

3.2.1.1 Number of research papers published per teacher in the Journals notified on UGC website during the year

SR NO	Title of paper	Name of the author/s	Department of the teacher	Name of journal	Year of publication	ISSN number
1	Dual axis solar tracking systems for improved solar power generation efficiency	Prof. Husain Shaikh	Mechanical Engineering	IJME	2023	0974-5823
2	Spilled oil Cleaning Device	Dr.Harish Harsurkar	Mechanical Engineering	IJME	2023	0974-5823
3	Dual axis solar tracking systems for improved solar power generation efficiency	Dr.Harish Harsurkar	Mechanical Engineering	IJME	2023	0974-5823
4	Spilled oil Cleaning Device	Prof. Husain Shaikh	Mechanical Engineering	IJME	2023	0974-5823
5	Design and Manufacturing of Hydraulic un-Coiler	Prof. Husain Shaikh	Mechanical Engineering	IJME	2023	0974-5823
6	Redesigning of Boiler chimney against fouling of enhance the efficiency of boiler	Dr.Harish Harsurkar	Mechanical Engineering	IJPREMS	2023	2583-1062
7	Design and Manufacturing of Hydraulic un-Coiler	Dr.Harish Harsurkar	Mechanical Engineering	IJME	2023	0974-5823
8	Design and Analysis of Flywheel Composite Material	Dr.Harish Harsurkar	Mechanical Engineering	IJSART	2023	2395-1052
9	Rewards System For Google Classroom	Prof. Rashmi Bhumbare	Computer Engineering	IJRASET	2023	2321-9653
10	Online E-Voting Smart System	Prof. Priti T. Chorade	Computer Engineering	IJRASET	2023	2321-9653
11	Agromarketing & Crop Recommender System	Soni R. Ragho	Computer Engineering	IJERT	2023	2278-0181
12	Depression Monitoring System Via Social Media Data Using Maching Learning Framework	Prof. Rashmi Bhumbare	Computer Engineering	IJRASET	2023	2321-9653
13	Attribute-Based Storage Supporting Secure Deduplication of Encrypted Data in Cloud	Asst. Prof. Soni R. Ragho	Computer Engineering	IJRASET	2023	2321-9653
14	Women Safety Android Application	Prof.Soni Ragho	Computer Engineering	IJRASET	2023	2321-9653
15	Secure QR-code Based Message Sharing System using Cryptography and Steganography	Prof. Chorad Priti	Computer Engineering	IJRASET	2023	2321-9653
16	USE OF INDUSTRIAL WASTE WATER IN CONCRETE	Prof. Pranesh Chawhan	Civil Engineering	TJCM	2023	Vol.14 No.01 (2023),311-320



Dual-Axis Solar Tracking Systems for Improved Solar Power Generation Efficiency

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Abstract:

The fluctuation in solar energy happens every day as a result of changes in the day-night cycle and seasonal variations all year long. The world's population is growing at a fast rate. Over the last ten years, non-renewable energy sources like coal and oil have been running out, making it difficult to supply the globe with stable energy. Yet a significant source of primary energy is solar energy. This study proposes a dual-axis solar tracking system that makes use of Arduino as the primary processing unit to capture the maximum amount of solar energy. In this study, an autonomous solar tracker system powered by a microcontroller is anticipated to employ photovoltaic conversion panels. Our goal is to create both a single-axis and dual-axis solar tracker system. The tracker follows the sun and adjusts its location to optimise the sun's production of energy. Two geared DC motors are used to move the solar panel in order to maintain the solar panel's alignment with the sun's light. The experimental model's functioning is based on a DC motor that is intelligently controlled by a specialised drive to move a small solar panel. The presence of two cheap but effective light sensors allow a microcontroller to receive data from them. Experimental analysis is done on the solar tracker device's performance and attributes.

Keywords: LDR Sensor, Dual axis solar tracker, Servo motor, Arduino.

1. Introduction

A dual-axis solar tracking system is a type of system designed to increase the efficiency of solar panels by automatically adjusting their orientation to face the sun throughout the day. It uses two axes of movement to track the sun's position in the sky and keep the solar panels aligned with it, maximizing the amount of sunlight they receive[1].

The two axes of movement are horizontal and vertical, with the horizontal axis rotating the panels from east to west and the vertical axis tilting them up and down to follow the changing angle of the sun in the sky. By moving the panels to follow the sun's path, the system can increase the amount of energy they produce by up to 40% compared to fixed, non-tracking systems.

Dual-axis solar tracking systems can be either active or passive. Active systems use motors or actuators to move the panels in real-time, while passive systems rely on changes in temperature or pressure to cause the panels to move. Passive systems are generally simpler and less expensive, but they may not be as accurate as active systems[2].

Overall, dual-axis solar tracking systems are a powerful tool for increasing the efficiency and effectiveness of solar power systems, especially in areas with high levels of solar radiation. They can help to reduce the cost of energy production and make solar power more accessible to a wider range of people and communities.

A solar tracker is a tool that is used to gather solar energy from the sun. Solar tracking is nothing more than shifting a panel's location in relation to the sun. Typically, the photovoltaic module installed in the solar tracker is more powerful than the stationary system's essential irradiance. Based on performance and cost, solar trackers are categorised. By using a tracking system, we may get a 40–50% increase in efficiency over a fixed panel. One of these, dual axis, offers a 48% efficiency boost over single axis tracking. Due to seasonal fluctuations, dual axis trackers can detect the sun's location anywhere in the sky. The solar tracking systems shown in the following images[3].

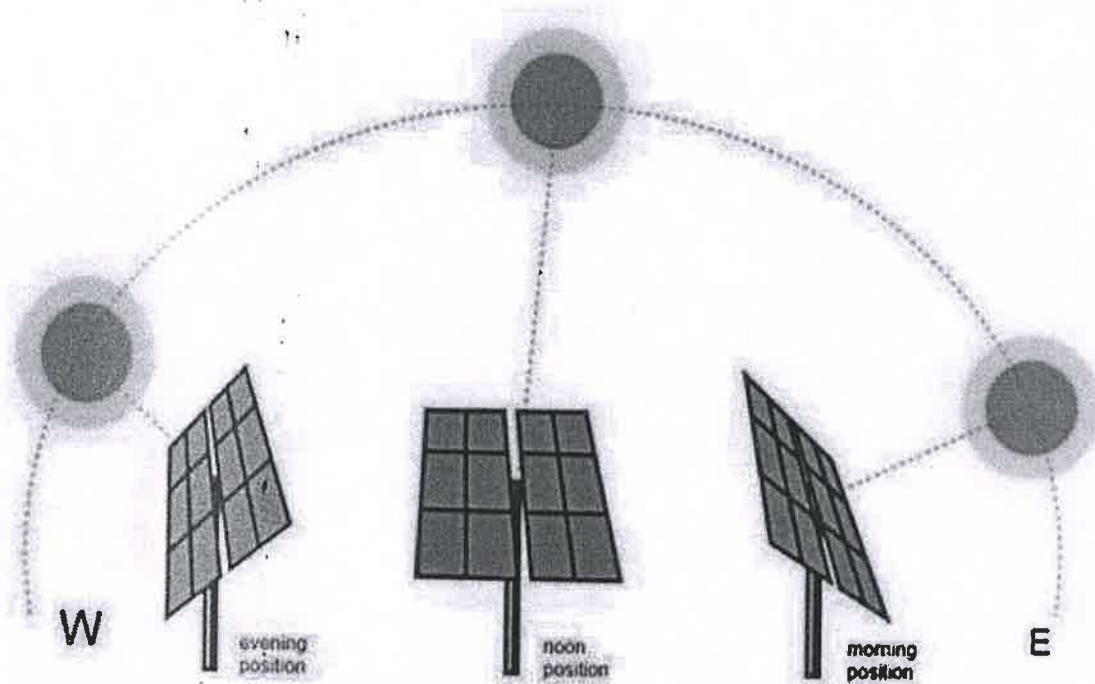


Figure 1. Solar path

2. Literature Survey

Dual-axis solar tracking systems have become an increasingly popular technology for improving the efficiency of solar power generation. As such, there have been numerous research studies and literature reviews on the subject. Here are a few key findings from recent literature surveys:

Efficiency gains: Studies have shown that dual-axis solar tracking systems can improve the efficiency of solar panels by up to 40% compared to fixed, non-tracking systems. This is due to the ability of the system to maintain optimal alignment with the sun's position throughout the day, resulting in increased exposure to sunlight and greater energy production.

Cost-benefit analysis: A literature review conducted by P. J. Sangwaiya et al. (2016) found that while dual-axis solar tracking systems can be more expensive to install than fixed systems, the increased energy production and resulting cost savings over time can make them a worthwhile investment. The study concluded that the payback period for the additional investment in a dual-axis tracking system is generally less than ten years.

Environmental benefits: Another review by K. S. Reddy and M. K. Tripathy (2018) highlights the environmental benefits of dual-axis solar tracking systems. By increasing the efficiency of solar panels, these systems can reduce the amount of land required for solar power plants and decrease the overall environmental impact of energy production.

Technological developments: Finally, a literature survey by S. S. Patil et al. (2018) emphasizes the importance of ongoing technological development in the field of dual-axis solar tracking systems. Advances in materials science, control systems, and sensor technology are all contributing to the continued evolution of these systems and their ability to maximize energy production from solar panels.

Overall, these literature surveys indicate that dual-axis solar tracking systems are a promising technology for improving the efficiency and sustainability of solar power generation. While there are still challenges to be addressed, ongoing research and development in this area are likely to lead to even greater gains in efficiency and cost-effectiveness in the coming years.

Haneih's (2009) study highlights the importance of solar tracking systems in increasing the efficiency of PV panels in desert regions. The use of two degrees of freedom orientation and close loop control with solar tracking sensors and feedback control loops can help to optimize the alignment of the panels with the sun's position in the sky, leading to greater energy production.

The consideration of the grid arrangement of panels is also important in maximizing the effectiveness of solar tracking systems. By carefully arranging the panels in a way that minimizes shading and ensures optimal alignment with the sun, the overall energy output of the system can be further increased. Overall, Haneih's study underscores the importance of solar tracking systems in improving the efficiency and effectiveness of solar power generation in challenging environments like desert regions. By optimizing the alignment of solar panels with the sun's position in the sky, these systems can help to maximize energy production and make solar power more viable and sustainable.

3. Proposed work

The system utilizes LDR (Light Dependent Resistor) sensors to detect any differences in intensity between the sides of the PV panel. If there is a difference, a signal is produced and sent to the control system (circuit1/circuit2) where it is evaluated. The control system then sends a signal to the motor (motor2/motor1) which rotates the PV panel until it directly faces the sun.

This system appears to be a type of single-axis solar tracking system, as it only rotates the panel around a single axis to align it with the sun's position in the sky. By using LDR sensors to detect any deviations in intensity, the system can quickly and automatically adjust the position of the panel to maximize energy production. Overall, this type of solar tracking system could be a cost-effective way to improve the efficiency of solar power generation, particularly in areas with high levels of sunlight. However, as with any technology, there may be limitations and challenges to consider, such as maintenance requirements and the cost of implementing the system on a larger scale.



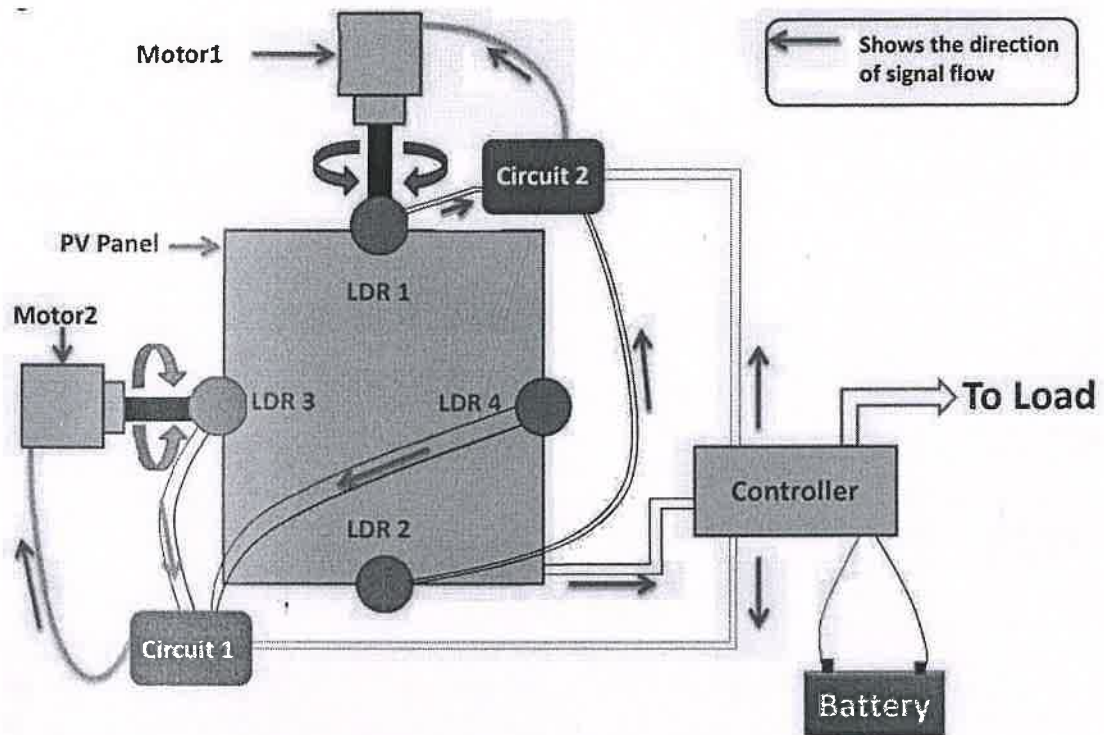


Figure 2: Block diagram of the setup

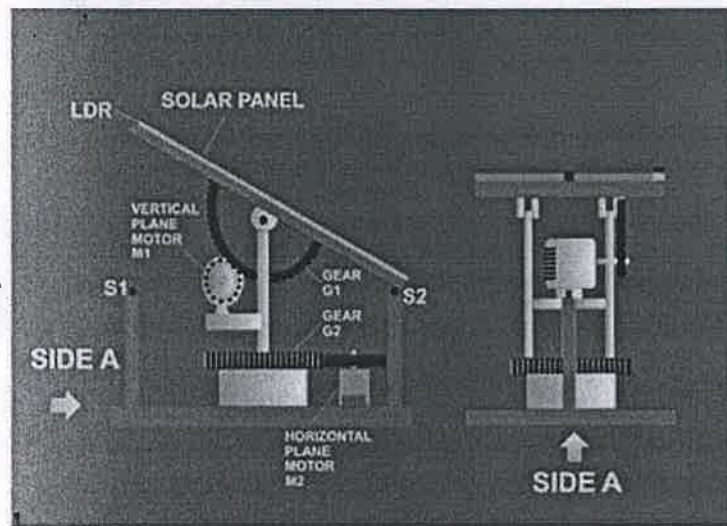
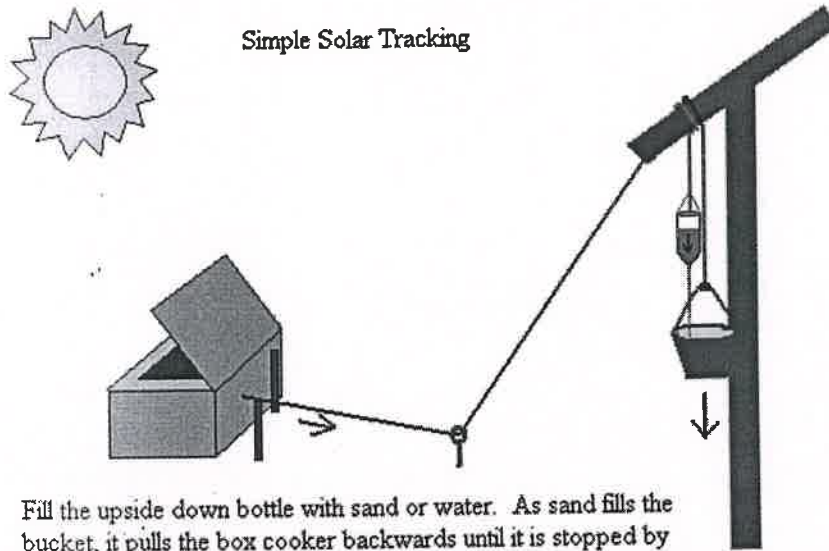


Figure 3. Solar tracking by using sensor, motor and gears





Fill the upside down bottle with sand or water. As sand fills the bucket, it pulls the box cooker backwards until it is stopped by the sticks. Adjust the size of the hole in the bottle cap to slow the sand until it takes a couple of hours for it to empty into the bucket.

Figure 4. Simple solar tracking by using sand

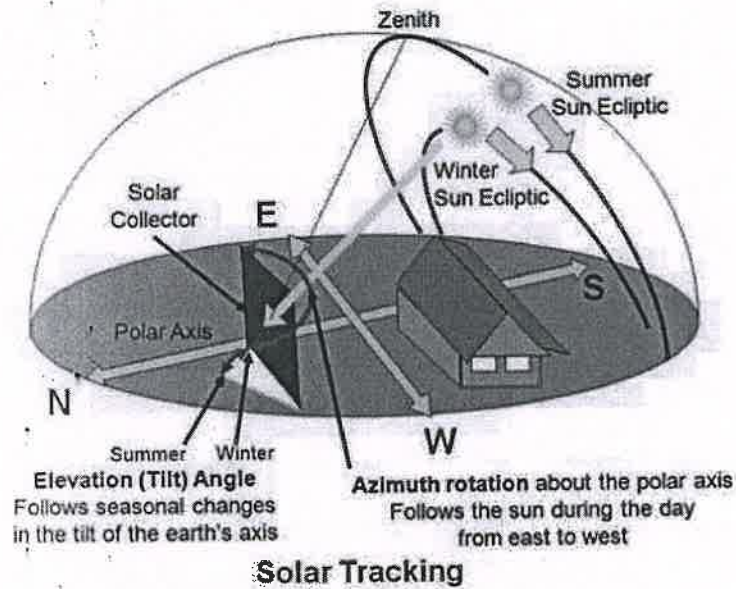


Figure 5. Manual solar tracking



4. Implementation

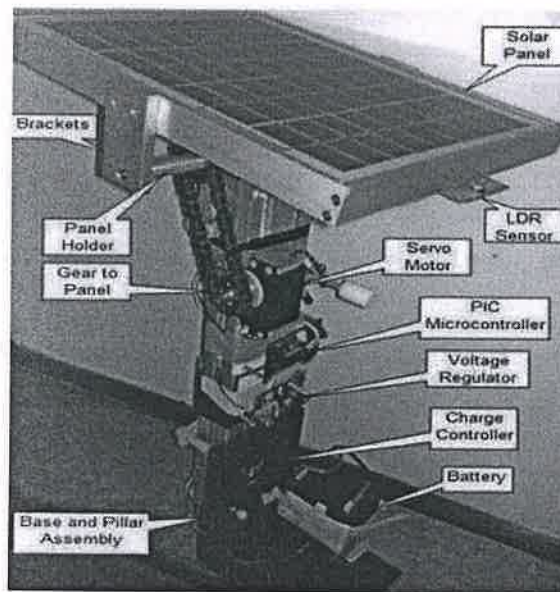


Figure 6. Solar tracking by using chain sprocket and sensors

5. Conclusion

The dual-axis solar tracking system is an effective way to increase the efficiency of solar power generation. By aligning the solar panels with the sun's position in the sky, these systems can maximize energy production and improve the overall performance of solar power plants. Compared to single-axis or fixed solar systems, dual-axis trackers have been shown to provide significantly greater energy output, with studies indicating efficiency gains of up to 40% or more. Additionally, while the initial installation costs of a dual-axis tracker may be higher than other systems, the long-term cost savings resulting from increased energy production can make them a cost-effective investment.

Further research and development in the field of solar tracking systems is likely to lead to even greater efficiency gains and cost savings in the future. Overall, the evidence suggests that dual-axis solar tracking systems are a promising technology for improving the effectiveness and sustainability of solar power generation, particularly in challenging environments like desert regions.

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SPILLED OIL CLEANING DEVICE

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Abstract: It sounds like this paper is focused on finding a better solution for separating oil and water to recover oil from a water surface mixture, specifically in the context of the Empress Oil spill. The paper describes the fabrication of mechanical equipment, such as an oil and water separator, which can be used in environmental pollution control to remove oil from leaked water and produce oil-free water. The oil separator described in the paper appears to be made of acrylic material and can be used in effluent treatment plants. The paper includes details on the construction, fabrication, assembly, working, and applications of the oil and water separator. While there are different methods for removing oil from water, the paper notes that the disc type oil skimmer is commonly used. It's important to note that while the development of mechanical equipment for separating oil and water is an important part of addressing oil spills and environmental pollution, it's also crucial to focus on prevention and reducing the likelihood of spills in the first place. Additionally, it's important to consider the potential environmental impacts of any oil recovery method, as well as the economic and social costs and benefits.

Keywords: oil spill, Skimmer, CAD, Yield Strength, Density. Cleaning Device.

1. Introduction

Crude oil is a fossil fuel that is formed over millions of years through the decay of organic matter such as plants and animals. It is a complex mixture of hydrocarbons, with varying properties depending on its source and composition. The production, processing, and distribution of crude oil have become increasingly important to the global economy over the past century, with crude oil being used as a feedstock for the production of a wide range of consumer and industrial products, including gasoline, diesel fuel, and lubricating oil, among others. Fractional distillation is a common process used to separate crude oil into its various components, which are then further processed into final products [1]. When an oil spill occurs, it can have devastating effects on the environment, economy, and human health. Oil spills can contaminate water bodies, killing fish and other marine life, and can also lead to the destruction of important habitats such as wetlands and coral reefs. They can also have serious economic impacts, such as loss of revenue for fishing and tourism industries, as well as cleanup and restoration costs. Additionally, exposure to oil and its components can cause health problems for humans and wildlife, ranging from skin irritation to cancer. Therefore, it is crucial to take measures to prevent oil spills and to effectively respond to them when they occur [1, 5, 10, 7, 29, 2, 18].

Oil skimming is a widely used technique for oil-water separation. It relies on the principle of specific gravity, which means that oil and water have different densities, and the surface tension that causes oil to stick to certain materials more than water. The skimming media, which can take different forms such as belts, disks, or drums, is made of materials that attract oil and grease, while repelling water.

As the media passes through the fluid's surface, it picks up the oil and grease, which are subsequently removed by wiper blades or pinch rollers.

Oil skimmers are commonly used in various industries, including manufacturing, power generation, transportation, and oil and gas production, to separate coolants, lubricants, and other hydrocarbons from water. They are simple, reliable, and cost-effective tools that can achieve a high level of water purity by removing most of the oil and grease before more complex and expensive treatments are needed.

Oil skimmers are available in different sizes, designs, and configurations, depending on the specific application and environmental conditions. Some of the factors that affect the choice of an oil skimmer include the type and thickness of the oil, the flow rate and depth of the water, the temperature and pH of the fluid, and the presence of solids and other contaminants.



Figure 1. Marine life struggling in oil spillage

There are several devices and methods that can be used to clean up spilled oil, depending on the size of the spill and the location where it occurred. Here are a few examples:

1. **Oil Absorbent Pads:** These pads are made of materials that can absorb oil but repel water. They can be used to soak up small spills and can also be used to clean up oily surfaces. The pads can then be disposed of in accordance with local regulations.
2. **Oil Booms:** These are long, cylindrical floats that are used to contain and absorb oil spills in water. They are typically deployed around the perimeter of the spill to prevent the oil from spreading. Once the oil is contained, it can be absorbed using absorbent materials or skimmed off the surface of the water.
3. **Skimmers:** These devices are used to skim oil off the surface of the water. They work by using a rotating drum or belt that collects the oil, which can then be separated from the water using a separator.
4. **Vacuum Trucks:** These trucks are equipped with powerful vacuum systems that can suck up oil and water from spills. The oil and water are then separated using a separator, and the oil can be disposed of in accordance with local regulations.

It's important to note that cleaning up spilled oil can be dangerous and should only be done by trained professionals using appropriate equipment and safety gear.

Additionally, it's important to consider the potential environmental impacts of using certain cleaning methods or devices. For example, chemical dispersants can be effective in breaking up oil spills, but they can also have negative impacts on marine life and ecosystems. Therefore, it's important to assess the potential risks and benefits of different cleaning methods before choosing a particular approach.

Finally, preventing oil spills from occurring in the first place is the most effective way to minimize their environmental impact. This can be done by implementing strict safety protocols, maintaining equipment regularly, and investing in spill prevention technologies.

2. Literature Survey

The movement of crude oil and processed goods from the site of production to the customer is a complicated process. As a result, there is constant oil leakage, which has terrible effects on the environment. As a result, many people have expressed grave worries about the potential environmental effects of severe oil spills [2, 18, 33, 25, 12]. Many different methods are used, including the application of sorbents to remove oil from water through absorption and/or adsorption (Figure 2) [35, 25, 34, 10]. These methods include the use of mechanical means like skimmers, pumps, booms, and mechanical separators; the use of microorganisms to break down the oil; the adoption of chemical dispersants like detergents to break large oil slicks into tiny droplets. Each strategy has advantages and disadvantages, and the selection of a specific technique relies on a number of variables, including the type of oil that was spilled, the temperature, the wind's direction and speed, and the topography of the area where the oil was spilled [10].

It's true that transportation of crude oil and refined products carries a risk of oil spills, which can have devastating environmental consequences. As mentioned, oil spills can harm marine life, ecosystems, and human health, and they can also result in significant economic losses for oil companies and origin states.

To address the problem of oil spills, various remediation technologies have been developed. These technologies fall into several categories, including physical/mechanical, chemical, thermal, and biological remediation. Each category of technology has its own set of advantages and disadvantages, and the choice of a particular technique will depend on various factors, such as the type of oil spilled and the location of the spill.

Some examples of physical/mechanical remediation technologies include the use of skimmers, pumps, booms, and mechanical separators to remove oil from the surface of the water. Chemical dispersants, which break down large oil slicks into smaller droplets, are another option. In-situ burning, or controlled burning of the spilled oil, can also be used to mitigate the impact of an oil spill. Finally, biological remediation technologies, which involve the use of microorganisms to break down the oil, can also be effective.

It's worth noting that each of these techniques has its own limitations and potential drawbacks. For example, chemical dispersants can have negative impacts on marine life, and in-situ burning can release harmful pollutants into the air. Additionally, some remediation techniques may not be effective in certain circumstances, such as when the oil is too thick or viscous.

In conclusion, the problem of oil spills is a complex and ongoing challenge that requires ongoing efforts to prevent and mitigate their environmental and economic impacts. The use of remediation technologies is an important part of this effort, but it's also crucial to address the root causes of oil spills, such as inadequate safety protocols and equipment maintenance.



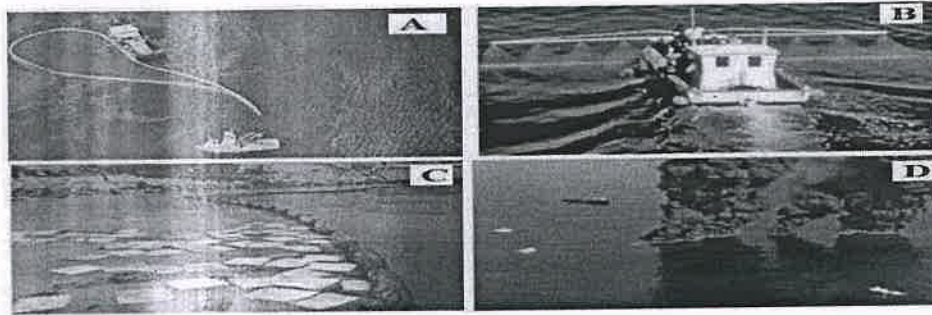


Figure 2. Common techniques for cleaning up an oil spill include (A) utilising booms to confine the spill; (B) using a vessel to spray chemical dispersants; (C) employing adsorbents; and (D) burning the spill in place [10, 25, 34, 35].

3. Proposed work

The procedure is explained in the following fig. To achieve the objective of the study activity, the process flow indicated above will be taken into consideration.

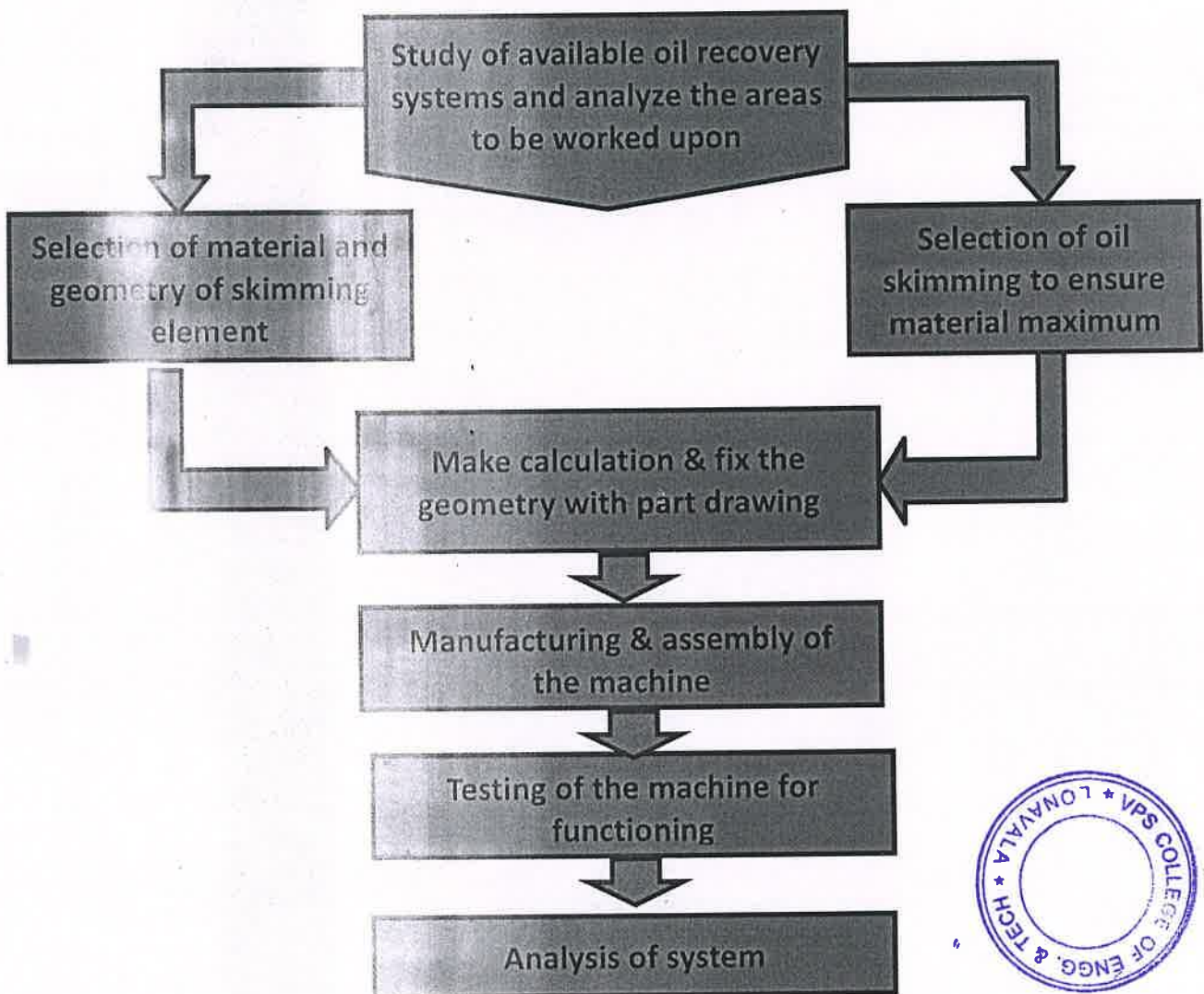


Figure 3. Steps of Execution



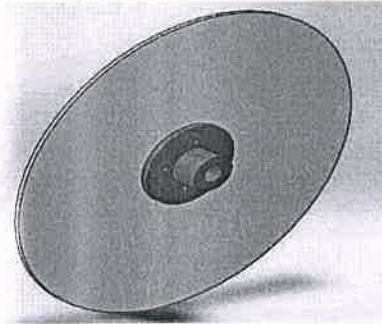


Figure 7. Skimmer disc

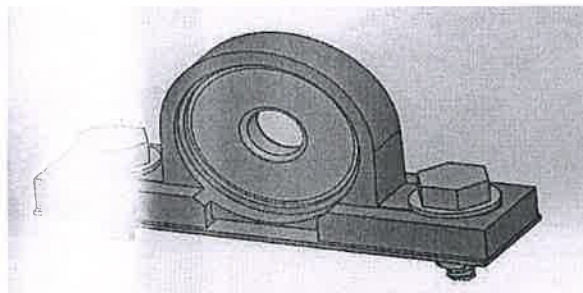


Figure 8. Pedestal bearing

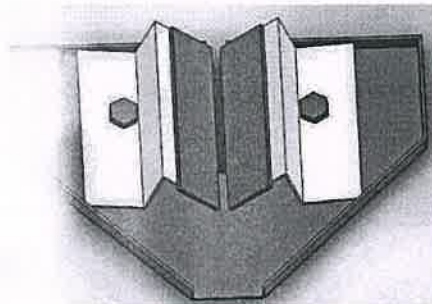


Figure 9. Scrapper

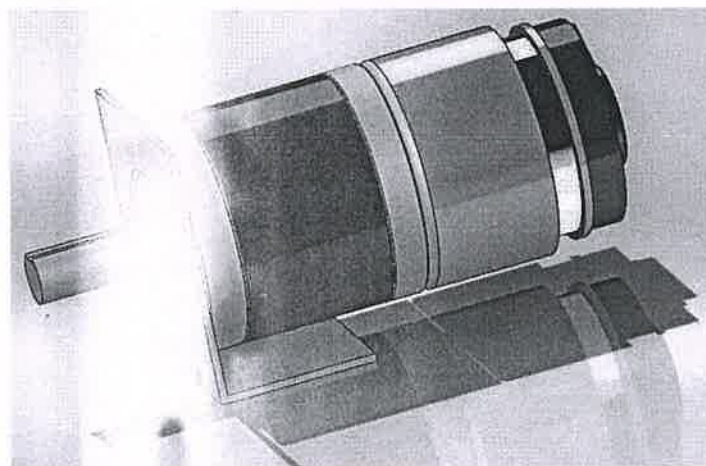


Figure 10. Gear motor



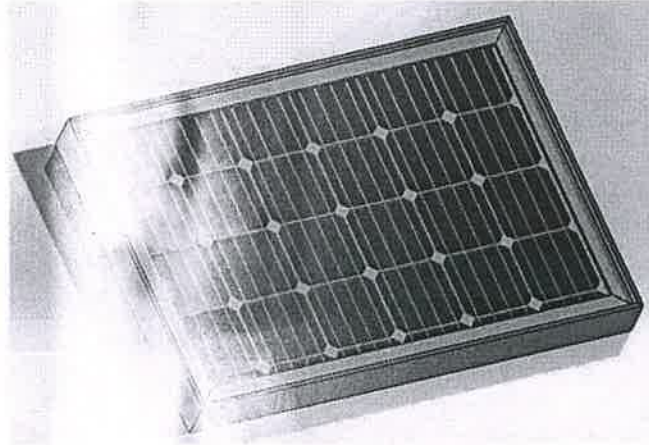


Figure 11. Solar panel

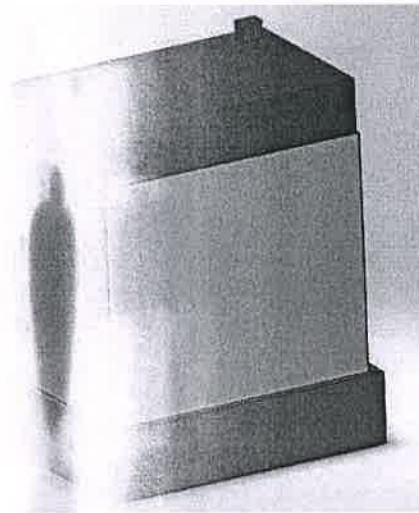


Figure 12. Battery

3.2 Calculations

EN 10083 C45 steel carbon steel

Steel Sheet C45 Tensile testing, hardness testing, impact testing, flattening testing, and chemical composition analysis are a few of the physical-chemical testing procedures for plant-produced goods. Cold drawing is the procedure used to create C20 and C45 steel pipes.

When more strength and hardness are necessary than in the "as rolled" form, C45, a medium carbon steel, is employed. In high speed applications, extreme size precision, straightness, and concentricity work together to reduce wear. It is rolled, ground, and turned.

Heat to 680–710°C and then slowly cool in a boiler for soft annealing. A maximum Brinell hardness of 207 will result from this.

Air temperature normalisation temperature: 840–880 °C.

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Harden at a temperature between 820 and 860 °C, then quench with water or oil.

Temperature for tempering: 550–660 °C/air.

C45 steel plate, EN 10083 C45 steel plate, C45 steel plate is classified as high carbon steel under EN 10083 standard.

High carbon steel is mostly used in C45 steel plates, per EN 10083. For tempering and quenching, use C45 steel plate. Technical delivery requirements for non-alloy steels used in ordinary engineering applications.

C45 EN 10083-2 Number:1.0503	Comparison of steel grades	
	EN G 4051	S 45 C
	EN N 17200	C 45
	EN A 33-101	AF65-C 45
	EN I 7846	C 45
	EN S 970	070 M 46
	EN E 36011	C 45 k
	EN E J 403-AISI	1042/1045

Table 1: steel grades

Chemical Composition of EN C45 steel

Grade	C (%) min- max	Si (%) min-max	Mn (%) min-max	P (%) max	S (%) max	Cr (%) min- max
C45	0.42- 0.50	0.15-0.35	0.50-0.80	0.025	0.025	0.20- 0.40

Table 2: Chemical Composition

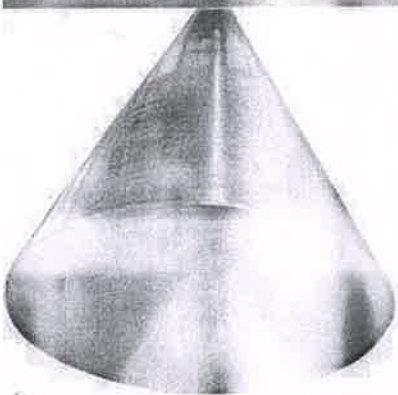
Mechanical Properties of EN C45 steel

Grade	Condition	Yield Strength R ^o (Mpa)	Tensile Strength Rm (Mpa)	Elong- ation A5(%)	Hardness HRC	Quenching Temperature (°C)	Bendability	Nominal Thickness, t 1.95mm≤t≤10.0mm	
								Rolled	Annealed
C45	Rolled	460	750	18	58	820	Min.reco- mmended Bending radius (≤90°)	2.0×t	1.0×t
	Annealed	330	540	30	55	860			
	Water- quenched		2270						
	Oil quenched		1940						

Table 3: Mechanical Properties of EN C45 steel



Product Information



ITEMS INFO

SPECIFICATION FOR OPTION:

Round bar	Diameter: 4mm-800mm or as required
Steel plate	Thick: 8mm-300mm, Width: 100mm-2300mm
Angle bar	Size: 3mm*20mm*20mm-12mm*800mm*800mm
Square bar	Size: 4mm*4mm-100mm*100mm Width: 10mm-2000mm
Hexagonal	Size: 4mm-800mm
Length: 2m, 4m, 5.8m, 6m, 11.8m, 12m or as required	

MECHANICAL PROPERTY:

Subcritical annealing	Forging	Tempering and Hardening	Normalization
Subcritical annealing: 650-700	1100-850	Tempering: 550-660	840-880
Isothermal annealing: 820-860		Hardening: 820-860 water	

CHEMICAL COMPOSITION:

NO.	C	Mn	Si	Cr	Cu	Ni	P	S
ASTM 1045	0.43-0.50	0.9	0.10-0.60				< 0.040	< 0.050
EN1119	0.42-0.48	0.9	0.15-0.35	≤ 0.15	≤ 0.3	≤ 0.2		
EN10275	0.42-0.48	0.8	0.20-0.40	≤ 0.40		≤ 0.4		
EN10276	0.42-0.48	0.8	0.2-0.4				< 0.035	< 0.035
EN10277	0.42-0.48	0.8	0.17-0.35	< 0.25	≤ 0.25	≤ 0.3	≤ 0.035	≤ 0.035
EN8	0.42-0.48	0.9	0.15-0.35	< 0.20	< 0.30	< 0.20	< 0.030	< 0.030

Figure 13. Properties of steel C45

Material = C 45 (mild steel)

Take $f_{os} = 2$

$$\sigma_t = \sigma_b = 500 \text{ MPa} = 270 \text{ N/mm}^2$$

$$\begin{aligned} \sigma_s &= 0.5 \sigma_t \\ &= 0.5 \times 270 \\ &= 135 \text{ N/mm}^2 \end{aligned}$$

Design of motor:

Power of shaft = $P = 10 \text{ kW}$

Power transmitted by shaft

$$P = \frac{2\pi NT}{60}$$

Where, $N \rightarrow$ RPM of motor shaft = 30

$T \rightarrow$ Torque transmitted

$$10 = \frac{2\pi \times 30 \times T}{60}$$

$$T = 3182.6 \text{ N-mm}$$

Design of shaft

Now, T_1 is the maximum torque among all shafts, so we will check shaft for failure here.



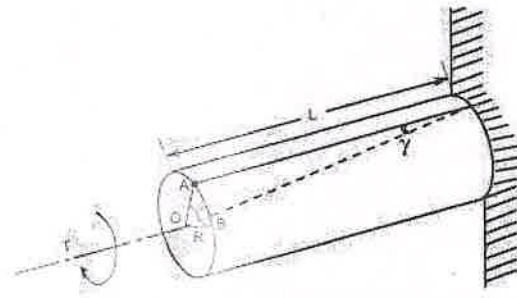


Figure 14. Shaft design

$$T = \frac{\pi \tau d^3}{16}$$

$$3182.6 = \frac{\pi}{16} \times 135 \times d^3$$

$$D = 4.9 \text{ mm}$$

Motor shaft is 5mm and main shaft is 20mm, so our design is safe.

Selection of bearing

For 20mm Shaft diameter we take standard bearing no. P204



Figure 15. P-204 bearing



Calculations for batteries

Batteries - 6V/1.5 Amp = 27 watt Charging Time

3 watt solar panel

Impedance (I) = 9V

$I = 3/10.21 = 0.29$ Amp

Battery Watt/Panel Watt = (27/3) = 9 hours for charging.

Time to Discharge = (Battery Watt/Total Watt Consumed) = 27/15 1.8 Hours = 108 min

Design of transverse fillet welded joint.

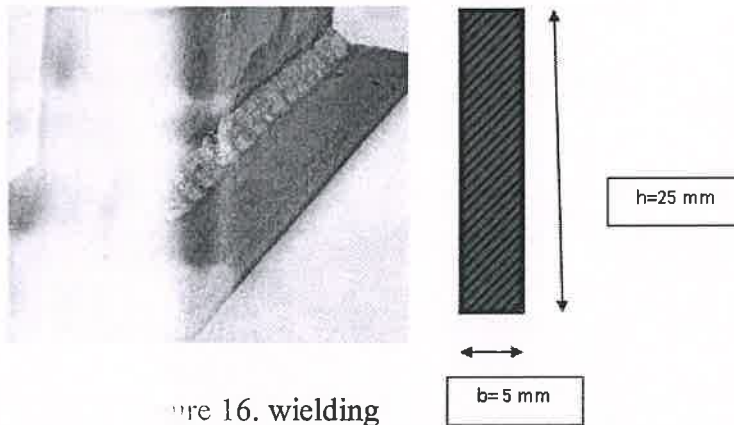


Figure 16. welding

Hence, using a mild steel rod size of 3.2 mm

Area of Weld = 0.707 times Yield Strength of rod length = 0.707 times 3.2 times 25 = 56.56 mm²

Force applied on m/b = N.

Force exerted / Weld Area = Stress induced $\sigma = F / 56.56$ $F = 1187.76$ N = 121.07 kg

Maximum Allowable Stress = 21 N/mm² For Welded Joints.

4. Experiment 11: Mudda

Table 1: Demonstration readings

Sr. No.	Oil quantity	Time	% oil purity
1	100 ml	33 sec	90%
2	200 ml	55 sec	92%
3	300 ml	70 sec	95%
4	400 ml	82 sec	97%



5. Conclusion

The SOLAR PANEL, DISC TYPE AND OIL RECOVERY SYSTEM is a simple, efficient, cost-effective, and environment friendly solution to the oil spill dilemma. Compared to current

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DESIGN AND MANUFACTURING OF HYDRAULIC UN-COILER

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Abstract: Hydraulic Un-coiler is used to uncoil sheet out driven by retarded. Hydraulic driven expands or loosen the inner holes of coil. It gives proper feeding to material in given direction. Expanding mechanism consists of cam and guide and guide ways.

Hydraulic unit is used to give liner motion to expanding mechanism. Auto stop device control it start/stop. Stock decoilers, straightness, feeders, part handling as well as scrap removal system are known as press auxiliary equipment. Other examples of auxiliary equipments may include robots and dedicated die change carts. Like any press working equipment subjects to movement, appropriate safeguarding measures are required to prevent injury to personnel.

Company is designing hydraulic uncoiler because the cost of machine in market is too high, so in order to reduce the cost hydraulic uncoiler is designed by the company itself.

In some cases, the entire system is delivered as a turnkey package by the press builder or equipment supplier. However, it is very common to find a mixture of used equipment working as an integrated system. Cost conscious stampers often retrofit older equipment with modern drive systems and controls at a fraction of the cost of new machinery.

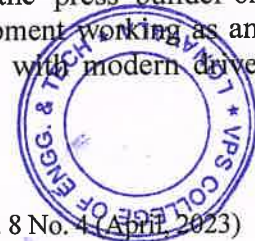
Keywords: oil spill, Skimmer, CAD, Yield Strength, Density. Cleaning Device.

1. Introduction

As the name suggests, de-coiler or un-coiler is the mechanism which uncoils the wound coils so that they can further be used to process. De-coiler or Un-coiler basically works on the hydraulics or pneumatic systems where the systems are used to do the various operations like expanding or collapsing in order to hold or remove the respective coil. De-coiler or un-coiler also has the rotational movement which is achieved by any suitable electrical motor. It is also one of the mechanism which is mounted in almost every coil processing line at the beginning of the process.

There is a variety of commercially available coil handling, decoiling, straightening, and feeding equipment used in coil-fed die operations. The equipment, available from many manufacturers, can be used interchangeably in a variety of configurations.

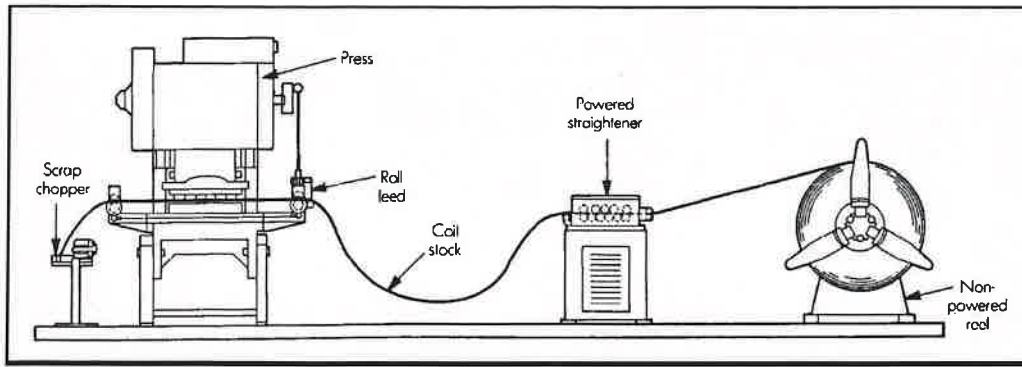
In some cases, the entire system is delivered as a turnkey package by the press builder or equipment supplier. However, it is very common to find a mixture of used equipment working as an integrated system. Cost conscious stampers often retrofit older equipment with modern drive systems and controls at a fraction of the cost of new machinery.



The stock must be decoiled (unwound) from the stock reel in a smooth manner. Uneven stop-go operation may cause kinks in the stock that can result in variations in the parts being produced. Both power and non-powerdriven systems are used.

Powered systems should incorporate controls to insure smooth decoiling action. Powered systems that use on and off motor controllers have the advantage of simplicity and low cost. However, these systems may pay out too much stock. The result may be that the stock will contact the floor and become contaminated. Kinked material may also result. The inertia of the driving motor armature, the stock reel and stock will feed out stock after the decoiler stop signal shuts off power to the motor.



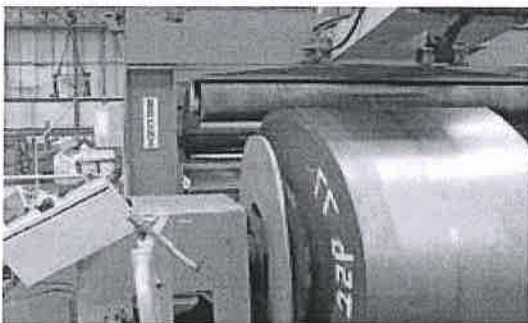


Various part of hydraulic decoiler

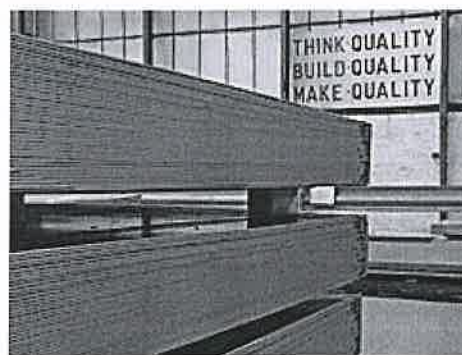
What is de-coiling?

De-coiling is the action of unwinding a parent coil, making it flat and cutting it into sheets. These sheets can be varied in length to suit the customer requirements. The parent coil is unwound and passed through a levelling head. This is a bank of hardened rolls that are positioned above and below the passing steel. The rolls have a controlled level of pressure placed on them at varying intensity and location. Curvature existing in the material leaving the parent coil is then fully removed to create a flattened product. When sufficient material has been flattened a shear is used to cut it to length and it is then fed into a system which stacks it into bundles of the specified quantity or weight.

Finished bundles are then moved to a banding area where they are securely strapped ready for dispatch. Our customers have the option of collecting their material or requesting us to arrange delivery



Steel In



Steel Out



The global motorized de-coiler machine market can be segmented into following categories:

On the basis of operating load, the global motorized de-coiler machine market can be segmented as:

- Less than 5 Ton (< 5 Ton)
- 5 ton to 10 Ton (5 Ton – 10 Ton)
- Above 10 Ton (> 10 tons)

On the basis of number of heads, the global motorized de-coiler machine market can be segmented as:

- Single head
- Dual Head
- Multi Head

On the basis of drive, the global motorized de-coiler machine market can be segmented as:

- Electric
- Hydraulic

On the basis of material stock, the global motorized de-coiler machine market can be segmented as:

- Strip De-coilers
- Sheet De-coilers
- Wire/ Pipe De-coilers

On the basis of end use industry, the global motorized de-coiler machine market can be segmented as:

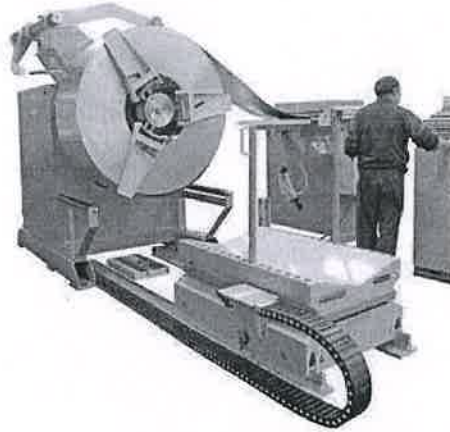
- Machine and equipment manufacture
- Automotive
- HVAC and duct manufacturing



Types of De-coiler:

Single De-Coilers For One Coil

8 machines cover a range of coils from 50 kg to 25 tonnes. Depending on the material being de-coiled and the layout of the line, the de-coiler can be equipped with a pneumatic safety brake or a mandrel rotation drive. The drive is then powered by a hydraulic motor or an asynchronous motor piloted by a frequency inverter. It considerably assists the introduction and recoiling of the strip.



Horizontal De-Coilers

Reserved for coils of up to 1800 kg and with a maximum diameter of 1300 mm, they are particularly suitable for the de-coiling of thin strips and delicate materials. The pallet loaded with several stacked narrow coils can be directly installed on the de-coiler.

Components of Hydraulic Un-coiler

1. Supporting frame
2. Hydraulic unit
3. Breaking circuit
4. Power unit
5. Sheet holding unit
6. Control unit



Supporting frame:

- 1 It supports whole assembly
- 2 I section and L section beams are preferred
- 3 Gives sufficient rigidity
- 4 Provides sufficient working space to coiled sheet

Methodology

- 1 Design of de-coiler
- 2 Manufacturing of different.
- 3 Checking diamentions of each.
- 4 Testing.
- 5 Analysis.
- 6 Final Assembly.

2. Literature Survey

Jigless robot welding is one of the most demanding disciplines in the automation industry. Jigless processes offer significant benefits by reducing the cost of custom tooling and providing flexibility to process part variations with low batch sizes but make high demands on robotics and the know-how of suppliers and users. The main aim of this research project is to study plant layout and materials handling for jigless spot welding systems in order to investigate the best strategy in Alhasawi Company in Kuwait. This project was done to optimize the jigless spot welding and compare between the original layout of Al-Hasawi Company (semiautomated system) and the re-designed layout (fully automated system - Jigless robot welding). It is found that the jigless welding process has better performance and utilization, less process time and less defect rate.



Joseph Julian US Patent 4,848,694, 2019

This author in the present paper gives a brief description of the strip de-coiler of the invention has a dancer arm in a vertical plane which sets the speed of the de-coiler turntable. The lower end of the dancer arm mounts an adjustable connection which in turn supports a spool shaft carrying a support spool. The spool shaft can be swiveled about so that the spool can support the de-coiling strip evenly all across its width. The shaft is quickly and easily adjustable for use with clockwise or counterclockwise Strip de-coiler

This author in the present paper gives a brief description of de-coiler for delivery of wire or rod feed stock to a downstream production machine from a pre-formed coil. The de-coiler includes an extended length rotatable mandrel adapted to extend along the interior of the coil such that the mandrel supports loops of the coil in hanging and slideable relation along the mandrel. At least a first feed head is disposed adjacent to the proximal end of the mandrel.

The first feed head is adapted to feed the wire or rod feed stock from a rear loop of the coil outwardly in a curved path to form a spiral feed loop having a diameter greater than the coil. A variable height guide element is disposed at a position below the first feed head. The variable height guide element engages and follows an interior of the spiral feed loop to change height with a change in diameter of the spiral feed loop and to provide an output signal for speed control of the first feed head to maintain the diameter of the spiral feed loop within predefined limits.

Johnnie L Jones US Patent 6,119,971, 2015

This author in the present paper gives a brief description of Dereeler for spooled strip and wire materials and the like includes a platform shaped to support a spool of coiled material in a horizontal orientation. A motor is operably connected with the platform and selectively rotates the same in a horizontal plane to pay the coiled material off of the spool. A material control post is disposed in a vertical orientation and mounted for axial rotation. A control is operably connected with the motor and the material control post to actuate the motor and uncoil the coiled material from the spool in response to tension applied to the material. A material guide is connected to the material control post for rotation therewith, and is shaped to pass uncoiled material there over and apply a preselected tension to the material to facilitate smooth material feeding. A variable tensioner is connected with the material control post and generates the preselected tension that is applied to the material, the tensioner being adjustable to vary the preselected tension such that the dereeler can be quickly and easily adapted for use with a wide variety of differently sized spooled strip and wire materials.



Sergey Y Orlov, Paweł Komada[2]

The article is devoted to questions of building of uncoiler electric drive simulation model at rolling mill. Model detects current, moment, electro driving power, magnetic flow and engine rotation speed.

Wen-Yuan YANG, Yu-Shi FEI MACHINERY DESIGN & MANUFACTURE 4, 021, 2018

This author in the present paper gives a brief description of the main structures and features, design and calculation formulas and modern design of de-coiler has been discussed in this paper.

GA Sivyakova, Sergey Y Orlov, Waldemar Wójcik, Paweł Komada Przegląd Elektrotechniczny 90 (11), 173--176, 2017

The article is devoted to questions of building of uncoiler electric drive simulation model at rolling mill. Model detects current, moment, electro driving power, magnetic flow and engine rotation speed.

3. Proposed work

Supporting Frame

Supporting frame forms the base structure on which all components are mounted with help of bolted joints. The function of the frame is to support components of system. The components mounted on frame are hydraulic power pack, motor, gearbox, shaft, bearing housings, collar etc. The frame should sustain against bending load, axial load and shear stresses at the joints.

Selection of cross section for frame

A beam in general may have to deal with the following loads or a combination of them:

- Axial Loads (Tension/Compression)
- Shear Loads
- Bending Loads (Moment due to a force)

For simplicity we will consider separate and singular application of each load on different cross section beams.



To calculate the effect of axial loads on the beam the factors to be considered are applied Force/Load and cross section area of the beam. Considering same weight sections and same material beam means the cross section area is same for all and hence for axial load purpose all sections are equally effective.

Shear stresses developed on the beam are also dependent on Force applied and cross-sectional area.

Hence, it is quite evident that for same weight and material section the choice for structurally better section is governed by the bending stresses developed on the beam.

Bending Stress is defined as the stress induced in the beam as a result of external bending moment applied on the beam.

It can easily be calculated by following Equation which is derived from the famous bending equation:

$$\sigma_b = (Mc/I)$$

Where M – Moment caused by the applied force/load

I – Second Moment of Area of the cross section of structure –

Distance of extreme fiber from the neutral fiber

σ_b – Bending Stress



Therefore the lower the bending stress for same load, the better the section would be structurally. Hence I (Second Moment of Area) is very crucial as the greater its value the lower will be bending stresses developed in the beam. When calculated the value of I is maximum for the I-section, C-section and the box section. However for I-section the moment of area remains fairly constant along other axes as opposed to other sections.

Hence due to its better load bearing capabilities and also symmetric design I-section is preferred over other sections.

Also, L-section is selected for intermediate members which enables ease of assembly of components, ease of serviceability, cheaper in cost and good strength against buckling loads.

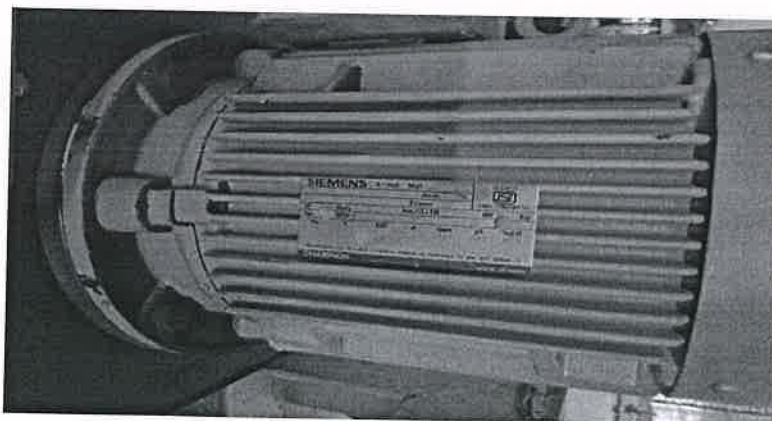
Material selection of frame:

Material selection for the frame is governed by three base parameters which are Strength, Availability, and Cost:

Sr No.	Structural Steel Grade	Yield Strength (MPa)	Ultimate Tensile Strength (MPa)
1	S235	235	360
2	S275	275	370
3	S355	355	470

Hence, structural steel grade **S355** is selected for frame material which has good yield strength, readily available, with considerable cost.

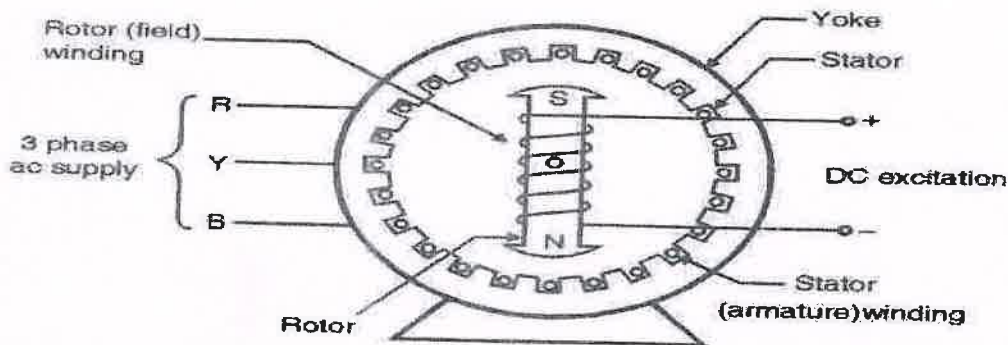
Selection Of Motor



AC motors can be divided into two main categories - (i) Synchronous motor and (ii) Asynchronous motor. An asynchronous motor is popularly called as Induction motor. Both the types are quite different from each other. Major differences between a synchronous motor and an induction motor are discussed below.

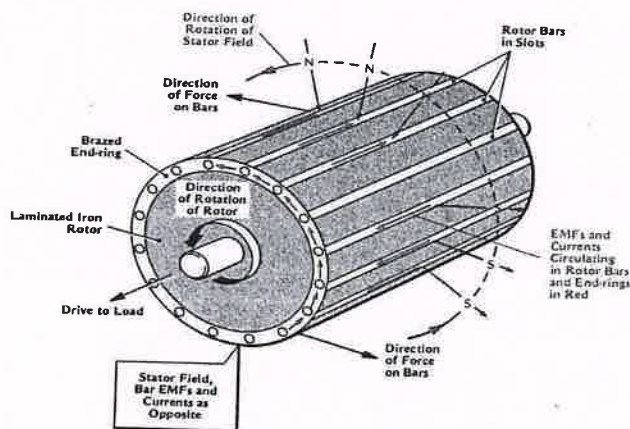
Constructional Difference:

Synchronous motor: Stator has axial slots which consist stator winding wound for a specific number of poles.



Motor Terminology

Generally a salient pole rotor is used on which rotor winding is mounted. Rotor winding is fed with a DC supply with the help of slip rings. Induction motor: Stator winding is similar to that of a synchronous motor. It is wound for a specific number of poles. A squirrel cage rotor or a wound rotor can be used. In squirrel cage rotor, the rotor bars are permanently short-circuited with end rings..



Squirrel Cage Induction Motor



DESIGN AND MANUFACTURING OF HYDRAULIC UN-COILER

Technical-Parameter

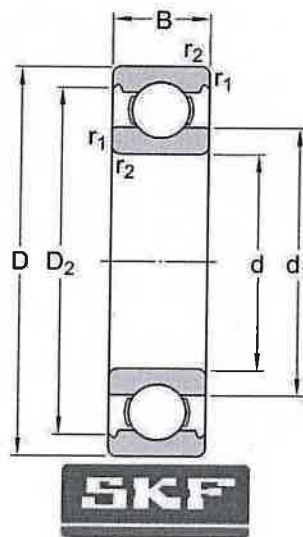
Description	Specification
Retarder	GR87-YEJ3-4P-60.61-M1-3
Motor	3KW
Hydraulic Pressure	12MPa
Coil Inner Diameter	Min 480mm Max 540mm
Coil Outer Diameter	Max 1300mm
Coil Width	Max 1250mm
Capacity	Max 5Ton

Hydraulic unit:

1. Gives liner motion to expanding mechanism
2. Direction control valve, pump, motor, reservoir, filter
3. Single acting cylinder, pressure relief valve, etc.

Bearings

Single row deep groove ball bearing with brass cage & C3 clearance 160mm inside x 290mm outside x 48mm width Single row deep groove ball bearings are used in a wide variety of applications, they are simple in design, non-separable, suitable for high speeds and are robust



DESIGN AND MANUFACTURING OF HYDRAULIC UN-COILER

in operation, and need little maintenance. Deep raceway grooves and the close conformity between the raceway grooves and the balls enable deep groove ball bearings to accommodate axial loads in both directions, in addition-to-radial-loads. Single row deep groove ball bearings are manufactured as open type (unsealed),sealed and shielded, the most popular sizes of deep groove ball bearings are also produced in sealed versions with shields or contact seals on one or both sides, the bearings with shields or seals on both sides are lubricated for life and are maintenance free. A sealed bearings seals has contact on the bearings inner and outer, a shielded bearings shield has contact on the outer only, and Shielded bearings are primarily intended for applications where the inner ring rotates. If the outer ring rotates, there is a risk that the grease will leak from the bearing at high speeds.

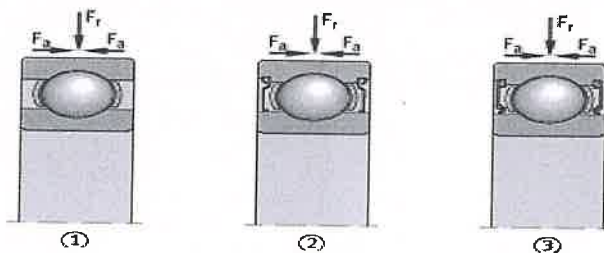
Bearing Design

Single row deep groove ball bearings are available as:

1. *Standard Bearings*
2. *Bearings of Generation*
3. *Matched Bearing Sets*
4. *Corrosion-resistant Bearings*

Standard bearings

Single row deep groove ball bearings are self-retaining units, which are part of the group of radial ball bearings. The solid outer and inner rings have deep raceway grooves, with shoulders which are not generally interrupted by filling slots. Solid cages made from polyamide PA66 or brass, and sheet metal cages made from steel or brass, are used as standard cages. The bearings are open or sealed. Due to the manufacturing processes used, open bearings, which are also available as sealed versions, can have turned recesses in the outer and inner ring for sealing washers or sealing shields.



Single row deep groove ball bearings, open or sealed



DESIGN AND MANUFACTURING OF HYDRAULIC UN-COILER

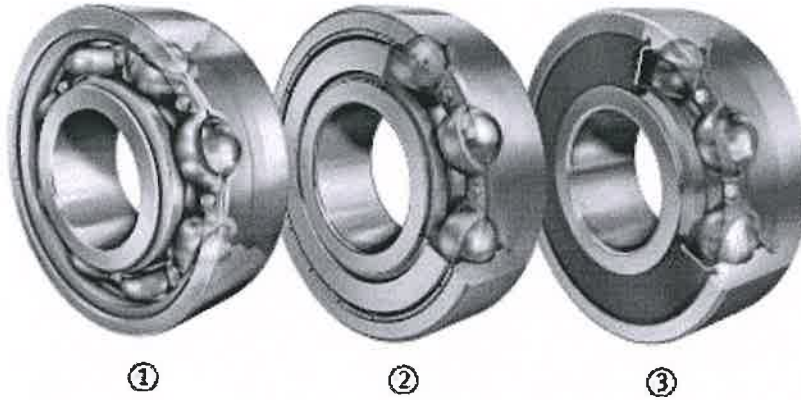
1 Open

2 Sealing shield on both sides (non-contact)

3 Contact seal on both sides

F_r = radial-load

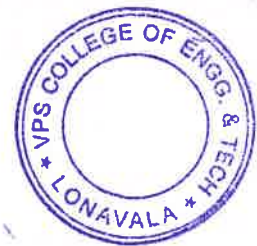
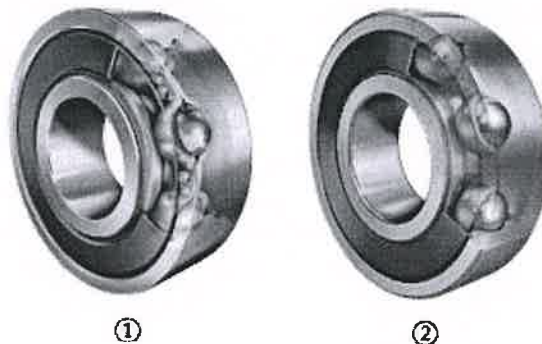
F_a = axial-load



1. Open

2. Sealing shield on both sides (suffix2Z)

3. Contact seal on both sides (suffix2BRS)



DESIGN AND MANUFACTURING OF HYDRAULIC UN-COILER

Single row deep groove ball bearings, Generation C, contact seals

1. Contact sealing shield on both sides (suffix2HRS)
2. Contact sealing shield on both sides (suffix2ELS)

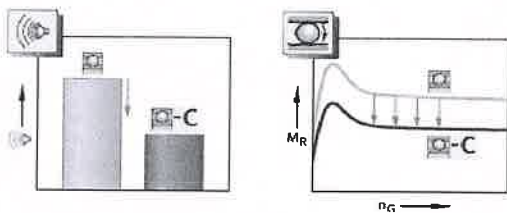
1. Deep groove ball bearings are available in single row and double row designs.

Single row bearings are particularly suitable where:

1. High and very high speeds are required
2. The bearing arrangement must be operated with very low friction very low running noise is required, without reducing the speed, load carrying capacity and operating life of the bearing high demands are made on the sealing of the bearing, without increasing heat generation or limiting the speed
3. The bearing position is to be designed particularly economically.

2. Double row bearings can be considered for bearing arrangements where:

1. The load carrying capacity of single row deep groove ball bearings is no longer sufficient axial loads in both directions and/or tilting moments must be supported in addition to radial loads
2. A high load carrying capacity is required and the design envelope available in a radial and axial direction is relatively small.



Comparison of standard deep groove ball bearings with bearings of Generation C: running noise, frictional torque

C = bearings-of Generation CMR

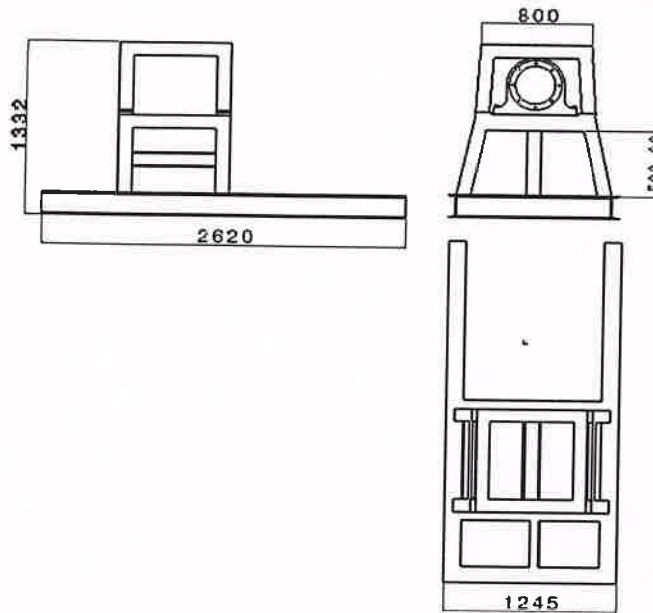
= frictional-torque

n_G = limiting

speed.



Design of Decoiler

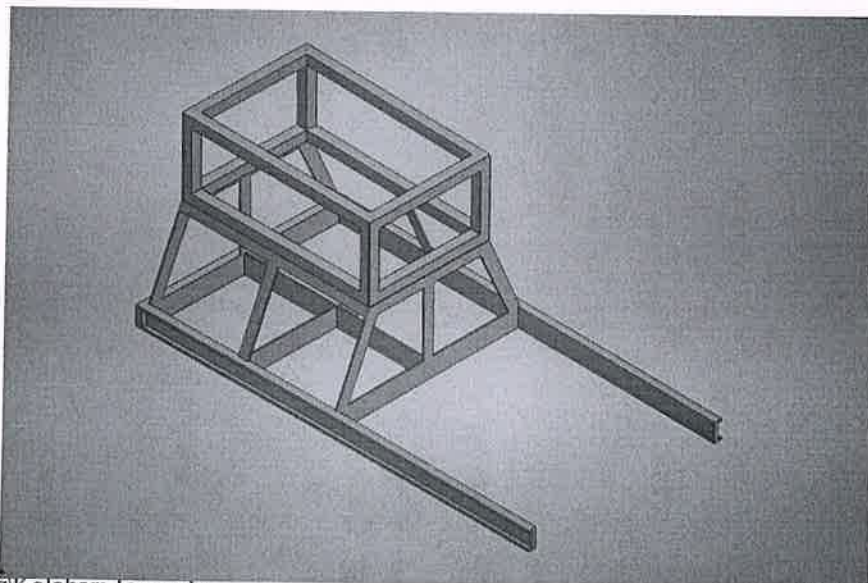


Frame parts

4.1 Design of Frame

Design Considerations for frame design :

1. Better load bearing capacity.
2. Optimized packaging space.
3. Ease of serviceability.

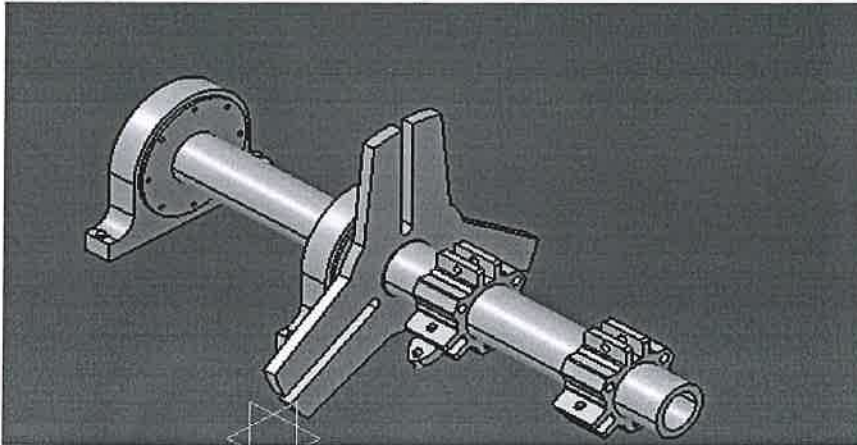


DESIGN AND MANUFACTURING OF HYDRAULIC UN-COILER

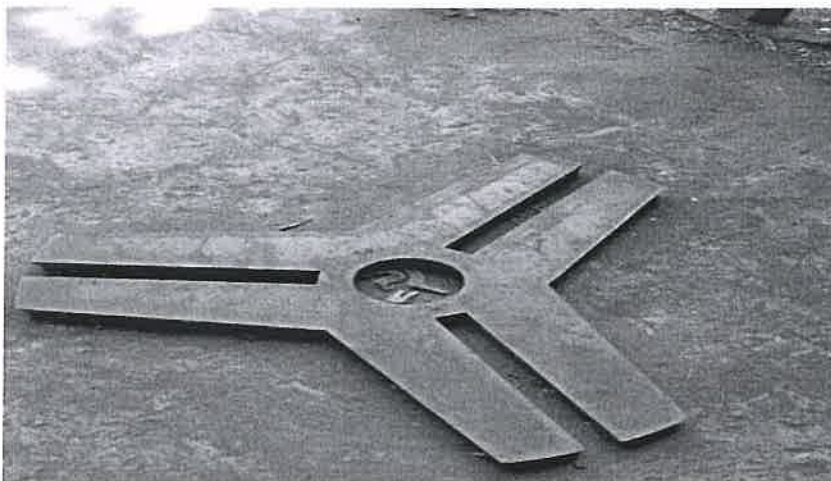
Sheet holding unit

1. Consists of a shaft which can slide and operated by hydraulic circuit
2. Guide way and cam mechanism provide loading and unloading of metal sheet
3. Coil holding supporter supports and give proper feeding

Holder

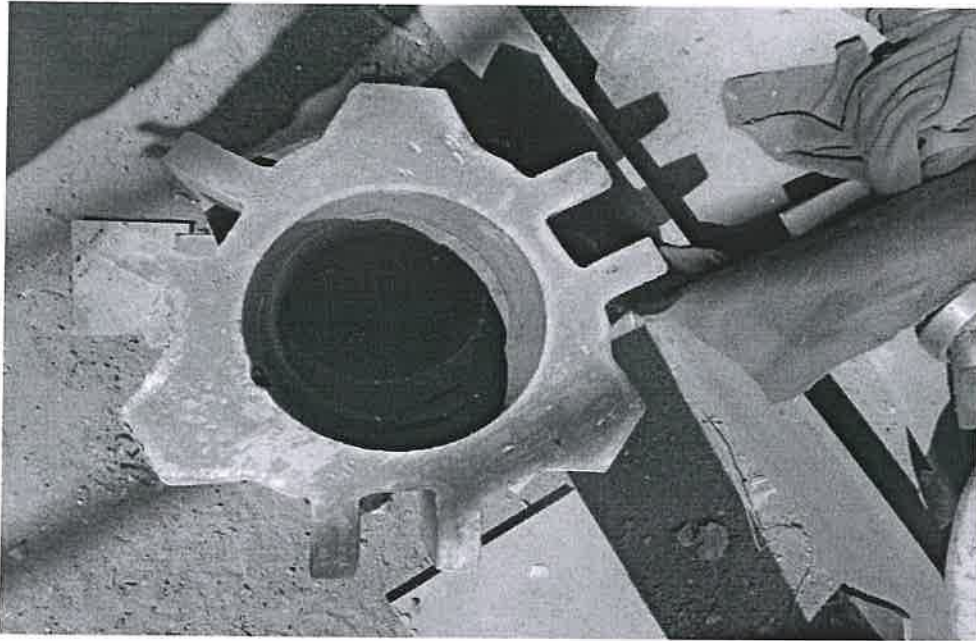


Holder Parts



Coil Holding Supporter

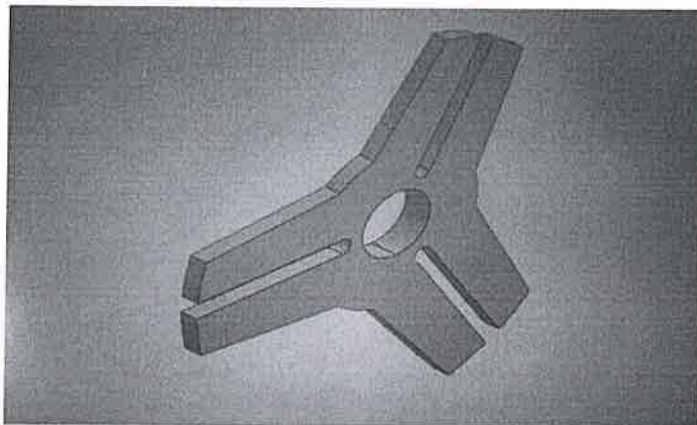


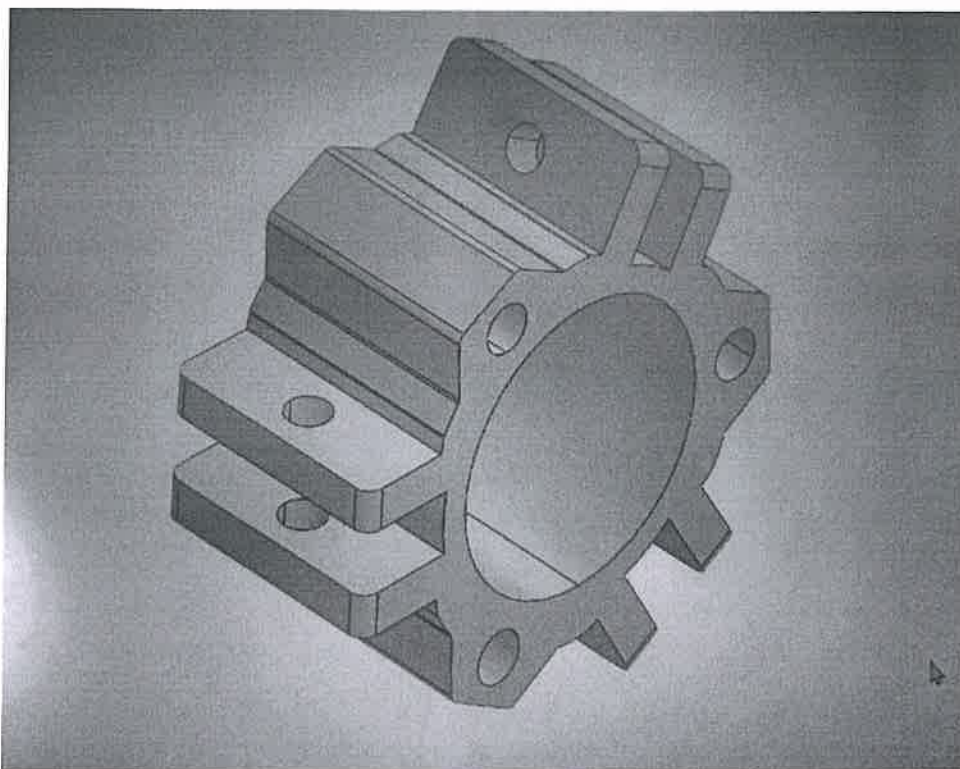


Guide Ways For Cam

Consists of a shaft which can slide and operated by hydraulic circuit Guide way and cam mechanism provide loading and unloading of metal sheet Coil holding supporter supports and give proper feeding. Shaft can handle 5-6 Tons weight easily.

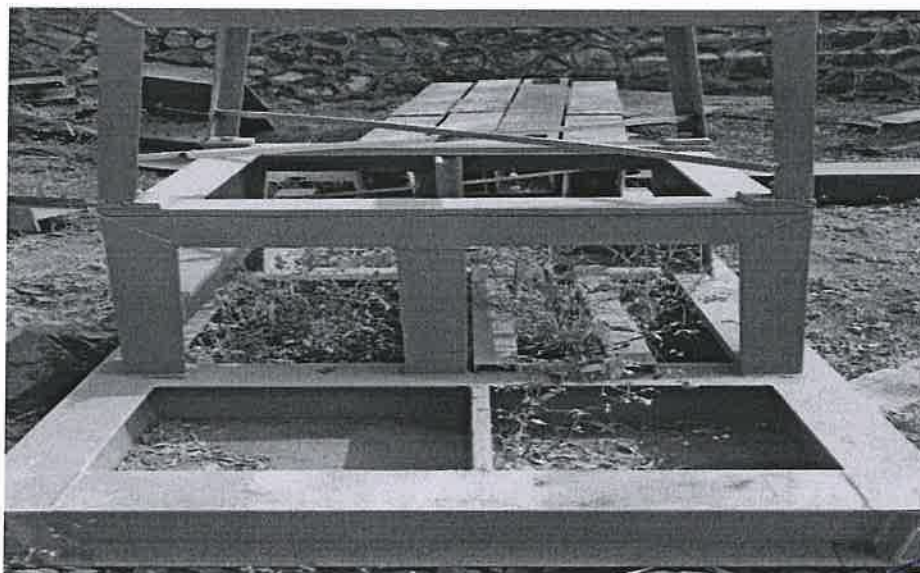
Coil Holding Suppouter





Guideway Cam

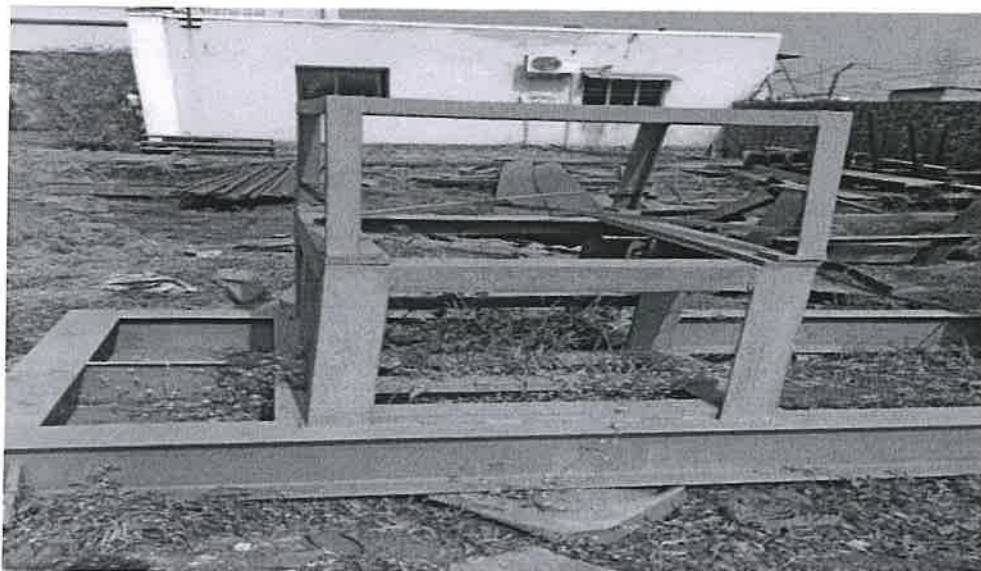
Actual Model In Industry



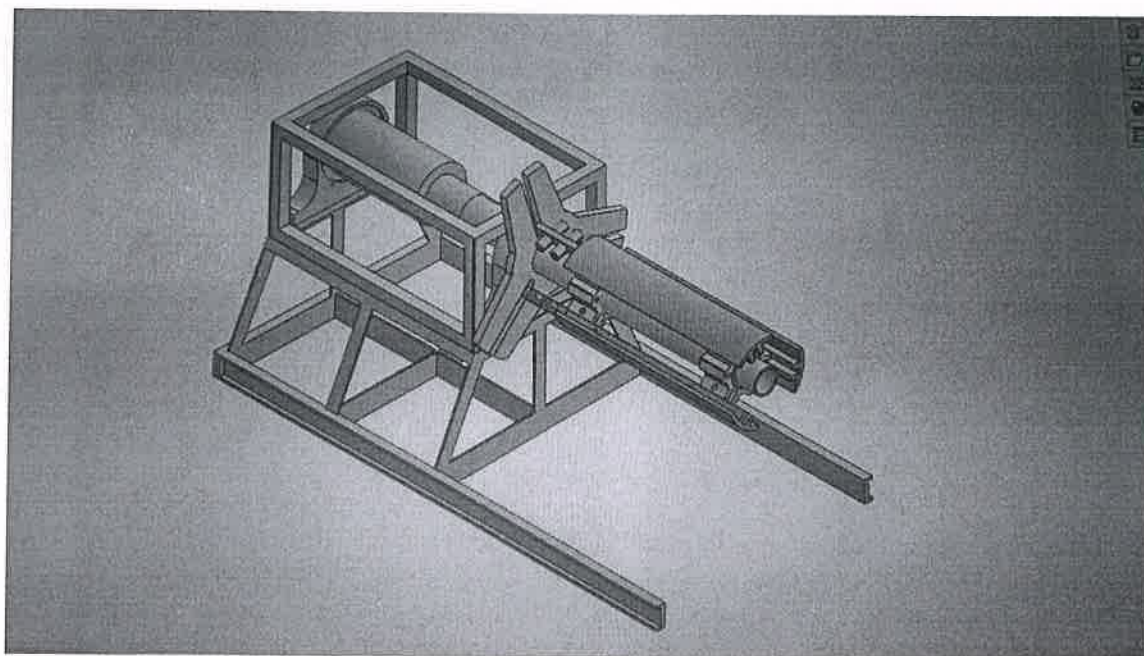
Main Frame



DESIGN AND MANUFACTURING OF HYDRAULIC UN-COILER



Main Frame



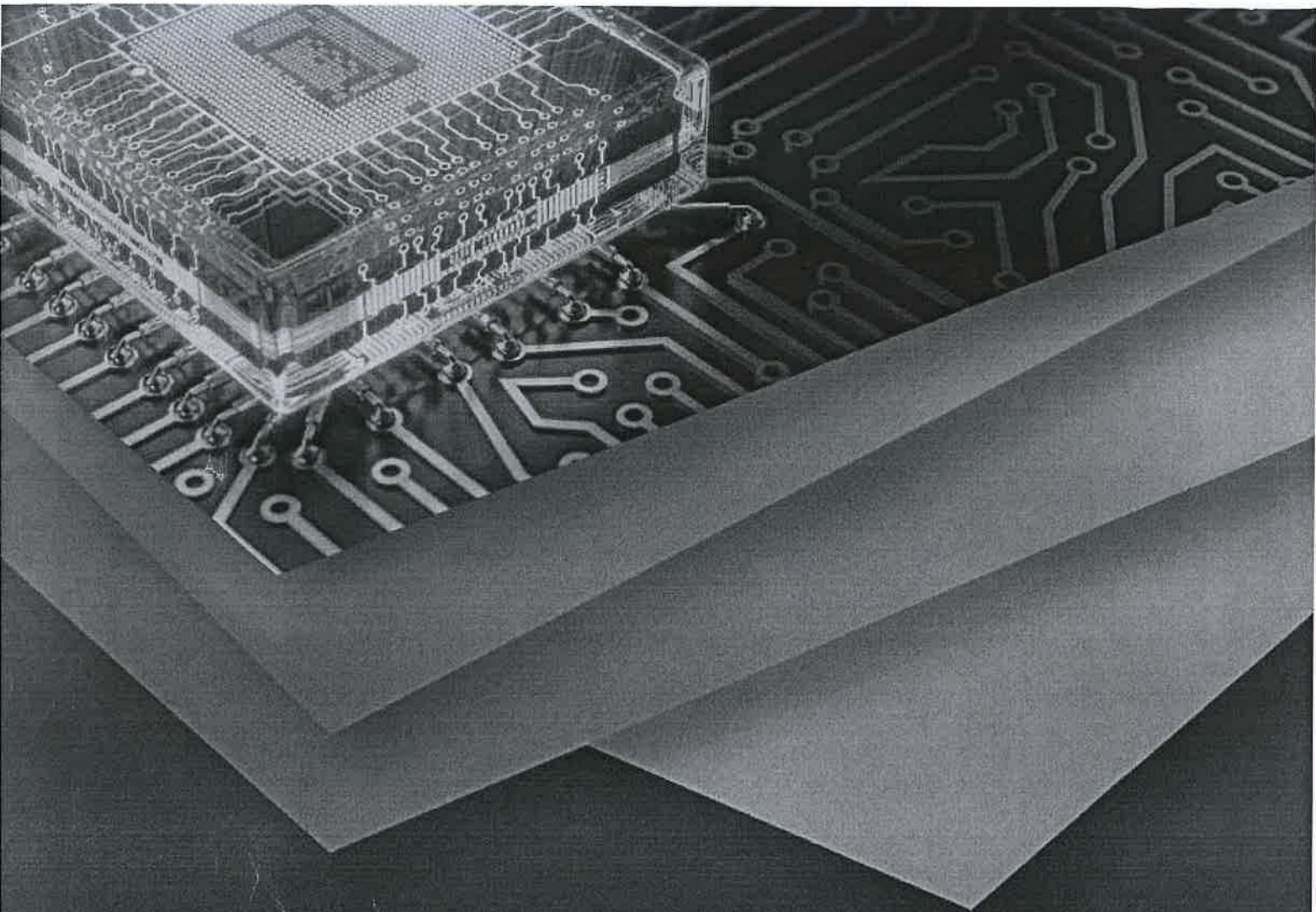
Final Assembly



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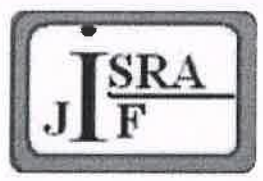




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REDESIGNING OF BOILER CHIMNEY AGAINST FOULING TO ENHANCE THE EFFICIENCY OF BOILER

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ABSTRACT

The heat lost in boilers is through many ways such as discharge of hot combustion gases to the atmosphere through chimneys, discharge of hot wastewater, and heat transfer from hot surfaces. This energy loss can be recovered through heat exchangers and be put to other use such as preheating other industrial fluids such as water or air.

This project focuses on recovering heat that is lost through boiler chimney flue gas. The major advantages of heat recovery include increasing the energy efficiency of the boiler & decreasing thermal and air pollution dramatically.

In this project scope, an initial design of chimney for 15 TPH boiler, 16 bar pressure is provided. The design had a problem, in that designed chimney, the maximum amount of carbon particles i.e. fouling formed. This report is based on the work undertaken to redesign the flue gas duct in the chimney to reduce the formation of fouling which affects the efficiency of the boiler. This system was specifically designed for boiler chimney. In the completion of the design, the flappers are provided in the flue gas duct (segment IV). The attempt of the project is to reduce the cross-section area in that particular segment to increase the flow of flue gases.

Keywords: Analysis, investigation, research

1. INTRODUCTION

1.1 Industrial waste heat

This is heat lost in industries through ways such as discharge of hot combustion gases to the atmosphere through chimneys, discharge of hot wastewater, heat transfer from hot surfaces. This energy loss can be recovered through heat exchangers and be put to other use such as preheating other industrial fluids such as water or air. This project focuses on recovering heat that is lost through boiler chimney flue gas. The advantages of heat recovery include:

- i). Increasing the energy efficiency of the boiler.
- ii). Decreasing thermal and air pollution dramatically.

1.2 Challenges to recovering low-temperature waste heat

Corrosion of heat exchanger surface as the water vapor contained in the exhaust gas cools some of it will condense and deposit corrosive solids and liquids on the heat exchanger surface. The heat exchanger must be designed to withstand exposure to these corrosive deposits. This generally requires using advanced materials, or frequently replacing components of the heat exchanger, which is often uneconomical. Large heat exchanger surface required for heat transfer; since low-temperature waste heat will involve a smaller temperature gradient between two fluid streams, larger surface areas are required for heat transfer. This limits the economy of heat exchangers. Finding a use for low-grade heat: recovering heat in low temperatures range will only make sense if the plant has a use for low-temperature heat.

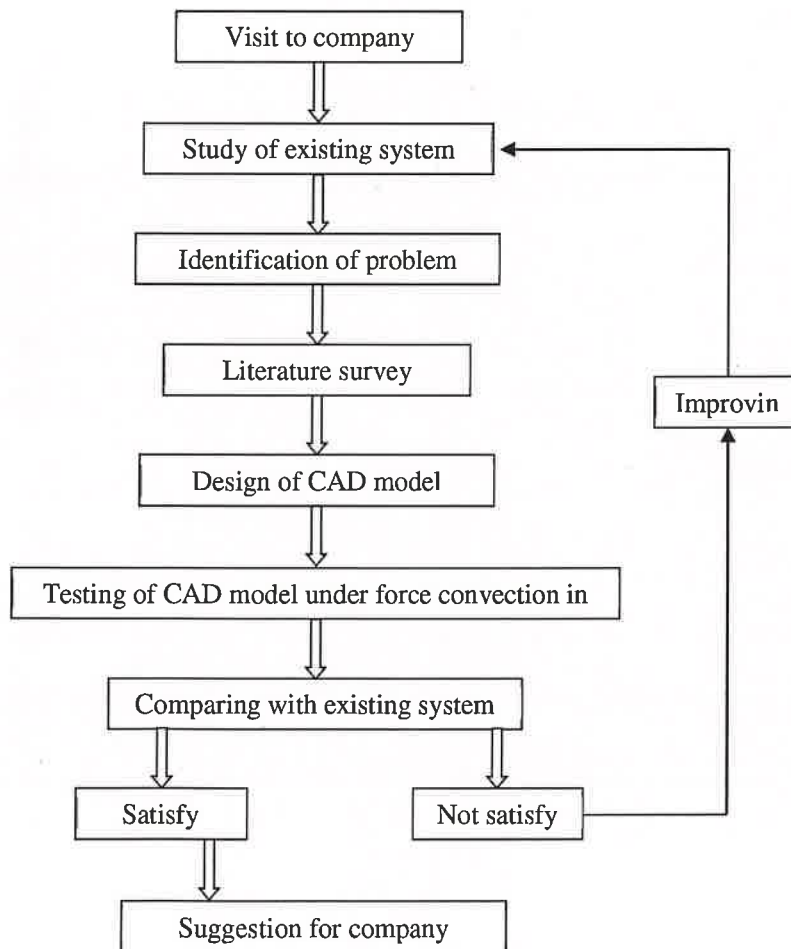
2. METHODOLOGY



The project is proposed to be done in the following manner.

1. Compiling the problems, difficulties arise in the boiler system which causes a reduction in boiler efficiency.
2. Research on fouling in boilers & its effect on boiler efficiency.
3. Research on ways of minimizing fouling.
4. Finding out the best way to change the design to reduce fouling problems.
5. Analysis of the design system by using CFD analysis.

The aim of this project is to recover heat loss through flue gases exhaust at the chimney stage taking a keen consideration of the effect of fouling especially at the core of the heat exchanger. Some research was done and the exchanger system designed and fabricated though not to completion. It was nevertheless tested specifically to determine its heat exchange effectiveness. However critical factors such as fouling were not keenly observed. The small plate spacing of the exchange core will allow for substantial heat recovery. This obviously means the core will undergo fouling at a higher rate as compared to boiler tubes. This makes the exchanger require more frequent maintenance than the normal boiler maintenance. The objective was to review the design ensuring that fouling was reduced and that the maintenance practice on the exchanger does not adversely interfere with the normal operation of the boiler.



3. MODELING AND ANALYSIS

3.1 DESIGNS AGAINST FOULING

It was our duty to consider the effect of fouling up on the heat exchanger performance during the desired operation and make provisions in our design for sufficient extra capacity to ensure that the exchange will meet process specifications till shut down for cleaning. We were also to consider the mechanical arrangements that are necessary to permit easy cleaning.

In our design, the following measures have been taken to reduce the rate of fouling.

- Provision for particulate filters.
- Introduction of turbulent flow upstream of the exchanger core.

3.2 Provision of particulate filters

At the entry of the flue gas, a cone-shaped duct whose narrower end can be attached to the diesel particulate filter. The particulate filter is designed to remove fuel particulate matter (soot) from the fuel gases. The efficiency of the filter is inversely proportional to the pressure that is built up due to resistance to gas flow. It is therefore difficult to achieve 100 percent efficiency through filtration, as there must be a compromise between efficiency and pressure build up. The best filters are therefore broadband filters that can filter particles of diameters between 0.2-150 μ m. The filters can easily be removed through a door on the side of the side duct for cleaning.

3.3 Introduction of turbulent flow upstream of the exchange core

The cone shape element at the gas-duct entry causes turbulence as it suddenly opens into the larger gas duct, this causes turbulence. This turbulent flow of air picks up some of the particles that stick on the exchanger surface due to its drag effect. This helps to reduce fouling. The above filtration and turbulence only minimize the rate of fouling. But the fouling still takes place. This, therefore, implies that the exchanger will require maintenance (cleaning). There are various ways that could be used in cleaning the exchanger.

In the design we consider using the following methods:-

- Blowing
- Washing

The system was designed with a slit on the wall of the flue gases duct downstream of the exchanger. This allows the overhead water washing. Pressurized water mixed with abrasives e.g. fine sand is used to remove soot that cannot be removed by blowing air past the exchanger. The abrasives help in scrubbing the surface. Before washing, the particulate filter is removed and replaced with laid to prevent water from entering the boiler. During washing, the wastewater drains out of the system through the outlet ducts, at the base of the flue gas inlet duct.

3.4 Chimneys and draft

The height and diameter of a properly designed chimney depend upon the amount of fuel to be burned, its nature, design of the flue, with its arrangement relative to the boiler or boilers, and the altitude of the plant above sea level. There are so many factors involved that as yet there has been produced no formula which is satisfactory in taking them all into consideration, and the methods used for determining stack sizes are largely empirical. In this chapter, a method sufficiently comprehensive and accurate to cover all practical cases will be developed and illustrated.

The draft difference in pressure available for producing a flow of gases. If the gases within a stack are heated, each cubic foot will expand, and the weight of the expanded gas per cubic foot will be less than that of a cubic foot of the cold air outside the chimney. Therefore, the unit pressure at the stack base due to the weight of the column of heated gas will be less than that due to a column of cold air. This difference in pressure, like the difference in the head of water, will cause a flow of the gases into the base of the stack. In its passage to the stack the cold air must pass through the furnace or furnaces of the boilers connected to it, and it in turn becomes heated. This newly heated gas will also rise in the stack and the action will be continuous.



4. RESULTS AND DISCUSSION

4.1 CAD MODEL

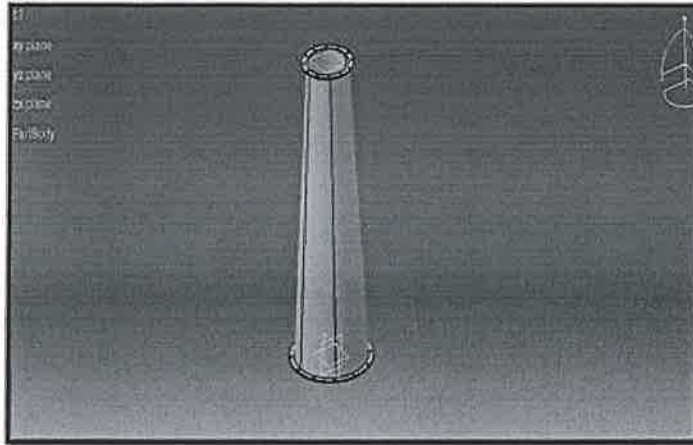


Fig 4.1 CAD Model

We have made a CAD model to show how the flapper actually looks. Then we made more angles of Flappers as seen in the next section.

4.2 CALCULATIONS

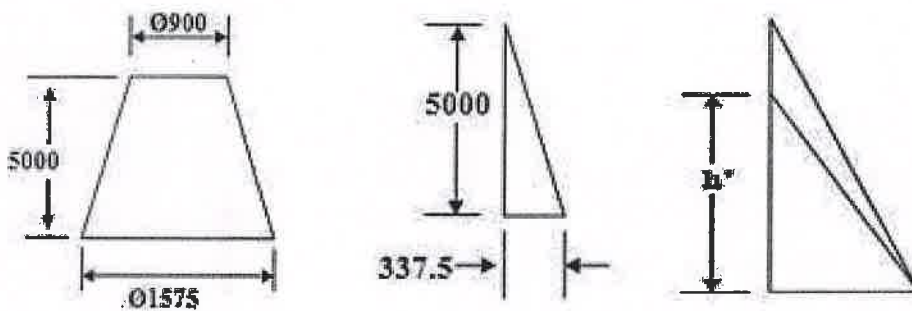


Figure 3.8: Dimension of Part to be Re-designed

$$1) \tan(\alpha) = 5000/337.5 \\ = 86.138^\circ$$

Now we are adding flappers at 3 different angles at 10, 12, 15



a) At 10°

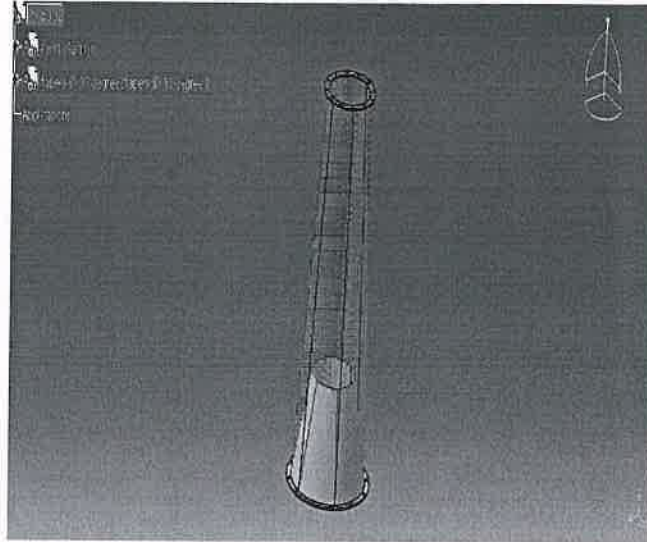


Fig 4.2 Flapper with angle 10°

At 10°

$$(\beta') = 86.138^\circ - 10^\circ$$

$$= 76.138^\circ$$

$$\tan(\beta) = h'/337.5$$

$$h' = 1367.70 \text{ mm}$$

b) At 12°

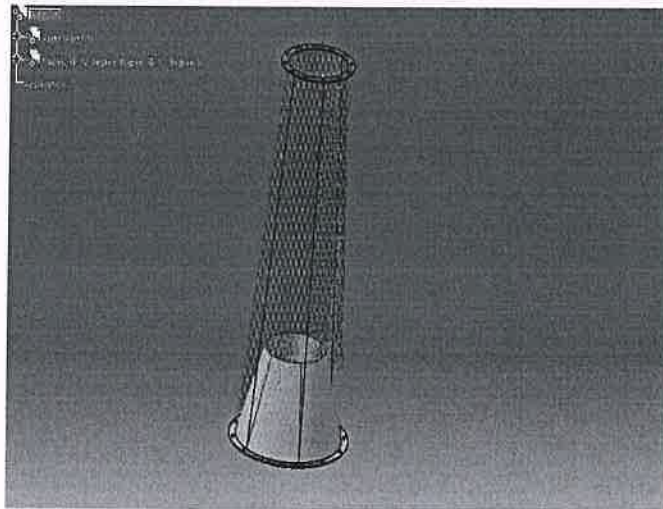


Fig 4.4 Flapper with angle 12° At 12°

$$(\beta') = 86.138^\circ - 12^\circ$$

$$= 74.138^\circ$$

$$\tan(\beta) = h'/337.5$$

$$h' = 1187.79 \text{ mm}$$

c) At 15°



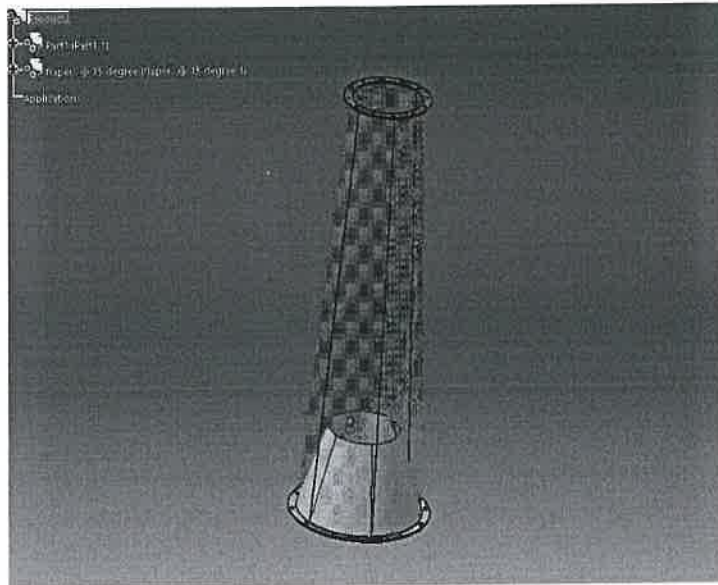


Fig 4.5 Flapper with angle 15°

At 15 °

$$(\beta') = 86.138$$

$$= 71.138 ^\circ$$

$$\tan(\beta) = h'/337.5$$

$$h' = 987.89 \text{ mm}$$

4.3 Other Boiler Efficiency Improvement Steps

- 1) Moisture free fuel should be fed to the boiler so that no amount of heat is lost in removing the moisture from fuel and all the heat can be efficiently used to convert water to steam.
- 2) Radiation and convection losses though cannot be measured but can be reduced by regular maintenance of the boiler and using insulation to prevent heat losses to the surrounding.
- 3) Most heat losses are due to the high temperature of dry flue gases leaving the boiler. Boiler maintenance should be done regularly and removing the scale deposited on the heat transfer tubes should be given prime importance as this scale prevents the transfer of heat between flue gas and water.
- 4) Bottom ash from the boiler is generally at a high temperature and has a lot of sensible heat. This heat can be utilized to preheat the air or water used in a boiler.
- 5) Adjusting the fuel-air ratio for combustion can be quite tricky. If the fuel is too much as compared to the air, incomplete combustion occurs. This will give rise to carbon soot deposits inside the combustion chamber or even over the boiler tubes.
- 6) Installing Economizer.
- 7) Reducing Scale and Deposits.
- 8) Steam which is used in a process after transferring its heat gets converted to condensate water. This condensate is generally at high temperature and can be recovered using Condensate Recovery Module which can be reused to preheat water or air.



4. CONCLUSION

The objective of this project was completion and testing of boiler chimney heat recovery from system that could be used to recover heat lost through flue gases and reduces the effects of fouling. Design calculation with specified working parameters in order to reduce the fouling on boiler chimney surface were validated and implemented successfully. Attempts were made to reduce fouling by introducing flappers in the fifth section of the chimney. Flappers were installed at various angles like 10°, 12°, 15° and analysis is done on the results by comparing all of them.

The effects of pressure and velocities of flue gases on the boiler chimney surface are analyzed through finite element method, the results of which were validated with the actual with satisfactory results.

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Design and Analysis of Flywheel Composite Material

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Mr. Yogesh Masurkar⁴, Mr. Mohammed shaikh⁵

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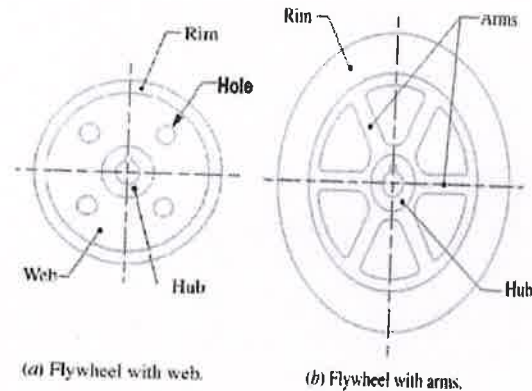
Abstract- The widespread use of composite materials is due to their desired properties or flexibility to a variety of applications. Carbon fiber reinforced resin compounds are acquiring prominence owing to their outstanding real estate, such as great particular rigidity and strength, as well as chemical resistance, which are in high demand by the automobile sector. However, by modifying epoxy resins in reacting liquid rubbers or inorganic additives, their brittleness can be decreased. This investigation investigates the impact of carboxyl terminating butadiene acrylonitrile (CTBN), Nano silica, as well as hybrid (CTBN and nanosilica) alterations on the radial suspense-tension fatigue durability of Nano modified carbon fibre content-reinforced composites made of epoxy. After characterizing the mechanical properties of basic, plastic, and the nanosilica modified resin specimens, carbon fibre-reinforced Nano modified the epoxy composite panels are produced using Vacuum Assisted Resin Transfer Moulding (VARTM) or a centrifugal planetary mixer (THINKYTM). Two rubber and nanoparticle concentrations have been assessed under elastic, flexural, or comparable shear stresses, or the outcomes are contrasted with the results for an untreated mixture. This information is then used to perform extensive axial suspense-tension fatigue experiments on control, rubber-modified, nano-modified, and hybrid composites.

Keywords- Composite materials, Light weight components, Carbon-fiber reinforced epoxy composites, Specific strength and stiffness, etc.

I. INTRODUCTION

The flywheel used in a machine acts as a tank that holds energy if the supplied is greater than the demand and discharges it when the demand exceeds the source. A hybrid goods permits a higher speed of rotation, resulting in lightweight flywheel rotors with a high specific energy. Therefore, composite materials are preferable to metals when building flywheel blades. Theoretically, the particular potential produced by composite rotors is approximately five times that of metallic rotors. The concept of the fast speeds flywheel originated in the early 1970s. A researcher from Lawrence Livermore National Laboratory published a piece in Scientific American proposing a fresh approach to rotor

design and suggesting the inclusion of the mixture products as opposed to metal.



Composite materials outperform metallic materials in terms of safety. Composite flywheels are smaller liable to disintegrate in free-flying projectiles if a prospective fail occurs at a high velocity angles or radial pressures exceed their material's strength. Instead, circumferential fractures form, as well as the flywheel progressively falls apart.

Background

In an a century of intense competition, new difficulties for industrial manufacturing procedures include maximising productivity, assuring high output quality, or concurrently reducing production time and production cost. With modern engineering products requiring greater precision, the management of the outer roughness is growing increasingly essential. The operation of these procedures is based on a specific idea and makes use of particular properties.

ANSYS

ANSYS, Inc. (NASDAQ: ANSS) is a developer of computer-aided engineering (CAE) engineering simulation software with headquarters in Canonsburg, Pennsylvania, United States. Dr. John A. Swanson founded the corporation in 1970 under the name Swanson Analysis Systems, Inc. ANSYS Multiphysics/Structure mechanics is the company's flagship product. The code in question is capable of



undertaking static (stress) analysis, thermal analysis, motion evaluation, frequency response analysis, transition simulation, and linked field evaluation. Ansys multiphase is capable of coupling diverse physical domains, including structural, radiative, and electromagnetics. Numerous researchers and engineers favour this module due to its Ansys Parametric Design Language (APDL) parametric language. The APDL enables users to carry out all reprocessing, solution, and postprocessing commands from a distinct text file defined as a macro.

II. PROBLEM DEFINITION AND OBJECTIVES

Problem definition:

Its weight increases its fuel consumption. It has an excessive inertia of rotation, which reduces the rate at which engine rpm can increase or decrease, thereby increasing engine stress. It must be precisely balanced to prevent excessive vibration. It increases the price for resources and production. The energy used to accelerate a flywheel is lost when it is decelerated unless special provisions are made to recapture it.

If a flywheel becomes dislodged during engine operation, it may result in catastrophic damage. This is a rare occurrence, yet it has occurred.

When transforming a trolley into a race car, installing a lightened flywheel is one of the modifications that is considered. The objective is to permit the vehicle accelerate more rapidly and to reduce the wasteful decrease in horsepower caused by shifting the flywheel's mass.

Objectives:

Composite material permits greater speed of rotation, resulting in lightweight flywheel rotors with an excessive particular energy. Therefore, composite materials are preferable to alloys when building flywheel rotors. Theoretically, the specific energy generated by composite rotors is approximately five times that of metallic rotors. The concept of the fast speeds flywheel originated in the early 1970s. A researcher from Lawrence Livermore National Laboratory published an article in Scientific American proposing an innovative approach to rotor layout, suggesting the use of material composites as opposed to metallic. Composite materials outperform metallic materials in terms of safety. Hybrid flywheels are less likely to break down in liberate-flying projectiles if the material's strength is exceeded by a potential breakdown at high speed angles or tangential

pressures. Instead, circular cracks or gradual disassembly of the flywheel occur.

The project's primary objectives are:

- To decrease the total mass of a vehicle's flywheel using a composite material.
- To analyse the automobile flywheel using ANSYS (finite aspect modelling and simulation software) in order to optimise weight and determine the resultant stresses.

III. LITERATURE REVIEW

Akshay P. Punde, G.K.Gattani In the present investigation, a flywheel is created and analysed to counteract the need to level out the substantial oscillations in motion throughout the course of an I.C. engine. By calculating the stresses within the flywheel using Finite Element Analysis, we can contrast the design or study results to existing flywheels. The next inference can be taken from the preceding work on the flywheel or its optimisation methodologies. It is evident that flywheels made of cast iron experience greater Pressure or distortion. S Glass Epoxy can be used to store energy in fewer components in flywheels. It is also applicable for high-speed applications.

Palak J Patel, Arvind S. Sorathiya The primary issue with flywheels is their increased mass, resulting in slower rotational speeds. Flywheel was created using a 3D modelling application. The 3-D model was then imported using the IGES format into ANSYS. Using finite element analysis, a static structural analysis of three distinct materials, namely Grey cast iron, 5059 H321 aluminium alloy, and Kevlar carbon fibre, was conducted, and their relative performance was observed. Using the tetrahedron solid element, this model was then idealised using finite elements. The analysis was conducted in a static state. Using FEA software, we calculate the sum of stretching, normal tension, and equivalent stress. Observing the results of static analysis, this paper suggests carbon fibre as a superior material for wheel design due to its lower weight. The flywheel model is created in Cre-o and then imported into ANSYS for processing. In the direction of rotation of a flywheel made of grey cast iron, 5059 H321 Al Alloy, and kevlar Carbon Fibre, an angular velocity of 471 rad/sec is applied and the flywheel's rim is fixed. The ones that follow are the conclusions drawn from the obtained results: The grey cast iron flywheel experiences greater total deformation than 5059 Al alloy and carbon fibre. The grey cast iron wheel is subjected to a greater amount of von-mises tension or normal stress than the 5059 H321 Al alloy as well as carbon fibre wheels. Kevlar carbon fibre weighs 80 percent less than grey cast iron or 5059 H321 Al alloy. Kevlar carbon fibre is

resistant to erosion and corrosion. 5. Comparing all results suggests that kevlar carbon fibre is a superior material for wheel design over grey cast iron or 5059 H321 Al alloy.

Sushama G Bawane, A P Ninawe1 and S K Choudhary In this research, a flywheel is created, optimised, or examined to satisfy the need of smoothing out the significant fluctuations in motion that occur throughout the cycle of an internal system. Utilising an optimising method, different variables such as substance and cost can be optimised for a flywheel, and the result may be contrasted to that of an existing flywheel by modifying working factors such as effectiveness, results, or battery ability. On a foundation of the dynamic tasks as well as system requirements, the fundamental characteristics of the flywheel are originally determined, and a comprehensive design study of the flywheel is conducted. The software is then utilised to conduct FEA ANALYSIS on an increasing number of designs in a variety of engineering disciplines. In addition to responding to forces exerted by other elements, FEA provides the capability to analyse tensions or displacements of a component or installation. This thesis describes the process of designing the flywheels or analyses the substance selection procedure. The FEA model is explained so that the mesh type, mesh size, or border constraints used to develop an effective FEA model can be comprehended. Lastly, the design objective may be to minimise the flywheel's material content in order to reduce its price. By applying tools intended to reduce 1kg of weight, 20% of the flywheel's circumference may be eliminated in the future. After finishing the analysis in CAE software, ANSYS 11.0, based on the concept of Similar stresses for substance transferring diseases, it is clear that these values are less compared to the allowed pressures for the particular chemical in the used conditions, so the structure is safe.

SudiptaSaha, Abhik Bose, G. Sai Tejesh, S.P. Srikanth Mainly, The effectiveness of a flywheel is determined by three key factors, namely the durability of the substance used, the geometry of the flywheel's cross-section, and the speed at which it rotates. This study aims to examine the impact of flywheel shape on the Specific Energy, which refers to the energy storage and delivery capacity per unit mass. It is worth noting that the strength of the material plays a crucial role in determining the quantity of kinetic energy that can be safely generated when combined with rotor speed. According to the findings of the suggested computer-assisted analysis and optimisation technique, the intelligent configuration of flywheel geometry has the potential to considerably influence the specific energetic efficiency and reduce the operational stresses imposed on the shaft/bearings during high rotational velocities as a result of decreased mass. The present study centres on an examination of the five most

commonly occurring geometries, specifically those that are two-dimensional and either straight, concave, or convex in shape. The current flywheel design exhibits potential for further enhancement, particularly with regard to optimising efficacy as the primary goal. The operational circumstances of the system impose a limited margin for energy storage, thus even minor enhancements can significantly impact the overall achievement of the whole thing. The present research demonstrates the importance of appropriate flywheel geometry selection and its impact on energy storage efficacy. This study demonstrates the utilisation of a computer-assisted analysis and optimisation methodology through the presentation of sample cross-sectional data. The primary aim of the issue is articulated in relation to the maximisation of specific energy by selecting the most suitable geometry from the five pre-established cross-sectional options. By leveraging contemporary technology, it is possible to achieve significant progress in advanced fields of study that require the use of flywheels. Engineers often face challenges related to the load capacity of magnet gears, size limitations, and overall effectiveness in this domain.

IV. METHODOLOGY

Flywheel Origin:

The development or utilise of gyroscope technology for energy storing started during the Industrial Revolution, several centuries ago. Dr. A. Stodola's dissertation in the conceptual load limits of rotating discs was translated into English for the first time in 1917, making it one of the earliest contemporary papers on the subject. In the 1970s, sophisticated flywheel development commences.

The flywheel is considered to be a single of the first people creations or had been widely employed for an extended period of time. Initial combat vehicles in ancient China were built using four timber flywheels. Around 2,500 years ago, the ancient Egyptians fabricated the earliest chariots featuring flywheels made of timber. According to Genta (1985), flywheel systems were widely utilised in everyday activities, such as the use of water wheels for water circulation and wind-powered flywheels for energy production. The historical development of flywheels and their utilisation has been significantly impacted by the progressions in machinery content and the internet, and also by fortuitous circumstances or necessity, as noted by Horner et al. (1996). The initial noteworthy progressions were achieved during an epoch of Industrial Revolution that occurred in the 18th century.



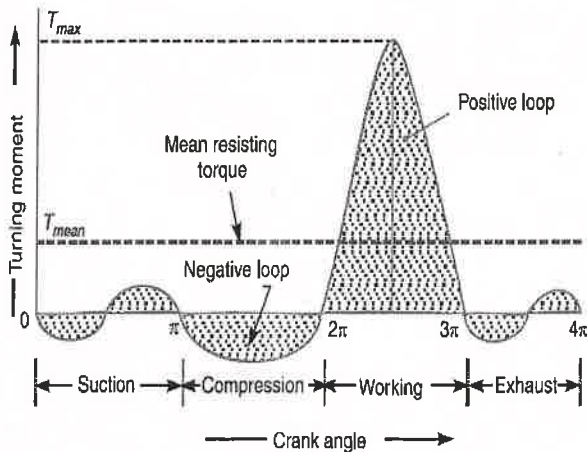


Fig. 2: Turning moment diagram for a four-stroke cycle I. C. Engine

Energy stored in a flywheel:

You recognise that a flywheel's motion increases when it absorbs energy and decreases when it releases energy. Let,

- m = Mass of the flywheel in kg,
- k = Radius of gyration of the flywheel in metres,
- I = Mass moment of inertia of the flywheel about its axis of rotation in $kg \cdot m^2$
 $= m \cdot k^2$

N_1 and N_2 = Maximum and minimum speeds during the cycle in r.p.m.,

ω_1 and ω_2 = Maximum and minimum angular speeds during the cycle in rad/s,

N = Mean speed during the cycle in r.p.m. = $\frac{N_1 + N_2}{2}$

ω = Mean angular speed during the cycle in rad/s = $\frac{\omega_1 + \omega_2}{2}$

C_S = Coefficient of fluctuation of speed = $\frac{N_1 - N_2}{N}$ or $\frac{\omega_1 - \omega_2}{\omega}$

We know that the mean kinetic energy of the flywheel,

$$E = \frac{1}{2} \times I \times \omega^2 = \frac{1}{2} \times m \cdot k^2 \times \omega^2$$

As the speed of the flywheel changes from ω_1 to ω_2 , the maximum fluctuation of energy,

ΔE = Maximum K.E. – Minimum K.E.

$$= \frac{1}{2} \times I \times \omega_1^2 - \frac{1}{2} \times I \times \omega_2^2$$

$$= \frac{1}{2} \times I \times (\omega_1^2 - \omega_2^2)$$

$$= \frac{1}{2} \times I \times (\omega_1 + \omega_2) (\omega_1 - \omega_2)$$

$$= I \cdot \omega (\omega_1 - \omega_2)$$

$$= I \cdot \omega^2 \left(\frac{\omega_1 - \omega_2}{\omega} \right)$$

$$= I \cdot \omega^2 \cdot C_S$$

$$= m \cdot k^2 \cdot \omega^2 \cdot C_S$$

$$= 2 \cdot E \cdot C_S \quad \dots\dots \text{(in N-m or joules)}$$

The radius of gyration (k) may be taken equal to the mean radius of the rim, because the thickness of rim is very small as compared to the diameter of rim

Types of Flywheel Applications:

There are three distinct types of applications of flywheels

1. Constant driving torque and variable load torque.
2. Variable driving torque and constant load torque.
3. Variable driving torque and variable load torque.

Constant driving torque and variable load torque:

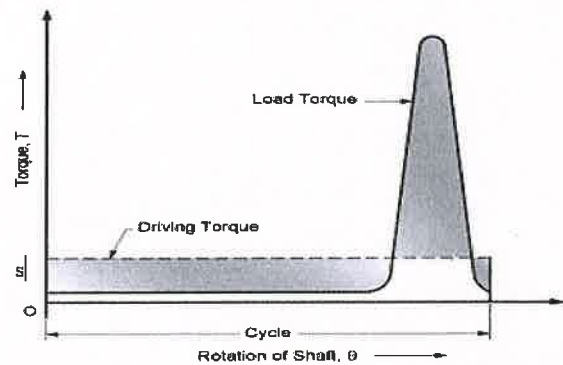


Fig. 3: Constant Driving Torque and Variable Load Torque

Variable driving torque and constant load torque:

As displayed in Figure 4, in this type of flywheel use, the driving force supplies energy at various rates while the machine requires energy at a constant rate.

This form of wheel utilisation is illustrated by a four-stroke gasoline engine operating a centrifugal pump.

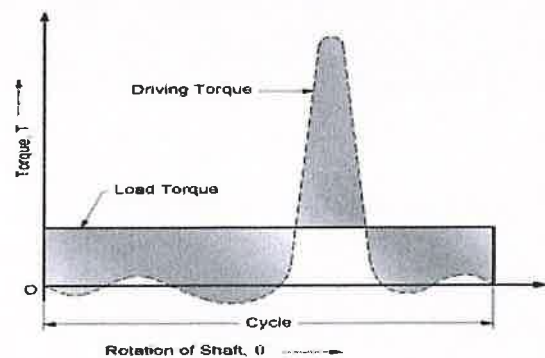


Fig. 4: Variable Driving Torque and Constant Load Torque



Variable driving torque and variable load torque:

As stated in Figure 5, in this form of spinning use, the engine supplies energy at a variable rate, while the machine's energy demand is also variable.

The aforementioned type of flywheel implementation entails the utilisation of the internal combustion engine to power the rotary compressors and to operate the rock crusher, between other potential applications.

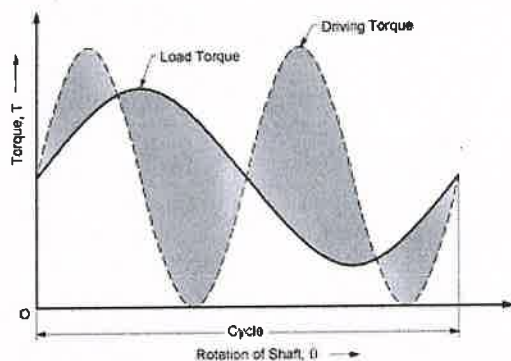


Fig. 5: Variable Driving Torque and Variable Load Torque

CAD modeling:

The software suite known as CATIA (Computer Aided Three-dimensional Interactive Application) has been developed by the French company Dassault Systems and encompasses CAD/CAM/CAE functionalities. It is available on multiple platforms and is a commercial software. CATIA, which is developed in the C++ programming language, serves as the foundation of Dassault Systems' software suite for managing the product lifecycle.

The CATIA software offers a means of designing intricate and sophisticated products through the utilisation of systems engineering principles. The aforementioned elements encompassed in the process are the delineation of prerequisites, the establishment of the systems architecture, the modelling of behaviour, and the creation of a virtual product or embedded software. Application Programming Interfaces (APIs) enable the customization of CATIA software. The customization of CATIA V5 and V6 is achievable through the utilisation of programming languages such as Visual Basic for Applications and C++.

Whilst NURBS were eventually incorporated into subsequent versions of CATIA V4, piecewise polynomial surfaces were predominantly utilised in this version. The CATIA V4 software utilises a solid, non-manifold

computational engine. The CATIA V5 software features a solid and surface-based package that is parametric in nature and utilises NURBS as its main exterior depiction. Additionally, the software offers several workbenches that facilitate Knowledge-Based Engineering (KBE).

The flywheel CAD model is established using CATIA V5. The complete model includes the body, hub, web, and rim. The various design parameters are derived directly from the TOYOTA TF105 flywheel, and for the internal structure, appropriate simplifications and assumptions are made.

Flywheel specifications:

- Model – FORMULA 1 CAR
- Power (P) = 552KW
- Speed (N) = 19000 rpm
- Torque (T) = 274 Nm

Flywheel layout:

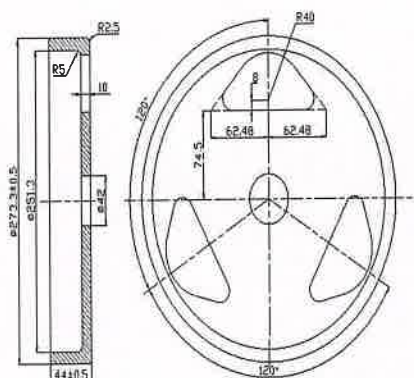


Fig. 6: Flywheel layout

Principle dimensions for parametric model:

Table 2: Principle dimensions of flywheel

Sr. No.	Description	Dimensions(mm)
1	Outer diameter	273.3
2	Mean diameter	262.3
3	Hub diameter	149
4	Shaft diameter	42
5	Rim Width	44
6	Rim thickness	10

Modeling of assembly in ANSYS:



The analysis's pre-processing phase is crucial because it needs additional memory.

Resources and equipment. The pre-processing phase consists of the that follows steps:

- Engineering Data
- Geometry
- Discretization

Engineering Data:

Table 3: Material properties

Sr. No.	Material Properties	Unit	Steel	Carbon Fiber
1	Density	kg/m ³	7850	2150
2	Poisson's ratio	-	0.3	0.23
3	Young's Modulus	MPa	2×10 ⁵	2×10 ⁵
4	Tensile Yield stress	MPa	1300	1040
5	Tensile Ultimate Stress	MPa	1550	-

Step 1: Collecting information and data related to flywheel.

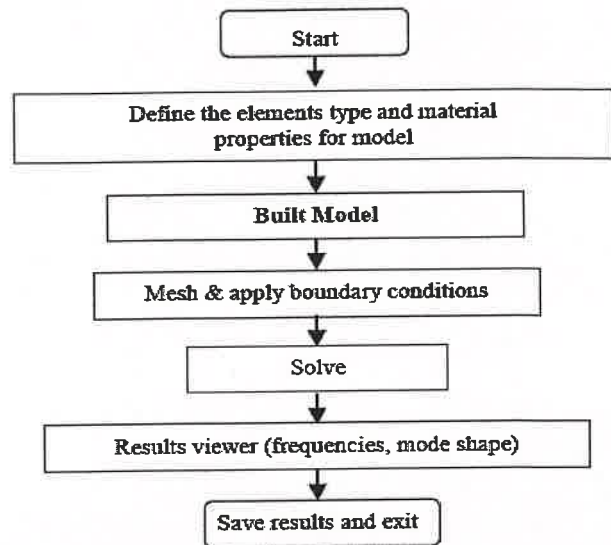
Step 2: A fully parametric model of the flywheel is created in CATIA V5 software.

Step 3: Model obtained in Step 2 is analyzed using ANSYS 14.5, to obtain the stresses and mass of flywheel.

Step 4: Manual calculations are done and results are compared with those obtained in ANSYS.

Step 5: Lastly, we examine outcomes derived from ANSYS or manual calculations for various flywheel materials, including steel, carbon fibre, and composites.

To accomplish this assignment, we will use the accompanying flowchart to complete the steps in the correct order.



Parametric modeling using CATIA V5:

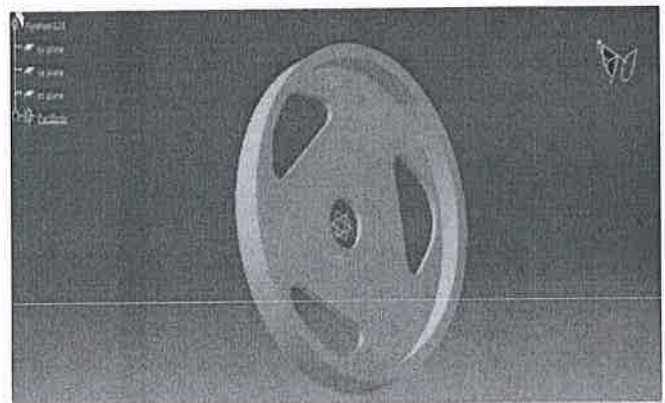


Fig. 7: Flywheel model in CATIA V5



Fig. 8: Model of Flywheel Body (Carbon Fiber)



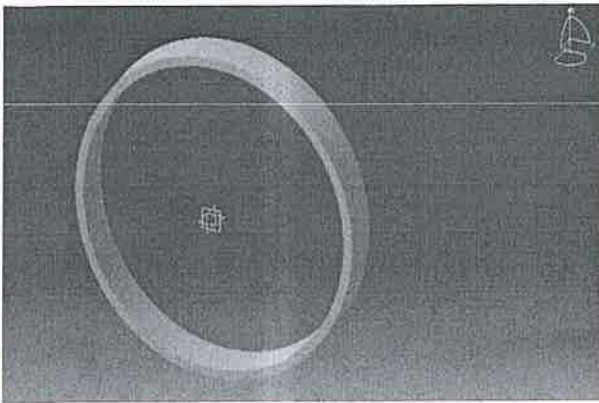
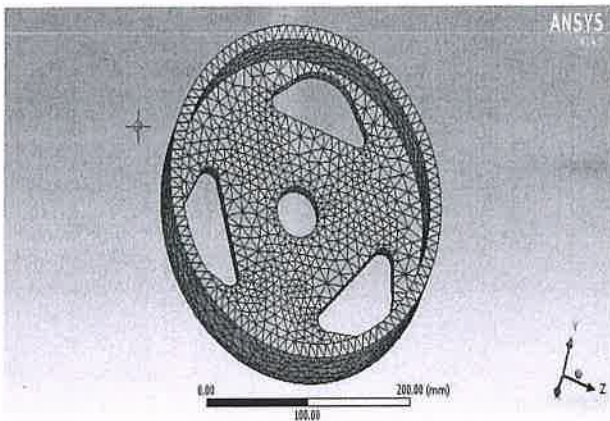


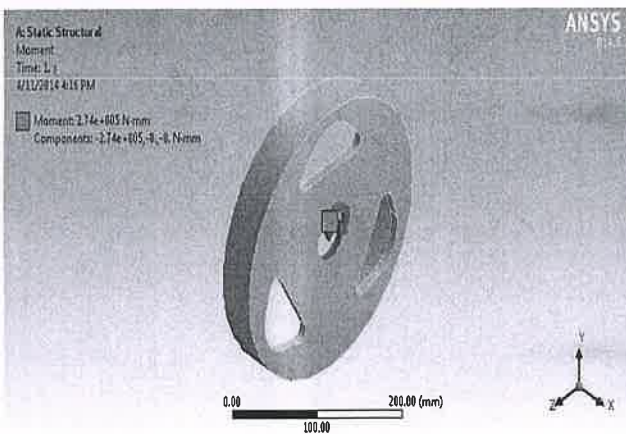
Fig. 9: Model of Flywheel Rim (Steel)

Some input conditions applied in ANSYS during simulation:

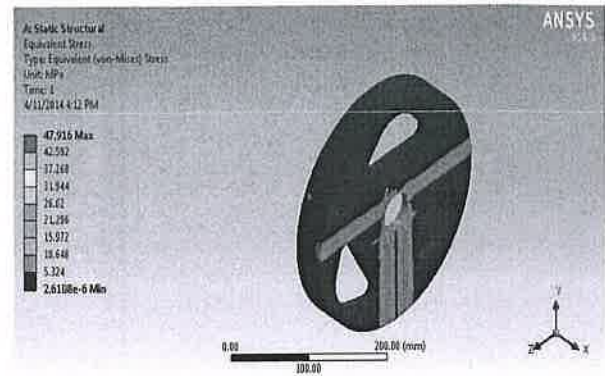
Fine Meshing (Tetrahedrons Method):



Moment:



Carbon Fiber:



CFRP (Carbon Fiber Reinforced Polymer)

$$\text{Mean rim speed, } v = \frac{\pi DN}{60} \dots \dots \dots \text{(PSG 7.120)}$$

Where, D = mean diameter of rim (m)

N = speed (rpm)

$$\therefore v = \frac{\pi \times 0.2623 \times 19000}{60}$$

$$\therefore v = 260.945 \text{ m/sec}$$

$$\text{Tensile stress due to centrifugal force, } \sigma = \frac{\gamma \times v^2}{g} \dots \dots \dots \text{(PSG 7.120)}$$

Where, γ = specific weight = $\rho \times g$

g = gravitational acceleration $\approx 10 \text{ m/sec}^2$

Comparison:

Material	Density [kg.m ⁻³]	Strength [MN.m ⁻²]	Mass [kg]	Equivalent Stress [MPa] (Theoretical)	Equivalent Stress [MPa] (Ansys)	Comment
Steel (AISI 4340)	7850	1800	6.08	178.17	17.826	Safe (heavy)
Carbon Fiber (60 vol% carbon)	2050	2400	1.63	46.19	47.916	Fail (Light)
Composite (Steel rim + carbon fiber body)	3650	-	2.80	82.84	63.482	Safe (Lighter than steel)



V. CONCLUSION

In conclusion, designing and analysing composite materials for flywheels is a challenging and crucial procedure in the discipline of mechanical engineering. In comparison to more conventional materials like steel, the use of composite materials in flywheels has a variety of benefits, including less weight and greater strength. However, careful consideration of elements including material characteristics, design parameters, and manufacturing processes is needed when designing and analysing these materials. The use of composite materials in flywheels has the potential to greatly increase their performance, especially in terms of energy storage and efficiency, according to comprehensive study and analysis. To guarantee the best performance and safety, the design process must be precisely adapted to the unique application and operating circumstances. Overall, designing and analysing composite materials for flywheels is a difficult and continuous topic of study in the discipline of mechanical engineering, therefore it will continue to be a key area of concentration for advancements in this area.

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Rewards System for Google Classroom

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Abstract: The Rewards system for college student, this abstract will explain about how group of 3 students will help student's finish their assignments and they get reward out of it (Pavlov experiment). This will help both the Teacher and student have their work done in time. Students will get reward for completing assignments this could be achieved using monetary system. Google ads Sens will help provide money in case if this is your doubt, also need of sponsors at early stages then it could be used in many ways as an extension for e.g. In Google classroom, MS Teams, Topper, or any other newer application. That is easy to implement and very enjoyable for the students. Reward systems are central to the Human Resource Management function. Their purpose is to attract talented individuals, motivate them and retain those that have a better fit with the organization. Rewarding is one of the factors that influence student learning outcomes so it is important to describe the reward given by the teacher, the teacher's perception of the reward and the student's perception of the reward given by the teacher. Then student Redeem the point and get rewards like canteen voucher, library voucher, Bus subscription.

Keywords: Student, classroom, google, assignments, rewards, teacher, sponsors

I. INTRODUCTION

As topic discussed Rewards system, we the team of trio are going to explain the mechanism algorithm as well as working of the project. Following will contain details of research papers as well as IDEA presented by the students in graphical and written format. Rewards system is introduced to boost the performance of student in terms of academic. This indeed will help the teachers as well as student. The application will contain point system for student who all are attending lectures period, submitting assignments on time. This application will use various different approaches to give points "reward" to applicable student.

Google has made its application user friendly so accessing data is apparently easy when you have decent knowledge about programming. The design of application as well as its uses would be used in any rewards system. Using rewards system poorly performing students can be turned into more smarter ones. Provision educational media and methodologies of dynamic, conductive and dialogical are essential for the optimal development of potential learners. Because the potential of students will be more aroused when assisted by many media or facilities and infrastructure that support the process of interaction in learning. Step-by-step, scientific approach in the learning process includes digging through observation, questioning, experiment, and then process the data or information, presenting data or information, followed by analyzing, reasoning, then concluding, and creating. The scope of assessment of the learning outcomes by educators (teachers) includes attitude competence, knowledge (cognitive) and skills (psychomotor).

II. LITERATURE REVIEW

To date little research has been done on effective tourism websites focusing on the content we have researched and studied various Literature Surveys which are summarized below:

A. Literature Review 1

Paper Name: Dopaminergic rewards system Authors Name: International Archives of Medicine Year of Publication: 2010

Content of the paper: Among the endogenous molecules that participate in the consolidation of memory, including the drug-seeking reward, considered as a form of learning, is dopamine • The behavioral definition of reward attributes also certain of non-alimentary and nonsexual functions such as gambling. [1]

B. Literature Review 2

Paper Name: Gamification rewards system

Authors Name: MIPRO

Year of Publication: 2019

Content of the paper: In the last couple of years, gamification has been increasingly used in education in order to motivate and encourage student engagement and interaction in class lectures, but also E- learning.



- 2) Secondly, we put forth a methodology to modify a ciphertext over one access policy into ciphertexts of the same plaintext but under any other access policies without revealing the underlying plaintext. This technique might be of independent interest in addition to the application in the proposed storage system.
- 3) Thirdly, we propose an approach based on two cryptographic primitives, including a zero-knowledge proof of knowledge [13] and a commitment scheme.

III. RELATED WORK

The template Attribute-Based Encryption. Sahai and Waters [6] introduced the notion of attribute-based encryption (ABE), and then Goyal et al. [16] formulated key-policy ABE (KP-ABE) and ciphertext-policy ABE (CP-ABE) as two complimentary forms of ABE. The first KP-ABE construction given in [16] realized the monotonic access structures, the first KP-ABE system supporting the expression of non-monotone formulas was presented in [17] to enable more viable access policies, and the first large class KP-ABE system was International Journal of Engineering Research & Technology (IJERT) ISSN: 2278-0181 Published by, www.ijert.org NCRACES - 2019 Conference Proceedings Volume 7, Issue 10 Special Issue - 2019 1 presented by in the standard model in [18]. Nevertheless, we believe that KP-ABE is less flexible than CP-ABE because the access policy is determined once the user's attribute private key is issued. Bethencourt, Sahai and Waters [19] proposed the first CP-ABE construction, but it is secure under the generic group model. Cheung and Newport [20] presented a CPABE scheme that is proved to be secure under the standard model, but it only supports the AND access structures. A CP-ABE system under more advanced access structures is proposed by Goyal et al. [21] based on the number theoretic assumption. In order to overcome the limitation that the size of the attribute space is polynomially bounded in the security parameter and the attributes are fixed ahead, Rouselakis and Waters [22] built a large universe CP-ABE system under the prime-order group. In this paper, the Rouselakis-Waters system is taken as the underlying scheme for the concrete construction.

IV. SYSTEM ARCHITECTURE

The architecture of our attribute-based storage system with secure deduplication is shown in Fig. 2 in which four entities are involved: data providers, attribute authority (AA), cloud and users. A data provider wants to outsource his/her data to the cloud and share it with users possessing certain credentials. The AA issues every user a decryption key associated with his/her set of attributes. The cloud consists of a public cloud which is in charge of data storage and a private cloud which performs certain computation such as tag checking. When sending a file storage request, each data provider firstly creates a tag T and a label L associated with the data, and then encrypts the data under an access structure over a set of attributes. Also, each data provider generates a proof pf on the relationship of the tag T , the label L and the encrypted message ct_3 , but this proof will not be stored anywhere in the cloud and is only used during the checking phase for any newly generated storage request. After receiving a storage request, the private cloud first checks the validity of the proof pf , and then tests the equality of the new tag T with existing tags in the system. If there is no match for this new tag T , the private cloud adds the tag T and the label L to a tag-label list, and forwards the label and the encrypted data, (L, ct) to the public cloud for storage. Otherwise, let ct_0 be the ciphertext whose tag matches the new tag and L_0 be the label associated with ct_0 , and then the private cloud executes as follows.

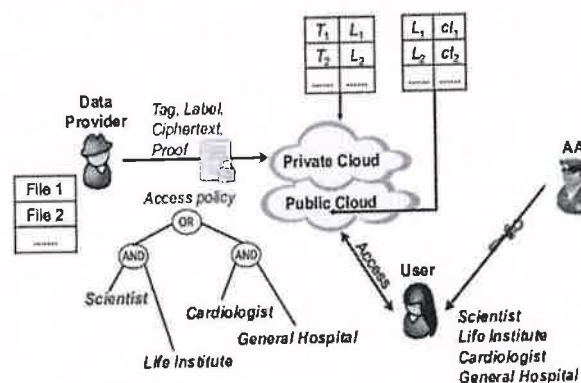
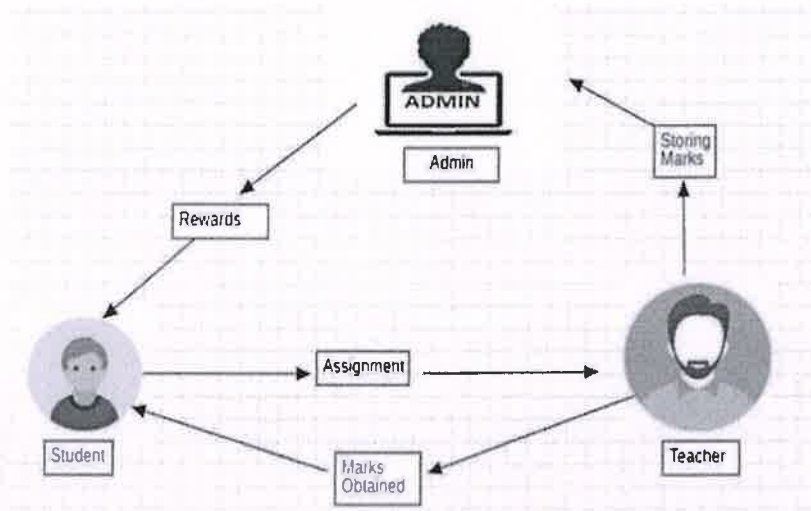


Fig. : System architecture of attribute-based storage with secure deduplication.



V. PROPOSED SYSTEM

In reward system for a google classroom projects we are making connection between google classroom and API. An API is a software which can be used by other software, to communicate with other software or even hardware. It acts as of bridge between different software and devices. When we are making connections, we can fetch all the information which we want to be used in our software for e.g., Marks, submission date, etc. And we are storing all the information in my SQL database. All the information which we are stored in MySQL database we have to fetch for that we are making connection between MySQL and eclipse IDE or java. We are using XAMPP for making server connectivity to my SQL. We are writing all the source code by using Java programming language in eclipse IDE.



Representation of Proposed System

VI. IMPLEMENTATION

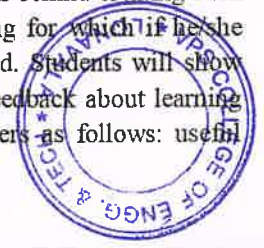
If student submitted assignment, it will store in the database. Then teacher will check the assignment and student gets a point such point that will be store in the database. Now admins job is assigned reward card to the student if student is in appropriate criteria. Reward details again store in database and student reach a mail regarding a reward card, now he/she have to redeem the card and use it for education and more.

Also, student can solve the quiz from quiz mania which will be updated once in week. Student solve quiz will be store in database and teacher gets a notification about it now teacher will check it and gives marks, such marks will be again store in database.

Admin has multiple roles in a system. Admin have to keep tracking on student login and logout activity. He has to be check that if any hacker will be there, he has to be catch by IP address of the student. Also, admin have to keep track on new generated accounts. Admin have to updates all the news feeds. He also has to be managed all the rewards section

VII. CONCLUSION

So, we Conclude that a good reward system aims to motivate student to work harder. The current trend towards performance-related reward systems is designed to lead to greater rewards and motivation for those who contribute the most. In order to stimulate learning and to motivate good behavior, lots of teachers use rewards for students. Rewards system is introduced to boost the performance of student in terms of academic. This indeed will help the teachers as well as student. The application will contain point system for student who all are attending lectures period, submitting assignments on time. Motivation behind creating such app is that students will be *provoked* by the sweet rewards other than marks, they will have something for which if he/she completes assignment they will get some rewards. Rewards will be provided according to marks obtained. Students will show interest and raise their participation in the everyday classroom tasks, responsibilities and learning. The Feedback about learning and behavior should be frequent and early. The benefits of this reward system applications among others as follows: useful applications, easy to use, easy to learn, and Applications can save time.





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Online E-Voting Smart System

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Abstract: India is the world's biggest vote based system with a populace of more than 10 million; Casting a ballot is the extension between the represented and government. The most recent couple of years have welcomed a re-established center around to the innovation utilized in the democratic cycle. The current democratic framework has numerous security openings, and it is hard to demonstrate even basic security properties about them. A democratic framework that can be demonstrated right has numerous worries. There are a few explanations behind an administration to utilize electronic frameworks are to expand decisions exercises and to lessen the races costs. Still there is some extent of work in electronic democratic framework in light of the fact that it is extremely unlikely of distinguishing proof by the electronic democratic framework if the user is credible and getting electronic democratic machine from reprobates. The proposed framework is to build up a viable democratic machine with high security by utilizing Block-chain innovation to expand security and straight forwardness between the users.

Keywords: Block chain, Data Security, Voting System, Voter ID, Vote.

I. INTRODUCTION

Voting, whether traditional ballot based or electronic voting (e-voting), is what modern democracies are built upon. In recent years' voter apathy has been increasing, especially among the younger computer/tech savvy generation. E-voting is pushed as a potential solution to attract young voters. For a robust e-voting scheme, a number of functional and security requirements are specified including transparency, accuracy, auditability, system and data integrity, secrecy/privacy, availability, and distribution of authority. Block-chain technology is supported by a distributed network consisting of a large number of interconnected nodes. Each of these nodes have their own copy of the distributed ledger that contains the full history of all transactions the network has processed. There is no single authority that controls the network. If the majority of the nodes agree, they accept a transaction. This network allows users to remain anonymous. A basic analysis of the block-chain technology suggests that it is a suitable basis for e-voting and moreover, it could have the potential to make e-voting more acceptable and reliable.

II. RELATED WORK

This paper, proposed secure voting system with fast voting results through RFID based biometric voting system. In this paper, there are two verification steps involved. First, RFID tag is used which contains the verification data which is already stored in LPC 2148. Second, the Fingerprint scanner is used to check whether the RFID is belonging that particular person or not. The drawback of this paper is cost maximized due to use of RFID method.

The proposed method is to build a Smart voting system using fingerprint recognition technology that allows any voter in INDIA to cast the vote to their respective constituency from anywhere in INDIA by going to their nearest voting booth in the place of stay. Also to develop a secure smart voting system based on biometric recognition. Provides the voter to vote from any region with in India to their Residential Constituency from the nearest Voting Booth with a secure voting process without neglecting to vote.

This paper, proposes protected voting system to avoid the unlawful voting. The authentication of an individual is made using biometric and capability of the voter is affirmed using the Aadhaar. In this system the data stored in the Aadhaar card act main criteria for authentication and conformation. The security is provided through biometrics such as fingerprint. The fingerprint information stored in the Aadhaar is taken as the reference and used for authentication at the time of voting.

Basic electronic machine which is used nowadays has some laggings like multiple vote casting from one member and invalidity of votes are checked automatically. To reduce these disadvantages, the smart automatically processed and fingerprints are used to reduce multiple vote casting in simple way.

This paper has shown the possibility of establishing E-Voting protocol based on public-key encryption cryptosystem. The security of the proposed E-Voting depends on RSA public key encryption protocol. It allows the voter to vote from his/her own personal computer (PC) without any extra cost and effort. This protocol is proposed to replace the unreliable previous voting system, since voters feel justifiably confident that their votes will be counted.





This system provides security from all type of attacks, when vote is travelling from voting client to voting server from their experimentation. These attacks include security threats from passive as well as active intruder. For authentication of voter instead of USERNAME, if we can use thumb impression of voter or capture photo of his/her face and compare it with photo stored in our database, it will be more secure.

In this paper , a block-chain-based voting system. It needs time to popularize block-chain for a voting system as it is a novel idea and voting itself is a crucial matter in a democratic country.

The proposed model is more secure than other models and it is suitable for use in major elections on a large scale. After casting a vote with NCVVS system, the voter receives a confirmation email containing the ballot fingerprint (and also the fingerprint of the election) calculated by standard hash function SHA (256) .

The proposed work is based on the block-chain technology, which remove all the threats from the communication link. It is a decentralized system, contain hashing and encryption concept for providing the security.

In this paper , used of Aadhaar card provided by UIDAI with QR code present in it. Online instead of offline mode and storing the voting data to secured online server. Results can be displayed by admin after entering user id and password.

Blockchain is offering new freedoms to grow new kinds of computerized administrations. While research on the theme is as yet arising, it has for the most part centered on the specialized and legitimate issues as opposed to exploiting this novel idea and making progressed computerized administrations. In this paper, author will use the open source Blockchain innovation to propose a plan for another electronic democratic framework that could be utilized in nearby or public decisions. The Blockchain-based framework will be secure, solid, and mysterious, and will help increment the quantity of electors just as the trust of individuals in their administrations.

In this article , author propose the principal self-counting decentralized e-casting a ballot convention for a positioned decision casting a ballot framework based on Borda check. This convention needn't bother with any confided in arrangement or counting power to process the count. The citizens communicate through an openly open notice board for executing the convention in a way that is openly irrefutable. Our fundamental convention comprises of two adjusts. In the first round, the electors distribute their public keys, what's more, in the second round they distribute their randomized polling forms. All citizens give Non-intelligent Zero-Knowledge (NIZK) verifications to show that they have been following the convention determination sincerely without uncovering their mysterious votes. Toward the finish of the political race, anybody including an outsider spectator will actually want to register the count without requiring any counting authority. This system give security verifications to show that our convention ensures the most extreme security for every citizen.

Author propose a functional stage free secure and obvious democratic framework that can be sent on any blockchain that bolsters an execution of a savvy contract. Undeniable nature is intrinsically given by the fundamental blockchain stage, though cryptographic procedures like Paillier encryption, confirmation of-information, and linkable ring mark are utilized to give a structure to framework security and client protection that are free from the security and protection highlights of the blockchain stage. We break down the accuracy and intimidation obstruction of our proposed casting a ballot framework. We utilize Hyperledger Fabric to convey our democratic framework and break down the exhibition of our conveyed conspire mathematically.

Author present the first implementation of a decentralised and self-tallying internet voting protocol with maximum voter privacy using the Blockchain. The Open Vote Network is suitable for boardroom elections and is written as a smart contract for Ethereum. Unlike previously proposed Blockchain e-voting protocols, this is the first implementation that does not rely on any trusted authority to compute the tally or to protect the voter's privacy. Instead, the Open Vote Network is a selftallying protocol, and each voter is in control of the privacy of their own vote such that it can only be breached by a full collusion involving all other voters.

Political violence related to elections has been common in Africa and other developing countries. BEV can ensure security and transparency and reduce electoral violence. It can also produce more mathematically accurate election results. Because BEV doesn't require management from a central authority, votingrelated costs will decrease. Finally, BEV should reduce the cost of paperbased elections and increase voter participation.

III. EXISTING APPROACH

A lot of work has been done in this field thanks to its extensive use and applications. This section mentions some of the approaches that have been implemented to achieve the same purpose. These works are mainly differentiated from the algorithm for E-voting systems. The existing machine had security risks that can potentially undermine the election process. In addition to human error; internet e-voting is susceptible to a range of threats such as hacking by domestic and foreign saboteurs, technical glitches, voter impersonation and even system failure.



IV. METHODOLOGY

In our system Block Chain Concepts are applied to Online Voting System when we are developing a Smart E-voting system by taking advantage of block Chain concepts with web interface.

The proposed model has a greater security in the sense that voter high security OTP and Adhar Card is confirmed before the vote is accepted in the main database. The additional feature of the model is that the voter can confirm if his/her vote has gone to correct candidate/party. In the proposed system the tallying of the votes will be done automatically, thus saving a huge time and enabling Election Commissioner of India to announce the result within a very short period.

A. Flow Diagram

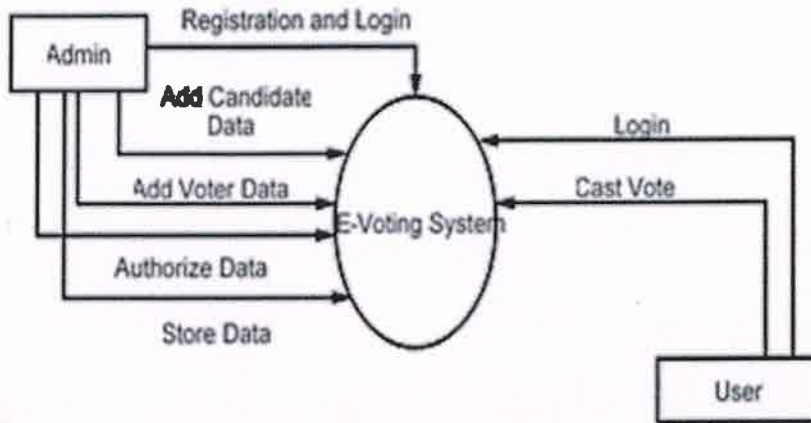


Fig.1 : Block diagram of e-voting system

B. Algorithm

AES Algorithm for Encryption.

AES (advanced encryption standard).It is symmetric algorithm. It used to convert plain text into cipher text .The need for coming with this algo is weakness in DES. The 56 bit key of des is no longer safe against attacks based on exhaustive key searches and 64-bit block also consider asweak.AES was to be used128-bit block with128-bit keys.

Rijendeal was founder. In this drop we are using it to encrypt the data owner file.

Input:

128_bit /192 bit/256 bit input (0, 1)

Secret key (128_bit) +plain text (128_bit).

Process:

10/12/14-rounds for-128_bit /192 bit/256 bit input

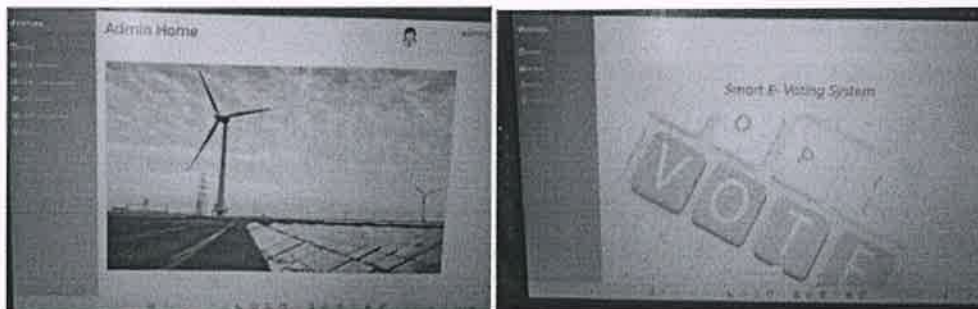
Xor state block (i/p)

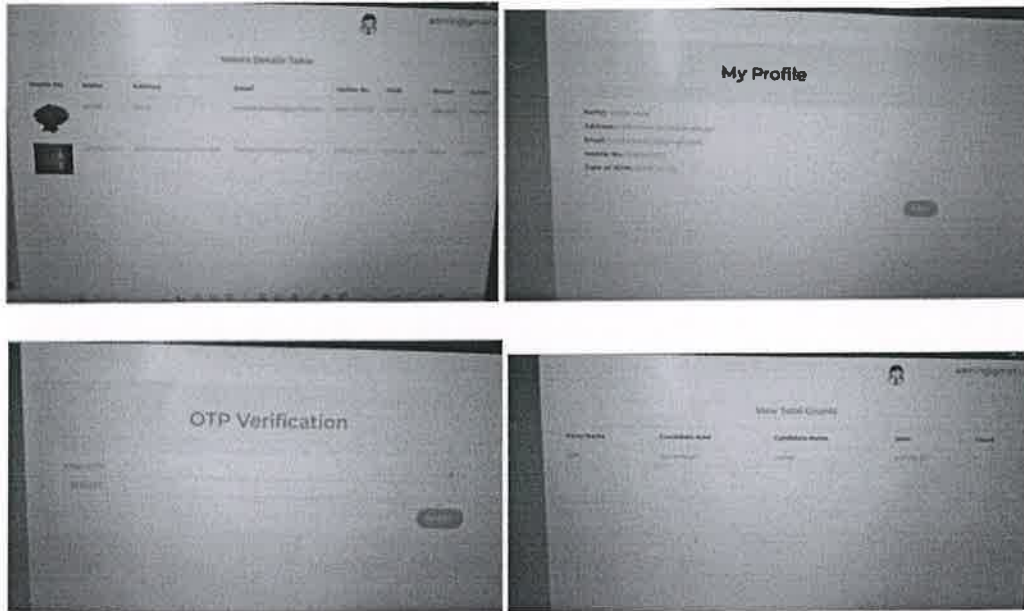
Final round:10,12,14

Each round consists: sub byte, shift byte, mix columns, add round key.

Output:

Cipher text (128 bit)





V. CONCLUSION

This paper described, an electronic Voting system for small to medium sized Internet-based public opinion systems that provides privacy of vote, voter's authentication, auditability, security, double-voting prevention, fairness voting device from manipulating the authenticated voters voting choices.

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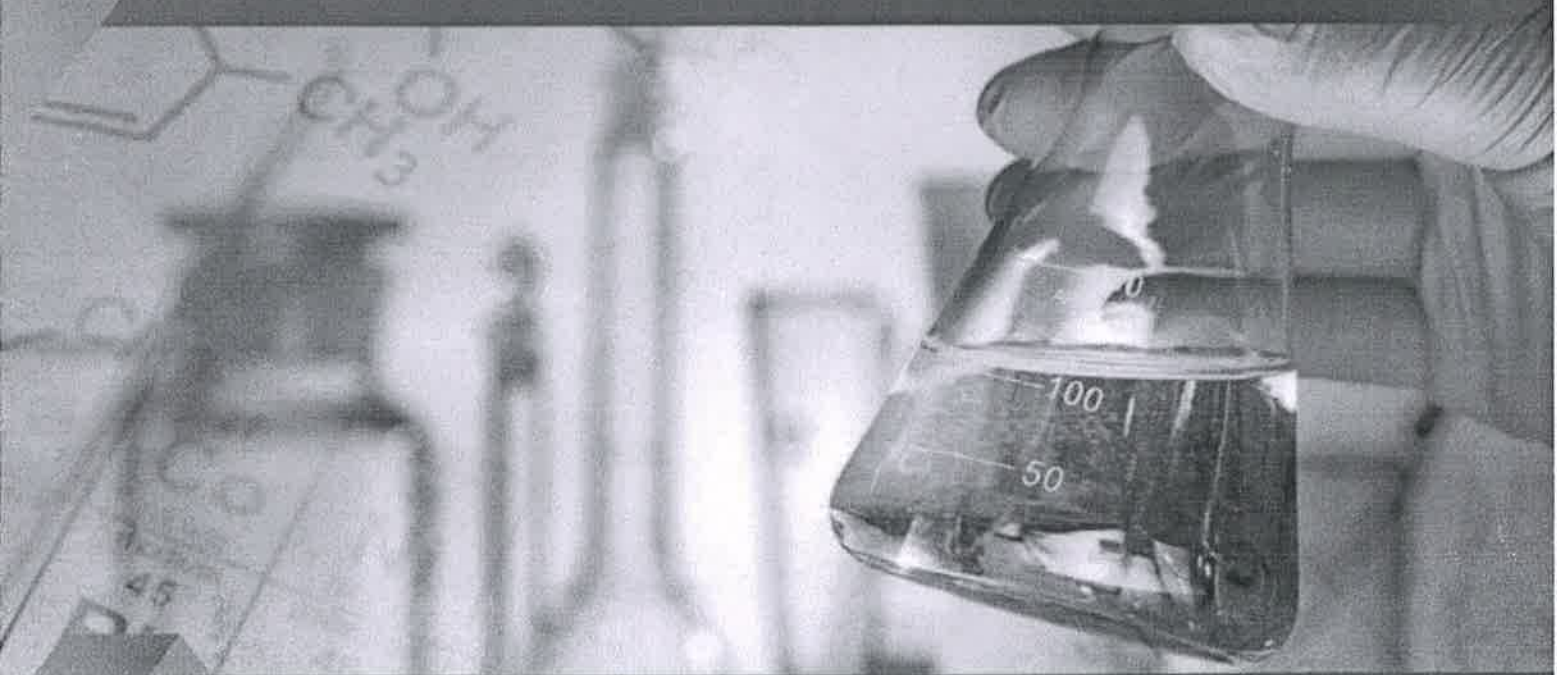
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Agromarketing & Crop Recommender System

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Abstract — Agriculture and its allied sectors are certainly the biggest companies of livelihoods in rural India. agriculture is a main contributor to the Indian financial system. the common problem existing a few of the Indian farmers are they do not pick the proper crop based on their soil requirements. Precision agriculture is a current farming technique that makes use of studies information of soil traits, soil kinds, crop yield records series and suggests the farmers the proper crop based totally on their soil. This reduces the wrong desire on a crop and increases the productivity. And 2nd one is marketplace cost of crop. situation is worst sufficient which ends up in the suicide of farmers. farmers are nonetheless in down role to get benefits of their paintings. they're nonetheless no longer having any idea about the way to sale? the way to get right fee of their produce? they do not know the way to channelize their produce? and in the event that they face any losses then how to conquer from this? they do not know the state-of-the-art technology. so far, the betterment of farmers and ultimately for the agricultural development there's a want to know the significance of right marketing of agriculture produce and how the better advertising and marketing affects the farmers livelihood. it's far concluded that proposed set of rules has an average accuracy of 85on the given dataset. The executedaccuracy is extra in evaluation to existing paintings.

Keywords— Precision Agriculture, yield prediction, gadget getting to know.

I. INTRODUCTION

Agriculture has an in-depth history in India. recently, India is ranked 2nd in the farm output international [14]. Agriculture is the fundamental source of food supply of all of the countries of the arena whether underdeveloped, growing or maybe evolved. the world population is estimated to be approximately 9.7 billion with the aid of 2025. This delivered with unpredictable climate situations makes it tough to make certain food sustainability. fortunately, there may be a solution for this trouble as for many others. A farmer's choice about which crop to grow is typically clouded via his intuition and other inappropriate factors like making instant profits, lack of understanding approximately market demand, overestimating a soil's ability to assist a specific crop, and so on. a very misguided choice on the part of the farmer should region a enormous stress on his circle of relatives's economic circumstance. possibly this could be one of the many motives contributing to the limitless suicide instances of farmers that we listen from media on a day-by-day basis. We propose a device, an intelligent device that would bear in mind environmental parameters temperature, rainfall, geographical vicinity in terms of nation and soil traits soil kind and nutrients awareness earlier than recommending the maximum suitable crop to the user.

additionally, India is a worldwide agricultural powerhouse. Agricultural marketing in India still is still in a very horrific form in rural area. there is also the corruption that is growing now a day. Farmers didn't get proper advertising facilities so; they should depend on neighborhood buyers and middlemen for the disposal in their farm produce that's sold at very low priceby promoting agricultural marketing, we are able to offer many opportunities to farmers. The facilities that can be provide E-farming is one of the approaches in an effort to assist the farmers to perform the agro- advertising. affords privilege for each farmers and customers to shop for and promote the desired farm products without the involvement of a intermediary at its proper worthwhile fee. To beautify the percentage of farmers within the ultimate rate of his agriproducts. Soil is the free floor fabric that covers most land. Soil provides the shape help too flowers utilized in agriculture and also their supply of water and vitamins. Soil varies significantly in there chemical and physical residences. Leaching, weathering and micro real interest integrate to make maintain unique soil sorts. each type has unique power and weaknesses for agriculture production. In India, the Indian Council of Agriculture research (ICAR) has classified soils into 8 fundamental classes as in line with soil class gadget including a hierarchy of 6 tiers through Order, Suborder, extraordinary institution, Subgroup, own family and series. There are greater than 1400 notified soil collection in India. All soils given the equal soil series name possesses the identical characteristics throughout the panorama. unique kinds of crops may be efficiently grown on distinctive kinds of soils. We therefore need to know the features and characteristics of numerous soil sorts to understand the form of first-rate suitable crop. The changing environmental conditions, mainly international warming and weather variability, are primary issues and have an unfavourable impact on the destiny of agriculture output. Crop yield depends on many different factors such as climate, weather, soil, use of fertilizer, and seed range. while customer request to the farmer for precise crop at specific rate, the chatbot robotically displays the farmer information alongside their touch and information. The gadget collects the farmer, the crop cultivated in conjunction with land information and keeps a database. [21] Soil is the maximum crucial variable for any kind of crop production. every form of soil isn't best for every form of crop due to the fact distinctive soils have distinct varieties of properties suitable for different vegetation. as an instance, sandy soil needs a massive amount of water. subsequently, soil kind identification and crop choice are the number one steps earlier than starting any crop cultivation. traditionally soil types are labeled by means of the conventional technique of chemical evaluation that's time



consuming, tedious and high-priced technique. Human beings started the usage of statistical fashions to expect the crop kind and yield.

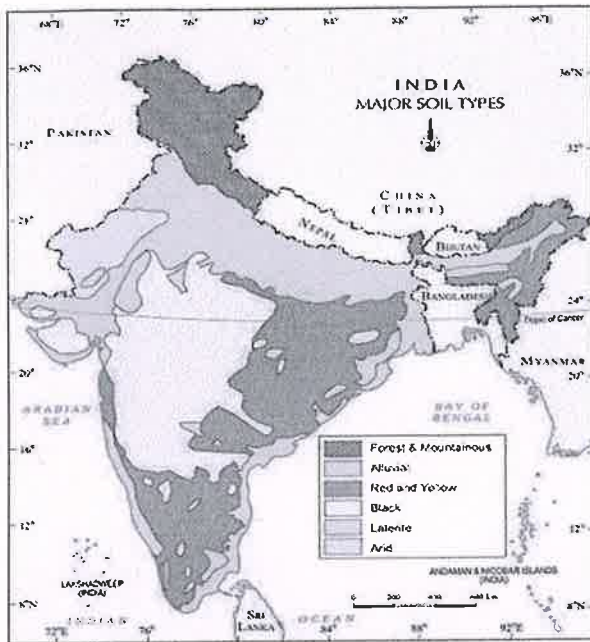


Fig1. Major Classification of Indian soils

II. RELATED WORK

Crop yield prediction is an essential task for the decision-makers at national and regional levels (e.g., the EU level) for rapid decision making. An accurate crop yield prediction model can help farmers to decide on what to grow and when to grow. There are different approaches to crop yield prediction. This review article has investigated what has been done on the use of machine learning in crop yield prediction in the literature. During our analysis of the retrieved publications, one of the exclusion criteria is that the publication is a survey or traditional review paper. Those excluded publications are, in fact, related work and are discussed in this section.

The paper concludes that quick developments in sensing technologies and ML techniques will result in cost-effective solutions in the agricultural sector. Elavarasan et al. performed a survey of publications on machine learning models associated with crop yield prediction based on climatic parameters. The paper advises looking broad to find more parameters that account for crop yield (Elavarasan et al., 2018). Liakos et al. (2018) published a review paper on the application of machine learning in the agricultural sector. The analysis was performed with publications focusing on crop management, livestock management, water management, and soil management. Li, Lecourt, and Bishop performed a review study on determining the ripeness of fruits to decide the optimal harvest time and yield prediction (Li et al., 2018). Mayuri and Priya addressed the challenges and methodologies that are encountered in the field of image processing and machine learning in the agricultural sector and especially

in the detection of diseases (Mayuri and Priya,). Somvanshi and Mishra presented several machine learning approaches and their application in plant biology (Somvanshi and Mishra 2015). Gandhi and Armstrong published a review paper on the application of data mining in the agricultural sector in general, dealing with decision making. They concluded that further research needs to be done to see how the implementation of data mining into complex agricultural datasets could be realized (Gandhi and Armstrong, 2016). Beulah performed an eda survey on the various data mining techniques that are used for crop yield prediction and concluded that the crop yield prediction could be solved by employing data mining techniques (Beulah, 2019). According to our survey of review articles, the significant ones of which are presented in this section, this paper is the first SLR that focuses on the application of machine learning in the crop yield prediction problem. The existing survey studies did not systematically review the literature, and most of them reviewed studies on a specific aspect of crop yield prediction. Also, we presented 30 deep learning-based studies in this article and discussed which deep learning algorithms have been used in these studies.

One of the early works developed a dedicated website to assess the impact of weather parameters on crop production in the identified districts of Madhya Pradesh [10]. The districts were selected on the basis of the region covered by the crop. Based on these criteria, the first five top districts with a maximum crop area were chosen. The basis of the crops selected for the study was on prevailing crops in the selected districts. The crops picked included maize, soybean, wheat and paddy, for which the yield for a continuous period of 20 years of knowledge, were tabulated. The accuracy of the established model ranged from 76% to 90% for the chosen crops with an average accuracy of 82%. Another important work checks the soil quality and predicts the crop yield along with a suitable recommendation of fertilizers [10]. The Ph value and the location from the user were inputs used in this model. An API was used to predict the weather, temperature for the current place. The system used both supervised as well as unsupervised ML algorithms and compares the results of the two.

A classifier that uses a greedy strategy to predict the crop yield was proposed in [11]. A decision tree classifier that uses an attribute has been shown to yield better results. An ensemble model proposed suggests integrating the effects of different models, which has been shown to be typically better than the individual models. Random forests ensemble classification uses multiple decision tree models to predict the crop yield. The data are split up into two sets, such as training data and test data, with a ratio of 67% and 33%, with which the mean and standard deviation are calculated. This work also incorporates the clustering of similar crops to get the most accurate results.

Extensive work has been done, and many ML algorithms have been applied in the agriculture sector. The biggest challenge in agriculture is to increase farm production and offer it to the end-user with the best possible price and quality. It is also observed that at least 50% of the farm



produce gets wasted, and it never reaches the end-user. The proposed model suggests the methods for minimizing farm produce wastage. One of the recent works presents a model where the crop yield is predicted using KNN algorithms by making the clusters. It has been shown that KNN clustering proved much better than SVM or regression [12].

III. MODELS AND METHODOLOGY

The solution proposed here aims to solve these limitations, by developing a user-friendly application that considers the parameters like rainfall, temperature, soil type etc. that directly affect cultivation. The Primary goal is to attain a higher type of plants that may be grown over the season. The proposed device could assist to limit the difficulties faced via farmers in deciding on a crop and maximize the yield in effect to reduce the suicide rates [15].

The overall block diagram of the system is shown in modules. It takes in the preprocessed input image at the end and uses the pickled historical data sets of soil and crop type parameters to predict the soil class and crop type.

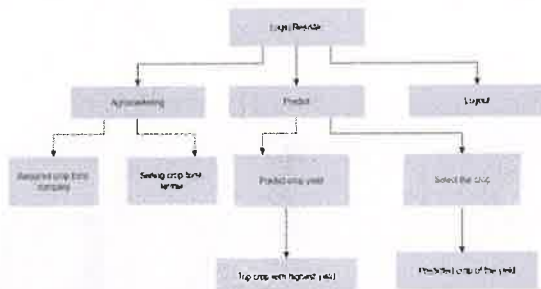
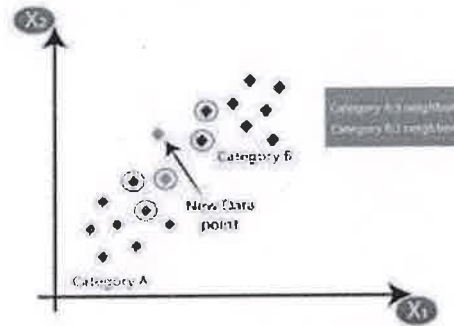


Fig. 2 System Architecture

The abbreviation KNN stands for "k-Nearest buddies". It's far a supervised device mastering set of rules. The algorithm may be used to remedy both class and regression hassle statements. The variety of nearest neighbors to a brand-new unknown variable that must be anticipated or classified is denoted by way of the image 'ok'. allows take a terrific study a associated real-world state of affairs before we get began with this tremendous set of rules. we are often notified that you percentage many characteristics together with your nearest friends, whether it be your wondering procedure, operating etiquettes, philosophies, or other factors. As a result, we construct friendships with human beings we deem much like us. The KNN set of rules employs the equal principle. Its aim is to locate all of the closest neighbors around brand-new unknown facts factor in order to parent out what magnificence it belongs to. It's a distance-based technique. A refinement of the okay-NN category set of rules is to weigh the contribution of every of the okay associates in step with their distance to the query point x_q , giving extra weight we to nearer buddies.



Its miles given by means of $F(x) = \text{Summation of } (i=1 \text{ to } K) W_i f(x)$ summation of $(i=1 \text{ to } k) w_i$
 Where the burden is $w_i = 1/d(x_q, x_i)$

In case x_q precisely matches one among x_i , so that the denominator becomes zero, we assign $F(x_q) = F(x_i)$.

CNNs are used for photo category and recognition because of its high accuracy. It turned into purposed by way of pc scientist Yann LeCun with in the past due 90s. when he changed into inspired from the human visual perception of spotting things. A convolutional neural network (ConvNet/CNN) is a deep learning model that gains knowledge of set of rules which could soak up an entire image, assign significance (learnable weights and biases) to diverse factors/items in the photo and have the ability to distinguish one from alternative. The preprocessing required in a convNet is a good deal lower compare to other class algorithms. Whilst in primitive strategies filters are hand-engineered, with enough training, ConvNets have the capability to analyze these filters/characteristics

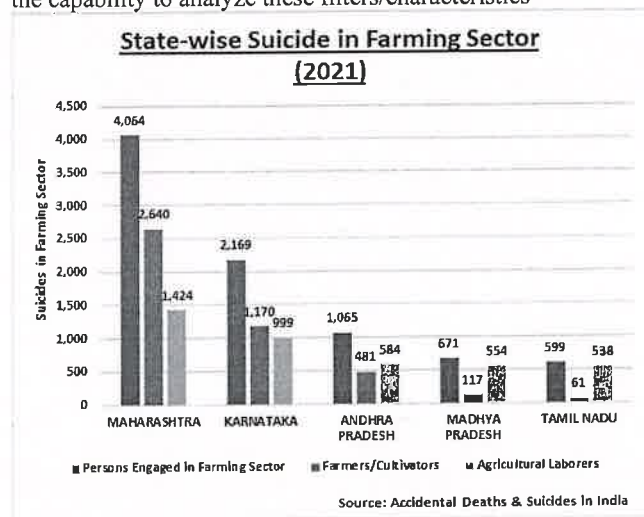


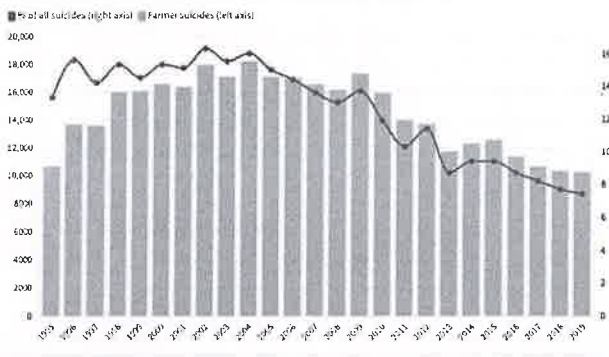
Fig. 3 Farmers suicide sector graph for states

when you consider that this system mainly specializes in the production of natural food, it could change the records that are photograph there may be a clean image about the amount of minerals which can be used in the meals crop. this can degrade the satisfactory of the soil in addition to the crop's authentic first-class. This gadget provides the farmers with all of the inputs and thereby helps them in reducing the debts that they want to pay. when the input is provided, the farmer can cultivate and get his pay as properly. This encourages the future generations to live in



agriculture as it gives them with all comforts financially and psychologically. The figure 4 represents the number of deaths in India as according to the file of CSO in 2019. It clearly depicts that most of the problems confronted by using farmers are debt and water problems which this device can triumph over. The overall framework of this machine provides the farmers with input thereby decreasing the reasons for farmer suicide. also depicts the wide variety of farmer suicides together with the motives. Now as you can see, the difference in the income margin whilst the device is used against our system not being used is huge.

10281 farmers killed themselves in 2019, the lowest in 25 years



Source: National Crime Records Bureau
Farmers include cultivators as well as agricultural labourers.

Fig. 4 Reasons for farmers suicide (Source: National crime record bureau 2019)

IV. CONCLUSION

The Facility that can provide E-farming is one of the ways to which will help farmers to perform agromarketing, provides privilege for both farmers and consumers to buy and sell the required farm products without the involvement of a middlemen at its rights profitable price. To enhance share of farmers in the ultimate price of his agriproducts. The model has been examined via making use of specific styles of the system learning system set of rules. Bagged tree and okay-NN indicates precise accuracy but amongst all the classifiers, SVM has given the very best accuracy in the soil classification with much less time. It gives us more accuracy compare to exiting gadgets and gives more gain to farmers. The Solution will benefit farmer to maximize productivity in agriculture, reduce soil degradation in cultivated fields, and reduce fertilizer use in crop production by recommending the right crop by considering various attributes. This would provide a comprehensive prediction on the basis of geographical, environment and economic aspect.

The device may be prolonged to the cell software to help the farmers by using uploading the image of agriculture place. The efficiency of pre-processing is confirmed by using the amount of unwanted data (like leaves, grass and other stuffs) present in it. Due to this undesirable information gift inside the enter image, each for the duration of education and classification, the pre-processor fails to pick out the precise counters, as result failing to carry out with advance performance. the parameter for the picture like climatic aspect, moisture and beyond dataset can be use to accept to yield of crop. The series of extra

legitimate info of soil class, range longitude and suitable crop significantly accelerate the performance of work. The pre-processing unit may want ro for these reasons to improved and loads more features may be extended, as a consequence considerably contributing closer to the rural welfare international.

V. ACKNOWLEDGEMENT

With immense pleasure, we present a report on 'AGROMARKETING AND CROP RECOMMENDATION USING MACHINE LEARNING' as part of the curriculum of B.E. Computer Engineering. We wish to thank all the people who gave us an unending support right from the stage the idea was conceived. We are thankful to our Project Guide Prof. Soni Ragho, for her great support throughout the course of this project. We are also thankful to our Project Coordinator for conduction of project activity. We also thank all to those who have directly or indirectly guided and helped in preparation of this Project.

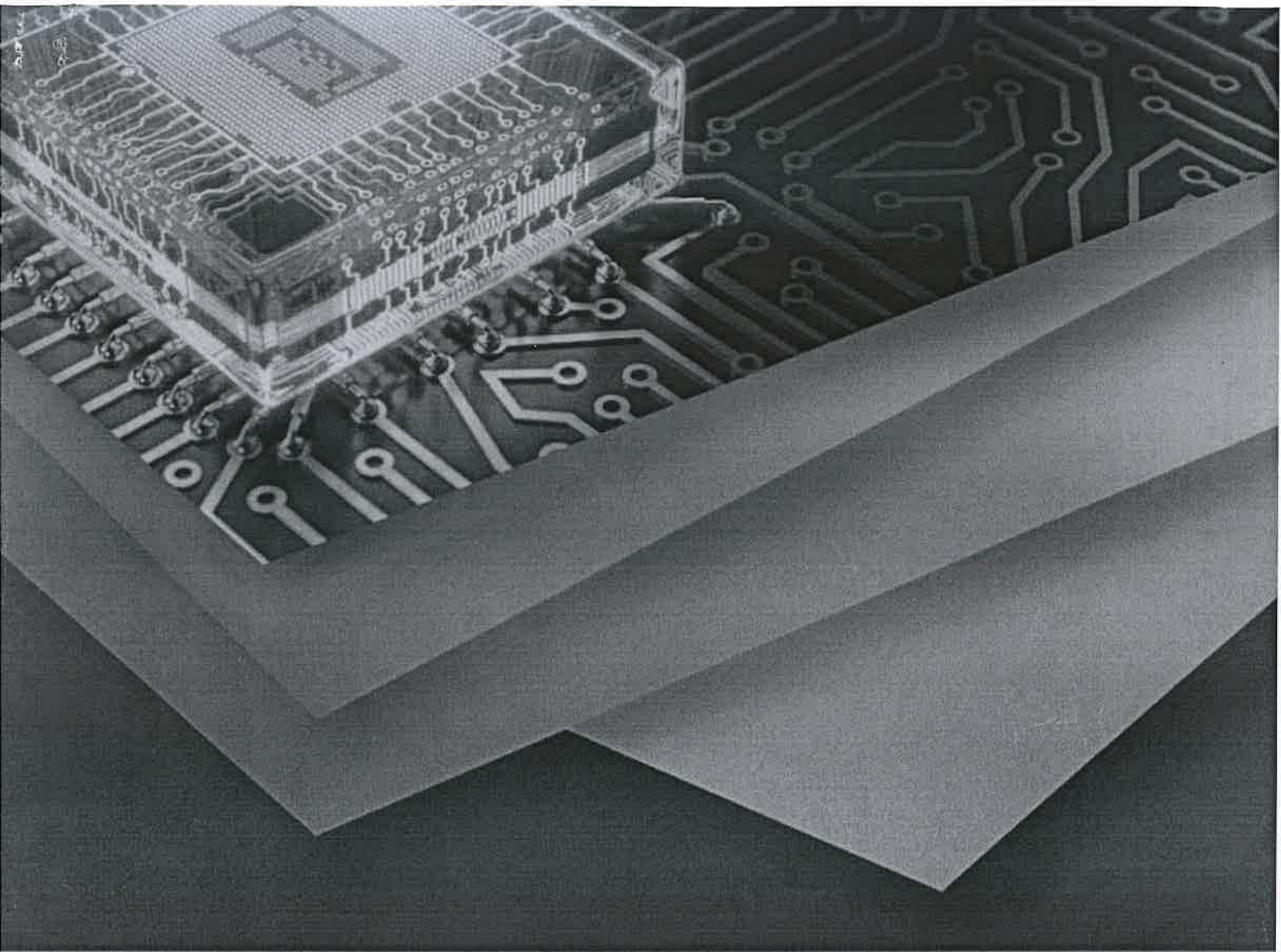
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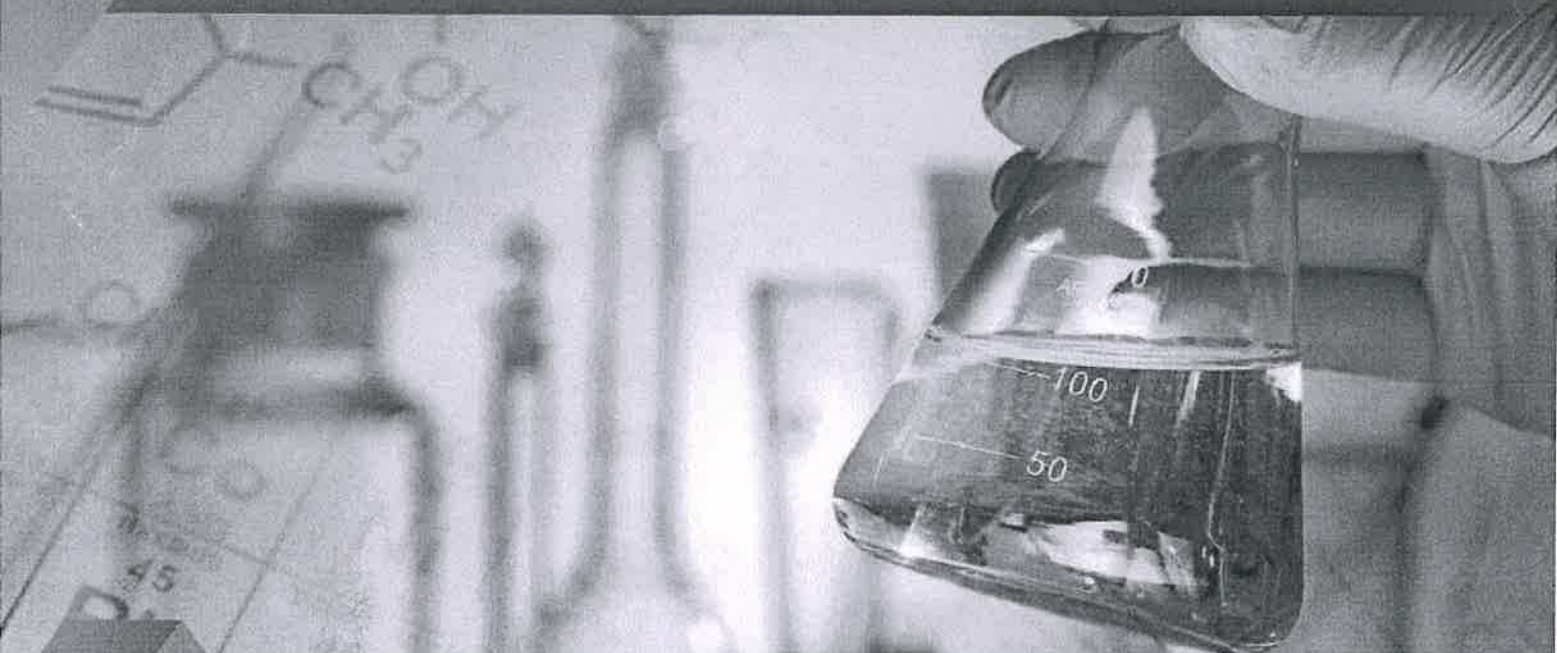
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Depression Monitoring System via Social Media Data using Machine Learning Framework

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Abstract: Stress and Depression is one of the most widely recognized and handicapping mental issue that relevantly affects society. Automatic health monitoring systems could be crucial and important to improve depression and stress detection system using social networking. Sentiment Analysis alludes to the utilization of natural language processing and content mining approaches planning to recognize feeling or opinion. Full of feeling Computing is the examination and advancement of frameworks and gadgets that can perceive, decipher, process, and mimic human effects. Sentiment Analysis and deep learning techniques could give powerful algorithms and frameworks to a target appraisal and observing of mental issue and, specifically of depression and stress. In this paper, the application of sentiment analysis and deep learning methodologies to depression and stress detection and monitoring are discussed. In addition, a fundamental plan of an incorporated multimodal framework for stress and depression checking, that incorporates estimation investigation and full of feeling processing strategies, is proposed. In particular, the paper traces the fundamental issues and moves comparative with the structure of such a framework.

Keywords: Stress and depression; ehealth; sentiment analysis, social media, deep learning.

I. INTRODUCTION

Social media is arguably the richest source of human generated text input. Opinions, feedback and critiques provided by internet users reflect attitudes and sentiments towards certain topics. This paper presents a knowledge-based system, which includes an emotional health monitoring system to detect users with possible psychological disorders specially depression and stress. Symptoms Of these psychological disorder are usually observed passively. In this situation, author argue that online social behaviour extraction offers an opportunity to actively identify psychological disorder at an early stage. It is difficult to identify the disorder because the psychological factors considered in standard diagnostic criteria questionnaire cannot be observed by the registers of online social activities.

Depression and stress is one of the most common and disabling mental disorders, and has a relevant impact on society. Currently, methods for depression and stress detection and diagnosis rely on self-reporting coupled with the health care practitioners informed assessment. The provision of effective health monitoring systems and diagnostic aids could be crucial and important to improve health professional's work and lower healthcare costs. Sentiment and deep learning technology could help to tackle these objectives by providing effective tools and systems for objective assessment. Such tools and systems do not aim to replace the psychologist or psychiatrist but they could support their decisions.

Our approach, New and innovative for the practice of psychological disorder detection, it does so do not trust the self-disclosure of those psychological factors through the questionnaires. Instead, propose a machine learning technique that is detection of psychological disorder in social networks which exploits the features extracted from social network data for identify with precision possible cases of disorder detection. We perform an analysis of the characteristics and we also apply machine learning in large-scale data sets and analyse features of the two types of psychological disorders.

II. RELATED WORK

Renata L. Rosa, Gisele M. Schwartz, Wilson V. Ruggiero, and Dem'ostenes Z. Rodr'iguez - Online social networks (OSN) provide relevant information on users' opinion about different themes. Thus, applications, such as monitoring and recommendation systems (RS) can collect and analyze this data. This paper presents a Knowledge-Based Recommendation System (KBRS), which includes an emotional health monitoring system to detect users with potential psychological disturbances, specifically, depression and stress. Guang Yang, Haibo He, Fellow, IEEE, and Qian Chen - Sentiment analysis on microblog posts has been studied in depth, sentiment analysis of posts is still challenging because of the limited contextual information that they normally contain. In microblog environments, emoticons are frequently used and they have clear emotional meanings.





They are important emotional signals for microblog sentimental analysis. They address this issue by constructing an emotional space as a feature representation matrix and projecting emoticons and words into the emotional space based on the semantic composition.

M. Al-Qurishi, M. S. Hossain, M. Alrubaiyan, S. M. M. Rahman, and A. Alamri - In this paper, author propose an integrated social media content analysis platform that leverages three levels of features, i.e., user-generated content, social graph connections, and user profile activities, to analyze and detect anomalous behaviors that deviate significantly from the norm in large-scale social networks. Several types of analyses have been conducted for a better understanding of the different user behaviors in the detection of highly adaptive malicious users.

Huijie Lin, Jia Jia, Jiezhong Qiu, Yongfeng Zhang, Lexing Xie, Jie Tang, Ling Feng, and Tat-Seng Chua - In this paper, we find that users stress state is closely related to that of his/her friends in social media, and we employ a large-scale dataset from real-world social platforms to systematically study the correlation of users' stress states and social interactions. We first define a set of stress-related textual, visual, and social attributes from various aspects, and then propose a novel hybrid model - a factor graph model combined with Convolutional Neural Network to leverage tweet content and social interaction information for stress detection.

Budhaditya Saha, Thin Nguyen, Dinh Phung, Svetha Venkatesh - Mental illness has a deep impact on individuals, families, and by extension, society as a whole. Social networks allow individuals with mental disorders to communicate with others sufferers via online communities, providing an invaluable resource for studies on textual signs of psychological health problems. Mental disorders often occur in combinations, e.g., a patient with an anxiety disorder may also develop depression.

Chun-Hao Chang, Elvis Saravia, Yi-Shin Chen - In this paper, aim at building predictive models that leverage language and behavioral patterns, used particularly in social media, to determine whether a user is suffering from two cases of mental disorder. These predictive models are made possible by employing a novel data collection process, coined as Subconscious Crowdsourcing, which helps to collect a faster and more reliable dataset of patients. Our experiments suggest that extracting specific language patterns and social interaction features from reliable patient datasets can greatly contribute to further analysis and detection of mental disorders.

Andrey Bogomolov, Bruno Lepri, Michela Ferron, Fabio Pianesi, Alex (Sandy) Pentland- In our paper, propose an alternative approach providing evidence that daily stress can be reliably recognized based on behavioral metrics, derived from the user's mobile phone activity and from additional indicators, such as the weather conditions (data pertaining to transitory properties of the environment) and the personality traits (data concerning permanent dispositions of individuals). Our multifactorial statistical model, which is person-independent, obtains the accuracy score of 72.28% for a 2-class daily stress recognition problem. The model is efficient to implement for most of multimedia applications due to highly reduced low dimensional feature space (32d). Moreover, we identify and discuss the indicators which have strong predictive power.

Bimal Viswanath† Alan Mislove Meeyoung Cha Krishna P. Gummadi - In this paper, study the evolution of activity between users in the Facebook social network to capture this notion. Also find that links in the activity network tend to come and go rapidly over time, and the strength of ties exhibits a general decreasing trend of activity as the social network link ages. For example, only 30% of Facebook user pairs interact consistently from one month to the next. Interestingly, and find that even though the links of the activity network change rapidly over time, many graph-theoretic properties of the activity network remain unchanged.

I.-R. Glavan, A. Mirica, and B. Firtescu - Social media tools are wide spread in web communication and are gaining popularity in the communication process between public institutions and citizens. This study conducts an analysis on how social media is used by Official Statistical Institutes to interact with citizens and disseminate information. A linear regression technique is performed to examine which social media platforms (Twitter or Facebook) is a more effective tool in the communication process in the official statistics area. Our study suggests that Twitter is a more powerful tool than Facebook in enhancing the relationship between official statistics and citizens, complying with several other studies. Next, performed an analysis on Twitter network characteristics discussing "official statistics" using NodeXL that revealed the unexploited potential of this network by official statistical agencies.

A. E. U. Berbano, H. N. V. Pengson, C. G. V. Razon, K. C. G. Tungcul, and S. V. Prado - The paper presents further research on neural engineering that focuses on the classification of emotional, mental, physical and no stress through the use of Electroencephalography (EEG) signal analysis. Stress is one of the leading causes of several health-related problems and diseases. Therefore, it becomes necessary for people to monitor their stress. The human body acquires and responds to stress in different ways resulting to two classifications of stress namely, mental and emotional stress. Traditional methods in classifying stress such as through questionnaires and self-assessment tests are said to be subjective since they rely on personal judgment. Thus, in this study, stress is classified through an objective measure which is EEG signal analysis.

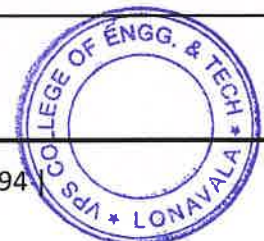




The features of the EEG recordings are then pre-processed, extracted, and selected using Discrete Wavelet Transform (DWT). These features are then used as inputs to classify stress using Artificial Neural Network (ANN) and validated using K-fold Cross Validation Method. Lastly, the results from the software assisted method is compared to the results of the traditional method.

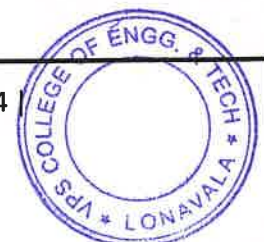
Gap Analysis

Sr No	Title	Author	Journal	Description
1	Online Public Shaming on Twitter: Detection, Analysis, Mitigation	Rajesh Basak, Shamik Sural, Niloy Ganguly, and Soumya K. Ghosh	IEEE 2019	Author proposed Shaming tweets are categorized into six types: abusive, comparison, passing judgment, religious/ethnic, sarcasm/joke, and whataboutery, and each tweet is classified into one of these types or as nonshaming using support vector machine.
2	Anyone Can Become a Troll: Causes of Trolling Behavior in Online Discussions	Justin Cheng, Michael Bernstein, Cristian Danescu-Niculescu-Mizil, Jure Leskovec	ACM-2017	Both negative mood and seeing troll posts by others significantly increases the probability of a user trolling, and together double this probability. A predictive model of trolling behavior shows that mood and discussion context together can explain trolling behavior better than an individual's history of trolling.
3	Deep Learning for Hate Speech Detection in Tweets	Pinkesh Badjatiya, Shashank Gupta, Manish Gupta, Vasudeva Varma	International World Wide Web Conference Committee-2017	Hate speech detection on Twitter is critical for applications like controversial event extraction, content recommendation and sentiment analysis. Task to classify a tweet as racist, sexist or neither. The complexity of the natural language constructs makes this task very challenging.
4	Statistical Twitter Spam Detection Demystified: Performance, Stability	Guanjun Lin, Sun, Surya Nepal, Jun Zhang, Yang Xiang, Senior Member,	IEEE TRANSACTION S	Due to the popularity of online social networks, cyber criminals are spamming on these platforms for potential victims. In





	and Scalability	Houcine Hassan	2017	this paper, performance of a wide range of mainstream machine learning algorithms are compared, aiming to identify the ones offering satisfactory detection performance and stability based on a large amount of ground truth data.
5	Hate Speech on Twitter: A Pragmatic Approach to Collect Hateful and Offensive Expressions and Perform Hate Speech Detection	HAJIME WATANABE, MONDHER BOUAZIZI, AND TOMOAKI OHTSUKI	Digital Object Identifier – 2017	Hate speech refers to the use of aggressive, violent or offensive language, targeting a specific group of people sharing a common property, whether this property is their gender, their ethnic group or race or their beliefs and religion. Ternary classification of tweets into, hateful, offensive and clean.
6	Defining and predicting troll vulnerability in online social media	Paraskevas Tsantarliotis, Evaggelia Pitoura, Panayiotis Tsapara	Springer-2017	Novel concept of troll vulnerability to characterize how susceptible a post is to trolls. Measures of troll vulnerability with respect to both the volume and the proximity of the trolling associated with each post.
7	Locate the Hate: Detecting Tweets against Blacks	Irene Kwok and Yuzhou Wang	AAAI, 2013	Author proposed supervised machine learning approach, employing inexpensively acquired labeled data from diverse Twitter accounts to learn a binary classifier for the labels “racist” and “nonracist.”
8	Cyber Hate Speech on Twitter: An Application of Machine Classification and Statistical Modeling for Policy and Decision Making	Pete Burnap and Matthew L. Williams	Policy Internet 2015	Classification features were derived from the content of each tweet, including grammatical dependencies between words to recognize “othering” phrases, incitement to respond with antagonistic action, and claims of well-founded or justified discrimination against social groups.
9	Common Sense Reasoning for Detection, Prevention,	KARTHIK DINAKAR, BIRAGO JONES, CATHERINE HAVASI, HENR Y LIEBERMAN, and	ACM 2012	Propose an “air traffic control”-like dashboard, which alerts moderators to large-scale outbreaks that appear to be





	and Mitigation of Cyberbullying	of ROSALIND PICARD		escalating or spreading and helps them prioritize the current deluge of user complaints. For potential victims, we provide educational material that informs them about how to cope with the situation, and connects them with emotional support from others. A user evaluation shows that in-context, targeted, and dynamic help during cyberbullying situations fosters end-user reflection that promotes better coping strategies.
10	Automatic identification of personal insults on social news sites	Sara Owsley Sood, Elizabeth F. Churchill and Judd Antin	J. Assoc. Inf. Sci. Technol. 2012	In this paper, we address this question through a machine learning approach to automatic detection of inappropriate negative user contributions. Our training corpus is a set of comments from a news commenting site that we tasked Amazon Mechanical Turk workers with labeling. Each comment is labeled for the presence of profanity, insults, and the object of the insults

III. PROPOSED APPROACHES

In the proposed systemic approach, we formulate the task as a classification problem to detect four types of detection of psychological disorders in social networks using the sentiment analysis and ssdeep learning framework:

- 1) Stress
- 2) Depression
- 3) Positive comments
- 4) Negative comments

An innovative solution to monitor and detect potential users with emotional disorders, according to the classification of sentences with depressed or stressed content.

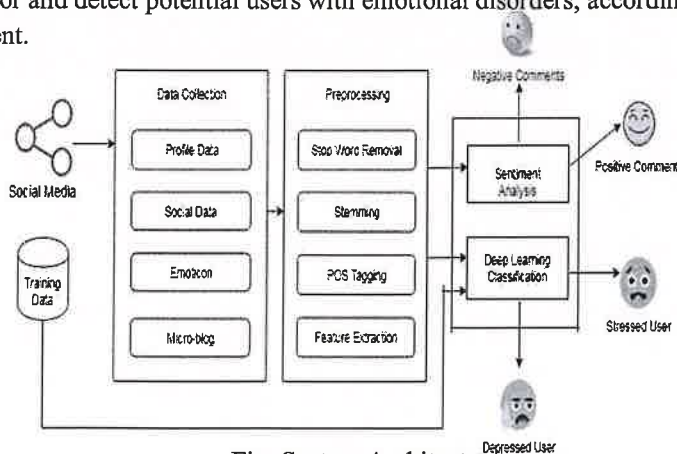


Fig. System Architecture





IV. CONCLUSION

In this proposed system, automatically identifying potential online users with depression and stress is threatening people's health. Thus users suffering from depression can be identified and they might be helped before they take any drastic steps which might have a long lasting impact. Using the data of the social networks of the real world as a basis, we study the correlation between the states of psychological disorder of users and their social interaction behaviour we recommend the user for health precautions to send by mail for user interaction

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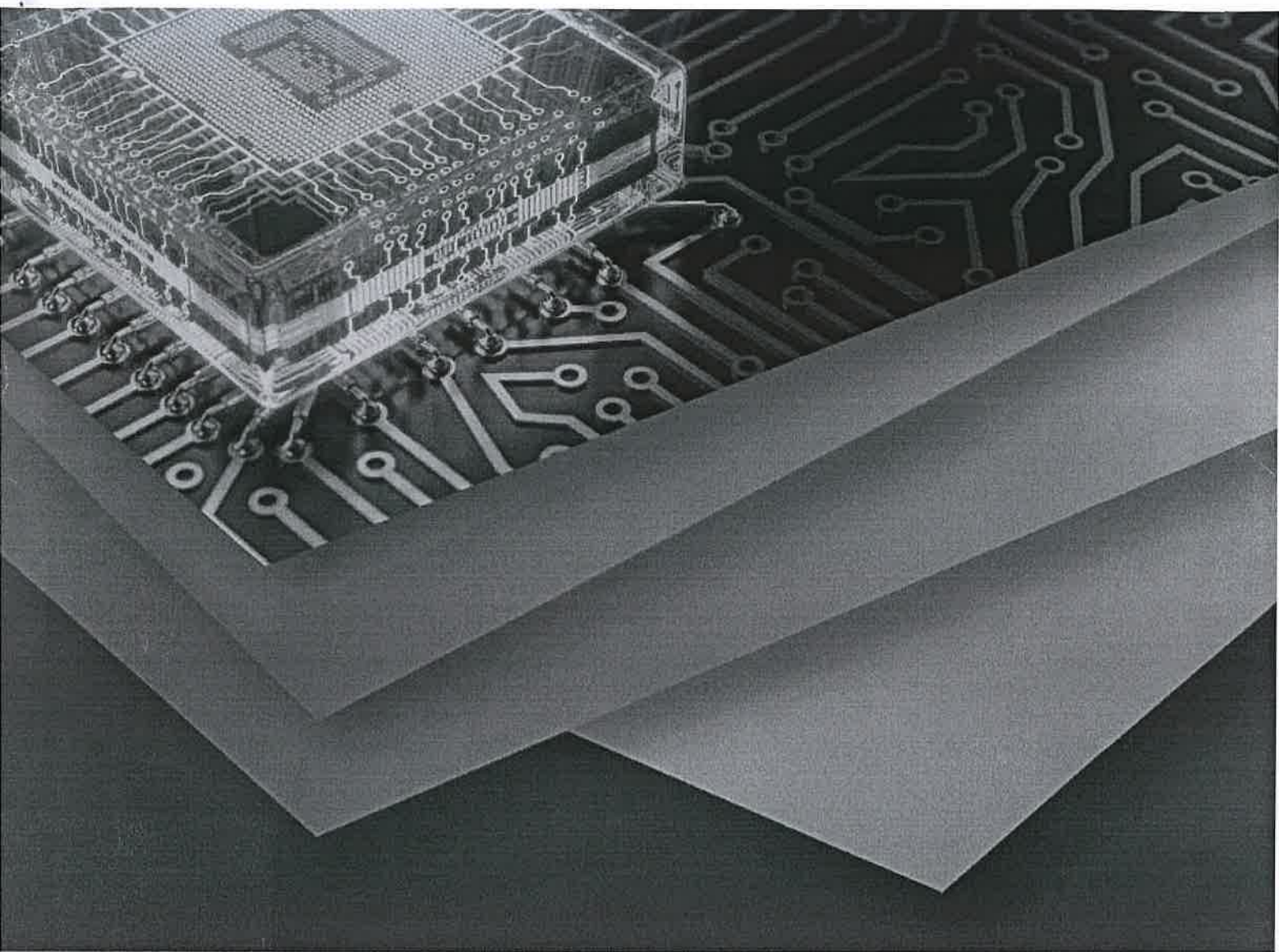
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Attribute-Based Storage Supporting Secure Deduplication of Encrypted Data in Cloud

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Abstract: Attribute-based encryption (ABE) has been widely used in cloud computing where a data provider outsources his/her encrypted data to a cloud service provider, and can share the data with users possessing specific credentials (or attributes). However, the standard ABE system does not support secure deduplication, which is crucial for eliminating duplicate copies of identical data in order to save storage space and network bandwidth. In this paper, we present an attribute-based storage system with secure deduplication in a hybrid cloud setting, where a private cloud is responsible for duplicate detection and a public cloud manages the storage. Compared with the prior data deduplication systems, our system has two advantages. First, it can be used to confidentially share data with users by specifying access policies rather than sharing decryption keys. Second, it achieves the standard notion of semantic security for data confidentiality while existing systems only achieve it by defining a weaker security notion. In addition, we put forth a methodology to modify a ciphertext over one access policy into ciphertexts of the same plaintext but under other access policies without revealing the underlying plaintext.

Keywords: Data Storage, Attribute Based Encryption (ABE), Data Deduplication.

I. INTRODUCTION

Cloud computing greatly facilitates data providers who want to outsource their data to the cloud without disclosing their sensitive data to external parties and would like users with certain credentials to be able to access the data [1], [2], [3], [4], [5]. This requires data to be stored in encrypted forms with access control policies such that no one except users with attributes (or credentials) of specific forms can decrypt the encrypted data. An encryption technique that meets this requirement is called attribute-based encryption (ABE) [6], where a user's private key is associated with an attribute set, a message is encrypted under an access policy (or access structure) over a set of attributes, and a user can decrypt a ciphertext with his/her private key if his/her set of attributes satisfies the access policy associated with this ciphertext. However, the standard ABE system fails to achieve secure deduplication [7], which is a technique to save storage space and network bandwidth by eliminating redundant copies of the encrypted data stored in the cloud. On the other hand, to the best of our knowledge, existing constructions [8], [9], [10], [11] for secure deduplication are not built on attribute-based encryption. Nevertheless, since ABE and secure deduplication have been widely applied in cloud computing, it would be desirable to design a cloud storage system possessing both properties.

We consider the following scenario in the design of an attribute-based storage system supporting secure deduplication of encrypted data in the cloud, in which the cloud will not store a file more than once even though it may receive multiple copies of the same file encrypted under • Hui Cui is with the Secure Mobile Centre, School of Information Systems, Singapore Management University. E-mail: hcui@smu.edu.sg • Robert H. Deng, Yingjiu Li and Guowei Wu are with the School of Information Systems, Singapore Management University. Manuscript received Month Day, 2016; revised Month Day, 2016. different access policies. A data provider, Bob, intends to upload a file M to the cloud, and share M with users having certain credentials. In order to do so, Bob encrypts M under an access policy A over a set of attributes, and uploads the corresponding ciphertext to the cloud, such that only users whose sets of attributes satisfying the access policy can decrypt the ciphertext. Later, another data provider, Alice, uploads a ciphertext for the same underlying file M but ascribed to a different access policy A_0 . Since the file is uploaded in an encrypted form, the cloud is not able to discern that the plaintext corresponding to Alice's ciphertext is the same as that corresponding to Bob's, and will store M twice. Obviously, such duplicated storage wastes storage space and communication bandwidth.

II. OUR CONTRIBUTIONS

In this paper, we present an attribute-based storage system which employs ciphertext-policy attribute-based encryption (CP-ABE) and supports secure deduplication. Our main contributions can be summarized as follows.

- 1) Firstly, the system is the first that achieves the standard notion of semantic security for data confidentiality in attribute-based deduplication systems by resorting to the hybrid cloud architecture [12].





- 2) Secondly, we put forth a methodology to modify a ciphertext over one access policy into ciphertexts of the same plaintext but under any other access policies without revealing the underlying plaintext. This technique might be of independent interest in addition to the application in the proposed storage system.
- 3) Thirdly, we propose an approach based on two cryptographic primitives, including a zero-knowledge proof of knowledge [13] and a commitment scheme.

III. RELATED WORK

The template Attribute-Based Encryption. Sahai and Waters [6] introduced the notion of attribute-based encryption (ABE), and then Goyal et al. [16] formulated key-policy ABE (KP-ABE) and ciphertext-policy ABE (CP-ABE) as two complimentary forms of ABE. The first KP-ABE construction given in [16] realized the monotonic access structures, the first KP-ABE system supporting the expression of non-monotone formulas was presented in [17] to enable more viable access policies, and the first large class KP-ABE system was International Journal of Engineering Research & Technology (IJERT) ISSN: 2278-0181 Published by, www.ijert.org NCRACES - 2019 Conference Proceedings Volume 7, Issue 10 Special Issue - 2019 1 presented by in the standard model in [18]. Nevertheless, we believe that KP-ABE is less flexible than CP-ABE because the access policy is determined once the user's attribute private key is issued. Bethencourt, Sahai and Waters [19] proposed the first CP-ABE construction, but it is secure under the generic group model. Cheung and Newport [20] presented a CPABE scheme that is proved to be secure under the standard model, but it only supports the AND access structures. A CP-ABE system under more advanced access structures is proposed by Goyal et al. [21] based on the number theoretic assumption. In order to overcome the limitation that the size of the attribute space is polynomially bounded in the security parameter and the attributes are fixed ahead, Rouselakis and Waters [22] built a large universe CP-ABE system under the prime-order group. In this paper, the Rouselakis-Waters system is taken as the underlying scheme for the concrete construction.

IV. SYSTEM ARCHITECTURE

The architecture of our attribute-based storage system with secure deduplication is shown in Fig. 2 in which four entities are involved: data providers, attribute authority (AA), cloud and users. A data provider wants to outsource his/her data to the cloud and share it with users possessing certain credentials. The AA issues every user a decryption key associated with his/her set of attributes. The cloud consists of a public cloud which is in charge of data storage and a private cloud which performs certain computation such as tag checking. When sending a file storage request, each data provider firstly creates a tag T and a label L associated with the data, and then encrypts the data under an access structure over a set of attributes. Also, each data provider generates a proof pf on the relationship of the tag T , the label L and the encrypted message ct_3 , but this proof will not be stored anywhere in the cloud and is only used during the checking phase for any newly generated storage request. After receiving a storage request, the private cloud first checks the validity of the proof pf , and then tests the equality of the new tag T with existing tags in the system. If there is no match for this new tag T , the private cloud adds the tag T and the label L to a tag-label list, and forwards the label and the encrypted data, (L, ct) to the public cloud for storage. Otherwise, let ct_0 be the ciphertext whose tag matches the new tag and L_0 be the label associated with ct_0 , and then the private cloud executes as follows.

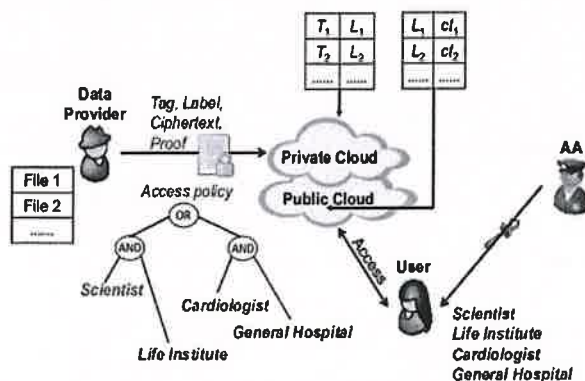


Fig. : System architecture of attribute-based storage with secure deduplication.



- 1) If the access policy in ct is a subset of that in ct' , the private cloud simply discards the new storage request; else, if the access policy in ct' is a subset of that in ct , the private cloud asks the public cloud to replace the stored pair (L', ct') with the new pair (L, ct) where $L = L'$.
- 2) If the access policies in ct and ct' are not mutually contained, the private cloud runs the ciphertext regeneration algorithm to yield a new ciphertext for the same underlying plaintext file and associated with an access structure which is the union of the two access structures, and forwards the original label and the resulting ciphertext to the public cloud.

At the user side, each user can download an item, and decrypt the ciphertext with the attribute-based private key generated by the AA if this user's attribute set satisfies the access structure. Each user checks the correctness of the decrypted message using the label, and accepts the message if it is consistent with the label.

Concerning the adversarial model of our storage system, we assume that the private cloud is "curious-but-honest" such that it will attempt to obtain the encrypted messages but it will honestly follow the protocols, whereas the public cloud is distrusted such that it might tamper with the label and ciphertext pairs outsourced from the private cloud (note that such a misbehavior will be detected by either the private cloud or the user via the accompanied label). Another difference between the private cloud and the public cloud is that the former can not collude with users⁴, but the latter could collude with users. This assumption is in line with the real world practice where the private cloud is trusted more than the public cloud. We assume that data users may try to access data beyond their authorized privileges. In addition to trying to obtain plaintext data from the cloud, malicious outsiders may also commit duplicate faking attacks as described before.

V. METHODOLOGY

Secure Data Deduplication: Secure Deduplication. With the goal of saving storage space for cloud storage services, Douceur et al. [23] proposed the first solution for balancing confidentiality and efficiency in performing deduplication called convergent encryption, where a message is encrypted under a message-derived key so that identical plaintexts are encrypted to the same ciphertexts. In this case, if two users upload the same file, the cloud server can discern the equal ciphertexts and store only one copy of them. Implementations and variants of convergent encryption were deployed in [24], [25], [26], [27], [28]. In order to formalize the precise security definition for convergent encryption, Bellare, Keelveedhi and Ristenpart [8] introduced a cryptographic primitive named message locked encryption, and detailed several definitions to capture various security requirements. Abadi et al. [9] then strengthened the security definition in [8] by considering the plaintext distributions depending on the public parameters of the schemes. This model was later extended by Bellare and Keelveedhi [11] by providing privacy for messages that are both correlated and dependent on the public system parameters. Since message-locked encryption cannot resist to brute-force attacks where files falling into a known set will be recovered, an architecture that provides secure deduplicated storage resisting brute-force attacks was put forward by Keelveedhi, Bellare and Ristenpart [10] and realized in a system called server-aided encryption for deduplicated storage. In this paper, a similar technique to that [9] is used to achieve secure deduplication with regard to the private cloud in the concrete construction.

VI. CONCLUSION

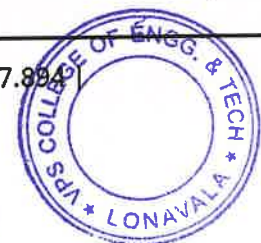
Attribute-based encryption (ABE) has been widely used in cloud computing where data providers outsource their encrypted data to the cloud and can share the data with users possessing specified credentials. On the other hand, deduplication is an important technique to save the storage space and network bandwidth, which eliminates duplicate copies of identical data. However, the standard ABE systems do not support secure deduplication, which makes them costly to be applied in some commercial storage services. In this paper, we presented a novel approach to realize an attribute-based storage system supporting secure deduplication. Our storage system is built under a hybrid cloud architecture, where a private cloud manipulates the computation and a public cloud manages the storage. The private cloud is provided with a trapdoor key associated with the corresponding ciphertext, with which it can transfer the ciphertext over one access policy into ciphertexts of the same plaintext under any other access policies without being aware of the underlying plaintext. After receiving a storage request, the private cloud first checks the validity of the uploaded item through the attached proof. If the proof is valid, the private cloud runs a tag matching algorithm to see whether the same data underlying the ciphertext has been stored. If so, whenever it is necessary, it regenerates the ciphertext into a ciphertext of the same plaintext over an access policy which is the union set of both access policies. The proposed storage system enjoys two major advantages. Firstly, it can be used to confidentially share data with other users by specifying an access policy rather than sharing the decryption key. Secondly, it achieves the standard notion of semantic security while existing deduplication schemes only achieve it under a weaker security notion.





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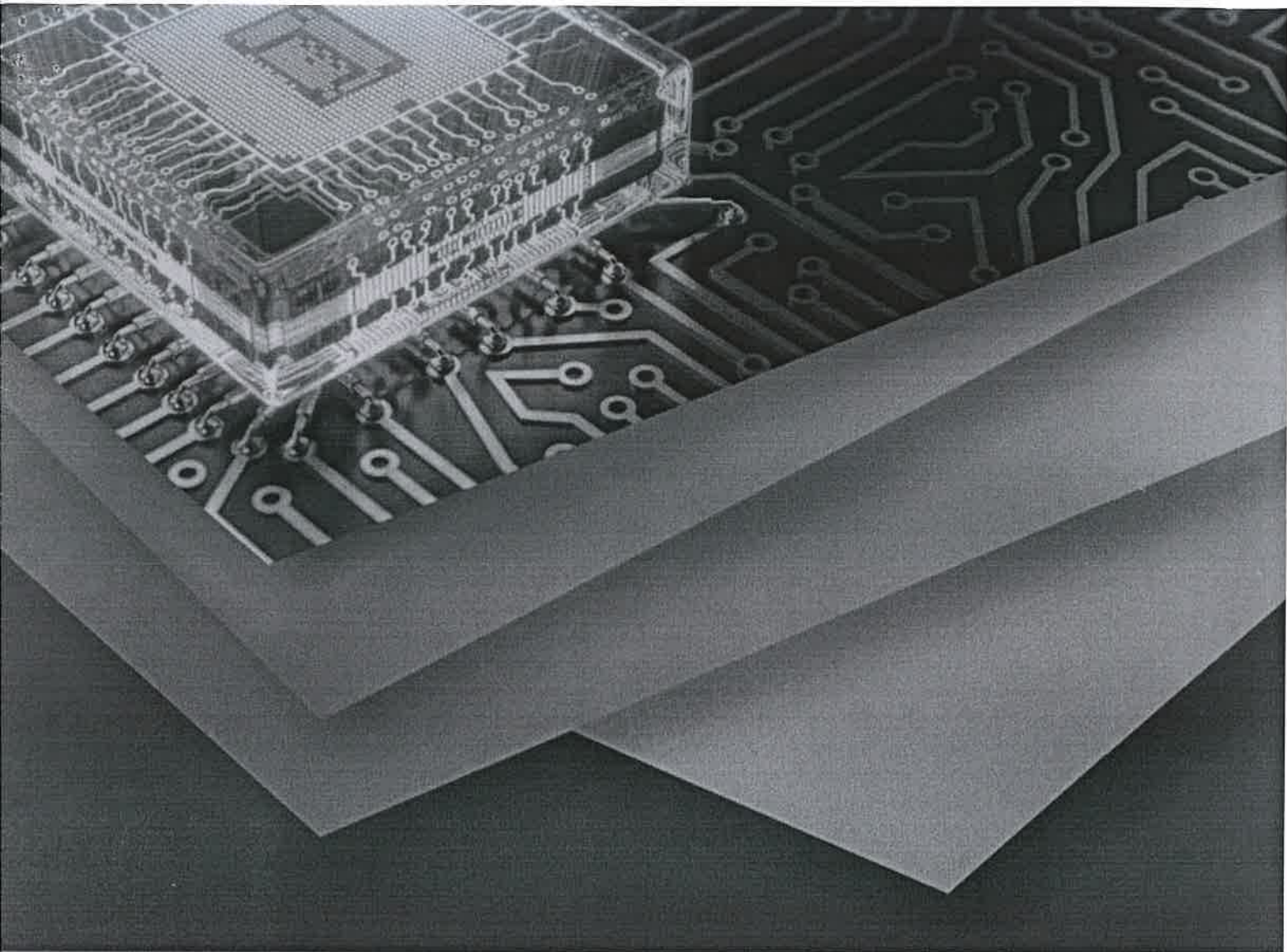


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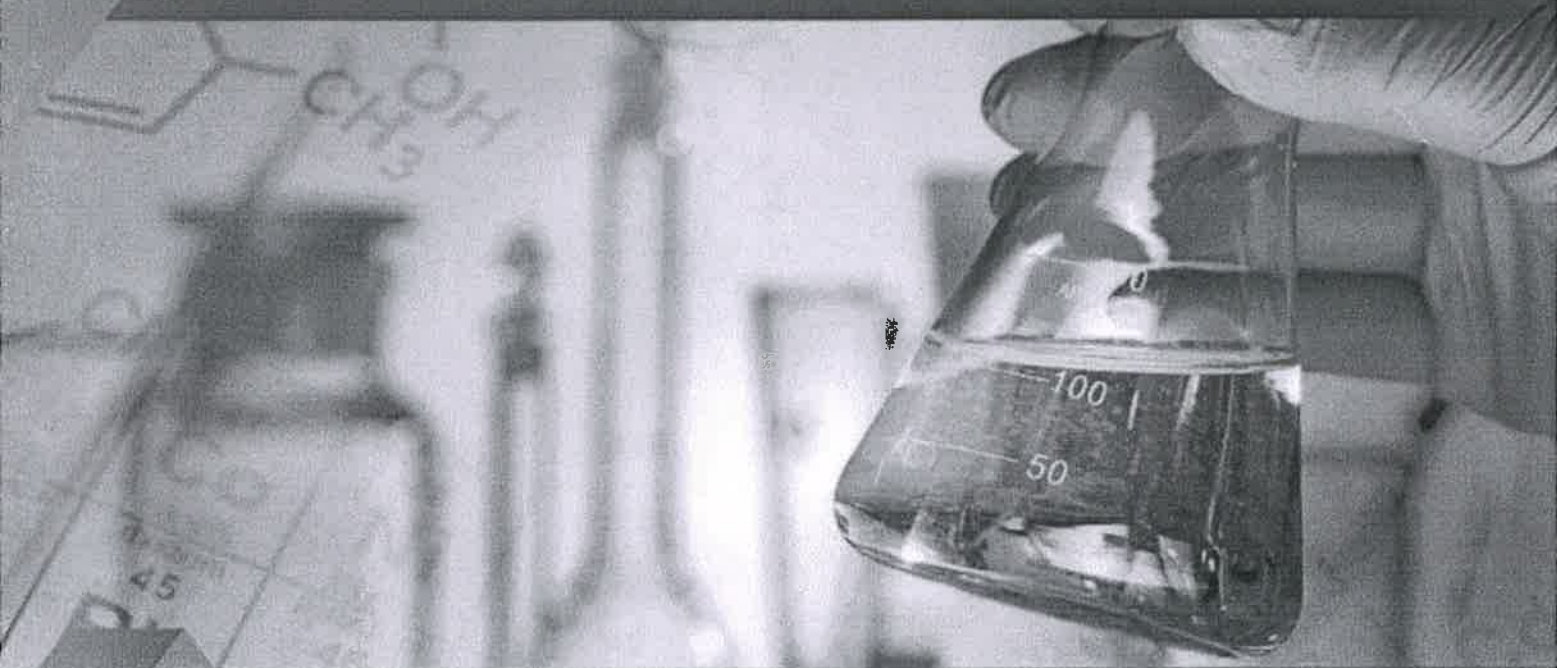
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Woman Safety Android Application

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Abstract: In the modern's world, it will be unsafe to travel alone for a person at night especially for women. To provide safety for women a good way to reduce the chances of becoming a victim of violent crime is to identify and call on resources to help you out unsafe situations. Having a safety app on your phone can reduce the reason for the risk situation and add assistance when we need to use it. Unlike the other applications available, which work only at the time of Emergency or Danger, this app can be used as a safety or precaution measure. So that, "Protection is better than cure". The main purpose of this app is to provide a safe platform through Android phone as today all person is taking Smart Phones to travel here and there. The user also gets to know the current user address using GPS location tracker. The fetched information is sent to the emergency contact of the user. This paper presents women security an Android Application for the Safety of Women and this app can be activated this app by a shaking the mobile, whenever need arises.

In today's world, even though there are so many economic developments in our country, but crimes against women are equally raising. Since we cannot travel with them all the time, though it is necessary that they need protection. It is predictable that every single one of them is having smart phones with them. So this application is to provide security through smart phones. This paper presents women security an Android Application for the Safety of Women and this app has so many features like a call is sent on a single shake and message is also sent to the emergency contacts with the present location of the person in trouble.

Keywords: XML, JAVA, android, SDK (software development kit), AVD emulator, firebase database, authentication, real time database, notification, layout.

I. INTRODUCTION

In today's fast-moving world, Women Security is an issue of growing concern. We have read about many unfortunate incidents happening with women and the rate is increasing. Women these days are working women and the globalization has made us aware of gender equality. Earlier the women were restricted only to the household chores. With the changing scenario, women are competing with men in all fields. We can see women going to great success levels in all fields, may it be corporate, scientific, education, business or any other field. Safety of women matters a lot whether at home, outside the home or working place. Last few crimes against women especially the case in Delhi was very dread and fearful. Because of such crimes, women safety has become a major topic. According to the statistics, it is found that every two out of three women have suffered trauma in the last year. According to the survey of women, it is found that women are losing their confidence because of such incidents. By the survey of Delhi government's Women and Child Development Department, around 80% of the women in national capital have fear regarding their safety. Women are harassed not only in the night or evening but also in the day time at their home, working places, or other places like street, club, etc. It is found through the survey that the reason of safety concern is the lack of gender-friendly environment and improper functional infrastructure such as consumption of alcohol and drugs in open area, lack of adequate lighting, safe public toilets, sidewalks, lack of effective police service, lack of properly working helpline numbers, etc. A huge percentage of women have no faith that police can curb such harassment cases. There is an urgent need to understand and solve this problem of women safety so that they can also grow equally like men in their own country.

II. LITERATURE SURVEY

A. Cloud Based Smart Mobile Application For Women Safety

Women face numerous difficulties in today's competitive environment, including abuse. Women's safety has become a serious concern as the amount of crime against women and girls continues to increase. The government has undertaken several proactive steps to prohibit such unethical acts, but they've had little effect on the rising number of such offenses and have remained unchanged. As a solution, in this study, a wearable smart device combined with numerous sensor devices and a microcontroller is used in conjunction with an android-based phone app with a model employs that alerts and provides location-based intelligence. The smart wearable device proposed consists of a series of sensors such as temperature and pulse sensors which send the input signals to the microcontroller which is integrated with GPS and GSM modules.





When the sensors send in signals which indicate that the user is in distress or trouble the GSM module connected with the Wi-Fi module sends a message to relatives and calls the nearby police station through a mobile app designed for this device. The GPS integrated with the microcontroller sends the location details through the mobile app. The proposed model's primary goal is to offer women safety in public locations, and the key advantage of this proposal is that this gadget is compact enough to be worn anywhere.

B. Safety Solution for Women Using Smart Band and CWS App.

Women endure a lot of sexual harassment these days which is becoming alarming day by day. The situation is extremely serious in developing countries as well as underdeveloped ones. Consequently, it poses a significant challenge to women's empowerment as well as to a country's budgetary growth. In this project, we are advancing an IoT device along with an android app that can make women's movement safer. Women can get swift and supreme safety support by pressing the device's emergency switch. If any incident occurs, this device can track the user's location in real-time and send it to the nearby police box and volunteer. The user can also get location of the nearest safe zone by this device as well. In addition, this device functions in both online and offline mode. If there is no internet available, the user can still use the device to access the nearest police box and volunteer support. The device consists of Arduino nano, GPS, GSM, Bluetooth, etc. The aggregate of all these elements collectively offers this device to be affordable and easy to navigate.

C. Lifecraft: An Android Based Application System for Women Safety.

Women have ensured the stability, progress and long-term development of the nations throughout the history. If women are subjected to violence and harassment, they cannot be genuinely included in society. With increasing heinous incidents involving women and children, an advanced system is needed to serve the purpose of getting help as soon as possible. At present time, the use of smartphones has increased rapidly, making it possible to use a smartphone efficiently for security or other protective purposes. All the recent atrocious incidents have made us think about to go for the safety issues. The crimes against women can be minimized with the help of our application "LifeCraft". It is an application for android for women's safety though men can also use it at a distress situation. It can be activated by voice command or SOS key. An alert message with location is sent to the user defined numbers in every five minutes until the system is turned off [1]. Many cases remain mysterious due to insufficient evidence. So, we have kept audio recording option to keep evidence. Continuous location tracking, showing the victim safe zone, offline mode is some of the most useful features of this system. Keywords—women security, android application, voice command, location tracking, offline, safe zone.

D. An Intelligent LoRa based Women Protection and Safety Enhancement.

A country's economic destiny is heavily influenced by the contributions of its women. Instead of being confined to the house to take care of domestic responsibilities, women are now able to work and raise a family while still contributing to economic growth on an equal basis with men. In the past several decades, there has been a lot of effort and money put into increasing the number of women who get hired and stay in their jobs. Sexual harassment of women in the workplace and other settings has come to light more often in recent years, raising important concerns concerning the gender-specific effect of this kind of discrimination on women's lives. We believe that technology can play an important role in developing a solution to alleviate women's daily annoyance. LoRa-based devices may be used to improve the security of women, according to this report. In this work, we present a method for programming such devices such that they can analyze a person's unique temperature and heart rate patterns and determine at what point to sound an alert. Large-distance transmission is made possible by the LoRa physical layer, which serves as the primary communication interface. Additionally, an Android app has been built to indicate the position of the pushed node and to give navigation routes to the relevant security personnel in order to visit that node. It was decided to evaluate energy use and cost. According to our findings, our network is far less expensive and power-hungry than the alternatives

E. An Insight into Android Applications for Safety of Women: Techniques and Applications.

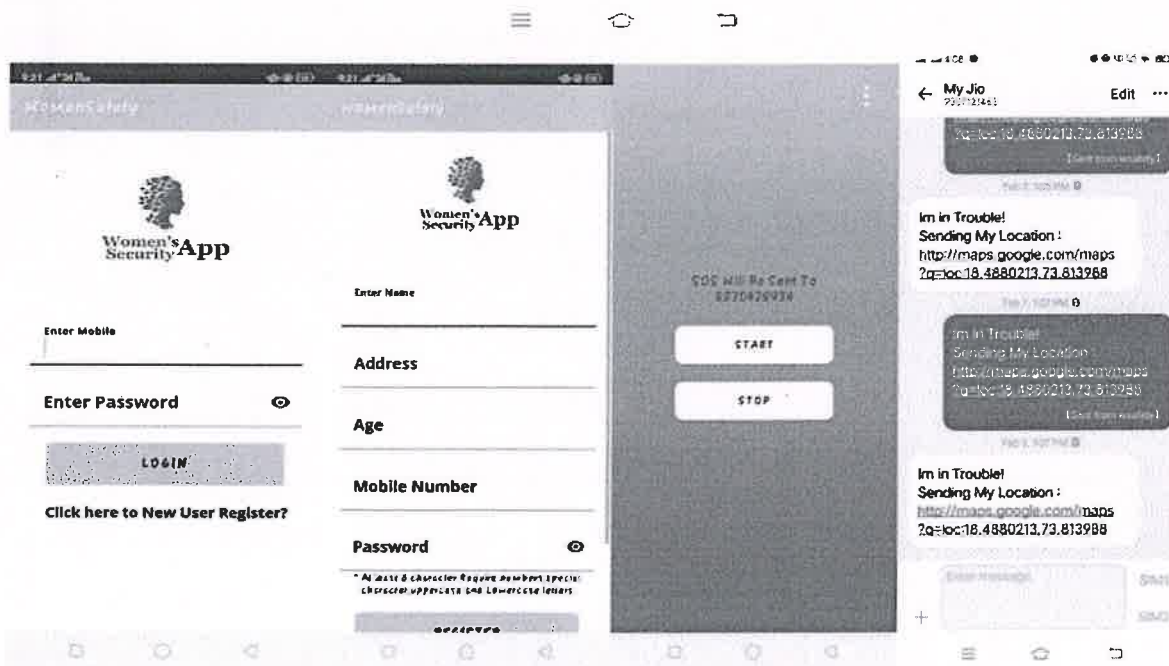
Smartphones play a significant role in today's era of technical advancement. It not only helps to communicate or a medium of entertainment that can be used efficiently for transactions office work and even for personal security and protection purposes. Women are the crucial segment of our society and contribute in almost every field, still, they are not safe and are most vulnerable when traveling alone. Government and police are taking strict actions for the safety of women.



- 3) **Implementation:** With inputs from system design, the system is first developed in small programs called units, which are integrated in the next phase. Each unit is developed and tested for its functionality which is referred to as Unit Testing.
- 4) **Integration and Testing:** All the units developed in the implementation phase are integrated into a system after testing of each unit. Post integration the entire system is tested for any faults and failures.
- 5) **Deployment of System:** Once the functional and non-functional testing is done, the product is deployed in the customer environment or released into the market.



Feel Safe Everywhere



- 6) **Maintenance:** There are some issues which come up in the client environment. To fix those issues patches are released. Also to enhance the product some better versions are released. Maintenance is done to deliver these changes in the customer environment.



V. CONCLUSION

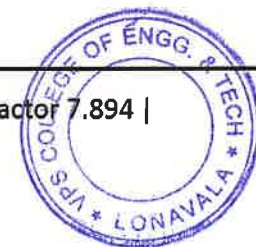
This paper proposes a new women's safety model that aims to provide a very safe environment. Many unfortunate incidents took place in the case of women. Problems can come from anywhere. This paper analyses the key needs of the intelligent security system with technology demand and system building challenges. Since the prediction of such incident is not possible hence to minimize it our proposed mobile application will be very helpful. It will not only help the women but also the children as it can work with voice command which is easy for a child to operate. And men can also use it when they face any big trouble and need help. Not only in sexual related problem, it can be used when someone faces accident or hijacking or public attack. Whenever anyone is in any kind of danger, our system will help to decrease the risk and make the world a better and safer place.

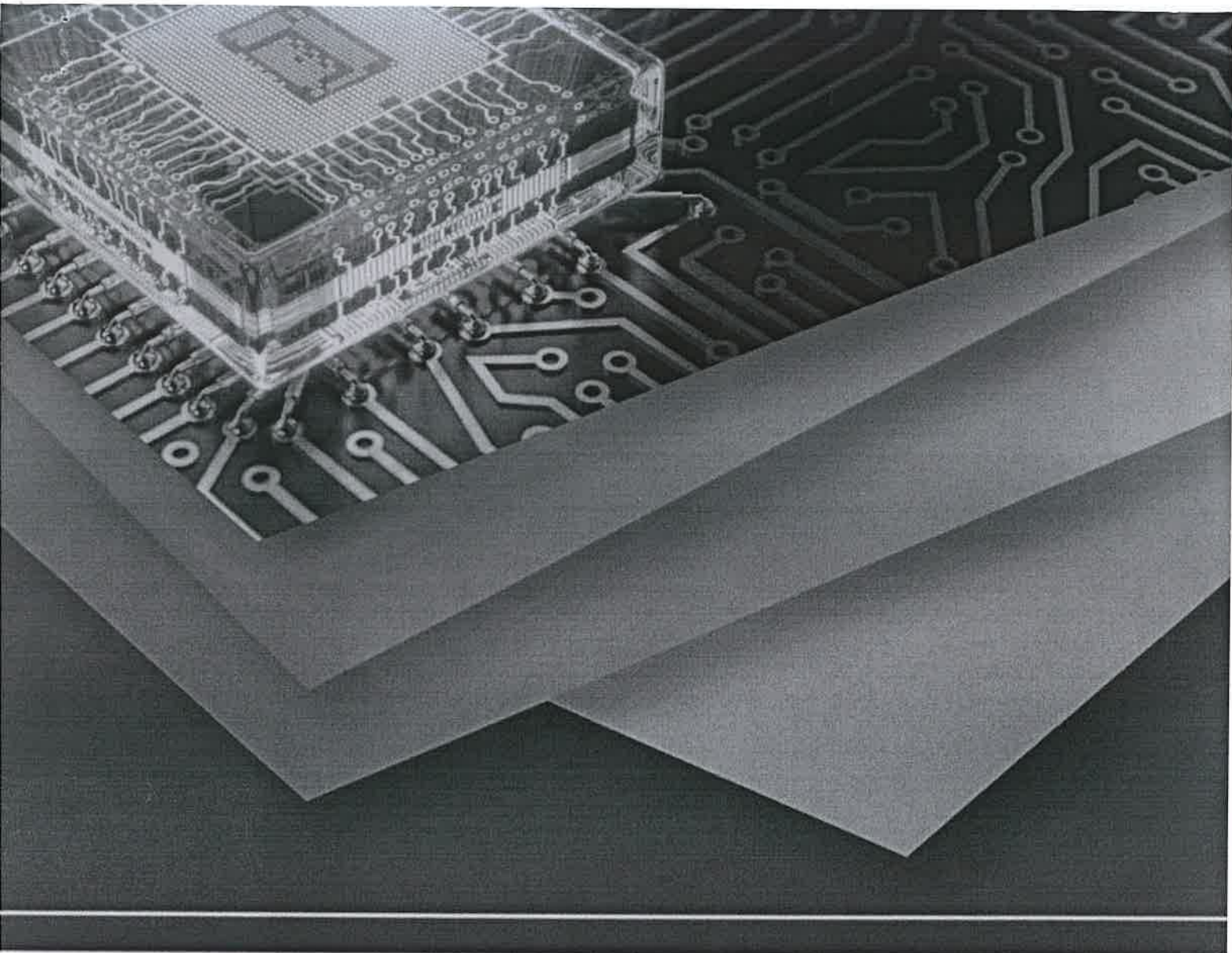
VI. FUTURE SCOPE

In future we will work on making it more secure so that we can decrease the crimes at the lowest level possible. We are planning to implement two unique features in this application which are new in safety app. That is hidden camera and microphone detection. As this is also a safety issue for women. User can check whether there is a camera or microphone hidden in the place. There are two ways to find a hidden camera using our mobile app. One is to look for the magnetic activity and another is to detect the nonvisible white light. We will use the magnetic sensor of the smart phone's hardware (magnetometer) and infrared sensor (IR) in the camera to detect hidden camera. User can move his/her phone around suspected area, if a strong field is detected, user can be sure about hidden device that is secreted within the wall or object. Another way is by detecting light reflecting from a lens which can be caught by the phone's camera.

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Secure QR-Code Based Message Sharing System Using Cryptography and Steganography

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Abstract: Numerous cryptographic methods are accessible for filling the need of data security over the web, servers, and neighbourhood frameworks.

Be that as it may, there is consistently request of greater security which may not be meet by such cryptographic calculations alone due to realized security assaults and numerical intricacy. Consequently, envisioning the essential mix of cryptography and steganography strategies can give a more significant level of safety. Speedy Reaction (QR) codes are utilized broadly because of their advantageous attributes.

It incorporates strength, intelligibility, mistake amendment ability, huge information limit than customary standardized tags and so forth. Consequently, in this work, we propose a 3-layered engineering for getting message sharing system by utilizing QR code picture in one layer.

This engineering uses the exact and vital utilization of cryptography and steganography procedures. The proposed framework gives the more significant level of safety based on quantitative and subjective outcomes. Additionally, we consider our framework in contrast to the presentation assessment standards examined in the paper.

Keywords: Cryptography, Image Steganography, 3DES, RSA, AES, QR Codes.

I. INTRODUCTION

In this mechanical time, advanced correspondence is considered as helpful method for sharing data. Data sharing has turned into the foundation of our day to day action. It tends to be in various modes like dividing of data among two unique organizations, divisions inside an association or among a gathering of people. Data sharing and information security has its own significance on account of expanding assaults rehearses now days.

To give a satisfactory security, numerous calculations have been proposed by the time. Many cryptographic algorithms always ensure the integrity and security while sharing information. There is always a trade-off between the computational complexity and strength of these algorithm.

In the advent of electronic age, computational power of machines has increased considerably and thus now computational complexity may be tolerated to some extent.

However, incremented computational power enhances the power of attackers on the cryptographic algorithms and thus, there is a need to improve security strength of the information. Thus in order to enhance security, may researchers are thinking appropriate solution to combine cryptographic and steganographic techniques.

The QR codes are additionally widely utilized in data sharing. These was created by the Japanese Denso-Wave organization in 1994. These codes' principles gives 40 QR variants (1-40) to convey different information payloads. The capacity limit is relies on the variant level. Higher the form, bigger the information payload. Additionally, this code gives the Reed-Solomon blunder amendment capacity.

In this way, they have another huge property, which is dependability. This property permits the QR code perusers to recuperate the information from code accurately regardless of whether piece of QR code is grimy or harmed.

To accomplish dependability, QR code principles offers four revision levels, i.e., L, M, Q and H for each QR rendition. Table I shows the levels of the QR codes.

Cryptographic calculations may not give the better security alone. In this manner, picturing the essential blend of the cryptography and steganographic strategies can give the more significant level of safety. In picture steganography, to full fill the need of advanced picture, QR-Code picture can be utilized.

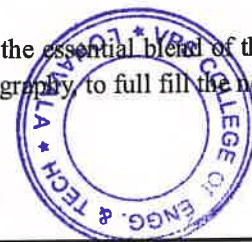




Table I. Reliability of QR Code [3]

TABLE	RELIABILITY OF QR CODE
Error correction Level	Error correlation capability % of code words
L(Low)	7
M(Medium)	15
Q(Quantile)	25
H(high)	30

The rest of the paper is organized as follows. The following section II will contain the relevant work and discussed by comparing the approaches. After that in section III, we presented our proposed scheme. Section IV, is about the results and comparison of the proposed scheme. Here we compare the performance with existing one. And finally in section V we presented the conclusion and future work followed by the reference list.

II. RELATED WORK

As information security and secure data sharing is continuously being viewed as a center region, numerous scientists are working in the field and contributed a ton. Likewise, as security prerequisite are expanding a direct result of expansion in data trade, presently the escalated research is going on connected with the QR code-based data sharing frameworks. Hence, we have zeroed in our work on this and recorded some work in this segment.

Shweta Sharma et al. analyze the attributes of QR code labels and proposed three-layer security framework which utilizes the blend of cryptography and Steganography. The execution of their framework is finished utilizing MATLAB. The examination work of creators and momentum research pattern in data sharing gives motivation to us to move the protected data framework towards the picture steganography and QR standardized identification tag.

Pei-Yu Lin, introduced the qualities of QR standardized identification is used to plan a mysterious QR sharing way to deal with safeguard the confidential QR information with a solid and dependable disseminated framework. In the proposed framework the mystery can be parted and conveyed with QR labels in the dissemination application, and the framework can recover the lossless mystery when approved members collaborate. The trial results are given to reason that, the new methodology is achievable and gives content comprehensibility, con artist perceptibility, and a movable mystery payload of the QR standardized tag. This original work proposed by the creators, gives the plan to oppose the print and output activity of QR code and make our framework more adaptable.

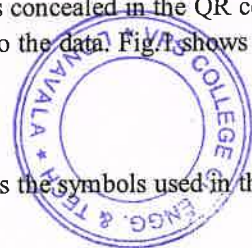
K. S. Seetha Lakshmi et al., introduced the visual cryptography which is a prestigious method to safeguard information which is picture based. Creators proposed a plan to improve the security in picture steganography. To upgrade security system, creators proposed the strategy where visual cryptography and picture steganography are utilized together. Creators uses the brain networks are worried about recognizing the best areas in have picture to implant the restricted information hence further developing the picture quality[9]. Here the creator demonstrates that there is no information misfortune when QR code labels uses and cover it with the other visual illustrations. Subsequently, a comparative sort of approach we proposed where we utilized picture steganography by concealing QR code behind veil picture.

III. PROPOSED SYSTEM

The proposed system is an essential blend of cryptographic as well as the steganographic procedures. This work zeroed in on improving the security necessities by utilizing QR-code. A three layer layered design is proposed to achieve the undertaking. In the main layer, the strength of public key cryptosystem is used, hence RSA encryption calculation is utilized to encode the data. In the subsequent layer, picture steganography methods are used where the scrambled message is concealed in the QR code picture. In the third layer, the QR Code picture is encoded utilizing veil picture to give greater security to the data. Fig.1 shows the flow of the proposed methodology of the message sharing system.

A. List of Symbols

Proposed system comprises the algorithms and are discussed in following sections. Table II shows the symbols used in the proposed algorithms.



B. Algorithms

Proposed system follows complicated process which contains four stages. At each stage in the process, complexity of the proposed system increases in terms of security. Process begins by providing secret message to the system and system will generate the encoded image as output.

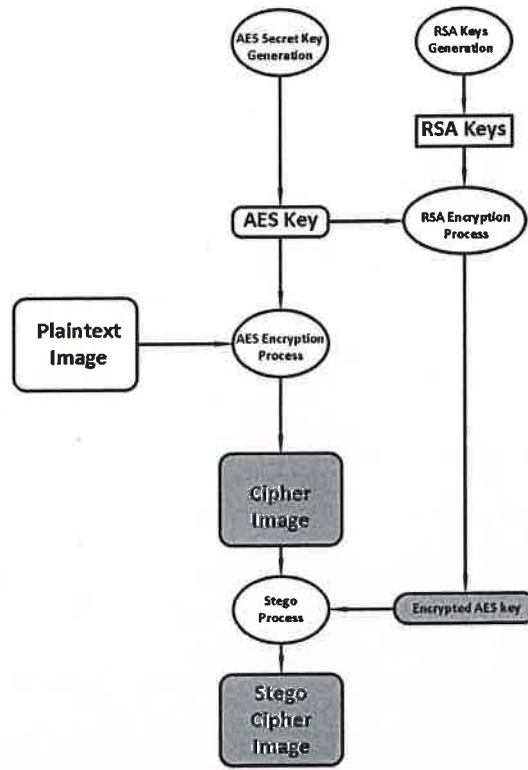


Fig. 1: Proposed Methodology

TABLE II: LIST OF SYMBOLS

M	Message or plain text
CT	Cipher text the outcome of the encryption process which is unreadable text
R	The outcome results of the system
EQR	Encoded QR code
DQR	Decoded QR Code
RPI	The pixel value of the initialized random image
QPI	The pixel value of QR image

Following algorithm Secure_Message_System_Main() represents the general methodology of proposed work followed by the algorithm description. Fig. 2 shows the data components in the proposed system.

- 1) Secure_Message_System_Main()
 - a) Start
 - b) M Input message from the user
 - c) CT Call Encryption_RSA(M)
 - d) QRcode Call_QR_Generator(CT)
 - e) R Call Image_Encoding(QR code)
 - f) Show R to user
 - g) End





- The process starts with providing the plain text (secret message) to the proposed system.
- Next, the RSA encryption technique is applied to encrypt the secret message. This stage will provide the output as cipher text. Here 1024 bit keys is used in RSA encryption technique.
- This unreadable cipher text is then provided to next module, which in turn generate the QR code which represents this cipher text.

QR code image will then be encoded with the help of mask image using proposed image encoding algorithm.

Following algorithm Image_Encoding (QR code) describes the image steganography. This algorithm is proposed to encode the QR code image using mask image, Where the QR image will be encoded into the randomly initialized pixel image.

2) Image_Encoding (QR code)

- a) Start
- b) Initialize random image with pixel size \geq pixel size (QR code)
- c) For each pixel of random image R_{Pi} :
For each pixel of QR code Q_{Pi} :
If Q_{Pi} is even no:
Do: change R_{Pi} to nearest even number
Else if Q_{Pi} is odd no:
Do: change R_{Pi} to nearest odd number
- d) return EQR
- e) END

- Proposed system initialize the random image having pixel size greater than or equals to the pixel size of QR code image.
- Now, for each pixel value of QR code image, manipulate the pixel value of the random image as per the following rule.
- If the pixel value of QR code image is odd then make the pixel value of random image to nearest odd number.
- If the pixel value of QR code image is even number then make the pixel value of random image to nearest even number.

Following Image Decoding (EQR) algorithm describes the extraction of QR code image at receiver side from encoded image.

3) Image Decoding (EQR)

- a) Start
- b) Initialize random image with a pixel size of EQR
- c) For each pixel of EQR Q_{Pi} :
If Q_{Pi} is even no:
Do: store 0 in image matrix of EQR
Else if Q_{Pi} is odd no:
Do: store 1 in image matrix of EQR
- d) return DQR
- e) END

Fig. (a) shows the original QR code (b) shows the mask image (c) shows the result after applying Image Encoding() algorithm.

- Initialize the random image with pixel size equals the pixel size of encoded QR code image.
- For each pixel value of the encoded QR code image, change the pixel value of the random image to the 0 or 1.
- If the pixel value of encoded QR image is even number then change the pixel value of the random image to the 0 and if the pixel value of encoded QR image is odd number then change the pixel value of the random image to the 1.
- This is how, finally, system will contain the matrix of 0s and 1s. where 0 represents the presence of color (black) and 1 represents the absence of the color (white).
- This matrix constitutes the pixel matrix of an image and this image is our QR code image.





(a) Original QR Image



(b) Randomly Initialized Pixel image or Mask Image



(b) Resulted Image

IV. CONCLUSION AND FUTURE WORK

In this proposed work, an itemized examination of lopsided encryption calculations is introduced based on various boundaries. The primary goal was to give security in data sharing by decisively consolidating two security systems for example cryptography and steganography.

During this examination, it was seen that RSA was awesome among all with regards to Security, Adaptability, and Encryption execution. Albeit the other calculations were likewise skillfull, the greater part of them have a compromise between memory use and encryption execution. Although the proposed methods had already demonstrated a good performance, the following need to be incorporated in future work:

- 1) Applying different cryptographic asymmetric encryption algorithms to provide more security.
- 2) Applying different encoding mechanisms to encode QR image for securing data hidden in QR image.
- 3) Effective use of the 24-bit image in image steganography module to increase security and data storage capacity.

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USE OF INDUSTRIAL WASTE WATER IN CONCRETE**Prof. Pranesh chawhan¹, Akash A.Bhosale², Harshal Jamsutkar³, Amej Jamsutkar⁴, Ragini Jadhav⁵, Aarti Jadhav⁶**Department of Civil Engineering¹²³⁴⁵⁶VPS College of Engineering & Technology, Lonavala, Pune¹²³⁴⁵⁶.

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Abstract: Water is a basic need of living beings. So, everyone should be benefited with quality and quantity water. Oceans hold over 97 percent of the world's water, while freshwater makes up only 3 percent. Moreover, freshwater is not distributed equally across land surfaces, and there are some densely populated nations where freshwater is scarce. On other hand, concrete industry consumes large amount of water in mixing of mortar, mixing of concrete and even in curing which otherwise can be used for drinking purpose. Construction industry is second largest industry in India which consumes major amount of water. Waste water gets mixed with the surface water after discharging it from industries. It tends to reduce the quality of surface water which is sometimes get consumed by humans for drinking purpose. Bad quality of water may affect the health of human beings and aquatic life also. Water shortage is becoming a global issue these days. And more efforts should be made to fix this issue. As a result, using waste water released from various types of companies or sites in the building sector may assist to alleviate the problem of water shortage. This project intends to demonstrate how treated waste water may be used in the construction sector while reducing the environmental impact. While building concrete, waste water collected from dairies, car wash centres, sewage treatment plants, and other locations is utilised as a 100 percent substitute. After casting and curing with oil industry water for 7, 14, and 28 days, cubes are intended to be assessed against compression stress.

Keywords: Waste Water, Concrete,

1. Introduction

India is presently dealing with its worst crisis ever. India is dealing with one of the biggest national water problems in the world. It is actually referred to as the water and sanitation crisis. Almost 50% of the population lacks access to clean drinking water, and around 2,000 000 people every year pass away as a result.

An continuous water catastrophe that affects over 1 million people each year in India is water shortage. The huge population of India's rural and urban areas, as well as the environment and agriculture, are all significantly impacted by the country's water crisis. India only contains 4% of the world's fresh water resources while having a population of over 1.3 billion. Due to both an abundant supply of freshwater and the drying up of rivers and their reservoirs in the summer, right before the start of the monsoon season over the whole country, India experiences a severe water scarcity.

Water shortages are not a recent problem in India. Less than 1,700 cubic metres of available water per person are regarded to be in a water-stressed area, while India now has 1,545 cubic metres available per person. According to the Ministry of Water Resources, water availability might reach 1,140 cubic metres by 2050 and drop to 1,341 cubic metres in 2025. The availability of water for each individual in this situation is less than 1,000 cubic metres.

Periodically, severe drought conditions have affected people, agriculture, animals, etc. in various states around the nation.

All Indian sectors have been affected in some manner by the lack of water, including the building sector. For many different uses, the building sector requires a lot of water. To mix cement, sand, and other raw materials for the building project right away, water is required. Using green and sustainable materials is crucial to reducing the country's escalating water issue since the construction sector is the second largest in the nation after agriculture. Surface water quality is decreased by the garbage that is simply added to waste water that is released by various sorts of companies. Surface water is frequently utilised in place of portable water for drinking purposes. The health of people or aquatic life may be impacted by surface water of lower quality. A better way to preserve the quality of surface water is to reuse this industrial waste water. Also, if it is employed in the construction business, it might significantly lessen the requirement for fresh portable water.

2. Literature Survey

As water scarcity is ongoing major crisis, reduction or reuse of water is very important thing. Water which get discharged from industries get mixed with natural streams. Reuse of that water could be possible in general works. As construction industry consumes major amount of potable water, replacing the use of potable water with treated industrial waste water could be better option. Water from dairy, carwash center, sewage treatment plants can be used as replacement with potable water in construction industry. This research is done to check whether treated water from oil industry can be use in concrete or not. If result came positive, then it can help to reduce load on potable water in construction industry.

This author discusses the manufacture of concrete cubes using industrial waste water. For the purpose of examining the impact of sunlight on the chemical characteristics of wastewater and ultimately the compressive strength of concrete, sixteen samples total were prepared: four with potable water, four with fresh, treated wastewater, four exposed to the sun, and four with treated wastewater stored in the shade.

Concrete's compressive strength decreased when treated industrial wastewater was exposed to the sun for seven days compared to samples made with the same water and left in the shade. Yet, the strength of the concrete in both situations (made with potable water and wastewater left in the sun and shade) was greater[1].

NMAM IT Nitte Campus potable water, treated home sewage water, service station water (garage), and dairy water were the four sources from which water samples were taken. The samples' pH, total dissolved solids (TDS), chloride, hardness, alkalinity, and sulphates levels were all measured. In the investigation, concrete of grade M20 was used. Specific gravity, water absorption, and sieve analysis are a few of the physical tests that are performed on the aggregates used in the concrete mix. Regular Portland Cement, graded aggregates, and 100% treated wastewater replacement were used to create plain cement concrete mixes. 12 concrete cubes were cast in total and given 3, 7, and 28 days to cure. Using the Standard laboratory technique of IS: 10262-2009, the mix ratios and compressive strengths of the cubes were calculated[2].

By employing recovered waste water, K. Nirmalk Umar and V. Sivk Umar (2008) [1] studied the durability influence of concrete. In order to considerably alleviate the water deficit by doing some initial treatment, they utilised recycled waste water from the tannery business

for building purposes. The concrete admixture was then added to the specimens at doses of 0.5%, 1.0%, 1.5%, 2.0%, and 2.5%. The samples' durability was examined over the course of 28, 90, and 365 days. Using this, cubes and cylinders were cast and put through sulphate attack, chloride attack, and corrosion impact tests to determine their durability[3].

R. A. Taha (2010) [4] looked at the viability of using production (oily) and ground (brackish) water in building as opposed to tap water. Four P DO (Petroleum Development Oman) asset locations provided samples of non-fresh water. TDS, pH, chloride, hardness, alkalinity, and sulphates were all measured in nine water samples, including regulated drinkable (tap) water. In addition, pure drinkable water was used to produce cement pastes, mortars, and simple concrete mixes. Nine mixes were created and allowed to cure for up to 1.5 years. Initial setting times, compressive strength, and flexural strength of mixtures were examined.

3. Proposed work

3.1 Tests on Cement

There are just four steps in the particular gravity test process. The four stages for performing a specific gravity test on cement are as follows:

Calculation:

$$W1 = 133.8 \text{ gm}$$

$$W2 = 189.8 \text{ gm}$$

$$W3 = 396.1 \text{ gm}$$

$$W = 347.7 \text{ gm}$$

$$Sg = \frac{W2 - W1}{(W2 - W1) - (W3 - W4)} \times 0.79$$

$$Sg = \frac{189.8 - 133.8}{(189.8 - 133.8) - (396.1 - 347.7)} \times 0.79$$

$$Sg = 3.15$$

Conclusion : Specific Gravity of Cement is 3.15.



Fig 3.1 Cement

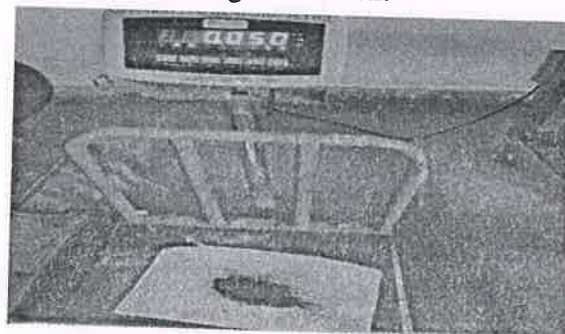


Fig 3.2 Passing Weight of Crushed Aggregate



3.2 Impact Test



Fig 3.3 Impact test

Observations:

- Size of the aggregate = 12.5 passing
- Number of blows applied = 25

Table 1: Impact Value

Sr.No	Details	Sample 1	Sample 2	Average Impact Value
1	Weight of aggregate sample in the cylindrical measure, w1 gm (excluding empty weight of cylindrical measure)	250 gm	260gm	19.615%
2	Weight fo crushed aggregate after passing through 2.36 mm sieve w2 gm	50gm	50gm	
3	Aggregate Impact Value = $w2/w1*100$	20%	19.23%	

3.3 Crushing Test

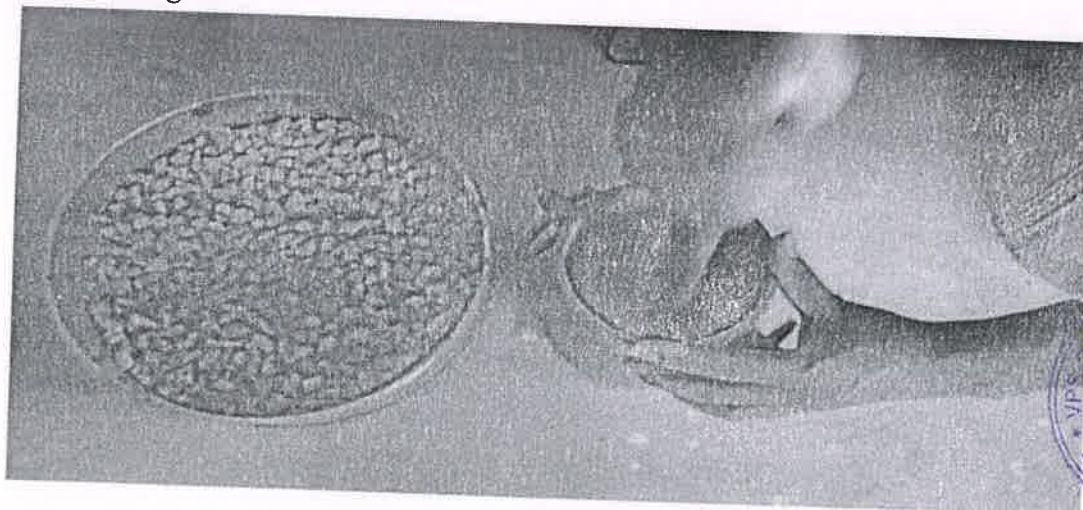


Fig 3.4 Crushing

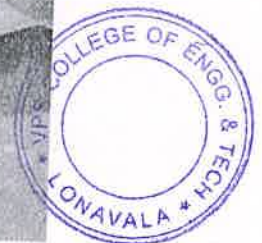


Table 2: Crushing Value

Sr.No	Details	Sample 1	Sample 2	Average Crushing Value
1	Weight of aggregate sample in the cylindrical measure, w1 gm (excluding empty weight of cylindrical measure)	2857 gm	2857 gm	22.19%
2	Weight of crushed aggregates after passing through 2.36 mm sieve, w2 g	635.1gm	632.2gm	
3	Aggregate crushing value = $w2w1 * 100$	22.23%	22.15%	

3.4 Shape Test

Table 3: Shape test values

Size of Aggregate thickness (mm)		Thickness Gauge * Thickness Gauge Size (mm) Length Gauge** Length Gauge Size (mm)	
Passing through IS Sieve	Retained on IS Sieve		
63	50	33.90	-
50	40	27.00	81.0
40	25	19.50	58.5
31.5	25	16.95	-
25	20	13.50	40.5
20	16	10.80	32.4
16	12.5	8.55	25.6
12.5	10	6.75	20.2
10.0	6.3	4.89	14.7



Fig 3.5 Coarse Aggregates for Water absorption Test



Percentage Water Absorption of Coarse Aggregate Sample{I} = 2.00 % Percentage Water Absorption of Coarse Aggregate Sample{II} = 1.31 %

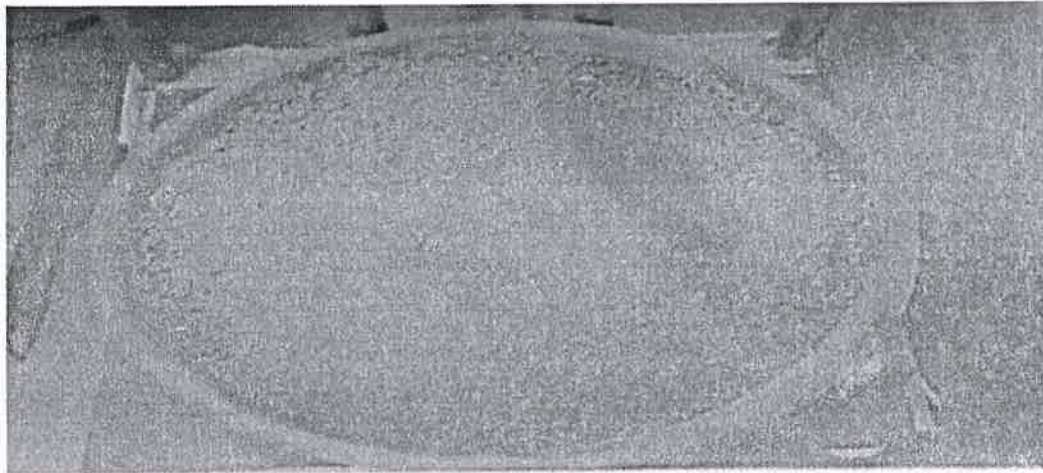


Fig 3.6 Fine Aggregates for Water absorption Test
Percentage Water Absorption of Fine Aggregate Sample = 6.34%

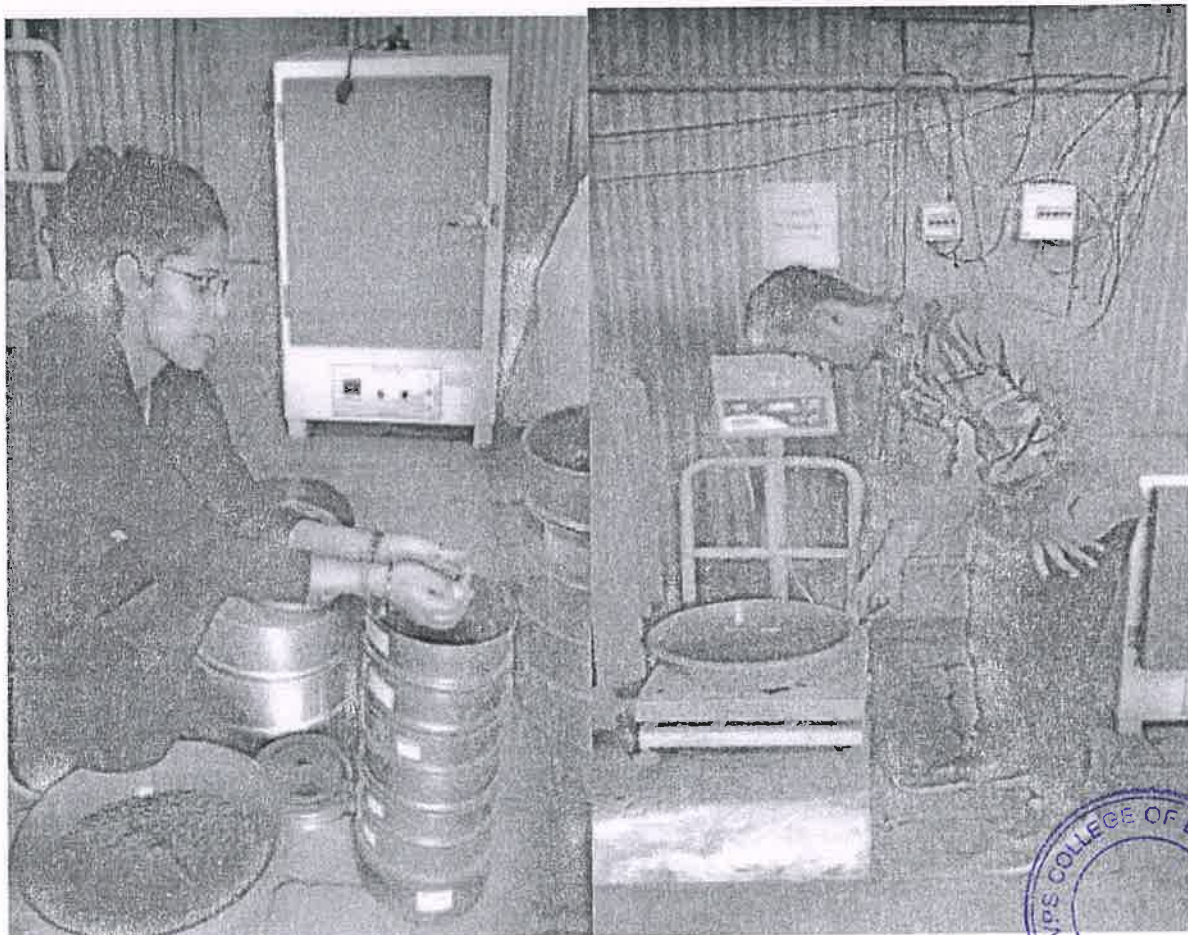
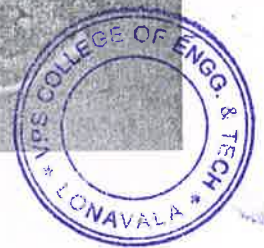


Fig 3.7 Fineness Modulus Test



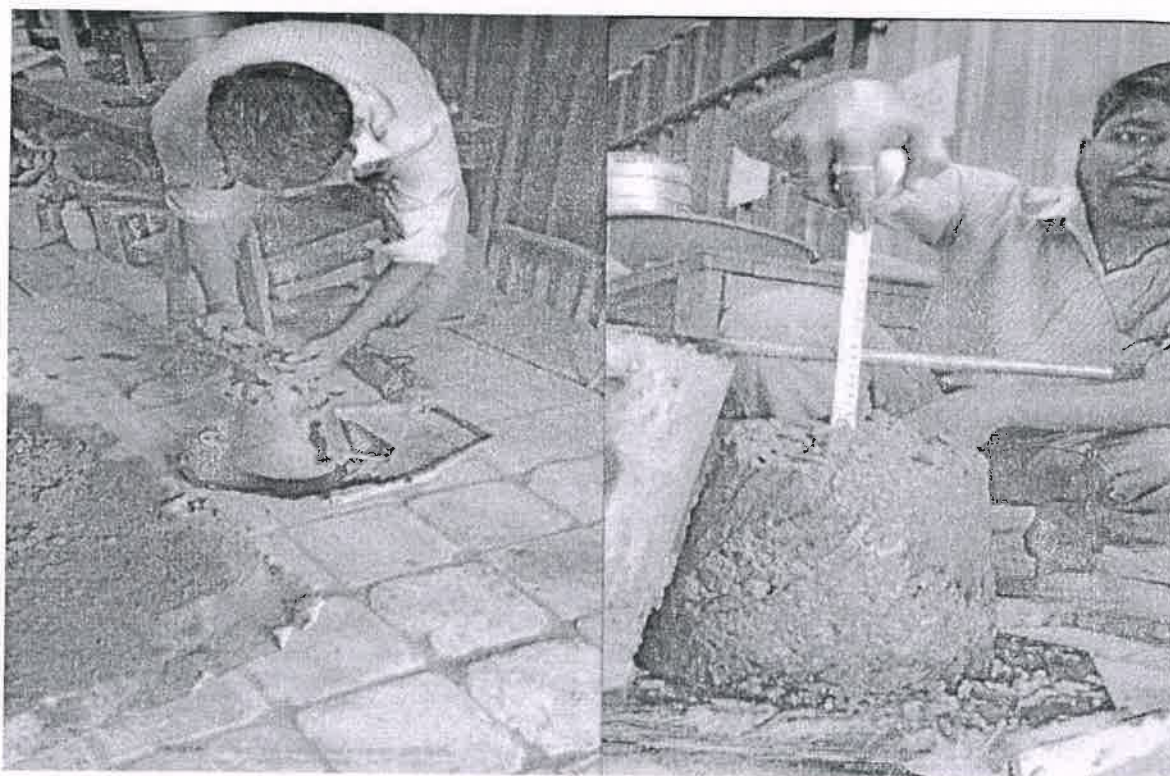


Fig 3.8 Slump Cone Test

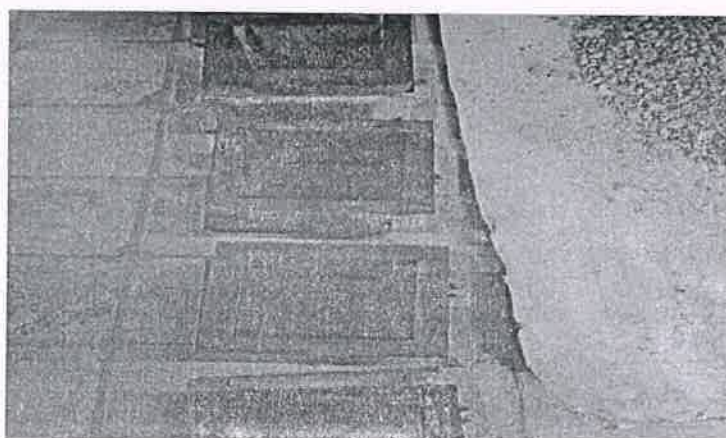


Fig 3.9 Oiling of Mould



Fig 3.10 Casting of Cubes



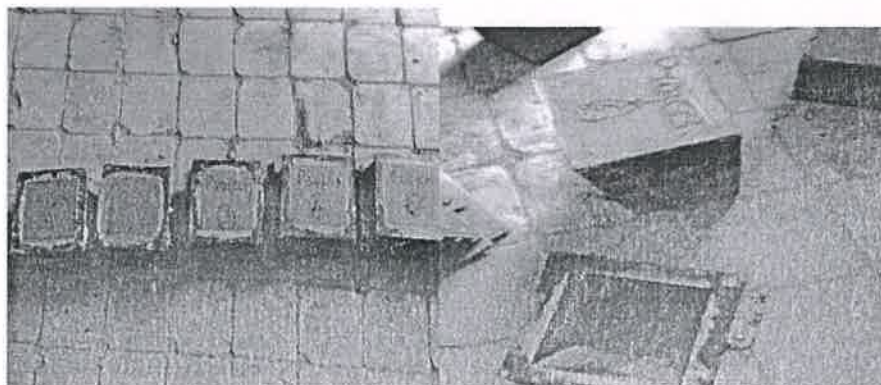


Fig 3.11 Removal of Cubes



Fig 3.12 Curing

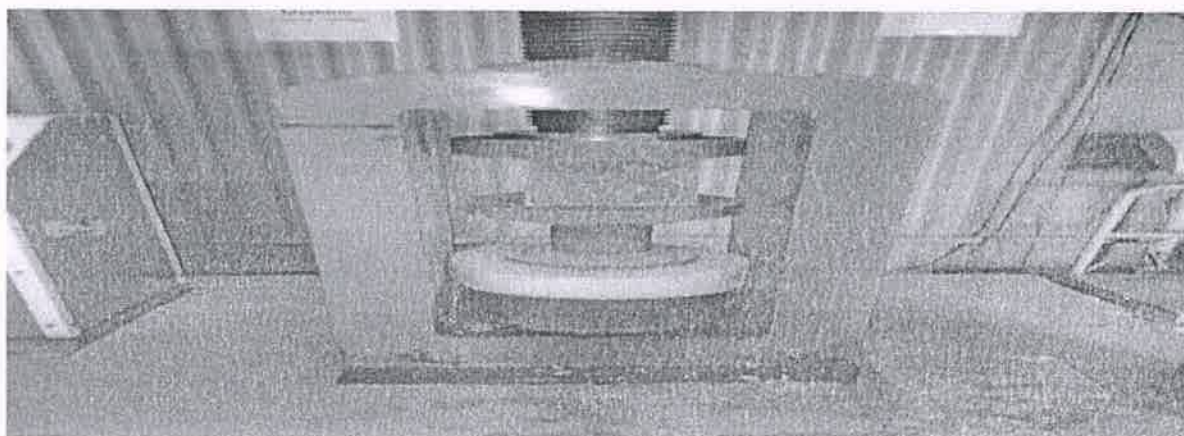


Fig 3.13 Compressive Test

4. Result Analysis

4.1 Water Analysis

The result of tests on water was enough satisfied in both cases of potable water as well as treated waste water of oil industrial. Basically, the pH value of potable water and treated industrial waste water was within the standard limits. As per BIS, pH of water to be used in construction should not be less than 6 and pH test shows that potable water and treated waste water have pH as 7.1 and 7.2 respectively. Some other tests of waste water like turbidity, hardness, alkalinity, etc. gives results as per norms given by the government. Result values of pH and Chlorides fits within the standards given in BIS regarding water used in concrete.



4.2 Water Analysis

The result of tests on water was enough satisfied in both cases of potable water as well as treated waste water of oil industrial. Basically, the pH value of potable water and treated industrial waste water was within the standard limits. As per BIS, pH of water to be used in construction should not be less than 6 and pH test shows that potable water and treated waste water have pH as 7.1 and 7.2 respectively. Some other tests of waste water like turbidity, hardness, alkalinity, etc. gives results as per norms given by the government. Result values of pH and Chlorides fits within the standards given in BIS regarding water used in concrete.

4.3 Compressive Strength Analysis

The design and casting of grade M20 cubes was done with the aid of industrial waste water. Nine cubes in all were cast. out of those nine. Three out of nine were tested to determine the compressive strength after 7, 14, and 28 days. Cubes poured in accordance with the mix design intended to reach the specified 26.6 MPa compressive strength. The average compressive strength of the cubes cast using industrial waste water was 36.26N/mm2 at day 28, exceeding both the intended mean strength and the characteristic strength.

Table 1: Compressive Strength Test Results

Cube No	Water Type	Testing Day	Compressive Strength (MPa)/{N/mm2}	Average Compressive Strength (Mpa)/{N/mm2}
1	Industrial	7	22.00	22.22
2	Industrial	7	22.44	
3	Industrial	7	22.22	
4	Industrial	14	28.40	27.55
5	Industrial	14	28.40	
6	Industrial	14	26.97	
7	Industrial	28	35.40	36.23
8	Industrial	28	36.50	
9	Industrial	28	36.50	

5. Conclusion

In order to reach the appropriate strength, according to BIS, concrete should only be mixed with drinkable water. Yet, several investigations revealed that treated wastewater from a variety of sectors provides concrete with the desired goal strength. According to the literature review, concrete cast using potable water doesn't have as much strength as concrete cast with treated waste water from places like car wash centres, dairies, and sewage treatment plants.

This study examines whether oil industry waste water can be used to make concrete or not. Concrete that has been cast and cured with potable water has strength that exceeds the desired mean strength. Contrarily, concrete that was cast and dried using industrial waste water produced strength above the desired mean strength.

Results indicate that the concrete cube's strength exceeds the required mean strength, indicating that industrial waste water may be utilised in place of the concrete's original water source.



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