable of the river courses and causing bank slides, loss of vegetation on the bank of rivers, reveal the intake well of water supply schemes, disturbs the aquatic life as well as impactful agriculture due to diminution the underground water table etc. are few examples. Attribute of aggregate affect the durability and performance of concrete, so fine aggregate is an essential component of concrete and cement mortar. The generally used fine aggregate is pit sand. Fine and coarse aggregate establish about 75% of total volume. It is therefore, important to attain right type and good quality aggregate at site, because the aggregate forms the main matrix of concrete or mortar. Now a day's sand is becoming a very scarce material, in this circumstances research started for reasonable and easily attainable substitute material to natural sand. Some substitute materials have already been used as a part of natural sand e.g. Fly-ash, slag limestone and siliceous stone powder are used in concrete mixtures as a partial replacement of natural sand. However, scarcity in mandatory attribute is the major restriction in some of the above materials. Now a day's feasible infrastructural extension stipulation the substitute material that should compensate technical needful of fine aggregate as well as it should be attainable abundantly. As there is huge progress is conduct, old times, stone, bricks and timber were the prominent building materials. Later cement was contrive & cement concrete was assemble as a very good building material. Structures in concrete have become very common in civil. Now a day's progress in construction work is very large hence utilization of concrete rising day per day .concrete requires more natural sand in its mixture but now there is scarcity of natural sand so we discovered other substitute in replacement of natural sand. Our project aim is to diminution utilization of natural sand in concrete. River resources are eroding very fast & even because of other reasons which will be to conquer natural sand drawback & inaccessible, government restrictions, demoting ecological circumstances by diminution river bed which induce to floods &

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

hence cost of natural sand is more. Natural sand manufactured by deposition after millions of years. Hence we must replace conventional products with good substitute. Extraction of natural sand from basin can stimulated deliberate detriment to our environment & now a day's rising in construction cost. Natural sand is not beneficial & affordable for middle class people. Hence we discovered on trial basis, best substitute for natural sand i.e. foundry sand & crushed sand. Crushed sand is product from parent rock. It is fine material obtained after crushing parent rock. It major contain of concrete. It does not contain any harmful material manufactured from parent rock & approves good quality of concrete. It is best, easily available & cheap material in construction work. A foundry is a manufacturing facility that produces metal castings by pouring molten metal into a preformed mould to yield the resulting hardened cast. The primary metals cast include iron and steel from the ferrous family and aluminium, copper, brass and bronze from the nonferrous family. Foundry sand is high attribute silica sand that is a by product from the production of both ferrous and nonferrous metal castings. The physical and chemical characteristics of foundry sand will depend in great part on the type of casting process and the industry sector from which it originates. It is available in large amount from metal industry & if disposal of foundry sand is not properly done then it is harmful for environment as well as living organisms. When foundry sand is spread in open place, it is detriment to environment & it is necessary to use that foundry sand for construction work. Hence our work is beneficial for middle class people & therefore we can say that our work is eco-friendly & our work is going towards green project and hence use of crushed sand and foundry sand we can achieve strength more than or equal to strength using natural sand. By using foundry and crushed sand in replacement of natural sand construction we can reduce cement utilization and diminution the construction cost. Concrete has the advantage of being moulded into any desired shape most conveniently. It is an artificial stone like mass attained by mixing aggregates, cement & water. The product thus manufactured is allowed to cure for hardening. It's essential ingredients are cement & water, which react with each other chemically to form another material having useful strength. Strength of concrete depends upon the attribute of its ingredients, their relative quantities & the manner in which they are mixed, compacted & cured. It is possible to manufacture concrete of different specifications for various purposes by suitably adjusting the proportion of cement, aggregate & water. But natural sand have many drawbacks, it reduces strength of concrete. To conquer this problem it is essential to manufacture some optional material for natural sand. The foundry sand and crushed sand is one of the permanent options for natural sand.

II. LITERATURE REVIEW

Mr Attar I M, Professor Gupta A.K. research on recycling of waste foundry sand in the manufacture of brick. Initially, clay with a major content of soil was used. The obtained specimens showed high porosity due to the combustion of the organic matter present. Moreover, this type of raw material has properties that vary greatly according to the extraction sites. In order to improve quality and achieve uniformity in the properties of the obtained products, samples with commercial clay in similar composition are studied in this work.

Balapgol B, Kulkarni S A, Bajoria K.M. have studied and investigated the strength and durability properties of concrete viz. compressive strength, flexural strength and permeability of hardened concrete. An experimental study was performed to observe the performance of concrete incorporating crushed basalt stone fine aggregates replacing the natural sand. The test results indicate that the performance of concrete with crushed basalt stone fine aggregates were excellent. The compressive strength of concrete for different grades increased from 8 % to 26 %, the flexural strength was increased from 1 % to 5 % and coefficient of permeability was decreased significantly.

Bhimani Rameshbhai Dushyant, Prof. Pitroda Jayeshkumar, Prof. Bhavsar Jaydevbhai J. have produced low cost concrete by blending various ratios of fine aggregate with used foundry sand & to reduce disposal and pollution problems due to used foundry sand. It is most essential to develop profitable building materials from foundry sand. The innovative use of used foundry sand in concrete formulations as a fine aggregate replacement material was tested as an alternative to traditional concrete. The fine aggregate has been replaced by used foundry sand accordingly in the range of 0%, 10%, 30% & 50% by weight for M-20 concrete. Concrete mixtures were produced, tested and compared in terms of workability and strength with the conventional concrete.

Bhimani R Dushyant, Pitroda Jayeshkumar, Bhavsar Jaydev have used Pozzocrete P60 and the results obtained of the concrete having mix proportion 1.48:3.21 in which cement is partially replaced by Pozzocrete P60 as 30% by weight of cement; and fine aggregate is partially replaced by used foundry sand obtained from ferrous and non-ferrous metal casting industries as 10%, 30% and 50% by weight of fine aggregate. For this study, five sets of mixture proportions were made. First (A0) were the standard mix containing no Pozzocrete and no used foundry sand, with regional fine aggregate and coarse aggregate. Second mix (C0) contained 30% Pozzocrete P60 as a replacement of cement. Other mixes (C1, C2 and C3) contained Pozzocrete P60 (30%) plus used foundry sand (10%, 30% and 50%) respectively. The compressive strength of each sample is carried out at 7, 14 and 28 days. The water absorption test is also carried out at 28 days. This research was performed to achieve technical, ecological and economic benefits by utilizing the huge amounts of used foundry sand and Pozzocrete, produced every year, in India and elsewhere.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

Jadhav A Priyanka, Kulkarni K. Dilip - have explained the forward applications of manufactured sand as an attempt towards sustainable development.The effect of water-cement ratio on hardened properties of cement mortar with partial replacement of natural sand by manufactured sand is investigated. Designed mortar mix having proportion as 1:2, 1:3 and 1:6 with water cement ratio of 0.5 and 0.55 respectively is used in experimental study. Mortar cube specimens are tested for evaluation of compressive strength. The mortar exhibits excellent strength with 50% replacement of natural sand by manufactured sand. . It will help to find viable solution to the declining availability of natural sand to make eco-balance.

Mogre P. Rajendra, Dr. Parbat K Dhananjay, Dr. Bajad P Sudhir They present the physibility of artificial sand in concrete for the purpose of experimentation concrete mixes are design for m20 and m25 grades by 0 to 100 % with increment of 20 % replacement of natural sand by artificial sand. Compressive and tensile test are conducted to study the strength of concrete for above replacement.

Nimitha Vijayaraghavan and Wayal A S they finds alternative to natural sand. Now-a-days due to constant sand mining the natural sand is depleting at an alarming rate. Sand dragging from river beds have led to several environmental issues. Due to various environmental issues Government has banned the dragging of sand from rivers. This has led to a scarcity and significant increase in the cost of natural sand. There is an urgent need to find an alternative to river sand. The only long term replacement for sand is manufactured sand.

Rathod A Hiren, Prof. Pitroda Jayeshkumar investigate on utilization of foundry waste by partial replacement to natural sandby 10%, 20%, 30%, 40% and recycled aggregate as a partial replacement of natural coarse aggregate by 25%, 50%, 75% and 100%. This various trial mixes are compared in the terms of compression strength and water absorption with respect to the standard mix proportion. The result shows the increase in compressive strength and reduction in water absorption with increase in content of foundry sand whereas reduction in compressive strength and increase in water absorption with increase in content of recycled aggregate.

Salokhe P Eknath, Desai D. B. have done comparative study of the properties of fresh & hardened concrete containing ferrous & non-ferrous foundry waste sand replaced with four (0%, 10%, 20% and 30%) percentage by weight of fine aggregate & tests were performed for M20 grade concrete. He concluded that (i) addition of both foundry sand gives low slump mainly due to the presence of very fine binders.
ii) Compressive strength at 7 days of both ferrous & non ferrous mixtures increases as compared to the ordinary mix. Maximum increase was observed with 20% FWS of both types of sand. However 20% ferrous WFS addition gives more value of compressive strength than 20% non ferrous FWS addition iii) Water absorption is minimum with 20% ferrous FWS & with 10% non ferrous FWS. Whereas mixture with 10% non ferrous FWS gives least water absorption value iv) Both ferrous & non ferrous FWS can be suitably used in making structural grade concrete.

III. METHODOLOGY

In our project we are checking compressive strength of concrete. As concrete strong in compression.By adding Crushed Sand and Foundry Sand in concrete as a Partial Replacement to Natural Sand and casted concrete cubes.

1) Collection of materials.
2) Testing of Foundry sand.
3) Test carried out on material.
4) Finding the proportion for concrete mixture.
5) Casting of blocks.
6) Curing of blocks.
7) Checking compressive strength of blocks.
8) Plotting graph for result.
9) Preparing cost analysis

- **Wet Curing-**

In this we are going to cure concrete as specified in the IS codes. The concrete blocks will be totally immersed in water till 7th, 14th & 28th day from casting. The strength will be checked as per schedule.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

Indian Standard (IS 456:2000) advises to keep concrete constantly wet –

1) For at least 7 days from the date of placing concrete in case of Ordinary Portland cement
2) For at least 10 days where mineral admixtures or blended cements are used
3) The period shall not be less than 10 days for concrete exposed to dry and hot weather conditions
4) And 14 days when mineral admixtures or blended cements are used

- **Preparation Of Cube Specimens-**

Quantity of materials required are calculated,
M20 --- 1:1.5:3
TAKEN---13.2 KG: 19.8 KG: 39.6 KG
Cement: Fine Aggregate: Course Aggregate
Specimen – 9 cubes of 15cm size

- **MIXING-**

Mix the concrete either by hand or in a laboratory batch mixer ,Hand Mixing and Machine Mixing- Mix the cement and fine aggregate on a water tight none-absorbent platform until the mixture is thoroughly. Add the coarse aggregate and mix with cement and fine aggregate until the coarse aggregate is uniformly distributed throughout the batch. Add water and mix it until the concrete appears to be homogeneous and of the desired consistency.

- **Sampling –**

Clean the moulds and apply oil Fill the concrete in the moulds in layers approximately 5cm thick.Compact each layer with not less than 35 strokes per layer using a tamping rod (steel bar 16mm dia. and 60cm long, bullet pointed at lower end).Level the top surface and smoothen it with a showel.

- **Curing-**

The test specimens are stored in moist air for 24 hrs and after this period the specimens are marked and removed from the molds are kept submerged in clear fresh water until taken out prior to test.

- **Precaution-** The water for curing should be tested every 7 days and the temperature of water must be at 27+- 2°

- **Procedure-**

Remove the specimen from water after specified curing time and wipe out excess water from the surface.
Take the dimension of the specimen to the nearest 0.2m
Clean the bearing surface of the testing machine.
Place the specimen in the machine in such a manner that the load shall be applied to the opposite side of the block.
Align the specimen centrally on the base plate of the machine.
Rotate the movable portion gently by hand so that it touches the top surface of the specimen.
Apply the load without shock and continuously at the rate of 140/kg/cm2/minute till the specimen fails.
Record the maximum load and note any unusual features in the type of failure.

Note- Maximum of 3 cubes should be tested.

- **Calculations**

- Size of the cube =15cm X 15cm X 15cm
- Area of specimen (calculated from the mean size of the specimen) = mm2
- Characteristic compressive strength (fck) at 28 days=20N/mm2
- Expected maximum load =fck X area X FOS Range to be selected is =20 X 22500 X 1.5=675 X 103

- **Casting**

As discussed above we will cast cubes for 3 ways of curing and by adding constant amount of admixture from 0ml to 400 ml respectively.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

The samples are named as –

- S0 – 100% of Natural sand.
- C1- 90% of Natural sand & 10% of Crushed Sand.
- C2- 80% of Natural sand & 20% of Crushed Sand
- C3 - 70% of Natural sand & 30% of Crushed Sand
- C4- 60% of Natural sand & 40% of Crushed Sand
- C5- 50% of Natural sand & 50% of Crushed Sand
- C6- 40% of Natural sand & 60% of Crushed Sand
- C7- 30% of Natural sand & 70% of Crushed Sand
- F1- 90% of Natural sand & 10% of Foundry Sand
- F2- 80% of Natural sand & 20% of Foundry Sand
- F3 - 70% of Natural sand & 30% of Foundry Sand
- F4- 60% of Natural sand & 40% of Foundry Sand
- F5- 50% of Natural sand & 50% of Foundry Sand
- F6- 40% of Natural sand & 60% of Foundry Sand
- F7- 30% of Natural sand & 70% of Foundry Sand

The blocks are casted in 9 numbers of each set. Total 135 blocks will be casted for entire project. The compressive strength of every block is to be checked as per planned schedule. Slump of every set of concrete cubes also to be recorded each time of casting. The readings are to be recorded in a record table.

IV. EXPERIMENTAL INVESTIGATION AND RESULTS

Introduction-

All the physical & chemical properties can be determined by different standard tests. The procedure of these tests is specified by institutes governing standards in different nations .In India, the standards are prescribed by Bureau of Indian Standards (BIS) through different codes known as BIS codes or IS codes & the builders & cement manufacturers must abide by these standards. The IS code giving all these test is IS: 4031, Part 1 to part 6, 1986

Test on OPC

Standard consistency test

This test must be performed before other remaining tests as the value of standard consistency is required to determine water contain to be used in other tests. Consistency of cement refers to thickness or thinness of cement paste when cement is mixed with water. Standard consistency is defined as that consistency which will permit a standard vicat plunger to penetrate a depth of 33to 35mm from top of the mould in the standard vicat apparatus.

Test result 37.14%.

Initial setting time (IS 4031, PART 5 1988, 2000)

Initial setting time is the time elapsed between the moment when water is poured in cement to the moment when the cement paste starts losing its plasticity. It is very difficult to exactly know the moment when cement paste start loosing plasticity, hence convenient but arbitrary limit is define by initial setting time test. This test is also performed on the vicat's apparatus, only this time plunger is removed & initial setting time needle is attached in its place.

Test Result: 40 min.

Final setting time (IS4031, PART 5, 1988, 2000) Final setting time is defined as the time elapsed between the moment when water is added to cement and the moment when the paste has completely loss its plasticity. Final setting time taste is conducted as a continuation of initial setting time test an at the same mould of cement is used for test.

Test Result: 600 min.

Fine aggregate:

For determining various properties of fine aggregate, different tests are performed according to IS codes. This section deals with the main important test

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

1) Determination of fineness modulus of sand and grading of sand by sieve analysis (IS 2386 1963 part1)

1. The proportion of different particle sizes present in an aggregate determines its grading. If all the sizes of the range are present in appreciable proportions then the aggregate is termed as well graded.
2. If the size all particles is almost same the aggregate is poorly graded
3. If the aggregate shows total absence of particular size or a particular range of sizes is called gap graded
4. For finding fineness modulus of sand the sieves 4.75 mm 2.36mm,1.18mm,600micron,300micron,150micron,75 micron are used
5. The weight retain on each sieve are measured from this cumulative weight retained is calculated for each size
6. The sum of cumulative percentage retained is divided by an arbitrary number100, and the resulting value is known as fineness modulus.

$$\text{Fineness modulus} = \frac{\text{Sum of cumulative percentage retained}}{100}$$

Fineness modulus as per IS:
Fine sand =2.2 to 2.6
Medium sand =2.6 to 2.9
Coarse sand =2.9 to 3.2

Test result – 3.2

Silt content in sand and its specification as per IS 383

- Excessive silt content in sand also makes it unsuitable for use in concrete .silt means very fine particle of size less than 75microns.
- The presence of silt makes the concrete more permeable and also increases shrinkage and reduce strength
- The quantity of silt, fine silt, clay and fine dust is determined by sedimentation method
- In this method a sample of aggregate mixed with water is poured into a graduated measuring jar and the aggregate is nicely rounded to dislodge particles of clay and silt adhering to the aggregate.

$$\% \text{ of silt by volume} = \frac{\text{Volume of silt after 3 hour}}{\text{Volume of sample}} \times 100$$

Specific gravity:

It is the ratio of dry weight of aggregate to the weight of equal volume of water.
The specific gravity of aggregate is determined along with the water absorption as specified in IS2386 part3 1963.

TEST RESULT=2.2

Table: Test Result on Fine Aggregate

Sr. No.	Property	Result	As per IS
1.	Silt content	8.5%	
2.	Specific gravity	2.6	2.6 to 2.8

Coarse aggregate-

Determination of fineness modulus of coarse aggregate by sieve analysis-

1. The test is very similar to sieve analysis for fine aggregate. The aggregate is sieved through to a series of sieves of range 80mm, 40mm, 20mm, 10mm & 4.75mm. The weight retained on each sieve is measured.
2. From this the percentage & then cumulative percentage retained on each sieve size is calculated.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

Grading of coarse aggregate

1. Concrete may contain coarse aggregated from 4.75mm to 150 mm sizes.

2. The percentage of different sizes is taken for maximum density &strength. This is done with the help of grading curves and standard tables. Good grading of aggregates will give very good quality & quantity.

3. The grading of aggregate is normally done by following IS test sieves: 3.35mm,2.36mm, 1.18mm, 600micron, 300micron, 150micron, 75micron, 80mm,63mm, 50mm, 40mm, 31.5mm, 25mm, 20mm, 16mm, 12.5mm, 10mm, 6.3mm & 4.75mm.

Impact Value

- This test gives relative measure of resistance of aggregate to suddenly applied load or impact load.
- The test sample consist of aggregate passing through 12.5mm IS sieve and retained on 10mm IS sieve. The aggregate is oven dried at 110C for 4 hours.
- For ordinary concrete impact value should not be more than 45% & for concrete for wearing surface it should not be more than 30.

TEST RESULT—12.82 % SAY 13% .

Concrete

Determination of workability-

Slump Cone Test:

This method can be used on site as well as in the laboratory. Apparatus essentially consists of a metallic mould in the form of the frustum of a cone and metallic tray. 3) The mould is known as slump cone and its dimensions are as under:-

Bottom diameter	: 20 cm
Top diameter	: 10 cm
Height	: 30 cm

The thickness of the metallic sheet for the mould should not be less than 1.6 mm. for tamping; a steel rod of 16 mm diameter, 0.6 m long with bullet end is used.

Procedure:

1) Thoroughly clean the mould from inside to remove any moisture or previously set concrete.
2) Place the mould on a smooth horizontal, rigid and non-absorbent surface or at the centre of the metallic tray
3) Fill the mould with the concrete to be tested in four layers, tamping each layer 25 times with the tamping rod, taking care that the strokes are evenly distributed over the cross-section.
4) Remove the mould by one smooth continuous vertical motion.
5) The concrete subsides and this subsidence is called “slump”. Measure the slump in mm by using a metric scale.
6) If the frustum just settles down. It is called true slump.

Foundry Sand

Table No. Proportion of Foundry Sand.

SPECIMEN NO.	% NATURAL SAND	% FOUNDRY SAND
S0	100	0
F1	90	10
F2	80	20
F3	70	30
F4	60	40

IARJSET

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ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

F5	50	50
F6	40	60
F7	30	70

Crushed sand

Block Proportions of crushed sand

Sr. No.	% NATURAL SAND	% CRUSHED SAND
S0	100	0
C1	90	10
C2	80	20
C3	70	30
C4	60	40
C5	50	50
C6	40	60
C7	30	70

V. CONCLUSION

A) On Foundry sand

- From graphical representation, by replacing 10% foundry sand by natural sand we got increase in strength by 13.61% as well as save in cost is Rs 80/M^3
- Further adding above 10% will not increase in strength. From results the 30% replacement of foundry sand by natural sand giving fairly same strength as using 100% natural sand as well as save in cost is Rs 230/-

B) On Crushed sand

- From graphical representation, by replacing 10% crushed sand by natural sand we got increase in strength by 27.16% as well as save in cost is Rs 90/-. For per M^3
- Further adding above 10% will not increase in strength.
- From results the 60% replacement of foundry sand by natural sand giving fairly same strength as using 100% natural sand as well as save in cost is Rs 300/-

So optimum level replacing crushed sand is 10%.

From above result we can reduce the consumption of cement in concrete for residential building and also with using same proportion we can use that concrete mixture for big construction project such as dam, bridge & various commercial projects.

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IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

Experimental Investigation of Concrete blocks with high volume fly ash and foundry Sand

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Abstract: In this paper experimental work is done to calculate mechanical &durability characteristics of the concrete blocks, during which cement is partially substituted with fly ash 50% & Manufacture- sand was partially substituted with foundry sand upto the percentage of 15. Compression strength test has been done to find out the mechanical characteristics of the blocks at the time of 7 days and 28 days. Durability characteristics, chloride ion penetration tests and water absorption tests are done.

Keywords: Fly ash, Foundry sand, Concrete blocks, Water absorption

I. INTRODUCTION

Concrete blocks are the new trend utilized in construction purposes for load-bearing & non-load bearing of walls. Blocks are made up of the cement, sand& aggregates and these are also called the precast concrete products. These blocks are of light grey block consist of fine surfaces and with good compression strength. Cement blocks are classified into three classifications solid blocks, hollow blocks and interlocking these concrete blocks are first started in United States. These blocks are rectangular. There are different types of blocks in the construction Hollow concrete blocks, Aerated autoclaved blocks, Lintel blocks& Solid concrete blocks, Paving blocks cellular lightweight blocks. Several advantages of concrete blocks are High strength and easily transported, it will reduce around 60% of the mortar used, less water absorbent, less time for the work process. Fly ash generated from burning coal. Class C & Class F are the two different classes of fly ash, difference among these two classes is mainly quantity of calcium, alumina, silica& iron content. The drying shrinkage can be decreased with incrementation of fly ash, as well as the inclusion of the fly ash reduces the sorptivity and chloride ion permeation and mainly one more advantage of the fly ash is economical, class C fly ash contains 10% lime content when compared to class F.A well-proportioned fly ash can increase the workability when compared to the normal Portland cement. The use of fly ash also enhances cohesiveness and decreases the segregation, and generally, it will decrease the rate and also the amount of bleeding mainly due to reduced water demand. Replacing the cement with the fly ash early stage strength decreased and there will be long term strength increased Table 1.

Table 1 Fine aggregate properties.

S. No.	Properties	Value
1	Type	Crushed
2	Specific gravity	2.65
3	Water absorption	1%
4	Fineness modulus	2.25

II. OBJECTIVE

1) To develop mix proportions by using fly ash as partial substitution to cement& foundry sand as fine aggregate.
2) To investigate the hardened characteristics of the concrete blocks.

III. EXPERIMENTAL WORK

1. Materials used

1.1. Cement -Cement is fine and grey powder. It is blended with water and the materials are sand, crushed stone, gravel to make the concrete. Cement containing the two ingredients named as argillaceous &calcareous. IS mark 43-grade is used for all the mixes. The testing was done by the IS: 8112-1989.

1.2. Fine aggregate (M-sand) the fine aggregates used for the investigational work was M sand &confirming to Indian standards IS: 383-1970. M-sand with the fineness modulus of 2.78, and confirming the zone II, the fine aggregate were used with the specific gravity 2.6 in concrete Blocks.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

1.3. Waste foundry sand-Various properties are done on waste foundry sand and various studies were made on ferrous foundry sand produced as of various foundry industries and the physical & chemical characteristics of the FS are described in the Table 2.

1.4. Coarse aggregate

The coarse aggregate used for these concrete blocks is 10 mm in size with a specific gravity of 2.8 was taken for the present work. The size of the aggregate used was 10 mm.

2. Mix proportion, procedure

The materials like cement, fine aggregate and coarse aggregate were mixed into two variables those are fly ash and foundry sand, where fly ash was replaced with 50%, and foundry sand upto 15%. Concrete block moulds size 400x200x200 were casted and cured for 7 & 28 days. These blocks were analysed for both mechanical & durability properties of the concrete blocks. And the mix proportions were shown in the Tables 3.

Table 2 Properties of WFS.

S. No.	Properties	Value
1	Specific gravity	2.12
2	Bulk relative density kg/m3	2489
3	Absorption	0.43
4	Moisture content	0.10

Table 3 Mix proportions.

Mixes Coarse	Cement (Kg/m3)	Fly ash (Kg/m3)	M Sand (Kg/m3)	Foundry sand (Kg/m3)	aggregate (kg/m3)	Water (Kg/m3)
M1	120	120	950	0	891.02	144
M2	120	120	902.5	47.5	891.02	144
M3	120	120	878.75	71.25	891.02	144
M4	120	120	869.25	80.75	891.02	144
M5	120	120	864.5	85.5	891.02	144
M6	120	120	855	95	891.02	144
M7	120	120	836	114	891.02	144
M8	120	120	831.25	118.75	891.02	144
M9	120	120	826.5	123.5	891.02	144
M10	120	120	817	133	891.02	144
M11	120	120	807.5	142.5	891.02	144
M12	120	120	807.5	142.5	891.02	144
M13	120	120	807.5	142.5	891.02	144

Table 3 Mix proportions.

Mixes Coarse	Compression strength	
	7 Days	28 Days
M1	12.12	17.04
M2	12.24	18.19
M3	13.05	18.82
M4	13.14	18.94
M5	13.85	19.12
M6	14.26	19.45
M7	15.23	19.69
M8	15.25	18.45
M9	15.12	19.26
M10	15.41	20.02
M11	15.22	20.24
M12	15.34	20.46
M13	15.56	20.59

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

IV. RESULTS AND DISCUSSION

1. Compression strength

Blocks are moulded with a 400x200x200 mm of size to define the compression strength of blocks. This testing was done for a period of 7 & 28 days as per IS 516–1959. The compressions strength is done for all the specimens for 7 and 28 days. Table 3 shows the compression strength of concrete blocks. From the results of the compression strength from all the 13 mixes it was observed that compression strength keep on increasing when the percentage of foundry sand increases and M13 mix having more strength when compared to the other mixes M13 having the foundry sand to 15% and from the tests I have observed that the strength of the concrete blocks increased when the percentage of the foundry sand increases.

4.2. Water absorption

Fig. 1. Concrete block

From the different types of mixes of concrete blocks the water absorption test was done and from the results, we have considered that water absorption was reduced with the incrimination of fly ash & foundry sand. Water absorption continuously decreased with the incrimination of fly-ash & foundry sand. And the results are shown in the table. Basically, this test is conducted to determine the capacity of the water absorption of blocks. After the casting work has been done the specimen should be in oven at a constant temperature of 105 _C for 24 h and it should be weighted and taken as w1 after that the specimen was taken out and should immersed in the water for 24 h. The specimen should be removed and wiped with dry cloth and weighed and the value should taken as W2. And from the formula the percentage of the water absorption .

will be determined (Figs. 1).

The formula for finding the percentage of the water absorption,

Water absorption %= 100(W2-W1)/W1

From the observations, the percentage of the water absorption decreases and at the M13 less amount of water absorption takes place when compared to the other mixes, M13 consists of 50% of fly ash and 15% of the foundry sand.

From the water permeability test conducted on blocks replacement of fly ash and WFS with certain percentages, it has been observed that the penetration was decreasing with the increase in foundry sand percentage. Fly ash inclusion reduces the pores due to fly-ash and WFS also penetration of the concrete blocks decreased (Figs 4–7).

Chloride ion penetration

Chloride at surface migrates inside and within the concrete. This chloride penetration in blocks is a very complicated process, temperature also takes place a major role in chloride penetration. The capillary absorption takes place through a thin outer layer of concrete. The chemical analysis is done for the specimens after exposure to the NaCl solution. the specimens are drilled to certain depths.(5,10,15,20,25) mm at 28 days. The 40 ml of distilled water is added to the 4gms of the sample drilled at particular depths. Set it out for one hour after the hour take the only 10 ml of that and add

90 ml of fresh distilled water in a conical flask, the burette is filled with AgNo3 solution and in the conical flask add 2drops of potassium chromate titrated with the 0.01 N AgNo3 solution which changes from pale yellow to brick red color which.

Table 4. % Chloride Ion Penetration.

Mixes Coarse	% Chloride Ion Penetration.				
	5 mm	10 mm	15 mm	20mm	25mm
M1	1	0.7	0.65	0.6	0.35
M2	0.9	0.65	0.6	0.55	0.25
M3	0.85	0.6	0.5	0.5	0.2
M4	0.8	0.58	0.5	0.45	0.28
M5	0.78	0.55	0.48	0.38	0.25

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

M6	0.75	0.5	0.45	0.32	0.25
M7	0.7	0.475	0.425	0.3	0.2
M8	0.65	0.5	0.475	0.38	0.2
M9	0.8	0.5	0.45	0.3	0.2
M10	0.7	0.45	0.3	0.25	0.19
M11	0.65	0.3	0.2	0.21	0.15
M12	0.63	0.33	0.25	0.2	0.13
M13	0.675	0.35	0.2	0.18	0.13

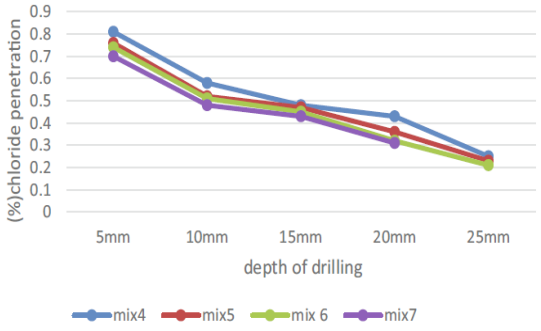

Fig. 5. Chloride ion penetration for 28 days.

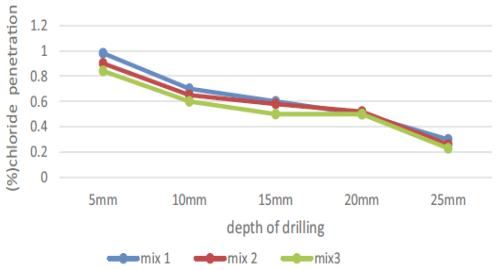

Fig. 4. Chloride ion penetration for 28 days.

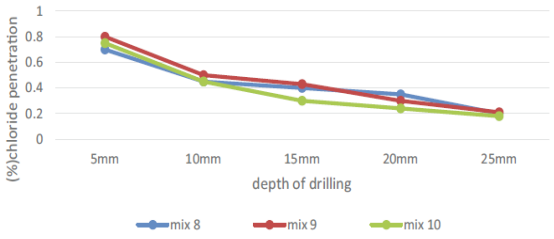

Fig. 6. Chloride ion penetration for 28 days.

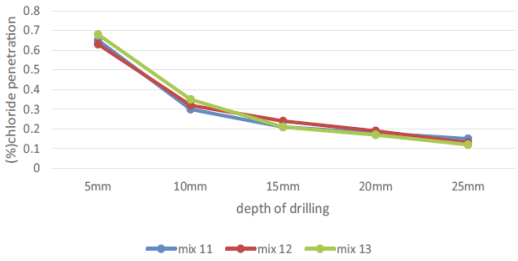

Fig. 7. Chloride ion penetration for 28 days.

V. CONCLUSION

1. The strength of the concrete blocks increased by using WFS up to 15%.
2. FA and WFS decrease the chloride ion penetration in concrete blocks cause to increase the durability of the concrete blocks.
3. Water absorption of FA and WPS blocks was less when compared to the normal blocks

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IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

An IoT Based Data Analysis Framework for Water Supply Monitoring

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Abstract: According to the latest survey, the increase in population has encouraged cities to deal with problems of water supply. To overcome water supply-related issues, the right tracking and control of machines must be implemented. IoT implementation is considered to consist of two stages where the devices or sensors are connected to send and receive data. In the proposed work, the design of a web-based application for industrial, and community water consumption and management are done using data analysis. The system aims to propose a methodology to improve operational performance and monitoring of water supply systems. The solution includes sensors and software that process generated data and create insights for the decision-makers. In the proposed work of an IOT based data analysis framework for water monitoring, the work is distributed into two core parts i.e., hardware and software parts. The hardware part consists of Raspberry Pi, a level sensor (Ultrasonic sensor). In this system, the controller reads the values of the level sensor, and also, the current data of the sensors is uploaded to the server by the raspberry pi and displayed on the user panel.

Keywords: IoT implementation, water monitoring, operational performance, statistics procedure, raspberry pi**.**

I. INTRODUCTION

At present, drinking water is very precious to all human beings. The water level is very low in the recent past and the water in the lakes is receding. It is therefore very important to find solutions for water monitoring and control systems. In our daily lives, we depend on the water resources system for many tasks like agricultural games domestic water supply, and recreational activities. Common people get access to water for today's needs in different ways.

Electronic flow measuring devices based on hardware sensors are available in the market but software applications have not been developed. The project is automatically related to the efficient management of water. The importance of this model is to control the water level for predefined specifications. The main objective of this project is to develop a level control device.

In recent times, the development of computing and electronics technologies has given rise to the internet of things technology. The Internet of Things can be described as a network of electronic devices interacting between them with the help of a controller. IoT is a collection of instruments that work together to perform human functions efficiently. It combines computing power to send data about the environment. These devices can be in the form of sensors, devices, embedded systems, and data analysis microchips. This paper presents a low-cost water monitoring system, which is a solution to water wastage and water quality. Micro-controllers and sensors are used in this system. Ultrasonic sensors are used to measure water levels. Although there is domestic Wi-Fi access, the data to measure the water level is sent to the database.

Data analysis is important in business to understand problems facing an organization, and to explore data in meaningful ways. Data analysis organizes, interprets, structures, and presents the data into useful information that provides context for the data. The implemented system helps in preventing wastage of water and increasing consumer consumption awareness.

In the proposed work of an IOT based data analysis framework for water monitoring, the work is distributed into two core parts i.e., hardware and software parts. In the software part, a smart water monitoring and automation system model is proposed by integrating Internet of Things (IoT) technologies and controllers with sensors. After sensing data from the hardware part, the proposed web application will perform monitoring tasks for water consumption, controlling and decision making using data analysis.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

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The remaining part of this paper is organized as follows: Department II reviews the related work of the project, describes the proposed system in Department III with modules explanation, provided the planned circuit in Department IV, Department V shows the results and discussions, Department VI concludes with future scope.

II. LITERATURE SURVEY

Water wastage is a global problem. It requires continuous monitoring to forestall the wastage of water .one of the rationales for this to happen be the unawareness of the public and administration. Various sorts of water monitoring systems are available but the control must be done manually in it. Designed a smart system capable of controlling the water automatically. This project is of low cost and thus the efficiency of the project is more compared to the previous methods. Using this project, automatic controlling and monitoring. [1]

During this paper, we introduce the project of water level monitoring additionally as controlling with IoT and android applications. Conventional water tanks can neither monitor nor control the water level in the tank leading to a peck of wastage. Neither technology had certain drawbacks in some or other way. The need to remove these shortcomings and provide an efficient and economical solution has been the foremost focus of this project. [2]

Water is also a precious need in our lives. Because of the rapid population and urbanization, water usage monitoring may be a major problem facing our society. One solution is to manage, analyze, and reduce the water consumption of homes. The emergence of the net the things (IoT) concept lately in our lives has offered the possibility to work out water usage efficient smart devices, systems, and applications for buildings and cities. During this paper, an energy-efficient IOT based smart meter has been developed and tested with different scenarios. [3]

Existing methods that supported discretization face the dilemma of solution accuracy and computational efforts. This paper formulates the dynamic water resources planning problems. The silent feature of the new method is that the performance is improved systematically and there's no must determine the difficult trade-off between computational accuracy and efficiency. It's demonstrated that the module proposed within the paper can effectively capture the governmental regulations on annual water consumption and release. [4]

consistent with the water resources, geography, crop planting composition, and flexibility of varied water-saving irrigation techniques, etc., the optimal planning of minimum annual price for agricultural water-saving irrigation will be obtained supported the finitely agricultural water resources by using the model.[5]

In a very study conducted by Ejiofor Virginia Ebere and Oladipo Onaolapo Francisca [7], the automated detection of water level in an exceeding tank is finished by a comparator circuit. They used the electrical conductivity property of water as a bonus. The copper conductors function as the water level sensor. When the copper sensor is touched by water, voltage runs to the copper which successively is transferred to the comparator circuit for further processing. Then a micro-controller uses this signal coming from the comparator to control the pump.

Also, another study on automatic cistern filling systems was conducted suitable to be used in home activities to cut back energy consumption because of water spills [8]. This study also helps the community to research their water consumption. The prototype is accustomed solve pump problems due to the operations of the manual switch still because the floating ball tap to forestall the cistern filling.

III. EXISTING SYSTEM

The popularity of IoT technologies is growing due to their capability in developing various applications and only a few portions are currently available in the community. It includes health care, transportation, logistic, a smart environment, and many more.

Pracht Verma et al. developed an IOT based for water distribution on campus. They developed a system that will distribute enough water to each tank to satisfy local demands. In their study, an ultrasonic sensor has been used to monitor the water level in a tank.

In a study conducted by Nayef. A.M. Alduais2*, Hairulnizam B. Mahdi, the automatic detection of water level in a tank is done by a comparator circuit. They used the electrical conductivity property of water as an advantage the copper constructor senses the water level through the level sensor (Ultrasonic sensor) When the copper sensor is touched by water, voltage runs to the copper which in turn is transferred to the comparator circuit for further processing. Then a micro-controller uses this signal coming from the comparator to control the water pump. Also, another study for automatic water tank filling system was conducted suitable to be used in home

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

Activity to reduce energy consumption due to water spills. The prototypes can be used to solve water pump problems due to the operations of the manual switch as well as the floating ball tap to stop the water tank filling.

IV. PROPOSED WORK

In the proposed work of an IOT based data analysis framework for water monitoring, the work is distributed into two core parts i.e., hardware and software parts. The hardware part consists of Raspberry Pie and a level sensor (Ultrasonic sensor) each block is explained below architecture. The System is working on a Prototype model Shown in fig.1

The level sensor gets the value through the raspberry pie. And also; the current data of the sensors is uploaded to the server by the raspberry pi. The raspberry pie and database are connected with a Wi-Fi module. Software Part will Perform, Data visualization and analysis using server-side visualization of sensed data. The collected data from raspberry pie are stored in the database. After sensing data from the hardware part, the proposed web application will perform monitoring tasks for water consumption, and measurement using data analysis, which will mainly perform two main operations first is controlling and the second is decision making. And what will be the output generated displayed on the system interface.

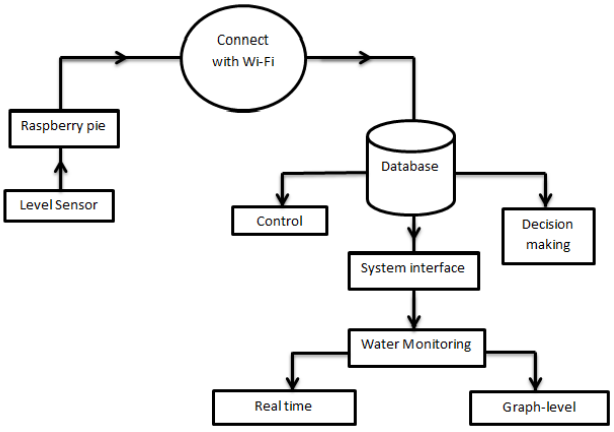
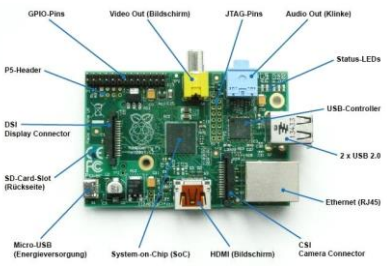


Fig.1. SYSTEM ARCHITECTURE.

Control: By analyzing sensed data, it can help utility providers know how much water they are using, and ways to reduce water use. It is used to analyze the amount that is currently being used by utility providers, then to inform strategies for reducing its use

Decision Making: To get the necessary water data for viewing in the web interface of the application this module was proposed. This is beneficial to improve the decision-making process to better forecast, monitor, control, and prevent water issues as discussed before.



IARJSET

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Vol. 9, Special Issue 1, April 2022

Fig.2 Raspberry Pie

Raspberry Pie is a series of small single-board computers developed in the United Kingdom by the Raspberry Pie Foundation in association with Broadcom. The Raspberry Pie project originally leaned towards the promotion of teaching basic computer science in schools and countries. The original model became more popular than anticipated, selling outside its target market for uses such as robotics. Raspberry pie is a mini-computer with Raspbian OS. It can run multiple programs at a time. It is difficult to power employing a battery pack. It needs complex tasks like installing library files and software for interfacing sensors and other elements.

It is expensive. Raspberry pie is often easily connected to the web using an Ethernet port and USB Wi-Fi dongles. Raspberry pie did not have storage on board. It provides an SD card port. Raspberry pie has 4 USB ports to Attach different devices. The processor used is from the ARM family. This should be properly shut down otherwise there's a risk of files corruption and software problems. The Recommended programming language is python but C, C++, Python, and ruby are pre-installed.

Fig.3 Ultrasonic sensor

An ultrasonic sensor has two eyes that are transmitter and a receiver. Transmitters convert electrical signals into ultrasound, receivers convert ultrasound into electrical signals, and transceivers can both transmit and receive ultrasound. Ultrasound can be used for measuring wind speed and the direction of tank water levels. For measuring speed or direction, a device uses multiple detectors and calculates the speed from the relative distances to particulates in the air or water

V. RESULTS

Fig 4 shows real-time monitoring, which allows data to be stored and displayed on the system interface throughout the day. Using real-time monitoring we can see water data for one day. Fig 5 shows graph level monitoring which allows it to store data within 15 days and display it graphically. We store data for at least 15 days using graph-level monitoring.

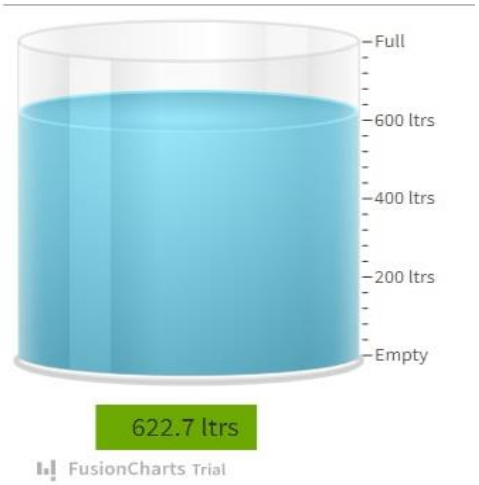

Fig.4 Real-Time Monitoring

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

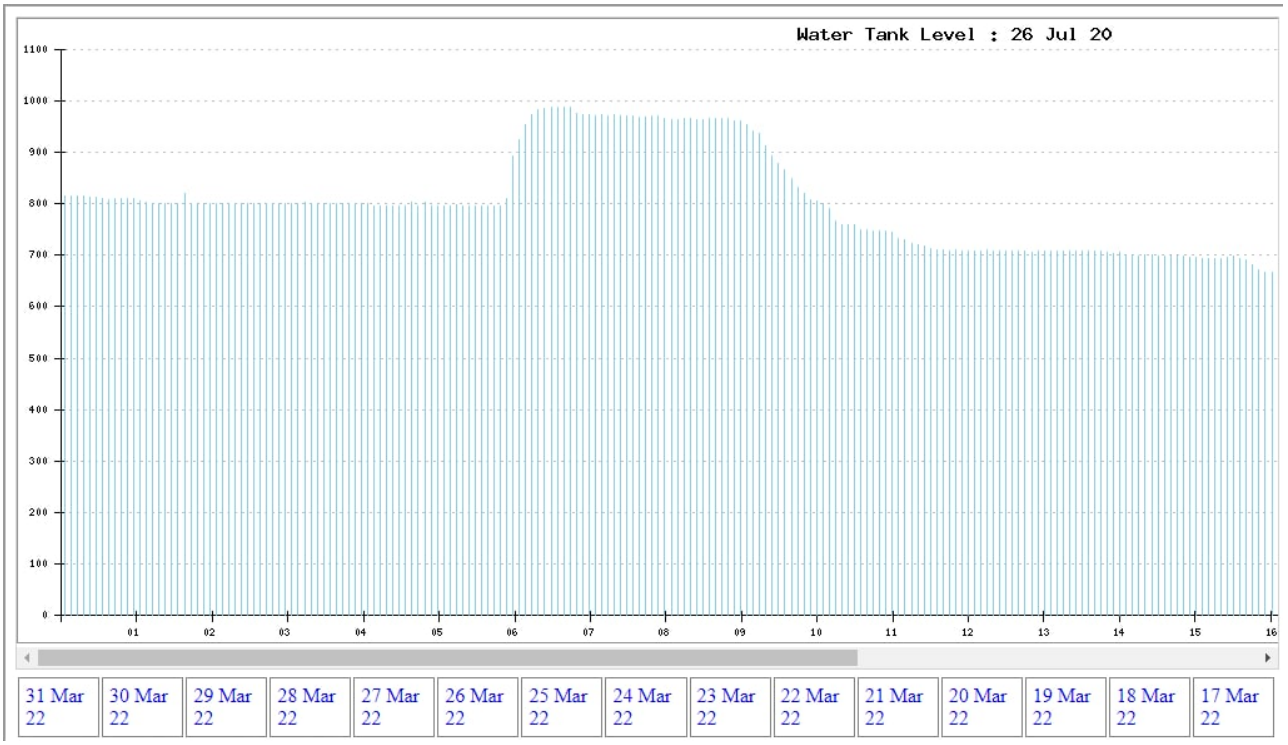

Fig.5 Graph-level Monitoring.

VI. CONCLUSION

We designed a smart system that can control the level of water. The project is low-cost. Using this project, we can monitor the level of water. Disadvantages of the previous system that required manpower were eliminated and water data analysis through the application is not ever implemented. This real-time project for simple and automatic management prevents wastage of water.

As a future task, we are thinking to extend our project using large datasets. We identified more factors to improve the quality of data. We thinking about integrating with government databases with updated values.

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IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

IoT-Based Smart Healthcare Monitoring

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Abstract: IoT in healthcare is a crucial actor in offering improved medical facilities to people while also assisting doctors and hospitals. The suggested system consists of various medical equipment such as sensors and web-based or mobile-based applications that communicate via network-connected devices and aid in the monitoring and recording of patients' health data and medical information. The paper's proposed objective is to construct a system to deliver world-class medical help to patients even in the most remote locations where there are no hospitals by connecting via the internet and capturing information about their health state through the wearable devices given in the kit, which use an arduino microcontroller to monitor the patient's heart rate and blood pressure. In the event of a medical emergency, the system should notify the patient's family members and doctor of the patient's current health state and complete medical information.

Keywords*:* Internet of Things, IoT in Healthcare, Patient Monitoring, Arduino, Smart Health Monitoring.

I. INTRODUCTION

The Internet of Things (IoT) is the interconnection of devices, apps, sensors, and network connectivity that allows these entities to collect and exchange data more efficiently. The constant monitoring of a patient through numerous metrics and inferring a favourable result from the history of such constant monitoring is the defining feature of Internet of Things in the healthcare system. In today's ICUs, many of these gadgets with medical sensors are present. Despite 24 hours of monitoring, there may be times when the doctor is not alerted in time when there is an emergency. There may also be difficulties in exchanging data and information with specialists as well as concerned family members and relatives. The technology to improve these features is currently available, but it is out of reach and out of reach for the majority of people in developing nations like India. As a result, the remedies to these issues may be as easy as a simple These features will be added to current devices that do not have them.

Numerous parameters that use power, cost, and enhance efficiency are identified as a result of having a smart system. Doc tors are also important, but the checkup process is lengthy, as a person must first register, then schedule an appointment, a nd then wait for the checkup reports to be generated. Working people prefer to disregard or postpone checkups as a result of the length process.This cuttingedge method cuts down on the amount of time it takes to complete the task.
This societal contribution will be incredibly valuable. Because humans may detect abnormal physiological behaviour before developing a serious illness. The individual who is most concerned about any other loved one's health can monitor and care for his health using IOT from anywhere on the planet. The body temperature, heart rate, blood pressure, and breathing rate are the most important factors in determining the severity of the disease. Using IoT, this project provides temperature and heart rate readings.

The paper's main goal can be summarized as follows:
• Using IoT to collect real-time medical information about a patient.
• Information gathered about the patient is processed and classified.
• To give healthcare solutions based on the Internet of Things at any time and from any location.

IARJSET

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Vol. 9, Special Issue 1, April 2022

II. RELATED WORK

A lot of researchers have presented numerous models for IoT in Healthcare and disease prediction using various methodologies. This section focuses on the work that has been completed in the same area.

Dwivedi et al. [1] established a framework to secure clinical information that must be communicated over the internet for Electronic Patient Record (EPR) systems, proposing a multi-layered healthcare information system framework that is a combination of Public Key Infrastructure, Smartcard, and Biometrics technologies.

Gupta et al. [2] developed a model that uses Raspberry Pi to measure and record ECG and other vital health parameters of patients, which might be of tremendous help to hospitals, patients, and family members.

Gupta et al. [3] provide an approach based on the Intel Galeleo development board that collects various data and uploads it to a database where it may be used by doctors while also reducing the agony experienced by patients who must visit the hospital on a regular basis to check their health parameters.

Lopes et al. [4] suggested an IoT-based platform for disabled individuals to study and locate IoT innovations in the healthcare segment that can assist them and their community They chose two use cases to investigate the most recent IoT technology and their applications, which are mostly aimed at the disabled.

Sahoo et al. [5] investigated the healthcare management system and the vast amount of patient data generated by numerous reports They then examined the health parameters to forecast the patient's or subject's future health status. They use a cloud-based big data analytic tool to accomplish the same thing utilising probability.

Tyagi et al. [6] They investigated the role of IoT in healthcare and studied its technical aspects in order to make it a reality and identify the opportunities for which they propose a cloud-based conceptual framework in which patients' medical data and information can be securely transferred, with the permission of the patient and their family, by building a network among patient, hospital, doctors, labs, and so on. The fundamental objective for this is to relieve patients of costly clinical aid, overcome the scarcity of doctors, and thus provide better care and service to patients.

Xu et al. [7] proposed a data paradigm for recording and analysing IoT data They created a resource-based Ubiquitous Data accessing method to capture and publish IoT data globally so that it may be accessed anywhere, at any time. They also demonstrate an IoT-based emergency medical service, as well as how to acquire and use IoT data on various platforms.

IARJSET

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Vol. 9, Special Issue 1, April 2022

III. SYSTEM ARCHITECTURE

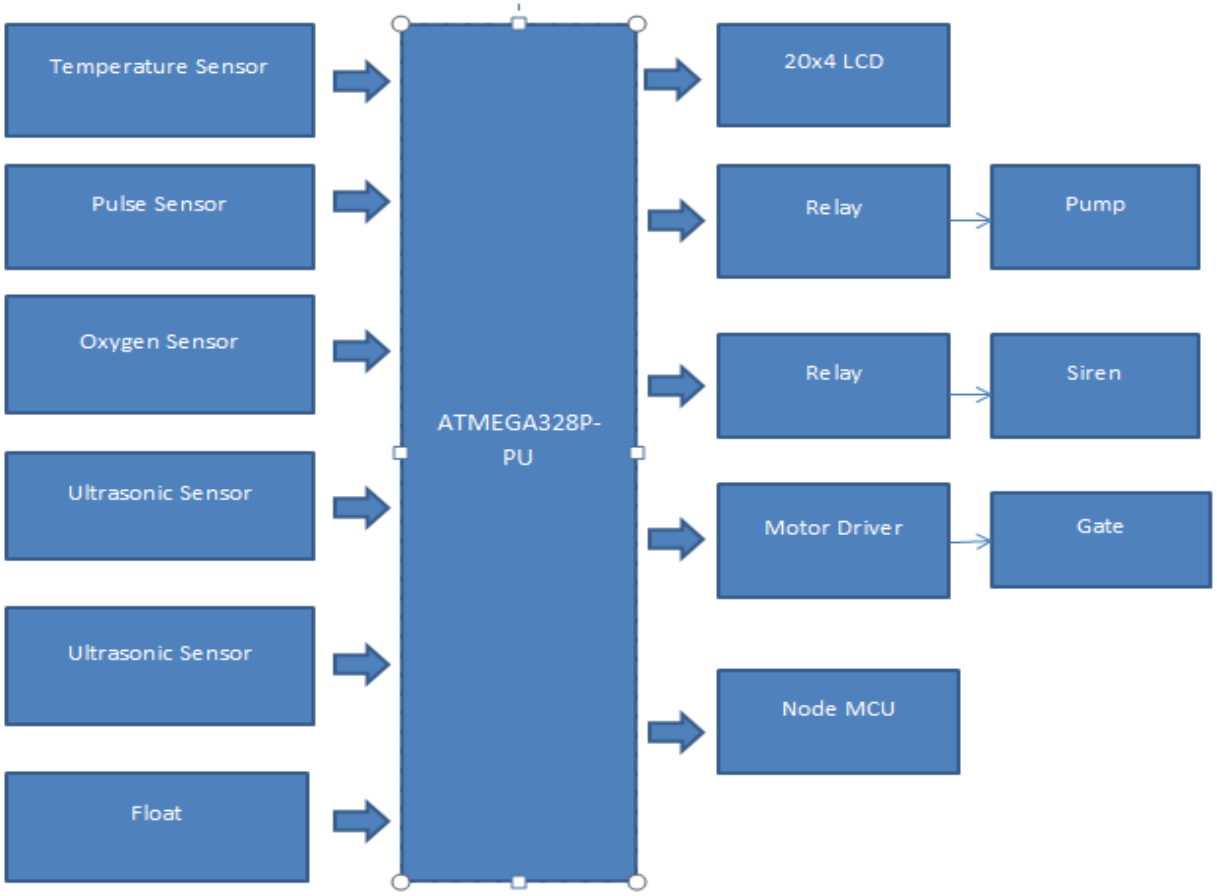

Figure 1. System Architecture

We suggest an automatic method to monitor a patient's body temperature, heart rate, bodily movements, and blood pressure in this study. Furthermore, we extend the existing system to forecast whether the patient is suffering from any chronic disorder or disease based on the numerous health parameters and symptoms gathered by the system.

IV. SYSTEM MODULES

1) Health Monitoring Section
2) Emergency Alert Section
3) Health Status Prediction System

A. Health Monitoring Section

This module consists of the system's hardware components that enable IoT and is used to record the patient's health parameters using various sensors.

B. Emergency Alert Section

This module in particularly deals with the steps to be taken after an abnormality is detected in the health of patient such as notifying his/her family member . We have set up certain threshold values in our program which if crossed will trigger an alert in the form of emergency alarm.

IARJSET

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TABLE 1: THRESHOLD VALUES

Component	Normal Range
Blood Pressure Body Temperature Heart Rate	80-120 mm Hg 36.5-37.5C 60-100 beats/min

C. Health Status Prediction System

This is one of our system's most promising modules. In this module, we use the patients' health data from our system, as well as any symptoms.

V. IMPLEMENTATION

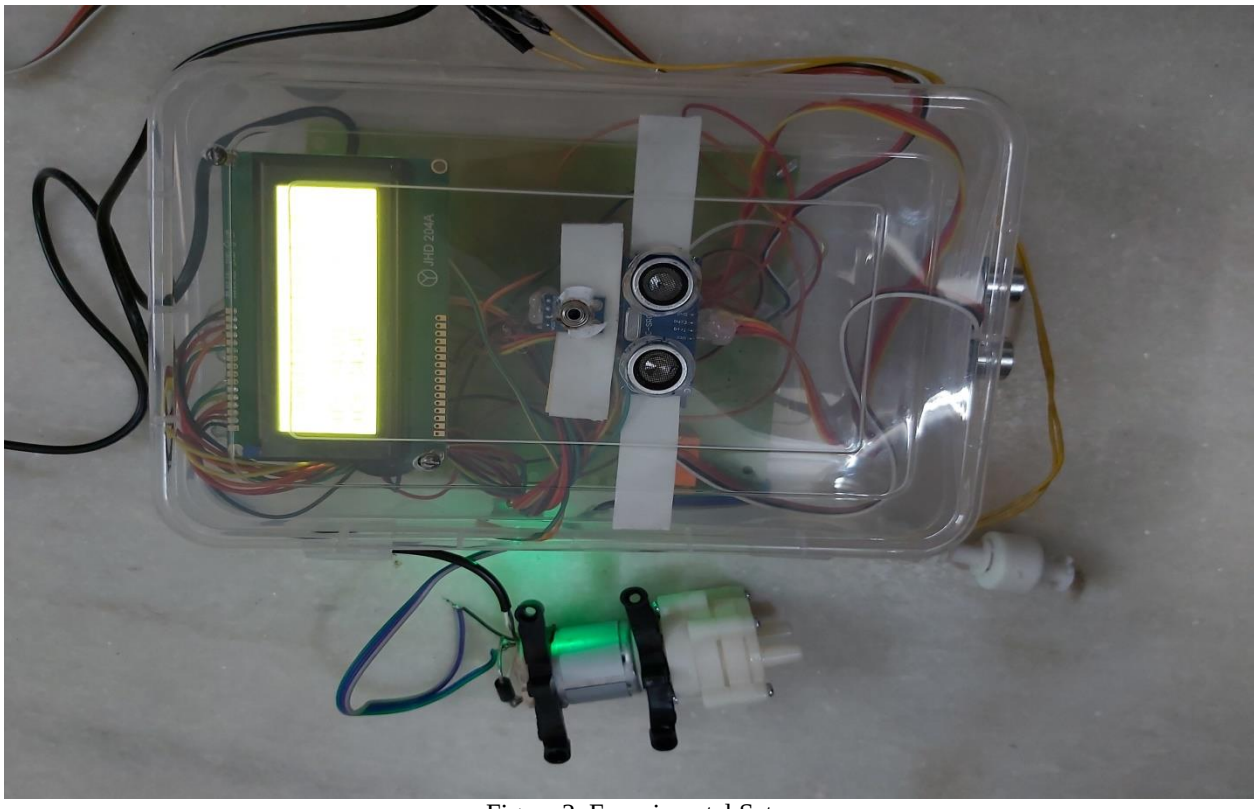


Figure 2. Experimental Setup

The various Components to be used in system are :

A. Arduino :

The Arduino Uno is a microcontroller board built by Arduino.cc that is based on the Microchip ATmega328P microprocessor. The board features a number of digital and analogue I/O pins that can be used to link to various expansion boards (shields) and other circuits. The simulation is carried out with the Arduino IDE application. The ATmega 16U2 has an integrated USB connector that sends serial data to the main processor. The Arduino Uno requires a standard A-BUSB cable.

This board contains 14 digital I/O pins.

IARJSET

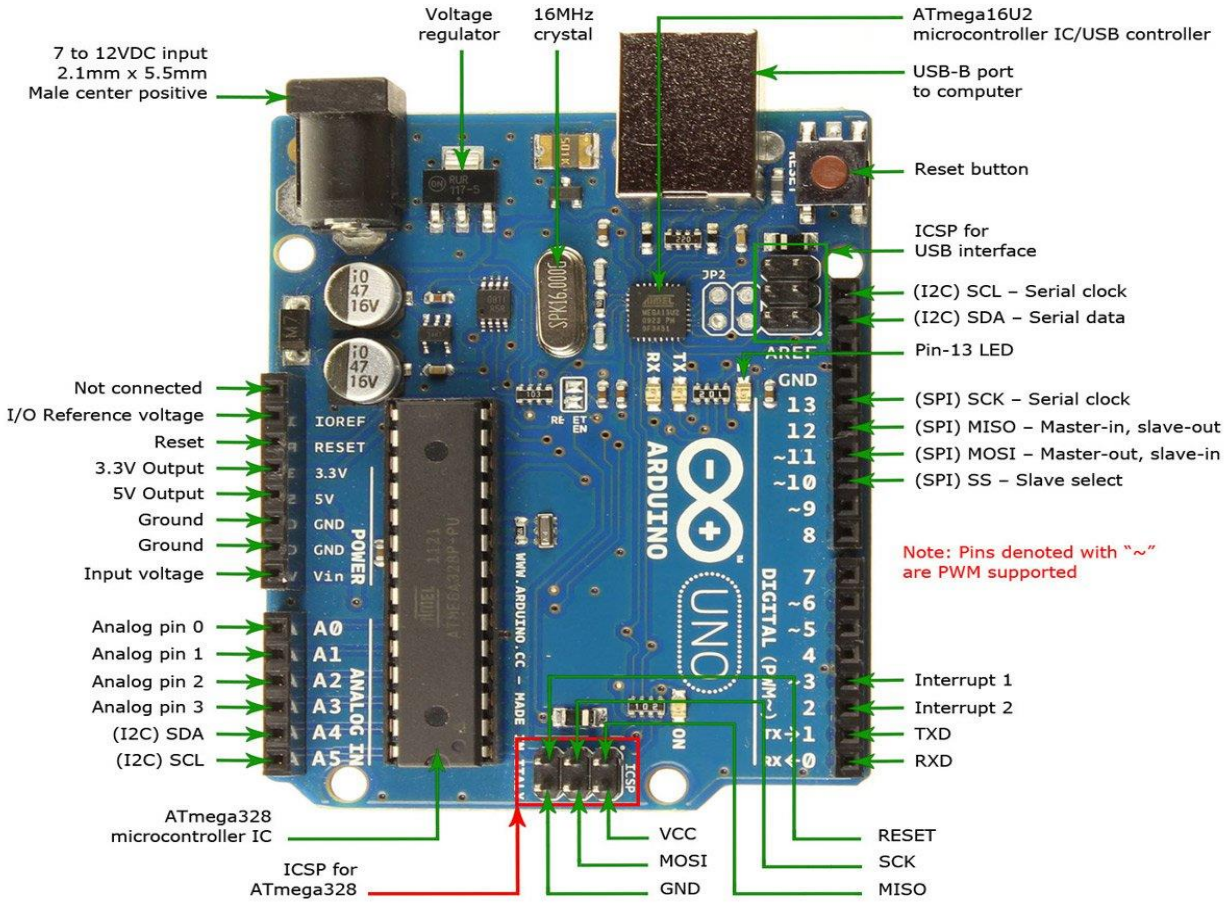
ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022



B. Temperature Sensor :

For measuring the temperature LM35 sensor has been used which is an IC sensor used to measure the temperature with the help of the analog output proportional to the temperature.

Figure 4. Temperature Sensor

The LM35 is an IC temperature sensor with an output voltage which is proportional to the Celsius temperature. The LM35 is better than linear temperature sensors which have calibration in Kelvin, because one doesn't need to remove a large constant voltage from the output value to obtain the Celsius reading. These salient features of the LM35 sensor make interfacing to any type of circuit extremely easy.

C. Heartbeat Sensor

The heart rate is measured using a pair of LED and LDR and a microcontroller and it works on the fundamentals of optoelectronics. The infrared radiation is emitted by IR led and the infrared light is reflected by the surface. The intensity of radiation generated electron-hole pair which in turn produces leakage current. This current thus generated is sent through a resistor to obtain the proportional voltage. Thus, the greater is the intensity of the incident ray, the larger value of voltage flowing across resistor will be obtained.to obtain the proportional voltage.

IARJSET

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ISSN (Print) 2394-1588

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National Conference on Recent Trends in Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

Thus, the greater is the intensity of the incident ray, the larger value of voltage flowing across resistor will be obtained.

Figure 5. Heartbeat Sensor

The heart rate is measured by placing the tip of forefinger upon the sensor. Once the circuit senses the pulse, an LED will start blinking along with your pulse. The output is sent to a circuit or a micro-controller to measure the heart beat rate in BPM.

D. Pulse Sensor :

The Pulse Sensor is a heartrate sensor that works with Arduino. It may be used by students, artists, athletes, makers, and game and smartphone developers who want to include real heartrate data into their work. The system's heart is an integrated optical amplification circuit and a noise-reducing circuit sensor.

By attaching the Pulse Sensor to your earlobe or fingertip and wiring it into your Arduino, you can now read your heart rate. It also includes an Arduino demo code, making it easy to use.

Figure 6. Pulse Sensor

E. Wi-Fi Module :

The ESP8266 wifi module is a selfcontained SOC with an integrated TCP/IP protocol stack that allows any controller to connect to a wireless network. The protocols 802.11 b/g/n are utilised. The amount of standby power used is less than 0.1MW.

IARJSET

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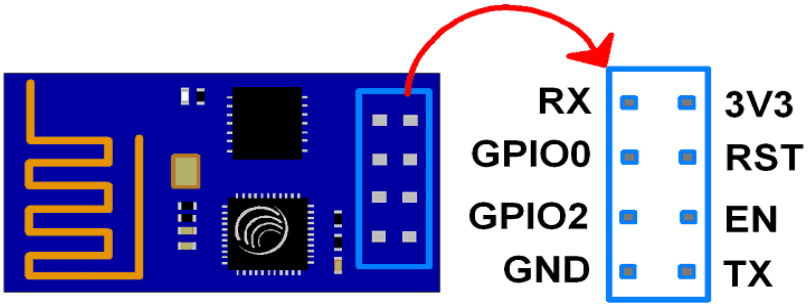

Figure 7. ESP8266

F. ADC (MCP3008) :

The MCP3008 is a low-cost 8-channel 10-bit A/D converter. This chip is an excellent choice for reading simple analogue signals, such as those from a temperature or light sensor.

Figure 8. MCP3008

G. Ultrasonic Sensor and Nozzle Assembly:

An automatic hand sanitizer discharges the sanitising liquid without the need to press any nozzles. The mechanism for pressing the hand sanitizer's nozzle, which requires a conversion from a rotational action to a translational movement, is important to the design of the automatic hand sanitizer.

Figure 9. Ultrasonic Sensor and Nozzle Assembly

The VDI 2221 approach was used to create the automatic hand sanitizer, which contains an Arduino Nano as the microcontroller, a servo motor as the motor, an ultrasonic sensor for detecting movement in the environment, and a rack and pinion system for pressing the nozzle from the hand sanitizer.

IARJSET

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ISSN (Print) 2394-1588

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Vol. 9, Special Issue 1, April 2022

VI. RESULT

As the title suggests, the outcome of the Smart Health Monitoring system is extremely beneficial to both patients and doctors. Patients can monitor their health status from the comfort of their own homes at any time and only visit hospitals when absolutely necessary. Our system displays near-real-time values for numerous health parameters and simulates how they may be implemented in the actual world. The log of the patient's body condition can also be used by doctors to investigate and identify the influence of drugs or other such items.

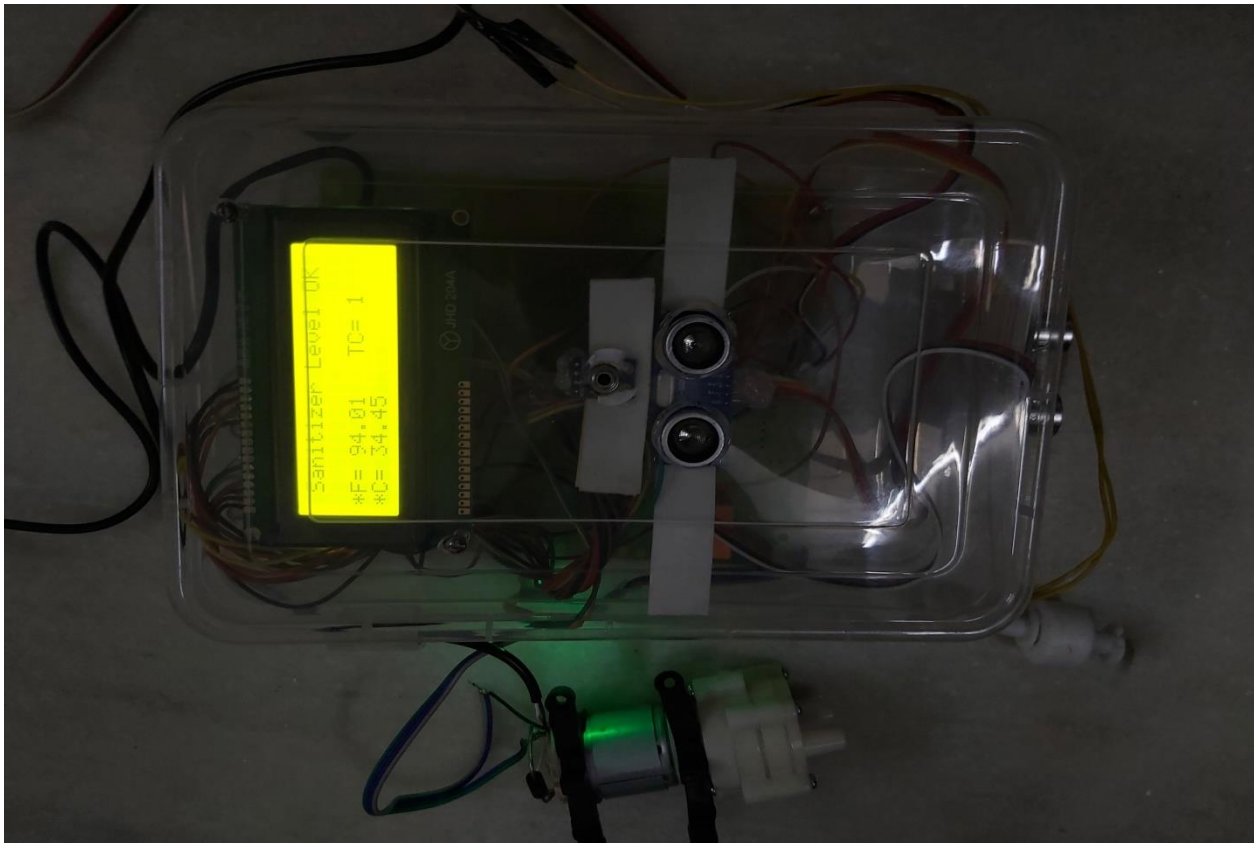

Figure 10. Project Output

VII. CONCLUSION AND FUTURE WORK

In this study, we proposed and demonstrated a prototype for an automatic system that assures continuous monitoring of multiple health indices and prediction of any form of disease or disorder, sparing the patient the agony of repeated hospital visits. The proposed technology may be installed in hospitals, and a large amount of data can be collected and saved in an online database. Even the results can be made mobile-accessible via an application.

The system can be developed further by incorporating artificial intelligence system components to help doctors and patients. Data mining can be used to analyse the data, which consists of the medical history of many patients' parameters and related outcomes, in search of consistent patterns and systematic linkages in the disease. For example, if a patient's health metrics change in the same way as a previous patient in the database, the repercussions might be anticipated. If similar patterns are discovered again, doctors and medical researchers will have an easier time finding a solution to the problem.

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IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

System for Analysing Student Results

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Abstract: Innovation in today's world has come to degree that it can be utilized to do different errand in day to day life effectively with less exertion and time. In In today's world has realized the significance of one's life which has driven to insurgency within the field of instruction framework. Colleges, schools nowadays have loads of errand to be completed in given timeline. Data mining is powerful tool for analysis. In today's situation colleges has to analyse understudy comes about manual which takes parts of time, exertion squander cash by resources working on it. Subsequently, in arrange to rearrange these errands, a web-based result analysis is presented which can carry out the examination of understudy comes about. The system takes as input the record of understudy comes about gotten by colleges within the frame of Exceed expectations spread sheets. The result of investigation will at that point be shown in sorted way concurring to rank of understudy. The result will be displayed on the semester, year and subject wise. User can see individually academic performance and display in the score card. So, that can be useful for the end users. This result analysis system runs on web-browser on computer with well-connected arrange.

Keywords*:* Result Analysis, Data Mining, Classification, Academic Performance, Score card.

I. INTRODUCTION

Student Result Analysis System is a web based application developed for colleges to analyse the result and keep track of students .We will able to see the individual candidate's results separately. Student result analysis system has been designed for mark analysis process in educational institutions. The results can see without much of manual involvement. Given the continuous rise in student population, tertiary institutions calculate examination result of students with the help of computer programs. Analysis of student's information and their academic record is as important as examination result computation. The need for data use to inform decision-making in tertiary institutions cannot be overemphasized.

However, the use of programs that extends capabilities beyond examination result computation is not widespread. The system provides all the users requirement and correctly display all the performance. Information from such data can facilitate decision-making and improve educational standards.

Student Result Analysis System is a web application which designed using PHP and MySQL used for database. This application used for the analysing the student results according to the user requirements and generate the performance report of student, subject or branch. It will be allow all students to see their performance. This system will be also helping us to improve the education qualities and improve the student performance. And it also removes the data management problem if any change is made in data then everyone can see in this system.

However, the usage of programmes that extend beyond the computation of examination results is not common. The system offers a complete solution for exam result computation, as well as student information and academic record administration. The system is robust and flexible enough to suit future requirements. It is expected to encourage tertiary institutions to use data. Data from these sources can help with decision-making and raise educational standards in tertiary institutions.

II. LITERATURE SURVEY

The current study aims to create a web-based student results management system, reducing time, effort and improving security. The research results in the development of a multi-user system based on web-based web-based technologies and developed using Java programming language with the support of Xampp Server and MySQL Database Management System.

This study includes a hands-on way to collect student results. The result found in our system is simple and tailored. Essential assistance to teacher staff to judge their performance in a particular subject and all subjects should be exposed. Also the performance of teachers of various subjects is easily compared which is very useful for the Head of department

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

and also for staff members were identified and a new system was proposed, designed and implemented. The results analysis is displayed in a single managed file (pdf). This new framework is flexible and can be adapted to suit any type of student record keeping and information management at universities.

When they have been abstractly specified IEEE, SI, MKS, CGS, sc, dc, and rms are examples of abbreviations that do not need to be specified. Abbreviations should only be used in the title and headings if they are unavoidable.

III. PROPOSED WORK

a) EXISTING SYSTEM

The current system is time consuming as it requires a certain amount of work to be done before for example to make an excel sheet containing student information such as marks, personal details or inserting all this information in person and Totally data was entered on paper so it is very problematic.

1) The current system is time consuming.
2) In the current system, some manual work has to be done making it difficult.
3) In the current system the user must have some knowledge about creating and managing a specific file that will be uploaded to the system to extract data.
4) Some of the current software is not platform independent.

As previously said, various computer programmes exist today that assist users in finding and storing basic information such as a student's name, grades, and seat number. The rest of the computational work is either done manually by faculty at that university or requires a different programme.

The proposed approach and its advantages over the current system are as follows:

1) Friendly to the user (as faculties can easily use web based application).
2) Availability at All Times.
3) Calculation is simple.
4) Data storage is simple.
5) More effective.
6) It takes less time and effort.

b) PROPOSED METHODOLOGY

This is a tracking system used to track student performance and report. In this program, all the user has to do is put up the student result in this system and you can see the student performance report. This application used for the analysing the student results according to the user requirements and generate the performance report of student, subject or branch. The system can also compare student results with another student and the user can see a comparison analysis report of the bulk of the student. In the proposed program, all the user has to do is download the result in PDF format and upload it to the program and some features will be made into a program that makes it easy and fast.

The Student Result Analysis System is a student-driven system that utilises technology to keep track of student data. Result analysis is now done manually, which takes a lot of time and effort, and the requisite precision isn't always obtained. Updating data is also challenging because every data must be revised afresh. There is also more paperwork and documentation to be completed.

The results can see without much of manual involvement. Given the continuous rise in student population, tertiary institutions calculate examination result of students with the help of computer programs. Analysis of student's information and their academic record is as important as examination result computation.

This system was created to manage: information about multiple users :

1) Detailed information about the subjects available in each semester
2) Every semester, a student's grades are calculated, and reports are generated.
3) Data analysis based on aspects.

IARJSET

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Vol. 9, Special Issue 1, April 2022

c) SYSTEM ARCHITECTURE

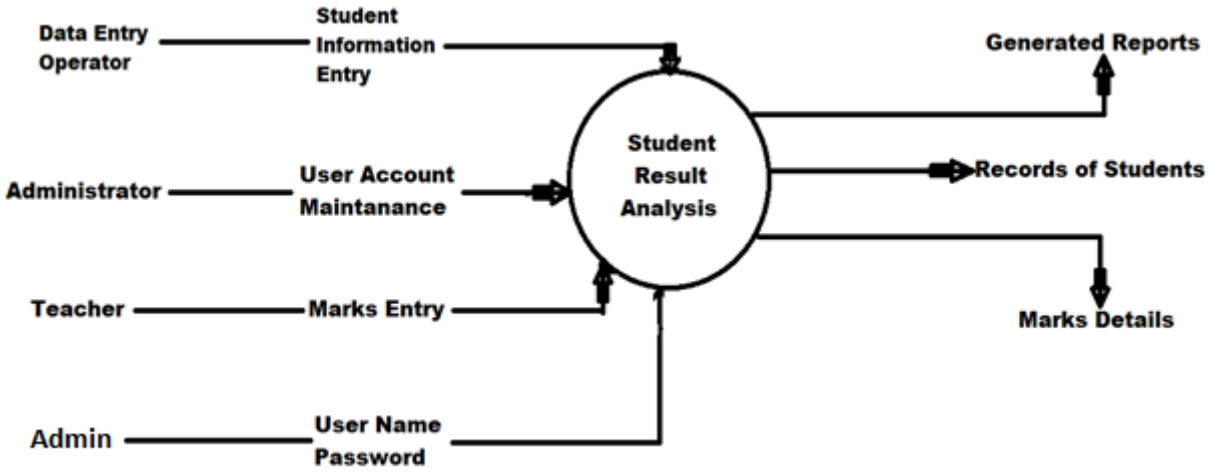

Figure 1- system's overall functionality

The student result analysis system is a straightforward HTML-based web application. MySQL is used to create the database in this system. The main logic of the total system operation is contained in java script, which is used for logical coding. CSS is used to create multiple styles for web pages. All authentication validation checks are performed on the system. Data is loaded into the database from an excel sheet. These student records were examined for several factors such as marks, grade, and rank[3][4]. The system will be built in such a way that it may be upgraded in the future to accept new formats. To do this, all data will be initially stored in temporary storage and then formatted before being inserted into the database.

Figure 1 depicts the system's overall functionality. It also depicts the interaction between the system's many modules. The system's use can be readily demonstrated by looking at the use case diagram. The system's three users have access to the system modules based on the rights granted to them by the administrator.

Teachers have the ability to view a student's record, alter results, and change his or her login password. Initially, the administrator provides the password to the teachers. The administrator has the authority to change, amend, delete, or add data or records for new students or users. Admin grants other users in the system access rights to data.

IV. IMPLEMENTATION

We created a website to analyse and provide reports for students based on their academic performance based on the curriculum. We created the system in such a way that it would automatically extract data from an excel file into a database, reducing the amount of time spent on data analysis. We utilised php, my SQL, and java script to create these. After a teacher logs into the system, data is dynamically retrieved from the database. Parsing is done with PHP Excel in this case. It's a php package that allows you to get data from excel files over or within a network. By establishing the analytic system, we intend to speed up the process. It assists teachers and administrators in keeping track of each student's, subject's, and department's records.

The system is developed based on following languages:

1. HTML: at front end.
2. SQL server: as a database language.
3. php,js: for validation and scripting.

The outcome is determined by the marks provided by the database. These grades were updated with the use of an

excel document provided from the university. The data is updated by parsing an excel sheet with php Excel. The method reads data in binary format and delivers data for any cell implicitly. The biggest advantage is that it decreases PHP Excel's memory footprint; it does so by using a lazyloader autoloader, which only runs functions when they are needed, saving memory. There is separate cache storage for each sheet. To import data into the database, many methods have been developed to read, write, set Page, set Scale, set Width, and so on. Co-ordinates or cell values are used to obtain data.

Algorithm working of the system:

- Upload the excel file of students marks.
- Internal calculation(system logic):
- Display of analysis.

V. FUTURE SCOPE

Previously, data had to be manually entered in order to analyse the results. But, For data extraction, the project currently supports excel(.xlsx) files. Data can be fetched and parsed in various formats such as doc, csv, and odt in the future. Data can be represented in a graphical format via visualisation. Various representations, such as a pie chart, a graph, and so on.

VI. CONCLUSION

It will help increase the productivity of teachers and college staff as they do not have to spend their time analyzing the result and in producing a student performance report also helps teachers and college staff maintain student data as this web application uses a centralized communication site and can access data from a remote site user id and password to gain access to the data.

The system's purpose has been met, and problems have been resolved. The project is designed to be user-friendly. The scoring system's analysis reveals grade-by-grade results for each topic, as well as grade-by-grade ultimate results based on the range of marks. The project can easily be utilized in college to analyses student results. It saves time by eliminating the need for manual calculations. This system aids in the calculation of results quickly, hence maximising manpower.

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IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

Report a Crime

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Abstract: It is Android utility causes of machine locating the criminal's info as quickly as possible. Our surrounding place there are numerous troubles are occurring however we need to criticism or supply facts approximately Criminals. It take greater time to written criticism via FIR. So many time to be wasted on this process. Victims can also additionally publish the FIR to the Application in diverse sections. The police may have a crook database via which they are able to get admission to the information anytime. In this machine, person's facts may be stored exclusive and simplest customers bitch may be forwarded to the closest police station. Users bitch variety are forwarded from the server aspect automatically . For figuring out vicinity and proper person, idea of cookies and IP addressing has been used .The customers may be notified if the police have filed the FIR. This undertaking is right for the police, too.. .The FIR in such instances may be registered quick in order that the docs can begin the remedy as early as possible. User Interface Module An authentication module is a plug-in that collects facts from a main asking for get admission to to a covered aid and tests the facts in opposition to entries in a information store . If the facts furnished meets the authentication standards then the person may be verified and if the facts furnished does now no longer meet the authentication standards, the person is denied validation.

Keywords - First Information Report(FIR), Victims, Evidence, Internate protocol

I.INTRODUCTION

Crime Reporting System" is a android application. This application offers facility for reporting online crime, show most favored criminal detail ,missing people etc. With the help of this crime reporting tool android application the police will realize the criminal information quickly. Online Crime Reporting System is superior on java,html and SQL Server. The number one intention for this undertaking is to provide all crime manage solutions which is probably with out issues reachable with the useful resource of the use of everyone. The tool starts offevolved offevolved with every folks that want to login a grievance through the internet just so it's miles very useful for police department and social worker to find out the hassle withinside the society without making people to go back again to police station every time. The number one purpose of the tool is to control criminal data in a centralized database and provide solution for public to provide grievance through online. This undertaking offers lot of features to control all the statistics in well manner. The tool has been superior to override the issues prevailing withinside the manual tool. The undertaking is supported to cast off and reduce the hardships faced with the useful resource of the use of the winning tool This tool is designed for precise need of the employer to carry out operations in a smooth and effective manner. The application is reduced as an entire lot as feasible to avoid errors while entering the statistics.and it moreover provide mistakess message while entering invalid statistics. No formal information is needed for the individual to use this tool and for that reason it proves it's miles individual friendly. Online crime reporting tool can purpose mistakess free, stable, reliable and fast manage tool and it may assist the individual to pay interest on the alternative sports activities in preference to to pay interest on the record keeping. The purpose of the undertaking is to automate the winning manual tool with the help of automated equipments and to fulfill the requirements just so the statistics can be stored for prolonged length with easy gaining access to and manipulation.

The big achievement of net and data generation have a splendid impact on each public and personal sectors inside a country. The net offerings and programs have extensively increased. That's why human beings discover it extra handy to apply net programs to provide an internet bitch concerning any suspicious interest in place of travelling a police station. This approach is fairly stable considering it's far viable to cover the identification of the individual that stated the bitch approximately the crime. Many instances aren't registered in police station because the individual complained desires to conceal the identification because of the viable danger or danger. It is likewise feared that there are numerous pending investigations because of loss of right evidences from the reporting human beings. An on-line software can bridge this communique hole among police and the people to ship reviews or different required data. This paper proposes an software that may be utilized by the people in Riyadh to document and manipulate their complains effectively. Further the gadget may be utilized by the human beings to sign up the court cases and is beneficial to the police branch in figuring out the

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

criminals. The most important cause of the software is to enhance the effectiveness and performance of interplay tactics among the police officers and not unusualplace human beings.

The reason of the challenge is developing a internet site wherein citizen may be file approximately crime. If all people desires to whinge in opposition to approximately crime he should do it thru police[4]. The crime management and reporting gadget made the crime reporting easier. This challenge may be beneficial for police branch and different agencies. The domestic web page is a login web page. Only the management and station in-fee of various police station can be capable of login their domestic web page

II.LITERATURE SURVEY

Author	Problem Statement	Discussion
TITLE: The Police complaints in india. AUTHOR:Divya Lala,Dahalila,Naveen Garb,Vikas deeps Student of information technology ,Amity university uttar pradesh	In this paper given only see the missing people list and no any authentication process.	According to this paper I prepare authentication module for Aadhar card only genuine person only login the page.
TITLE: Design and implementation of an Android device to internally position the use of the WLAN fingerprint.	in this paper do not provide fir facilities.	In this Paper given only sending location to police station.

Well and meaningful societies in the world frown at crime and any social vices that undermine the collective safety and values that have been adopted in that society. Crime persists as long as human society exist, therefore there is a continuous effort and legitimacy to report, investigate and provide convincing evidences to prosecute individuals who perpetrate any criminal activity. The word Crime originated from the Latin word Crimen dubbed charge or offence. Shodghangha (2011) projected Crime as a function of the adoption of standards by the society rather than individualistic standards, that is, the society gradually determine what is perceived as good value and bad acts and proscribe possible consequences. Tappan (2001) defined Crime as an intentional act in violation of criminal law which is without an excuse. Sampson et.al (1993) also defined Crime any act or omission that is forbidden by law that can be punished by imprisonment and/or fine after due hearing in a law court. Elizabeth (2003) expressed a holistic definition of Crime as an act that is not just harmful to some individuals but also to the state orgeneral public.

The determination of what is obnoxious or sane is determined through a long and continuous complex interactions and reactions among members of a society. As society varies so what is considered as crime varies from people to people. Wilson et.al (1985) argued that there cannot be a general theory to define Crime for all societies because of the diversity of human society and culture. More so, Gottfredson et.al (1990) and Sampson et.al (1993) had a different view, stating that differences in cultures and societies do not really matter but the common characteristics in cultures can be identified and a general theory can be formulated to prescribe what the society should adopt as a crime, that is criminologist should not isolate crimes but to look for the commonality in crimes so as to propose a general rule to determining Crime for all societies. The dynamism of culture and unpredictability of human make it unlikely to have a general set of rules for all human societies.

No continent is left out; Ukoji et.al (2016) reported that Africa is considered a flash point for high crime. He noted that giants of Africa like Nigeria and South Africa now have high records of violent crimes in recent time. America also has high crime index while some places in Europe have been able to crime index by few digits. Another important component of the justice system is the crime investigation and prosecution.The general knowledge of what Crime constitutes is not enough without ultimately punishing the offender to serve as deterrent and freeing the falsely accused persons in such occasions. The general justice system constitute the laws; which indicate what Crime is, the law apparatuses like security agencies, people and processes that are followed to implement justice. The people who are to be served by the justice system may soon begin to lose confidence and underreport or result to jungle justice to redress their anger if existing justice system continues to fail with time.Criminal justice system also constitute the system of practices and institutions of Government directed at ensuring social control, deterring and mitigating crime or sanctioning individuals who violate laws with criminal penalties and rehabilitation efforts.

Another important component of the justice system is the crime investigation and prosecution.The general knowledge of what Crime constitutes is not enough without ultimately punishing the offender to serve as deterrent and freeing the falsely accused persons in such occasions. The general justice system constitute the laws; which indicate what Crime is, the law apparatuses like security agencies, people and processes that are followed to implement justice. The people

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National Conference on Recent Trends in Engineering and Technology

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who are to be served by the justice system may soon begin to lose confidence and underreport or result to jungle justice to redress their anger if existing justice system continues to fail with time. Criminal justice system also constitute the system of practices and institutions of Government directed at ensuring social control, deterring and mitigating crime or sanctioning individuals who violate laws with criminal penalties and rehabilitation efforts.

However the perception of criminal justice system in Nigeria is usually put in poor light because of rapid and failing structures of the justice system. Tosin (2016) reported that Amnesty international has always rated Nigeria justice system poorly and it is represented as a conduit for injustice from start to end. The actors in the justice system have also not helped the situation to start acting as expected by the lofty positions they hold and the important role they play in the process of dispensing justice. There is a sentiment about law makers having vested interest there by making inadequate laws that do not really server the interest of the general public. The judicial system is also almost compromised as judges are bribed to pervert justice and dah the hope of the common man. Components of the justice system vary for different societies.

The process of the justice system is very important as it determines if the people who are served will accept the outcome of the process and continue to support the system. An important aspect of the justice system is being able to report cases, investigate and prosecute based on laws and get sentencing. Until recently, most communities report crime incidences on papers, which make the process vulnerable to alteration, theft; mutilation and erase of evidences that could have made the system apportion justice appropriately. With the advent of information technology, crime reporting has taken a new turn, has many cases can be reported independently and security agencies can easily access them and act promptly. There are state and individual sponsored ICT platforms for reporting, investigating crime and giving feed back to the people. The manual and 17 old process does not engage the people as anticipated which has gendered all sorts of perception about how professional and sincerely reported cases have been investigated. United States of America has a common database for reporting crime incidences which has improved policing in the US

III. EXISTING SYSTEM

The essential motive of growing the net crime reporting gadget is for the welfare and protection of the public. Due to a few elements in today's time public now and again do now no longer believe the authorities officers, because of this they don't ever need to visit the station and record a report. So this gadget will reconstruct the bridge among the two - public and authorities officers respectively. So now if absolutely everyone need to record a criticism or misconduct, they are able to do it without difficulty from their home. This internet site is an smooth to view form of a site. It is really accessible to absolutely everyone who's 16 years and above and that is an instance of a easy engineering which is simple and may be used freely without complexion. This internet site will offer consumer with a profile under which he/she will be able to upload whatever and no misuse might be performed asit has a few eligible standards and which needs to be taken care off, so the possibilities are less.

IV. PROPOSED WORK

In this device there are exceptional interface, one is for the public that's the general public portal wherein registration can be performed through the general public area after which comes the alternative portal which is the admin portal that's managed through government organization.

In this application there will be user and admin module.
Admin:
*__Login:__ Admin can login in this personal Account using id and Password.
*__View Complains:__ Admin can view the complains.
*__Update Cases:__ Admin can update the crime Report.
User:
*__User login:__ User can login to system to file.
*__Complaints:__ Complaints consists of basic details the system ask the user has to fill in order on register a complaints.

In this application there are two modules one of them is Admin and second is User. Admin can login own mail id and password. User can login own mail id and password. Allows officers to upload data about the criminal.
Officer and user have different accounts to maintain their records. Officer has right to delete the data and update the data.Public can view data of thieves and criminals according to category. More than 3 crimes in 2 years will be listed as wanted. User can file the case in virtual form and this form will be helpful for immediate action.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

You may be taken to the police station due to the fact the police arrest you for committing a crime. The police also can take you to the police station as an area of protection if they may be concerned approximately your intellectual fitness. Everyone who has been arrested has 3 fundamental rights. You can get unfastened prison advice, ask the police to allow a person understand you've got got been arrested and examine the police Codes of Practice. If you're vulnerable, you have to have the precise person with you on the police station that will help you recognize what goes on. If you've got got intellectual fitness problems, the police have to address this sensitively. They have to get you the precise person. And ask a clinical expert to look you.

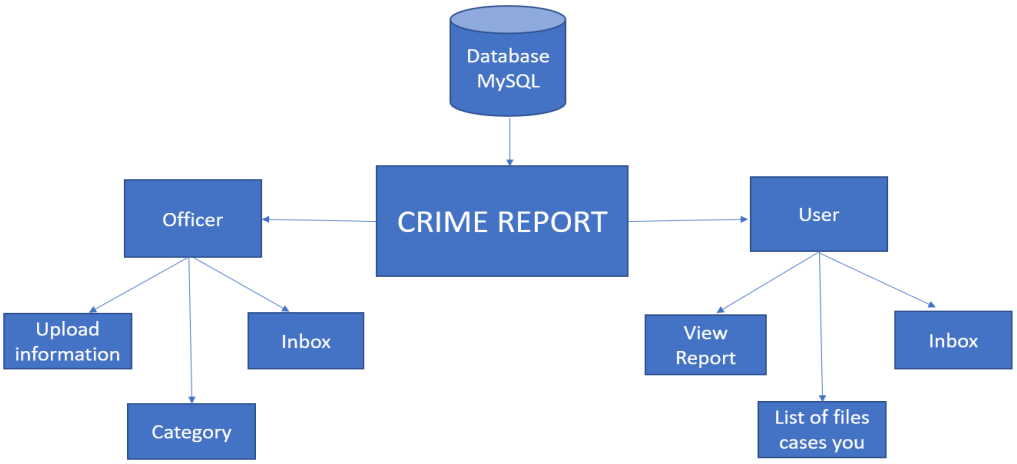

Fig.1. System Architecture of Crime Report System

Types of Crimes: Otwin et.al (1995) reported that long-term trend shows a steady increase in all crimes, with some fluctuation from year to year. Crimes have increased nearly threefold since 1960, the year Nigeria gained independence. A decline was however noticed in crime between 1967 and 1969 which may the consequence of the Biafra civil war. More so, crime data were not a high priority, and some of the most populous regions were in the secessionist areas and did not report at all.

1. Normal Crime: Normal crime includes criminal acts such as theft (kidnapping, shoplifting, armed robbery etc.), assault (e.g. rape, murder, manslaughter etc.), and homicide. Data on these crimes are published by the Nigerian police in annual reports which appear occasionally. However Bennett et.al (1990) and LaFree (1985) warned that reports coming from crime statistics should be treated as suspect because of inadequate and well-documented failures in reporting, recording, and collating procedures. Ekpenyong (1989) and Nkpa (1976) also reported armed robbery crime is significant among other crimes and has occurred throughout Nigerian history. It has become increasingly violent, however, following the civil war for two reasons: (a) criminals were able to buy or steal weapons from the military, and (b) some demobilized and unemployed soldiers who had few legitimate prospects after the war ended were enticed into using their military skills for illegality. Although the actual number of robberies are few, when they occur they are dramatic and heavily reported in the national media.i

2. Political- economic Crime: Political and economic crimes exist at all levels in Nigerian society and take different forms. Odekunle (1986) separates this category into Elite and working-class crimes. He classifies the elite crimes into white-collar (e.g., embezzlement, tax fraud), political and economic corruption (e.g., illegal patronage, vote buying and/or kickbacks), and organized crimes (e.g., hoarding, smuggling, burglary syndicates). Working-class Elite-crimes. Nigeria, as is common with most developing countries, must import many consumption and economic investment goods from developed countries. The dependence on importation opens the doors for corruption, fraud, and economic, elite white-collar crimes for both Nigerians and foreigners. Foreign companies often sell secondhand goods as new, sell shoddy goods they cannot sell at home, 6 overstate the price of goods, and understate the profits they attain to lower the tax they must pay for doing business in Nigeria. These activities require the induced cooperation of Nigerian nationals-their signatures are needed on import permits, sales contracts, consultancy assignments, and directorship appointments. Forrest (1993) also confirmed the collaboration between foreign companies and local officials such that these foreigners are willing to pay for access to profits, and find Nigerians eagerly in pursuit of personal wealth. Investigations conducted by the Nigerian government have revealed that such payoffs can be in the hundreds of millions of dollars. Diamond (1984) cites many instances of fraud, theft, and bribery during the 1978-1982 periods, all of which were discussed and condemned in the media.s complete.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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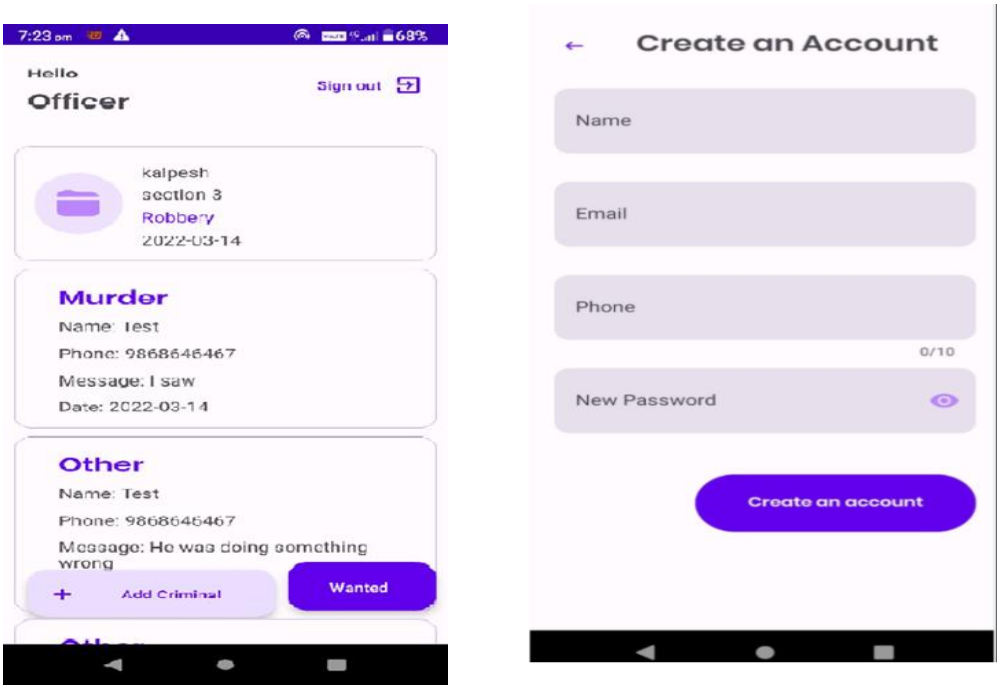
Vol. 9, Special Issue 1, April 2022

V. RESULT



- **Contribution:** The goal of our project is to develop a system for the computerization for the Police Officers.

VI. CONCLUSION

This project allows you to organize the data of criminals and helps the public to reach out the criminals irrespectively to the officer. The officer can take immediate action as virtual case file is allocated. By viewing the criminal data public can be alert by such candidates from their next actions.

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IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

SMS Spam Classifier

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Abstract: As the usage of mobile phones elevated, using short Message carriers accelerated substantially. Due to the lower prices of text messages; individuals started exploiting them for promotional functions and unethical activities. This resulted in the quantitative relation of spam messages increasing exponentially and thereby loss of private and monetary information. It is important to detect spam messages as quickly as possible to prevent data loss. We aim to develop a website that identifies the SMS i.e. spam or ham. We are importing the dataset from the UCI repository for spam SMS detection in this system. Data cleaning and pre-processing were done in python using the NLTK library. We are going to center on creating a Naïve Bayes show for spam message identification. These ML techniques can learn and identify spam messages and phishing messages by analyzing loads of such messages throughout a vast collection of computers.

Keywords: spam, ham, UCI repository, NLTK library, Naïve Bayes, phishing

I. INTRODUCTION

Short Text Messages (SMS) are an important way to do this correspondence today between a large number of individuals around the globe. In our day-to-day life, we receive a considerable amount of SMS messages from friends, telephone, banks, and companies regarding our daily transactions. In recent times, unwanted commercial bulk SMS called spam has become a huge problem on the internet. The person sending the spam messages is referred to as the spammer. Spam SMS is any unwanted text message sent to your mobile phone for commercial purposes. Some types of SMS spam try to charge mobile users by tricking them into calling premium-rate numbers registering for services or deceiving users into dealing with certain numbers to collect confidential information for use in other purposes As the People invest According to worked concurring up to 30% of messages are seen as spam in Asia, mainly because of the minimal effort of sending short messages. We are facing the problem of various types of malicious incoming SMS Malicious attackers. These advanced APIs allow attackers to send large numbers of SMS as well. Including malicious behavior when we respond positively or negatively to SMS Targeted attacks take place. As the spam messages squander network assets, yet additionally increase costs for cell phone customers and lead to digital assaults, for example, phishing. Henceforth there is a solid requirement for SMS spam identification. As a result, people's Banks lose real informative messages such as transactions. Ignorance of SMS can prove to be harmful as sometimes fraudulent transactions are possible, but the information is ignored. The main task of our project is to make a machine learning model which can predict the SMS as spam/ham. The purpose of this project Applies machine learning algorithms to distinguish spam messages from real messages. Machine Learning Techniques are used to make the process more agile and efficient.

On the other hand, we are facing a separate malicious incoming SMS issue Types of malicious attackers. Attackers can also send because of these advanced APIs Too many SMS with malicious behaviors when we reply to SMS Target attacks can be positive or negative. These could be attacks Consumers can get different types like economic impact, power consumption, etc. Data leakage and ransomware etc. On Android mobile, very secure Attacks can be made by sharing sensitive messages or clicking on sensitive messages. After the user clicks on the malware SMS, device security has compromised some attacks such as mobile botnets, spyware, and Trojans Mobile botnets Such as security attacks on pathless mobile operating systems. The attack targets smartphones and gives them full access to mobile data Contacts and photos etc. This attack is also self-propelled to forward malware Messages and emails to his contacts from the tampered mobile. Spyware attacks are designed to steal information from Internet users Move through the collection of cookies and sessions. It can steal very delicate Information such as user baking information, security key, and user browser History. It may also cause ads to pop up on devices. Trojan Attacks May Affect a variety of mobiles, such as malicious code insertion the operating system may cause the phone to lock and send messages ransomware, huge payment fees that lead to attackers, etc. Victims were forced to pay the full amount for unlocking mobile devices Or unlocking data.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

II. LITERATURE SURVEY

(Collin Mulliner and Charlie) are described in, how spam messages are injected into layers of communication, and how to block spam message injections. In this, they suggest a horizontal frame of the Radio Interface uses a monitoring phone. This can only be distributed to an Android-based mobile operating system for monitoring and testing SMS injections. (Bhowmicket al.) Proposed a concept called TREC (Conference for Text Recovery) is content Spam based filtering method. This spam detection method is developed based on context-based on SMS and emails mainly based on text-related data. In this spam, the acquisition is proposed using four steps. Making tokens,
Stop deleting words, Stemming, and Feature Domain. In Tokenization, it is a process of dividing a statement into several words. Next to the Suspended Names process is the removal process to remove non-teaching words like 'an ‟", „Is‟‟, „the‟‟ etc. will remove here. In the next Stemming process, in this case, change the name to the morphological format. The next step is Featured Feature, Comparison, and Calculation of input and spam words and ham data corpus. Using the BoW (Names Bag) model. Icon complete SMS affects spam or ham. (Kanaris et al) proposed a concept called Anti-Spam filtering, using standard data mining processes called N-Grams. Here the entry statement will be accompanied by the N-grams type. Here are the types that can be 1-gram, 2-gram, 3-gram, etc. After the conversion of N-gram, tokens will be able to compare Spam and Ham data corpus data. (Yerazuniset al.) a proposed concept called SBPH (Sparse Binary Polynomial Hashing), the main reason behind this, when comparing inputs to a statement containing Spam or Ham data corpus, may lead to serious accounting costs due to text-to-text comparisons. So, in this survey, they translated the text into hashing before comparing input data and data corpus. For both the input data and the corpus data we need to hide hashing, in this way we can cover the calculation costs. To receive a Spam Messages survey using concepts like BoW, following the proposed N-Grams, instead of text-by-text comparisons proposed SBPH survey, to develop this concept and reduce the cost of computation. (Siefkes et al.) Proposed a concept called OSP (Orthogonal Sparse Bigrams) in SBPH we need it to take combinations of the word 2N-1 to match the corpus. But in OSP, through proposed Concepts, we can reduce combinations to N-1. We can do this by using the proposed skip feature to Decrease the number of feature sets. Ying et al. propose a concept and prove that it is a better solution than OSP. As proposed Method LC (Local Concentration). In which they are calculated to have a weighted score Matching scores. Here he proposes two concepts of fixed length and the so-called sliding window Variable length. (Hamadi et al.) The SMS monitoring system is described at the Android Operating system kernel level. In it, he says that the + CMT command will be used for monitoring Forward and receiving messages from Android mobile. But there are such concepts Restricted to specific mobile operating systems.

III. PROBLEM STATEMENT

Short message service (SMS) is one of the popular communication services in which a Sends messages electronically. Discounting SMS benefits through telecom companies has led to the widespread use of SMS. The climb was filmed on Raiders SMS spam issue reported. Ads, free services, spam messages Promotions, awards, etc. People are using mobile phone devices which are expanding day by day by day they offer a huge variety of services by lowering the price of services. Short Message Service (SMS) is one of the most widely used communication services. In any case, it is SMS has spurred the proliferation of mobile phone attacks such as spam. The first in the problem the results mentioned or described here are based on publicly available datasets based in Singapore. This problem is further exacerbated by the use of multiple themed datasets.

IV. OBJECTIVE AND SCOPE

The purpose of this project is to classify and analyze Spam and non-spam (HAM) through the use and use of Flash. Because it could be the Web Benefit Advancement Micro Framework to create an API like Multilayer Perceptron and the like in Python it has been compared to the Neo Bayesian Classifier. The purpose of this work is to focus on different aspects to compare classification methods and their performance in Detect spam messages on a domain. Processed multiple SMS spam identification messages previously classified Methods to see which is the most successful and under the set of features.

V. EXISTING SYSTEM

Most of the current methods of combating SMS spam are exported from successful email anti-spam solutions. However, not all solutions to email spam apply to SMS due to the lack of specific information such as 140 bytes short message size (160 English alphabet characters), edit format, headers, and Multi-Purpose Internet Mail Exchanger (MIME). Non-standard abbreviations and abbreviations. Finally, support for text-only representations. The spam filter is implemented on the client-side (user mobile phone) or server-side (mobile network operator side) or on both ends (client and server-side approach).

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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VI. PROPOSED METHODOLOGY

The system requires load training SMS dataset accessible from the UCI repository, Data cleaning is a critically important step in any machine learning project. In tabular data, there are many different statistical analysis and data visualization techniques you can use to explore your data to identify data cleaning operations you may want to perform. Before jumping to the sophisticated methods, there are some very basic data cleaning operations that you probably should perform on every single machine learning project. These are so basic that they are often overlooked by seasoned machine learning practitioners, yet are so critical that if skipped, models may break or report overly optimistic performance results. ML model is used for the examination and order of the dataset. The chief degree of information is inspected from different sources to shape extract, SMS Spam identification is utilized to recognize whether it's ham or spam, Data pre-processing is a process of preparing the raw data and making it suitable for a machine learning model. It is the first and crucial step while creating a machine learning model. When creating a machine learning project, it is not always a case that we come across clean and formatted data. Vectorization is a technique by which you can make your code execute fast. It is a very interesting and important way to optimize algorithms when you are implementing them from scratch. Clarifies about extraction and highlights of Data Pre-processing dataset and Pre-processing to use the feature as well as removing the words stop and stemming Extraction, we can retrieve the most repetitive keywords as dataset attributes TfidfVectorizer Class This is a built-in Python library. One can view such a classification as a specialized form of Bayesian network, termed naive because it relies on two important simplifying assumptions. In particular, it assumes that the predictive attributes are conditionally independent given the class, and it posits that no hidden or latent attributes influence the prediction process.

VII. SYSTEM ARCHITECTURE:

A system that receives spam for short message service (Figure 1). The process involves the following steps:

A. The data selection category that provided the UCI machine learning resource data Kaggle and data downloaded from Kaggle in .csv format.
B. Data processing and pre-processing are done in Python using the NLTK library.
C. In the data mining process, machine learning models such as Na¨ıve Bayes were used.

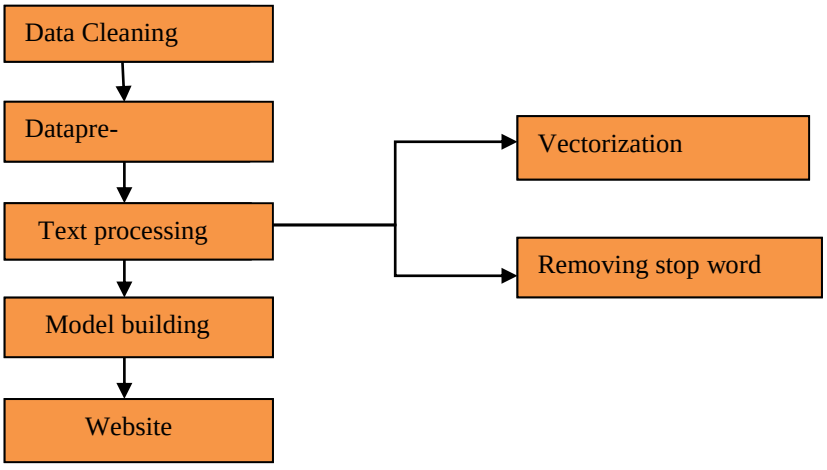

Fig.1 System architecture

A machine learning model is a file that has been trained to recognize certain types of patterns. You train a model over a set of data, providing it an algorithm that it can use to reason over and learn from that data. Once you have trained the model, you can use it to reason over data that it hasn't seen before, and make predictions about those data. Once pre-processing and feature-complete Extraction can then divide the dataset into training and we select Machine Learning Classifiers, such as NB can be used to diagnose SMS spam Take test data as input and with the help of the training dataset, the naive Bayesian classifier provides a simple approach, with clear semantics, to representing, using, and learning probabilistic knowledge. The method is designed for use in supervised induction tasks, in which the performance goal is to accurately predict the class of test instances, and in which the training instances include class information it presents the output as spam or ham. Then the pre-prepared information data is changed into a machine decipherable structure or non-relevant structure by changing over to vector or by doing discretization, investigates the utilization of Bayes calculation to

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

the characterization issue is considered and the model is tried Later Turing the spam message classifier into a web application.

VIII. RESULT

Fig.1 Home page
Here is the page when the web browser navigates, we can enter the messages

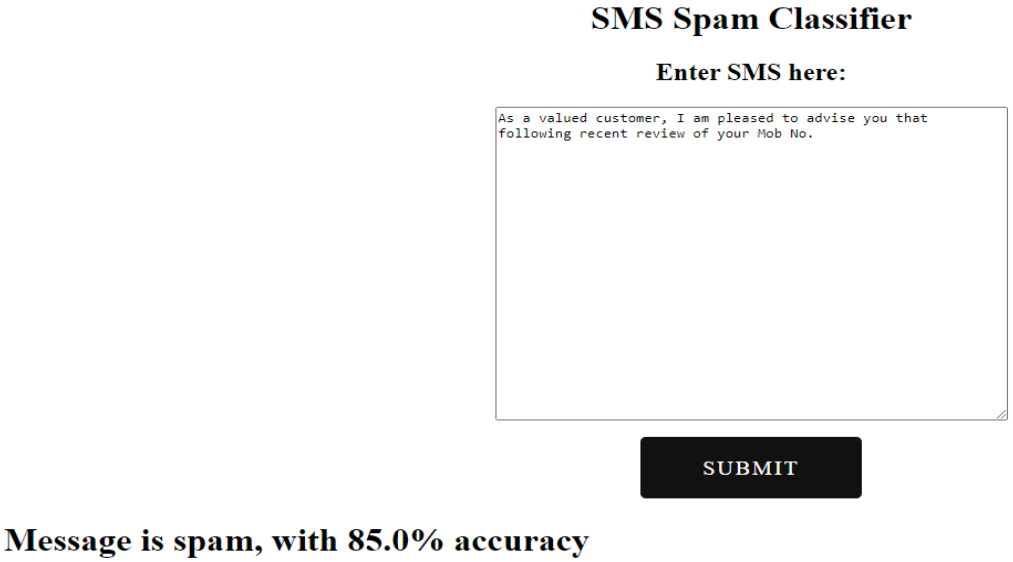

Fig.2 shows SPAM Message which is generally sent in Systems

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

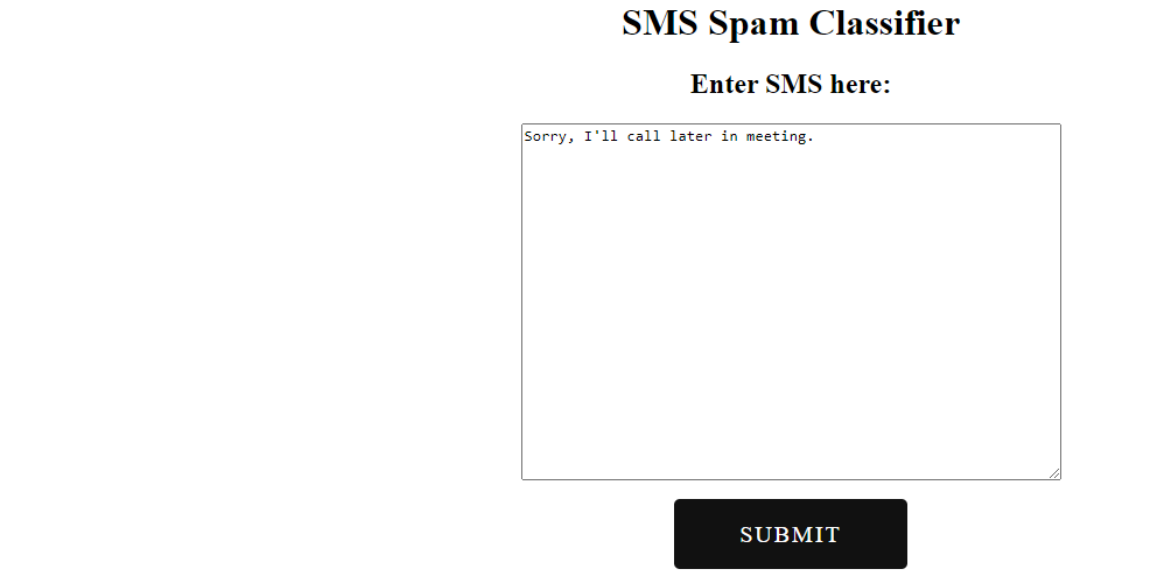

Fig.3 shows Ham's message

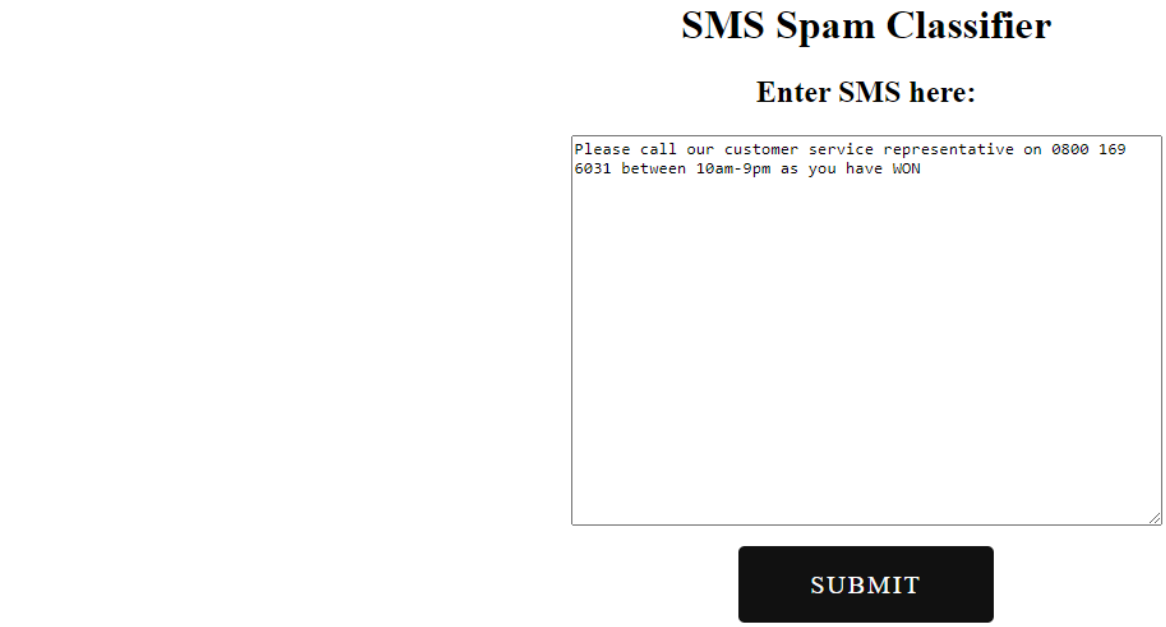

Fig.4 shows SPAM Message which is generally sent in Systems

IX.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

X. CONCLUSION:

Due to limitations associated with existing SMS spam filtering policies, especially for client-side SMS spam fixes, the following errors have been identified:

A. Limited memory space
B. Limited Bag of Words (BoW)
C. Power and calculation requirements
D. Limited processing capacity.

Therefore, the errors listed above make it impossible to implement computationally serious solutions on the client-side. This study proposes a positive and collaborative Server-side SMS spam filtering solution with an intrusion detection system to ensure privacy and consumer safety. The positive nature of the proposed system allows it to be adapted Spammer concept drift like mispronunciation, compound, hyphenation, toggle, etc.

This work can be done for future work Extended using another dataset to increase accuracy. In addition, the use of features is also considered.

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ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

Sanitary Pad Disposal Machine

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Abstract: Improper disposal of the sanitary pad can lead to various problems which include large heaps of pads all over, bacteria causing infection, unhygienic environment etc. The flushing in drain results clogging in drain and throwing in dustbins results in health related problems due to hazardous content in the used sanitary pad. Sanitary Napkin Incinerator is a product where the used Sanitary Napkin can be disposed off most user friendly and safe way, by burning it at the required temperature. The solution of both of this problem is installing automatic sanitary napkin vending and disposal machine. Fabrication of both vending and disposal machine will provide an easy availability of napkin and disposal of napkin at the same time in hygiene manner. This system aims to work on solar powered intelligent sanitary napkin vending and disposal machine. The proposed system uses safe scientific process of disposal of sanitary napkins is to incinerate them to ash, in comparatively low temperatures. This system is one of the best way to dispose menstrual waste is to burner is napkin using electrical fire based burner without allowing smoke generate in the process to escape into the atmosphere.

Keywords*:* Electromagnetic switch, Arduino UNO R3,Temperature sensor.

I. INTRODUCTION

The management of solid waste is an important concern in developing and emergency conditions, e.g. those of a refugee camp, where solid waste management infrastructure and services are far from achieving basic standards in terms of hygiene, efficient collection and disposal (Collivignarelli, 2004).These situations are characterized by: difficulties in evaluating and choosing the most appropriate solution with respect to the specific operating conditions, inadequate service coverage, operational inefficiencies of services, limited utilization of recycling activities, inadequate management of non industrial hazardous waste, and inadequate landfill disposal.

Every month, 353 million women and adolescent girls across India need to dispose of their that women did not want the menstrual waste in their houses so they disposed it away without thinking much about how it will be disposed of further.With Sanitary Napkins, we also need to give solution to dispose these sanitary napkins and avoid current ways of disposal like sanitary napkins are mixed with regular waste and it's difficult to segregate them and dispose them off. Good menstrual hygiene practices means that women and adolescent girls are using a clean menstrual management material to absorb or collect menstrual blood, that can be changed in privacy as often as necessary for the duration of a menstrual period, using soap and water for washing the body as required, and having access to safe and convenient facilities to dispose of used menstrual management materials. Poor menstrual hygiene management (MHM) can negatively impact the health and psycho-social well-being of women and girls. Most of the health problems of women are cause due to menstrual cycle. A solution to this problem is installing automatic sanitary napkin vending machine in school, college and public places, working and educational institutions, it would help them to get the napkins as and when they needed. Vending machine to be fabricated and integrated with disposal machine, so that dispensing and disposing of napkin can be achieved in a single unit.

II. OBJECTIVE OF WORK

To install incinerators that will decrease spread of disease due to disposal of sanitary napkins, and to take care of the issue of sanitary napkin disposal and decrease pollution due to reduced clogging of drainage system in public and also we use scrubber to reduce air pollution from disposal machine.

III. METHODOLOGY

- Literature Survey
- Study of Materials
- Design and Modeling of Incinerator
- Manufacturing Process

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

- Results and Discussion

IV. LITERATURE SURVEY

A.Chourasia Sandhya Bhagawat, Dr. Tambolishabanam, Mali Satish (2019): Napkin disposer too can be fabricated and integrated with the vending machine, so that dispensing and disposing can be achieved in a single unit [1]

B.Madheshwar Subhramaniyan; Anandha Moorthy Appusamy; Prakash Eswaran (2019): The system involves an incinerator which uses electricity to heat the heating coil which in turn will lit up the sanitary napkins when dumped into the incinerator [2].

C. Rotary Club of kalyan (2017): Discretion and hygiene would be factors of concern in managing menstruation for girls, and too little information about menstrual disposal practices at the exterior was happened [3].

D.K. Samba Siva Rao, K. Harish, M. Kavin Kumar, D. Vishnu Harish (2018): The system works on the automatic napkin dispenser in toilets and places that keep track of available napkins and inform the person concern when fewer napkins are available [4].

E.Akshey B Tower to Bhangava (2016): Wet scrubbers are compactible and effective air pollution control devices to arrest particulate matters and polluting gases coming out of industrial processes as air pollution emissions there are various types of wet scrubbers but the present papers deals with the spray towers for a 100 TPD cement plants based on the vertical shaft technology (VSK) after monitoring the air emissions in regard to designed parameters under variable conditions on a time scale [5].

F. Chourasia sandhya bhagawat, dr. Tambolishabanam. S Mali satish & jamdadeamar (2019) : This system is among the very best method to dispose waste that would bleach napkin utilizing fire, without letting the procedure generated in, by the smoke established burner. Also we know that objectives of incinerator. background and related work ,disposal method. Present Challenges in Market: Design and Develop a Smart, Cost Effective, Efficient Sanitary Napkins Incinerator Machine which will automatically burn the sanitary napkins thrown inside the machine and Portable Sanitary Napkin Incinerator comprising a chamber, having there in, a heating unit arranged in grid fashion for supporting the sanitary napkin. We Have Two Major Objectives for this Project • To educate and develop awareness on utilization of Sanitary Napkins and supply accessibility by installment, straight to Sanitary Napkins Vending Machines using application in Schools and Faculties that, Girls/Women get habituated to apply this Sanitary Napkins for their health care [6].

G. Yash pawar, pradnya chavan, prof meena ugale (2020): Present Challenges in Market: Design and Develop a Smart, Cost Effective, Efficient Sanitary Napkins Incinerator Machine which will automatically burn the sanitary napkins thrown inside the machine and Portable Sanitary Napkin Incinerator comprising a chamber, having there in, a heating unit arranged in grid fashion for supporting the sanitary napkin. We need to educate and guide women, girls regarding the disposal of sanitary pads in a proper way. Poor menstrual management and improper disposal of sanitary wastes lead to a various medical complication, raising awareness on menstrual management and breaking the silence and stigma around menstruation on the issue of safe disposal and to promote the cleanliness about our country [7].

V. PROPOSED SYSTEM

Destroys solid sanitary napkins hygienically, Powder coated steel body, User friendly features and easily usable, Operates on electricity, Burns 150 t0 200 napkins per day, can be programmed for cycles/day Burns napkins completely producing only less than 1 gm of ash per napkin. It consists of different component like Arduino UNO R3, Relay Driver, Heating coil, Temperature sensor, Filter and 16*2 LCD Display. When system is connected i.e. 230V AC the power supply present in the system convert that 230V AC into 5V DC. This voltage is applied to the arduino uno and it starts to work Once the program is loaded into the computer along with a system name i.e." Sanitary Napkin Disposal System", the initial state of timer i.e. ON/OFF and temperature reading are display on LCD.As system turn ON, another power supply converts 230V AC into 12V DC which is required for the relay to turn ON, its starts heating the coil of burner. Once the required heat to burn the napkin is attained, the Microcontroller display the message regarding the system being ready for its process. A timer is being programmed for 5min to dispose of one napkin. After the dispose ash is produce which is the final output we want. Once the ash is completely form, LED glows indicating that process is completed and turn of the heater and relay. Also there is another condition such a that if we put another napkin along with the napkin under process, the sensor present

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

there sense another napkin and automatically increments the time of the timer by 5 minutes for which the timer is being programmed. Time is go increasing with quantity of napkin with 5 minutes. In this way system works.

VI. SYSTEM ARCHITECTURE

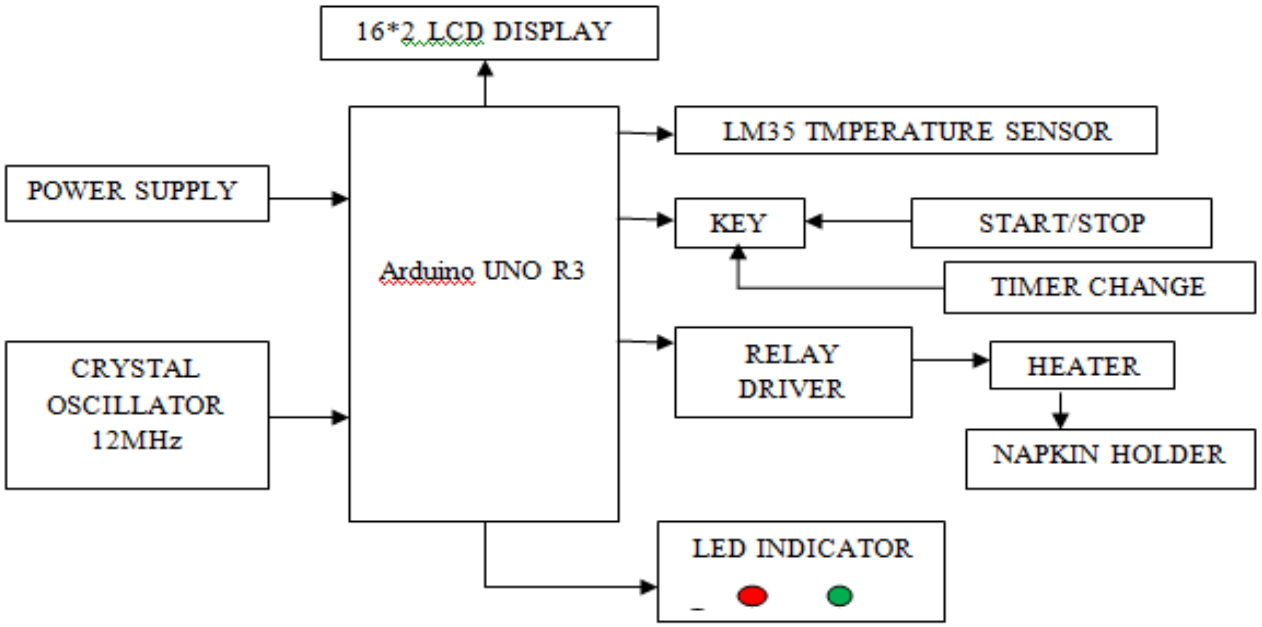

Fig. 1 Block diagram

Hardware Specifications:-

- Arduino UNO R3
- Temperature Sensor LM35
- 16*2 LCD Display
- Electrical Heating Coil
- filter
- Relay Driver [ULN2803]
- Light Emitting Diode [LED]

Software specifications:-

- Arduino IDE

VII. COMPONENTS USED

A.Arduino UNO:- Arduino uno based on ATmega328 and it is same as microcontroller. It includes digital input/output pins 14, analog input 6, USB connection, and reset button also , resonator-A16MHz this all components helps to connect this board to computer. The power supply can be given to this board by AC/DC adapter, USBcable or battery. The operating voltage is 5V. and input voltage is 7v or 12V . flash memory is 2KB , EEPROM is 1KB, CLK speed is 16MHz, also TX/RX pins and test LED.

B.Electromagnetic Relay:- Electromagnetic relays are the oldest type of relays used in the market. The electromagnetic relay operates largely as per the principle of electromagnetic induction, which also means that as the electric current is passed on the conductor, the conductor behaves like a magnet. Further, the armature gets back to its initial position under tension of the spring to part the movable contact from the stationary contact (normally closed contract or NC). A relay is capable of handling the high power needed to directly control a load but the difference is of voltage. A temperature sensor is an electronic device that measures the temperature of its environment and converts the input data into electronic data to record, monitor, or signal temperature changes. Some temperature sensors require direct contact with the physical object

that is being monitored (contact temperature sensors), while others indirectly measure the temperature of an object (non-contact temperature sensors)

C.Heater:-Electric heater converts Electric energy into heat energy in the form of resistive loss in the resistive element. Resistive element is the alloy of two metals. When current pass through this coil it was heated and pass this heat energy to material filled inside and its burns. And converted into ash.

VIII. WORKING

The sanitary napkin is inserted through the door opening and allowed to fall and rest against the door extension which closes the material inlet. The door is then closed, thereby enabling the door extension to rotate downwardly to allow the sanitary napkin to fall onto the heating coil. The heat supplied by the heating coil burns the sanitary napkin to ash which falls, by gravity, through the heating coil into the removable tray where the debris is collected.

Air passing into the housing through air inlet also aids in both the combustion of the sanitary napkin and the conveyance of the undesirable fumes and odors to the filter assembly. The filter assembly filters the gases passing there through and removes any undesirable odors and fumes so that only filtered and clean gases may be returned to the immediate environment of the room through the clean gas outlet. The operation of the circuit is such that, when the Switch is closed, current will flow through the switching mechanism directly to the heating coil and to the motor of the fan. Either upon the expiration of a time interval or upon the presence of specified temperature in the heating chamber, the current to the heating coil will be terminated and the current will be directly passed to the motor of the fan which will operate the fan for a specified period of time after the heating coil is deactivated.

IX. CONCLUSION

Sanitary waste disposal has become and increasing problem in India as the plastic used in disposable sanitary napkin's are not bio-degradable and lead to health and environmental hazard. The purpose of our job is to keep environment clean by means sanitary napkin disposal method, we also should provide solution to dispose sanitary napkin and steer clear of present ways of disposal such as sanitary napkins are blended with regular trash, and it isn't easy to distinguish them and remove off them.

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IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

Protection of Wireman For Non Back Current Of Generator/Inverter

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Abstract: Backfeeding is the flow of electric power in the direction reverse to that of the generally understood or typical flow of power. Depending on the source of the power, this reverse flow may be intentional or unintentional. If not prevented (in the case of unintentional backfeeding) or properly performed (in cases of intentional backfeeding), backfeeding may present unanticipated hazards to electrical grid equipment and service personnel.

I. INTRODUCTION

Intentional backfeeding

Development and economization of consumer power generation equipment such as wind turbines and photovoltaic systems has led to an increase in the number of consumers that may produce more electrical power than they consume during peak generating conditions. If supported by the consumer's electric utility provider, the excess power generated may be fed back into the electrical grid. This process makes the typical consumer a temporary producer while the flow of electrical power remains reversed. When backfeeding is performed this way, electric utility providers will install a specially engineered electrical meter that is capable of net metering.

Unintentional backfeeding

A common source of unintentional backfeeding is an electrical generator (typically a portable generator) that is improperly connected to a building electrical system. A properly installed electrical generator incorporates the use of a transfer switch to ensure the incoming electrical service line is disconnected when the generator is providing power to the building. In the absence (or improper usage) of a transfer switch, unintentional backfeeding may occur when the power provided by the electrical generator is able to flow over the electrical service line. Because an electrical transformer is capable of operating in both directions, electrical power generated from equipment on the consumer's premises can backfeed through the transformer and energize the distribution line to which the transformer is connected.[1]

Intrinsic backfeeding

Backfeeding also exists in other instances where a location that is typically a generator becomes a consumer. This is commonly seen when an electrical generation plant is shut down or operating at such a reduced capacity that its parasitic load becomes greater than its generated power.[2] The parasitic power load is the result of the usage of: pumps, facility lighting, HVAC equipment, and other control equipment that must remain active regardless of actual electrical power production. Electrical utilities often take steps to decrease their overall parasitic load to minimize this type of backfeeding and improve efficiency.[3]

Grid Design Considerations For manufacturing cost and operational simplicity reasons, most circuit (overcurrent) protection and power quality control (voltage regulation) devices used by electric utility companies are designed with the assumption that power always flows in one direction. An interconnection agreement can be arranged for equipment designed to backfeed from the consumer's equipment to the electrical utility provider's distribution system. This type of interconnection can involve nontrivial engineering and usage of costly specialized equipment designed to keep distribution circuits and equipment properly protected. Such costs may be minimized by limiting distributed generation capacity to less than that which is consumed locally, and guaranteeing this condition by installing a reverse-power cutoff relay that opens if backfeeding occurs. [4]

Safety and Operational Hazards Because it involves transfer of significant amounts of energy, backfeeding must be carefully controlled and monitored. Personnel working on equipment subject to backfeeding must be aware of all possible power sources, and follow systematic protocols to ensure that equipment is fully de-energized before commencing work, or use special equipment and techniques suitable for working on live equipment.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

When working on de-energized power conductors, lineworkers attach temporary protective grounding assemblies or "protective ground sets", which short all conductors to each other and to an earth ground. This ensures that no wires can become energized, whether by accidental switching or by unintentional backfeeding.
Because of the hazards presented by unintentional backfeeding, the usage of equipment that defeats engineered or standardized safety mechanisms such as double-ended power cords (an electrical cord that has a male electrical plug on both ends) is illegal and against the United States National Electrical Code

II. LITERATURE SURVEY

Roshan M. Hatwar, Kunal T. Rahandale, Mohan G. rivedi, DzConcept, Design and Development (Naik et al., 2013) optimum siting as well as sizing of DGs and also shunt capacitor at the RDN for the objective of active power loss reduction is attracting the interest of electrical power utilities in the recent time. Some integral advantages of power loss reduction consists of decrease of power flow in feeder lines, reduces tension on feeder loading, as well as therefore enhances their lifetime, includes possibility to utilizing the existing centre to offer any kind of raised load need, evasion of power bought from the grid and also the expense of loss compensation tools, decrease in consumer expense, and so on. The paper proposed a technique based upon the logical method for optimum allotment of siting and sizing of DGs as well as a capacitor with the goal to reduce the overall active power loss based on equality and also inequality restraints in the RDN. A sensitivity evaluation strategy has actually used to determine the optimum prospect places for DGs as well as capacitor positioning and also the heuristic curve suitable method is utilized to identify their optimum capacity in the circuits. To verify the viability of the suggested technique, it has actually been tested 12-bus and IEEE 33-bus RDN. The acquired simulation outcomes, as well as the contrast of various situations taken into consideration, discloses that allotment of DGs, as well as capacitor mix, leads to substantial loss decrease with great voltage profile as well as additionally release in the line loading in the power RDN. It can be wrapped up that allotment of capacitor alone can enhance the voltage but might not lower the loss as expected. However, allotment of DG can lower the power losses as well as additionally enhances the system voltage account. If the DG, with both active as well as reactive power generation ability, is integrated with the capacitor and is ideally placed, can lead to a considerable decrease in an actual power loss of the RDN and additionally boosts the voltage account along the feeder.
(Khatod et al., 2013) the paper proposed an evolutionary programs (EP) based method for the optimum positioning of DGs based on renewable resources (wind as well as solar) in RDN. The relationship between load as well as renewable energies has actually been squashed by separating the research duration into numerous sections and dealing with each section separately. To deal with the unpredictability‟s related to load and renewable energies, probabilistic strategies have been utilized. Two procedure methods, particularly shutting off wind turbine generator as well as clipping wind turbine generator outcome, have been embraced
to limit the wind power dispatch to a defined portion of network load for network stability factor to consider. To minimize the search area and thus to reduce the computational concern, a sensitivity evaluation method has been utilized which provides a collection of areas appropriate for DGs positioning. For the suggested EP based method, an index-based plan has been created to produce the populace guaranteeing the expediency of each person and also hence significantly decreasing the computational time. The created method has been tested on 69-bus RDN. The options cause a substantial decrease in loss and voltage profile enhancement.

III. OBJECTIVE AND SCOPE

When it comes to inverter vs generator for home usage, many Indian households get confused about what is right for them. Although there is a difference between inverter and generator, most people don’t fully understand it and believe them to be the same. While generators produce electrical power, inverters basically convert DC current to AC current. Both can be used at home, but deciding which is better, generator or inverter, depends on a number of factors.

IV. EXISTING SYSTEM

Importance Of Contactor :

A contactor is an electrically-controlled switch used for switching an electrical power circuit.[1] A contactor is typically controlled by a circuit which has a much lower power level than the switched circuit, such as a 24-volt coil electromagnet controlling a 230-volt motor switch.

Unlike general-purpose relays, contactors are designed to be directly connected to high-current load devices. Relays tend to be of lower capacity and are usually designed for both normally closed and normally open applications. Devices switching more than 15 amperes or in circuits rated more than a few kilowatts are usually called contactors. Apart from

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

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optional auxiliary low-current contacts, contactors are almost exclusively fitted with normally open ("form A") contacts. Unlike relays, contactors are designed with features to control and suppress the arc produced when interrupting heavy motor currents.

Contactors come in many forms with varying capacities and features. Unlike a circuit breaker, a contactor is not intended to interrupt a short circuit current. Contactors range from those having a breaking current of several amperes to thousands of amperes and 24 V DC to many kilovolts. The physical size of contactors ranges from a device small enough to pick up with one hand, to large devices approximately a meter (yard) on a side.

Leakage Currents

Electric equipment operating in the patient vicinity, even though operating perfectly, may still be

hazardous to the patient. This is because every piece of electrical equipment produces a leakage

current. The leakage consists of any current, including capacitively coupled current, not intended to be applied to a patient, but which may pass from exposed metal parts of an appliance to ground or to other accessible parts of an appliance.

Normally, this current is shunted around the patient via the ground conductor in the power cord. However, as this current increases, it can become a hazard to the patient.

Isolated systems are now commonly used to protect against electrical shock in many areas, among them:

- Intensive care units (ICUs)
- Coronary care units (CCUs)
- Emergency departments
- Special procedure rooms
- Cardiovascular laboratories
- Dialysis units
- Various wet locations

Without proper use of grounding, leakage currents could reach values of 1,000 μA before the problem is perceived. On the other hand, a leakage current of 10 to 180 μA can injure the patient. Ventricular fibrillation can occur from exposure to this leakage current.

The following figure illustrates the origin and path of leakage current.

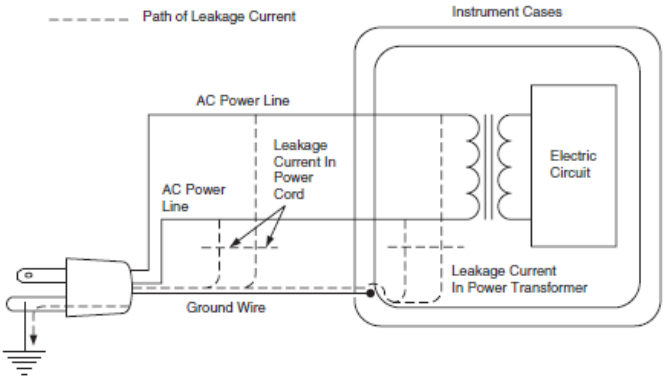

Fig: Path of Leakage Current

Failure to use the grounding conductor in power cords causes a dangerous electrical hazard. Thiscommonly results from using two-prong plugs and receptacles, improper use of adapters, use oftwo-wire extension cords, and the use of damaged electrical cords or plugs. The following figure illustrates these hazards.

Working

When current passes through the electromagnet, a magnetic field is produced, which attracts the moving core of the contactor. The electromagnet coil draws more current initially, until its inductance increases when the metal core enters the coil. The moving contact is propelled by the moving core; the force developed by the electromagnet holds the moving and fixed contacts together. When the contactor coil is de-energized, gravity or a spring returns the electromagnet core to its initial position and opens the contacts.

For contactors energized with alternating current, a small part of the core is surrounded with a shading coil, which slightly delays the magnetic flux in the core. The effect is to average out the alternating pull of the magnetic field and so prevent the core from buzzing at twice line frequency.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

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Because arcing and consequent damage occurs just as the contacts are opening or closing, contactors are designed to open and close very rapidly; there is often an internal tipping point mechanism to ensure rapid action.

Rapid closing can, however, lead to increase contact bounce which causes additional unwanted open-close cycles. One solution is to have bifurcated contacts to minimize contact bounce; two contacts designed to close simultaneously, but bounce at different times so the circuit will not be briefly disconnected and cause an arc.A slight variant has multiple contacts designed to engage in rapid succession. The first to make contact and last to break will experience the greatest contact wear and will form a high-resistance connection that would cause excessive heating inside the contactor. However, in doing so, it will protect the primary contact from arcing, so a low contact resistance will be established a millisecond later. This technique is only effective if the contactors disengage in reverse order that they engaged. Otherwise the damaging effect of arcing will be split evenly across both contactors.[citation needed]

Another technique for improving the life of contactors is contact wipe; the contacts move past each other after initial contact in order to wipe off any contamination.

2. ADVANTAGE

- There is no need of any manual operator as the system is fully automatic.
- Switching time changes according to our requirement .
- Energy is Conserved.
- There are lower chances of Accident.
- Risk of accidents is also minimized.
- Helps in reducing unwanted use of Manual Operator.

V.EXPLANATION

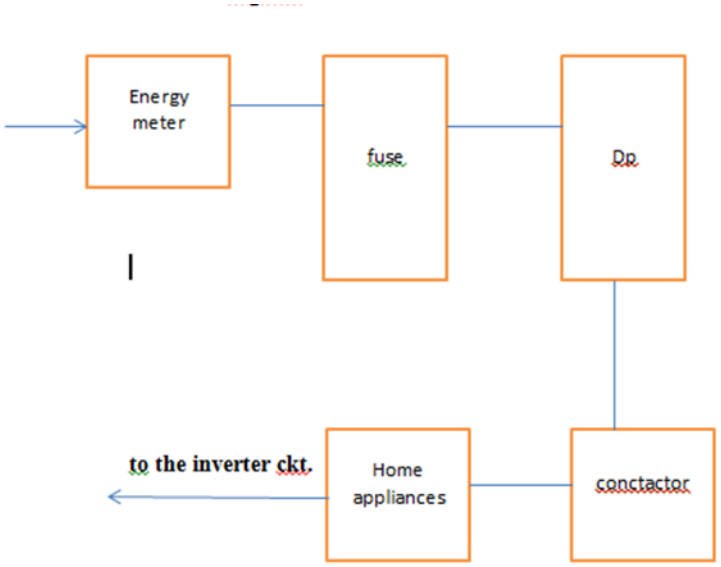

Fig:Block Digram

Explanation

In this we connect energy meter to the fuse circuit and in series with DP after that a test lamp is connected for testing purpose and then connected to the contactor and after that that contactor we connect this to home appliances.

When there is MSEB supply is on at that time its important that inverter or generator supply is off so that there is no danger of short circuit. When MSEB supply is off inverter supply is on and the same time contactor opposes the reverse current flow toward pole so that wireman's life protected.

IARJSET

ISSN (Online) 2393-8021
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Vol. 9, Special Issue 1, April 2022

VI . CONCLUSION

Three optimal sized DGs units at various power factors are penetrated at an optimal location in the IEEE 69 bus system with the help of adaptive schemes. The adaptive schemes are based on ANFIS, BBO, and PSO techniques. These adaptive schemes are successfully modelled using MATLAB software and tested into the IEEE 69 bus RDN. Comparison of the results between these three adaptive schemes for DGs penetration, with simple DGs penetration and base case, i.e. without DGs penetration, is done successfully. The DGs penetration has successfully done for power loss minimization and voltage profile enhancement of the RDN.

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IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

Street Light Automation Control using Advanced PIR Motion Sensor

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Abstract:Smart Street light is a robotized framework which automate the road. The primary point of Smart Street light isto reduce the power utilization when there are no vehicle moments on road. The Smart road light will turn to be ON when there are vehicles out and about generally the lights will be turned OFF. With improvement in technology, things are getting to be easier and simpler for everybody around the world today. Robotization is the utilization of control frameworks and information technologies to decrease the requirement for human work in the production of services and enterprises. In the extent of industrialization, robotization is a stage past mechanization, though motorization gave human operators apparatus to help the clients with the solid prerequisites of work, robotization enormously diminishes the requirement for human sensory and mental requirements also. Automation play a vital job on the world's economy and in day by day experience. Programmed frameworks are being favored over manual framework. The experimental work demonstrates programmed control of streetlights because of which control is spared to a degree. The Smart road light gives an answer for energy recusing and saving which is accomplished by detecting a moving toward vehicle utilizing the IR sensors and after that exchanging ON a block of road lights in front of the vehicle. As the vehicle moves by, the street lights turn OFF naturally. Subsequently, we save a great deal of energy. So at the point when there are no vehicles on the roadway, at that point every one of the lights stay OFF Index Terms: IR(infrared motion sensor),LDR(Light dependent resistor),LED(light emitting diode).

I. INTRODUCTION

Automated street light is very efficient as compared to normal light system. We are using PIR Motion sensor to detect motion an turn on and off the light system. PIR sensors is one of the commonly used sensor for motion detection No human interaction with control system required. After installation system is very cost efficient and power efficient. PIR sensor automation can be used in various places for automation purpose the smart road light gives an answer for energy recusing and saving which is accomplished by detecting a moving towards vehicle utilizing the PIR sensor and after that exchanging on a block of road light in front of the vehicle. Internet of Things (IoT) is the networking of physical objects that contain electronics embedded within their architecture in order to communicate and sense interactions amongst each other or with respect to the external environment. In the upcoming years, IoT-based technology will offeradvanced levels of services and practically change the way people lead their daily lives. Advancements in medicine, power, gene therapies, agriculture, smart cities, and smart homes are just a very few of the categorical examples where IoT is strongly established. With increment in urbanization and improvement of the city life, the utilization of street lighting is expanding day by day.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

II. LITERATURE SURVEY

Using sunset and sunrise procedures and the information of light intensity the system controls the street lights being kept in automatic programming mode.The proposed control organization empowers disconnection of the road lighting framework from the mains amid pinnacle load time, lessening its effect in the distributed power framework natural utilization, decline the administration cost and screen the status data of every road lighting unit. This system is developed to give the benefits of operating and controlling light intensity, automatic running of street lights and scheduling through web browser. This is monitoring and control system of street lights which makes use of system's control command to make the street lights on and off automatically. Rajput and katav propounded an intelligent street lighting system to lessen the large amounts of power wasted in street lightening system.To be specific, a low weight sodium light, a high weight sodium light and a fluorescent light have been utilized for establishment in every pole to decide the reasonable framework to introduce in a regular provincial zone of Thaila

III. OBJECTIVE AND SCOPE

This project "IOT Based Smart Intelligent Lighting System for Smart City " is a cost effective, practical, eco-friendly and the safest way to save energy and this system the light status information can be accessed from anytime and anywhere. It clearly tackles the two problems that world is facing today, saving of energy and also disposal of incandescent lamps, very efficiently. Initial cost and maintenance can be the draw backs of this project.With the advances in technology and good resource planning the cost of the project can be cut down and also with the use of good equipment the maintenance can also be reduced in terms of periodic checks. The LEDs have long life, emit cool light, donor have any toxic material and can be used for fast switching. For these reasons our project presents far more advantages which can over shadow the present limitations. Keeping in view the long term benefits and the initial cost would never be a problem as the investment return time is very less. The project has scope in various other applications like for providing lighting in industries, campuses and parking lots of huge shopping malls. This can also be used for surveillance in corporate campuses and industries.The above project we can develop solar street light system with Automatic street light controller. The system can be powered from a battery, which can be charged during day time by harvesting the solar energy through a solar cell. The solar energy harvested from sunlight can be stored, inverted from DC voltages to AC voltage using sun tie converter. The AC voltage can be stepped down rectified and using the circuit. The above mentioned strategy will enable us to harvest solar energy in an effective way for the operation of the circuit and for powering the street light also.

IV. EXISTING SYSTEM

To administer and keep up complex road lighting frame of reference all the more financially, different road light control frameworks are created.HID lamps are a category of electrical gas remittance lamp which bring forth light by means of an electric arc in middle of tungsten electrodes resided inside a translucent or crystalline fused quartz or inter fuse alumina arc tube.Once the arc is initialized, it heats and disperse the metal salts materializing plasma, the plasma thus generated greatly boosts the concentration of light emitted by the arc and power consumption is curtailed.

IARJSET

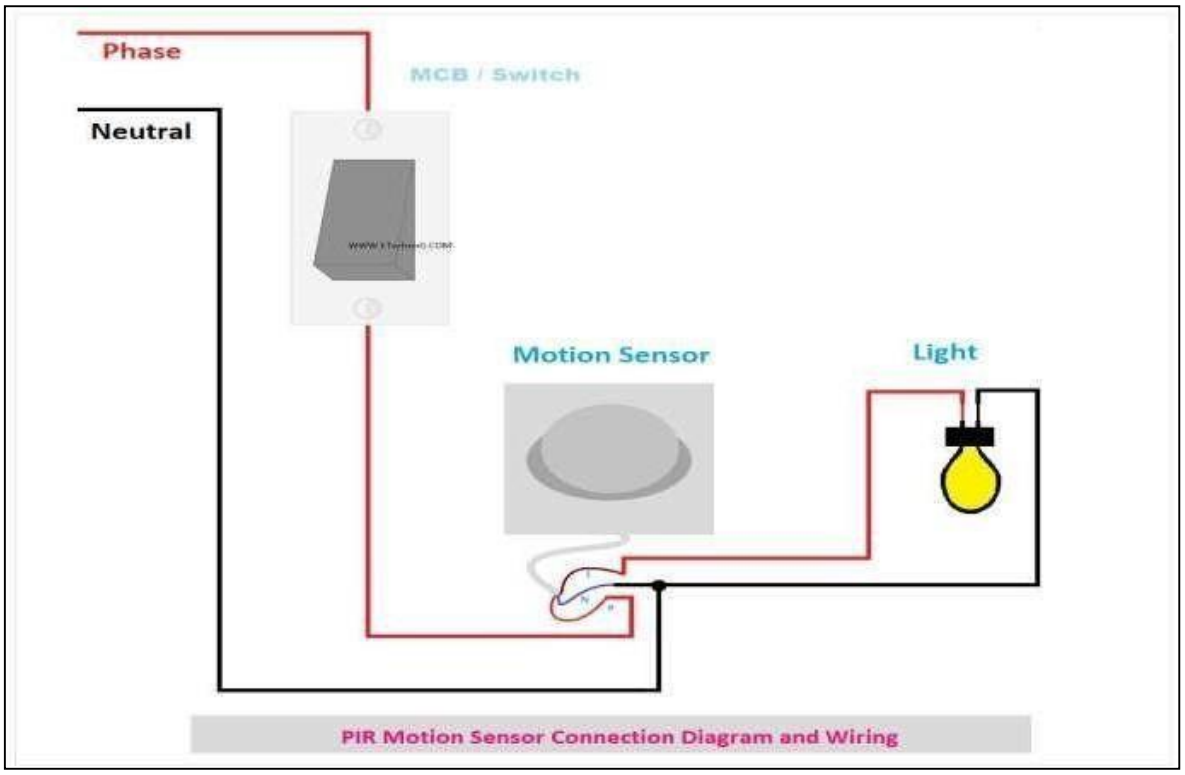
ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022



ADVANTAGE

1. There is no need of any manual operator as the system is fully automatic.
2. Switching time changes according to the climate i.e. in summer lights where switched on at19:00 pm and switched off at 6:00 am and timing also changes in winter and rainy season, hence as it is a closed loop system output will change accordingly.
3. Energy is Conserved.
4. There are lower chances of the automatic street light system overheating.
5. Risk of accidents is also minimized.
6. Cost of operating automatic street lights is far less when compared to the conventional street lights.
7. Helps in reducing unwanted use of electrical energy & Saves a lot of money on large scale.

IARJSET

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ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

EXPLANATION

The PIR sensor is mainly used to detect motion by measuring any change in InfraRed levels emitted by objects. Pyroelectric devices have elements which are made of a crystalline material, means they generate an electric current when they are exposed to InfraRed radiation. Changes in the amount of Infrared falling on such devices then it changes the voltages that are generated. Sensor output usually goes high when it detects motion or movement.

PIRs are basically made of a pyroelectric sensor (which you can see below as the round metal can with a rectangular crystal in the center), which can detect levels of infrared radiation. Everything emits some low level radiation, and the hotter something is, the more radiation is emitted. The sensor in a motion detector is actually split in two halves. The reason for that is that we are looking to detect motion (change) not average IR levels. The two halves are wired up so that they cancel each other out. If one half sees more or less IR radiation than the other, the output will swing high or low.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

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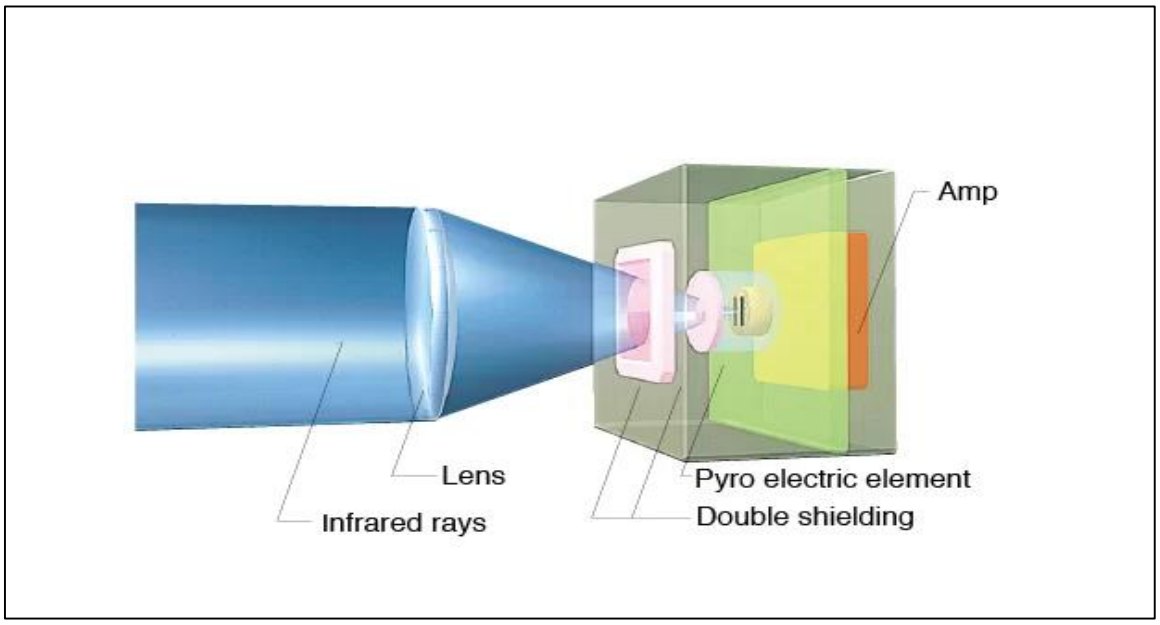
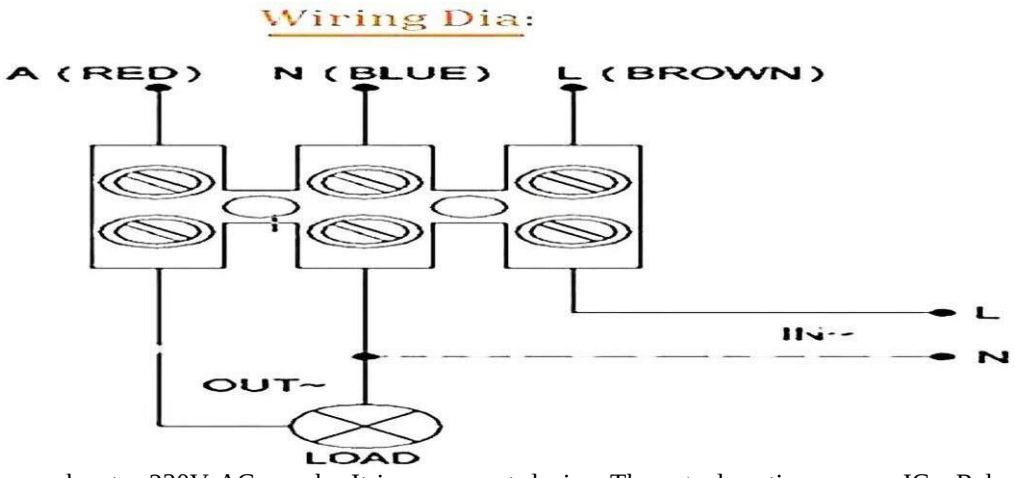
Vol. 9, Special Issue 1, April 2022



A PIR sensor is made from a Pyroelectric component (combination of metal and crystal) and other essential electrical components like circuits, resistors, capacitors. The sensor is enclosed in a metal sheet protector and a silicon window is provided in that to allow the infrared radiations to pass through it. The PIR motion sensors are mostly rectangular in shape irrespective of the device they are installed in. To increase the detection sensitivity, the motion detector devices cover the PIR sensor with lenses to focus more energy on it.All the objects, living things having a temperature more than absolute zero emit infrared radiations in their surroundings. Warmer the object, more the infrared radiations are emitted.The PIR sensor is a thermal infrared sensor (IR Sensor) which detects the motion of objects on reading these infrared radiations' variations in its nearby environment.



This motion sensor works at a 230V AC supply. It is a compact device. The actual motion sensor, ICs, Relays, everything are available inside this compact device. You can see there are a total of three terminals – Phase (P), Neutral (N), and Load (L). Overall, it will work as a Normally Open (NO) contact in the circuit. Generally, the 230V AC supply is to be connected across the P and N terminals. In normal conditions, there is no movement near the sensor, no voltage in the Load or 'L' terminal. When there is a movement near the sensor the 230V supply will be available in the 'L' terminal.

1. Connect the neutral terminal of the power source to the neutral terminal(N) of the sensor and the neutral terminal of the Light or bulb.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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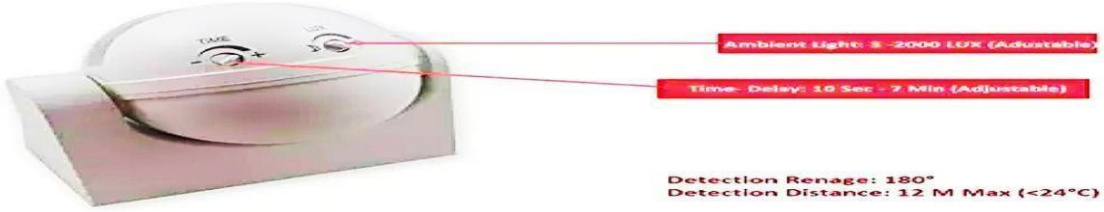
Vol. 9, Special Issue 1, April 2022

2. Connect the phase terminal of the power source to anyone terminal of the switch.
3. Connect another terminal of the switch to the phase terminal of the sensor.

4. Connect the Load Terminal(L) of the Sensor to the phase terminal of the light.



1. The motion sensor must be projected at the movement side or application area.

2. The average range of a motion sensor is up to 6 meters. So, install or place the sensor within 6 meters of the application area.

3. There is no obstacle in front of the motion sensor. Also always clean the sensor to increase its range, working efficiency.

V. CONCLUSION

This paper explains the design and improvement of Smart Street lighting control system circuit. Circuit meets desires suitably to turn street light ON/OFF. In the wake of designing the circuit which controls the light of the street as outlined in previously sections. LDR sensor and the item sensors are the two basic conditions in satisfying the desiresof the circuit. In case the two conditions have been satisfied the circuit will do the needed work as demonstrated by the specific framework. Each sensor controls the killing ON or the lighting section. The street lights have been successfullyconstrained by Microcontroller. With requests from the controller, the lights will be ON in the spots of the developments. Other than the drawback of the street light system using clock controller has been succeeded, where the system depends on upon photoelectric sensor. Finally, this control circuit can be used as a piece of a long roadway between the urban zones just as the provincial zones. The endeavor indicates were diminish the responses of the presentroad lighting structure and find a response for power misfortune. In this endeavor, the main activity is to set up the data sources and yields of the structure to control the lights of the road. The model demonstrations of course and will end up being uncommonly profitable and will fulfill all the present restrictions whenever completed on an immense scale.

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IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

ICT Based Composting

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Abstract: Currently, one of the biggest challenges in developing countries. As the unhealthy disposal of solid waste which is generated from human activities of development and survival. A smart city is a great concept in urban cities to improve lifestyle through information and communication technology (ICT). Information communication technology notably to help the acquisition and combination of knowledge, offering growing countries never before experienced opportunities to improve educational systems. To measure the desired output of raising awareness through domestic solid waste management (SWM) within the cities using computer aided tools (CAL). The contribution of this study can be seen in two folds. Firstly, the suggested system helps in accomplishing sustainable development goals like sanitation, clean water, clean industry, good infrastructure, sustainable communities and lifestyle. Secondly, contribution is the best way for solid waste management which could help in achieving three pillars of sustainability: social, economic and environmental, for sustainable enhancing of smart cities. CAL tool is effective for knowledge of students about solid waste management (SWM).

Keywords*:* Information communication technology, computer aided tools, solid waste management, sustainable development

I. INTRODUCTION

Information and verbal exchange generation (ICT) in training is find of data and verbal exchange as a device to beautify coaching and getting to know. Educational ICT equipment may be divided into 3 classes: 1. Input supply 2. Output supply 3. Others.
In this studies paper, enter supply is the scholar reaction machine and output supply is the interactive show with others together with audio-visuals. Worldwide studies have proven that ICT can lead to advanced scholar getting to know and higher coaching methods. A file made with the aid of using the countrywide institute of multimedia training in Japan, proved that a boom in scholar publicity to ICT in training via curriculum integration had a good sized and a fantastic effect on scholar fulfilment specially in phrases of information, comprehension, practical ability and presentation ability in challenge regions together with mathematics, technological know-how and social studies. The principal gain of ICT equipment for training on home waste control:
1. Through ICT images- they may be effortlessly used in coaching and enhancing the retentive reminiscence of college students.
2. Through ICT, instructors can effortlessly provide an explanation for complex commands and make sure college students comprehension via audio-visual or with the aid of using the usage of graphics.
3. Through ICT instructors are capable of create interactive instructions and make the classes extra fun that may want to enhance scholar awareness or hobby with inside the challenge. Thus, integrating ICT into training is being taken into consideration a catalyst device for educator's/training directors with inside the international to beautify training. Solid wastes are the ones natural and inorganic waste substances produced with the aid of using diverse sports of the society, that have misplaced their price to the primary user. Improper disposal of stable wastes pollutes all the essential additives of the dwelling surroundings (i.e., air, land and water) at neighbourhood and worldwide levels. It is a trouble diagnosed with the aid of using all international locations on the 1992 Conference on Environment and Development, and seemed as a chief barrier with inside the course closer to sustainability. Environmental Impact of Solid Waste Disposal on Land-When stable waste is disposed of on land in open dumps or in improperly designed landfills (e.g. in low lying regions), it reasons the subsequent effect on the surroundings.
(a) Ground water infection with the aid of using the leach ate generated with the aid of using the waste sell off
(b) Surface water infection with the aid of using the run-off from the waste sell off
(c) Bad odour, pests, rodents and wind-blown muddle in and across the waste sell off
(d) Generation of inflammable gas (e.g. methane) in the waste sell off

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

(e) Bird risk above the waste sell off which affects flight of aircraft
(f) Fires in the waste sell off
(g) Erosion and balance troubles regarding slopes of the waste sell off

(h) Epidemics via stray animals
(i) Acidity to surrounding soil and
(j) Release of inexperienced residence gas
. The approaches of storage, series, transport, remedy and disposal of wastes all have the capability to pollute the surroundings and in particular groundwater because of out of control migration of fluids (leachate) derived from the wastes. In addition to the capability for groundwater pollutants at web sites in which wastes are produced and saved previous to series, web sites related to the remedy and disposal of wastes, in which leachate can be generated include: landfills (each managed as sanitary landfill or out of control as open dumps), Scrap-yards; cemeteries; waste series and processing facilities; and composting facilities.

Literature Review:

Chris Zurbrugg, Rehan Ahmed, Roland Schertenleib states that the waste generated through the rapid developing towns in growing international locations is more and more past the gathering potential and monetary boundaries of the municipal administrations. Shimizu, K. emphasizes human being's participation in waste control. According to researcher wider awareness/education, duty and know-how sharing, introduction of modern market-base instruments, personal projects to decorate income and employment opportunities, and opportunity of leasing MSW control offerings and fee sharing thru carrier fees. For statistics evaluation the first-class manner to start to respect the sort of records that investigator would possibly hire in his very own studies is to have a glance at what others have done; therefore, the paper through John Berry and Pasi Sahlberg which is 'Investigating pupils' thoughts of studying' become used to become aware of the records that may be used. The section 'Findings 'consists of a number of the vital measures that researcher use in quantitative studies techniques. Likewise, SAS records tutorials studied which provide an explanation for the use and interpretation of standard statistical evaluation strategies for Scientific Research. The examples consist of how-to instructions for SAS Software. For Statistical speculation testing and for statistical evaluation software program like SIS and MY STAT is used.

Environmental Education:

UNESCO-UNEP, Environmental schooling is a manner of growing an international populace this is privy to and worried approximately the whole surroundings and its related issues, and which has the knowledge, skills, attitudes, motivations and dedication to paintings for my part and together closer to answers of modern issues and the prevention of latest ones. John Berry, in step with him, the aspect of quantitative strategies facilitates investigator to start considering the strategies in academic studies. Its intention is to provide a perception into the issues. Investigator can pick out quantitative strategies as a part of the study's methodology.

Benefits of Compost to the Environment and Agriculture

ENVIRONMENT:

- Water and soil conservation.
- Protects groundwater quality.
- Minimizes odours from agricultural areas.
- Avoids methane production and leachate formation in landfills by diverting organics from landfills into compost.
- Prevents erosion and turf loss on roadsides, hillsides, playing fields, and golf courses.
- Drastically reduce the need for pesticides and fertilizers.
- Binds heavy metals and prevents them from migrating to water resources, being absorbed by plants, or being bioavailable to humans.
- Off-farm materials can be brought in and added to manure to make compost.
- Facilitates reforestation, wetlands restoration, and wildlife habitat revitalization efforts by amending contaminated, compacted, and marginal soils.
- Off-farm materials can be brought in and added to manure to make compost.
- Composted manure weighs about ¼ as much as raw manure per ton.

IARJSET

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AGRICULTURE:

- Adds organic matter, humus, and cation exchange capacity to regenerate poor soils.
- Suppresses certain plant diseases, parasites, and kills weed seeds.
- Increases yield and size in some crops.
- Increases length and concentration of roots in some crops.
- Increases soil nutrient content and water holding capacity of sandy soils and water infiltration of clay soils.
- Reduces fertilizer requirements.
- Restores soil structure after natural soil microorganisms have been reduced by the use of chemical fertilizers – compost is a soil inoculant.
- Increases earthworm populations in soil.
- Provides slow, gradual release of nutrients, reducing loss from contaminated soils.
- Reduce water requirements and irrigation.
- Provides opportunity for extra income – high quality compost can be sold at a premium price in established markets.
- Moves manure to non-traditional markets that do not exist for raw manure. 1 Brings higher price for organically grown crops.
- Is a long-term stable organic matter source?
- Buffers soil pH levels. Source: EPA: Compost – New Applications for an Age Old Technology What Are the Benefits to the Food Industry?
- Reduces solid waste disposal fees.
- Ends wasting large quantities of recyclable raw ingredients.
- Educates consumers on the benefits of food waste composting.
- Markets your establishment as environmentally conscience.
- Markets your establishment as one that assists local farmers and the community.
- Helps close the food waste loop by returning it back to agriculture.
- Reduces the need for more landfill space.

Solid waste management (SWM)

. The environmentally sound control of stable wastes problem had acquired the eye of worldwide and countrywide coverage making our bodies and citizens. The achievement of SWM strongly relies upon on human being's conduct. Responsible conduct or modifications in waste disposal practices can first-class be made whilst human beings recognize the problem. ICT is an indispensable a part of the contemporary world. The pervasiveness of ICT has introduced about fast technological, social, political and economic transformation, which has eventuated in a network society organised round ICT. In studies ICT gives faster and simpler get admission to greater extensive and cutting-edge information According to Culp Honey and Mandinach, ICT is an extrude agent. It is similarly proper for geographically dispersed audiences and it additionally enables college students to gather and make experience of complicated statistics. As extrude agent it catalyses diverse different modifications with inside the content, techniques and usual excellent of coaching and studying. In order to behaviour this studies amongst the undergraduate college students, the investigator has proposed following objectives. a. To diagnose know-how of the scholars about home stable waste control. b. To improve stage of know-how with inside the goal group concerning home stable Waste control through the use of laptop assisted studying device evolved through investigator.

Tools used:

Data series tool i.e. device is developed, that's questionnaire, after components of the idea and hypothesis. Based on reviewed literature, a questionnaire became designed on student's expertise approximately home stable waste management. Total 30 questions have been protected with inside the questionnaire with a purpose to decide the volume to which college students related to those issues. Each query with inside the questionnaire, having 4 answers, exact as a, b, c and d. The pattern scale tool consists of four-factor Likert scale kind questions responses which can be scored from 1 to four and correspond to "1 = disagree", "2 = neither agree nor disagree", "3 = agree", "four = strongly agree". The tool became proven with the help of 3 specialists in studies and environmental sciences in addition to from the school of education.

Variables - Related to problem:

In this studies paper, the understanding of survey respondents, concerning strong waste control of home waste is variable, as variables are the situations or traits that the experimenter manipulates, controls or observes which may be modified whilst experimenter introduces the correct understanding upgrading strategies which include with the aid of using pc assisted getting to

IARJSET

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ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

know device advanced with the aid of using investigator. It is essential to differentiate amongst key variables, explicative and shape variables: key variables are the ones which describe the subject below investigation, in gift studies the look at is relative to focus concerning SWM and illnesses because of the mistaken waste handling, key variables might be relative to SWM.
Explicative variables are all the ones variables which is probably correlated (linked) to the important thing variables, for instance with inside the case of SWM it can be the environment, attitude, understanding, and so on. Structure variables are age, sex, training, profession; variables that are commonly used to describe the pattern of the take a look at. In order to avoid deciding on explicative variables which is probably inappropriate it's far vital to be helped with the aid of using professionals who have a terrific understanding of the subject. Accordingly, the help from the professionals with inside the area of training and environmental technology become taken. In this take a look at variables are used, namely - pre take a look at rating is variable 1 and publish take a look at rating is variable

II. METHODOLOGY:

Selection of the Sample

Measuring each unmarried piece of object in populace is simply now no longer realistic. That is why researchers evolved and used statistical techniques to remedy problems. The maximum realistic manner to do it is, to draw a pattern from the populace. For choice of pattern, difficult estimates of the dimensions of pattern made from expertise of the diploma of precision desired. In statistics, a pattern is a topic selected from a populace for investigation; a random pattern is one selected with the aid of using a technique regarding an unpredictable component. Random sampling also can refer to taking some of impartial observations from the equal possibility distribution, without regarding any actual populace. The pattern generally isn't always a consultant of the populace from which it was drawn. This random version with inside the outcomes is termed as sampling error. In the case of random samples, mathematical idea is to be had to evaluate the sampling error. Thus, estimates received from random samples may be followed with the aid of using measures of the uncertainty related to the estimate. This can take the shape of a preferred error, or if the pattern is huge sufficient for the primary restriction theorem to take effect, self-assurance periods can be calculated. For records series easy random sampling approach is used. An easy random pattern is decided on so that everyone samples of the equal length have an equal risk of being decided on from the populace. Fifty students, doing their commencement in Science, Commerce & Arts, have been decided on as a goal group. Random sampling approach used for pattern series. These topics have been from various undergraduate faculties in rural in addition to from urban regions of the Nasik district of Maharashtra, India.

Procedure

The questionnaire became surpassed out for data gathering, as in school room putting for the scholars to solution and return (pre-test). After the pre-test, to boom understanding approximately strong waste control with the assist of CAL device i.e. Digital Video Disc (DVD: Prepared via way of means of investigator). The laptop aided gaining knowledge of device used on this look at is primarily based totally on understanding approximately home strong waste and control of the waste. The fitness aspect additionally taken into consideration right here as Solid waste control's direct relation isn't handiest with aesthetics however additionally with the illnesses produced because of unhealthy/unclean environment. This device is likewise supplemented with the technological develop with inside the area of environmental science, statistics generation and systematic evaluation and interpretation. The module became primarily based totally at the prolonged case look at, layout in addition to at the foundation of ADDIE version taken into consideration via way of means of Morrison, Ross and Kemp for the research of issues. The case looks at method became decided on for the layout of the module because it gives the teacher with a massive quantity of flexibleness and control. The teacher can pick out the problem, decide strategies to be used and make choices regarding the intensity to which the problem can be analysed. It is an academic approach making use of each number one and secondary reassess to supply issue-focused statistics and abilities to college students and may be used for novices in colleges. With the assist of Digital Video Disc and power factor presentation supplemented with pictures, charts, animation etc. on influences of Solid waste control, with an illustrative lecture became delivered. Each and each doubt positioned forth via way of means of the college students became resolved at the spot. After per week a publish take a look at became carried out for the identical college students and via way of means of the use of identical questionnaire. The college student's responses (pre, publish etc.) had been analysed via way of means of the use of statistical approach primarily based totally at the importance of the distinction among the way of matched or correlated groups.

Related Work

About Composting

Composting and its benefits on agriculture were recognized for the reason that 10th century. Greeks and Romans knew approximately compost, a reality contained in 10th- and twelfth-century Arab writings, in medieval Church texts, and in Renaissance

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

literature. Since then, as technological know-how developed, compost has developed with it. In general, compost is notable, nutrient-rich, inactive manure that detracts bugs and pests. It is an herbal soil scale back that complements organic-depend content material and capabilities as a water reserve, stopping runoff and soil erosion, a feature this is normal with inside the Mediterranean because of its ordinarily hilly terrain. To produce notable compost, it calls for uninterrupted interest and intervention, and sure know-how with inside the Fifield. The usual method is sensitive and easily corrupted. Process corruption can result in toxicity with inside the produced fabric that may be disastrous for agriculture. The composting system is split in predominant phases, the decomposition and maturation segment. The decomposition segment is characterized through severe microbial activity, introduced through the speedy decomposition of the fabric. This segment is dissected in sub phases depending at the fabric's temperature. In the first sub phase (mesophilic), decomposition has simply started, and temperature rises, accomplishing as much as 60 ◦C. In the second one segment (thermophilic), decomposition is in complete enlarge and the temperature rises as much as 65–70 ◦C. During those sub phases, the fabric's moisture ought to be saved among 50% and 60%. Moisture lower underneath 50% slows down or maybe stops the degradation method since, so as for the vitamins to be ate up through micro-organisms, they ought to be with inside the solution. Moisture boom above 60% renders the method anaerobic and consequences in infection of the system. The usual period of the first segment varies, from fifteen to thirty days. In the maturation segment, decomposition has finished, and the fabric begins off evolved to mature and settle. Temperature gradually drops, and the fabric extent begins off evolved to lower. The usual period of the 2d segment varies, from thirty to sixty days. Figure 1 illustrates the correlation of every segment with the fabric's temperature.

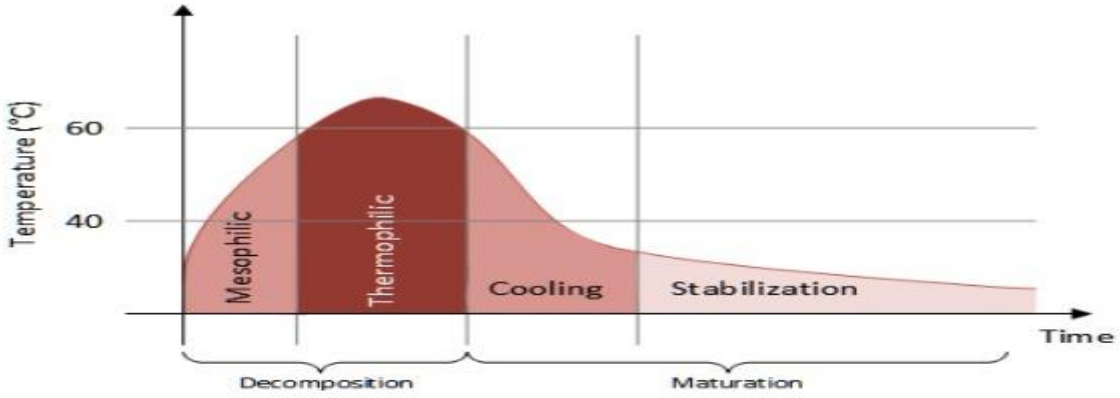
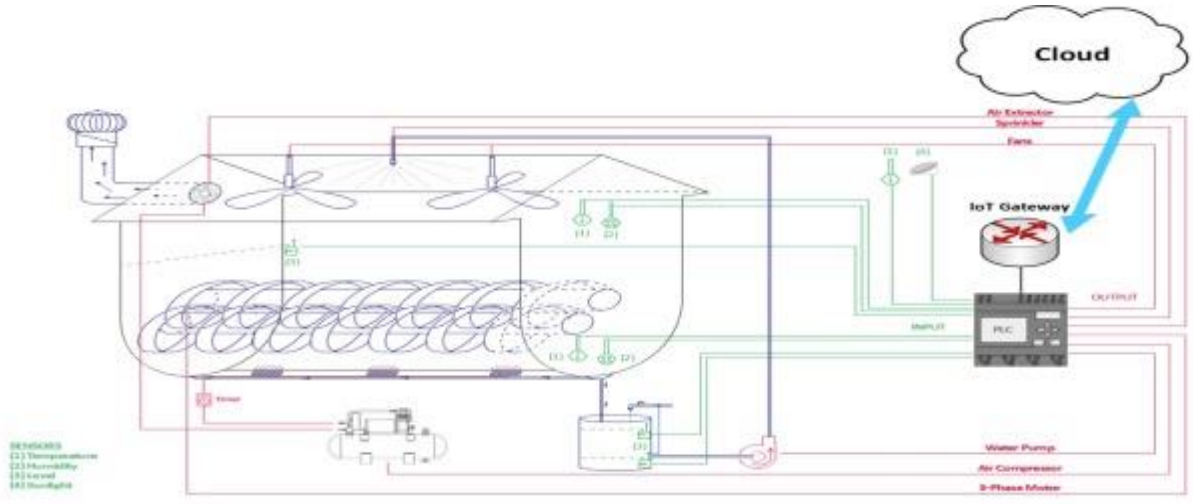


Fig.1 Temperature evolution during the composting process



IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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Fig.2 Composting frame

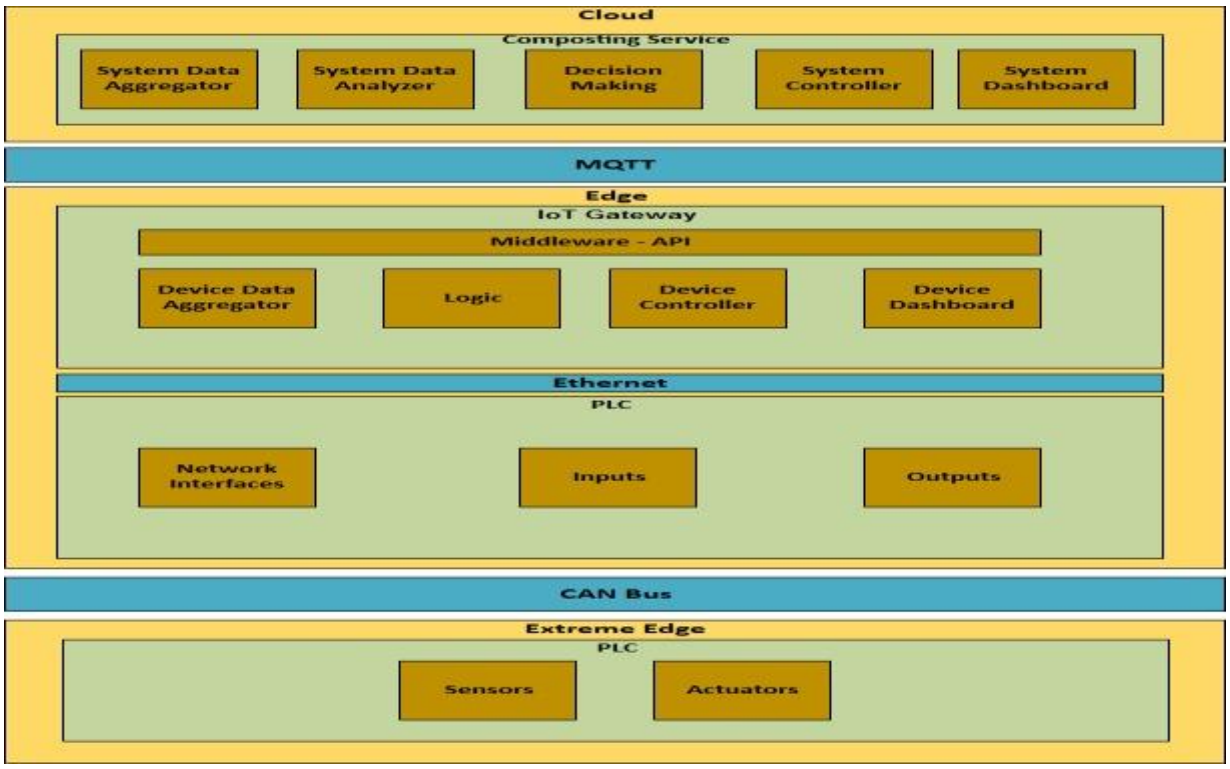

Fig .3 System architecture

Fig. 4. Real-life composting frame.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

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Fig. 5. Sensor mounting

Fig.6 Frame motors

Fig.7.Electrical panels.

IARJSET

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International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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III. CONCLUSION

After evaluation almost about check ratings of college students with the aid of using the usage of frequency distribution proved high wonderful skewness for pre-test ratings and negative skewness for post-test ratings signifying that relatively on a mean the put up check ratings of the scholars who advantage understanding with the aid of using energy point presentation are eminent in comparison to pre-test ratings. I.e. for teaching and accommodating acquaintance many of the college students, definitely suggesting that gift approach advanced with the aid of using the researcher is powerful in growing consciousness about strong waste control and associated fitness aspect. Subsequent to the frequency distribution whilst information units from businesses i.e. from male and lady student's as in comparison with the aid of using the usage of z check, it's miles located that there may be no giant distinction among common growth in ratings of male and lady college students. As method do now no longer vary considerably consequently the end is 'gift approach is similarly powerful for each businesses as a way as their understanding and mindset is concern'. At the stop of studies investigation, during contrast of information units of all of the participants specifically ratings earlier than and after making use of the approach i.e. teaching them by energy point presentation with illustrative lecture whilst analysed with the aid of using t check confirmed that common rating of college students is elevated because of use of laptop aided getting to know approach, signifying improvement of powerful laptop assisted getting to know device as a ways as the consciousness of survey populace is concerned. As the t Critical -tail cost of 2.009575199 exceeds t important cost of 9.683482771for tailed check at the .05 degree for forty-nine stages of freedom, we rejected null hypothesis, concluding that preliminary rating of pre-test is much less than that of very last rating of post-test of survey respondents, whilst lecture with energy point presentation is delivered. Indicating that, there may be elevated consciousness concerning home waste control and associated fitness components i.e. giant distinction in mindset of college students. Secondly researcher concludes that there may be tremendous distinction in student's understanding about home waste control and associated heath aspect after getting to know with the assist of techniques advanced with the aid of using investigator.

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IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

A Study of Design & Analysis of Earthquake Resistance Building Structure

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Abstract: The project mainly focused on Earthquake resistant building structure with their design and analysis with advanced technology. Civil structures such as high-rise buildings and long span bridges are designed with increasing flexibility & their susceptibility to external excitation. This report includes all the works related to analysis, design, and structural detailing of earthquake resistant building. Here, we mainly focused on structural analysis and design of multi storied framed structure. Materials properties are assumed as per the common practice and soil bearing capacity is also assumed suitably. The design of elements was done by using limit state design philosophy which is economic, safe and reliable. The designing tools used in this project are AUTOCAD and STAAD-Pro. The applied load calculation is as per IS456:2000.

Keywords*:* STADD - Pro, Base-isolation, Design, Susceptibility, Economical

I. INTRODUCTION

The earthquake engineering and technology have been developed with the lessons learned from earthquake disasters. The history of earthquake disaster on human life is long especially when the building construction used natural materials such as adobe, masonry and timber. The damage of buildings is caused by the inertia forces associated with the vibration of buildings exceeding the resistance of the structure. Heavy construction materials such as masonry and adobe attract large inertia forces where as the resistance is low.

Base isolation is a present day technique wherein the shape (superstructure) is separated from the bottom (basis or substructure) with the aid of using introducing a suspension device among the bottom and the primary shape. The fundamental precept at the back of base isolation is that the reaction of the shape or a constructing is changed such that the ground underneath is able to transferring without transmitting minimum or no movement to the shape above. A entire separation is viable best in an excellent device. In a actual global scenario, it is important to have a vertical aid to switch the vertical hundreds to the bottom.

Base isolation is a state-of-the-art method in which the structure (superstructure) is separated from the base (foundation or substructure) by introducing a suspension system between the base and the main structure. The basic principle behind base isolation is that the response of the structure or a building is modified such that the ground below is capable of moving without transmitting minimal or no motion to the structure above. A complete separation is possible only in an ideal system. In a real world scenario, it is necessary to have a vertical support to transfer the vertical loads to the base.

The importance of constructing buildings against lateral forces was recognized towards the end of the 19th century. For example, John Milne, a British instructor at The University of Tokyo, studied the damage of the 1891 Nohbi

Earthquake, Japan, and recommended that "…we must construct, not simply to resist vertically applied stresses, but carefully consider effects due to movements applied more or less in horizontal directions."

The first quantitative seismic design recommendations were made by M. Pnetti, Professor of Applied Mechanics in Turin after the 1908 Messina Earthquake, Italy. He recommended that the first story be designed for a horizontal force equals to 1/12 the weight above and the second and third stories to be designed for 1/8 of the building weight above. Structural layout is the technological know-how of reading and designing any shape with last strength, safety, serviceability and economic system.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

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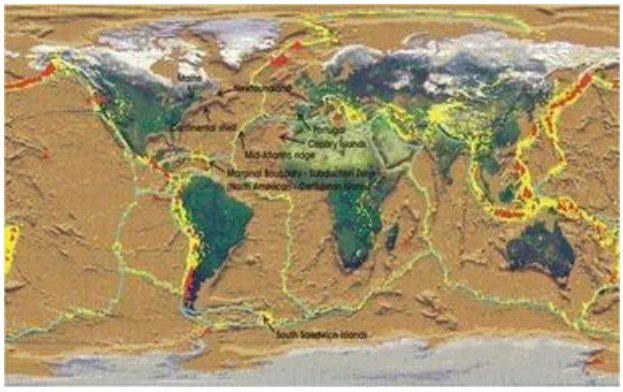
II. OBJECTIVES

Generation of building model on STADD-Pro.
Load calculation due to different loading conditions.
Application of loads on STADD- Pro model.
Analysis of the structure on STAD-Pro.
Study of the reaction forces; shear force, bending moment and node displacement.
Design of the building.

III. METHODOLOGY



Seismology is the study of vibrations caused by earthquakes. The study of these vibrations by various techniques, understanding the nature and various physical processes that generate them from the major part of these seismology. Elastic rebound theory is one such theory, which was able to describe the phenomenon of earthquake occurring along the fault lines. Seismology as such is still a much unknown field of study where a lot of things are yet to be discovered.

The above Picture is showing the fault lines and we can see that epicentres are all concentrated all along the fault lines. The reason for seismic activities occurring at places other than the fault lines are still a big question mark .Also, the forecasting of earthquake has not been done yet and would be a landmark if done so.There is general saying that it's not the earthquake which kills people but it's the bad engineering which kills people. With industrialization came the demand of high rise building and came dangers with that. A seismic design of high-rise buildings has assumed considerable importance in recent times. In traditional methods adopted based on fundamental mode of the structure and distribution of earthquake forces as static forces at various stories may be adequate for structures of small height subjected to earthquake of very low intensity but as the number of stories increases the seismic design demands more rigorous.

IARJSET

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ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

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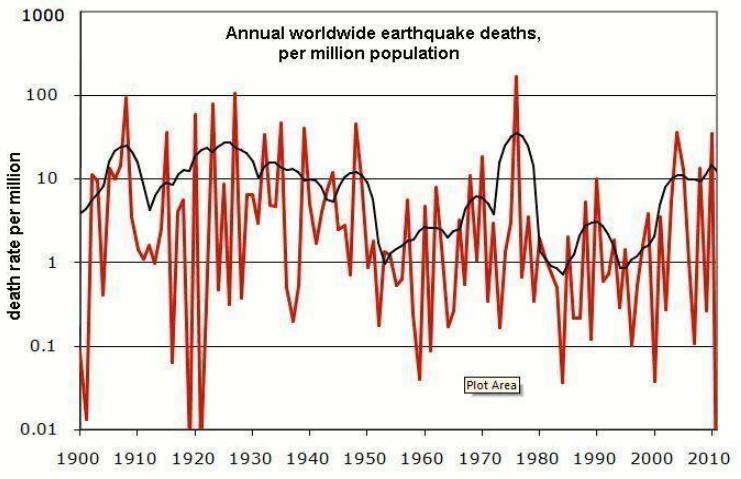

Fig.2 Annual worldwide earthquake deaths per million population

Importance of India's Seismic Zoning Map

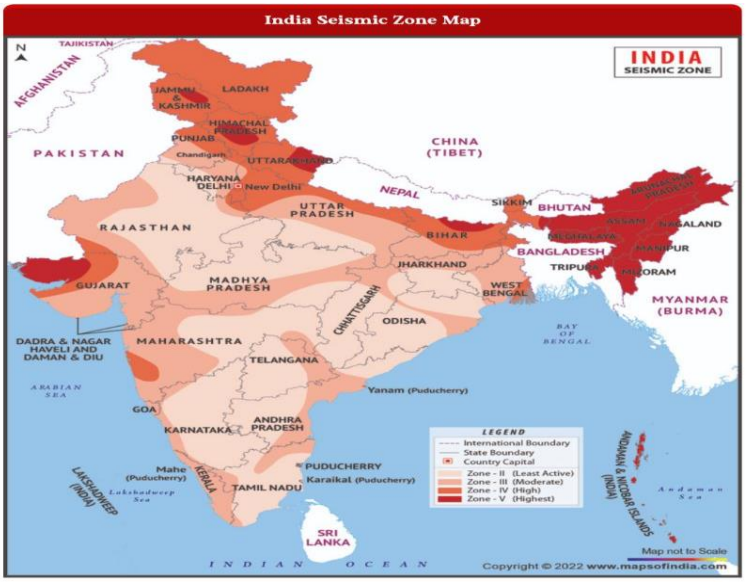

Fig.3 Map Showing the Seismic zones in India.

The Geological Survey of India (G. S. I.) first published the seismic zoning map of the country in the year 1935. With numerous modifications made afterwards, this map was initially based on the amount of damage suffered by the different regions of India because of earthquakes. Color coded in different shades of the color red, this map shows the four distinct seismic zones of India. Following are the varied seismic zones of the nation, which are prominently shown in the map:

- Zone - II: This is said to be the least active seismic zone.
- Zone - III: It is included in the moderate seismic zone.

IARJSET

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International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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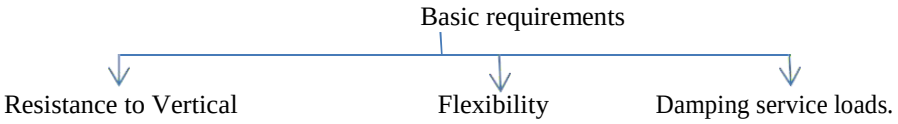
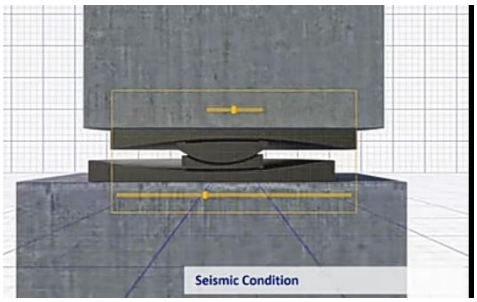
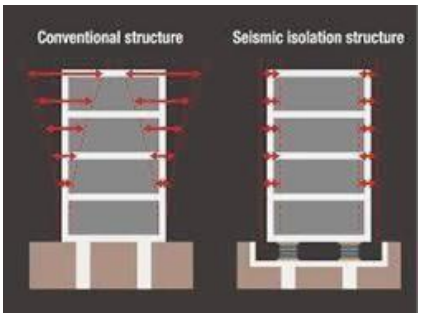
- Zone - IV: This is considered to be the high seismic zone.
- Zone - V: It is the highest seismic zone.

This kind of map is mainly used by the Department of Disaster Management of the different state governments in the country. This map helps them in planning for a natural disaster like earthquake. An Indian seismic zoning map assists one in identifying the lowest, moderate as well as highest hazardous or earthquake prone areas in India. Even such maps are looked into before constructing any high rise building so as to check the level of seismology in any particular area. This in turn results in saving life in the long run.

Basic requirements of Seismic base isolation







Seismic condition Building safe during earthquake

Fig.4 Fig.5

IV. DESIGN PROCESS

Step-1: Nodal factor generation.

With appreciate to the site of the column at the constructing plan respective nodal factors have been entered at the STADD model. Structure would be designed on sloping ground for all possible load combinations pertaining to IS 456, IS 1893 and IS 13920 manually. The carried out load calculation is as in keeping with is code IS 456: 2000. Base isolation is present day technique wherein the shape (superstructure) is separated from the bottom (basis or substructure) with the aid of using introducing a suspension device among the bottom and the primary shape.

Step-2: Base isolation design:

All the isolators are located under the external walls and internal columns, and lead-rubber bearings are located in the corner of the building and also in the corner internal columns. The allocation of isolators is different in each unique case but all depends on the well-thought-out factors of construction.

Step-3: Assign support and member property.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

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Supports were provided underneath each column as constant helps. Subsequently, primarily based totally on load calculations, the beam and column cross-sections were assigned. This assignment particularly makes a specialty of earthquake resistant constructing Structure and their layout and evaluation. With the arrival of superior era, civil systems together with high-upward thrust buildings are designed with extended flexibility, growing their susceptibility to outside excitation.

Step-4: Structural Design on STADD. Pro and Output Generation

To make the structure earthquake resistant, the fundamental period of the building while vibration should be calculated and provided as input to STADD. Pro for seismic analysis.

BASE ISOLATION

- **Base Isolation**

Base isolation is a technique invented in Wellington by Bill Robins on to minimize damage to buildings during an earthquake.

1. What is a Base Isolation System?

A base isolation system is a method of seismic protection where the structure (superstructure) is separated from the base (foundation or substructure). By separating the structure from its base the amount of energy that is transferred to the superstructure during an earthquake is reduced significantly.

2. Why is base isolation effective?

BaseIsolationisaveryeffectivewayforcontrollingseismicresponseofcivilengineeringstructures.Thistechnique is based on the principle that it is more efficient to reduce seismic demand on a structure rather than increasing its earthquake resistance capacity. In the previous couple of years, the use of base isolation structures as a median of a seismic layout of systems has attracted enormousattention.Differentdesignsforbaseisolatorshaveuniquecapabilitiesincommon, the most critical of which can be the horizontal flexibility and the electricity dissipation capacity. Base isolation can greatly lessen earthquake depth and losses, which immediately reduces the shaking depth and harm that permanent system and constructing contents enjoy all through earthquake floor shaking. Base Isolation is one in all the passive electricity dissipation strategies for earthquake resistant designs of a structure. It is beneficial to controlling electricity, that's passing from basis or floor to the top stories. The major use of isolation machine is to lower the displacements, base reactions and member forces in structure. The specific research has been achieved on structural isolation machine. To recognize the distinction among the responses of constant base and remote base structure, to decide the effectiveness of various isolator and to examine the isolator residences in element the short evaluate of a few papers is given on this article.

Fig.6 Working Model

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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V. RESULT

Based on the above study it is clear that the performance of fixed base and remoted base infrastructure relies upon the form of underlying soil on which the infrastructure rests. For difficult strata, the reaction is distinctly quality however the soil of smooth soil will increase the acceleration, so the electricity dissipation of the infrastructure decreases and the frequency will increase. For low to medium height buildings, the efficiency of isolators is good. The reaction of the infrastructure is developed due to the advance types of adjustments because of the adjustments in physical properties of an isolator.

VI. CONCLUSION

The design of building was done using appropriate method. The detailing of structure was done as per relevant IS Codes as well as building design codes. The tools used in this project are STAAD-Pro, AUTOCAD. The structural members are designed to resist the dead load, live load and earthquake loads. This project has indeed widened our knowledge regarding the analysis and design of frame structures. This project work mainly focuses towards earthquake resistant structural design only .The design and drawings are presented as per the calculation. The principle and methodology applied while designing the frame structure is universally valid for any type of framed structures. Finally, we wish our project report will become the guidance to the students and other designers. We hope that project work will prove much useful to use in our career.

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IARJSET
ISSN (Online) 2393-8021
ISSN (Print) 2394-1588
International Advanced Research Journal in Science, Engineering and Technology
National conference on recent trends in Engineering and Technology
Adarsh Institute of Technology & Research Centre, Vita, India
Vol. 9, Special Issue 1, April 2022

Environmental Technology in industrial Pollution Control; Effluent wastewater Treatment of Sugar Industry.

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Abstract: In the world sugar industry is one of the most important food processing industries. Sugar industry plays very important role for economic growth of India. Sugar industries spread nearly seven to eight states of India and Maharashtra is one of them. Considering the rapid growth of sugar industries also needs to consider the wastewater generation. Waste water of sugar industry have low pH, high BOD, high COD, brown Color, TDS, TSS and odor problems. Present studies thus give the different parameters such as PH, BOD and COD etc. The objective of the present work is to study design of various components of treatment plant. The case study followed on the Udagiri Sugar Private Limited, Maharashtra.

Keywords: ETP, Wastewater, Sugar cane, BOD, TDS etc.

I. INTRODUCTION

Today industrialization is a bright feature of economic intensification in a developing country. In the way of employment-industrialization, Sugar industries are playing a most important role offering tremendous opportunities for the economy of Maharashtra. But, unplanned congested growth of industries leads to adverse impact on environment consequently increases pollution. Large quantity of water associated with the production of a Sugar industries, releases toxic wastewater rich in chemicals to the environment that result in severe water-body pollution. These untreated sugar industrial effluents not only affect surface water quality, ground water, soil, vegetation, but also cause many water borne diseases that are threatening to public health. Therefore, treatment facility for such wastewater is strictly recommended within the industry. But, in developing countries like Maharashtra, where less attention is paid towards environmental protection, environmental regulations are not effectively implemented and pollution control techniques are not yet fully developed. Water is very essential part of all living organisms. In this relation water plays a most valuable and important role in the natural cycle. Among the whole water available on the earth, only 3% fresh water. In the available sources of fresh water, pollution of water has been significantly increased from industries and domestic activities. In this scenario, huge quantity of fresh water will be consumed for the production process which will be held in the industry.

In this situation, pollution and the public health problem caused by the sugar industries along with other industries in Maharashtra has been the focus recently and the gravity of installation of Effluent Treatment Plant (ETP) has drawn attention. Thus, industries have to continue to progress in meeting environmental obligations by undertaking anti-pollution measures. As, a large number of factories are operating without the ETPs, violating the existing laws, it has become a challenge for Government and private sector to work together to promote ETP installation with clear understanding the gravity of the problem and to take necessary steps by giving proper attention to all aspects.

II. LITERATURE REVIEW

1. KLE Dr MSSCET, Belgaum he studied that present Sugar Industry is one the most polluting industry in the environment. The sugar industry wastewater is characterized by its brown colour, low pH, high temperature, high BOD, high COD, odor problem, total solids, and high percentage of dissolved organic and inorganic matter. So, this untreated wastewater will create problem to the environment. The analyzed parameters are pH, COD, BOD, TS, TSS, TDS, OIL and GREASE. Initial concentrations of COD, BOD, TSS, TS, TDS are 5102mg/l,1988mg/l,772mg/l,4530mg/l,3758m g/l respectively. After treatment of effluent the removal efficiency of

IARJSET
ISSN (Online) 2393-8021
ISSN (Print) 2394-1588
International Advanced Research Journal in Science, Engineering and Technology
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Vol. 9, Special Issue 1, April 2022

COD, BOD, TDS, TSS, TS, OIL and GREASE are 97%,95%,69.21%,87.30%,72.29%,64.28% respectively. The low grade potash powder is generated from molasses distillery spent wash. This potash powder is used as fertilizer. It is also a solution for zero water pollution. The powder contains 14.70% of potash.

2. Sanket D Awasare*, Harshavardhan U Bhosale, in this paper he analyse that, Sugar Industry is also called sugar cane mill. The production of sugar from which is carried out. As we known the cane is cash crop. So the sugar industry is the major industry which takes part in the growth of the country. Sugar industry is one of the major industries which have been included in the polluting industries. Sugar industry wastewater has a high degree of pollution parameters. Present report thus gives the different parameter studies such as pH, BOD, COD, etc. also the study of the sugar industry Bidri – Shri Dudhganga-Vedganga Sahakari Sakhar Karkhana Ltd. The parameters permissible limits which are prescribed by the board are also studied.
3. Sankalpasri S.S, Prithviraj H K, this paper presents about performance evaluation of E T P of Sugar industry wastewater. The large quantity of wastewater generated at all stages of sugar production is highly contaminated because of improper water management. This type of waste water is discharged to surface water or on land. The Karnataka Pollution Control Board (KPCB) has prescribed that the effluent generation in a sugar factory has to be limited to 1000 L/tons of cane crushed. Also, as per CREP norms, certain provisions have been made for sugar factory effluent treatment as well. An attempt has been made to evaluate the performance of Effluent treatment plant (ETP) of KPR Sugar Mills Pvt. Ltd in a district of Vijayapur. This factory has provided and managed well equipped effluent treatment plant of capacity15000 TCD and a distillery of 90KLPD. During this study, the samples were collected in clean polyethylene containers. A total of 6 grab samples were collected at a regular interval of 2hours [8am, 10am, 12pm, 2pm, 4pm, and 6pm] in each shift and mixed to give composite sample. Performance appraisal is been carried out by comparing the concentrations of pollutants at the inlet and outlet of the treatment unit. The grab samples were collected at the inlet and outlet of all the treatment units and analyzed as outlined in the standard methods for the examination of water and wastewater. The samples were analyzed to various parameters like pH, BOD, COD, and TDS depending on the results, performance of each unit was evaluated. The present study shows that treated effluent is clear. Overall COD and BOD removal efficiency of ETP was more than 96%on an average. Average TDS removal efficiency is 90%. And all other parameters are within consented limits stipulated by KPCB.

4. Harush D P, Sugar is one of major product in India. Water management in the industry is one of major problem. Due to this there is lots of effluent generated to effluent treatment plant and thus efficiency getting reduced for the treatment to be achieved. Industry can be well maintained if proper water management activities can practice and applied in the required area. Recycling of condensate, segregation of high strength and low strength effluent, proper operation of ETP (Effluent Treatment Plant), etc. leads to a well-maintained water management in the industry and leads to reduction of cost on water. Well Operated and maintained ETP will not have any problem and can achieve the prescribed norms by statutory board. The Paper is completely prepared based on my personal experience as consultant in sugar industry and by review of few of related articles.

Objectives Of Proposed Study

1. Characterization of effluent wastewater samples.
2. To verify the design of various components of treatment plant.
3. To propose possible amendments and modifications in the design of wastewater treatment plant.

Scope of The Work

- To clean industry effluent and recycle it for further use.
- To reduce the usage of fresh/potable water in Industries.
- To cut expenditure on water procurement.
- To meet the Standards for emission or discharge of environmental pollutants from various Industriesset by the Government and avoid hefty penalties.
- To safeguard environment against pollution and contribute in sustainable development.

III. METHODS AND MATERIAL

2.1. SUGAR MANUFACTURING PROCESS

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ISSN (Online) 2393-8021
ISSN (Print) 2394-1588
International Advanced Research Journal in Science, Engineering and Technology
National conference on recent trends in Engineering and Technology
Adarsh Institute of Technology & Research Centre, Vita, India
Vol. 9, Special Issue 1, April 2022

Fig. 1 Sugar factory production unit

The case study is conducted on the production process of white crystal sugar at the Udagiri sugar and power ltd, bamani (Pare). Udagiri sugar factory is one of the sugar factories located in Bamani, sangli,Maharashtra. Stages of white crystal sugar (Cane sugar)processing consists of the following steps: sugar cane is crushed, the juice is heated and filtered, then sent to a series of crystallization steps to create crystals of raw sugar, followed by centrifugation to remove any remaining juice or syrup. The last step produces a small stream of remaining syrup called cane mill molasses containing up to 55% (wt.) sucrose and substantial amounts of invert sugar (glucose/fructose mixture) impurities.

Steps involved for the production of sugar cane

Sugar cane is prepared for milling by knives and shredders. Sugarcane juice is then extracted bypressing the prepared cane through mills. Each mill consists of three rollers:Extracted juice mixed with water is weighed and sent to the boiling house for further processing. Residual bagasse is sent to boilers for use as fuel for steam generation
This juice is heated and then treated with milk of lime and sulphur dioxide. The treated juice is then further heated and sent to clarifies for continuous settling. The settled mud is filtered by vacuum filtersand filtered juice is returned to be further processed while the Oliver cake is sent out the clear juice is evaporated to a syrup stage, bleached by sulphur dioxide and then sent to vacuum pans for further concentration and sugar grain formation. Crystals are developed to a desired size and the crystallized mass is then dropped in the crystallizers to exhaust the mother liquor of its sugar as much as possible. This is then centrifuged for separating the crystals from molasses. The molasses is re-boiled for further crystallization.

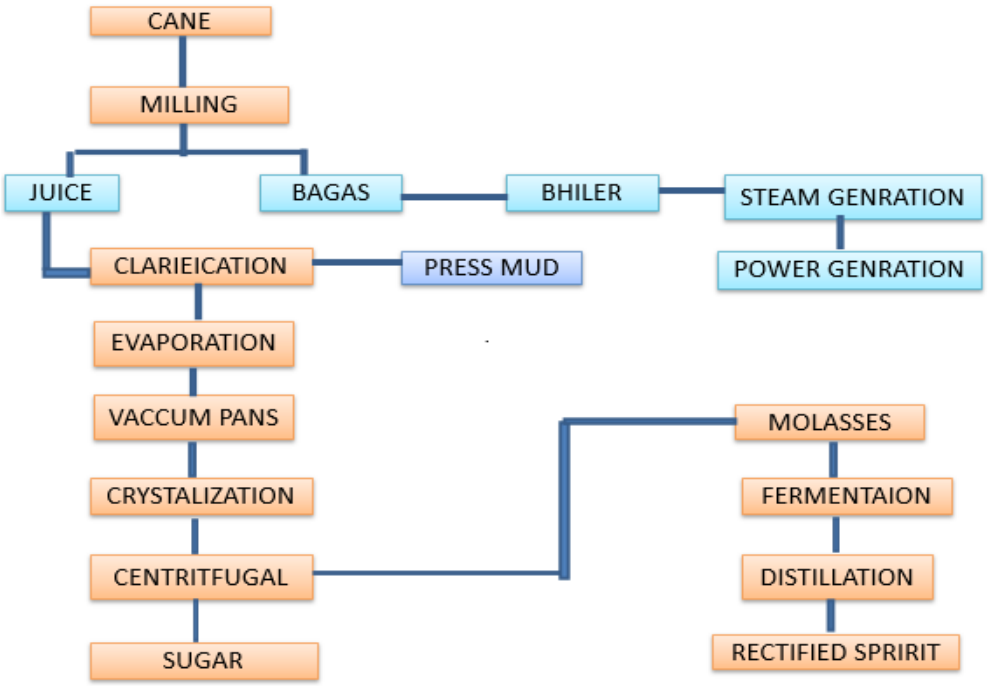

Figure 2: Flow Diagram for Sugar Manufacturing Process

IARJSET
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ISSN (Print) 2394-1588
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Thus, the original syrup is desugarised progressively (normally three times) till finally, a viscous liquid is obtained from which sugar can no longer be recovered economically. This liquid, which is called final molasses, is sent to the distillery for making alcohol.

The sugar thus is separated from molasses in the centrifuge is dried, bagged (50 Kg and 100 Kg), weighed and sent to storage houses.

2.2 GENERAL INFORMATION OF UDGIRI SUGAR AND POWER LTD., BAMANI

Table 1: Information of Sugar industry

1.	Name of the industry	Udgiri Sugar and Power ltd., Bamani
2.	Location of the industry	Bamani (Pare), Vita Tal-Khanapur, Dis- Sangli
3.	Total Plot Area	60
4.	Built up Area	30
5.	Area available for the treated effluent for gardening	18
6.	List of Product and By-product	Sugar Molasses Bagasse electricity
7.	List of Raw material	Sugar cane Bagasse coal

2.3 SOURCES OF WASTEWATER IN SUGAR INDUSTRY

There are various sources of wastewater generating in a sugar industry. The quantity of the effluent depends on the size of the factory Waste from sugar industry includes the water used as splashes to extract maximum amount of juice, and those used to cool the roller bearings. As such the waste water contains high BOD due to the presence of sugar and the machineries. The filter cloth used to filter the juice need cleaning. The wash water thus used produced though small in volume, contains high BOD and suspended solids. Additional waste originates due to the leakages and spillages of juices, syrups and molasses in different sections, and also due to the handling of molasses. The periodical washing of the floor also contributes a great lot of the pollution load. Though these wastes are small in volume and are discharged intermittently, they have got a very high BOD.

Table 2: Wastewater generation units

Sr. No.	Waste water generation Units
1	Mill house
2	Boiling house
3	Pump cooling water
4	Sulphur furnaces
5	Lime hydrator
6	Excess condensate

EFFECT OF WASTE ON RECEIVING WATER

Disposal of various industrial waste products into water sources, such as river, lake, ponds, on surface of earth and improper handling of industrial wastes, results in polluting fresh water sources. Such water pollution disturbs the ecosystem inside, resulting in the death of various animal and plant species present in the water and also on the earth. Waterways are generally at risk to the harmful effects of wastewater. Toxic compounds present in the effluent disturb aquatic ecosystems. When a large number of biodegradable substances end up in the water, organisms will start to break them down, and they use a lot of

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dissolved oxygen. The importance of wastewater treatment design and infrastructure is especially relevant with bodies of fresh water, as these materials would end up in your home if water wasn't treated properly.

WATER BUDGET DAILY REQUIREMENT OF WATER IS GIVEN IN THE TABLE BELOW.

The quantity of water requirement was measured before treatment and modifications and after treatment for the sugar factory having an average daily sugar production capacity of 5000quintal.

Sr.No.	Sources	Generation of wastewater(m3/day)
1	Cleaning and washing	54.50
2	Hot liquor pumps for gland cooling	444.00
3	Spray pond overflow	50
4	Boiler blow downs	19
5	Gland leakages	23
	Effluent generation	365.00

Table 3: wastewater generation in m3/day

D. Effluent Wastewater Treatment Plant

There are various types of effluent treatment plants which is based on types of industries waste generated according to production and the raw material used for the manufacturing process. The advantage of ETP installation is to keep environment clean. Also, it has some advantages-

- Quality of treated water maintained as per standard parameters of treated effluent.
- Under any circumstances stringent regulatory norms for discharge are met.
- As far as possible it keeps the environment clean & free from contamina tion. Minimal
- electricity consumption, less chemical consumption with low operation & maintenance cost

General Parameters of raw effluent water generated in sugar industry

1	pH	4.0. to 6.5
2	Chemical oxygen Demand (COD)	2000 to 3000 mg /lt.
3	Biological oxygen demand (BOD)	1000 to 1200 mg /lt
4	Total Suspended solids (TSS)	500 to 600 mg/lt.
5	Total Dissolved Solids (TDS)	5000 to 6000 mg/lt.
6	Oil and grease	10 to 50 mg/lt.

Table 4: Parameters of raw effluent

DIFFERENT STEPS INVOLVED IN WASTEWATER TREATMENT PLANT

SCREENING

The untreated effluent contains bigger suspended solids and floatable matter like bagasse which contributes organic and inert matter that needs to be removed from effluent.

The untreated industrial effluent is first passed through the fixed bar screens where all the bigger suspended solids and floatable matter get separated and removed.

The screened effluent is then taken to the oil and grease removal tank by gravity.

OIL & GREASE TRAP

Untreated sugar effluent stream contains some Oil & Grease, which may cause clogging in mechanical equipment. Also seriously affect the working of other Subsequent treatment units of biological treatment.

The sugar effluent from Bar Screen Chamber would be received in the Oil & Grease (O & G) removal chamber by gravity. Oil and Grease will float to the surface of the tank during the detention period (half an hour) and are removed

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with the help of some mechanical equipment like Oleophilic, belt type oil skimmer.

EQUALIZATION OF EFFLUENT

The raw effluent is allowed into the equalization tank, and is mixed continuously with a floating aerator or air diffused system to homogenize the combined effluent from different sources of the plant and to maintain the uniform characteristics of the effluent.

Equalization tank will be to even out the fluctuations in the flow and quality of raw effluent and to ensure supply of steady and uniform flow of the composite effluent both in terms of flow and quality to the subsequent treatment units.

This aerator will be operated as per requirement, and adjust itself according to the liquid level in the tank.

Figure4: equalization tank

NEUTRAL PH OF EFFLUENT

Generally, the effluent having low pH value. So, the equalization tank is thoroughly mixed by dosing lime or caustic soda or soda ash in the equalization tank to neutralize the pH of the raw effluent before letting into the other subsequent units.

PRIMARY CLARIFIER

The neutralized effluent from Equalization Tank is pumped to the primary clarifier. Here different types of primary clarifier (like conventional type or lamella type) are used to removing suspended solids. The supernatant from the clarifier enters into next treatment unit. Sludge from the clarifier is sent to the sludge drying beds.

IV. RESULT AND DISCUSSION

INDUSTRIAL WASTE TREATMENT:

The trade effluent generated from sugar plant will be treated in preliminary treatment tanks consisting of grit chamber, oil & grease trap and screen chamber etc. It is equalized and then treated by activated sludge treatment with extended aeration process. The outlet of aeration tank will be exclusively used for irrigation to grow sugarcane crop. Sufficient land is available for the purpose. The biological ETP sludge will be dried in SDB and used as soil conditioner after composting with the press mud.

1. PRELIMINARY TREATMENT:
2. EQUALIZATION CUM NEUTRALIZATION TANK:
3. DIFFUSED AERATION TANK:
4. CLARIFIER:
5. SLUDGE SUMP:
6. SLUDGE DRYING BED:
7. TREATED TANK:
8. LAND AVAILABILITY FOR IRRIGATION:
9. MONTHLY WASH TANK:

PRELIMINARY TREATMENT:

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A twin unit consisting of screen, grit chamber and oil & grease trap is provided A provided for inletflow measurement. Size of tank: 2.0 X 5.0 X1.0 m.

EQUALIZATION CUM NEUTRALIZATION TANK:

Flow	300 m^3 / day
Detention period	24 hours
Volume of tank	300 cum
Size of tank	15.0X10.0X2.0 mtr

DIFFUSED AERATION TANK:

Flow	300 m^3 / day
BOD load	360 kg /day
F/M ratio	0.15
MLSS maintain	3000 mg /L
MLSS required	2400 kg
Volume of aeration tank	800 cum
Provided liquid depth	2.5m + 0.3 free board
Area	320 m^2
Size of tank	32 x 10 x 2.5mtr

BLOWER FOR AERATION:

BOD load kg/day	360 kg/day
Oxygen required	720 kg/day
Blower provided	800 m^3 / hr.
Motor	20 P

CLARIFIER:

Flow	300 m^3 / day
Surface overflow rate	15 cum / day
Area	20 m^2
Size in diameter	6.0 meter.

Clarifier of diameter 6.0 m and SWD 2. 5 m with 0.5 m free board with mechanical scrapper is centrally drivenrolling arm with scrapper blades and squeegees.

SLUDGE SUMP:

Flow	300m^3 / day
Sludge volume	90 cum / day
Detention time	2 hours
Volume required	75 cum / day
Size	1.5 x 2.0 x 2.5mtr

SLUDGE DRYING BED

Excess sludge shall not be more than 2 5 % on wet basis of the daily flow. Two nos are SDE areprovided.

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Size	10 x 5 meter

TREATED TANK:

Flow	300m^3 / day
Detention period	24 hours
Volume of tank	300 cum
Size of tank	15.0 x 10.0 x 2.0mtr

LAND AVAILABILITY FOR IRRIGATION:

Treated water of 300 cum is irrigated on land for irrigation, garden and plantation of factory premises.15 hector lands are available for disposal of treated water.

MONTHLY WASH TANK:

A monthly washing tank for two days cleaning water is provided to store the water and slowly treated along with the daily waste throughout the month. A tank of 600 cum capacity of the following size is provided with required pump arrangement.

Size of tank	15 x 10.0 x 2.0mtr

COMPRESSION BETWEEN WASTEWATER BEFORE TREATMENT AND AFTER TREATMENT

Sr. No.	Parameters	Standard Norms	Untreated wastewater	Treated Wastewater
1	pH	6.5 to 8.5	**4.0. to 6.5**	
2	Total Solids	< 2000	**5000 to 6000 mg/lt.**	<2000
3	Suspended Solids	<300	**500 to 600 mg/lt.**	<300
4	Chemical OxygenDemand	<250	**2000 to 3000 mg /lt.**	<200
5	Biological OxygenDemand	<100	**1000 to 1200 mg /lt**	<100
6	Oil and Grease	<10	**10 to 50 mg/lt.**	<35

V. CONCLUSION

Effluent Treatment Plant The consumption of large volumes of water and the generation of organic compounds as liquid effluents are major environmental problems in sugarcane processing industry. The inadequate and indiscriminate disposal of this effluent in soils and water bodies has received much attention since decades ago, due to environmental problems associated to this practice. The sugar cane industry is among those industries with the largest water demands and, in addition, is an important source of nontoxic organic pollution combined with the fact that India it is second largest producer and largest consumer makes it all the more important. Like any other industries, the pollution load in sugar mills can also be reduced with a better water and material economy practiced in the plant. Judicious use of water in various plant practices, and its recycle, wherever practicable, will reduce the volume of waste to a great extent [1] . The operation of the ETP is such that it will give an effluent of such standard, prescribed by the Maharashtra Pollution

Control Board (MPCB). The following prescribed standard by the board or under EP Act, 1986. Udagiri Sugar and Power ltd has provided an ETP. The units of the ETP are: 1) Screen Chamber cum Oil & Grease tank 2) Equalization Tank

3) Mixing Tank 4) Aeration Tank with aerator 5) Clarifier 6) Sludge Drying Bed.

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IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

Pneumatic Grinding Machine

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Abstract: The pneumatic granulating is a metal pounding machine apparatus intended to cut/crush metal by applying pneumatic weight. The machine is solely planned for large-scale manufacturing and they speak to the fastens and more proficient approach to cut a metal. The moderate speed task is happens in a granulating activity. This machine is a multipurpose machine. Hacksaws are utilized to cut thin and delicate metals. The crushing shaft is accustomed to granulating task by supplanting the hacksaw outline. The task of the unit is disentangled to a couple of straightforward activities including a chamber piece and cylinder game plan. There are various kinds of pounding machines in Engineering field, which are utilized to satisfy the prerequisites. We are intrigued to present the pneumatic framework in particularly in crushing machine and furthermore pounding activity. The principle capacity of Pneumatic granulating is to cut thin and delicate metals by pneumatic power.

I. INTRODUCTION

There are many electrically operated grinding machines of different configurations and different manufacturers are available for the use in machine shop. These machines can grind jobs of different material precisely. Now in industry, it is necessary to grind jobs with very high rate to achieve mass production requirements. So there is need to move for a new technology which gives us a mass production with less time and less energy input. It is impossible to depend upon conventional grinding machine.

By using this pneumatic grinding machine the jobs can be ground maintaining tolerances to achieve high speed cutting rate and mass production for maximum benefit in manufacturing industries. This machine overcomes the drawbacks and limitations of conventional grindingmachines. It can be used in a small workshops and industries as it is available in very low price and its smaller size and high efficiency.

The setup of pneumatic grinding machine is very simple, it operates with mechanism of pressurized air from a compressor. Compressed air pushes the piston of cylinder back and forth. This reciprocating motion of pneumatic cylinder is used to obtain the linear motion of grinder mounting plate and material is ground.

The size and shape of this setup is small. Base plate is provided for placing the work piece to be ground. A simple air compressor is required for its operation. These machines are so precise that they can grind jobs with minimum time made up of different materials. For industries to achieve the mass production, it is necessary to jobs with high rate. So it is impossible to depend upon conventional grinding machines and need the improvement in technology and design of such machines.

II. LITERATURE REVIEW

1. **Jobs et al**. presented The reason for using pics, or any type of energy transmission on a machine, is to perform work. The accept of work requires the application of kinetic energy to a resisting object resulting in the objess moving through a distance. In a pneumatic system is stored in potential state under the form of compressed air. Working may kinetic energy and pressure) results in a pneumatic system when the compressed air is allowed to espant. For example, a tank is charged to 100 PSIA with comprised air. When the valve at the tank outlet is opened, the air inside the tank expands until the pressurt inside the tank equals the atmospheric pressure. Air expansion takes the form of airflow. To perform any applicable amount of work then, a device is needed which can supply an air tank with a sufficient amount of air at a desired pressure. This device is positive displacement compressor.
Society of manufacturing engineers presented After watching the video and reviewing this printed material, the viewer will gain knowledge and understanding of the primary industrial grinding processes. cylindrical, internal, center less and surface grinding are demonstrated types of abrasives and bonding methods are shown grinding wheel maintenance is explained specifics of surface finishing are detailed

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Simplified Valve Circuit Guide presented the simplified pneumatic circuits, functions of valves, characteristics of valves, selection of valves and detailed information about valves. It gives the details about, valves, types of valves, operation of valves, circuit diagrams of valves and many more.

Pneumatic Manual 2008 says about pneumatics, Fluid power technology encompasses both hydraulics and pneumatics. Hydraulic applications are pressurized fluids, mostly oil, while pneumatic applications are pressurized gases, mostly air. It gives detailed information about pneumatics, pneumatic components, their working their construction, application etc.

III. OBJECTIVES

After watching the video and reviewing this printed material, the viewer will gain knowledge and understanding of the primary industrial grinding processes.
• Cylindrical, internal, center less and surface grinding are demonstrated
Types of abrasives and bonding methods are shown
• Grinding wheel maintenance is explained
Specifics of surface finishing are detailed

IV. COMPONENTS

1. COMPRESSOR

Fig.1A COMPRESSOR

Compressor is the main component of Pneumatic Grinding Machine, which compresses air. Here compressed air is used for running the Grinding Machine. This compressor have a indicator, it shows the air pressure generated is about 6 to 8 bar, which is sufficient to run our project i.e. Pneumatic Grinding Machine.

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2. FRL UNIT

Fig. B FRL UNIT

FRL Unit Consist of Filter, Regulator and Lubricator, Filter is used for removing the impurities from air which is to be compressed, Regulator is used for regulate the air flow and Lubricator is used to lubricate air for smooth operation.

3. DOUBLE ACTING CYLINDER

Fig. C DOUBLE ACTING CYLINDER

We have selected double acting cylinder because we want a motion of piston to directions i.e. up and down. As knob moved down the piston comes down and when knob moved upwards the piston moves to upward position.

IARJSET

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4. A SINGLE ACTING CYLINDER

A single acting cylinder has only one entrance that allows compressed air to flow(Single acting cylinderthrough. Therefore, it can only produce thrust in one direction The piston rod a propelled in the opposite direction by an internal spring, or by the external forceprovided by mechanical movementor weight of a load The thrust from the piston rod is greatly lowered because it has to overcome the force from the spring. Therefore, in order to provide the driving force for machines, the diameter of the cylinder should be increased. In order to match the length of the spring, the length of the cylinder should also be increased, thus limiting the length of the path. Single acting cylinders are used in stamping, printing, moving
materials,

5. DIRECTION CONTROL VALVE

Fig. E DIRECTION CONTROL VALVE

When a pressure pulse is input into the pressure control port 'P', the spool will move to the left, connecting inlet "P" and work passage 'B'. Work passage 'A' will then make a release of air through R1 and "R2'. The directional valves will remain in this operational position until signals of the contrary are received. Therefore, this type of directional control valves is said to have the function of "memory.

6. DC VALVE

DC Valve is taken to guide the air flow. DC Valves gives direction to compressed air flow in required direction.

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Fig. F DC VALVE

7. NON-RETURN VALVE

Fig. Non-Return valve

A non-eetum valve allows air to flow in one direction only. When air flows in the opposite direction, the valve will close. Another name for non-return valve is poppet valve

i Non Return Valve

(i) Flow control valve A flow control valve is formed by a non-retum valve and a variable throttle

8. FLOW CONTROL VALVE

IARJSET

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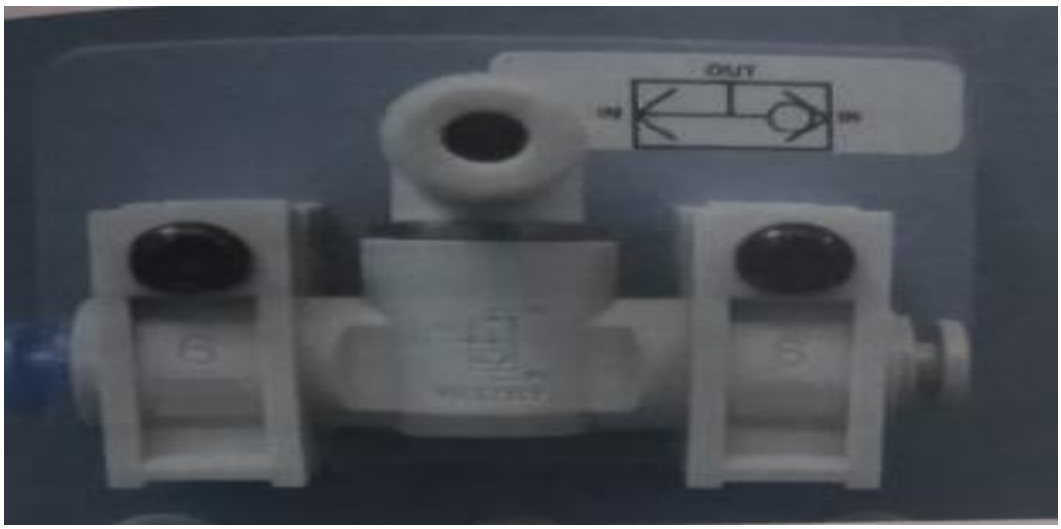
Fig.H Flow Control Valve

9. SHUTTLE VALVE

Shuttle valves are also known as double control or single control non-return valves. A shuttle valve has two air inlets "P" and "P2' and one air outlet "A". When compressed air enters through PI", the sphere will seal and block the other inlet P2 Air can then flow from P1' to 'A'. When the contrary happens the sphere will block inlet "PI', allowing air to flow from P2 to "A" only.



V. CONCLUSION

Generally in all foundries and machine shops Grinding is a common operation inding Machines are electrically operated. For operating Grinding In Machine there is need of more electricity, which affects on production cost Le grinding cost of product. Now a days every manufacturer wants to reduce the production cost of his product. Therefore for reducing the production cost of product or for reducing the cost of grinding we made a grinding machine which operates pneumatically. Todays industries are fully automated by using pneumatic system. So, every industry has pneumatic power.

Pneumatic Grinding Machine requires electricity only for operating the compressor and remaining all components gets operated by compressed air. Grinding operation is done Pneumatically and hence the production cost or grinding cost is reduced as the use of electricity is reduced.

Pneumatic Grinding Machine is economically convenient Grinding Machine, use of air saves consumption of electricity, it is totally pollution free, and the operation is safe. Mass production, where more accuracy is needed in less cycle time. our Pneumatic Grinding Machine is useful.

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IARJSET

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ISSN (Print) 2394-1588

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National Conference on Recent Trends in Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

Maize Oil Blended With Diesel as an Eco-Friendly Energy Source

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ABSTRACT: Petroleum – based fuels is a finite resource that is rapidly depleting. Consequently, petroleum reserves are not sufficient enough to last many years. Considering also the fact that petroleum – based fuels, can cause many environmental problems, imbalance of trade, high oil process etc., it becomes necessary the development of alternative fuel sources. At this paper will be examined the use of diesel-maize oil mixtures in diesel four-stroke engine. The mixtures used are the following: diesel-5% maize oil (k5), diesel-10% maize oil (k10), diesel-20% maize oil (k20),diesel-30% maize oil (k30), diesel-40% maize oil (k40), diesel-50% maize oil (k50). For those mixtures the gas emissions of carbon monoxide (CO), hydrocarbons (HC), nitrogen monoxide (NO) are being measured and the fuel consumption is also examined

Key-Words*:* - Bio fuels, maize oil as a fuel, Gas emissions,

I. INTRODUCTION

Diesel engines have been in use since the late 18th century. The first diesel engine was developed to run on a peanut oil .Once the technology becomes widely known in the 1900's, the abundance and low cost of fossil fuels, caused a paradigm shift away from vegetable based fuels. At the turn of current century, the same paradigm was beginning to shift back, due to rising fuel costs, the environmental impact and an abundance of waste feedstock available. In India, most of the heavy transportation plants, agricultural plants and power generation plants are powered by diesel engines. Thus there is a demand to find alternative fuels for diesel engines. It is thus very essential to make all possible efforts to search for alternative fuel oils.

A number of renewable energy sources, have been considered to achieve the above objectives. Some of them are Biogas, Alcohol, Hydrogen and vegetable oils. Particularly in tropical countries like India, oil seeds are produced by cultivation. Therefore vegetable oils are more dependable, sources of energy.

In the present conditions, even though the use of diesel is less expensive in engine in course of time, the natural sources will be exhausted and hence its price is bound to increased, then it would be appropriate to use vegetable oils as fuel oils. If vegetable oils are used as fuel oil, there is wide scope for, huge production of oil seeds. Hence cost of vegetable oil automatically will come down. In the present work, a study of the performance of C.I. Engines with maize oil and diesel blends, as fuels are made. The most serious drawbacks for vegetable oils, however is, it's very high viscosity, thus making is very difficult to inject into the cylinder and higher carbon residue, which makes, exhaust smoker than diesel oil.

In this paper, to study the performance characteristics, the experimental setup consists of a single cylinder four stroke diesel engine, coupled to eddy current dynamometer. The mixtures used are the following: diesel-5% maize oil (k5), diesel-10% maize oil (k10), diesel-20% maize oil (k20),diesel-30% maize oil (k30), diesel-40% maize oil (k40), diesel-50% maize oil (k50). For those mixtures the gas emissions of carbon monoxide (CO), hydrocarbons (HC), nitrogen monoxide (NO) are being measured and the fuel consumption is also examined.

After the performance of the above blend following result and conclusion are drawn

WORLDWIDE MAIZE PRODUCTION:-

Country	Production (tonnes)
United States	333,010,910
China	163,118,097
Brazil	51,232,447
Mexico	20,202,600
Indonesia	17,629,740
India	17,300,000

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

France	15,299,900
Argentina	13,121,380
South Africa	12,050,000
Ukraine	10,486,300
World	**817,110,509**

COMPARATIVE STUDY OF PROPERTIES OF MAIZE OIL AND DIESEL OIL:-

We have checked the following properties of maize oil and compare it with diesel.

Properties	Maize	Pure Diesel
Density	0.82	0.78
Calorific value	9800 Kcal/Kg	10,840.0 Kcal/Kg
Viscosities	20.8 Centistokes	3.39 Centistokes
Flash Point	295^0 C	55^0 C
Volatility	Low	Higher
Carbon Residue	Higher	Low

a) Viscosities at room, temperature are much higher compared to diesel oil.
b) The cetane number is slightly lower than diesel oil.
c) The flash point is very making them quite safe to store.
d) Volatility is quite low.
e) Carbon residue is higher.

By above-mentioned properties we have seen that viscosity of maize oil is high, it is quite difficult to blends, so we have modification of maize oil properties by following method.

MODIFICATION OF MAIZE OIL:-

Modification of maize oil properties is carried out by the following methods:

a) Heating the oil:

By heating vegetable oils, its viscosity is considerable reduced. This how ever does not alter the deposition problem.

b) Thermal cracking of the oil:

It is possible to Breakdown the heave molecules of vegetable oils into lighter ones by thermal cracking, thus reducing the viscosity.

c) Transestrification:

It is chemical reaction in which glycerol of the glycosides are replaced by mono-alcohols like methanol and ethanol.

It has been found that after transestrification there is a significant decrease in the viscosity, which is brought close to that of diesel oil. Carbons residues are lower and could points are reduced too. And also the substitution of glycerol by methanol ion the molecule yields significantly higher significantly higher certain number that those of diesel oil. Etherification however does not improve the volatility of vegetable oils.

Transesterification Process

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

Fig 1:- Transesterification process

Trans esterification process (fig. as shown in previous page.) It mainly consists of two containers. The upper containers have the mixture of KOH and methanol chemical and lower container consists of thermostat. This thermostat is used for heating the maize oil. The assembly consists of a motor which is used continuous stirring purpose.

The maize oil is heated up to 60 degree in lower container with the help of thermostat during the heating the mixture from upper tank is added drop by drop in the lower tank. Now the whole mixture is stirred using thermostat. This leads to thermal cracking of the mixture. The processed oil is then stored in a storage tank where the glycerine & bio-diesel is separated after some period of time.

After Modification of maize oil properties we can blend this oil with diesel as 100%diesel, 80%diesel-20% maize oil, 60%diesel-40% maize oil , 40% diesel-60% maize oil, 20%diesel-80% maize oil, 100% maize oil in following Experimental Setup.

II. EXPERIMENTAL SETUP FOR THE DETERMINATION OF PERFORMANCE CHARACTERISTICS

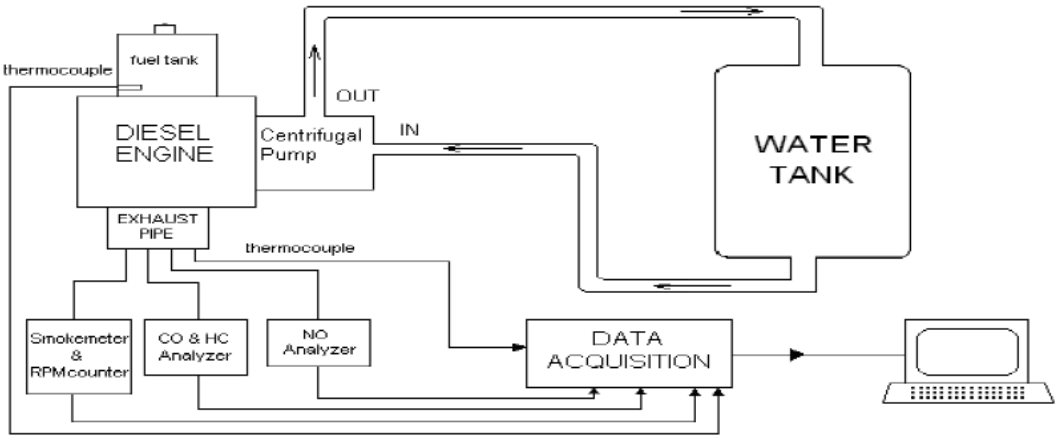

Fig 1:- Experimental Setup

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

TEST RESULTS:-

rpm	CO %						
	diesel	k5	k10	k20	k30	k40	k50
1000	0,0289	0,0310	0,0309	0,0309	0,0319	0,0397	0,0345
1500	0,0303	0,0302	0,0304	0,0311	0,0345	0,0211	0,0288
2000	0,01	0,0280	0,0232	0,0284	0,0274	0,0281	0,0219
2500	0,0350	0,0244	0,0317	0,0296	0,0324	0,0305	0,0292

rpm	HC(ppm)						
	diesel	k5	k10	k20	k30	k40	k50
1000	2,535	14,937	6,244	10,326	3,406	5,358	9,167
1500	13,31	21,485	9,236	17,997	14,718	0,449	17,197
2000	7,131	3,184	13,970	15,965	8,402	8,502	12,913
2500	10,961	16,347	18,884	23,556	30,551	7,451	17,712

III. CONCLUSIONS

The use of mixture of diesel and maize oil has the following impacts:

1.About CO it can be noticed that when the maize oil is increased on the fuel regarding to diesel, It appears a decrease of CO, except in the case k40/1500rpm.

2.About HC it can be noticed the biggest reduction of HC regarding to diesel in case of k40/1500rpm

3. The biggest reduction of NO regarding to Diesel is noticed in the case of k20/2000-2500rpm.

4.The smoke it can be noticed the biggest reduction for k10/1500-2000rpm

5. The temperature of exhaust gases is not influenced by the type of mixture of fuel.

6. Knocking of the I.C. Engine during its performance using Maize oil is much lesser than blends & diesel oil.

7. It is biodegradable. It has been found that its degradation rate is four times that of conventional diesel fuel. Practically it means that is case of a spill over and the cleanup would easier.

8. Biodiesel also assist in the process of engine lubrication acting as solvent, it helps to loosen deposits from inside of the engine that could have clogged the lubrication oil passages. On its own pure biodiesel does not leave any deposits. Thus it results in longer engine life.

9. It is also safer and non-toxic having higher flash point than conventional diesel oil, accidental fibers are less likely. Thus makes it easier to store and transfer.

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IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

Electricity Generation by Speed Breaker

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ABSTRACT: Energy is the primary need for survival of all organisms in the universe. Everything what happens in the surrounding is the expression of flow of energy in one of the forms. But in this fast moving world, population is increasing day by day and the conventional energy sources are lessening. The extensive usage of energy has resulted in an energy crisis over the few years. Therefore to overcome this problem we need to implement the techniques of optimal utilization of conventional sources for conservation of energy. This project includes how to utilize the energy which is wasted when the vehicles passes over a speed breaker. Lots of energy is generated when vehicle passes over it. We can tap the energy generated and produce power by using the speed breaker as power generating unit. The kinetic energy of the moving vehicles can be converted into mechanical energy of the shaft through rack and pinion mechanism. Then, this mechanical energy will be converted to electrical energy using generator which will be saved with the use of a battery. The energy we save during the day light can be used in the night time for lighting street lights. Therefore, by using this arrangement we can save lot of energy which can be used for the fulfillment of future demands.This project harvests energy from speed breaker by making gear arrangement and using electronic gadgets. Large amounts amount of electricity can be generated saving lot of money. And if implemented will be very beneficial for Government.When vehicle is in motion it produces various forms of energy like, due to friction between vehicle"s wheel and road i.e. rough surface HEAT Energy is produced, also when vehicle traveling at high speed strikes the wind. The principle involved is potential energy to electrical energy conversion. There is a system to generate power by converting the potential energy generated by a vehicle going up on a speed breaker into kinetic energy. When the vehicle moves over the inclined plates, it gains height resulting in increase in potential energy, which is wasted in a conventional rumble strip. When the breaker comes down, they crank a lever fitted to a ratchet-wheel type mechanism (a angular motion converter) which in turn rotates a geared shaft loaded with recoil springs. The output of this shaft is coupled to a dynamo to convert kinetic energy into electricity

KEYWORDS *:* Electricity ,Generation ,Speed, Breaker.

I. INTRODUCTION

Increasing demand of energy adds to the need of identifying non-conventional resources of energy. In my paper, I will discuss about power generation from speed breaker and the possible mechanism required for it.An energy crisis is any great bottleneck (or price rise) in the supply of energy resources to an economy. It usually refers to the shortage of oil and additionally to electricity or other natural resources. An energy crisis may be referred to as an oil crisis, crisis, energy shortage, electricity shortage electricity crisis. While not entering a full crisis, political riots that occurred during the 2007 Burmese antigovernment protests were initially sparked by rising energy prices. Likewise the Russia-Ukraine gas dispute and the Russia-Belarus energy dispute have been mostly resolved before entering a prolonged crisis stage. Market failure is possible when monopoly manipulation of markets occurs. A crisis can develop due to industrial actions like union organized strikes and government embargoes. The cause may be ageing over consumption, infrastructure and sometimes bottlenecks at oil refineries and port facilities restrict fuel supply. An emergency may emerge during unusually cold winters. EMERGING SHORTAGES Crisis that currently exist include.

The availability of regular conventional fossil fuels will be the main sources for power generation, but there is a fear that they will get exhausted eventually by the next few decades. Therefore, we have to investigate some approximate, alternative, new sources for the power generation, which is not depleted by the very few years. Another major problem, which is becoming the exiting topic for today is the pollution. It suffers all the living organisms of all kinds as on the land, in aqua and in air. Power stations and automobiles are the major pollution producing places.

II. LITERATURE REVIEW

1. Mr. Akash L. Gorle : Perceiving BE in Computer Science and Engineering at Priyadarshini Institute of Engineering and Technology Nagpur, Maharashtra, India. He Received Diploma in Computer Technology from Maharashtra State Board of Technical Education Mumbai India. Currently he is working on Electricity Generation From Speed Breaker.

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IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

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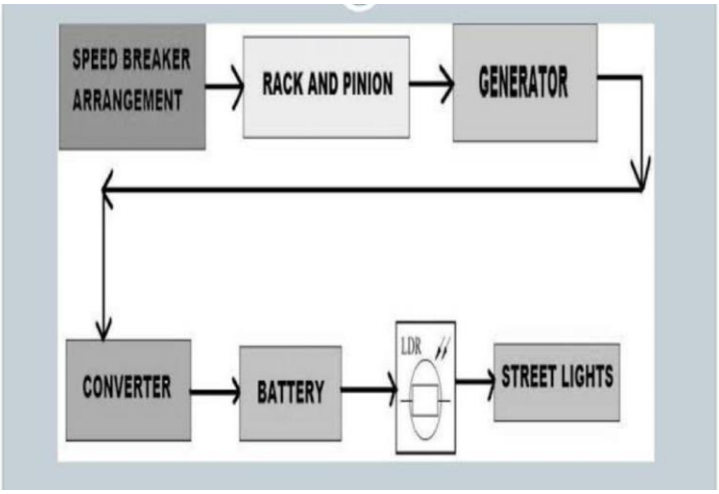
III. METHODOLOGY

The working principle of this power generation program is to convert the kinetic energy to electric energy via mechanical energy. This can be done when the brakes are applied upon the vehicle kinetic energy is produced. After this the kinetic energy is converted to mechanical energy using a rack and pinion gear and the by connecting the pinion gear to a generator shaft the energy is converted into electrical energy.

1. Speed Breaker:- This is a normally used thing in everyday life. This element can be made from the composite of carbon fibre and rubber so that the speed breaker can sustain the heavy load of vehicles such as a container filled with some material in it. The speed breakers can be made such that the starting and ending slopes would be made up of concrete and cement mixture and the central part would be made up of the composite mentioned before.
2. Rack and Pinion Gear :- This is one of the simplest types of gears and can be manufactured according to one's own need. As the name suggests this type of gear has two components namely Rack which is a straight gear with tooth in only one direction, the second component is the Pinion which is a round shaped gear and will roll upon the rack to perform its task. The alignment of this gear will be in vertical direction.
3. Generator:- A generator is a device which converts mechanical energy into electrical energy. In this case the work of the generator remains the same and for that the shaft of the generator will have a pinion gear on its edge. The pinion gear will be meshed with the pinion gear of Rack and Pinion arrangement. As the first pinion gear will rotate the second gear will also rotate with the shaft of the generator. This will induce EMF (Electro Motive Force) in the generator and electricity will be produced.
4. Electricity Storage:- It is very difficult to store electricity for a long time into any kind of storage. To deal with this issue a battery pack will be introduced which will help us store the electric energy in to the battery pack. Also battery packs can be useful to transfer electric energy from one place to another.



IV. OBJECTIVES

The generation of electricity using speed breaker is one of the easiest way as now-a -days everyone is having vehicle. It can be widely accepted at individual level because of its low production cost also it doesn't need any extra effort. Also the piezo electric crystal which will convert the mechanical pressure in electric output will enhance the system output.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

V. COMPONENTS

RACK :

Gear racks are utilized to convert rotating movement into linear motion .A gear rack hasst raight teeth cut into one surface of a square or round section of rod and operates with a pinion, which is a small cylindrical gear meshing with the gear rack.

Fig.1. Rack

SPURGEAR :

Spur gears or straight-cut gears are the simplest type of gear . They consist of a cylinder or disk with teeth projecting radially. Viewing the gear at 90 degrees from the shaft length (side on) the tooth faces are straight and aligned parallel to the axis of rotation. Looking down the length of the shaft, a tooth's cross section is usually not triangular. Instead of being straight (as in a triangle) the sides of the cross section have a curved form)to achieve a constant drive ratio. Spur gears gears mesh together correctly only if fitted to parallel shafts. No axial thrust is created by the tooth loads .Spur gears are excellent at moder ate speeds butt end to be noisy a thigh speeds

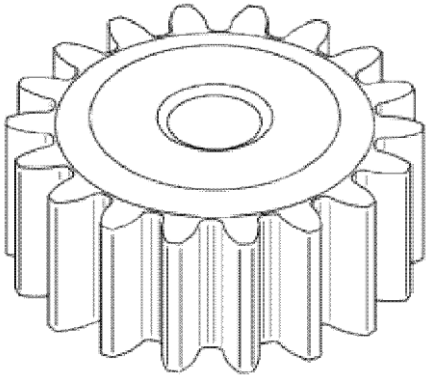


Fig.2. Spurgear

FLYWHEEL:

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

A flywheel is a mechanical device which uses the conservation of angular momentum to store rotational energy a form of kinetic energy proportional to the product of its moment of inertia and the square of its rotational speed .In particular ,assuming the flywheel's moment o finertia is constant(i.e.,afly wheel with fixed mass and second moment of area revolving about some fixed axis) then the stored energy is directly associated with the square of its rotational speed.

Fig.3. Flywheel

SHAFTWHEEL :

These are the wheels and shaft sets we use with our wheel edall-terrain robotkits .The wheels with shaft sets are specifically designed for our robot kits, but can be used in your applications as well. We also sell the wheels and shaft sindividually here Weal so carry Treads and Tracks, for those that want to roll with it.

Fig.4.Shaftwheel

GENERATOR MOTOR:

A motor–generatoris a device for converting electrical power to another form. Motor–generator sets are used to convert frequency, voltage, or phase of power. They may also be used to isolate electrical loads from the electrical power supply line. Large motor–generators were widely used to convert industrial amounts of power while smaller motor–generators (such as the one shown in the picture) were used to convert battery power to higher DC voltages.

Fig.5.Generator Motor

BATTERY:

When a battery is supplying power, its positive terminal is the cathode and its negative terminal is the anode. The terminal

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

marked negative is the source of electrons that will flow through an external electric circuit to the positive terminal. When a battery is connected to an external electric load, a redox reaction converts high-energy reactants to lower-energy products, and the free-energy difference is delivered to the external circuit as electrical energy. Historically the term "battery" specifically referred to a device composed of multiple cells; however, the usage has evolved to include devices composed of a single cell.

Fig.6.Battery

VI. CONCLUSION

This is generating many kilowatts power by using downward as well as the upward motion of rack. With the help of speed breaker mechanism, linear motion of rack is converted into rotary motion of pinion and thus is used to rotate the shaft of DC generator. It generates 273.24 watts with 400kg of load and 14cm of the height of the rack. DC voltages charge the batteries during the passage of moving vehicles. Using inverter (DC to AC conversion), we will be able to use batteries power for other useful applications. It can be implemented on the toll plazas, highways. Guide slots and lubricating oil sump is required to mini mise friction losses. The initial cost of this arrangement is high but after the first cost ,it will be free energy system.

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IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

Manufacturing of Interlocking Bricks using Laterite Soil and Fly Ash

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Abstract: This project demonstrate a comparative study of cement and lime stabilized lateritic interlocking blocks produced with laterite samples from the Olomi area in Ogbomoso, Oyo State, Nigeria. The stabilizing agents were added at 5%, 10% 15%, 20%, and 25% by weight replacement levels. The blocks were tested for compressive strengths, water absorption, and resistance to abrasion. The results showed that average dry compressive strength at 28 days for cement stabilized blocks at 5%, 10% 15%, 20%, and 25% stabilization were 1.63 N/mm2, 2.60 N/mm2, 2.78 N/mm2, 2.82 N/mm2, and 3.12 N/mm2, respectively, while those of lime stabilized blocks were 0.92 N/mm2, 1.25 N/mm2, 1.15 N/mm2, 1.06 N/mm2, and 0.94 N/mm2, respectively. The Nigeria Building and Road Research Institute (NBRRI, 2006) specified that the minimum 28 days strength should not be lower than 2N/mm2. Only cement stabilized blocks satisfied this requirement at 10% and above stabilization level. It was concluded that cement stabilized interlocking blocks are of better quality and cheaper than those stabilized with lime.

Keywords: laterite, interlocking block, ordinary Portland cement, lime, compressive strength**.**

I. INTRODUCTION

Soil stabilization may be defined as any process aimed at improving the performance of a soil as a construction material. Bell (1993), referred to soil stabilization as the process of mixing additives with soil to improve its volume stability, strength, permeability and durability. The soil that is of concern in this study is laterite. Laterite is a red tropical soil that is rich in iron oxide and usually derived from wide variety of rock weathering under strongly oxidizing and leaching conditions. It forms in tropical and sub-tropical regions where the climate is humid. Laterite is very abundant in Ceylon, India, Burma, Central Africa, West Africa and Central America (Encyclopedia Britannica, 2001). The two most commonly used stabilizers are cement and lime. Cement stabilization involves the addition of small amount of cement to modify the soil properties. The amount of cement needed to stabilize soil may range from 3 to 16% by dry weight of soil, depending on the soil type and properties required. Any type of cement may be used for soil stabilization but ordinary Portland cement is mostly used according to Bell (1993).

Lime stabilization refers to the process of adding burned limestone products either calcium oxide (i.e. quicklime) or calcium hydroxide (Ca (OH)2) to soil in order to improve its properties. This process is similar to cement stabilization except that according to Bell (1993); lime stabilization is suitable for soils with high clay contents. Lime was used throughout the world by the ancient civilization as a binding agent for brick and stone. Nowadays, improved technology induced people to use lateritic interlocking blocks as an alternative for concrete blocks in building houses because they do not require cement mortar in bonding the blocks during construction, thereby reducing the building cost. This study compares the properties of lateritic interlocking blocks stabilized with cement and lime in order to ascertain which is more effective structurally and economically.

India is world's fifth largest aluminum producer with an aluminum production competence of around 2.7 million tones, accounting almost 5% of the total aluminum production in the world. India is also a huge reservoir of Bauxite with a Bauxite reserve of 3 billion tones. India lies at the eighth position in the list of leading primary aluminum producers in the world. Red mud is the by-product of the manufacture of alumina from bauxite by the Bayer process. World production of aluminum is 15 MTPA provided from about 30 MTPA of alumina produced from 50 MTPA of bauxite which give approximately 30 MTPA red mud. The production rates of red mud depend on the origin of the bauxite. From Surinam bauxite, 0.33 tons of red mud is produced per ton of alumina, while the production of red mud from Jamaican bauxite is one ton per ton of Al2O3 and from Arkansas bauxite it is two tons per ton of Al2O3. In spite of the efforts to utilize red mud, most of the residue remains unused and the disposal of the discarded red mud is a great environmental problem for two main reasons. The first is the toxicity due to the high pH (caustic soda). The second reason is the volume of the residue. Every ton of alumina produced leaves about 1 ton of solid residue in suspension and 4 tons of slurry.

The various materials collected for the manufacturing are

1. Laterite soil
2. Fine Aggregate
3. Cement
4. Admixture

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

LATERITE SOIL

Laterite are shaped from the draining of parental sedimentary rocks (sandstones, dirts, limestone's); transformative rocks (schist's, gneisses, migmatites); molten rocks (stones, basalts). Laterites are soil types wealthy in iron and aluminium, framed in hot and wet tropical zones. The tropical areas incorporate the states like TamilNadu (Nilgiris), Kerala, Karnataka, Uttaranchal,Uttarakhand, Himachal Pradesh and different rugged spots. The gathered example is cleaned from squanders and folded into powder. This laterite soil is ruddy dark coloured shading and wealthy in iron and alumina content.

Parameter	Value
Water Content	10.7 %
Specific Gravity	2.48
Unit Weight g/cc	1.59
Optimum Dry Density	1.78
Shrinkage Limit	13.48 %
Liquid Limit	38.50 %
Optimum Moisture Content	21.40 %

FINE AGGREGATE

River sand is used as fine aggregate. Confirming IS 383 (1970).

CEMENT

43 grades Ordinary Portland Cement is used confirming IS 8112: 1989

II. METHODOLOGY

2.1 General

Interlocking bricks/blocks (IBs) can be produced as solid, perforated or hollow bricks. The demarcation between hollow and perforated bricks depends on the surface area of holes. If they occupy less than 25% of the surface area, they are called `perforated bricks`, if more we define them as `hollow blocks` (BS 6073-1:1981 clause 3.3).

We can characterize bricks in terms of their solidity as follows: -

• The more solid the brick the more material required and the more powerful the press needed to attain enough brick density, but less binder will be needed for satisfactory brick strength.

• The more perforations, increasing up to 50%, the more binder will be required in the mix to achieve the higher strength needed for thin membranes formed onto a hollow block. The two solidity characteristics of blocks above, each have extreme conditions that increase cost of blocks. The best percentage of perforation is that which minimize some combination of weight, material and the power requirement of the press. To reduce the cement/sand ratio in the mix for hollow blocks, the size of perforations should be reduced. Interlocking requires a variety of shapes/parts to construct different wall joints. The existing commercial interlock designs have different configurations (Ramamurthy & Nambiar 2004, Dyskin et al. 2005, Thanoon et al. 2004, Croft 1993. Harris et al. 1992) and thus vary the number of part-bricks necessary to perform the same construction operations.

Interlocking bricks divided into two groups, according to their locking systems. Category A bricks have interlocks that restrict movement both horizontally and transverse to the wall surface, Category B bricks allow horizontal movement and only limit transverse movement during wall assembly. Interlocking bricks have three types of locking (jointing) methods; Tongue and Groove (T&G), Protrusions and Depressions (P&D), and Topological non-planar locking. The T&G and P&D are the typical locking methods, while topological method is not a popular one.

2.2 SOLBRIC SYSTEM FROM SOUTH AFRICA

The SOLBRIC system uses solid interlocking bricks, formed by pressing on their ends (the compacting stroke moves parallel to the longer side), with guided or controlled width and height. In bricklaying, SOLBRICs are arranged at the normal bed surface. The size of a SOLBRIC is 250 x 200 x 100mm. SOLBRIC provides small horizontal cavities between the courses in which conduits and pipes can be installed or reinforcements placed to strengthen the wall at certain locations (cill and lintel levels). The SOLBRIC wall has a flat internal surface and externally a pointed joint surface from the chamfered edges of the bricks on one side. The flat internal surface of SOLBRIC reduces the thickness of required plaster mortar and the external pointed joint makes the external appearance attractive. However this difference means that bricks may not be reversed (front to back). Although the SOLBRIC interlocking brick system seems to be easy to use, the shape of the bricks and the parts made from the machine make it possible to build only the external walls because there is no means of connecting partitions i.e. of making a tee or cross joints.

2.3 HYDRAFORM SYSTEM FROM SOUTH AFRICA

Hydraform is the simplest type of interlocking block in shape, when interlocked makes a tongue and grooved joint at the sides and top and bottom. Being free to slide along the course horizontally, it can be pushed along to achieve tighter perpends (vertical joints).

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

Hydraform block is moulded by pressing along its length from the ends, as for the SOLBRIC. It is also a solid block, but slightly shorter, wider and thicker in size (240 x 220 x 115mm) than the SOLBRIC (Figure). The stability of the wall built from the Hydraform blocks is not provided by the locking mechanism but by the width and weight (massiveness) of the block. In production they require considerable power to mould (compress) due to their large volume, 30% more soil is used compared to the other five reported types. Moreover the
compression must be sufficient to allow a fresh block to withstand the squeezing forces occurring when it is manually moved from machine to the curing area. A powerful (moulding pressure 4MPa to 10MPa) and expensive motorised machine (Hydraform Manual, 2004) is required to compact such a volume of soil. This can be compared to the cheaper manual presses (with pressures under 2MPa) used to produce Bamba, Tanzanian and Thai types (VITA 1975, Weinhuber 1995).

The Hydraform blocks require some 'shaving' and/or chopping (Figure) if two blocks have to be laid perpendicular to each other (this could have been included in the production process for time-saving at site). A half bat to cover the tongue/male is also required (Hydraform Manual 2004). The longitudinal course joints (Figure) of the blocks have a clearance of 1-1.5mm between the tongue/ridge and groove of the mating blocks. The reason behind this 'play' is easy of longitudinal sliding, to simplify the block-laying in order to achieve tight perpends. Apart from being stacked dry all other wall construction operations are as conventional bricklaying i.e. any compensation blocks are cut manually at site.

III. EXPERIMENTAL WORK:

3.1 PROPORTIONING OF MIX

Laterite bricks were manufactured with general mix design (or mix proportion, of 1:10 (cement: laterite) (by weight batching).

The proportion of laterite was progressively replaced with sand thereby having unlike mix proportions of 1: 3: 7; 1: 4: 6 and 1: 5: 5 (cement: sand: Laterite respectively) while keeping the quantity of cement constant.

Two units each of the five different mix proportions were therefore produced. In the first mix proportion, 1kg of cement and 10 kg of laterite were carefully mixed with water until a consistent mixture was obtained. About 1 kg of water was sprayed on the mixture using bucket.

Figure 3.1: Material Collection

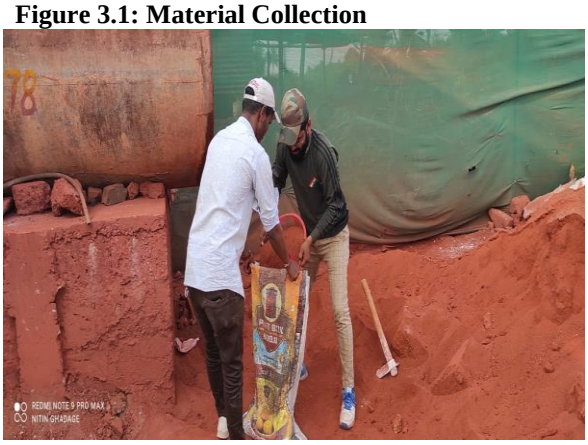

Figure 3.2: Mix Design

Figure 3.3: Casting of Laterite Bricks

Figure 3.4: Curing of Laterite Bricks

IARJSET

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ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

3.2 MIX DESIGN RATIO

TABLE 3.1 PROPORTIONS OF INGREDIENTS (1: 3: 7)

Sr. No.	Ratio	Cement (Kg)	Sand (Kg)	Laterite Soil (Kg)	Fly ash (Kg)	Samples
1	1 : 3 : 7	1	3	7	0	3
2		0.8	3	7	0.2	3
3		0.75	3	7	0.25	3

TABLE 3.2 PROPORTIONS OF INGREDIENTS (1:4:6)

Sr. No.	Ratio	Cement Kg	Sand Kg	Laterite Soil Kg	Flyash Kg	Samples
1	1 : 4 : 6	1	4	6	0	3
2		0.8	4	6	0.2	3
3		0.75	4	6	0.25	3

TABLE 3.3 PROPORTION OF INGREDIENTS (1 : 5 : 5)

Sr. No.	Ratio	Cement Kg	Sand Kg	Laterite Soil Kg	Fly ash Kg	Samples
1	1 : 5 : 5	1	5	5	0	3
2		0.8	5	5	0.2	3
3		0.75	5	5	0.25	3

3.3 CASTING OF BRICKS:

The resulting combination was relocated into a steel mould of size 228 mm x 152 mm x 127 mm. The mixture was compacted by levitating the mould to a height of 1m and consenting it to fall freely to the ground. It was filled again to the brim, compacted manually and the mould removed. The process was repeated for the same mix proportion. The mix proportion of the cement: sand: laterite ratio was varied to the next sand and laterite mixture, that is, 1kg of cement 1kg of sand and 9 kg of laterite. The production process was also repeated, and continued until all the bricks of the five different mix proportions were casted.

3.4 CURING OF BRICKS:

After removing the mould all the produced cement sand– stabilized laterite bricks produced were left in the open air under normal temperature to cure.

Tarpaulin is placed over the bricks and water was sprayed on the bricks once in the morning and once in the evening for required number of days for curing.

In this project we cure the bricks for 7 days and 28 days before conducting the laboratory test and field test of bricks.

3.5 COMPRESSIVE STRENGTH CHECKING TEST:

Compressive strength test on bricks are carried out to determine the load carrying capacity of bricks under compression with the help of compression testing machine. Bricks are generally used for construction of load bearing masonry walls, columns and footings.

These load bearing masonry structures experiences mostly the compressive loads. Thus, it is important to know the compressive strength of bricks to check for its suitability for construction.

Procedure of Compressive Strength Test on Bricks

1. Place the specimen with flat face s horizontal and mortar filled face facing upwards between plates of the testing machine.
2. Apply load axially at a uniform rate of 14 N/mm2 (140kg/cm2) per minute till failure occurs and note maximum load at failure.
3. The load at failure is maximum load at which the specimen fails to produce any further increase in the indicator reading on the testing machine.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

Compressive Strength of Bricks = Maximum Load at Failure (N)/Average area of bed face (mm2)

Figure 3.5: Testing of Laterite Bricks

IV. RESULTS

4.1. Compressive Strength Test Results for 7 Days:

- **For proportion 1: 3: 7 :**

TABLE 4.1.1:- Compressive Strength for Ratio 1:3:7 and 0% replacement of cement by Fly ash

Sr. No.	Ratio	Self-Weight of Brick (KG)	Compressive Strength (N / mm2)	AVG (N/mm2)
1	1 : 3 : 7	8.190	3.53	3.200
2	1 : 3 : 7	8.090	2.97	
3	1 : 3 : 7	8.366	3.11	

TABLE 4.1.2:- Compressive Strength for Ratio 1:3:7 and 20% replacement of cement by Fly ash

Sr. No.	Ratio	Self-Weight of Brick (KG)	Compressive Strength (N / mm2)	AVG (N/mm2)
1	1 : 3 : 7	7.390	3.538	4.104
2	1 : 3 : 7	7.455	4.387	
3	1 : 3 : 7	7.6	4.387	

TABLE 4.1.3:- Compressive Strength for Ratio 1:3:7 and 25% replacement of cement by Fly ash

Sr. No.	Ratio	Self-Weight of Brick (KG)	Compressive Strength (N / mm2)	AVG (N/mm2)
1	1 : 3 : 7	7.860	4.599	4.575
2	1 : 3 : 7	7.545	4.599	
3	1 : 3 : 7	8.125	4.529	

- **For proportion 1: 4: 6 :**

TABLE 4.1.4:- Compressive Strength for Ratio 1:4:6 and 0% replacement of cement by Fly ash

Sr. No.	Ratio	Self-Weight of Brick (KG)	Compressive Strength (N/mm2)	AVG (N/mm2)
1	1 : 4 : 6	7.820	4.10	4.220

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

2	1 : 4 : 6	7.630	4.46	
3	1 : 4 : 6	7.730	4.10	

TABLE 4.1.5:- Compressive Strength for Ratio 1:4:6 and 20% replacement of cement by Fly ash

Sr. No.	Ratio	Self-Weight of Brick (KG)	Compressive Strength (N / mm2)	AVG (N/mm2)
1	1 : 4 : 6	7.715	3.538	4.245
2	1 : 4 : 6	7.720	4.529	
3	1 : 4 : 6	7.620	4.670	

TABLE 4.1.6:- Compressive Strength for Ratio 1:4:6 and 25% replacement of cement by Fly ash

Sr. No.	Ratio	Self-Weight of Brick (KG)	Compressive Strength (N / mm2)	AVG (N/mm2)
1	1 : 4 : 6	8.330	6.015	5.472
2	1 : 4 : 6	7.230	4.882	
3	1 : 4 : 6	7.885	5.519	

- **For proportion 1: 5: 5:**

TABLE 4.1.7:- Compressive Strength for Ratio 1:5:5 and 0% replacement of cement by Fly ash

Sr. No.	Ratio	Self-Weight of Brick (KG)	Compressive Strength (N / mm2)	AVG (N/mm2)
1	1 : 5 : 5	8.280	6.085	5.468
2	1 : 5 : 5	7.665	4.95	
3	1 : 5 : 5	8.050	5.37	

TABLE 4.1.8:- Compressive Strength for Ratio 1:5:5 and 20% replacement of cement by Fly ash

Sr. No.	Ratio	Self-Weight of Brick (KG)	Compressive Strength (N / mm2)	AVG (N/mm2)
1	1 : 5 : 5	7.750	4.670	4.723
2	1 : 5 : 5	7.145	2.689	
3	1 : 5 : 5	8.065	6.812	

TABLE 4.1.9:- Compressive Strength for Ratio 1:5:5 and 25% replacement of cement by Fly ash

Sr. No.	Ratio	Self-Weight of Brick (KG)	Compressive Strength (N / mm2)	AVG (N/mm2)
1	1 : 5 : 5	8.065	3.679	3.748
2	1 : 5 : 5	7.610	3.467	
3	1 : 5 : 5	7.685	4.10	

4.2 Water Absorption Test Results:

- **For proportion 1: 3: 7 :**

TABLE 4.2.1: Water Absorption Test for ratio 1:3:7 and 0% replacement of cement by Fly ash

Sr. No.	Ratio	Self-Weight of Brick (KG)	% Water Absorption	AVG (%)
1	1 : 3 : 7	8.190	22	22
2	1 : 3 : 7	8.090	23	
3	1 : 3 : 7	8.366	21	

TABLE 4.2.2: Water Absorption Test for ratio 1:3:7 and 20% replacement of cement by Fly ash

IARJSET

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ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

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Sr. No.	Ratio	Self-Weight of Brick (KG)	% Water Absorption	AVG (%)
1	1 : 3 : 7	7.390	21	21
2	1 : 3 : 7	7.455	22	
3	1 : 3 : 7	7.6	20	

TABLE 4.2.3: Water Absorption Test for ratio 1:3:7 and 25% replacement of cement by Fly ash

Sr. No.	Ratio	Self-Weight of Brick (KG)	% Water Absorption	AVG (%)
1	1 : 3 : 7	7.860	22	21
2	1 : 3 : 7	7.545	20	
3	1 : 3 : 7	8.125	21	

- **For proportion 1: 4: 6 :**

TABLE 4.2.4: Water Absorption Test for ratio 1:4:6 and 0% replacement of cement by Fly ash

Sr. No.	Ratio	Self-Weight of Brick (KG)	% Water Absorption	AVG (%)
1	1 : 4 : 6	7.820	19	19
2	1 : 4 : 6	7.630	20	
3	1 : 4 : 6	7.730	18	

TABLE 4.2.5: Water Absorption Test for ratio 1:4:6 and 20% replacement of cement by Fly ash

Sr. No.	Ratio	Self-Weight of Brick (KG)	% Water Absorption	AVG (%)
1	1 : 4 : 6	7.715	20	20.5
2	1 : 4 : 6	7.720	21	
3	1 : 4 : 6	7.620	20	

TABLE 4.2.6: Water Absorption Test for ratio 1:4:6 and 25% replacement of cement by Fly ash

Sr. No.	Ratio	Self-Weight of Brick (KG)	% Water Absorption	AVG (%)
1	1 : 4 : 6	8.330	19	19
2	1 : 4 : 6	7.230	19	
3	1 : 4 : 6	7.885	19	

- **For proportion 1: 5: 5:**

TABLE 4.2.7: Water Absorption Test for ratio 1:5:5 and 0% replacement of cement by Fly ash

Sr. No.	Ratio	Self-Weight of Brick (KG)	% Water Absorption	AVG (%)
1	1 : 5 : 5	8.280	19.5	19.5
2	1 : 5 : 5	7.665	19	
3	1 : 5 : 5	8.050	20	

TABLE 4.2.8: Water Absorption Test for ratio 1:5:5 and 20% replacement of cement by Fly ash

Sr. No.	Ratio	Self-Weight of Brick (KG)	% Water Absorption	AVG (%)
1	1 : 5 : 5	7.750	20	19
2	1 : 5 : 5	7.145	19	
3	1 : 5 : 5	8.065	18	

TABLE 4.2.9: Water Absorption Test for ratio 1:5:5 and 25% replacement of cement by Fly ash

IARJSET

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International Advanced Research Journal in Science, Engineering and Technology

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Vol. 9, Special Issue 1, April 2022

Sr. No.	Ratio	Self-Weight of Brick (KG)	% Water Absorption	AVG (%)
1	1 : 5 : 5	8.065	18	19
2	1 : 5 : 5	7.610	19	
3	1 : 5 : 5	7.685	20	

4.3 Compressive Strength Test Results for 28 Days:

- **For proportion 1: 3: 7 :**

TABLE 4.3.1:- Compressive Strength for Ratio 1:3:7 and 0% replacement of cement by Fly ash

Sr. No.	Ratio	Self-Weight of Brick (KG)	Compressive Strength (N / mm2)	AVG (N/mm2)
1	1 : 3 : 7	7.490	7.530	6.340
2	1 : 3 : 7	7.590	5.630	
3	1 : 3 : 7	7.816	5.860	

TABLE 4.3.2:- Compressive Strength for Ratio 1:3:7 and 20% replacement of cement by Fly ash

Sr. No.	Ratio	Self-Weight of Brick (KG)	Compressive Strength (N / mm2)	AVG (N/mm2)
1	1 : 3 : 7	6.590	5.788	6.434
2	1 : 3 : 7	6.730	6.677	
3	1 : 3 : 7	6.866	6.837	

TABLE 4.3.3:- Compressive Strength for Ratio 1:3:7 and 25% replacement of cement by Fly ash

Sr. No.	Ratio	Self-Weight of Brick (KG)	Compressive Strength (N / mm2)	AVG (N/mm2)
1	1 : 3 : 7	7.136	6.599	4.747
2	1 : 3 : 7	6.870	6.899	
3	1 : 3 : 7	7.490	6.743	

- **For proportion 1: 4: 6:**

TABLE 4.3.4:- Compressive Strength for Ratio 1:4:6 and 0% replacement of cement by Fly ash

Sr. No.	Ratio	Self-Weight of Brick (KG)	Compressive Strength (N / mm2)	AVG (N/mm2)
1	1 : 4 : 6	7.166	6.75	6.713
2	1 : 4 : 6	7.030	6.71	
3	1 : 4 : 6	7.110	6.68	

TABLE 4.3.5:- Compressive Strength for Ratio 1:4:6 and 20% replacement of cement by Fly ash

Sr. No.	Ratio	Self-Weight of Brick (KG)	Compressive Strength (N / mm2)	AVG (N/mm2)
1	1 : 4 : 6	6.927	6.488	7.562
2	1 : 4 : 6	6.944	7.729	
3	1 : 4 : 6	6.884	8.470	

TABLE 4.3.6:- Compressive Strength for Ratio 1:4:6 and 25% replacement of cement by Fly ash

Sr. No.	Ratio	Self-Weight of Brick (KG)	Compressive Strength (N / mm2)	AVG (N/mm2)
1	1 : 4 : 6	7.655	8.225	8.415

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

National Conference on Recent Trends in Engineering and Technology

Adarsh Institute of Technology & Research Centre, Vita, India

Vol. 9, Special Issue 1, April 2022

2	1 : 4 : 6	6.532	8.102	
3	1 : 4 : 6	7.21	8.919	

- **For proportion 1: 5: 5:**

TABLE 4.3.7:- Compressive Strength for Ratio 1:5:5 and 0% replacement of cement by Fly ash

Sr. No.	Ratio	Self-Weight of Brick (KG)	Compressive Strength (N / mm2)	AVG (N/mm2)
1	1 : 5 : 5	7.615	8.185	8.201
2	1 : 5 : 5	7.122	8.300	
3	1 : 5 : 5	7.435	8.120	

TABLE 4.3.8:- Compressive Strength for Ratio 1:5:5 and 20% replacement of cement by Fly ash

Sr. No.	Ratio	Self-Weight of Brick (KG)	Compressive Strength (N / mm2)	AVG (N/mm2)
1	1 : 5 : 5	7.084	7.920	7.740
2	1 : 5 : 5	6.400	6.089	
3	1 : 5 : 5	7.265	9.212	

TABLE 4.3.9:- Compressive Strength for Ratio 1:5:5 and 25% replacement of cement by Fly ash

Sr. No.	Ratio	Self-Weight of Brick (KG)	Compressive Strength (N / mm2)	AVG (N/mm2)
1	1 : 5 : 5	7.383	7.129	7.252
2	1 : 5 : 5	6.939	7.027	
3	1 : 5 : 5	7.071	7.600	

V. CONCLUSION

- In 1 : 3 : 7 proportion, compressive load carrying capacity is gradually increases as percentage of fly ash increases
- In 1 : 4 : 6 proportion, compressive load carrying capacity is gradually increases as percentage of fly ash increases
- In 1 : 5 : 5 proportion, compressive load carrying capacity is gradually increases as percentage of fly ash increases at some constrain then it is decreasing
- In every proportion water absorption is likely to be maintained same.

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