

# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH001

### Problem Statement

Wheel Alignment /Balancing setup modification for ease,work accuracy and efficiency improvement in Wheel balancing

### Name of Industry / Organisation

Vaibhav Auto Service Station

### Type Of Industry / Organisation

Small

### Challenge Description with Context

The problem with the fix type existing wheel alignment balancing is that it can't accommodate all vast range of vehicle in term of length and breadth of vehicle wheel base. The challenge is to design the flexible setup that can accommodate vast range of vehicle for the alignment and balancing. The new setup also have ease and comfort in term it should reduce the fatigue to the worker by providing excess to vehicle from the pit only.

### What Exact Problem is being Solved?

In automobile sector one of the common service procedures is to perform alignment and balancing of automobile wheels. The problem with the fix type existing wheel alignment balancing is that it can't accommodate all vast range of vehicle in term of length and breadth of vehicle wheel base. It is also difficult for single person to perform whole procedure alone. For single person its time consuming and tedious to up and down on downstairs made in the setup to perform different task.

### Users

Automobile service stations around the state and nations are the prime user of the alignment/balancing setup as automobile industry is booming like anything. In every city there are minimum 5-10 service stations which use alignment/balancing setup.

### Expected Outcomes

Outcomes expectation of this problem statement is modification in existing setup or new design of vehicle alignment/balancing setup which can accommodate all vast range of vehicle in term of length and breadth of vehicle wheel base. The new setup should also provide ease and comfort by reducing the fatigue to the worker with excess to vehicle wheel from the pit only. It should improve the efficiency of worker.

### Potential Impact

The reduction in worker time to complete the whole alignment/balancing procedure is one of the impacts in automobile service industry which intern improves the overall efficiency and setup utilization. Modified/Newly designed setup reduce the requirement of manpower to perform the same task as compare to conventional setup and in urn reduce the overall cost by saving manpower cost. These two aspect impact a lot to the automobile service station industry.

### Probable Discipline

Automobile Engineering

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## Problem Statements

### Problem ID

SGH002

### Problem Statement

POSTURE CORRECTION

### Name of Industry / Organisation

UNITED CHARITABLE TRUST

### Type Of Industry / Organisation

Public Entities (Boards/Corporations/Panchayat/Government Societies etc)

### Challenge Description with Context

Cervical spondylosis is a general term for age-related wear and tear affecting the spinal disks in your neck. As the disks dehydrate and shrink, signs of osteoarthritis develop, including bony projections along the edges of bones (bone spurs). Cervical spondylosis is very common and worsens with age. Posture correction is fundamental need for today's industries. this term is also known as "ERGONOMICS". Where Ergo means work and Nomics means law of rules .These ergonomics and posture correction knowledge prevents various medical and orthopaedic conditions(Cervical Spondylitis,Lumbar Spondylitis , sciatica).

### What Exact Problem is being Solved?

Posture correction is fundamental need for today's industries. this term is also known as "ERGONOMICS". Where Ergo means work and Nomics means law of rules .These ergonomics and posture correction knowledge prevents various medical and orthopaedic conditions(Cervical Spondylitis,Lumbar Spondylitis , sciatica).A posture corrector should be lightweight and comfortable to wear when your spine is in its neutral position. If you start to slouch or round your shoulders, the device should provide gentle correction.

### Users

WHOLE SOCIETY HAVING CERVICAL PROBLEMS , PAIN IN NECK, persons who are continuously working on office chair.Poor posture can lead to severe back pain and individuals who are experiencing issues associated with poor posture should consider using one of the available posture correcting products.

### Expected Outcomes

Much like people want to take a pill and lose weight overnight, they also want to see immediate results with their posture. These CORRECTORS are effective for "reminding" you to have good posture.it should give the treatment with auto correction of posture with more accurate features.A posture corrector should be lightweight and comfortable to wear when your spine is in its neutral position. it should be wearable and small so that office going persons cant have any difficulty.

### Potential Impact

Posture correctors are a range of devices used to strengthen muscles in the lower and upper back, making it easier to stand up straight. They work by pushing your shoulders back so that your spine is aligned with your pelvis. As you continue to use the device, your muscles strengthen, allowing you to gradually maintain straight posture on your own. Posture correctors can reduce back pain.Posture correctors can help treat some tension headaches. it will have a large impact on society.

### Probable Discipline

Biomedical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH003

### Problem Statement

IoT based Smart bottle for Healthcare

### Name of Industry / Organisation

A V Parekh Technical Institute, Rajkot

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

During recent years, due to the technological advancements many sophisticated techniques has been evolved for assuring fast recovery of the patients in hospitals. Need for good patient care in hospitals, assessment and management of fluid and electrolyte is the most fundamental thing required. All most in all hospital, an assist/nurse is responsible for monitoring the electrolyte's bottle level. But unfortunately most of the time, the observer may forget to change the bottle at correct time due to their busy schedule

### What Exact Problem is being Solved?

To overcome this critical situation, a IoT based automatic alerting and indicating device is proposed where sensor is used as a level sensor or weight sensor. It is based on the principle that the sensor output changes when fluid level/weight is below certain limit. When Fluid level/weight is low, will alerts the observer through the display or/and mobile phone at the control room indicates the room number of the patient for quick recovery

### Users

Hospital uses simple electrolytes bottles with no indication, it may create a problem to patient because the reverse flow will start, blood start to flow from body towards bottle.

In, Hospital ICU, CCU, NICU, OPD, OT, most of all department of hospital required such kind of automatic monitoring and indication system.

Also Health care industries will one of the users. such monitoring system can be useful in small , medium and large size of hospitals and also it useful during home care.

### Expected Outcomes

If such a monitoring system builds, it will decrease the chances of patients hazards and increases the accuracy of health care in hospital. In future we can design a ready mate portable cover system for such bottle. Ready mate Wearable sensors on sides of bottle can detect level/weight of-fluid inside bottles.

Such data can also send to nurses and/or doctor`s mobile and they can start or stop the fluid and also monitoring fluid condition, such things required security password also.

### Potential Impact

Hospital staff, the constant need to manually monitor the level of bottles is avoided. This is of high advantage to the patients especially during night times. This system also avoids the fatal risk of air bubbles entering the patient's bloodstream, which is a serious threat as air bubbles in blood can cause immediate death. Such a device will create assurity of non-harm condition to patients. and also helpful to monitoring of data and such data can be stored and will be useful in future.

### Probable Discipline

Biomedical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH004

### Problem Statement

Enhancement of Collimator mechanism for better illumination in X-Ray machine by replacing the filament bulb with cheap LED for better collimated light or parallel rays in specific direction

### Name of Industry / Organisation

Genuine X-Ray and Radiological Equipment Pvt. Ltd.

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

An x-ray (radiograph) is a noninvasive medical test that helps physicians diagnose and treat medical conditions. imaging with x-rays involves exposing a part of the body to a small dose of ionizing radiation to produce pictures of the inside of the body.

A collimator is a device which narrows a beam of particles or waves. To narrow can mean either to cause the directions of motion to become more aligned in a specific direction (i.e., make collimated light or parallel rays), or to cause the spatial cross section of the beam to become smaller (beam limiting device). A collimator is a device used to regulate the size and shape of the x-ray beam , as we know the x-ray beam cannot be seen with naked eye. So a reflecting mirror and bulb is used in a collimator mechanism for visualizing the x-ray beam. A major problem occurring in the collimator mechanism is that light produced by the bulb get scattered and the field observed is not properly illuminated.

### What Exact Problem is being Solved?

The collimator consist of relays, various resistors ,ICs ,reflecting mirror and bulb the x-rays cannot be seen by the naked eyes so bulb is used to visualize the x-ray beam hence the problem in the collimator mechanism is that of the bulb, the light produced by the bulb is not properly illuminated and get scattered so fir this problem we have concluded a solution by replacing the bulb by LED for better illumination and much better visualization. the advantages of replacing the bulb with the LED is that the machine becomes more reliable, cheap, accurate, longer life span and also gives better illumination.

### Users

Doctors, Technicians, Super Speciality and Multi Specialty Hospitals, Researchers, Students, Academicians, Industries,All other stakeholders associated with medical field and dealing in medical instruments, Airport security system.

### Expected Outcomes

Project Title: Collimator Mechanism

The aim of this project is enhancement of collimation mechanism for better illumination and more accurate visualizing in X-ray machine

X rays are electromagnetic radiation that differentially penetrates structures within the body and creates images of these structures on photographic film or a fluorescent screen. These images are called diagnostic x rays.

A collimator is a device that narrows a beam of particles or waves. To narrow can mean either to cause the directions of motion to become more aligned in a specific direction (i.e., make collimated light or parallel rays), or to cause the spatial cross section of the beam to become smaller (beam limiting device).

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Collimators used in the medical field are almost always used for imaging devices, especially x-ray machines. Depending on the type of collimator used (there are five basic collimator types) the collimator works to channel and redirect photons of differing levels of energy, and are often used to assist with the magnification or minimization of images, and also allow technicians and medical practitioners to choose between the quality of the image that they are taking or the speed of the image that they are taking.

An X-ray collimator can be made from multiple materials including lead, tungsten, molybdenum, tin, bismuth, high density plastics and more.

A collimator consist of relays ,various resistors, a reflecting mirror and a bulb the problem occurring in the mechanism of collimator is that of the bulb, the light produced by the bulb get scattered and not properly illuminated

For this problem we have suggested a solution by replacing the bulb with the LEDs for better illumination and much better resolution

### Potential Impact

By solving the industrial defined problem many advantages have been noticed such as the cost of the manufacturing of the instruments get reduced and becomes much cheaper which results in increasing in the production of the instrument as well as the selling of the instruments on large scale. By this the society also gets benefit in reduction of the x ray reports costs .overall by solving this problem medical imaging gets better illuminated effect in the x rays.

### Probable Discipline

Biomedical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH005

### Problem Statement

Mobile device for COPD Detection and Classification

### Name of Industry / Organisation

RHP Medical Services

### Type Of Industry / Organisation

Small

### Challenge Description with Context

The pulmonary function test (PFT) is a very well-known method to identify pulmonary capacities and volumes. Available technology provides stand-alone, bulky and stationary devices. There is a constant gap of miniaturizing the PFT device with smart technology to evaluate the chronic obstructive pulmonary disease (COPD) conditions in rural areas having less medical facilities as compared to urban areas.

### What Exact Problem is being Solved?

Pulmonary function tests measure the amount of air a person can inhale and exhale, and if your lungs are delivering enough oxygen to your blood. Spirometry is the most common lung function test. During this test, you'll be asked to blow into a large tube connected to a small machine called a spirometer. This machine measures how much air your lungs can hold and how fast you can blow the air out of your lungs. Spirometry can detect COPD even before you have symptoms of the disease. It can also be used to track the progression of disease and to monitor how well treatment is working. Spirometry often includes measurement of the effect of bronchodilator administration. Other lung function tests include measurement of lung volumes, diffusing capacity and pulse oximetry.

### Users

Medical Practitioners or laboratories may use this device for detection of COPD condition in rural area where generally the symptoms are very hugely found. Moreover, if the device has been commercialized it can be used as Health Appliance for chronic asthmatic patients for assessment of their daily vital signs. The patients over 60 years having symptoms of respiratory tract diseases can also be considered as potential users of the developed solution.

### Expected Outcomes

Expected outcome of the given problem statement can be a medical device using some sort of sensor assembly to detect the abnormal conditions of pulmonary functions. The device may have few or all of the functionalities of Vital Pulmonary Parameters measurements, COPD classification algorithms, Intuitive GUI design, Miniaturized Design, Battery Powered and Real-time data logging on IoT servers.

### Potential Impact

The market of Medical instrument is having a vast potential for societal problem solution and it does touch to many lives globally. With increasing vehicles and industrial gas discharges in environment, there are growing complications in respiratory problems worldwide. These problems can be identified at early stage to take precautionary actions. If this problem is resolved, at least diagnosis of COPD for subjects having less economic or academic privileges can be availed at remote locations.

### Probable Discipline

Biomedical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH006

### Problem Statement

APEX Locator accuracy problem in dental treatment.

### Name of Industry / Organisation

Smile Dental Hospital

### Type Of Industry / Organisation

Small

### Challenge Description with Context

APEX is a last portion of our teeth. During many dental treatment its need to clean for next dental process. It is crucial to clean it properly else it will create other dental problem. An APEX locator helps us to find that wither apex cleared properly or not. But it has very less accuracy so we have to check apex with the help of X-ray (called IOPA). This leads high dose of X-ray for both patients and doctors.

### What Exact Problem is being Solved?

In dentistry APEX related problem is very common and challenging Problem. It is crucial to clean it properly else it will create other dental problem. An APEX locator helps us to find that wither apex cleared properly or not. But it has very less accuracy so we have to check apex with the help of X-ray (called IOPA). so We want to increase accuracy of APEX locator in their reading on display so we can avoid X-ray technology.

### Users

Dentist

Prosthodontics.

Periodontics.

Orthodontics.

Oral & Maxillofacial Surgery.

Operative Dentistry.

Pedodontics & Preventive Dentistry.

Conservative, Endodontics & Aesthetic Dentistry.

Periodontology & Oral Implantology.

### Expected Outcomes

Good accuracy leads to give better results of APEX locator. By increasing accuracy of APEX locator in their reading on display, allowing us avoid X-ray technology. So we can avoid X-ray technology. So Patient does not get high dose of X-Ray and get benefited from harmful radiation as well as the cost of X -Ray. Apart from that the process time also get reduced by this way so at the end it is win win situation for all patients, doctors and the Society.

### Potential Impact

Avoiding X-ray leads to stop high dose of X-ray for both patients and doctors. By increasing accuracy of APEX locator in their reading on display, allowing us to avoid X-ray technology. So Patient does not get high dose of X-Ray and get benefited from harmful radiation as well as the cost of X -Ray. Apart from that the process time also get reduced by this way so at the end it is win win situation for all patients, doctors and Society.

### Probable Discipline

Biomedical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH007

### Problem Statement

Degradation of pollutants using industrial wastewater

### Name of Industry / Organisation

Baba Wash

### Type Of Industry / Organisation

Small

### Challenge Description with Context

industrial wastewater treatment is still not satisfactory in many ways. Growing environmental pollution and its impact on ecology has forced us to be more stringent with our effluent release standards. Novel techniques like photocatalysis which have the potential to utilize sunlight for degradation of pollutants will help a long way in overcoming the current barriers.

### What Exact Problem is being Solved?

Problem of reducing the toxicity of wastewater released in industries.

### Users

Industries, Common Effluent Treatment PLants

### Expected Outcomes

Cheaper and efficient treatment of wastewater.

### Potential Impact

great scope of solar energy usage. Reduced sludge formation through photocatalysis.

### Probable Discipline

Chemical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH008

### Problem Statement

Design external/internal cooling system for Diazotization reaction in Batch reactor to reduce ice consumption

### Name of Industry / Organisation

Balaji Industries

### Type Of Industry / Organisation

Small

### Challenge Description with Context

It is desired to reduce ice consumption during dye manufacturing due to generation of huge quantity of wastewater at the end of the production.

Design external/internal cooling system for Diazotization reaction in Batch reactor to reduce ice consumption. System should be capable to maintain 0-5 C temperature of reaction mass. pH= 1 to 3. It is a rubber lined batch reactor.

Expected outcome may be cooling system that dye manufacturing unit can use for the production of dye. This system will conserve natural resources like fresh water and reduce treatment cost.

### What Exact Problem is being Solved?

It is desired to reduce ice consumption during dye manufacturing due to generation of huge quantity of wastewater at the end of the production.

Design external/internal cooling system for Diazotization reaction in Batch reactor to reduce ice consumption. System should be capable to maintain 0-5 C temperature of reaction mass. pH= 1 to 3

Expected outcome may be cooling system that dye manufacturing unit can use for the production of dye. This system will conserve natural resources like fresh water and reduce treatment cost.

### Users

There are more than 1000 small and medium scale dye manufacturing industries in Gujarat. During dye mfg. they are using huge quantity of ice. Using this system, consumption of ice can be reduce. Subsequently, wastewater generation can be reduce.

### Expected Outcomes

Expected outcome may be cooling system that dye manufacturing unit can use for the production of dye. It is expected to reduce ice consumption during dye manufacturing due to generation of huge quantity of wastewater at the end of the production.

Design external/internal cooling system for Diazotization reaction in Batch reactor to reduce ice consumption. System should be capable to maintain 0-5 C temperature of reaction mass. pH= 1 to 3. It is a rubber lined batch reactor.

### Potential Impact

Conservation of natural resources like fresh water and reduction of treatment cost. Expected outcome may be cooling system that dye manufacturing unit can use for the production of dye. It is expected to reduce ice consumption during dye manufacturing due to generation of huge quantity of wastewater at the end of the production.

Design external/internal cooling system for Diazotization reaction in Batch reactor to reduce ice consumption. System should be capable to maintain 0-5 C temperature of reaction mass.

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pH= 1 to 3. It is a rubber lined batch reactor.

**Probable Discipline**

Chemical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH009

### Problem Statement

Production of biofuels from food waste

### Name of Industry / Organisation

EnviroChem Services (OPC) Pvt. Ltd

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Currently world is facing energy crisis. Majority of the world's energy demand is fulfilled by conventional fuel based sources, which is limited and likely to be exhausted in near future. Moreover energy demand is increased day by day because of population explosion, GDP improvement and improved life style. So there is strong need for alternative, green and renewable energy source. In India majority of the food waste is discarded as municipal waste, which can be utilised for biofuel production.

### What Exact Problem is being Solved?

Production of biofuels from food waste by effectively process design and optimisation of process parameters. By effectively design process, plants operating and capital cost can be reduced to greater extent. Current prices of biofuel is way higher than the conventional fuels, which limits the use of biofuels in current market scenario. Thereby in order to make process cost effective, process modification and optimisation of process parameters are highly required.

### Users

Potential user is Transportation industry. Produced biofuel such as bio-CNG can be used in vehicals. Bio-ethanol can be blended with conventional fuel such as petrol and diesel, which will reduce requirements for conventional fuel. In short any sector deals with energy production, that sector can be potential user.

### Expected Outcomes

Development of effecient process for biofuel production from food waste.

Optimisation of process parameters for effective production of biofuels.

Design of equipments for effective production of biofuels from food waste.

Process integration in order to reduce utility requirements.

Checking economic viability of biofuels with conventional fossil based fuels.

Selection of appropriate food waste for biofuel production.

### Potential Impact

It can produce biofuel which will suffice world's energy demand. As currently world is facing energy crisis. Majority of the world's energy demand is fulfilled by conventional fuel based sources, which is limited and likely to be exhausted in near future. By effective design and optimisation of process parameters, produced biofuel would be competent with conventional fuel and reduce the gap between energy demand and supply.

### Probable Discipline

Chemical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH010

### Problem Statement

To develop cheap adhesive material for sticking precious stone and gems to different materials

### Name of Industry / Organisation

Forever Technology

### Type Of Industry / Organisation small

### Challenge Description with Context

Gem, jewelry and diamond industry is booming industry. Many types of gems and diamond cutting and polishing works are carried out for making rough gems and diamonds to fine polished diamonds. For this processes it is required to stick them with some metal or non metal materials. But the glue or other sticky materials are not much more firm to bind the gems for longer time with better strength. Sometimes these materials do not give proper strength so the gems or diamond come outs during process of cutting and polishing. So we required to have such material which can bind gem and diamonds with proper strength and also be detached after the completion of process.

### What Exact Problem is being Solved?

During the cutting and polishing process the diamond and gems must be stucked with proper strength and after the process will over it must be unstitched from the base material. So the process must be easy to use and there should be not required any hazardous chemicals. It may be used some handy tools so that the semiskilled workers can also use this process of sticking and detaching the gems and diamonds. Mixing of some chemicals can also be used for the process to make it viable. One more problem of coast effectiveness should also be maintained.

### Users

Diamond industry, gem and jewelry industry, workers, merchants and other people who use to cut and polish the diamonds. There are millions of people and institutions around the globe who are willing to invest in diamonds. Many individuals and organizations are very natural gems buyers and users. Fashion industry people are also stack holders of this problem.

### Expected Outcomes

After the problem identification and analysis one can prepare the glue type material and it can be used for sticking the gems or diamonds to the surfaces like metals and alloys. this glue type outcome material must be removed by some semi chemical or semi physical methods. the process must be handy and should not be required highly skilled man powers to dell wit this material. it should be also environment friendly and non hazardous to livings.

### Potential Impact

It is impact full for the diamond industry as well as for the fashion and jewelry industry too. If this problem statement is solved than it is possible to carry out the cutting and polishing work with less time consumption and also it will be coast effective for the industry. This process will also save energy and protract environment by eco friendly sticky glue type material. The workers in this industry will also benefited by getting this solution. This small and big both types of diamond industry can have this product impactful.

### Probable Discipline

Chemical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH011

### Problem Statement

Cold startup and choking of fuel sprayer due to increase in viscosity or solidification of Biodiesel.

### Name of Industry / Organisation

Infinium Biofuels Ltd.

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Viscosity of Biodiesel is higher than petrodiesel. During cold season it increases significantly with decrease in temperature

also sometimes it may solidified and choke the fuel sprayer of diesel engine. This creates engine startup problem during cold season and it is the drawback of the biodiesel. To use Biodiesel during cold season change in biodiesel in physical or chemical property needed.

### What Exact Problem is being Solved?

To solve this problem by somehow we have to change the physical or chemical change in the biodiesel so that the problem of choking and spraying of fuel in engine can be eliminate. By the physical properties we mean the viscosity of the biodiesel. By lowering the viscosity and not getting solidified it (biodeisel) the biodiesel can be used in standard diesel engine without coldstartup problem and choking of fuel sprayer.

### Users

The potential users of the biodiesel are the standard diesel engine operated vehicles.

Industries and diesel engine generators, engine to drive pumps at farms are also uses biodiesel as it is cheaper than petrodiesel now.

### Expected Outcomes

By solving this problem diesel engine startup problem during cold season and chking can be solved .To use Biodiesel during cold season change in biodiesel in physical or chemical property needed. The usage of biodiesel becomes easier and it can be used in standard diesel engine without creating problems of coldstartup of engine and choking of fuel sprayer in engine and it increases the usage of biodiesel.

### Potential Impact

Potentially by solving this problem it enhances the properties of biodiesel so it will not create problem during startup of engine and remove the drawback of biodiesel. It increases the use of biodiesel more and our dependancy on the non renewable source of energy will be decreased our foreign exchange needed to import the crude oil can be decreased and also it will helpful to the environment also as it lowers the emmision of Carbon monoxides.

### Probable Discipline

Chemical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH012

### Problem Statement

Develop such bricks or layer which absorb optimum heat and maintain maximum temperature in firing zone of kiln

### Name of Industry / Organisation

Jai Ganesh Vitrified Pvt. Ltd.

### Type Of Industry / Organisation

Small

### Challenge Description with Context

"The ceramic tile manufacturing process consumes a great amount of energy, mainly thermal energy, which is obtained from natural gas combustion. The increased cost of this fuel and the current economic situation make cost a critical issue that can hurt company competitiveness. The ceramic tile firing process in roller kilns does not exactly stand out for its energy efficiency, because about 50% of the energy input is lost through the kiln combustion flue gas and cooling gas stacks.

### What Exact Problem is being Solved?

The increased cost of this fuel and the current economic situation make cost a critical issue that can hurt company competitiveness . hence it need to reduce heat loss during firing process in kiln used for ceramics manufacturing. Study shows that about 50% of the energy input is lost through the kiln combustion flue gas and cooling gas stacks.

### Users

In Ceramic Industries such as ceramic wall tiles manufacturers, vitrified floor tiles manufacturers, porcelain floor tiles manufacturers, sanitary ware manufacturers, ceramic crockery ware manufacturers, ceramic refractories and insulator manufacturers.

### Expected Outcomes

Development of refractory bricks or insulation layer which can be used in to prevent heat loss in firing kiln.

### Potential Impact

Reduction heat loss during firing process in ceramics manufacturing which may lead to enhance firing efficiency of kiln and reduce the fuel cost and ultimately overall manufacturing cost can also be reduced. As a result the temperature outside the kiln may also drop which helps to improve surrounding working environment.

### Probable Discipline

Chemical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH013

### Problem Statement

Increase effective cooling rate in heat exchanger using cooling tower in plant

### Name of Industry / Organisation

KRISHNA FINECHEM INDUSTRIES

### Type Of Industry / Organisation

Small

### Challenge Description with Context

There are various types of cooling towers available into the area of chemical sector. The Cooling tower, as utility, have big role for the energy consumption rate in plant. Existed forced draft cooling tower was not reach up to the required cooling temperature while performing heat exchanger operation in plant. Heat exchanger is having key role for the production of product in plant. The continuous drop of cooling rate caused less heat transfer of material. The cooling chemical is used to reach cooling temperature near to reach 10 °C. Due to inappropriate cooling from cooling tower production rate is not maintained.

### What Exact Problem is being Solved?

Study the effect of heat transfer rate of cooling tower for the heat exchanger. The production rate is depending on the effective area of heat exchanger so need to understand heat removal rate with respect to cooling temperature. The cooling rate depends on design of cooling tower. Also the various coolants are being used to maintain appropriate cooling rate in to the heat exchanger. Confirm water is clean and free of debris. In order to reach the design condition we have to measure the airflow and also need to adjust the fan pitch. It is to be ensured that water is evenly distributed across the fill (clean nozzels, balance flow if multiple hot water tanks, other).

### Users

The problem statement is given by M/S. KRISHNA FINECHEM INDUSTRIES, Vapi. The research and development team of this Krishna finechem industries is trying to resolve this issue since last year and they have shared this problem with us under Smart Gujarat for new India Hackathon 2019-20.

### Expected Outcomes

If we are succeed to increase the effective cooling in heat exchanger for a cooling tower. These are the following expected outcomes may achieve.

#### 1. SAVES ENERGY

Cooling tower water treatment increases the efficiency of cooling tower by recirculating the water and removing particles such as suspended solids. If cooling system is operating at maximum efficiency, you save money and decrease maintenance.

#### 2. LESS MAINTENANCE

This also reduces cleaning of spray nozzles, heat exchanger plates, and other points of material build-up.

### Potential Impact

In potential Impact the solution of problem is going to reduce the cost of cooling water system. As if we installed a filtration system on the cooling tower, then less cleaning time will be required to reach the maximum cooling efficiency of cooling tower wherein, not only we can save the energy as well as reduced the maintenance costs and avoid expenses on

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replacement of parts. It also reduces the pollution as the coolant consumption will reduce.

### **Probable Discipline**

Chemical Engineering



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## Problem Statements

### Problem ID

SGH014

### Problem Statement

Full vacuum is not maintained during distillation process with water vacuum pump

### Name of Industry / Organisation

KRISHNA FINECHEM INDUSTRIES

### Type Of Industry / Organisation

Small

### Challenge Description with Context

In recent years, the industrial vacuum market has started making significant advancements in technology and efficiency. Industrial vacuum can be defined as vacuum used to perform a task in industrial processes, operating anywhere from atmospheric pressure to 1 torr. Distillation is a very important unit operation in any chemical industry used for separation of valuable products. For thermally degradable products vacuum distillation is used. There are various methods to create vacuum for vacuum distillation units such as rotary vane vacuum pumps, jet ejector and water vacuum pump etc. In water vacuum pump it is difficult to maintain desired level of vacuum. This same challenge is faced by Krishna Finechem industry.

### What Exact Problem is being Solved?

Various types of distillation process are used in industry to separate two or more liquids/gases. Vacuum distillation is one of such process. Vacuum distillation is performed under reduced pressure. Reduced pressure will increase the relative volatility and hence increases the recovery of the desired product. Pressure can be reduced by different vacuum system. Krishna Finechem industry uses vacuum water pump for reducing pressure in the distillation tower. In their vacuum distillation unit they are not able to maintain the vacuum as per their requirement using water vacuum pump. As a result they are not able to achieve their goal for higher recovery of the desired product.

### Users

The problem statement is given by M/S. KRISHNA FINECHEM INDUSTRIES, Vapi. The research and development team of this Krishna finechem industries is trying to resolve this issue since last year and they have shared this problem with us under Smart Gujarat for new India Hackathon 2019-20.

### Expected Outcomes

These are the following expected outcomes may achieve. 1. Degradation of heat sensitive product will be prevented by reducing its boiling point with the help of vacuum in distillation column to achieve desired separation. 2. With the help of vacuum relative volatility will be increased which allows easy separation of key components of interest which M/S Krishana Finechem Industries desired to separate from feed mixture.

### Potential Impact

In potential Impact the solution of problem is going to reduce the operating cost of distillation system. As if we installed a modified water vacuum system on the distillation tower, then less energy will be required to reach the maximum separation efficiency of vacuum distillation tower wherein, not only we can save the energy as well as reduced the maintenance costs and avoid expenses on replacement of parts. It also reduces the pollution as the coolant consumption will reduce.

### Probable Discipline

Chemical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH015

### Problem Statement

Utilization of coal gasifier as per GPCB norms

### Name of Industry / Organisation

Nilkanth Glazed Pvt. Ltd.

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

Coal gasifier can be utilized as per GPCB norms that environment pollution controlled

### What Exact Problem is being Solved?

Design a mechanism that can prevent environment pollution

### Users

Ceramic industry

### Expected Outcomes

Reduce environment pollution and utilization of coal gasifier

### Potential Impact

It can improve the price and quality of tiles.

### Probable Discipline

Chemical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH016

### Problem Statement

problem in manufacturing of flat sheet RO membrane

### Name of Industry / Organisation

osmotech india pvt. ltd.

### Type Of Industry / Organisation

Small

### Challenge Description with Context

To get pure potable water is the biggest issue now a days and to resolve this problem different types of water purifiers & filters are used. Among these reverse osmosis water filters are well known. In our country majority of the membrane used in RO filter (RO membrane) is imported from the other countries because we have very limited (one or two) manufacturing unit for RO membrane in India. This affects our economy as it decreases country's wealth. Keeping these facts in mind a manufacturing unit for flat sheet RO membrane is established at Shapar(Rajkot).

### What Exact Problem is being Solved?

water flux problem in manufacturing of flatsheet RO membrane

### Users

Public in general

### Expected Outcomes

To get a consistent quality of RO membrane

### Potential Impact

This will benefit the country's economy and India will be more self dependent in the production of RO membrane. Also, it may reduce the cost price of RO filters available in the market.

### Probable Discipline

Chemical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH017

### Problem Statement

Plastic to diesel converter

### Name of Industry / Organisation

Rajkot Municipality Corporation

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

To solve the problem of waste plastic in a green way, instead of landfill or burning. With many years exploring and conquering, Henan Doing producing waste pyrolysis plants and waste oil distillation plants, waste plastic to oil pyrolysis plant can pyrolysis down of waste plastic to energy. The final product from waste plastic to oil pyrolysis plant is fuel oil, carbon black and steel wire. Fuel oil can be as fuel to heating, such as heavy industries, cement factory, steel milling factory, glass making factory, boiler factory etc. The oil we get from the waste plastic to oil pyrolysis plant can be further distillate into diesel fuel oil. Diesel fuel oil is a very good diesel which is very close to common diesel. It can be used for tractors, trucks, diesel oil generators, and low speed engine like digging machine/road roller/loading machine and so on.

### What Exact Problem is being Solved?

Main features of plastic to diesel fuel oil distillation plant

#### 1. Fast.

The unique fast heating system is especially designed for shorten working time.

In market, mostly are horizontal reactor or old design for plastic to diesel distillation machine which take about 3-5days to finish one batch.

#### 2. Easy slagging

Vertical reactor make slagging from bottom automatically and fast.

#### 3. Energy saving

Fast heating system keep temperature even after slagging and you can use for next batch so is energy saving.

#### 4. Safe

Strict quality control system and professional safety devices guarantee our plastic to diesel distillation machine running safely and win a good reputation from customers.

#### 5. Environmental friendly

Professional dedusting systems ensure our plastic to diesel distillation machine runs zero pollution.

### Users

plastic to diesels users are all vehicles on road off roads entire society very good to society of urban and rural area with best out of waste. plastic to diesels users are all vehicles on road off roads entire society very good to society of urban and rural area with best out of waste

### Expected Outcomes

#### 1. Fast.

The unique fast heating system is especially designed for shorten working time.

In market, mostly are horizontal reactor or old design for plastic to diesel distillation machine which take about 3-5days to finish one batch.

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### 2. Easy slagging

Vertical reactor make slagging from bottom automatically and fast.

### 3. Energy saving

Fast heating system keep temperature even after slagging and you can use for next batch so is energy saving.

### 4. Safe

Strict quality control system and professional safety devices guarantee our plastic to diesel distillation machine running safely and win a good reputation from customers.

### 5. Environmental friendly

Professional dedusting systems ensure our plastic to diesel distillation machine runs zero pollution.

## Potential Impact

user review : I've successfully tried plastic pyrolysis oil in the distillation machine. It took 7 hours finished 4T fuel oil processing. Result is better for plastic oil as raw material. Plastic diesel quality is good. I've successfully tried plastic pyrolysis oil in the distillation machine. It took 7 hours finished 4T fuel oil processing. Result is better for plastic oil as raw material. Plastic diesel quality is good.

## Probable Discipline

Chemical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH018

### Problem Statement

Manufacturing cup and saucer in this ceramic industry. They have lot of rejection because of binding of cup and its handle is not proper and after vulcanisation create problem.

### Name of Industry / Organisation

Shiv Ceramic

### Type Of Industry / Organisation

Small

### Challenge Description with Context

This company is involved in manufacturing ceramic i.e. cup and saucer. They have problem of the rejection. The problem is binding of cup and handle. After that they put it for vulcanisation in kiln and which result in rejection. Quality improvement is required.

### What Exact Problem is being Solved?

To improve the binding of cup and handle which is bind with the help of resin. The selection of resin and method of joining is playing major role. It is proposed to try with different resins and the method should be modified and result should be less rejection.

### Users

Household users, small entrepreneurs and small shop keepers are selling this product.

### Expected Outcomes

The quality of product will improve and it will result in reduction of rejection. This will be beneficial to many units of similar types.

### Potential Impact

This problem is common for most of the Ceramic industry. This will have impact on market. The cost of cup will reduce.

### Probable Discipline

Chemical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH019

### Problem Statement

Removal of Ammonical Nitrogen from Industrial wastewater containing reactive dye.

### Name of Industry / Organisation

Shreenath Chemical Industries

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Shreenath Chemical Industries, plot no 6814 to 6818, Ankleshwar, Gujarat having effluent related problem. this industry produces reactive dyes, which produces enormous amount of effluent which contains ammonical nitrogen with reactive dye. so, as per the government norms it is required to treat the effluent and reduce the ammonical nitrogen within the permissible limits. Industry requires the treatment or removal process to solve this issue.

### What Exact Problem is being Solved?

Shreenath Chemical Industries, plot no 6814 to 6818, Ankleshwar, Gujarat having effluent related problem. this industry produces reactive dyes, which produces enormous amount of effluent which contains ammonical nitrogen with reactive dye. so, as per the government norms it is required to treat the effluent and reduce the ammonical nitrogen within the permissible limits. Industry requires the treatment or removal process to solve this issue.

### Users

Shreenath Chemical Industries, plot no 6814 to 6818, Ankleshwar, Gujarat.

outcomes of this problem can be useful to the any dye, dye intermediate and pigment producing industries. They can use the outcome of this problem for their effluent to solve their own issues.

### Expected Outcomes

Shreenath Chemical Industries, plot no 6814 to 6818, Ankleshwar, Gujarat having effluent related problem. this industry produces reactive dyes, which produces enormous amount of effluent which contains ammonical nitrogen with reactive dye. so, as per the government norms it is required to treat the effluent and reduce the ammonical nitrogen within the permissible limits. Industry requires the treatment or removal process to solve this issue.

### Potential Impact

Shreenath Chemical Industries, plot no 6814 to 6818, Ankleshwar, Gujarat having effluent related problem. this industry produces reactive dyes, which produces enormous amount of effluent which contains ammonical nitrogen with reactive dye. so, as per the government norms it is required to treat the effluent and reduce the ammonical nitrogen within the permissible limits. Industry requires the treatment or removal process to solve this issue.

solution of this problem reduce the environmental damage due to release of effluent into water bodies.

### Probable Discipline

Chemical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH020

### Problem Statement

Recycling/ reutilization of treated effluent

### Name of Industry / Organisation

The Banaskantha District Cooperative Milk Producers' Union Limited, Palanpur

### Type Of Industry / Organisation

Large

### Challenge Description with Context

At present we are treating effluent and getting required quality as per GPCB norms. We want to utilize this treated effluent in the various dairy process and utilities. We are facing problem of higher TDS of treated water. While further treatment with RO technology again higher TDS water will generate. At present we are treating effluent and getting required quality as per GPCB norms. We want to utilize this treated effluent in the various dairy process and utilities. We are facing problem of higher TDS of treated water. While further treatment with RO technology again higher TDS water will generate.

### What Exact Problem is being Solved?

At present we are treating effluent and getting required quality as per GPCB norms. We want to utilize this treated effluent in the various dairy process and utilities. We are facing problem of higher TDS of treated water. While further treatment with RO technology again higher TDS water will generate. At present we are treating effluent and getting required quality as per GPCB norms. We want to utilize this treated effluent in the various dairy process and utilities. We are facing problem of higher TDS of treated water. While further treatment with RO technology again higher TDS water will generate.

### Users

Various internal dairy plant sections. At present we are treating effluent and getting required quality as per GPCB norms. We want to utilize this treated effluent in the various dairy process and utilities. We are facing problem of higher TDS of treated water. While further treatment with RO technology again higher TDS water will generate.

### Expected Outcomes

Reduction in fresh water requirement of the plant. At present we are treating effluent and getting required quality as per GPCB norms. We want to utilize this treated effluent in the various dairy process and utilities. We are facing problem of higher TDS of treated water. While further treatment with RO technology again higher TDS water will generate. At present we are treating effluent and getting required quality as per GPCB norms. We want to utilize this treated effluent in the various dairy process and utilities. We are facing problem of higher TDS of treated water. While further treatment with RO technology again higher TDS water will generate.

### Potential Impact

Less water use from underground and surface water sources. At present we are treating effluent and getting required quality as per GPCB norms. We want to utilize this treated effluent in the various dairy process and utilities. We are facing problem of higher TDS of treated water. While further treatment with RO technology again higher TDS water will generate. At present we are treating effluent and getting required quality as per GPCB norms. We want to utilize this treated effluent in the various dairy process and utilities. We are facing

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## Problem Statements

problem of higher TDS of treated water. While further treatment with RO technology again higher TDS water will generate.

### **Probable Discipline**

Chemical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH021

### Problem Statement

Feasibility of Reuse/recycling of RO reject water

### Name of Industry / Organisation

Colourtex Pvt. Ltd, Surat

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

Reverse osmosis (RO) process uses widely in industries for wastewater and ultra water purification treatment. Waste generated by these process is released in form of reject water which is up to 30% of inlet water and it contains high TDS including dissolved silica compounds which is responsible for deposit and damage internal membrane, so it is problematic to recycle the water with secondary RO treatment. The challenge is to apply efficient technique to remove dissolved silica and profitably recycle water.

### What Exact Problem is being Solved?

It is possible to profitable recycling the water by removing the silica compounds throughout proper treatment and then passing through secondary RO plant. But the techniques for removal of dissolved silica is not feasible for apply for profitably recycling of water. The techniques available like electro-coagulation, electro-dialysis,etc which is either costly or requiring more maintenance. So it is necessary to find a feasible and innovative way to treat dissolved silica for profitably recycling of water.

### Users

The objectives of an RO plant for industrial use are distributed in the following way: 50% in desalination of seawater and brackish water; 40% in the production of ultrapure water for the electronic, pharmaceutical and energy production industries; 10% as decontamination systems for urban and industrial water.

### Expected Outcomes

As expected outcome, the industry is looking forward to utilize the Reverse Osmosis (RO) reject water that may be treated successfully using any of the techno-economic alternative as per the treated water characteristics. By treating the reverse osmosis reject stream, substantial saving in the water that is otherwise not utilised. also the reject water will be utilised so the fresh water make up quantity will be reduced.

### Potential Impact

The potential impact of the problem if solved are many viz., there will be substantial saving of fresh water due to the exploration of RO reject stream reuse/recycle based on the quality of water that will be produced. Thus water footprint will be lowered down. Wastewater quantity will also be reduced due to this. The process will become more greener. The life of membrane will be also affected and this will be added benefit to the company.

### Probable Discipline

Chemical Engineering, Environmental Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH022

### Problem Statement

To provide ventilator in the bathroom of a residential building.

### Name of Industry / Organisation

ALFA ENGINEERS AND CONTRACTORS

### Type Of Industry / Organisation

Small

### Challenge Description with Context

In a residential building, inner side attached bathroom needs ventilator which is not possible as there is common wall on one side, and there is store room and bedroom on the other two sides and kitchen on the remaining side.

So the challenge is to provide the necessary ventilator in the bathroom as all the sides are packed and it is not possible to provide the ventilator by conventional methods.

### What Exact Problem is being Solved?

In a residential building, inner side attached bathroom needs ventilator which is not possible as there is common wall on one side, and there is store room and bedroom on the other two sides and kitchen on the remaining side.

So the challenge is to provide the necessary ventilator in the bathroom as all the sides are packed and it is not possible to provide the ventilator by conventional methods.

### Users

The users are the Residents of the house for which the problem is being solved.

### Expected Outcomes

Ventilation in the bathroom has to be provided by critical thinking.

### Potential Impact

Fresh air will be available for the users.

### Probable Discipline

Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH023

### Problem Statement

Ground improvement solution to mitigate liquefaction problem.

### Name of Industry / Organisation

Anandjiwala Technical Consultancy

### Type Of Industry / Organisation

Small

### Challenge Description with Context

In an ongoing project due to high water table and low standard penetration test (SPT) N-value of soil is liquefied up to 30 m depth so construction on this land is difficult. solution to mitigate the liquefaction problem by using suitable ground improvement techniques is expected so that Liquefaction problem will be reduced and good soil parameter will be available for the structural design to be more economical resulting in reduced overall cost of the Project.

### What Exact Problem is being Solved?

In the trending position value of land is very high and availability of good land is less so it is necessary to mitigate the liquefaction problem by using suitable ground improvement techniques. Liquefaction problem will be reduced and good soil parameter will be available for the structural engineer for the design so design of structure will be more economical so the overall cost the structure will be reduced.

### Users

This ground improvement technique used by different construction agency for their project work. By using the ground improvement method we can construct structure on the cheap land and reduce the overall project cost.

### Expected Outcomes

This ground improvement technique used by different construction agency for their project work. By using the ground improvement method we can construct structure on the cheap land and reduce the overall project cost. Generally ground improvement techniques are most useful for such kind of problem. Any kind of ground improvement technique can be used to overcome this type of problem in the region which are prone to liquefaction.

### Potential Impact

This ground improvement technique used by different construction agency for their project work. By using the ground improvement method we can construct structure on the cheap land and reduce the overall project cost. Generally ground improvement techniques are most useful for such kind of problem. Any kind of ground improvement technique can be used to overcome this type of problem in the region which are prone to liquefaction.

### Probable Discipline

Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH024

### Problem Statement

Ground Improvement Techniques for highly plastic clayey soil of Dholera SIR region.

### Name of Industry / Organisation

Anandjiwala Technical Consultancy

### Type Of Industry / Organisation

Small

### Challenge Description with Context

In Gujarat state especially in Dholera region highly plastic clayey soil named as Black cotton soil is encountered which is unconsolidated due to tidal variation. While performing the Standard Penetration Test (SPT) in this type of soil it comes up to 10.00 m depth. Because of high Liquid limit,, Plastic limit, Free swell index and swell pressure, construction of any structure on this type of land is very difficult. After detail study of soil, suitable ground improvement techniques can be suggested which ultimately turns out to be economical.

### What Exact Problem is being Solved?

Settlement is the main problem which occurs in highly plastic clayey. In Gujarat state especially in Dholera region highly plastic clayey soil named as Black cotton soil is encountered which is unconsolidated due to tidal variation. While performing the Standard Penetration Test (SPT) in this type of soil it comes 1 up to 10.00 m depth. Because of high Liquid limit,, Plastic limit, Free swell index and swell pressure, construction of any structure on this type of land is very difficult. Dholera region is under special Investment Region (SIR) in Gujarat and the cost of land is very high and population growth is also high so due to less availability of good land it is necessary to use this land for development. To use this land it is necessary to improve the ground by using any of the suitable methods.

### Users

The solution given for ground improvement techniques can be used by different construction agency for their project works. By using the ground improvement methods we can construct structure on the available land and reduce the overall project cost.

The solution given for ground improvement techniques can be used by different construction agency for their project works. By using the ground improvement methods we can construct structure on the available land and reduce the overall project cost.

### Expected Outcomes

Settlement is the main problem which occurs in highly plastic clayey. In Gujarat state especially in Dholera region highly plastic clayey soil named as Black cotton soil is encountered which is unconsolidated due to tidal variation. While performing the Standard Penetration Test (SPT) in this type of soil it comes 1 up to 10.00 m depth. Because of high Liquid limit,, Plastic limit, Free swell index and swell pressure, construction of any structure on this type of land is very difficult. After detail study of soil suitable ground improvement techniques can be suggested.

### Potential Impact

The solution given for ground improvement techniques can be used by different construction agency for their project works. By using the ground improvement methods we can construct structure on the available land and reduce the overall project cost.

The solution given for ground improvement techniques can be used by different construction

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# Smart Gujarat For New India Hackathon 2019-20

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agency for their project works. By using the ground improvement methods we can construct structure on the available land and reduce the overall project cost.

### **Probable Discipline**

Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH025

### Problem Statement

Classified volume count of vehicles on roadway for 24 hours and 7 days automatically. Not only numbers. Numbers with category identification.

### Name of Industry / Organisation

ARTH INFRASTRUCTURE

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

To collect data manually for 24 hours is a tedious job. It proves costly if hiring manpower as a team of surveyor in 3 shifts, each for 8 hours. There are chances of error also due to human being involvement and lack of continuous observation. Weather also affects performance of humans during survey. On certain Highways there is requirement of data collection throughout year. Toll roads can give data about numbers and categories of vehicle but it is not available for urban and non-toll roads. The number of vehicles can not be counted category wise in mix traffic condition in India without manual method. By Videography, It is possible to get data in office without standing on roadside for counting, But, then also it is required to run video and count category wise vehicles manually.

### What Exact Problem is being Solved?

Some technique which record category wise vehicle counts at a road section or at an intersection?

What number of two wheelers?

What number of 3 wheelers?

What number of 4 wheelers?

What number of buses?

What number of trucks?

By conducting the survey at an intersection for limited hours so that during peak hours is generally observed on urban roads. In this method manually surveyors are counting vehicles from different directions. Those data has been entered in 10-15 min interval. Volume count in PCU/ hr and peak hour is considered for analysis.

### Users

Toll Collection Company for roadway

Government as a client for PPP mode of road projects

Government as authority for road construction and maintenance

Government as implementing safety strategies

Government as authority to take decision of widening of road

Municipal Corporation as an authority to construct and maintain roads.

Municipal Corporation as an authority to take decisions for signalized intersection and flyover project proposals.

Traffic cell and traffic police as an authority to control and manage traffic.

Contractors and companies working in roadway planning, designing, construction and maintenance

Students working on research projects

### Expected Outcomes

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

1. Classified volume count,category wise number of vehicles passing through roadway at a definite location.
2. From videography auto detection and counting number of vehicles of different categories.
- 3.. Develop program to identify vehicle category as per physical dimensions.
- 4.. Provide something in pavement section to detect vehicle category along-with time recording.
- 5.. It should be cost effective.
- 6.. It should weather resistant.
7. It should maintenance free/ demands for less maintenance.
8. It should be easy to implement.

## Potential Impact

1. Data collection time can be saved.
2. At any instant of time data can be retrieved easily.
3. Human man power requirements in any environmental conditions can be overcome.
4. Human error possibilities due to physical, psychological characteristics can be overcome.
5. Effect on human due to weather conditions during survey can be overcome.
6. New technique may demand for initial investment for implementation but wages to surveyor can be avoided/ saved.

## Probable Discipline

Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH026

### Problem Statement

High strength Self compacting concrete using marble waste in substitution of natural aggregate

### Name of Industry / Organisation

Ashish Bridgecon Pvt. Ltd.

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

The main challenge will be to gain the strength of Self Compacting Concrete using marble waste as compared to the strength of conventional concrete using conventional concrete making materials..

Overcoming the problems regarding the practical usage of Self Compacting Concrete.

Challenges regarding the change in entire production process of conventional concrete, and to go for least expensive operation.

As we all know, concrete is the second largest used material worldwide and aggregates being the body of concrete, constituting around 80% of the total volume of the concrete, the availability of natural aggregates will be a serious concern in the near future. Thus, it is essential to search an alternative source of aggregates. In this regard, marble waste can be a potential alternative source to natural aggregates. Now what is this marble waste and how it is produced? Marble is industrially processed by cutting, polishing, etc. for its application for various decorative purposes. During this process, a considerable amount of marble waste around 20-30% is produced, which causes a serious problem of deposing them. In most cases, this waste is dumped on open lands which causes lots of environmental as well as health problems. Thus, opening the doors for the usage of marble waste as a replacement of aggregates in concrete making. Though, lots of researches have been done and are currently being carried out on Self Compacting Concrete (S.C.C.), the practical application of Self Compacting Concrete is project specific, and that too with a limited scope. Currently, researches on Self Compacting Concrete have been carried out using conventional concrete making material (i.e. aggregates). Many researchers have worked on usage of marble waste as a replacement of aggregates in conventional concrete, but its application to High strength Self-Compacting Concrete has not been stressed upon. Further, this marble waste, being smooth textured will require comparatively less energy for workability, which suits its applicability to Self-Compacting Concrete.

Hence, the project is intended:

1. To utilize the marble waste in making high strength Self-Compacting Concrete, which otherwise would have been dumped on the land, causing the land pollution and other problems. This will minimize the environmental hazards.
2. To use marble waste as an alternative to aggregates for making high strength Self Compacting Concrete by partial or full replacement of aggregates. This will not only utilize the waste, but also minimize the use of depleting sources of natural aggregates.

Thus, the idea is to prepare a concrete which aims at the sustainable development.

### What Exact Problem is being Solved?

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

As the availability of natural aggregates will be problem in the near future, we have to search for an alternative to replace the aggregates.

In this regard, marble waste can be a potential alternative source to natural aggregates.

Though, lots of researches have been done and are currently being carried out on Self Compacting Concrete (S.C.C.), the practical application of Self Compacting Concrete is project specific, and that too with a limited scope. Currently, researches on Self Compacting Concrete have been carried out using conventional concrete making material (i.e. aggregates). Many researchers have worked on usage of marble waste as a replacement of aggregates in conventional concrete, but its application to High strength Self-Compacting Concrete has not been stressed upon.

Thus, determining all the parameters of marble waste, based on which, it may replace aggregates in concrete making in upcoming times.

### Users

Each living being who uses the concrete for various purposes.

Each one who is currently working on or wills to work in the future on Self Compacting Concrete, this research may be helpful.

As the cost of construction can be reduced by using potential waste materials, the development of the country can be fast, easy and economical.

### Expected Outcomes

Finding a potential source to replace the aggregates and taking a leap towards the sustainable development by using industrial waste.

To utilize the marble waste in making high strength Self-Compacting Concrete, which otherwise would have been dumped on the land, causing the land pollution and other problems. This will minimize the environmental hazards.

To use marble waste as an alternative to aggregates for making high strength Self Compacting Concrete by partial or full replacement of aggregates. This will not only utilize the waste, but also minimize the use of depleting sources of natural aggregates.

### Potential Impact

possibilities are endless. Future can demand anything, be it a replacement of aggregates, be it marble waste, even replacement of cement maybe.

Though, lots of researches have been done and are currently being carried out on Self Compacting Concrete (S.C.C.), the practical application of Self Compacting Concrete is project specific, and that too with a limited scope. Currently, researches on Self Compacting Concrete have been carried out using conventional concrete making material (i.e. aggregates). Many researchers have worked on usage of marble waste as a replacement of aggregates in conventional concrete, but its application to High strength Self-Compacting Concrete has not been stressed upon.

### Probable Discipline

Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH027

### Problem Statement

Development of tool for deciding the cable profile in PT structures AS per IS 1343:2012

### Name of Industry / Organisation

CASAD CONSULTANTS Pvt. Ltd.

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

Now-a-days long and slender structures are proposed to design to suit architectural and aesthetic requirements. As a result, the post-tensioning system is getting more and more popular in construction industry. Such long and slender structures are difficult to design using conventional RC elements because of limitation of RC elements. If RC elements are used, it will not only result in robust section but also leads to uneconomical solution. The designing of pre-stressed concrete structures is not only tedious and iterative but voluminous too. So for neophyte the designing of pre-stressed concrete is time consuming, uneconomical and involves iterations. Most of the commercially available software packages have the limitations of providing a guide to select preliminary cable profile which could result in minimal trails. In most cases this has to be decided based on past experiences. The designing of pre-stressed concrete structures is not only tedious and iterative but voluminous too. So for neophyte the designing of pre-stressed concrete is time consuming, uneconomical and involves iterations. Most of the commercially available software packages have the limitations of providing a guide to select preliminary cable profile which could result in minimum trails. In most cases to select preliminary cable profile has to be decided based on an engineer past experiences.

### What Exact Problem is being Solved?

So our idea here is to present a methodology to design PT slab involving minimum iterations by developing a tool for preliminary design of cable profile. And also idea of post tensioning the structure is used to design such structures which would result in not only economy but also aesthetically pleasing slender structures. Another reason to use post tensioning in the structures is to satisfy clearance height, self-weight, deflection and cracking requirements compared to conventional RC element.

### Users

Develop the tool for the determining preliminary cable profile for which it will be handy tool for design consultants to minimize the iterations, especially the neophyte users. As it will minimize time consuming, trail and error and itreation involved in the design of prestressed concrete slab.

### Expected Outcomes

Here we are developing the tool for the neophyte user to minimize the iterations for the preliminary design of cable profile because of preliminary design of cable profile has to be decided based on past experiences. It is our project main outcome to the industry and also neophyte users. Other outcomes of our project is, by using post tensioning system in the structure reducing floor to floor height, self weight of structure, deflection, rate of use of steel and concrete in the slab and crack controlling.

### Potential Impact

Most of the commercially available software packages have the limitations of providing a

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# **Smart Gujarat For New India Hackathon 2019-20**

## **Problem Statements**

guide to select preliminary cable profile which could result in minimum trails. In most cases this has to be decided based on past experiences. So, here our potential impact is we are developing the tool for determining preliminary cable profile for which it will be handy tool for design consultants to minimize the iterations, especially the neophyte users. In other words, a tool for determining preliminary cable profile will be developed which will not only result in economy but also minimize the time consuming, trial and error process.

### **Probable Discipline**

Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH028

### Problem Statement

Develop a program for designing slab as per IS code directly from CAD drawing

### Name of Industry / Organisation

Dhaval Barochia & Associates

### Type Of Industry / Organisation

Small

### Challenge Description with Context

For any building design first we have make a geometry in CAD software and from their we import geometry in design software , there are many software available for design of beam and column like Staad Pro, but for slab design very few software available and its also not a user friendly, if we develop a program which is design slab as per IS code directly from CAD drawing then its very helpful to use

### What Exact Problem is being Solved?

For any building design first we have make a geometry in CAD software and from their we import geometry in design software , there are many software available for design of beam and column like Staad Pro, but for slab design very few software available and its also not a user friendly, if we develop a program which is design slab as per IS code directly from CAD drawing then its very helpful to use

### Users

Autocad software is versatile drawing software. It is uses by all the field of engineering like Civil Engineering, Mechanical Engineering, electrical engineering etc. If the problems being solve as stated in above statement it will very beneficial to Structural Engineer.

### Expected Outcomes

If the problems being solve as stated in above statement it will very beneficial to Structural Engineer. If the Autodesk company made this changes in their Autocad software it will very beneficial to all civil and structural engineering practitioners to save their time. Also by making this change it will helpful the freshers also who are learning structural design particularly for civil engineering field.

### Potential Impact

By making this system in Autocad software, the perfection in design we will maintain in out day to day structural design of buildings. Also it will reduce the time for the practitioner. Right now the building structural design is carried out with some civil engineering design software like, Stadd. Pro., SAP, ETABS etc. If this designs readily available in Autodesk software than the drawing import in stadd pro software will easy.

### Probable Discipline

Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH029

### Problem Statement

Off Grid Solar Home System(SHS)

### Name of Industry / Organisation

Dr J N Mehta Government Polytechnic, Amreli

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

This chapter focuses on the second market segment, namely, solar home system business models with a particular focus on those operating on the PAYGO or “rent-to-own” basis. This option is rapidly emerging as the most promising solution to overcome some of the challenges of traditional, grid-based electrification efforts while still providing life-changing energy service for citizens in periurban, rural, and remote areas. SHS can be individually purchased, financed, implemented, and operated. This level of independence and flexibility allows rapid market growth without the need of extensive regulatory frameworks or policy support.

### What Exact Problem is being Solved?

A home solar system must provide enough electric energy to fulfil all the power requirements of a home. It should also be capable of providing AC power as traditionally all homes use AC power to operate lighting systems, gadgets, appliances and equipment such as computers, refrigerators, mixers, fans, air conditioners, TVs and music systems. It will overcome higher demand of energy by utilization of continuing and pollution free conventional energy sources.

### Users

Solar home systems (SHS) are stand-alone photovoltaic systems that offer a cost-effective mode of supplying amenity power for lighting and appliances to remote off-grid households. In rural areas, that are not connected to the grid, SHS can be used to meet a household's energy demand fulfilling basic electric needs. Globally SHS provide power to hundreds of thousands of households in remote locations where electrification by the grid is not feasible.

### Expected Outcomes

They contribute to the improvement of the standard of living by: reducing indoor air pollution and therefore improving health as they replace kerosene lamps, providing lighting for home study, giving the possibility of working at night and facilitating the access to information and communication (radio, TV, mobile phone charging). Furthermore, SHS avoid greenhouse gas emissions by reducing the use of conventional energy resources like kerosene, gas or dry cell batteries or replacing diesel generators for electricity generation. Further impacts of renewable energies, such as SHS, can be found in the Report on Impacts. Stand-alone photovoltaic systems can also be used to provide electricity for health stations to operate lamps during night and a refrigerator for vaccines and medicines to better serve the community.

### Potential Impact

There are many technical problems involved in the PV electrification process. The current strategies in PV electrification projects need to be improved, where education should be more emphasized and infrastructure strengthened. The World Bank has made a PV quality program which is promising. Further work could include contacting the World Bank, to learn more

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

about their plans for. While learning more about PV systems, the subject becomes larger. There is an enormous amount of theory concerning each component. Further work could include going deeper into a particular component. It would be most interesting to look at the most problematic components. Also, further laboratory exercises on the battery should be done.

### Probable Discipline

Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH030

### Problem Statement

Automatic Drip Irrigation System

### Name of Industry / Organisation

Dr J N Mehta Government Polytechnic, Amreli

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

In the recent era, the developments in the agriculture fields are the buzzword in the market. The proposed system uses sensors to monitor the soil moisture content which depends on the valves of the system which can get turned ON/OFF automatically. Soil moisture and temperature sensor will sense the condition of the weather and will send the same information to the microcontroller. The microcontroller takes action depending on these sensor data. The same information is provided to Global System For Mobile Communication (GSM) which will send this signal to users mobile as SMS (Short Message Service). The irrigation system can be widely used in agricultural lands, industrial automation, home gardens, weather station. This can be helpful in the development of agriculture field. In future, it is possible to develop video capturing of total crop condition by using 5G (5th Generation) technology and this information will be sent to the nearest weather station.

### What Exact Problem is being Solved?

Conventional irrigation method wastes a lot of water, leading to a high cost of electricity to run the pump set for irrigation. Automation can help save water, electricity as well as human efforts. Irrigation plant evolution has gone through several stages, in which the original irrigation system has many shortcomings because they don't save much water and human energy. Therefore, the introduction of automation can help to overcome these shortcomings and prepare a way to save water.

### Users

In this study, a drip irrigation automation system is proposed which tries to tackle problems related to traditional irrigation systems. The temperature and humidity sensors capture the data and send it to centralized cloud server where it gets processed. Moreover, farmers get all the information about their farm and also can interact with drip from their mobile devices. The developed system can also transfer fertilizer and the other agricultural chemicals (calcium, sodium, ammonium, zinc) to the field with adding new sensors and valves. The smart drip system can be used in commercial as well as agricultural use.

### Expected Outcomes

Automatic irrigation systems presently available are costly and are not adopted by most of the Indian farmers. Therefore, appropriate low cost technology has to be developed to facilitate high water use efficiency. As the farm holdings are not large enough in India and also high cost of automation cannot be realized in India, low cost automatic irrigation is suitable to farmers, if developed and can be made as a technology, farmers can feel comfortable in view of the frequent power cuts and less power available in his farm.

### Potential Impact

In future days we try cover larger area to implement this system. And design of smart drip irrigation system using

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# **Smart Gujarat For New India Hackathon 2019-20**

## **Problem Statements**

which we can even apply food nutrients to the root of plant and crop by air mixed with very less water. It will prove more reliable with better monitoring and processing. preservation of water sources and minimizing wastage of it done by this effective system which will helps for better productivity of corps. In this present world of increasing population, the huge demand of food can be fulfill with this state of the art process.

### **Probable Discipline**

Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH031

### Problem Statement

Cost Effective Treatment of Waste Water Using Construction Wetland

### Name of Industry / Organisation

Ghanshyam Eng Co.

### Type Of Industry / Organisation

MSME

### Challenge Description with Context

Most of the water from the industries now a days directly discharged into water body which in turn pollute water body as well as encourage the growth of water hyacinth which is very harmful to aquatic life. The conventional treatment is very costly and require skilled labour. So the challenge is to find a solution to treat waste water from the industry which is cost effective as well as can be applied on small scale and which does not require skilled labour.

### What Exact Problem is being Solved?

As stated, the main challenge is to find cost effective solution to treat waste water which can be applied at small scale. This problem can be solved by using construction wetland to treat waste water from the industry as it is cost effective as well and can be applied at small scale. It will also decrease the area of water hyacinth as construction wetland uses water hyacinth for biological treatment.

### Users

Various industries can use construction wetland to treat their waste water. Small panchayat can also use it for primary treatment where community is very small scale. societies in city area can also use it.

### Expected Outcomes

- 1) Cost effective treatment of waste water.
- 2) Reduce in various parameters of waste water, though the scale of effect is not sure.
- 3) Application of construction wetland at small scale industries.
- 4) Decrease in area of water hyacinth in water bodies.
- 5) Decrease in burden on conventional waste water treatment plant of corporations.
- 6) Awareness among community about water hyacinth.
- 7) Saving of water as treated water can be used for other purposes.

### Potential Impact

- 1) The solution provided can impact to the Community health as this method is cost effective and can be applied at small scale.
- 2) The solution provided can also decrease the area of water hyacinth as it uses the aquatic plants for biological treatment.
- 3) The solution provided can help industries to save water as the water treated at industry by construction wetland can be used for other purposes also.

### Probable Discipline

Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH032

### Problem Statement

Clients are not aware about material testing and soil investigation process.

### Name of Industry / Organisation

Global Consultancy Services

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

Materials testing is a diligent approach to ensuring that your infrastructure and vital equipment will provide continued production, undergo minimal degradation and are designed with optimal performance in mind. For material testing, client should know about the quantity of no of testing. (Ex. For cement concrete work 10 cubic meter = 1 set) For soil investigation, client should know which type of structure it is and which type of foundation it is. After testing and investigation client should read report carefully and properly.

### What Exact Problem is being Solved?

Materials testing can also supply a wealth of information about the materials you are developing or incorporating into products to ensure they perform within expected specifications. There should be proper data management system so that client should aware about criteria of material testing as well as for soil investigation. An initial, non-witnessed batch testing phase in which the possibility of creating a product is explored.

### Users

Civil engineers and Municipal engineers, structural consultants can take decision to save structures, residential people, commercial people, industrial people, industrial people, skilled and unskilled labours.

### Expected Outcomes

Proper and accurate quality control and quality assurance will be achieved. Quality work. The structure which is constructed (Residential, commercial, Institution, Industries) should acquire proper strength by using proper material as well as proper process should be taken into consideration. Using proper ration of materials give actual SBC report. Proper data management system should be recorded as a database.

### Potential Impact

Quality of structure of will be good. Life of structure will be safe during its design period. Failure get minimize if proper care should be taken. Proper soil investigation is required for safe and economic design. Proper data management system so that client should aware about criteria of material testing as well as for soil investigation.

### Probable Discipline

Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH033

### Problem Statement

Water harvesting and Water conservation system is carried out at Government (Shardadevi) Primary school campus – Patapur Ta. Dist. Junagadh.

### Name of Industry / Organisation

Government (Shardadevi) Primary School Patapur

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

Water is a scarce commodity nowadays; there is very shortage of water in the summer days. People have to suffer much to get needy amount of quality water. Ground water level is also depleted day by day. As well sources of water also decreases and become polluted. Thus, Water conservation and Water harvesting have become essential in all regions, even where water seems abundant. That's because our water resources are finite, and they are getting smaller every year.

Water conservation is a policy making agenda. This should be prepared for utilization and reuse of water, which is used in toilet block, gardening, kitchen etc...

Water conservation helps prevent water pollution in nearby lakes, rivers, and local watersheds. Conserving water also prevents greenhouse gas emissions associated with treating and distributing water.

While a rainwater harvesting system comprises components of various stages - transporting rainwater through pipes or drains, filtration, and storage in tanks for reuse or recharge.

Thus, water conservation and water harvesting is a must for sustainable development. Rain water is a main source of water at local level which can be harvested to use later, particularly to use as potable water.

### What Exact Problem is being Solved?

Water is a scarce commodity nowadays; there is very shortage of water in the summer days. People have to suffer much to get needy amount of quality water. Ground water level is also depleted day by day. As well sources of water also decreases and become polluted.

Thus, problem of shortage of potable water, shortage of water for daily usage, shortage of water for agriculture and shortage of industry use is occurred. To, solve this problem water harvesting and water conservation should be carried out.

At small scale water harvesting and water conservation is carried out at Government (Shardadevi) Primary school campus – Patapur Ta. Dist. Junagadh. This brings idea and awareness regarding water harvesting and water conservation in students of technical institutes, who try out to design for the same. As well idea and awareness regarding water harvesting and water conservation in students of primary school, teachers and staff of primary school and villagers of Shardanagar-Patapur also.

For implementing water harvesting of rain water, proper design of pipe network carrying rain water should be carried out, design of water filter media should be carried out, design of water tank and recharge mechanism should be carried out.

For Water conservation proper policy should be established for utilization, reuse and treatment of water.

### Users

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

Students of technical institutes, who try out to design for the same. as well students of government primary school - Patapur, teachers and staff of government primary school - Patapurool , Villagers of Shardanagar-Patapur also.

### Expected Outcomes

- Water harvesting techniques.
- Design of pipe network carrying rain water.
- Design of water filter media for filtration of rain water to remove large impurities.
- Calculation of water demand.
- Design of water tank for storage of rain water.
- Ground water recharges mechanism.
- Water conservation proper policy.
- Treatment of water.
- Pipe network for Reuse of water.
- Awareness regarding water harvesting and water conservation in students of technical institutes, in students of primary school, teachers and staff of primary school and villagers of Shardanagar-Patapur.

### Potential Impact

- need of quality water, Importance of water harvesting system for rain water to store in tank and use later and ground water recharge of the remaining quantity of water.
- Water conservation requirements.
- Awareness regarding water harvesting and water conservation in students of technical institutes, in students of primary school, teachers and staff of primary school and villagers of Shardanagar-Patapur.

### Probable Discipline

Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH034

### Problem Statement

Underpass with water harvesting system

### Name of Industry / Organisation

Government Polytechnic, Navsari

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

There are two railway crossing Sarah available at starting and ending of Navsari railway station. Railway station is located at middle of the town. Railway line is connected with Mumbai Ahmedabad megacities. Due to Vita Railway Crossings are closed for so many time. What underpass is available at one of the end of railway station. These underpass is becoming full of water during a small rain. this is because of lower level of underpass compared to surrounding Sewerage line. draining of this water is one of the main challenge for this project.

### What Exact Problem is being Solved?

Due to lower level of underpass, rainwater blocked the underpass way for entire rainy season. No way to drain of rainwater. There is no space available to drain of these water during rainy season. The surrounding area is becoming flooded during rainy season. The main problem is the water is accumulated by sewerage line which was designed for or dispose of rainwater and sewage of city. There is one manhole is available at underpass. This manhole is vomiting the rainwater during rainy season

### Users

for any town obstacles are Railway lines and rivers to cross people from one side to to another side. When railway crossing are closed there are too much of fuel is wasted due to waiting period. during rainy season this underpass become useless due to beach too much traffic is accumulated nearby railway station which will delay all the passenger coming from outside and also the citizen of Navsari so this project will help to others citizen and Navsari citizen both.

### Expected Outcomes

less underpass is available for 24 hours therefore there will be a less traffic during rainy season also. During peak traffic of railway there is too much of wastage of time due to closing of Crossings at both the side. after solution of this project there is saving of time for citizen of Navsari. Navsari is very close to Surat Development of city become fast due to saving in time of citizens and other coming from outside of Navsari.

### Potential Impact

Eight lane highway is available at one side of railway line and Heritage place Dandi and Agricultural University is other side of railway line. due to this underpass one more connectivity will be available for throughout the year. People coming from Surat from 4 lane old highway, this underpass is very near to this people on the way. so it is essential to have these underpass open. Growth of city become smooth after availability of this underpass for 24 hour.

### Probable Discipline

Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH035

### Problem Statement

Rain water harvesting in hostel ground using artificial recharge method

### Name of Industry / Organisation

Government Polytechnic, Palanpur

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

Rainwater harvesting system, which has been widely used in many parts of the world, possesses a great potential in addressing today's real challenge of water demand. The rainwater is free from arsenic contamination and the physical, chemical and bacteriological characteristics of harvested rainwater represent a suitable and acceptable means of potable water. People can construct storage reservoirs so that they can use rainwater during the entire rainy season and about 2-4 months of the dry period. The capacity and the construction materials of the reservoir and its maintenance depend on the socio-economic condition, population, educational background and awareness of the habitants of the area. So the rain water harvesting method is a cheaper option for storage water and increase ground water level.

### What Exact Problem is being Solved?

In the college large area is free from any construction. The area which is in front of hostel building is submerged by water during rainy season and much of the problem produced due to this water. Due to this situation the probability of producing the disease also occurs. So focus of study is reducing the ill effect of water illness and use this water by proper manner. For using this water, rain water harvesting will be proved a better technique.

### Users

Its uses include water for gardens, livestock, irrigation, domestic use with proper treatment, indoor heating for houses, etc. The harvested water can also be used as drinking water, longer-term storage, and for other purposes such as groundwater recharge.

### Expected Outcomes

Rainwater provides an independent and free water supply that offers several ways the water can be used. Harvesting rainwater can help the environment in a number of ways. For starters, it can reduce erosion around downspouts and in gardens. In nature, up to 90% soaks into the ground. Rainwater harvesting systems counteract storm water run off and thereby reduce flooding, erosion and ground water contamination. Taking water out of our lakes, reservoirs and rivers affects groundwater, irrigating with rainwater helps replenish groundwater supplies.

### Potential Impact

Rainwater harvesting is a system that is gaining speed over time. Areas that experience high amounts of rainfall will benefit the most from the system and will be able to distribute water to dry lands with ease. Till today, rainwater is used as a primary source of drinking water in several rural areas. The best thing about rainwater is that it is free from pollutants as well as salts, minerals, and other natural and man-made contaminants. In areas where there is excess rainfall, the surplus rainwater can be used to recharge ground water through artificial recharge techniques.

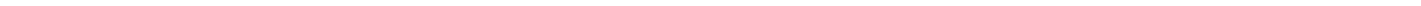
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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Probable Discipline

Civil Engineering





# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH036

### Problem Statement

Water Remediation and Purification of drinking water using Nanotechnology

### Name of Industry / Organisation

Government Polytechnic, Rajkot

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

Water is a basic need for households. There is lack of freshwater resources in India. There is also increase in industrial water consumption and discharge in water resources. Even WHO says water borne diseases are one of the major problem for the Indian society. The use of metals and chemicals in process industries has resulted in the generation of large quantities of effluent that contain high levels of toxic heavy metals, whereas mining and mineral processing operations also generate toxic liquid wastes.

### What Exact Problem is being Solved?

Various POU ( point of use) purifiers are available in the Indian market. Some of the POU includes RO ( reverse osmosis), UV ( ultra violet), membrane filtration, etc.  $\text{TiO}_2$  is use as membrane for filtration of drinking water. Some Euglena bacteria is useful for cleaning water in a pond or tank. Besides, Oxides of iron, zinc oxide and magnesium oxide are effective for the removal of heavy metals. Carbon nanotubes and graphene are having very good adsorption property which cover four possible sites i.e. external surface, inner surface, interstitial channel and peripheral groove. It is favourable for several environmental applications.

### Users

Any population living in households, working in industrial areas, working in domestic market. Pregnant women and newborn babies are mostly affected. Those who are residing at places near hotels, hospital, schools, etc.

### Expected Outcomes

Water which will finally reach to house should satisfy various characteristic of water as per IS:10500,2012 i.e ( drinking water specification). Water should satisfy physical characteristics of 'Taste and Odour', chemical characteristics of 'pH and Hardness' and biological characteristics of removal of E.Coli bacteria from the raw water supplied by the municipal corporation. This will not only solves the major issue of water borne diseases, but also will help to increase GDP of our nation by saving the fund for national growth of our country.

### Potential Impact

There will be an significant decrease in the percentage of water borne disease in the Indian society. This will purify our drinking water by making use of some properties of nanoparticles like catalyst, adsorptive,etc. It will also check out the possibility of utilisation and feasibility, environmental suitability and performance of nanoparticles in raw water and produce continual improvement in performance drinkable water.

### Probable Discipline

Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH037

### Problem Statement

Promotion of public transport or use alternative transportation to reduce traffic on road

### Name of Industry / Organisation

Government Polytechnic, Rajkot

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

Now a days, nuclear family culture is our major social problem. It leads to personal / individual vehicle demands. It raised our living standard which is good for our nation but on the other hand, it is one of the reason for creating unnecessary traffic . There is awareness in the public but because of the ignorant mindset of public. Traffic is increasing day by day with no proper reason. This leads to accident and loss of precious human life mostly in urban areas.

### What Exact Problem is being Solved?

There are number of available transport facilities like BRTS ( Bus Rapid Transit System ), MTS ( Municipal Transit System ) in metropolitan city etc. Which have partially solved traffic problem but there is still scope for improvement when it comes the matter of traffic on road. Transport facilities i.e. to minimize traffic on road by making use of public transport. Even some private companies like UBER, OLA etc have started pool services to solve traffic problem to some extent.

### Users

All the population in urban habitation like men, women, senior citizen and new born baby etc. They will be the responsible for creating trip in urban area. They will also take help from various service providers like school bus, private office vehicles, autorickshaw, taxi, two wheeler etc.

### Expected Outcomes

We will be able to create the awareness among the urban population to reducing traffic on road by promoting the public transport system in place of their own / personal vehicles. This will definitely reduce our traffic problems in addition to accident created by traffic. It will make our environment pollution free i.e. reducing Air and Noise pollution. This will also be helpful in increasing capacity of road and saving travel time.

### Potential Impact

Entire world is facing traffic problem, it may be under developed, developing or developed city. Latest trend have given increase to personal vehicle rather than making use of public transport service or/and pooling / sharing vehicle facility. If we promote public transport which is mostly followed at metros and mega cities. It will also result in hassle free transport service. It leads to good health of travellers.

### Probable Discipline

Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH038

### Problem Statement

TO SOLVE THE PROBLEM IN DISPOSAL OF CONCRETE WASTE MATERIAL

### Name of Industry / Organisation

Harsh Consultancy

### Type Of Industry / Organisation

Small

### Challenge Description with Context

DEMOLITION OF EXISTING BUILDING CREATES A LOT OF CONSTRUCTION WASTE. THIS CONSTRUCTION WASTE CONSISTS OF DIFFERENT MATERIALS LIKE CONCRETE, BRICKS, AND REINFORCEMENT BARS. THE DISPOSAL OF THIS WASTE IS DONE AT THE DUMPING SITE. THE DEGRADATION OF THIS MATERIALS IS NOT POSSIBLE IN THE SHORTEN PERIOD OF TIME BECAUSE IT WILL TAKE MORE TIME TO DEGRADE. CURRENTLY, THERE IS NOT SOLUTION OF REUSING THIS CONSTRUCTION WASTE. IT IS NECESSARY TO CONSIDER THIS PROBLEM ON PRIORITY BASIS.

### What Exact Problem is being Solved?

DEMOLITION OF EXISTING BUILDING CREATES A LOT OF CONSTRUCTION WASTE. THIS CONSTRUCTION WASTE CONSISTS OF DIFFERENT MATERIALS LIKE CONCRETE, BRICKS, AND REINFORCEMENT BARS. THE DISPOSAL OF THIS WASTE IS DONE AT THE DUMPING SITE. THE DEGRADATION OF THIS MATERIALS IS NOT POSSIBLE IN THE SHORTEN PERIOD OF TIME BECAUSE IT WILL TAKE MORE TIME TO DEGRADE. CURRENTLY, THERE IS NOT SOLUTION OF REUSING THIS CONSTRUCTION WASTE. IT IS NECESSARY TO CONSIDER THIS PROBLEM ON PRIORITY BASIS.

### Users

THIS CAN BE USEFUL TO THE ENGINEERS. THIS CAN BE USEFUL TO CONTRACTOR. THIS CAN BE USEFUL TO SOCIETY. THIS CAN BE USEFUL TO ROAD & BUILDING DEPARTMENT. THIS CAN BE USEFUL TO STUDENTS. THIS CAN BE USEFUL TO PUBLIC WORK DEPARTMENT. THIS CAN BE USEFUL TO THE PEOPLE.

### Expected Outcomes

BY SOLVING THIS PROBLEM OF CONSTRUCTION WASTE DISPOSAL, WE CAN REUSE THIS CONCRETE AS A DUMPING MATERIAL IN FILLING OF GROUND TO IMPROVE THE SOIL PROPERTIES. WE CAN REUSE THE CONSTRUCTION WASTE BY SEPARATING THE AGGREGATES FROM THE CONSTRUCTION CONCRETE WASTE, WHICH CAN THEREBY USED IN CONCRETING WORK AGAIN. WE CAN REUSE CONSTRUCTION CONCRETE WASTE FOR CONSTRUCTION OF APPROACH ROAD FOR DIFFERENT CONSTRUCTION PROJECT. WE CAN REUSE CONSTRUCTION CONCRETE WASTE AS BASE LAYER FOR CONSTRUCTION OF ROAD.

### Potential Impact

THE DEVELOPMENT PROGRESS IN CONSTRUCTION INDUSTRIES HAVE THE GREAT EFFECTS TO THE ENVIRONMENTAL ESPECIALLY IN ENVIRONMENTAL CHANGE AND WASTE PRODUCED. ONE OF THE CAUSES OF THE CONSTRUCTION WASTE IS NATURAL RESOURCES USE EXCEEDING WHAT IS REQUIRED IN CONSTRUCTION PROCESS. CONSTRUCTION MATERIAL WASTE REFERS TO THE MATERIALS FROM THE CONSTRUCTION LOCATION THAT CANNOT BE USED FOR CONSTRUCTION PURPOSES AND MUST BE REMOVED FOR ANY REASONS. BESIDE EFFECTS ON THE COST, CONSTRUCTION WASTE ALSO AFFECTS TO THE ENVIRONMENTAL.

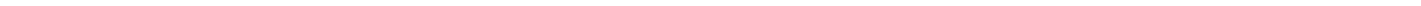
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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Probable Discipline

Civil Engineering



# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH039

### Problem Statement

Lack of shorter transportation route from Intala to Nagalpur & Intala to Sukhpur.

### Name of Industry / Organisation

Intala, Gram Panchayat

### Type Of Industry / Organisation

Public Entities (Boards/Corporations/Panchayat/Government Societies etc)

### Challenge Description with Context

The problem is lack of bridge or causeway through ozat river. Ozat river is main river of Junagadh district. During monsoon, the river gets full of water. There are lots of villages located on the banks of Ozat river. There are three villages named intala, nagalpr and sukhpur located in neighborhood. Intala is a Village located in the Taluka of Junagadh, in the district of Junagadh district, in the state of Gujarat state. There are 84 houses in the Village. Nagalpur is a Village in Mendarda Taluka in Junagadh District. Sukhpur is a medium size village located in Vanthali Taluka of Junagadh district To go towards nagalpur and sukhpur from intala, the people have to cross ozat river. The existing distance from intala to nagalpur is approx. 13 km. Google image of the existing route is shown in the video. The route passes through Khadiya and Anandpur. To cross the ozat river, people have to travel through the bridge located near Anandpur village and then people reach to Nagalpur. The existing distance from Village Intala to village Sukhpur is approx. 15 km. The route is shown in video. People have to travel through Junagadh Mendarda highway via Solvadar. To cross the ozat river, people have to pass through Junagadh Mendarda highway. The maximum high flood level observed in Ozat near Intala is approx 8m high above the crest of the check dam located near Intal village. This place is shown in video. If the banks of Ozat river near Intala is connected by a bridge or a cause-way, the distance from Intala to Nagalpur can be reduced upto 3 km and the distance from Intala to Sukhpur can be reduced upto 5 km. In the other seasons except monsoon, the river can be crossed by walking through river bed. But the vehicals can not be passed through it because of the high banks on both the sides of ozat river. In monsoon, the river can not be crossed because of high flood in Ozat river. The major population is farmer by profession in this area. For the daily work of farming, the have to travel a considerable distance to cross the river. So a lot of time is spent to go for farming activity. Also people have to spent considerable amount of money on fuel of vehicles to travel long distance. Heavy vehicles like tractor take a lot of time to travel.

### What Exact Problem is being Solved?

The problem can be solved by providing transportation facility to go towards Nagalpur and Sukhpur from Intala, the people have to cross Ozat river. The existing distance from intala to nagalpur is approx. 13 km. Google image of the existing route is shown in the video. The route passes through Khadiya and Anandpur. To cross the ozat river, people have to travel through the bridge located near Anandpur village and then people reach to Nagalpur. The existing distance from Village Intala to village Sukhpur is approx. 15 km. The route is shown in video. People have to travel through Junagadh Mendarda highway via Solvadar. To cross the ozat river, people have to pass through Junagadh Mendarda highway. Both the banks of ozat river near village Intala can be connected by causeway or bridge considering H.F.L. of 8 m above the crest of existing checkdam. So the distance from Intala to Nagalpur & Intala to

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

Sukhpur can be reduced upto 3 km and 5 km respectively.

### Users

Intala, Nagalpur and Sukhpur villages are situated near the banks of Ozat river. The villagers from these villages are the main users of the shorter route through causeway or bridge. Farmers have their farms near the banks of ozat river. They can use this route. The other travellers can also use this route.

### Expected Outcomes

If the banks of Ozat river near Intala is connected by a bridge or a cause-way, the distance from Intala to Nagalpur can be reduced upto 3 km and the distance from Intala to Sukhpur can be reduced upto 5 km. In monsoon, Ozat river can be crossed by using bridge or cause-way. The major population is farmer by profession in this area. By using the shorter route, for the daily work of farming, they can save a considerable distance to cross the river. So a lot of time can be saved to go for farming activity. Also people can save considerable amount of money on fuel of vehicles to travel long distance. Heavy vehicles like tractor can save a lot travelling time.

### Potential Impact

Wastage of money on fuel can be saved because the distance from Intala to Nagalpur can be reduced upto 3 km and the distance from Intala to Sukhpur can be reduced upto 5 km. Because the major population is farmer by profession in this area, they can reach by using the shorter route. They can save a considerable distance to cross the river. So a lot of time can be saved to go for farming activity. Villagers can save considerable amount of money on fuel of vehicles to travel long distance.

### Probable Discipline

Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH040

### Problem Statement

1. Cost EFFECTIVE.
2. safety.
3. bearing capacity of Constructed area.

### Name of Industry / Organisation

KATIRA CONSTRUCTION. LTD

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

The excavation technique that reduce the cost & improve safety at construction site.

Extra excavated soil for particular footing area that raising the cost in cutting and filling.

FEATURE:-

1. COST EFFECTIVE.
2. SAFETY.
3. BEARING CAPACITY OF CONSTRUCTED AREA.

In clay soils, the full change in groundwater tables can take up to 5 years, with 50% of the improvement taking place in the first year. Once water tables are lowered in clay soils, the change is permanent: rainfall events will not alter the groundwater level in the slope provided the drains do not clog. In sandier soils, the groundwater table will lower within a few months but will also fluctuate with rain events.

### What Exact Problem is being Solved?

The excavation technique that reduce the cost & improve safety at construction site.

Extra excavated soil for particular footing area that raising the cost in cutting and filling.

FEATURE:-

1. COST EFFECTIVE.
2. SAFETY.
3. BEARING CAPACITY OF CONSTRUCTED AREA.

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### Users

The excavation technique that reduce the cost & improve safety at construction site.

Extra excavated soil for particular footing area that raising the cost in cutting and filling.

FEATURE:-

1. COST EFFECTIVE.
2. SAFETY.
3. BEARING CAPACITY OF CONSTRUCTED AREA.

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

few months but will also fluctuate with rain events.

### Expected Outcomes

The excavation technique that reduce the cost & improve safety at construction site.

Extra excavated soil for particular footing area that raising the cost in cutting and filling.

FEATURE:-

- 1.COST EFFECTIVE.
- 2.SAFETY.
- 3.BEARING CAPACITY OF CONSTRUCTED AREA.

In clay soils, the full change in groundwater tables can take up to 5 years, with 50% of the improvement taking place in the first year. Once water tables are lowered in clay soils, the change is permanent: rainfall events will not alter the groundwater level in the slope provided the drains do not clog. In sandier soils, the groundwater table will lower within a few months but will also fluctuate with rain events.

### Potential Impact

The excavation technique that reduce the cost & improve safety at construction site.

Extra excavated soil for particular footing area that raising the cost in cutting and filling.

FEATURE:-

- 1.COST EFFECTIVE.
- 2.SAFETY.
- 3.BEARING CAPACITY OF CONSTRUCTED AREA.

In clay soils, the full change in groundwater tables can take up to 5 years, with 50% of the improvement taking place in the first year. Once water tables are lowered in clay soils, the change is permanent: rainfall events will not alter the groundwater level in the slope provided the drains do not clog. In sandier soils, the groundwater table will lower within a few months but will also fluctuate with rain events.

### Probable Discipline

Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH041

### Problem Statement

To develop estimation and costing software on the plan of project so that human error is minimized

### Name of Industry / Organisation

KNC Builtech

### Type Of Industry / Organisation

Small

### Challenge Description with Context

For the new building projects or any another construction projects like road, dam, canal, multi-storey buildings,etc. it is essential to carry out the estimation and costing.

Now-a-days some contractors are doing estimation and costing by thumb rules which do not give appropriate results.

To develop a estimation and costing software based on the plan of project so that human error is minimized.

Example: Uploading a 2D Autocad plan of project in the software and in return software gives exact estimate and cost of given project.

### What Exact Problem is being Solved?

For the new building projects or any another construction projects like road, dam, canal, multi-storey buildings,etc. it is essential to carry out the estimation and costing.

Now-a-days some contractors are doing estimation and costing by thumb rules which do not give appropriate results.

To develop a estimation and costing software based on the plan of project so that human error is minimized.

Example: Uploading a 2D Autocad plan of project in the software and in return software gives exact estimate and cost of given project.

### Users

Structural Designers, Site Engineers, Contractors, Students, Architechture, Software Designers, Web Designers, Government Sector,etc

### Expected Outcomes

For the new building projects or any another construction projects like road, dam, canal, multi-storey buildings,etc. it is essential to carry out the estimation and costing.

Now-a-days some contractors are doing estimation and costing by thumb rules which do not give appropriate results.

To develop a estimation and costing software based on the plan of project so that human error is minimized.

Example: Uploading a 2D Autocad plan of project in the software and in return software gives exact estimate and cost of given project.

### Potential Impact

For the new building projects or any another construction projects like road, dam, canal, multi-storey buildings,etc. it is essential to carry out the estimation and costing.

Now-a-days some contractors are doing estimation and costing by thumb rules which do not give appropriate results.

To develop a estimation and costing software based on the plan of project so that human

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

error is minimized.

Example: Uploading a 2D Autocad plan of project in the software and in return software gives exact estimate and cost of given project.

### **Probable Discipline**

Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH042

### Problem Statement

Develop a cost effective sensor and monitoring system that could provide deformations occurring in a structural member during its functional usage

### Name of Industry / Organisation

Krapa Structural Consultant

### Type Of Industry / Organisation

Small

### Challenge Description with Context

The Sensor and data acquisition system available in market are very uneconomical. The development of the cost effective and accurate sensor shall involve the help from other allied branches of engineering like EC and IC. This problem shall be an interdisciplinary problem and students shall acquire the understanding and application of electronics which is the need of the current time. This problem shall open up an altogether new arena for the students

### What Exact Problem is being Solved?

The development of sensor shall be very useful in conducting health monitoring of structures. Health monitoring is key to renovated and life line structures. The deformations that occurs during its functions can provide a lot of information about the requirement of strengthening and assess its effectiveness. The runtime data availability at a lower cost shall be very useful for administration and life-line structures.

### Users

The sensors and data acquisition system shall be utilized mainly by all Government departments that actively participate in administration during disasters, also by owners of life line structures and bridges.

### Expected Outcomes

Students shall be able apply concepts of instrumentation and computing techniques in evaluating output in form of deformations. These deformations shall provide enough time to repair or strengthen the defective structures. Based on the output obtained from the sensor on various elements of buildings, the strengthening strategy can also be finalized that can yield economic, effective and optimal solution.

### Potential Impact

The development of sensor shall open up new avenues in non-destructive testing of the buildings which are highly complex and very costly. This sensor once installed in a building shall be able to provide run time data that also help the dwellers to control the inflow of loads if it is in case buildings. In case of bridges and other public structures, steps taken to strengthen the structure can be assessed effectively.

### Probable Discipline

Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH043

### Problem Statement

Design of a Simple, Easily and Remotely Operatable, Accurate, Economical and Efficient Plastering Equipment

**Name of Industry / Organisation** M/s. Pravin C Savaliya

**Type Of Industry / Organisation** Medium

### Challenge Description with Context

In the manual plastering technique, the crucial factor is skilled labor because of which plastering has been done on the walls, but presently there is lack of skilled labors due to which it is very inconvenient to complete this process. The labor requires more time to finish the process which increases their wages and hence the total plastering or labor cost increases. Due to which the process will fast and there will be saving of cost and time this will helps to reduce the total cost, total time which ultimately responsible for the growth and hence the progress rate of a country is going to increase. In order to invent the standard equipment for plastering work. Due to manual process of wall plastering on construction site, there is a huge scale requirement of labor and hence the labor cost is responsible for increasing the price of construction or project work. The quality of work is mostly depending on the skill of the labor work in manual plastering process. The existing technique for plastering the walls is manual i.e. the labors are used to plaster the walls with their hand by using some instruments like flat board or other flat surface object which are made by metal, wood or plastic

### What Exact Problem is being Solved?

This Machine will reduce the human work. It will be straight forward in construction and simple to control. Higher excellence of the plaster can acquire. It will be move horizontally from to other place. So that it will be portable. It will assist to save labor cost. It will avoid wastage of the mortar, thus to save the cost. Machine cost will be less than existing machines. It can be control with the help of remote controller.

### Users

Automatic plastering machine is one type of unique machine will be used in construction industry. So it will be beneficial for various types field like construction industries, General public, Public building , Residential Building etc

### Expected Outcomes

This Machine will reduce the human work. It will be straight forward in construction and simple to control. The solution of these problems is just to automate the process, so that there will be a saving of period and cost and getting good plaster finishing to the walls. The plastering machine can plaster the walls automatically and very smoothly. Machine cost will be less than existing machines. It can be control with the help of remote controller

### Potential Impact

It helps to save the time and money. It works with cement mortar which is conventional one due to which no replacement of the material required. The machine is more productive than the conventional plastering technique. Higher quality of a plaster can be obtained with this machine. Due to saving in time, labor cost, raw material, the overall cost of construction is less hence the machine is economically efficient than the conventional plastering technique.

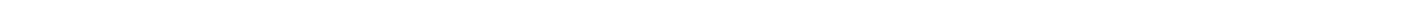
### Probable Discipline

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# **Smart Gujarat For New India Hackathon 2019-20**

## **Problem Statements**

Civil Engineering



# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH044

### Problem Statement

Water supply controlling in conventional concrete preparation

**Name of Industry / Organisation** Mahalaxmi Construction Co.

**Type Of Industry / Organisation** Medium

### Challenge Description with Context

Water is a key component in concrete. However, too much water can be detrimental to both the fresh and hardened concrete properties, especially strength, long term durability and potential for cracking. be sure to know the water requirements for the concrete mixtures being used, especially the allowable water that can be added for slump adjustments. Before adding water onsite, the allowable amount of water that can be added must be known. This amount should be printed on the delivery ticket or be determined during the pre-construction meeting and be agreed upon by all parties.

### What Exact Problem is being Solved?

for large scale concrete mixture preparation nowadays ready mixed concrete plant is being used so quantity of water required will be utilised as per need only. but if we talk about small scale construction work during concrete preparation water quantity required is not in fix quantity. so need of some measure is required to control the water supply for the concrete mix preparation. some techniques or measures can be developed for water supply control.

### Users

The most important factor affecting the amount of drying shrinkage and the subsequent potential for cracking is the water content or the amount of water per cubic yard of concrete. Fundamentally, concrete shrinkage increases with higher water contents. About half of the water in concrete is consumed in the chemical reaction of hydration and the other half provides the concrete's workability. Except for the water lost to bleeding and absorbed by the base material or forms, the remaining water that is not consumed by the hydration process contributes to drying shrinkage. By keeping the water content as low as possible, drying shrinkage and the potential for cracking can be minimized.

### Expected Outcomes

Do not exceed the maximum water content for the batch as established by the accepted concrete mixture proportions. No concrete has been discharged from the mixer except for slump testing. All water additions shall be completed within 15 minutes from the start of the first water addition. Water shall be injected into the mixer with such pressure and direction of flow to allow for proper distribution within the mixer. The drum shall be turned an additional 30 revolutions or more at mixing speed to ensure a homogenous mixture.

### Potential Impact

Do not exceed the maximum water content for the batch as established by the accepted concrete mixture proportions. No concrete has been discharged from the mixer except for slump testing. All water additions shall be completed within 15 minutes from the start of the first water addition. Water shall be injected into the mixer with such pressure and direction of flow to allow for proper distribution within the mixer. The drum shall be turned an additional 30 revolutions or more at mixing speed to ensure a homogenous mixture.

### Probable Discipline

Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH045

### Problem Statement

To minimise the manual labours for pouring of material in concrete mixer for preparing conventional concrete.

### Name of Industry / Organisation

Mahalaxmi Construction Co.

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

Current scenario of labours is very much difficult to get. Labours are not easily available for concrete mix for conventional concrete. Labours are going towards industry works. Labours are mostly illiterates, therefore it is having very much difficulties to handle the concrete mix work. More labours can creates chaos on the site so it is always feasible to have minimum labours the concrete mix works.

### What Exact Problem is being Solved?

Minimum Labours to utilize. Current scenario of labours is very much difficult to get. Labours are not easily available for concrete mix for conventional concrete. Labours are going towards industry works. Labours are mostly illiterates, therefore it is having very much difficulties to handle the concrete mix work. More labours can creates chaos on the site so it is always feasible to have minimum labours the concrete mix works.

### Users

Civil engineering Industry, educational industry, labour industry, small scale industry. Labours are mostly illiterates, therefore it is having very much difficulties to handle the concrete mix work. More labours can creates chaos on the site so it is always feasible to have minimum labours the concrete mix works.

### Expected Outcomes

Minimum labours to be utilized so that scarcity of labours and difficulty of handling them is minimized. Labours are mostly illiterates, therefore it is having very much difficulties to handle the concrete mix work. More labours can creates chaos on the site so it is always feasible to have minimum labours the concrete mix works.

### Potential Impact

Minimum Labours to utilize. Current scenario of labours is very much difficult to get. Labours are not easily available for concrete mix for conventional concrete. Labours are going towards industry works. Labours are mostly illiterates, therefore it is having very much difficulties to handle the concrete mix work. More labours can creates chaos on the site so it is always feasible to have minimum labours the concrete mix works.

### Probable Discipline

Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH046

### Problem Statement

To develop a non- destructive testing device for providing a convenient and rapid indication of the cement content in concrete structures.

### Name of Industry / Organisation

Mahalaxmi Construction Co.

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

Many millions of dollars are spent each year in construction using cement concrete. Because cement content influences many of the important properties of concrete and because it is often the basis for contractual obligations, it is important to have available some simple method for the determination of the cement content of concrete that is reasonably accurate and applicable in field testing. Such a test would enable determination of compliance to design specifications and of the uniformity of cement dispersion throughout the concrete mixture..The determination of the cement content of hardened concrete involves two problems.

1. The extraction of a representative sample from the large mass of concrete in question. It is of course not always possible to get such a sample, and is a problem common to all non-in-situ methods"
2. The second problem is to determine accurately and rapidly the cement content of the sample.
3. Time Consuming

### What Exact Problem is being Solved?

Determining the amount of soluble silica and calcium oxide in a sample by chemical analysis, and then indirectly calculating the percentage of cement by assuming or establishing from analyses of the original cement some definite concentrations of silica and calcium oxide in the cement used" The method gives reliable results, particularly if samples of original cement and aggregates are available. Such a test would enable determination of compliance to design specifications and of the uniformity of cement dispersion throughout the concrete mixture.

### Users

Determining the amount of soluble silica and calcium oxide in a sample by chemical analysis, and then indirectly calculating the percentage of cement by assuming or establishing from analyses of the original cement some definite concentrations of silica and calcium oxide in the cement used" The method gives reliable results, particularly if samples of original cement and aggregates are available.

### Expected Outcomes

To make a non- distractive testing device method of concrete which provide a convenient and rapid indication of the cement content. As a supplementary study the relationship between the cement content. and the specific gravity of a cement paste solution in alcoholic maleic acid was determined. It was thought that the latter might provide an alternative method by which cement content may be determined more rapidly than by the present version. of the selective solution method.

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## Problem Statements

### Potential Impact

Inasmuch as this method of selective solution possesses features ideal for a standard testing method, it was considered worthwhile to determine the extent to which the above mentioned problems affect the apparent cement content value s, Therefore, the principal objective of this study was to determine the effects of (1) various locally available aggregates, and (2) various factors which are related to the extent of cement hydration on the determination of the cement content of concrete by the method of selective solution with a methanolic solution of maleic acid

### Probable Discipline

Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH047

### Problem Statement

Lack of knowledge of site engineers related to proper documentation system in projects, results in project failure- In terms of delay, cost overruns, Changes in design, poor quality and unsafe working conditions on site

### Name of Industry / Organisation

MCC Projects

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

Lack of Knowledge to project engineer related to Documentation in Project related to following:

1. Scope of Works
2. Contracts with Contractors/Vendors/Suppliers
3. Safety
4. Quality
5. Project Progress
6. Assumptions and Constraints
7. Change Statement (for Scope, Time, Cost, Quality etc.)

Documents always clarify what needs to be done, by whom, when and how. But if it is not done as per requirements then there are always problems in project execution.

### What Exact Problem is being Solved?

Problem related to Project documentation can be solved which is very critical parameter in the success of any project. Documentation related to site, project (residential, commercial, industrial or institutional).

### Users

Total Project Stakeholders:

1. Architect and other consultants
2. Client/Owner/Sponsor
3. Project Execution Team

### Expected Outcomes

Following can be the outcome:

1. Clear roles and responsibilities can be identified
  2. Assumptions and constraints can be identified and documented
  3. Scope of works can be made more clear to total project team
  4. Safety, Quality and Timeline requirements can become very clear to total project team
- Overall total team vision will be in line with the project requirements, which will directly result in project success.

### Potential Impact

Impact on project if proper documentation system is followed will always be on positive side. Which directly results in timely delivery within cost and required quality of the Project

### Probable Discipline

Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH048

### Problem Statement

GIS BASED FLOOD RISK ASSESSMENT

### Name of Industry / Organisation

Narmada, Water Resources, Water Supply & Kalpsar Department (NWRWS), Dantiwada

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

Flood is a major environmental problem in India as it has destructive or damaging effects on life and property. There is a serious need of detailed research in the development of regional or national flood damage functions for pre-disaster flood damage estimation property. Risk assessment is important in making decisions, policies and managing floods. The objective of this study is to review and synthesize concepts and techniques of flood hazard, vulnerability and risk assessment with reference to the Uttarakhand.

### What Exact Problem is being Solved?

The objective of present study is to delineate and identify flood hazard and risk assessment Banaskantha district in Gujarat, India. There is a serious need of detailed research in the development of regional or national flood damage functions for pre-disaster flood damage estimation property. The objective of present study is to delineate and identify flood hazard and risk assessment Banaskantha district in Gujarat, India.

### Users

Human beings and Animals. To delineate and identify flood hazard and risk assessment at Dhanera city of Banaskantha district in Gujarat, India. Dhanera covering total geographical area of 16 km<sup>2</sup>. Dhanera is located at 24.52°N 72.02°E. It has an average elevation of 128 meters (420 ft.). There is a serious need of detailed research in the development of regional or national flood damage functions for pre-disaster flood damage estimation property. Risk assessment is important in making decisions, policies and managing floods. The objective of this study was to review and synthesize concepts and techniques of flood hazard, vulnerability and risk assessment with reference to the Uttarakhand.

### Expected Outcomes

Using geo spatial technology to model and predict the magnitude of flood risk areas, Geographic Information System (GIS) analysis techniques are used for this study the flooding causative factors such as rainfall distribution, elevation and slope, drainage network and density. This study aims at providing expertise for preparing flood mapping and estimating flood risks in growing urban areas. GIS and remote sensing play an important role in flood hazard, vulnerability and in risk assessment and useful for delineation of flood zones, preparation of flood hazard and risk maps

### Potential Impact

The main advantage of using GIS for flood analyses is that it not only generates a visualization of flooding, but also creates potential to further analyze these events to estimate probable damage due to floods. Compared to traditional mapping, GIS enables the comparisons across spatial units; comparison across different themes by category of hazards and disasters; merging of qualitative with qualitative assessment and spatial database, based on which logical and/or numerical operations can be dynamically performed. These are

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## Problem Statements

grounds for concluding that GIS has an important function to play in natural hazards analyses because natural hazards are multi-dimensional phenomena, which have a spatial component.

### **Probable Discipline**

Civil Engineering

# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH049

### Problem Statement

In India, many old buildings needing major repairs or go early in to a state of collapse condition to make them unfit for occupation. This premature deterioration is largely due to poor construction practices or inappropriate design and/or neglect of time

### Name of Industry / Organisation

Patel Ankitkumar Rajubhai

### Type Of Industry / Organisation

Small

### Challenge Description with Context

It is observed when conventional concrete is used to place concrete in the column element, there are more chances of honeycombing at lower portion due to a higher depth of column element and heavy reinforcement. Usually, the vibrator needle may not reach the bottom portion of the column which results in honeycombing. It is a complex problem and situation where proper placing and compaction is required by skilled labour. This results in early deterioration of concrete and reinforcement which leads to reduces the life of the structure.

### What Exact Problem is being Solved?

The Self-compacting concrete (SCC) does not need any external compaction. It is developed to overcome the deficiency of skilled manpower and problems of placing and compacting congested civil engineering structures. It has been observed that SCC not only reduces the requirement of manpower, both skilled and unskilled but also results in more durable concrete Hence, by using SCC in the column element, the problem of poor compaction can be solved.

### Users

Contractor, Builders, Engineers and people associated with the construction industry.  
Contractor, Builders, Engineers and people associated with the construction industry.  
Contractor, Builders, Engineers and people associated with the construction industry.

### Expected Outcomes

The poor quality of concrete in the column element will be eliminated by using Self-compacting concrete (SCC). Moreover, SCC has got many advantages over normal concrete such as no vibrations are required, reduced noise, improved health & safety at the site, reduced equipment cost as no vibrators are required, reduced manpower, denser reinforcement possible, improved durability, easier placing, better surface finish etc.

### Potential Impact

By using SCC in the column element, the problem of poor compaction can be solved. Self-consolidating concrete is a development that bypasses this need for external compaction. The quality of concrete is improved which results in enhancing the strength and durability of the column. The early repair or deterioration is diminished. Hence, the life of the concrete structure will be increased and the repairing cost can be decreased.

### Probable Discipline

Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH050

### Problem Statement

Rain water harvesting technique of collection and storage of rain water at surface or in sub surface aquifers

### Name of Industry / Organisation

POSEIDON HYDRO INFRATECH

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

Rain water harvesting is the technique of collection and storage of rain water at surface or in sub-surface aquifers, before it is lost as surface run-off. The augmented resource can be harvested in the time of need. Artificial recharge to ground water is a process by which the ground water reservoir is augmented at rate exceeding that under natural conditions of replenishment.

In urban areas, rain water available from roof tops of buildings, paved and unpaved areas goes waste. This water can be recharged to aquifer and can be utilized gainfully at the time of need. The rain water harvesting system needs to be designed in a way that it does not occupy large space for collection and recharge system and its efficiency can be monitored. It is seen that there is lack of awareness of this harvesting system amongst the people and many people are providing recharge wells for rain water harvesting but they are not working efficiently. The availability of technique or method to check the efficiency of recharge well and its functioning is not there at present. In present scenario, there is a great need to focus on this issue of water scarcity in urban areas where ground water level is depleting very fast with proper management, policies and monitoring technique to solve this problem.1. To meet the required water demands for various purposes.

2. To arrest decline in ground water levels.
3. To enhance availability of ground water at specific place and time and utilize rainwater for sustainable development.
4. To develop method techniques to check the working condition of recharge methods.
5. To prepare plan and policy for continuous monitoring of the harvesting system and water availability.

### What Exact Problem is being Solved?

The rain water harvesting system needs to be designed in a way that it does not occupy large space for collection and recharge system and its efficiency can be monitored. The availability of technique or method to check the efficiency of recharge well and its functioning is not there at present. In present scenario, there is a great need to focus on this issue of water scarcity in urban areas where ground water level is depleting very fast with proper management, policies and monitoring technique to solve this problem.

The Problem Solution Must contain the following Points.

1. How much water can be collected in particular area can be estimated by applying the concept of rain water harvesting.
  2. What is the collection system efficiency and how it can be checked or monitored.
  3. Present latest advancements, application of sensors & IoT in rain water harvesting system and policies in this field.
-

# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Users

All the peoples who are facing water availability related problems in the society or community. It is seen that there is lack of awareness of this harvesting system amongst the people and many people are providing recharge wells for rain water harvesting but they are not working efficiently.

In present scenario, there is a great need to focus on this issue of water scarcity in urban areas where ground water level is depleting very fast with proper management, policies and monitoring technique to solve this problem.

### Expected Outcomes

The availability of technique or method to check the efficiency of recharge well and its functioning is not there at present. In present scenario, there is a great need to focus on this issue of water scarcity in urban areas where ground water level is depleting very fast with proper management, policies and monitoring technique to solve this problem.

1. Provides self-sufficiency to water supply
2. Reduces the cost for pumping of groundwater
3. Reduces soil erosion in urban areas
4. Rainwater harvesting systems are simple which can be adopted by individuals
5. Development of technique, method or model to monitor the system functioning.
6. Application of sensors & IoT for monitoring availability of water in system.

### Potential Impact

As the world reels under the threat of unrelenting climate change, erratic monsoons and fast depleting groundwater reserves the development of technique, method or model to monitor the system functioning will help the system experts for decision making to increase the efficiency of rain water harvesting system.

Rain water harvesting is the technique of collection and storage of rain water at surface or in sub-surface aquifers, before it is lost as surface run-off. The augmented resource can be harvested in the time of need. Artificial recharge to ground water is a process by which the ground water reservoir is augmented at rate exceeding that under natural conditions of replenishment.

### Probable Discipline

Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH051

### Problem Statement

water distribution problem in society or residential area

### Name of Industry / Organisation

Rajkot Municipality Corporation

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

Water distribution should be equal to all houses as per requirement. now a days uneven distribution being provided by RMC. so many times some houses gets more water and some houses gets less water. if we make this water distribution automatic(Machine based) we can resolve this problem. Water distribution (WD) is an intermediate stage in the water production and supply chain. It comprises the distribution pipeline networks, service reservoirs, booster stations, valves, flow meters, chambers and indicator/marker posts. Safe for looping, it can be likened to the branches of a tree, transporting materials from the root (intake and waterworks/headworks) through the trunk (rising and trunk pipeline mains) to the leaves (consumers).

### What Exact Problem is being Solved?

In my opinion, WD challenges come in many forms: technical, environmental, economic, political, social and administrative challenges, among others.

Technical Challenges:

Technical challenges include design, construction and operations errors, leakages, aging pipelines, inappropriate technology, inadequately skilled workforce and water quality degradation, among others.

Design, Construction and Operations Errors: WD design is prone to errors coming mainly from wrong assumptions, inadequate statistics, computing input errors, inappropriate field changes during construction works and operational mistakes. Consequently, areas of low and high pressure regimes become unavoidable during operations. These often lead to frequent pipe bursts, loss of treated water, high repair and maintenance costs, traffic hold ups or diversions and reinstatement of roads before, during and after pipeline repairs. Another side effect is back siphonage of dirty and contaminated waters that impact negatively on the water qualities delivered to consumers.

### Users

Residential peoples, urban and rural area residents, village peoples, city peoples, ground level users are get benefited with this type of automation. Water distribution system should be based on a pipe layout that is suitable and have no or less water stagnation within the pipe to avoid tuberculation, encrustation and sediment deposits

### Expected Outcomes

Water distribution system should be based on a pipe layout that is suitable and have no or less water stagnation within the pipe to avoid tuberculation, encrustation and sediment deposits

Through a wealth of specialized publications and software development is now well understood that water distribution system management is technically difficult, but with

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

current technologies, software systems, and highly specialized equipment (flushing and scraper), this is simply not the case anymore.

Water utilities will also need to practice appropriate design of system expansions/distribution (e.g., new network parts already constructed as DMAs) and use higher quality works, materials, and equipment. In addition, regulators and policy makers should require water utilities to do periodic water audits and regularly publish detailed water distribution system data, which can then be independently audited.

### Potential Impact

water distribution system management should not be a one-time activity. Although an intense and comprehensive water distribution system reduction program is suitable to reduce the backlog of required water distribution system reduction measures, it should not lead to a sustainable low level of water distribution system unless water distribution system management becomes part of the normal day-to-day activities of the water utility.

### Probable Discipline

Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH052

### Problem Statement

Waste generated during cutting and polishing of vitrified tiles

### Name of Industry / Organisation

Real Granito Pvt. Ltd.

### Type Of Industry / Organisation

Large

### Challenge Description with Context

To re utilize the waste generated during cutting and polishing of vitrified tiles. To address the environmental pollution and health related problems. Tiles waste produced in cutting and polishing process and dumped into open ground. Which creates the waste humps open to environment and spreading the disease related to respiration system.

### What Exact Problem is being Solved?

Waste generated during cutting and polishing of tiles dumped into the open environment. This waste consist of nano particles which cause the respiration related disease to workers of the industry. Further it required a space of dumping site in the near by vicinity.

### Users

Users associated to this problem are ceramic industry peoples, from owner to workers and all people working under that environment.

### Expected Outcomes

To reduce Environmental and health related problems and application of waste generated

### Potential Impact

This will benefit to the tiles manufacturer industry and reduce respiration system disease in the workers.

### Probable Discipline

Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH053

### Problem Statement

Road maintenance record-keeping system

### Name of Industry / Organisation

Road and Building Department(GOG)

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

The maintenance of rural and urban roads is becoming an increasing challenge as a result of the rapid growth of the network. A large amount of money is going to waste due to irregularity and improper approach. Sound asset management principles need to be introduced as an integral part of road policies and maintenance program. Comprehensive maintenance planning with schedule, institutional reforms, linkage with initial construction, maintenance backlog, utilization of fund, regular on site inspections, training to the workforce, human attitude, existing practices and knowledge of different road patterns are the major challenges in record-keeping.

### What Exact Problem is being Solved?

The maintenance and record keeping of maintenance is the key issues in the government department after the liability period over of new construction. A comprehensive system will help for planning of maintenance schedule, frame work, methodology. Also a prediction can be made for the timely maintenance fund requirements. Effective techniques can be decided for the problems. Quality of initial construction work can be achieved. It is more important to say that wastage of public fund can be reduced from the repetitive approach.

### Users

Mostly, Public infrastructure is developed by the government department. It is obvious that various government bodies like municipalities, nagarpalika, panchayat and road and building department of state and central government etc. will be the potential users. Also private residential and commercial communities may use it for the maintenance records and fund estimation.

### Expected Outcomes

A comprehensive maintenance record-keeping system will be the ready tool, which serve different aspects of complete qualitative maintenance such as, data base of complete any type of inspection on-site, recording defects including capture of images and location data to aid in repair, repair methodology applied, cost of maintenance, effective area of work, frequency of maintenance including during liability period of new constructions and fund planning for the future. It will be fruitful for the executors for social and economic development of users.

### Potential Impact

Effective maintenance record keeping system will create social and economic impacts of rural roads users. It will serves ready record for long term budget planning as huge investment incurred in road infrastructure development. Some qualitative outputs such as, maintained roads provide access to where people live and important facilities such as markets, schools and health services. Good access provides the opportunity for improving livelihoods and increased employment opportunities, thereby contributing to the alleviation of poverty.

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# **Smart Gujarat For New India Hackathon 2019-20**

## **Problem Statements**

Although it may be argued that the link between rural roads and poverty alleviation is mostly indirect, experience clearly shows that areas with poor road access are generally more disadvantaged than areas that are better served.

### **Probable Discipline**

Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH054

### Problem Statement

The mass curing of tetrapods is too much difficult and requires huge amount of water.

Therefore there is a need of alternate procedure/method of curing such tetrapods without harming the structural stability of the same.

### Name of Industry / Organisation

Shree Ram Laxman Sthapatya Co.

### Type Of Industry / Organisation

Small

### Challenge Description with Context

The mass curing of tetrapods is too much difficult and requires huge amount of water.

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### Users

Structural Designers, Site Engineers, Contractors, Builders, Government Bodies, Students for project purpose of civil engineering branch

Structural Designers, Site Engineers, Contractors, Builders, Government Bodies, Students for project purpose of civil engineering branch

### Expected Outcomes

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### Potential Impact

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### Probable Discipline

Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH055

### Problem Statement

Solid Waste Management

### Name of Industry / Organisation

Tata Consulting Engineers Limited

### Type Of Industry / Organisation

Corporate

### Challenge Description with Context

Solid Waste Management generated in focus area

Waste management can be defined as the activities or actions required to manage waste from its inception to its final disposal. Waste can be solid, liquid or gaseous and each has different methods of disposal and management. Improper disposal of solid waste can create unsanitary conditions, and these conditions in turn can lead to pollution of the environment and to outbreaks of vector-borne disease—that is, diseases spread by rodents and insects. The tasks of solid-waste management present complex technical challenges. They also pose a wide variety of administrative, economic, and social problems that must be managed and solved. Technological advances continued during the first half of the 20th century, including the development of garbage grinders, compaction trucks, and pneumatic collection systems. By mid-century, however, it had become evident that open dumping and improper incineration of solid waste were causing problems of pollution and jeopardizing public health. As a result, sanitary landfills were developed to replace the practice of open dumping and to reduce the reliance on waste incineration. Proper solid-waste collection is important for the protection of public health, safety, and environmental quality. Treatment changes the form of the waste and makes it easier to handle. It can also serve to recover certain materials, as well as heat energy, for recycling or reuse. Recovered broken glass can be crushed and used in asphalt pavement. Color-sorted glass is crushed and sold to glass manufacturers as cullet, an essential ingredient in glassmaking. Steel cans are baled and shipped to steel mills as scrap, and aluminum is baled or compacted for reuse by smelters. Aluminum is one of the smallest components of municipal solid waste, but it has the highest value as a recyclable material. Recycling of plastic is a challenge, mostly because of the many different polymeric materials used in its production. Mixed thermoplastics can be used only to make lower-quality products, such as “plastic lumber.” Our mission is to make a sustainable healthy future possible in the campus through solid waste management. The primary aim of sustainable solid waste management is to address concerns related to public health, environmental pollution, land use, resource management and socio-economic impacts associated with improper disposal of waste. There are serious concerns on the increasing cost of waste disposal, especially in developing countries. It is estimated that around \$200 billion are being spent on waste management in the OECD countries for both municipal and industrial waste. The challenges are discussed as below:

1. Management of solid waste considering administrative, economic, and social factors
  2. Reuse and recovery of different type of metal, glasses etc.
  3. Legacy waste for any city
  4. Prevailing laws
-

# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### What Exact Problem is being Solved?

1. Focus area to be defined, such as college campus, study and analyse waste produced in campus and try to reuse it in other purpose or make some reliable product from the waste generated with less capital investment.
2. Solution to Legacy waste
3. Reuse/recycling of materials from solid waste
4. Biogas/any other reusable product generation from solid waste
5. Law and policy supporting easy solutions to problem arised

### Users

As sustainable solid waste management evolves through waste awareness among general public, students, efforts within the industry, and waste management becoming not just an environmental concern but a political and strategic apprehension too, there are realistic chances of advancements and scientific innovations. All the peoples who are facing solid waste management related problems in the society or community & concern government organizations.

Municipal solid waste department, societies, university campus, educational campuses etc.

### Expected Outcomes

Innovation will then give birth to revolutionary and self-sustaining ideas within the industry, which earlier focused on basic waste management, will now grow towards maximum utilization and sustainable management of waste. In the last couple of decades, sustainable solid waste management has become a matter of political significance with robust policies, strategies and agendas devised to address the issue. The good thing is that the industry has responded with innovative, cost-effective and customized solutions to manage solid wastes in an environmental-friendly manner.

1. Self sustaining Solid waste management of defined area
2. Legacy waste reduction
3. Reuse/recycling of materials from solid waste, quantum of solid waste generated/processed get reduced
4. Biogas/any other reusable product generation from low capital investment

### Potential Impact

Urban areas of India generate 1,88,500 tonnes of municipal solid waste (68.8 million tonnes per year), and waste generation increases by 50 percent every decade. More than 80 percent of this waste reaches open dumpsites causing public health issues, environmental degradation, and resultant climate change. Plastic and e-waste form the major chunk of this waste, with minimal facilities to take care of such environment degrading substances. India needs to find solution to these problems. Fresh and innovative ideas in consonance with the ambitious Swachh Bharat Abhiyan are required to solve this problem, which otherwise can have drastic repercussions in the near future.

### Probable Discipline

Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH056

### Problem Statement

Integrated Urban Water Management Design Framework for Smart Cities

### Name of Industry / Organisation

Tata Consulting Engineers Limited

### Type Of Industry / Organisation

Corporate

### Challenge Description with Context

Challenge Description:

India is a country which is rapidly growing into urban aspects showing infrastructure deficits and adaptation gaps in response to current and future climatic, societal and economic change. While key drivers are well understood and technological solutions exist, current approaches will be insufficient to deliver the transformative changes needed to deal with these challenges. Water is the basic need for all and plays very important role in day to day life. With the concepts of smart cities, it can be understood that there is a need to have smart integrated urban water system or infrastructure for the management of storm water, water supply, waste water, groundwater and floods. This raise a question for us provide good environment, infrastructure & technology and policies to solve water management issue using smart technology and innovative ideas and methodologies. With the availability of smart technologies (sensors, IoT, software, etc) and making smart policies, site specific actions can be provided to solve the water infrastructure management related problems for the coming smart cities.

1. To meet the required water demands for various purposes through smart water distribution network.
2. To protect decline in ground water levels by using conjunctive use of surface and sub surface water in supply.
3. To provide smart storm water network to carry excess rain water runoff effectively, and reusing.
4. To develop method or techniques to check the working condition of existing water infrastructures.
5. To prepare plan and policy for continuous monitoring of the water system and water availability & uses.

### What Exact Problem is being Solved?

What Exact problem is being solved?:

1. How much water is supplied and how much waste water is received/reused can be monitored.
2. The problem of flooding & burden over ground water can be minimized.
3. The storm water infrastructure will help in reducing the quantity of waste water for treatment specially during monsoon.
4. Present latest advancements, application of sensors & IoT in water infrastructure management and necessary policies in this field can be made.

### Users

All the peoples who are facing water management related problems in the society or

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

community & concern government organizations.

### Integrated Urban Water Management Design Framework for Smart Cities

India is a country which is rapidly growing into urban aspects showing infrastructure deficits and adaptation gaps in response to current and future climatic, societal and economic change. While key drivers are well understood and technological solutions exist, current approaches will be insufficient to deliver the transformative changes needed to deal with these challenges. Water is the basic need for all and plays very important role in day to day life.

### Expected Outcomes

Expected Outcomes:

1. Provides self-sufficiency to water supply
2. Optimum utilization of water (rainwater, ground water) & reuse of wastewater
3. Reduces the flooding over roads caused due to lack of storm water collection network.
4. Development of technique, method or model to monitor the system functioning of water supply
5. Application of sensors & IoT for monitoring availability and delivery of water in system.

### Potential Impact

Potential Impact:

As the world reels under the threat of unrelenting climate change, erratic monsoons and fast depleting groundwater reserves the development of infrastructure, technique, method or model to monitor the system functioning and manage the storm water, waste water, flood, etc will help the system experts for decision making to manage the available water among the community for sustainable growth of cities.

### Probable Discipline

Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH057

### Problem Statement

Avoid degradation of grains which creates health hazard problem due to flood in low lying area of city

### Name of Industry / Organisation

Valsad Nagarpalika

### Type Of Industry / Organisation

Public Entities (Boards/Corporations/Panchayat/Government Societies etc)

### Challenge Description with Context

Flood condition in the monsoon of Valsad city more than the other district of Gujarat. Due to the flood condition of Valsad city low lying area which hazardous to low lying area people. There is a problem during the old city construction conjunction of the city flooding condition is effected to the people of Valsad city and near by area. Flood condition of Auranga river Valsad city is more hazardous to rural area of people and near by area of Valsad

### What Exact Problem is being Solved?

To resolve issue of Valsad city during monsoon condition transport the grains in safer place to the Valsad city and protect the Flood condition in the monsoon of Valsad city more than the other district of Gujarat. Due to the flood condition of Valsad city low lying area which hazardous to low lying area people. There is a problem during the old city construction conjunction of the city flooding condition is effected to the people of Valsad city and near by area. Flood condition of Auranga river Valsad city is more hazardous to rural area of people and near by area of Valsad

### Users

Flood condition in the monsoon of Valsad city more than the other district of Gujarat. Due to the flood condition of Valsad city low lying area which hazardous to low lying area people as well as rural area people.

### Expected Outcomes

Flood condition in the monsoon of Valsad city more than the other district of Gujarat. Due to the flood condition of Valsad city low lying area which hazardous to low lying area people. There is a problem during the old city construction conjunction of the city flooding condition is effected to the people of Valsad city and near by area. Flood condition of Auranga river Valsad city is more hazardous to rural area of people and near by area of Valsad

### Potential Impact

Flood condition in the monsoon of Valsad city more than the other district of Gujarat. Due to the flood condition of Valsad city low lying area which hazardous to low lying area people. There is a problem during the old city construction conjunction of the city flooding condition is effected to the people of Valsad city and near by area. Flood condition of Auranga river Valsad city is more hazardous to rural area of people and near by area of Valsad.

### Probable Discipline

Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH058

### Problem Statement

Augmentation of existing Underground Drainage System to enhance discharge capacity of Underground Drainage System of Old main city - Valsad, Gujarat

### Name of Industry / Organisation

Valsad Nagarpalika

### Type Of Industry / Organisation

Public Entities (Boards/Corporations/Panchayat/Government Societies etc)

### Challenge Description with Context

By keeping the mentioned underground drainage problem of Urban area (Valsad city) in consideration and based on the assessment of the existing and future demand, the detailed project requirements for augmentation of underground drainage system will be proposed and prepared. Also based on the long term assessment may shows a big gap and improvement required to ensure Proper discharge or disposal facility.

### What Exact Problem is being Solved?

To solve Underground drainage Problem Valsad city : Main drainage line for old city ( Valsad ) was earlier designed for smaller size diameter of around 150mm to 450mm but now a days Due to rapid development of Valsad city has caused more drainage problem. So It is necessary to solve mentioned underground drainage problem by providing required augmentation of existing Drainage system of Valsad city.

### Users

All residents or people living within the area which is covered by the network of underground drainage system in old main city of valsad are the main users who are going to get benefited by successful implementation of Augmentation of existing drainage system.

### Expected Outcomes

Mainly, outcome of the study may be beneficial to all Urban local Body of Gujarat State and also the other states of India. Modification or improvement of the existing drainage system by providing or applying Augmentation to existing drainage system will results in efficient discharge which will definitely provide and promote environmental safe facilities to the Urban local bodies of state of Gujarat. It helps them to achieve a goal to become smart city of state of Gujarat

### Potential Impact

successful implementation of above mention solution of providing and promoting the the Augmentation to the Existing underground drainage system will definitely reduce the health hazard problem of people who are living within that area . It will also reduce the chances of flood within the area .It will reduce the cost or expenses and Valuable working hours of related Urban local body or Municipality of that area.Ultimately it will be useful in achieving environmentally sustainable waste management facility of the city.

### Probable Discipline

Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH059

### Problem Statement

Spray Dryer Sludge handling at CETP, Vatva

### Name of Industry / Organisation

The Green Environment Services Co-op. Society Ltd.

### Type Of Industry / Organisation

Large

### Challenge Description with Context

We are facing a problem regarding disposal of sludge, generating from the spray dryer. Currently, we are disposing at Treatment, Storage, and Disposal facility (TSDF) site. We are expecting from you to give us another useful alternative solution.

### What Exact Problem is being Solved?

The high TDS wastewater coming from different types of Industries is handled by the Multiple Effect Evaporator (MEE). Spray dryer connected to the MEE which handles the solids generated from MEE. Large amount of sludge is hence to be handled at site which presently disposed off at TSDF site. Hence, Handling and disposal of sludge is main problem which requires huge capital investment.

We are expecting from you to give us another useful alternative Techno-economical solutions for handling and disposal of spray dryer sludge.

### Users

Industries generating high Total Dissolved Solids (TDS) wastewater, Common Effluent Treatment Plants (CETPs)

### Expected Outcomes

Techno-economical solutions for handling and disposal of spray dryer sludge

### Potential Impact

Sludge can be handled at lower cost as less quantity of sludge will be generated. This will reduce load on landfill sites.

### Probable Discipline

Civil Engineering, Chemical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH060

### Problem Statement

Removal of Color from treated effluent

### Name of Industry / Organisation

Vapi Green Enviro Limited

### Type Of Industry / Organisation

Public Entities (Boards/Corporations/Panchayat/Government Societies etc)

### Challenge Description with Context

Removal of Color from diversified wastewater

### What Exact Problem is being Solved?

Techno-economical solution to treat the huge quantity of wastewater

### Users

Industries

### Expected Outcomes

Reduction in the color concentration using technically and economically feasible treatment

### Potential Impact

Improve the quality of receiving water bodies

### Probable Discipline

Civil Engineering, Chemical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH061

### Problem Statement

Hostel Management System

### Name of Industry / Organisation

A V Parekh Technical Institute, Rajkot

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

It will help hostel personnel and students in getting the process done without physically going to the other party for any hostel related work like admission, fess, room allotment other suggestions and grievances.

### What Exact Problem is being Solved?

1. Slow data retrieve.
2. poor data storage.
3. poor data security.

### Users

Student , parents , organization

### Expected Outcomes

- 1.to reduce cost used by the student traveling in Search of rooms.
- 2.enable hostel managers to easily track the payment and students data .
- 3.automate the booking and notification.

### Potential Impact

This will help in doing the process of hostel quickly and swiftly and no manual errors can be present that can be done if the process is done offline. All the services will be now available 24x7 by the software.

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH062

### Problem Statement

To design closed loop solution for the better complaint management. The complaint filed by user will go to the concerned authority and complete tracking of the complaint is possible. Admin, concern authorities and users can see the complaint status real t

### Name of Industry / Organisation

Ally Soft Solutions

### Type Of Industry / Organisation

Small

### Challenge Description with Context

To solve problem on time proper system is needed to register the complaint on time and also make sure that it is reached to correct authorities to take action on that.

We need mobile plus web based solution by which user can register complaint or problem or issue related to food quality in particular restaurant. If same complaints received by other users, admin can merge the issue and assign it to a specific department for action.

Once complaint is resolved or action is taken admin can select to show reply to all or to a specific user.

User identity is anonymous for other users but login is required if s/he wants to file complaint. Verification of user is must required by OTP/Email.

Integration of Android Application and Web applications must be done.

It Must be workable on any browsers.

User Identity must be anonymous.

### What Exact Problem is being Solved?

Proper complaint management solution for any system. It helps any authorities whether private or government to look into the issues and resolve it with the help of proper system. Managers will use this system to improve the quality of their product or service. They can also monitor the system to resolve the complaint.

### Users

Admin can control the system , Managers will see the complete process , Normal users can file complaints, login in the system, and view the actions taken.

Admin can also remove the complaints if he/she finds that complaint is irrelevant.

### Expected Outcomes

Our main outcome

should be complete complaint management solution to company and clients with 100 percent accuracy.

### Potential Impact

Positive complaint management will provide trust to the client.

Client can complaint about their product and service.

Also it will help the manager to take decisions regarding quality decisions.

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH063

### Problem Statement

Web Portal for Lawyers

### Name of Industry / Organisation

AssertionIT

### Type Of Industry / Organisation

Small

### Challenge Description with Context

The Main challenge of this problem is lot of manual process is carried out from start to conclusion of case. In during this period of time what lawyers' faces is difficulty in managing files and communication with client. Lawyer have to manually process each hearing details, all history records and opponent details etc. which sometimes could be misunderstood by others or paper in which every record is written could be misplaced or he/she might forget about it. It might possible that client didn't get which document supposes to be carried out during hearing.

### What Exact Problem is being Solved?

Web Portal for Lawyers needs to implement to mange layers day to day manual work. One system needs to be implemented which will contain all details about their client, previous hearing, case status, next hearing, important records, reminders etc. Addition to these, complete law book which involves all sections information. So lawyers can easily go through it. The Main challenge of this problem is lot of manual process is carried out from start to conclusion of case. In this system users will be lawyer and client.

### Users

In this system users will be lawyer and client. Lawyer has to enroll in system then after he/she can add their client and further individual client details in order to maintain case information and status of case. Same way client will access system and will be able to communicate with lawyer and will get information about case and schedule for next dates.

### Expected Outcomes

This definition aiming for system in which all the manual system's disadvantage should convert In advantage like that manual process of keeping data in files should be covert in records in digital form so it is easy to track. As lawyer has to look after for rule book and that should be convert like they just type section information and system will display brief about that rule. Else would be lawyer should be able to store information about every case which handle by him/her and meanwhile client should also get notify about next hearing details and current status of case. Client should able to upload all necessary documents needed in next hearing. There must be chat mechanism for communication.

### Potential Impact

Potential Impact will be huge of this definition because if we will get feasible outcome and expected outcome then it will solve huge manual process from lawyer's life. Because tracking of data will be so easily available. There is no need to look after for rule book. There will be history of each client case details and that issue of misplacing paper or lost data will be solved. Also Lawyer can have all documents of client in system. As well as client will also have all information like status of case and they can upload documents regarding case. And they can directly communicate using chat option.

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Probable Discipline

Computer/IT

# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH064

### Problem Statement

A Online System for Mentoring Student For Education Institute.

### Name of Industry / Organisation

BrainyBeam Technologies PVT. LTD

### Type Of Industry / Organisation

Small

### Challenge Description with Context

In routine life students are not always able to get the perfect answer for their queries and questions raised, though they search it on internet, using a video or tutorial. When a student have any issue with their studies or academics, he/she would contact their faculty but if that faculty is unavailable, it creates a havoc for the student to solve the problem. with the help of these app- " MENTOR MATE" students will post their query and the faculty will response it with the answer and notes with them, so it makes easy for students to learn from there. suppose if student was unable to understand the reply or the answer from the faculty, he can request for a one-to-one meeting with the faculty, that's makes easy for the student to learn the topic easily. Mostly all other learning platforms only provide tutorials and examples, but with these app they will also be able to have a one-to-one meeting with their concerned mentor.

### What Exact Problem is being Solved?

" MENTOR MATE" students will post their query and the faculty will response it with the answer and notes with them, so it makes easy for students to learn from there. suppose if student was unable to understand the reply or the answer from the faculty, he can request for a one-to-one meeting with the faculty, that's makes easy for the student to learn the topic easily. Mostly all other learning platforms only provide tutorials and examples, but with these app they will also be able to have a one-to-one meeting with their concerned mentor.

### Users

Students that are studies in various districts, taluka, rural and urban areas of study. In addition by using this app students and mentors of various branches are supposed to discuss problems and their solutions.

### Expected Outcomes

Students will be able to solve their queries and others problems by using this platform, students and mentors are able to solve problems in a convinient manner. Mostly all other learning platforms only provide tutorials and examples, but with these app they will also be able to have a one-to-one meeting with their concerned mentor. It provides very collobrative and user friendly approach in order to solve problem.

### Potential Impact

" MENTOR MATE" students will post their query and the faculty will response it with the answer and notes with them, so it makes easy for students to learn from there. suppose if student was unable to understand the reply or the answer from the faculty, he can request for a one-to-one meeting with the faculty, that's makes easy for the student to learn the topic easily. It provides one type of one to one problem soving approach.

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH065

### Problem Statement

Develop a System for providing Shortest and Fastest route to Ambulance to reach it at accident place and from that place to nearest Hospital. Fastest route will be identified by less congestion on the road.

### Name of Industry / Organisation

BrainyBeam Technologies PVT. LTD

### Type Of Industry / Organisation

Small

### Challenge Description with Context

In the metro cities there are many accidents during a day and ambulance has to face traffic problems so we are aiming to provide a service ambulance or 108 to solve the traffic problems while there is ambulance stuck in traffic provide fastest convenient to victim humans. In today's life in metro cities one of the main challenge to provide a quick response service to person who is suffering from the diseases.

### What Exact Problem is being Solved?

In the metro cities there are many accidents during a day and ambulance has to face traffic problems so we are aiming to provide a service ambulance or 108 to solve the traffic problems while there is ambulance stuck in traffic provide fastest convenient to victim humans. In today's life in metro cities one of the main challenge to provide a quick response service to person who is suffering from the diseases

### Users

It is useful to all end users like any person, for example a normal person who is residing in various areas of cities or villages where service quickness is necessary. Users like Villages, Citizens, Childrens.

### Expected Outcomes

In the metro cities there are many accidents during a day and ambulance has to face traffic problems so we are aiming to provide a service ambulance or 108 to solve the traffic problems while there is ambulance stuck in traffic provide fastest convenient to victim humans. In today's life in metro cities one of the main challenge to provide a quick response service to person who is suffering from the diseases

### Potential Impact

In the metro cities there are many accidents during a day and ambulance has to face traffic problems so we are aiming to provide a service ambulance or 108 to solve the traffic problems while there is ambulance stuck in traffic provide fastest convenient to victim humans. In today's life in metro cities one of the main challenge to provide a quick response service to person who is suffering from the diseases

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH066

### Problem Statement

design system for handling solid waste of municipal market like vegetables, fruits etc. using smart dustbin and android application.

### Name of Industry / Organisation

BrainyBeam Technologies PVT. LTD

### Type Of Industry / Organisation

Small

### Challenge Description with Context

solid waste generated in vegetable market generated in different cities.

in our application we have different kind of modules.

1) Collect solid waste from vegetable market using municipal corporation, then after municipal corporation gets order form various shepherds which is delivered to them.

2) Now solid waste generated by cattles again collected by municipal corporation and stored in centralized location. from where municipal corporation can sell it to farmers.

All operation is done via mobile application. There is other functionality as well which is Smart Dustbin which is based on IOT technology.

When dustbin is full, it send message to municipal corporation that this particular dustbin is full and this is the location.

### What Exact Problem is being Solved?

solid waste generated in vegetable market generated in different cities.

in our application we have different kind of modules.

1) Collect solid waste from vegetable market using municipal corporation, then after municipal corporation gets order form various shepherds which is delivered to them.

2) Now solid waste generated by cattles again collected by municipal corporation and stored in centralized location. from where municipal corporation can sell it to farmers.

### Users

User of this project is Municipality, buyer who buy the solid waste from Municipality, farmers who buy organic fertilizer from Municipality.

solid waste generated in vegetable market generated in different cities. in our application we have different kind of modules.

1) Collect solid waste from vegetable market using municipal corporation, then after municipal corporation gets order form various shepherds which is delivered to them.

2) Now solid waste generated by cattles again collected by municipal corporation and stored in centralized location. from where municipal corporation can sell it to farmers.

### Expected Outcomes

User of this project is Municipality, buyer who buy the solid waste from Municipality, farmers who buy organic fertilizer from Municipality.

solid waste generated in vegetable market generated in different cities.

in our application we have different kind of modules.

1) Collect solid waste from vegetable market using municipal corporation, then after municipal corporation gets order form

various shepherds which is delivered to them.

2) Now solid waste generated by cattles again collected by municipal corporation and stored

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

in centralized location. from where  
municipal corporation can sell it to farmers.

So it provides Seamless integration of various User of this project is Municipality, buyer who buy the solid waste from Municipality, farmers who buy organic fertilizer from Municipality via mobile app. and IOT enable dustbin.

### Potential Impact

via this project there will be Seamless integration of various User of this project is Municipality, buyer who buy the solid waste from Municipality, farmers who buy organic fertilizer from Municipality via mobile app. and IOT enable dustbin. so solid waste generated in vegetable market generated in different cities will be effectively managed and income can be generated for municipality, farmers and shepherds

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH067

### Problem Statement

To verify the genuineness of messages shared on social media messenger

### Name of Industry / Organisation

Creadigol Solution

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

We can stop spreading of incorrect, viral content through various social media platform such as WhatsApp, facebook, telegram etc . By using block chain technology, tracing the origin of message as well as genuineness of information can be achieved. A blockchain originally block chain is a growing list of records, called blocks, that are linked using cryptography. Each block contains a cryptographic hash of the previous block, a timestamp, and transaction data. We can also use some other approach, method or technology to solve this problem.

### What Exact Problem is being Solved?

In social media, There are many messages we see daily which are outdated or which are not true. Many pictures, news or information which claimed to be correct but instantly they come out to be outdated. Many riots, fights, viral information and modified or distorted pictures or videos have been shared through various social media platform such as WhatsApp, facebook, telegram etc which is not correct or latest. This misleads the people with inappropriate information.

How we can justify the originality of the message. How we can know which person has originally created the message and also at which location. If we can see the correct date, time, place and person detail on each message may we can decrease the quantity of viral and wrong information shared with people.

### Users

The users include all the technical persons, software developers, all the civil servants working in Police investigation department, cyber crime cell department, forensic department, all the persons who are using social media platform such as WhatsApp, facebook, telegram etc

### Expected Outcomes

The expected outcome of this problem idea is to develop some new social media platform or some tool which can integrate with current social media messenger, which can trace the origin or message and also genuineness of information by using Block chain distributed system. We can also use some other approach, method or technology to solve this problem other than using the Block Chain Technology which is described here.

### Potential Impact

If this problem is being solved then millions of people will be benefited. A sense of trust will be developed for the messages which are being circulated all over the social media platform such as WhatsApp, facebook, telegram etc, as originality of the message is being retained. Also if there is some unusual content being viral through any social media platform then we can easily find the person who has created that message.

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH068

### Problem Statement

We have aadhar card , Pan card, Voter id, Driving licence like identity proofs for our day to day transactions, but we have major missing that is our health card, which manages our day to day health history like disease, allergy etc. And same card is used

### Name of Industry / Organisation

CreArt Solutions

### Type Of Industry / Organisation

Corporate

### Challenge Description with Context

The main challenge is that, we have private and public hospitals and clinics, so government has public/govt hospital data but majority of people visit private clinic/hospital , so to avail that data to govt or concern authority so that at right time , right action can be taken. And there is no centralize state, city and area wise health data available of people. so it's also a challenge to decide what action to take on particular area/city to prevent diseases.

### What Exact Problem is being Solved?

The main problem in today's date is we are not having any centralize database of individual person, and because of that it is impossible to take proper precaution for prevention of any viral disease. Next is when dr give any prescription to patient dr do not have any record of that prescription. So next time if dr wants to take any past reference of same patient than it is not possible. So when we have this system , dr can record every minor details of every case of patient which can be refer any time.

### Users

All people, Doctors, Medical Store, Laboratory. People can do registration with basic details and get unique health id. Doctors can do registration with valid proof. Same medical store and lab will do sign up with proper valid proof.

### Expected Outcomes

This definition is aiming to store all the health related day to day data centrally which can be analysed by using AI and ML mechanism to retrieve the health trends of different state,city and area. Patient doesn't have any records of their past health history , which can be now stored online so patient can access it anytime for reference. In any person's lifetime , he/she visits to many different doctors and one dr is unaware about another dr's past treatment. But now after this project every thing is synchronized and well managed.

### Potential Impact

Potential Impact(is very huge) of this definition is that now after development of this project, Dr can keep record of every patient's health, Patient can manage all cases of his/her lifetime. Concern authorities can analyse the data and take appropriate action from stored data. One dr can easily understand past dr's treatment and thus patient will get accurate treatment. Gradually this leads to decrease death ratio of people because of unknown data of past. Also as it gives very potential analytics so this will reduce the threat of spreading many unwanted viral disease in society as everything is recorded online so on time we can get idea about such threats.

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH069

### Problem Statement

Solutions for Home Renovation

### Name of Industry / Organisation

Government Engineering College, Gandhinagar

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

Commonly the home renovation projects results in a cumbersome process for the home owners. They are unable to select the right product for their home which perfectly matches their choice. And even if they are able to find the right product, they are unable to decide whether it will look good in their present space or not without buying it. And after buying, if by chance the product does not fit their space, then they are left with no choice other than compromising.

### What Exact Problem is being Solved?

Struggles faced during home renovation. Commonly the home renovation projects results in a cumbersome process for the home owners. They are unable to select the right product for their home

which perfectly matches their choice. And even if they are able to find the right product, they are unable to decide whether it will look good in their present space or not without buying it. And after buying, if by chance the product does not fit their space, then they are left with no choice other than compromising.

### Users

People who wish to redesign their homes/ office/ or any other space.

Users who wish to renovate their homes or other spaces must think a lot about the cumbersome and tiring process it turns out to be.

### Expected Outcomes

The expected outcome of this problem definition would be easing out the entire process of renovation and also the reducing the overall efforts and money the users have to put in to achieve designs which they like, and also which suits their present home situation. Other useful outcome would be the optimal use of time and resources(fuel for transportation,etc...) to achieve the best expected design outcomes of their choice.

### Potential Impact

The above mentioned problem if solved, would affect the major portion of property owners, who think a lot before actually investing time and money in such projects.

If they do not get the desired output after the renovation is complete, they have to compromise for the present home rather than what they wished for.

The solution of this problem would positively affect those willing to undertake such projects by reducing the amount of time and efforts they have to put in.

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH070

### Problem Statement

Mobile application development for milk delivery app in daily morning.

### Name of Industry / Organisation

Government Engineering College, Gandhinagar

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

We want make milk delivery app in two side. User side in android app. And admin side in website. In user side we want functionality like create and track order, user profile, payment gateway, subscription system like daily, monthly, weekly, and use customise subscription system. In admin side we want all management functionally like filter orders in monthly, yearly. Ex. If user subscribed daily base so we want get automatically notification in admin side. So we get information about order and user.

### What Exact Problem is being Solved?

Milk is our essential need So everybody have to got to the market early in the morning to purchase milk and some people used to purchase milk from milkmen.. in this case customer can not customize milk like quantity wise, every brand wise like amul, gokul, maahi and customer can't buy organic and fresh milk from the farmers Customer can get product at market price. So that problem will be solved using this web application.

### Users

User can get easily milk from this application. User can customise subscription system like 2 Aug to 6 Aug. If user is not present in within their subscription . So user can pause system. And when user present then user can resume their system.

### Expected Outcomes

Mention about all problem will be solved using this system. this system works on subscription system like user can subscribe their milk in weekend, week, daily, custom schedule . And also user can pause their subscription if he/she is not available at home. Ex. if user is subscribed and he/she is not present he/she goes on vacation tour . So he/she pause their subscription system. And Resume system when he/she available. So we want this type of system.

### Potential Impact

This provides a digital platform so this can solve all problems which are mention above. It will also deliver other products which customers regular in daily morning like bakery products, fruits, vegetables etc. so customer buy other daily need products easily . so our system will make customers life easy , simple and also ansure that customers get satisfied and this will give a opportunity to bring our people to a digital platform.

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH071

### Problem Statement

Develop a solution for Government hostel management.

### Name of Industry / Organisation

Government Engineering College, Patan

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

Government Hostel Management is differ from many other available or existing Hostel management systems. Admissions of students are based on merit and availability of seat in their category. Merit prepared based on student 12th, Diploma and Previous semester percentage. Seats are allocated department wise and categorywise. Seat matrix for 120 Seats for girls and Boys hostel is represented on this link(<https://drive.google.com/file/d/1uVD1h8u-KPWIFTUbr3tGCdiPqmXxK7rn/view> ). System should manage available seats, rooms and reallocation of rooms in hostel. Sysem provide other features like News, Complain, Feedback ,profile mangement, fees and other basic services. Admin can configure no of rooms, availability of seats, floor, rooms, as well guest permission and allocation. The application should allow report generation (student wise, building wise, no of rooms empty /occupied etc.)

### What Exact Problem is being Solved?

This particular system deals with the problems on managing a government hostel and avoids the problems which occur when carried manually. Mainly student allocation and reallocation based on merit , category (SEBC,SC,ST..) and departmentwise(Computer, Elctrical,Mechanical, etc..) . Identification of the drawbacks of the existing system leads to the designing of computerized system that will be compatible to the existing system with the system Which is more user friendly and more GUI oriented. We can improve the efficiency of the system, thus overcome the drawbacks of the existing system.

### Users

Widely used in Government Education institutes like engineering, medical, pharmacy College hostels, Governement Higher secondary, Secondary Schools. Government provide hostel facility in many urban area like Ahmedabad and Gandhinagar for students who came from rural area.

### Expected Outcomes

- Less human error (Automatic Room Allocation and Reallocation)
- Strength and strain of manual labour can be reduced (Student Registration, Prepare chart and allocation matrix, Notice board management)
- Data redundancy can be avoided to some extent
- Data consistency
- Easy to handle
- Easy data updating of student profile, rooms, floors and other info
- Easy record keeping - Branchwise, category wise and other record finding and managing
- Backup data can be easily generated -

### Potential Impact

This particular project deals with the problems on managing a government hostel and avoids

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

the problems which occur when carried manually.

- Less human error (Automatic Room Allocation and Reallocation)
- Strength and strain of manual labour can be reduced (Student Registration, Prepare chart and allocation matrix, Notice board management)
- Data redundancy can be avoided to some extent
- Data consistency
- Easy to handle
- Easy data updating of student profile, rooms, floors and other info
- Easy record keeping - Branchwise, category wise and other record finding and managing
- Backup data can be easily generated -

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH072

### Problem Statement

Mobile application that keeps medical report/history of students

### Name of Industry / Organisation

Government Polytechnic For Girls, Surat

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

1. Medical History storage of each girl students
2. on regular time interval medical checkup report should send to parents, family doctors and hostel head
3. real time notification should send to parents, family doctors and hostel head
4. according to age medical report notification should be sent.
5. health monitoring system of girl students based on her medical history and send report to parents, doctors and hostel head.

### What Exact Problem is being Solved?

Health is major issue now days in college students. Specially in girls who are living far from home in hostels/PGs for their study. They often doesn't take healthy food. Therefore so many health issue occurs during their study. Parents are no aware of it. So a mobile application should be developed such manner that on regular time interval medical checkup report should send to parents, family doctors and hostel head.

### Users

all College students and their Parents, family Doctors, school students and thier parents, hostel students, girl students, any other human that wants their health up to date, working peoples, senior citizens

### Expected Outcomes

health monitoring system of girl students and send report to parents, doctors and hostel head. a mobile application should be developed such manner that on regular time interval medical checkup report should send to parents, family doctors and hostel head. all College students and their Parents, family Doctors, school students and thier parents, hostel students, girl students, any other human that wants their health up to date can use this.

### Potential Impact

medical history is stored so future medical emergency time we can predict her health and can give solution according to it. health problem solved easily. on regular time basis medical checkup report goes to parents, family doctors and hostel head so health monitoring is possible. no much worry for girl student parents is there. all College students and their Parents, family Doctors, school students and thier parents, hostel students, girl students, any other human that wants their health up to date can use this.

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH073

### Problem Statement

BLOCKCHAIN BASED DIGITAL IDENTITY

### Name of Industry / Organisation

Government Polytechnic For Girls, Surat

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

Frauds and corruptions are possible at every place, where producing identity or personal details or document is compulsory. From birth to death at every stage It is possible for a person to pretend to be someone else or manipulating & hiding details or preparing forged documents for personal benefits. It is very difficult to track such frauds and maintain transparent system. Moreover this can lead to serious financial threats and compromise in security.

### What Exact Problem is being Solved?

Blockchain technologies make tracking and managing digital identities both secure and efficient. Blockchain technology offers a solution to many digital identity issues, where identity can be uniquely authenticated in an irrefutable, immutable, and secure manner. Moreover the details are available to open network hence anyone can see the details and verify its integrity. For every detail a block of data is prepared and linked with previous block to form a chain. The block is required to sign by the issuing authority with its private key.

### Users

Common people, Government officers, police, hospitals, banks, schools, colleges, universities, RTO, election commission, lawyers, landlords, entrepreneurs, telephone exchange, doctors, residency, society, passport authority, etc.

### Expected Outcomes

With blockchain identity authentication check can be performed, whether or not the transaction was signed by the correct private key. It is inferred that whoever has access to the private key is the owner. So by reverse tracking the manipulated or forged details can be easily found. Also it is possible to find the criminal who performed such things. A transparent & authentic system in which identity & document verification can be done easily.

### Potential Impact

Blockchain technology has low operating cost & doesn't involve complex calculations. It can be applied to at every place, where producing identity or personal details or document is compulsory. Authentication of details and documents can be performed easily so, Birth certificate, schooling, diploma, degree certificate, caste certificate, income proof, digital IDs like voting card, PAN Card, driving license, Passport, death certificate, online account login & transaction, E-Residency are few to name.

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH074

### Problem Statement

Digital platform for book sharing

### Name of Industry / Organisation

Government Polytechnic, Palanpur

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

It is required to develop a platform where allumannies and senior faculties can donate their unused books or stationary materials for newly entered students to the institutes. The platform should be capable of showing data of books and its photos. The platform should be capable of showing data of book doner and book donee. It should be able to reduce the communication gap between senior students and junior students.

### What Exact Problem is being Solved?

Following points can will be solved :

- ( 1. ) unused books of senior students and faculties can be shared to needed community.
- ( 2. ) unused stationary of senior students and faculties can be shared to needed community
- ( 3. ) unused personal daily used things of senior students and faculties can be shared to needed community
- ( 4. ) It should be able to reduce the communication gap between senior students and junior students.

### Users

Institute's junior students will be the user who gets benifits, Institute's allumannies will be the user who gets benifits, Institute's faculties will be the user who gets benifits. Institute's senior students will be the user who gets benefits

### Expected Outcomes

platform should be maintanace free. It should be limited to only institute's members. plateform should be able to provide a platform where unknown book doner and recipient can meet and can share books and material with eachother. It will able to reduce the communication gap between senior students and junior students. unused books of senior students and faculties will be shared to needed community..

### Potential Impact

With this platform unused printed materials and stationary can be passed on to the upcoming students who come from weaker economic background. It also creates a nature of donation student's heart and a wide community of students can come closer to each other through this platform. This digital platform will able to reduce the communication gap between senior students and junior students. Proper distribution of old resources will be happen.

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH075

### Problem Statement

Buying apparel through e-commerce has certain limitation of trying apparel before buying it. Provide a virtual room to try apparel through e-commerce websites before buying it.

### Name of Industry / Organisation

iMOBDEV Technologies Pvt.Ltd.

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

Buying apparel through e-commerce has certain has certain limitation of trying apparel before buying it. Provide a virtual room to try apparel through e-commerce website before buying it.

### What Exact Problem is being Solved?

Provide a virtual room to try apparel through e-commerce website before buying it.

### Users

General User

### Expected Outcomes

Provide e-commerce website which provide a virtual room to try apparel through before buying it

### Potential Impact

users are motivated to buy online apparel through e-commerce website. lesser chances of returning and cancelling of apparel because of not having a facilities to try apparel through a virtual room.

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH076

### Problem Statement

To develop a software regarding MLM (Multilevel Marketing) to build a huge team by using different plans strategy and to generate the income from them and also monitoring the whole process with income statement of every user.

### Name of Industry / Organisation

Innovate Web Tec

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

To implement the process driven methodologies for the rapid deployment of business functionality in a dynamic, engaging and interactive environment. To use different income plan as per the requirement of the user and to maintain the information of that user with income statement.

### What Exact Problem is being Solved?

Consider that you have been successful in setting up the business and it is running but it is not only that. You will be out of the market, if you keep yourself and downlines updated about the recent happenings and trends of the MLM industry. You have to be extremely alert on the various changing laws and regulations around the world.

### Users

This software will be useful for company/organization to ensure smooth functioning of business. It also provides in and out knowledge on various aspects of the industry.

### Expected Outcomes

After generating leads and spreading around your business, it is equally important that you follow up with each and every person you meet. This is another step in a social skill. You have to remove that inhibition and regularly carry out follow up either personally or by autoreply system.

### Potential Impact

Using this MLM software, we will be able to manage the business easily as it provides the strategy for the sale of product in which revenue will be derived from participants by selling the company products or services.

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH077

### Problem Statement

Employee Management System

### Name of Industry / Organisation

Innovate Web Tec

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

Managing employees in a big organization is a challenge. Specifically in an IT Company as the work done is not easily measurable.

### What Exact Problem is being Solved?

To develop a web application which can store and monitor information of employees in that it will include leave management, client management, task system that which tasks are allocated to which employee and also the attendance system using thumb impression.task management system to track task assigned to an employ like task assignment, deadline for task, resource allocation to employ for task etc.

### Users

Admin

Employee(Developers)

### Expected Outcomes

Ease of operation.

### Potential Impact

Improved efficiency and transparency.

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH078

### Problem Statement

Trainee Management System

### Name of Industry / Organisation

Innovate Web Tec

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

Managing trainees(students) is a nontrivial task for a training institute. The institute has to keep track of student's progress and this is not a scalable task. As the number of students increases keeping track of every students becomes harder and harder. So an online Solution is needed.

### What Exact Problem is being Solved?

To develop an application for students who are working in a training centre, in this attendance of every student will be managed by thumb impressions and also the batch management will be monitor by particular developer allocated by the admin.

### Users

Admin Trainers Students(Trainee)

### Expected Outcomes

Keeping track of students will become easier.

### Potential Impact

Better attention to individual students.

Higher quality of each student project.

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH079

### Problem Statement

To develop a web application for committee which can be helpful for student and training firm who are connected in that, it is a portal where that people can visit with app and register in firm. Student can view fees and fees receipt in application.

### Name of Industry / Organisation

Innovate Web Tec

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

To develop a web application for committee which can be helpful for student and training firm who are connected in that, it is a portal where that people can visit with app and register in firm. Student can view fees and fees receipt in application. A Training Company can combine various form of training modes and provide more value to its customers. Organizations can combine eLearning & Virtual/webinar classroom for its customers/learners who can't visit their classrooms. This allows them to tap into newer markets and extend their services offering.

### What Exact Problem is being Solved?

Interaction of Training Firm with Student or Training seeker. it is a portal where that people can visit with app and register in firm. Student can view fees and fees receipt in application. When creating portals for specific clients, a Training Company can also create Portal Admins or Client Admins. This means a lot of user management or training delivery etc. can be done by the Client Admin, thereby empowering them while reducing a Training Company's overheads.

### Users

Students will be beneficial and Training firm can also manage students easily. Students can contact training firm without physically going there. When creating portals for specific clients, a Training Company can also create Portal Admins or Client Admins.

### Expected Outcomes

Interaction of Training Firm with Student or Training seeker. it is a portal where that people can visit with app and register in firm. Student can view fees and fees receipt in application. When creating portals for specific clients, a Training Company can also create Portal Admins or Client Admins. This means a lot of user management or training delivery etc. can be done by the Client Admin, thereby empowering them while reducing a Training Company's overheads.

### Potential Impact

Students will be beneficial and Training firm can also manage students easily. Students can contact training firm without physically going there. it is a portal where that people can visit with app and register in firm. Student can view fees and fees receipt in application. This means a lot of user management or training delivery etc. can be done by the Client Admin, thereby empowering them while reducing a Training Company's overheads.

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH080

### Problem Statement

Project Management Software

### Name of Industry / Organisation

Kachhua

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Project management software is a software that helps project managers and groups collaborate and meet goals on time whereas managing resources and price. Functions might embody task distribution, time following, budgeting, resource designing, team collaboration, and plenty of additional. Project management software package is additionally observed as Task Management software package or Project Portfolio Management. Business professionals usually consider project management systems to assist them manage tasks and projects.

### What Exact Problem is being Solved?

A company may run a number of projects at a time, and requires input from a number of individuals, or teams for a multi level development plan, whereby a good project management system is provide solution. By different groups of people such as, seals department, programmers or project managers will be let by project applications a controlled access to information and automated distribution of information.

### Users

Project management system specially designed for IT industry. Small and Medium scale IT company use these kind of system to structure and control the project. Startup companies are user of such kind of software because system guide and control the project.

### Expected Outcomes

The objective for collaboration has been: getting thing done faster, cheaper and better by applying their common knowledge, bringing together a selection of resources and attainments in a project. Because valid collaboration with teams improves productivity, speeds up result-making and optimizes of making a right decisions, it also helps to intercept precious intellectual fortune and time. Webbased project management system can surprisingly increase performance, productivity and efficiency within an organization. Since web-based applications can be accessed through any web browser, no desktop installation or updates are required.

### Potential Impact

- It excludes the manual work of tracking projects.
- It manages the use of proper resources in time.
- It maintains schedule of the projects that is the start and end date of project accomplishment and reminds prior to the end date.
- The system tells the admin when the resources are about to get replenished so that more resources are made available soon.
- The system saves time, efforts and cost of organization.
- It is easy and flexible to use.

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH081

### Problem Statement

Platform for building voice assistant system

### Name of Industry / Organisation

KEVIT Technologies Pvt. Ltd., Rajkot

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

A system which can be accessed through voice is known as voice-based assistant system. Amazon Alexa or Google Home are well-known voice assistants. Many systems using these devices are built for different objectives or applications. But it requires high level of programming/development skill to build such systems. If a platform can be developed which allows developers to build such voice-based systems, developer's task would be very easy.

### What Exact Problem is being Solved?

The task of developer is made easier. The platform to be developed would be easy to use. As a result, novice programmer can also develop voice based systems. This will reduce the efforts required to develop voice based systems.

### Users

IT Software Developers. As this system is a platform to develop applications, IT software developers are the main users of this system.

### Expected Outcomes

The main outcome of this system is a platform which will be used by developers to develop voice-based systems. The secondary outcomes are like as development becomes easier, more and more developers will develop such systems for different applications. As a result, there will be an increased usage of voice-based systems.

### Potential Impact

Increase in Use of voice-based system.

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH082

### Problem Statement

Machine Learning based House Price Prediction System

### Name of Industry / Organisation

KEVIT Technologies Pvt. Ltd., Rajkot

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

Normally house price is decided based on negotiation between seller and buyer. But there is a better way to decide price of a house. There are many factors which affect the price. For example, locality, average price in the locality, availability of transport, availability of health-care nearby, distance from schools, offices etc.. In US, nowadays there is a trend to use algorithms to decide price of a house. There is need of a machine learning algorithm which takes input different decisive parameters and outputs the estimated price.

### What Exact Problem is being Solved?

Estimating price of a house based on certain factors

### Users

Real Estate Developers, Brokers, Sellers, Buyers

### Expected Outcomes

A machine learning based software which takes values of decisive factors as input and outputs the estimated price

### Potential Impact

The price will not be decided based on need of buyer and seller. But a systematic estimation will lead to fair prices. Overall satisfaction of buyer and seller will increase.

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH083

### Problem Statement

Mobile App based on voice enabled forms submission

### Name of Industry / Organisation

Meditab Software (I) Pvt. Ltd.

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

It is tedious for the users to fill up various forms. And this would help the user to fill the form quickly and would give all together totally different and wonderful experience. It should be completely based on the voice command. Users need not enter the details manually.

Example: A user would speak up "Name Rahul". And Rahul should appear in the Name field.

OR App will ask for name and user speaks "Rahul"

### What Exact Problem is being Solved?

This can be used in general for all the applications requiring data to be entered into the system.

For example, whenever a patient visits a hospital, s/he has to fill up basic details before availing the services. This would help the patient to complete this procedure quickly.

Another example: Visitor information management system. Whenever any person visits any office/institute, s/he can fill up all the basic required details via speech.

### Users

General (based on application), Old age people, Non-natives of Digital Technology, Avoids usage of application due to the long tedious process of typing the information. The goal is to increase the usage and usability of the useful applications.

### Expected Outcomes

It should work like how a normal form works with the data being accurate, providing the user a new experience. All the data should get stored as expected with the normal forms. Solution should be in a position to integrate (plug and play) with any application.

The Application Program Interface can also be made to offer this as a service or as a part of operating system.

Overall user experience must improve.

### Potential Impact

Time Saving. Effective way of communication is always speech. Also data entry is always tedious task and sometimes needs training. The non-natives of digital technology will benefit. The IT industry as a whole will be benefited due to increased usage of technology by the people with such requirements.

The ease of usage of an application will make the application and information reach to the last mile.

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH084

### Problem Statement

Voice Enabled Issue Management System

### Name of Industry / Organisation

Meditab Software (I) Pvt. Ltd.

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

Users are not able to get the support they require because they are not able to convey it easily to the support team. And sometimes it's even difficult for the support department to figure out how the issue is coming on the client's system.

After sales service is a very crucial for any company. There can be multiple ways like email, phone etc. to provide after sales service. The phone line may be busy due to higher number of calls. And the email is a tedious task to write. Therefore, the above issue management is the need.

### What Exact Problem is being Solved?

This system will encourage the user to communicate their difficulties using speech which is a natural way. Also, this will help the support team to figure out the issues faced by the clients using the voice-recorded messages along with the relevant screenshots.

It would eliminate the long wait of connecting to a calling customer service agent and a tedious task of writing an email to the support team.

### Users

The users of the system can be any software/application developer who needs to provide the customer service to their users. The system should work like a plug and play system for different applications to use with.

### Expected Outcomes

There should be a provision in the system to log the issue using speech. It should also take screenshots of their last few steps. After the issue is logged in database, it should go into the support queue and user should get the notification of the issue identification number.

It should provide the solution with plug and play facility.

The solution may also provide the issue tracking facility also.

### Potential Impact

- Faster and effective way of communication with support in case any bug/issue is found.
- Increased customer satisfaction and gaining the loyalty of customer.
- Increase the reach of customers by enabling the non-digital natives to work with ease.
- The employees of the service department can work effectively with added information like screen shot of last status of the issue.
- Better issue management.

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH085

### Problem Statement

AI-based writing assistant to identify the problematic spells, incorrect grammar etc. and should have underline or highlight and also it should suggest correct options.

### Name of Industry / Organisation

NiviData Consultancy

### Type Of Industry / Organisation

Small

### Challenge Description with Context

AI-based writing assistant (Example:Grammarly)

1. Writing English accurately is a tedious job, as many parameters involved like Spells, Grammars, Punctuation, etc.
2. Need to create a data science-based system which can learn as many parameters.
3. Necessary to design an algorithm and model, which can be properly trained with any existing dataset.
4. Try to provide accuracy while writing.
5. It should also identify the problematic spells, incorrect grammar, etc. and should have underline or highlight and also it should suggest correct options.

### What Exact Problem is being Solved?

AI-based writing assistant. Try to provide accuracy while writing. It should also identify the problematic spells, incorrect grammar, etc. and should have underline or highlight and also it should suggest correct options.

### Users

Students, Writers, Corporate Users, professionals

### Expected Outcomes

AI-based writing assistant to identify the problematic spells, incorrect grammar, etc. and should have underline or highlight and also it should suggest correct options.

### Potential Impact

Helps students to improve their writing in essays, reports, theses, dissertations, and helps universities and corporations to write English accurately and error-free.

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH086

### Problem Statement

File Tracking System

### Name of Industry / Organisation

NiviData Consultancy

### Type Of Industry / Organisation

Small

### Challenge Description with Context

File Tracking System - an automated solution to get the current status of any file for any government organisation as well as any private industries, now a days what is the status of any file is very much important to handle the situation smoothly, this project file tracking system can easily able to handle this kind of problem, we can provide the exact status for file generated, general public or any client can be able to see the status of the file

### What Exact Problem is being Solved?

File Tracking System - an automated solution to get the current status of any file for any government organisation as well as any private industries, now a days what is the status of any file is very much important to handle the situation smoothly, this project file tracking system can easily able to handle this kind of problem, we can provide the exact status for file generated, general public or any client can be able to see the status of the file

### Users

Any Government Institutions as well as private organisation can be able to use this software for their day to day task to get the current and latest status of the file. Admin Users can change the status of the file

### Expected Outcomes

File Tracking System - an automated solution to get the current status of any file for any government organisation as well as any private industries, now a days what is the status of any file is very much important to handle the situation smoothly, this project file tracking system can easily able to handle this kind of problem, we can provide the exact status for file generated, general public or any client can be able to see the status of the file

### Potential Impact

File Tracking System - an automated solution to get the current status of any file for any government organisation as well as any private industries, now a days what is the status of any file is very much important to handle the situation smoothly, this project file tracking system can easily able to handle this kind of problem, we can provide the exact status for file generated, general public or any client can be able to see the status of the file

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH087

### Problem Statement

Hostel Data Base Management

### Name of Industry / Organisation

Purohit Hostel (Bhavan), Palanpur

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

More than 200 students are present in the hostel and daily 15-20 others member are come for food as well as night stay at hostel premises. All those data maintain by hostel rector manually but when trusty members visit the hostel that instant hostel rector couldn't show data in front of trusty members. In this situation hostel rector couldn't show all the data in front of trusty members and students parents.

### What Exact Problem is being Solved?

In case of hostel data base management their are so many data required like student general information, fee related data, student attendance, guest food coupon and guest night staying data. Student general information included previous history of student. This app we can use at admission time using this app we can show vacant sheet of hostel with room number. In this app we also want hostel related account like Deposit fee, hostel fee etc.

### Users

All government and private hostel can use this application because in this application all data are included which is required for hostel management. This application also used by PG center and private tuition classes.

### Expected Outcomes

we require hostel data base management application in which all hostel data are included like student general information, fee related data, student attendance, guest food coupon and guest night staying data. Student general information included previous history of student. This app we can use at admission time using this app we can show vacant sheet of hostel with room number. In this app we also want hostel related account like Deposit fee, hostel fee etc.

### Potential Impact

By solving the problem with this novelty we come out with the very economical solution of hostel management. If this type solution provided by student member than we got big success in hostel management. we compile all data at the instant and we send student attendance to his/her parents. Student parents and trusty member can see the student attendance and other data from remote location. This solution provide big impact to our society

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH088

### Problem Statement

eCommerce Aggregator - App and ERP for one Shop to fetch ALL orders from Amazon, Flipkart, Myntra.

### Name of Industry / Organisation

Serpent Consulting Services Pvt.Ltd

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

Its never been so easy to handle multiple E-Commerce platforms with handling concurrent Sales Analysis/Accounting and Inventory from each platform Individually. For now seller has to go through each marketplace system to handle Sales/Manage Product Inventories, CRM, Manual Data Import/Export and Handle Inventory mismatch during festival season and Rush hours. Managing accounting data across multiple Platforms and Submitting final Statement on Fiscal year closing.

### What Exact Problem is being Solved?

So Instead of dealing with each E-Commerce platforms individually for every single Update (It could be Order Confirmation/Order status Update, Shipping Updates, Order tracking Update, Post sale Process like return and Refund), We are creating single roof for all E-Commerce platforms which includes all these Operations by using just one system which makes easy to deal with All Business Processes and Easy analysis.

### Users

ERP Administrator , System Administrator ERP Manager, ERP User , Marketplace Vendors Inventory Manager , Inventory User , Accounting Manager , Accounting User Product Owners, Customer Relationship Manager End users, Marketplace Developers

### Expected Outcomes

Expected Outcome will be to use only one system which include Rich ERP features like CRM, Sales, Invoicing, Inventory, Manufacturing, HR Process and rich User Interface. By Implementing this there will be no need to use Multiple marketplace system to manage Sales/Inventory and Accounts and gathering all things into one by doing manual Import/Export.

Now, All these will be handled into one single system by using ERP features and multiple marketplace APIs.

### Potential Impact

Primary Impact will reduce the Efforts for managing Sales/Inventory and Accounts in each marketplace and doing Import/Export to handle all these under Single business Organization.

This makes lot easier to Tracking Organization growth/Sales Analysis, Manual Inventory Adjustments, Stock Forecast, Handling Individual E commerce Operations from single system with the use of specific APIs.

There will be no more case of Inventory Mismatch as we will use APIs to handle real-time stock updates.

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH089

### Problem Statement

ERP connectivity to solve support problems (Telephony Connector) - Exotel,Poptox,plivo,nexmo

### Name of Industry / Organisation

Serpent Consulting Services Pvt.Ltd

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

In ERP, if we looking at telephony connector,then there is big problem is there is no calling functions, no any intregator for voip/call,If customer wants to contact regarding invoice/sales, so there is no any connectivity or tracking records,also there is no bridge available to make voip connection with ERP.There is no analysis model, data report for voip functions.Also for customers if they wants to manage there own portal, they can't.

### What Exact Problem is being Solved?

In ERP we will provide VOIP connector: by this we will give to manage there own portal by voip connector,Also will tracking each calling records,we will make bridge between ERP with VOIP. We will make VOIP intrgations providers like exotel,poptox, knowlarity,Poptox,plivo,nexmo,So we will manage analysis model, data report for voip functions.Also for customers if they wants to manage there own portal,we will provide there portal by just on voip call.No Email communication needed, no manual paper work.

### Users

ERP Administrator , System Administrator ERP Manager, ERP User , Marketplace Vendors Inventory Manager , Inventory User , Accounting Manager , Accounting User Product Owners, Customer Relationship Manager End users, Marketplace Developers

### Expected Outcomes

Enterprise Solutions, All of the traditional call system features you expect are available in hosted VoIP systems, including call hold, call transfer, call hunt, conference calling, find me / follow me, and auto-attendant phone menus.Hosted VoIP phone systems let users access a convenient web portal to reconfigure the system at any time. Hosted VoIP phone systems are also terrific for businesses that have field workers or workers who travel a lot. Calls can be diverted to anywhere in the world due to cloud-hosted VoIP phone system features.All in under one roof.

### Potential Impact

Without the need for paper or toner,  
you can send and receive direct calls from customer, No more email communication, Tracking records for each communiction via call records, Easier to Install, Configure, and Maintain,

VoIP Scales Up, Employees' Numbers Follow Them Wherever They Go, A Range of Call Features Are Supported, Even dropped older technology Like Fax, VoIP Integrates With Other Business Systems, Easy and inexpensive to add new voip functions,

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH090

### Problem Statement

Restaurant aggregator - App and ERP for one Restaurant to fetch ALL orders from Swiggy, Zomato, Foodpanda etc marketplaces.

### Name of Industry / Organisation

Serpent Consulting Services Pvt.Ltd

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

It's never track all the orders in one screen of different market place, Live update of all different market order status, All Invoice, Sale Analysis, Restaurant Analysis, For now there is no restaurant aggregator available for fetch the details of order from food application to ERP, Inventory Analysis, Manage food inventory is difficult, Manage Order with different market place at the same time with assigned person and restaurants.

### What Exact Problem is being Solved?

Using the ERP all the restaurants with different market place order is easily manage, Track product inventory and updation easily, Invoice and accounting will smartly manage, live tracking of kitchen order status from the screen, Linked with order, invoice and inventory manage, Print/email/download the advance documents of order, invoice and shipment, using aggregator easily manage fetching order using import/export and scheduler by every minutes.

### Users

ERP Administrator , System Administrator ERP Manager, ERP User , Marketplace Vendors  
Inventory Manager , Inventory User , Accounting Manager , Accounting User Product  
Owners, Customer Relationship Manager End users, Marketplace Developers

### Expected Outcomes

Expected Outcome will be to use only one system which include Rich ERP features like Crm, Sales, Invoicing, Inventory, Restaurants, HR Process and rich User Interface. By Implementing this there will be no need to use Multiple marketplace system to manage Orders/Inventory and Accounts and gathering all things into one by doing manual Import/Export.

Now, All these will be handled into one single system by using ERP features and multiple marketplace APIs.

### Potential Impact

Primary Impact will reduce the Efforts for managing Orders/Inventory and Accounts in each marketplace and doing Import/Export and sync to handle all these under Single business Organization.

This makes lot easier to Tracking Organization growth/Sales Analysis, Manual Inventory Adjustments, Stock Forecast, Handling Individual Restaurants Operations from single system with the use of specific APIs.

There will be no more case of Inventory Mismatch as we will use APIs to handle real-time stock updates.

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH091

### Problem Statement

Shoppo is the android application used for home delivery of all type of products like grocery, cosmetics, medicines etc. Using shoppo you can buy any product from any local shop from your area.

### Name of Industry / Organisation

SilverWing Pvt Ltd

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

It will be difficult for application developer to cover all shops within given pin code. Difficult for delivery boys to deliver product at minimum cost as well as minimum time. After giving optimum and cheap products to all customers Shoppo android application owner should also gain some benefit. After completion of development of Shoppo android application, how developer can launch or publish this to clients or customers.

### What Exact Problem is being Solved?

Developer can get information of all shops within given pin code by searching different websites online. Developer can give cheap and optimum products by supplying maximum local vendors to the client and distributors both. Shoppo named android application can take help of electronic mails, internet and social medias to gain the benefit of its publicity to customers. By this way all can get win-win situation at the end.

### Users

People all over city can use Shoppo android application with the help of minor configuration and database changes. One can buy our android application to get its maximum benefit by minimum cost and can save lot of efforts and time.

### Expected Outcomes

Shoppo will try to deliver the best and user friendly environment android application. Whose any naive user can also get maximum benefit by easily accessing its various features. People all over city can use Shoppo android application with the help of minor configuration and database changes. One can buy our android application to get its maximum benefit by minimum cost and can save lot of efforts and time.

### Potential Impact

Thus society can get maximum benefit of Shoppo android application. Shoppo will try to deliver the best and user friendly environment android application. Whose any naive user can also get maximum benefit by easily accessing its various features. People all over city can use Shoppo android application with the help of minor configuration and database changes. One can buy our android application to get its maximum benefit by minimum cost and can save lot of efforts and time. People can get rid out of long queues.

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH092

### Problem Statement

Society Management System

### Name of Industry / Organisation

Silverwing Technologies Pvt Ltd

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Society Management system is the website portal designed to reduce conflicts among society member. Society Management system has automated functionality for calculating monthly maintenance and member can be able to view all societies bill/status on their own account. The society management system allows members to login with their own account and gets updated with society happening. Society management system provides a dashboard according to the user role. Admin can see the due payments, payment history, etc. resident can see about payment history, complaints, etc.

### What Exact Problem is being Solved?

The existing system for society is based on the traditional way of keeping records and details on paper and registers. Access of these details and paper are not granted to any society member in the absence of the authority. The existing system is manual so it is time-consuming and tedious. It needs more manpower to handle the whole existing system. Just to call a society meeting a person has to go door to door to inform all members.

### Users

Secretary can see the due payments, payment history, upload bills, etc. Society members can see their payment history, can complaints regarding any issue etc. Admin can create new users, can broadcast society news/message.

### Expected Outcomes

Society management system provides an online complaint management system where user can log a complaint through a web portal or through message, can be allocated a hall for any events like birthday parties, ring ceremony and also for any festival, can send message to all society members, can calculate maintenance, maintenance charges bills on regular periodical or for specific purpose/debit notes be generated with an ease.

### Potential Impact

The existing system for society is based on the traditional way of keeping records and details on paper and registers. Access of these details and paper are not granted to any society member in the absence of the authority. The existing system is manual so it is time-consuming and tedious. It needs more manpower to handle the whole existing system. Just to call a society meeting a person has to go door to door to inform all members, so it is time-consuming. Society management system provides an online portal where user can log a complaint, can book a hall for any events like birthday parties, ring ceremony and also for any festival, can send message to all society members, can calculate maintenance, etc.

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH093

### Problem Statement

Cleanliness Automation using Deep Learning

### Name of Industry / Organisation

Softvan

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Challenge with Description:

Here, we are targeting complete automation of garbage collection system which includes identification of garbage from CCTV camera footage. This is the critical task where knowledge of image processing and machine learning will be applied. Participants are expected to have a database of images of garbage to train their model.

### What Exact Problem is being Solved?

We have seen many a times that the garbage thrown on the streets gets uncollected for many days which is the source of many problems and leads to many health related issues. Here, we are assuming that CCTV has been employed at every street and we want an algorithm that can detect the garbage and determine the location of the same and notify the respective authorities. Authorities are expected to take immediate actions.

### Users

Users for this application will be Municipal Corporations, employees of municipal corporation. Citizens are not involved as the input will be collected from CCTV footage. So, only authorities of municipal corporation or private cleaning agencies will become the users.

### Expected Outcomes

Expected Outcome:

The complete automation of garbage collection. Live Input from CCTV camera (during competition participants can have still images to train and test their model) ----> Identification of garbage ---> Obtain the location of the garbage (Here, Participants can use any simple algorithm) ----> Send this location information with time to the respective authorities.

### Potential Impact

We have seen many a times that the garbage thrown on the streets gets uncollected for many days which is the source of many problems and leads to many health related issues. The complete automation of garbage collection will solve the problem to a great extent which would help to keep our city clean and healthy. Undeniably this would help in achieving the targets of "Swachchha Bharat" mission if it gets implemented in all cities across the country.

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH094

### Problem Statement

Online Food with Quality Checks

-should deliver hygienic food with regular check, -should show details of every ingredient used , -should black list bad vendors , -change commission and return policy

### Name of Industry / Organisation

Strat360

### Type Of Industry / Organisation

Corporate

### Challenge Description with Context

-routine and surprise quality check mechanism is challenging part of system.

It is easy to simulate the system for good/bad quality food. But this is practical challenge, to hire trusted party/ staff for regular quality check and surprise check maintain record in database.

-There are lots of food delivery services are available in India. It is also challenging to market it in this tough competition.

### What Exact Problem is being Solved?

Trusted, Quality Food Delivery system is being developed. All associated vendor will be agreed to routine and surprised check of food being delivered. People will be relived of thinking that 'what will be the quality of food is being delivered?'".

Always guaranteed, standard with bench marked food will be delivered.

People will know each minor ingredient are added to food he/ she is ordering .

Bad vendor will be blacklisted.

### Users

General public is ultimate user of system.

All vendor who want to deliver a good quality of food.

A trusted third party or a qualified staff who is responsible quality check will be the user of the system.

### Expected Outcomes

Trusted, Quality Food Delivery system will be developed. All associated vendor will be go through routine and surprised check of food being delivered. People will be relived of thinking that 'what will be the quality of food is being delivered?'".

Always guaranteed, standard with bench marked food will be delivered.

People will know each minor ingredient are added to food he/ she is ordering .

Bad vendor will be blacklisted.

### Potential Impact

General public will always ordered a food with good quality.

People will stay healthy.

There will be no cases of mass food poisoning. (it may happen sometime)

Always food with known ingredients will be delivered. so people will understand the benefits and harms from each minor ingredients (like kind of oil is being used to cook a food).

There will be healthy competition in market to deliver a good quality food

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH095

### Problem Statement

Application for the HR department to easily shortlist the candidate based on the RESUME ranking policy and to give an online test for personality and aptitude. The system will generate the test result in graphical form with marks.

### Name of Industry / Organisation

Techmicra IT Solutions

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

This system will enable a more effective way to the shortlist submitted

candidate resume /application from a large number of applicants providing a consistent and fair resume ranking policy, which can be legally justified. The system will rank the experience and key skills required for a particular job position. Then the system will rank the resumes based on the experience and other key skills which are required for a particular job profile. This system will focus not only on qualification and experience but also focuses on other important aspects which are required for a particular job position. This system will help the human resource department to select the right candidate for a particular job profile which in turn provide an expert workforce for the organization. Candidate here will register him/herself with all its details and will upload their own RESUME into the system which will be further used by the system to shortlist their RESUME. Candidate can also give an online test which will be conducted on personality questions as well as aptitude questions. After completing the online test, the candidate can view their own test results in graphical representation with marks.

### What Exact Problem is being Solved?

Candidate here will register him/herself with all its details and will upload their own RESUME into the system which will be further used by the system to shortlist their RESUME. Candidate can also give an online test which will be conducted on personality questions as well as aptitude questions. After completing the online test, the candidate can view their own test results in graphical representation with mark

### Users

HR department of All company, organization, institutions

### Expected Outcomes

The system will shortlist the resumes based on the RESUME ranking policy and candidate can give test for personality and aptitude also. The test result will be generated in graphical form with marks.

### Potential Impact

This system will help the HR department to easily shortlist the candidate based on the RESUME ranking policy

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH096

### Problem Statement

Scanned Documents with written text, QR or Barcode to Digital Documents

### Name of Industry / Organisation

TechSmith Solutions Pvt Ltd

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Scanning of hand written and/or typed documents pertaining to patient health care (e.g. First Consulting Report, Prescription, etc.). These documents may have affixed Bar Code Sticker indicating Patient ID anywhere on the page. Such documents will also have designated fixed place, where additional information (hand written but CAPITAL letter and NUMBERS) would have been provided and same can be used for document classification. Documents shall be scanned in bulk and not individually.

### What Exact Problem is being Solved?

Many patient health records and investigation reports are manually prepared or received from other agencies. Entering those data is a tedious task. Handwriting of such records is easier than typing for doctors and professionals in the healthcare domain field. However, it is also important to digitize the documents for insurance and recording and analysis purposes. The current method of manual entering is tedious task and hence there is a need for such a system. The additional challenge is sometimes, the record documents may also have data in barcode or QR code. The processing for those also need to be completed.

### Users

Healthcare domain professionals are the main users of this system. However, it can also be extended to various government agencies involved in the record keeping mechanism and other such related work.

### Expected Outcomes

- Convert the scan image in to digital editable documents with auto correction of medical terminology (covering chief complaints, symptoms, diagnosis, investigations, medicine names, etc.).
- Abstract auto corrected medical terms and enhance our internal dictionary for future use.
- Classify the documents and upload in respective folder with suitable file name.
- The document accuracy should be such that the trade-off for document correction to scanned accuracy should yield benefits.

### Potential Impact

- Faster data processing will result in speedy claim processing in healthcare industry.
- Human efficiency for data management and analysis is improved.
- If applied in government departments, the citizen services can be made available faster.
- The impact can result in better healthcare services, better governing services by government and increased efficiencies of departments.
- Meaningful also for documents containing bar code or QR code.

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH097

### Problem Statement

Access of local hardware through web browser plug and play mode

### Name of Industry / Organisation

TechSmith Solutions Pvt Ltd

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Presently any web based applications would not be able use local hardware (except few like printer or camera) resources. We would like to make it possible to use local scanner through web based application. Meaning, if web application has Scan Button, and if user presses Scan Button, application should be able to access scanner connected to computer from where this web application is executed. This utility should be browser agnostic.

### What Exact Problem is being Solved?

- It is not possible to use local hardware like scanner in web application due to which the document need to be scanned first in local machine and then to be uploaded. It should be possible directly.
- Through web based application, one shall be able access scanner by pressing Scan button on the web application functionality.
- It will remove the hassle for various web applications to provide the file uploading for various things. The direct access will make the access faster.

### Users

- Several users across platforms; where local hardware resources (in this case scanner) are required to access via cloud hosted applications.
- If given as the API service, it can be attached to any web application and can use any apparatus or hardware without any issues.

### Expected Outcomes

- An independent function or utility, which allows to access local resource via hosted / web application. This function or utility should be browser independent.
- Hassle free connectivity to range of hardware in healthcare industry to directly input data from data sources like the imaging machine, X-ray machine or any such ultrasonic or other therapeutic apparatus.
- This can ensure the thin client machines can also be used for various task related to audio / video application without storing them.

### Potential Impact

- Encourage more cloud based applications and thin clients. The web applications can be equipped with more tools.
- Less human interaction and hence, the chances of errors will reduce,.
- The medical field can attach all its devices as peripherals with the computer for a web based client.
- The web based client do not need multiple upgrade / installation on the client side making the application developers not worry about them.

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH098

### Problem Statement

To develop a user friendly common MIS system.

### Name of Industry / Organisation

The Banaskantha District Cooperative Milk Producers' Union Limited, Palanpur

### Type Of Industry / Organisation

Large

### Challenge Description with Context

Write now there are different MIS systems in different plants. We want a user friendly common MIS system which will be web enabled and contain KPI for MIS system. The Real time data will be obtained from PLCs, SCADAs and different MIS systems. Write now there are different MIS systems in different plants. We want a user friendly common MIS system which will be web enabled and contain KPI for MIS system. The Real time data will be obtained from PLCs, SCADAs and different MIS systems.

### What Exact Problem is being Solved?

Common system will be available for Management Information System. Write now there are different MIS systems in different plants. We want a user friendly common MIS system which will be web enabled and contain KPI for MIS system. The Real time data will be obtained from PLCs, SCADAs and different MIS systems. Write now there are different MIS systems in different plants. We want a user friendly common MIS system which will be web enabled and contain KPI for MIS system. The Real time data will be obtained from PLCs, SCADAs and different MIS systems.

### Users

Different cost centers and Top Management. Write now there are different MIS systems in different plants. We want a user friendly common MIS system which will be web enabled and contain KPI for MIS system. The Real time data will be obtained from PLCs, SCADAs and different MIS systems.

### Expected Outcomes

Realtime Plant data will be available at any place. Write now there are different MIS systems in different plants. We want a user friendly common MIS system which will be web enabled and contain KPI for MIS system. The Real time data will be obtained from PLCs, SCADAs and different MIS systems. Write now there are different MIS systems in different plants. We want a user friendly common MIS system which will be web enabled and contain KPI for MIS system. The Real time data will be obtained from PLCs, SCADAs and different MIS systems.

### Potential Impact

Fast decision making. write now there are different MIS systems in different plants. We want a user friendly common MIS system which will be web enabled and contain KPI for MIS system. The Real time data will be obtained from PLCs, SCADAs and different MIS systems. Write now there are different MIS systems in different plants. We want a user friendly common MIS system which will be web enabled and contain KPI for MIS system. The Real time data will be obtained from PLCs, SCADAs and different MIS systems.

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH099

### Problem Statement

To develop the data extraction technique from hard copy to various soft copy form like excel format for analyzing and prediction of data. User can also use collected data to form various graph, generate report or send relevant information via mobile/Email

### Name of Industry / Organisation

WayToWeb Pvt. Ltd.

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

In current scenario, Man power is used to collect the various form data and to process that data. Check every individual form like feedback form and find out the various keywords from it inefficient task. This process require so much time to complete the process. No automated system is available that will scan the document, find keywords and generate excel sheet accordingly. Also no system is available to scan signature also.

### What Exact Problem is being Solved?

This system will be used to convert various hardcopy forms like feedback form, suggestion form, complaint form to softcopy i.e., excel sheet, word file etc. Here excel sheet is preferable. Now using this collected digital data, User can use such data for different purpose like send greeting SMS, Advertisement SMS also send email using email id, or generate report as they need or compare the results accordingly.

### Users

This system is applicable to any small, medium, large scale organizations, universities, pharmaceutical companies, medical and any government organization where there will be need to evaluate their assests/ product/ manpower.

### Expected Outcomes

This system should be facilitated for data extraction from hardcopy to softcopy to enable smooth, accurate process and overall system save lots of human time for measuring efficiency of their products/human resources etc. Here you can use python technology. After developing this system, Organisation must be improve their evaluation process and modify their work flow accordingly. Also this is easy to use and user friendly system.

### Potential Impact

It can save time and enable better improvement of organization fast. In our society everyone wants to improve their work/ improve their human resources also improve their potential capabilities. This system should facilitates for the same. This is automated system. Main module of system is to scan document, convert it into soft copy in system, and extract the numerous information that one will require.

### Probable Discipline

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH100

### Problem Statement

To develop a product which can be helpful to the blind people as they can predict the distance of the object that they can come to contact, not only predict but also our product will suggest the route and the medium of transport to reach to the destination.

### Name of Industry / Organisation

WayToWeb Pvt. Ltd.

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

The main challenge that may be faced is the prediction of object that may come in between the user and object also the suggestion that will be given to the user according to the data found by the cameras and different sensors that using machine learning algorithms. The main challenge that may be faced is the prediction of object that may come in between the user and object also the suggestion that will be given to the user according to the data found by the cameras and different sensors that using machine learning algorithms.

### What Exact Problem is being Solved?

This product is mainly for the blind people, Using this Product it will be very helpful for them to reach their destination and also they can do many things as same as the normal person can do. Not only for the fully blind but also for the partially blind people. This product is mainly for the blind people, Using this Product it will be very helpful for them to reach their destination and also they can do many things as same as the normal person can do. Not only for the fully blind but also for the partially blind people.

### Users

This Product will have the sense to see the object surrounding them and also predict the object that can be helpful to user to reach the destination and also this product will suggest the medium of transport to reach their destination shortly as possible, this all be done by the user voice command.

### Expected Outcomes

This Product will have the sense to see the object surrounding them and also predict the object that can be helpful to user to reach the destination and also this product will suggest the medium of transport to reach their destination shortly as possible, this all be done by the user voice command. This Product will have the sense to see the object surrounding them and also predict the object that can be helpful to user to reach the destination and also this product will suggest the medium of transport to reach their destination shortly as possible, this all be done by the user voice command.

### Potential Impact

With help of this, Product will have the sense to see the object surrounding them and also predict the object that can be helpful to user to reach the destination and also this product will suggest the medium of transport to reach their destination shortly as possible, this all be done by the user voice command.

With help of this, Product will have the sense to see the object surrounding them and also predict the object that can be helpful to user to reach the destination and also this product will suggest the medium of transport to reach their destination shortly as possible, this all be

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

done by the user voice command

**Probable Discipline**

Computer/IT

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH101

### Problem Statement

Reduce Wastage of Lighting System in small and Medium Scale Industries.

### Name of Industry / Organisation

Dynamic Consultant

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

To reduce the Energy losses in Lighting system with effective control. All industries are different, with different operations and needs. There are also different lighting requirements for the various types of industrial activities in the lighting standard, as well as in other applications, and it is difficult to come up with a general recommendation for light control. A well planned lighting design together with a well-executed lighting control solution means optimized lighting for a specific activity is achievable. Whatever the requirements, it is smart to think lighting control at the planning stage, and in industrial and warehouse applications, we believe that a control system is the obvious, and in many cases, the only choice. However, to get maximum benefit of a control system it needs to be project specific. You must know how the industry works and how different areas are used during working hours. For example, it is important to establish if there is natural light? During what times, and for how long are staff present in certain areas? Are there areas of greater occupancy? How much activity is there in, say the aisles of the warehouse? If you do not ask these questions, you will not get the best results from the lighting control system.

### What Exact Problem is being Solved?

Reduce the Energy wastage in Industrial lighting system. There are number of sensors are used in Industry like occupancy sensors, motion sensors and many others. Effective control and on/off with on/off control is very desirable. Advance sensorless control techniques, IOT based techniques can be used to replace an existing solution. The desired solution if has form, feature, application, then it will be very helpful to industry, society and nation.

### Users

based on:

- Chronological time (time of day)
- Solar time (sunrise/sunset)
- Occupancy using occupancy sensors
- Daylight availability using photocells
- Alarm conditions
- Program logic (combination of events)

There are two types of lighting control systems which are:

- Analog lighting control
- Digital lighting control

Examples for digital lighting control systems are:

- DALI based system.
  - DSI based system
  - DMX512 based systems (often referred to as simply DMX).
  - KNX based systems
-

# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

There are also wireless lighting control systems that are based on some standard protocols like MIDI, ZigBee, Bluetooth Mesh, and others. The standard for digital addressable lighting interface, mostly in professional and commercial deployments, is IEC 62386-104.

Architectural lighting control systems can integrate with a theater's on-off and dimmer controls, and are often used for house lights and stage lighting, and can include worklights, rehearsal lighting, and lobby lighting. Control stations can be placed in several locations in the building and range in complexity from single buttons that bring up preset options-looks, to in-wall or desktop LCD touchscreen consoles. Much of the technology is related to residential and commercial lighting control systems.

Note: Industry, schools, colleges, Theaters, Villages, Urban area, Rural

Population, Panchayats, Government buildings etc all places Lighting control can be used

## Expected Outcomes

Students will be familiar while working in some of the below mentioned areas.

Lighting control measures in commercial, industrial, and other nonresidential facilities include:

- Sweep controls/energy management systems that shut off lighting at a set time, typically after normal operating hours
- Lighting occupancy sensors (OS) that turn lights on or off, based on space occupancy conditions
- Dimming control systems:
  - o Stepped dimming systems, such as dual ballasts (inboard/outboard)
  - o Dual ballast high/low high-intensity discharge (HID)
  - o Continuous daylight dimming systems.

Effective sensor and sensor less programs and devices made during Hackathon will help students developing their skills for solving present Industry problem. Best solution outcome will be really helpful to society and nation.

## Potential Impact

There are many reasons why owners should consider energy efficiency, from the clear environmental and financial benefits of cutting energy use to potential improvements in mental and physical health. In fact, energy efficiency has become one of the common features that prospective homeowners look for when purchasing a home.

Whether your motivations for energy conservation are economic, environmental, or personal, the benefits of energy efficiency will have something to offer for everyone. Here are the top eight reasons why energy efficiency is important for you and why it is important to conserve energy:

- 1 Significantly reduce your utility bills
- 2 Earn a great return on your investment
- 3 Increase your property value
- 4 Enhance your quality of life
- 5 Protect the environment
- 6 Energy savings tips help you easily cut costs
- 7 Earn incremental returns on energy efficiency investments
- 8 Insulate yourself from rising electricity prices

## Probable Discipline

Computer/IT, Electrical Engineering, Electronics and Communication

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH102

### Problem Statement

In this digital era our college campus also need technology for classy enviroment utilize secured an modern technology for E-campus activities.

Due to lack of digitalization in the government sectors or office(work area),there is always a problem of ener

### Name of Industry / Organisation

Government Engineering College, Bharuch

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

1)-Making of Automation Demo project is easy but in actual implementation in running system is very Difficult.

2)- Deep Circuit analysis and Deep circuit knowledge require which gives

3)- latest Technology knowledge Required so which one give better results and better performance of system.

4)- For Real time operation of Switching required server . Server Also protect whole system and also Designing web page & create Application for mobile. For these deep knowledge of Computer And IT.

### What Exact Problem is being Solved?

In this digital era our college campus also need technology for classy environment utilize secured an modern technology for E-campus activities.

Due to lack of digitalization in the government sectors or office(work area),there is always a problem of energy wastage due to unwanted operation of the electrical loads.

Remotely control switching of Electrical Load (Fan,Lights) which can reduce the wastage Electrical Energy.

### Users

Person Who is present that place where system installed can manually control the switching( In college like students,faculty)

Authorized Person (head of Organisation)whom have Responsibility of Organisation also remotely control whole organisation electrical load.

### Expected Outcomes

The benefits of automation typically fall into a few categories, including savings, convenience, and control.

Control:-User also choose smart home devices to better control functions within the home. With home automation technology, you can know what's happening inside your home at all times.

Convenience: Because automation technology performs rote tasks automatically, end users experience great convenience. Lots of smart gadgets are compatible with one another, and you can set different triggers between devices to automate regular home processes.

### Potential Impact

We are already seeing the impact of IoT at homes, at offices and several industries such as automotive, energy, manufacturing, insurance, agriculture and so on.

Organizations are interested in IoT because it helps them improve their business, be it

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# **Smart Gujarat For New India Hackathon 2019-20**

## **Problem Statements**

greater customer experience, or driving operational efficiency or even changing business models.

IoT as a solution with vertical applications, that operates in silos. IoT is all about connecting various systems and verticals, and thereby, how each application cooperates, talk and work together and use each other's information. It is about a seamless application on a common platform, that connects all vertical applications, that talks a uniform language and is protected by privacy and security. It is only then, that the real value of IoT can be perceived – A system of connected machines, connected homes, connected cities, that can extract useful information from one another, provide feedback, alert for taking action, coach each other and finally develop intelligence by understanding, learning and reasoning.

### **Probable Discipline**

Computer/IT, Electrical Engineering, Electronics and Communication

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH103

### Problem Statement

To detect and analyze milk parameters from cattle farm to dairy collection centre using AI and IOT

### Name of Industry / Organisation

AMUL DAIRY,ANAND

### Type Of Industry / Organisation

Large

### Challenge Description with Context

When milk is brought by farmers or cattle farm people from their cattle farm to dairy collection centre, there are chances that it gets spoiled. They do not get money for that. Sometimes they also do some mixing and adulteration and after that so many problems occur. If we can get the important milk parameters from cattle farm to dairy collection centre then we can have a complete record of all farmers bringing milk to collection centre. Here we must know the health of animal, their health parameters as well as milk parameters e.g fat and related milk parameters.

### What Exact Problem is being Solved?

When milk is brought by farmers or cattle farm people from their cattle farm to dairy collection centre, there are chances that it gets spoiled. They do not get money for that. Sometimes they also do some mixing and adulteration and after that so many problems occur. If we can get the important milk parameters from cattle farm to dairy collection centre then we can have a complete record of all farmers bringing milk to collection centre. Here we must know the health of animal, their health parameters as well as milk parameters e.g fat and related milk parameters.

### Users

Dairy collection Centre will get all records of important parameters but it will be helpful to all stake holder. this will be helpful before pasturization process and if we can know the important parameters from cattle farm itself then it will be really helpful in milk processing too.

### Expected Outcomes

Good quality of milk and milk products. Dairy collection Centre will get all records of important parameters but it will be helpful to all stake holder. this will be helpful before pasturization process and if we can know the important parameters from cattle farm itself then it will be really helpful in milk processing too. It will directly benefit end user. People can get good quality of milk and milk products.

### Potential Impact

Good quality of milk and milk products. Dairy collection Centre will get all records of important parameters but it will be helpful to all stake holder. this will be helpful before pasturization process and if we can know the important parameters from cattle farm itself then it will be really helpful in milk processing too. It will directly benefit end user. People can get good quality of milk and milk products.

### Probable Discipline

Computer/IT, Electrical Engineering, Electronics and Communication, Chemical Engineering, Multi Disciplinary- Instrumentation, Chemical Engg etc

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH104

### Problem Statement

Modification in Effluent Treatment Plant (ETP) to recover more water and generate revenue from waste products e.g bio gas

### Name of Industry / Organisation

AMUL DAIRY,ANAND

### Type Of Industry / Organisation

Large

### Challenge Description with Context

Optimization of the cost of milk products and recycling of waste. Industry is in process of solving it. they require moderate amount of water but that should be increased and revenue should be generated from it. Currently they produce biogas plant on small scale. Water consumption given by the corporation is to be reduced further. In nutshell finally it will be profitable to organization to cut down the price in the milk products inspite of higher price of raw material. Hence it will be also be helpful and beneficial to farmers and customers.

### What Exact Problem is being Solved?

Optimization of the cost of milk products and recycling of waste. Industry is in process of solving it. they require moderate amount of water but that should be increased and revenue should be generated from it. Currently they utilize biogas plant on small scale. Water consumption by the corporation is to be reduced further. In nutshell finally it will be profitable to organization to cut down the price in the milk products inspite of higher price of raw material. Hence it will be also be helpful and beneficial to farmers and customers.

### Users

All customers of milk and milk products in India and abroad. e.g. Retailers, traders, farmers and various malls as well as end users who consume milk and milk products e.g cheese, butter, buttermilk and other frozen food and sweets.

### Expected Outcomes

Reduction in water consumption, and thereby sustain the price of milk and milk products. Optimization of the cost of milk products and recycling of waste. Industry is in process of solving it. they require moderate amount of water but that should be increased and revenue should be generated from it. Currently they utilize biogas plant on small scale. Water consumption given by the corporation is to be reduced further. In nutshell finally it will be profitable to organization to cut down the price in the milk products inspite of higher price of raw material. Hence it will be also be helpful and beneficial to farmers and customers.

### Potential Impact

Reduction in water consumption, and thereby sustain the price of milk and milk products. Optimization of the cost of milk products and recycling of waste. Industry is in process of solving it. they require moderate amount of water but that should be increased and revenue should be generated from it. Currently they utilize biogas plant on small scale. Water consumption given by the corporation is to be reduced further. In nutshell finally it will be profitable to organization to cut down the price in the milk products inspite of higher price of raw material. Hence it will be also be helpful and beneficial to farmers and customers.

### Probable Discipline

Computer/IT, Electrical Engineering, Electronics and Communication, Chemical Engineering, Multi Disciplinary Problem

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH105

### Problem Statement

Design and Build Cloud Enabled & AI Powered "Heating/ Cooling System" for Industry 4.0

### Name of Industry / Organisation

Teksun Aerospace Pvt. Ltd

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

As a part of continuous update of industry and need to implement newer technology like IoT and other state of art technology to create updated version of traditional systems. Our basic need is to create Design and Build Cloud Enabled & AI Powered "Heating/ Cooling System" for Industry 4.0 for industrial application, which gives something innovative more safe and operator friendly outcomes.

### What Exact Problem is being Solved?

Our basic need is to create Design and Build Cloud Enabled & AI Powered "Heating/ Cooling System" for Industry 4.0 for industrial application for industrial application, which gives something innovative more safe and operator friendly screen with good option of Human and system interface. It would be better if system is having data log and self diagnosis options, historical trends etc.

### Users

Process Industries, chemical industries , power plant , fertilizer sector and all other industries where heat exchange system is implemented like HVAC or central heating system

### Expected Outcomes

Our basic need is to create Design and Build Cloud Enabled & AI Powered "Heating/ Cooling System" for Industry 4.0 for industrial application for industrial application, which gives something innovative more safe and operator friendly screen with good option of Human and system interface. It would be better if system is having data log and self diagnosis options, historical trends etc.

### Potential Impact

Our basic need is to create Design and Build Cloud Enabled & AI Powered "Heating/ Cooling System" for Industry 4.0 for industrial application for industrial application, which gives something innovative more safe and operator friendly screen with good option of Human and system interface. It would be better if system is having data log and self diagnosis options, historical trends etc.

### Probable Discipline

Computer/IT, Electrical Engineering, Instrumentation & Control

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH106

### Problem Statement

Drive Test Automatic Data Analysis and Report Generation

### Name of Industry / Organisation

Bharat Sanchar Nigam Limited

### Type Of Industry / Organisation

PSU

### Challenge Description with Context

BSNL Staff does regularly perform drive test to check Signal Levels at various locations around site. This kind of collected data then needs to be analysed to devise a conclusion about which of the BTS is having problem and then we need to make a decision on how to solve the issues if any in collected data of site. This whole process of Data Analysis and Report Generation is completely manual, takes a lot of time and effort, and most of the time less accurate due to human part involved in it.

### What Exact Problem is being Solved?

To automate the above process, An algorithm can be developed by taking inputs from Technical Staff of BSNL. This algorithm will help in performing some basic analysis and report generation of the collected data. This basic analysis will point out where is the main issue in Network coverage. This Algorithm will also suggest first steps in solving the problem with network, if any. This algorithm should help in performing some basic analysis and report generation of the collected data.

### Users

BSNL Technical Staff (ttas & jtos), All Telecom Users. All General Public, All BSNL Workers, All other Telecom Sector Companies may also adopt the same Solution to benefit from the same. Whole Telecom Sector in General.

### Expected Outcomes

This Tool should do some basic analysis and should suggest first steps towards solving Network issues if any found from Drive test data. This algorithm will help in performing some basic analysis and report generation of the collected data. This basic analysis will point out where is the main issue in Network coverage. This Algorithm will also suggest first steps in solving the problem with network, if any.

### Potential Impact

Impact on Telecom Staff and General Public. This algorithm will help in performing some basic analysis and report generation of the collected data. This basic analysis will point out where is the main issue in Network coverage. This Algorithm will also suggest first steps in solving the problem with network, if any. Will benefit Whole Telecom Sector in General to automate drive test report from collected data.

### Probable Discipline

Computer/IT, Electronics and Communication

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH107

### Problem Statement

Mobile App for BTS O&M with Control

### Name of Industry / Organisation

Bharat Sanchar Nigam Limited

### Type Of Industry / Organisation

PSU

### Challenge Description with Context

BSNL does operation and maintenance of its BTS through Nokia O&M software. They can track which sites are currently down using this software and can do some basic maintenance of BTS using this Software. Sites require continuous monitoring and maintenance by its engineers. This kind of manual monitoring is waste of human resources and time. So to solve this waste of resources we need some app that provides Control Interface also.

### What Exact Problem is being Solved?

This continuous monitoring can be replaced with a mobile app that gives notification in Smartphone. Continuous monitoring and maintenance of Cell sites can be made faster and easier if, some of the basic status monitoring and control functionality are included in an Android based mobile app. This will reduce average down time of a BTS site, and hence will improve user experience in general...

### Users

BSNL Technical Staff (ttas & jtos), All Telecom Users. All General Public, All BSNL Workers, All other Telecom Sector Companies may also adopt the same Solution to benefit from the same. Whole Telecom Sector in General.

### Expected Outcomes

A Mobile app to provide basic O&M of Cell Sites should be developed. continuous monitoring must be replaced with a mobile app that gives notification in Smartphone. Continuous monitoring and maintenance of Cell sites can be made faster and easier using required basic status monitoring and control functionality are included in an Android based mobile app. This will reduce average down time of a BTS site, and hence will improve user experience in general...

### Potential Impact

Impact on Telecom Staff and General Public. This app will reduce average down time of a BTS site, and hence will improve user experience in general. It will improve overall experience of the end users also. This app will also reduce hassle of BSNL Technicians and Engineers to operate in difficult weather condition. All other Telecom Sector Companies may also adopt the same Solution to benefit from the same.

### Probable Discipline

Computer/IT, Electronics and Communication

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH108

### Problem Statement

RFID based Indoor navigation app for Physically disabled

### Name of Industry / Organisation

Crear Electronics PVT LTD

### Type Of Industry / Organisation

Small

### Challenge Description with Context

A cost effective, RFID-based mobile indoor navigation application for the people with visual disabilities need to be developed. This application must combine the capabilities of modern mobile phones, allowing the creation of multi-modal interfaces and low cost passive RFID tags(NFC). It can be used for indoor navigation of people with visual disabilities (from room to room in hospitals, schools, universities, and etc.) this problem demands a lightweight smart phone equipped with a camera to read QR Codes attached to shelf sections like in shopping malls.

Near field communication is a short range wireless connectivity technology, which is mostly used in mobile phones. NFC is typically based on RFID. Currently lack of accessibility for blind and vision-impaired users due to their small size and visually driven accordance. To propagate the existence, location, and functionality of real-world tags, one need to develop the concept of

NFC for blind people.

### What Exact Problem is being Solved?

Near field communication operates in both passive and active modes. Near field communication doesn't only necessarily have to be something that makes it easier for people like you and me to pay and a cool way for us to view advertisements, websites etc. it can also be used as a great way to make the lives of the blind and handicapped much easier. NFC could be a great way for someone in a wheelchair to be able to pay for their goods without rifling through a bag or purse or having to rely on someone else to follow them around with money NFC can also work when one of the devices is not powered by a battery (e.g. on a phone that may be turned off, a contact less smart credit card, etc.).

### Users

this device will be useful to users who are partially visually challenged and completely visually challenged people. and also for the physically challenged people. People those who use blind stick will be able to use this.

### Expected Outcomes

A cost effective, RFID-based mobile indoor navigation application for the people with visual disabilities needs to be developed. This application will combine the capabilities of modern mobile phones, allowing the creation of multi-modal interfaces and low cost passive RFID tags. A low-cost indoor navigation system, which is based on mobile terminals, supporting technology Near Field Communication (NFC), and Java program access to Radio Frequency Identification (RFID) tags, will be developed.

### Potential Impact

this will be helpful to visually challenged people for navigation and to identify the surrounding things. In every field blind people have to face some problems for finding any kind of

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# **Smart Gujarat For New India Hackathon 2019-20**

## **Problem Statements**

information from the resources like from the person, internet, shopping mall, hospital, school, colleges and to reach the exact location every time blind person need the another person who is not blind. For helping blind people there is an indoor navigation system though which blind people can easily go everywhere or catch the information without facing any kind of problems.

### **Probable Discipline**

Computer/IT, Electronics and Communication

# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH109

### Problem Statement

There is no any proper communication system exist for stakeholders of Technical Education Institute like students, faculty, HOD, Principal, Industry partners, Placement companies etc from bottom to up hierarchy.

### Name of Industry / Organisation

Dr J N Mehta Government Polytechnic, Amreli

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

Currently we are using different type of communication methods at different level of institute. There is no any proper communication system exist for stakeholders of Technical Education Institute like students, faculty, HOD, Principal, Industry partners, Placement companies etc from bottom to up hierarchy. Connecting all stakeholders with their dynamic work profile. And system should be able to adopt faster changes on day to day work requirement

### What Exact Problem is being Solved?

Currently we are using different type of communication methods at different level of institute. There is no any proper communication system exist for stakeholders of Technical Education Institute like students, faculty, HOD, Principal, Industry partners, Placement companies etc from bottom to up hierarchy. Connecting all stakeholders with their dynamic work profile. And system should be able to adopt faster changes on day to day work requirement

### Users

The project can be used by any college level institutes having various hierarchical stakeholders such as students, faculties, Head of Departments, Administrative Staff, Principal, etc. Any other institute or organization with similar architecture can also use this with minor modifications.

### Expected Outcomes

The project aims to streamline the communication system in the organization. One of the biggest impact will be ease of communication and less dependence on paper based system.

The project will reduce the communication time between different stakeholders and it can lead to higher efficiency of work.

Also, using the single communication medium can increase the data security and data availability. Past data can also be easily be searched and recorded in organised manner.

### Potential Impact

The project aims to streamline the communication system in the organization. One of the biggest impact will be ease of communication and less dependence on paper based system.

The project will reduce the communication time between different stakeholders and it can lead to higher efficiency of work.

Also, using the single communication medium can increase the data security and data availability. Past data can also be easily be searched and recorded in organised manner.

### Probable Discipline

Computer/IT, Electronics and Communication

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH110

### Problem Statement

Student attendance system using face recognition

### Name of Industry / Organisation

Dr J N Mehta Government Polytechnic, Amreli

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

Our institute enrolls approximately 500 students per year. Existing paper based method is time consuming and distracting to both students as well as faculties. It is also prone to human errors. We propose a face recognition based smart attendance system. Student attendance can be made more robust. This also reduces the administrative work of faculties. The attendance data can be stored on cloud for further processing.

### What Exact Problem is being Solved?

We propose a face recognition with help of raspberry pi computer and mini camera based smart attendance system. By that way student attendance can be made more robust. This also reduces the administrative work of faculties. The attendance data can be stored on cloud for further processing. That way we can sort out irregular students, less attendant student, punctual students in real time basis

### Users

Any institute like Polytechnics, Degree colleges, Pharmacy Colleges, Medical Colleges, Any industry, Traffic points, Stampede prone area. students, faculty, HOD, Principal will be stakeholders of the system

### Expected Outcomes

The project aims to streamline the communication system in the organization. One of the biggest impacts will be ease of communication and less dependence on paper based system.

The project will reduce the communication time between different stakeholders and it can lead to higher efficiency of work.

Also, using the single communication medium can increase the data security and data availability. Past data can also be easily searched and recorded in an organized manner.

### Potential Impact

The project aims to streamline the communication system in the organization. One of the biggest impacts will be ease of communication and less dependence on paper based system.

The project will reduce the communication time between different stakeholders and it can lead to higher efficiency of work.

Also, using the single communication medium can increase the data security and data availability. Past data can also be easily searched and recorded in an organized manner.

### Probable Discipline

Computer/IT, Electronics and Communication

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH111

### Problem Statement

Water resources management and monitoring

### Name of Industry / Organisation

Dr J N Mehta Government Polytechnic, Amreli

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

That is wrong assumption water availability is infinite.. You have personally experience at our home college overflow of water after water tank full. The and after that it will be flow over building still any person manually not shut down water outlets. Like as our college only one peon is managing all 10 water tanks with routine work. So water empty or full is common problem So here we propose one solution automatic monitoring all resources. That system will monitor all water tank water level. And automatically shut down or open as per requirement

### What Exact Problem is being Solved?

That is wrong assumption water availability is infinite.. You have personally experience at our home college overflow of water after water tank full. The and after that it will be flow over building still any person manually not shut down water outlets. Like as our college only one peon is managing all 10 water tanks with routine work. So water empty or full is common problem So here we propose one solution automatic monitoring all resources. That system will monitor all water tank water level. And automatically shut down or open as per requirement

### Users

That system should work like plug and play so every such places that can be installed like college any government department industry health community building industry schools institutions or any household big apartments etc

### Expected Outcomes

That is wrong assumption water availability is infinite.. You have personally experience at our home college overflow of water after water tank full. The and after that it will be flow over building still any person manually not shut down water outlets. Like as our college only one peon is managing all 10 water tanks with routine work. So water empty or full is common problem So here we propose one solution automatic monitoring all resources. That system will monitor all water tank water level. And automatically shut down or open as per requirement

### Potential Impact

That is wrong assumption water availability is infinite.. You have personally experience at our home college overflow of water after water tank full. The and after that it will be flow over building still any person manually not shut down water outlets. Like as our college only one peon is managing all 10 water tanks with routine work. So water empty or full is common problem So here we propose one solution automatic monitoring all resources. That system will monitor all water tank water level. And automatically shut down or open as per requirement

### Probable Discipline Computer/IT, Electronics and Communication

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH112

### Problem Statement

Android app and its web version for lab equipment utilization for Polytechnic and Engineering colleges

### Name of Industry / Organisation

Government Polytechnic For Girls, Surat

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

Each Polytechnic and Engineering colleges have to maintain lab equipment utilization record separately for each equipment. It is very cumbersome to maintain this record manually in hard copy. Make an android app & its web version for lab equipment utilization using which faculty can enter equipment utilization detail and will be able to generate equipment wise report, lab wise report, faculty wise report etc.

### What Exact Problem is being Solved?

Currently we are using utilization file for each and every equipment separately. if this kind of app and web interface is made then equipment utilization record will be maintained digitally and easily. Faculty will be able generate any kind of lab utilization report instantly. This will make lab equipment utilization record keeping and report generation easy. Using this app institute can analyse utilization of each equipment.

### Users

If this problem is solved then it will be easy for faculties of Polytechnic and Engineering college to maintain record of lab equipment utilization. And they will be able to generate utilization report of equipment whenever required

### Expected Outcomes

Currently polytechnic and engineering colleges using utilization file for each and every equipment separately. if this kind of app and web interface is made then equipment utilization record will be maintained digitally and easily. Faculty will be able generate any kind of lab utilization report instantly. This will make lab equipment utilization record keeping and report generation easy. Using this app institute can analyse utilization of each equipment.

### Potential Impact

Digital record keeping of Lab equipment utilization. Currently polytechnic and engineering colleges using utilization file for each and every equipment separately. if this kind of app and web interface is made then equipment utilization record will be maintained digitally and easily. Faculty will be able generate any kind of lab utilization report instantly. This will make lab equipment utilization record keeping and report generation easy. Using this app institute can analyse utilization of each equipment.

### Probable Discipline

Computer/IT, Electronics and Communication

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH113

### Problem Statement

Alexa and Google Home integration within existing home automation system

### Name of Industry / Organisation

Nkonnnect Infoway Pvt Ltd

### Type Of Industry / Organisation

MSME

### Challenge Description with Context

We want a solution by the innovators of this competition that a software based platform or service be created by the means of which we can control home appliances by giving voice commands. We need to integrate both of the popular platforms called Amazon Alexa and Google Home. Special attention needs to be given that your solution needs to integrate with our existing system for which you can build a raspberry pi or beagle bone based home gateway to cloud servers. What your device needs to do is listen to alexa/google home commands coming from the cloud/internet and forward it to our home automation devices via HTTP requests or socket connections and also get data from our home automation devices and push it to the cloud back.

### What Exact Problem is being Solved?

There is not much problem considering current habit of people for switching their appliances on or off. But if we consider improving their life style a bit then there is a problem that they can't control the devices with our current home automation offering with voice commands. We expect innovators of this competition to bring out some solutions so that we can have popular voice end points such as alexa and google home integrated within our system.

### Users

The user base of this system will be very wide. It will be mostly users of smart home products whether it is at home, corporate, institution or industry, it will be useful for all. All kinds of users will add smartness to their lifestyle and will also save electric power as a bonus.

### Expected Outcomes

Expected outcome of this project will be a cost effective solution for integration of alexa and google home to our existing smart home array of products. Our customers will benefit by having voice control to control their electric appliances. It will be a big bonus to them considering no increase in price point. Also it will add luxury to their lifestyle as they will not even have to open our app in their phone to control devices.

### Potential Impact

Potential impact of this solution will be added luxury to the life of consumers of home automation products.

There will be also great savings on power as people will not feel lazy to turn off their home appliances. Using less energy environment will have long term benefit from this solution.

Other than that there will be savings on money as far as bills of our customers are concerned. Eventually make our products will be free of cost considering savings in the electricity bills.

### Probable Discipline

Computer/IT, Electronics and Communication

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH114

### Problem Statement

Human Interacted Wireless Digital Notice Board

### Name of Industry / Organisation

Phoenix Tech Solutions

### Type Of Industry / Organisation

MSME

### Challenge Description with Context

This project device should display scrolling notices to the people. It should seed the notice data from any website, excel file, text file, blue tooth, wifi or similar devices. It should be able to display and buffer multiple notices at the same time. Users should be provided with some input buttons below it by which users can scroll through notices backwards or forwards. It should also have a slideshow mode by which notices can be displayed one after other in rotating fashion.

### What Exact Problem is being Solved?

Normally we see notice boards at our offices, schools or colleges with some black or green kinds of colors on which we need to write stuff by chalks or markers. At maximum we can stick printed notices to them which is also not good for the environment as we need papers repeatedly every time we get some new thing to display on it. Moreover if we need to show some notice in color photos or videos format it is not possible with current means. This problem is being solved by the solution.

### Users

The users for this solutions will be mainly academic institutions like colleges, universities, schools. It will be also useful on public places of government offices like municipality offices, post offices, railway stations, bus stations etc. In private sector also it will be useful whenever there will be some kind of public dealing such as vodafone stores, mobile phone stores etc...

### Expected Outcomes

The outcomes for this solution will be that institutions or corporate will have an easy means of interacting with their audience. It is a mass media product so larger masses will be able to be addressed by some easy interface of app for this product. App user will have capability to easily put any kind of video, photo, scrolling notices to the notice boards. Also it will be connected to IoT cloud so control will be from around the world.

### Potential Impact

Larger crowd will be addressed easily by the solution. Mediator agencies to display ads on notice boards will be eliminated so there will be big savings in terms of money. Time is also a good factor this solution will address. It will make easy updation of notices by owner of the product in which updation will take minutes. So time will also be saved a lot by this product. People will also see videos in the notices which will be a big plus. Notices will come to life with that.

### Probable Discipline

Computer/IT, Electronics and Communication

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH115

### Problem Statement

Nowadays technological devices are not fully enabled with Artificial intelligence.

### Name of Industry / Organisation

SHANTILAL SHAH ENGINEERING COLLEGE

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

Unable to enhance the accuracy of technical devices interfaced with artificial intelligence beyond certain level, because it lacks with certain amount of data , by data we mean to provide the devices with emotion recognition which includes both facial expressions and changes in voice frequency . It can detect outside environment and also comment on what it sees with reliably and accurately. Unable to enhance the accuracy of technical devices interfaced with artificial intelligence beyond certain level, because it lacks with certain amount of data , by data we mean to provide the devices with emotion recognition which includes both facial expressions and changes in voice frequency . It can detect outside environment and also comment on what it sees with reliably and accurately. Unable to enhance the accuracy of technical devices interfaced with artificial intelligence beyond certain level, because it lacks with certain amount of data , by data we mean to provide the devices with emotion recognition which includes both facial expressions and changes in voice frequency . It can detect outside environment and also comment on what it sees with reliably and accurately.

### What Exact Problem is being Solved?

Unable to enhance the accuracy of technical devices interfaced with artificial intelligence beyond certain level, because it lacks with certain amount of data , by data we mean to provide the devices with emotion recognition which includes both facial expressions and changes in voice frequency . It can detect outside environment and also comment on what it sees with reliably and accurately. Unable to enhance the accuracy of technical devices interfaced with artificial intelligence beyond certain level, because it lacks with certain amount of data , by data we mean to provide the devices with emotion recognition which includes both facial expressions and changes in voice frequency . It can detect outside environment and also comment on what it sees with reliably and accurately.

### Users

It can be used by organization like industries , hospitals , Restaurants , Educational institutes , Air ports , Railways , it is also useful for spying , Defence .It can be used by organization like industries , hospitals , Restaurants , Educational institutes , Air ports , Railways , it is also useful for spying , Defence .

### Expected Outcomes

We can able to make robots to recognize human beings and objects present in outer environments.Unable to enhance the accuracy of technical devices interfaced with artificial intelligence beyond certain level, because it lacks with certain amount of data , by data we mean to provide the devices with emotion recognition which includes both facial expressions and changes in voice frequency . It can detect outside environment and also comment on what it sees with reliably and accurately. Unable to enhance the accuracy of technical devices

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

interfaced with artificial intelligence beyond certain level, because it lacks with certain amount of data , by data we mean to provide the devices with emotion recognition which includes both facial expressions and changes in voice frequency . It can detect outside environment and also comment on what it sees with reliably and accurately.

### Potential Impact

Very influential impact on technological world.Unable to enhance the accuracy of technical devices interfaced with artificial intelligence beyond certain level, because it lacks with certain amount of data , by data we mean to provide the devices with emotion recognition which includes both facial expressions and changes in voice frequency . It can detect outside environment and also comment on what it sees with reliably and accurately. Unable to enhance the accuracy of technical devices interfaced with artificial intelligence beyond certain level, because it lacks with certain amount of data , by data we mean to provide the devices with emotion recognition which includes both facial expressions and changes in voice frequency . It can detect outside environment and also comment on what it sees with reliably and accurately.

### Probable Discipline

Computer/IT, Electronics and Communication

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH116

### Problem Statement

Presence of humming noise in fan due to speed controller module in home automation

### Name of Industry / Organisation

Smart Yug Automation & Embedded Solution

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Due to controller interfacing with fan in IoT based module there is a problem of humming noise occurrence and will cause comfort to user and that is why there is a requirement of noise removal from the installed systems. It is required to identify the exact solution of the problem cause from the system with stable outputs desired by user. The team can work possibly in three different direction i.e mechanical solution (use of proper lubricant), Use of different controller modules or change in design of basic electric fan system

### What Exact Problem is being Solved?

Due to controller interfacing with fan in IoT based module there is a problem of humming noise occurrence and will cause comfort to user and that is why there is a requirement of noise removal from the installed systems. It is required to identify the exact solution of the problem cause from the system with stable outputs desired by user. The team can work possibly in three different direction i.e mechanical solution (use of proper lubricant), Use of different controller modules or change in design of basic electric fan system

### Users

user may be industries, house hold, shops,offices, MNC where automation system deployed, farm, electric motor in vehicle, etc where electric motor installed and output can be controlled by any means of devices

### Expected Outcomes

Due to controller interfacing with fan in IoT based module there is a problem of humming noise occurrence and will cause comfort to user and that is why there is a requirement of noise removal from the installed systems. It is required to identify the exact solution of the problem cause from the system with stable outputs desired by user. The team can work possibly in three different direction i.e mechanical solution (use of proper lubricant), Use of different controller modules or change in design of basic electric fan system for smoother functioning of motor

### Potential Impact

user may be industries, house hold, shops,offices, MNC where automation system deployed, farm, electric motor in vehicle, etc where electric motor installed and output can be controlled by any means of devices. if humming is less there may be less power consumption, saving of energy so it will help in progress of the nation like ujala LED concept which will help us. Noise reduction will reduce the noise and will make the smooth functioning of system

### Probable Discipline

Computer/IT, Electronics and Communication

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH117

### Problem Statement

Full HD Video Stitching - Goal is to Stitch Two High Resolution Video Stream and Make it 360 Degree Angle.

### Name of Industry / Organisation

Teksun Microsys Pvt. Ltd.

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Full HD Video Stitching - Goal is to Stitch Two High-Resolution Video Stream and Make it in 360 Degree Angle. Acquiring HD Stream: Processor and camera quality. Covering the field of view(angle): One camera needs to cover more than 180(+ 30) degrees. which involves lenses. Correcting the fish eye effect introduced while trying to capture more than 180-degree. Streaming them Parallely. Stitching them automatically without user involvement. this is a crucial part as most of the available solution needs post streaming editing and by stream we mean real-time. Mounting of the camera modules. Identifying Field of View in terms of distance. Figuring out the best setting b/w camera and the lens for a perfect result.

### What Exact Problem is being Solved?

Out of the all the above challenges the most daunting of them all would be fish-eye correction and stitching with user input live. Correcting the fish eye effect introduced while trying to capture more than 180-degree. The task is challenging which stitch stream automatically without user involvement, continuous efforts required to solve it. Mounting of the camera modules. Identifying Field of View in terms of distance. Figuring out the best setting b/w camera and the lens for a perfect result.

### Users

Security system, Parking lot of society and mall, Individual and Personal entertainment, Outdoor Adventure Sport, Underwater Photography, Live event management, Virtual tours, More realistic AR GAMES or experience.

### Expected Outcomes

Security of the Vehicles and help people to watch their activities. Dash-Cam in cars, Low-cost solution to cover a whole room, Parking lot, current traditional IP camera solution have blind zones which can be exploited. Users can use the solution for Individual and Personal entertainment, Outdoor Adventure Sport, Underwater Photography, Live event management, Virtual tours, Augmented Reality GAMES etc.

### Potential Impact

A major change in the security industry where end user takes it benefit / alert about misuse of asset or theft possibility. A Major Change in the Entertainment industry also. Takes us forward in the Autonomous and AI Industry where Major challenge is data. Solution for Outdoor/Indoor Adventure Sport, Underwater Photography, Live event management and monitoring, Virtual tours, Augmented Reality etc.

### Probable Discipline

Computer/IT, Electronics and Communication

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH118

### Problem Statement

Alcohol Detection Sensor - Bracelet Band which can measure Alcohol Level into Body

### Name of Industry / Organisation

Teksun Microsys Pvt. Ltd.

### Type Of Industry / Organisation

Small

### Challenge Description with Context

IoT base Instant Alcohol Detection Sensor to determine the alcohol content in body. Real-time information about the alcohol content in the body. Calibration of the device according to the different races. To develop a device which would not be pernicious for the users. Precise and instant calculation of alcohol concentration through the blood. To regulate the user in order to avert any serious accidents.

### What Exact Problem is being Solved?

Our goal is to detect the amount of alcohol content through the blood and ensure the safety of the alcohol consumers. The problem of high content of ethanol in the body is a critical issue. The students will use available sensor element to detect the low level alcohol. These devices will be integrated with available controller board (Arduino, PI etc). The data will be sent to cloud to cloud using GPRS model. The data will be received to the cloud, where data structure, analytics, etc to be built. The mobile and browser apps will be built by students to show the PPM level of the samples inserted to sensor.

### Users

The technology will be suitable for the youngsters and the adults. Crime Investigation authorities and Police officers. Transportation Network Companies and Multi-national Organisations. Alcoholic Beverages Companies. Medicines & Pharmaceutical Companies.

### Expected Outcomes

The problem of over-drinking will be curtailed excessively. Road mishaps due to over drinking alcohol can be warded-off. Health related diseases could be dwindled extensively. People will maintain their healthy relationships and social ecosystem. All these outcomes together will give us a widespread vision, from the development of this sensor to awareness among the masses. This project is intended to uplift the safety measures.

### Potential Impact

Revolutionize Automobile Companies with automated alcohol detecting vehicles. The crime rate all over the world will decline tremendously. A safety and a healthy society will be developed. Electronics Industries and Economy at large will get boost up. More employment to be generated. People will be aware about their drinking habits and will try to maintain their limit. The consumer will remain conscious about the safety measures and comply with the regulations.

### Probable Discipline

Computer/IT, Electronics and Communication

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH119

### Problem Statement

Wearable Device for Measurement and Indication of Emotional State

### Name of Industry / Organisation

Society for Energy and Emotion, Wellness Space LLP

### Type Of Industry / Organisation

Small

### Challenge Description with Context

A wearable device which can measure and indicate level of stress or person's state of mind is a demand of the society for the well being of society and personal improvement and care. Any person can have different states of mind at a particular time, i.e. person can be happy, sad, anxious, angry, relaxed, emotionally imbalanced to name a few moods. The change in the person's mood depends on various environmental and physiological parameters. The analysis of physiological parameters (like Heart rate, HRV, ECG, EEG, PPG or few other) can not only indicates the mental condition at different levels but they are early markers for finding out the change in the emotional changes in individuals.

A portable / wearable device can be designed which can be easy to use by all age groups and measure and indicate various types of emotional states (positive or negative, aroused i.e. energized or not aroused i.e. relaxed) in person. Further the device can store the historical patient data for comparison and indicates the variation with present level.

With prolonged recording of 2 - 24 hrs. The persistent negative level or state of mind can be alarmed by the device. It is appreciable if the device can be fit easily in the wrist or finger as a wearable device.

### What Exact Problem is being Solved?

A wearable device which can measure and indicate level of stress or person's state of mind is a demand of the society for the well being of society and personal improvement and care. Any person can have different states of mind at a particular time, i.e. person can be happy, sad, anxious, angry, relaxed, emotionally imbalanced to name a few moods. The change in the person's mood depends on various environmental and physiological parameters. The analysis of physiological parameters (like Heart rate, HRV, ECG, EEG, PPG or few other) can not only indicates the mental condition at different levels but they are early markers for finding out the change in the emotional changes in individuals.

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With prolonged recording of 2 - 24 hrs. The persistent negative level or state of mind can be alarmed by the device. It is appreciable if the device can be fit easily in the wrist or finger as a wearable device.

### Users

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

A portable / wearable device can be designed which can be easy to use by all age groups and measure and indicate various types of emotional states (positive or negative, aroused i.e. energized or not aroused i.e. relaxed) in person. Further the device can store the historical patient data for comparison and indicates the variation with present level.

### Expected Outcomes

A wearable device which can measure and indicate level of stress or person's state of mind is a demand of the society for the well being of society and personal improvement and care. Any person can have different states of mind at a particular time, i.e. person can be happy, sad, anxious, angry, relaxed, emotionally imbalanced to name a few moods. The change in the person's mood depends on various environmental and physiological parameters. The analysis of physiological parameters (like Heart rate, HRV, ECG, EEG, PPG or few other) can not only indicates the mental condition at different levels but they are early markers for finding out the change in the emotional changes in individuals.

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### Potential Impact

A wearable device which can measure and indicate level of stress or person's state of mind is a demand of the society for the well being of society and personal improvement and care. Any person can have different states of mind at a particular time, i.e. person can be happy, sad, anxious, angry, relaxed, emotionally imbalanced to name a few moods. The change in the person's mood depends on various environmental and physiological parameters. The analysis of physiological parameters (like Heart rate, HRV, ECG, EEG, PPG or few other) can not only indicates the mental condition at different levels but they are early markers for finding out the change in the emotional changes in individuals.

A portable / wearable device can be designed which can be easy to use by all age groups and measure and indicate various types of emotional states (positive or negative, aroused i.e. energized or not aroused i.e. relaxed) in person. Further the device can store the historical patient data for comparison and indicates the variation with present level.

### Probable Discipline

Computer/IT, Electronics and Communication, Biomedical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH120

### Problem Statement

Portable Frontal Alpha Asymmetry detection and analysis for human mood changes

### Name of Industry / Organisation

Society for Energy and Emotion, Wellness Space LLP

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Emotions play a significant role in daily life such as (a) If the individual is anxious or not or has a higher risk of developing anxiety or depression (b) Understanding the impact on the moods (positive asymmetry indicates positive mood or motivation and negative asymmetry indicates negative mood or withdrawal) (c) how the individual would take decision (e.g. choosing a particular product with positive mood or moving away from the product display).

There is a growing body of research in this area to understand the impact of various interventions (including neurofeedback) on frontal alpha asymmetry. However, the availability and cost of hardware along with the complexity of analyzing data makes it difficult to conduct research in this area. A simple, portable, cost-effective and easy to use device to measure frontal alpha asymmetry could enable more work in this area and benefit the society (e.g. understand how a relaxation impacts the asymmetry or the impact of disturbed sleep on asymmetry or detection of anxiety or risk of depression).

### What Exact Problem is being Solved?

Problem Statement:

Emotions play a significant role in daily life such as (a) If the individual is anxious or not or has a higher risk of developing anxiety or depression (b) Understanding the impact on the moods (positive asymmetry indicates positive mood or motivation and negative asymmetry indicates negative mood or withdrawal) (c) how the individual would take decision (e.g. choosing a particular product with positive mood or moving away from the product display).

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Expected outcome:

- Portable device with relevant electrodes and detection, storage and analysis of the data
- Ability to detect the quality of signals, provide visual indicator (of instantaneous data)
- Ability to correct artifact and store data for a typical session (max 30 minutes)
- Provide neurofeedback capability for frontal alpha asymmetry

References (for us only)

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

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### Users

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### Expected Outcomes

Expected outcome:

- Portable device with relevant electrodes and detection, storage and analysis of the data
- Ability to detect the quality of signals, provide visual indicator (of instantaneous data)
- Ability to correct artifact and store data for a typical session (max 30 minutes)
- Provide neurofeedback capability for frontal alpha asymmetry

### Potential Impact

Emotions play a significant role in daily life such as (a) If the individual is anxious or not or has a higher risk of developing anxiety or depression (b) Understanding the impact on the moods (positive asymmetry indicates positive mood or motivation and negative asymmetry indicates negative mood or withdrawal) (c) how the individual would take decision (e.g. choosing a particular product with positive mood or moving away from the product display).

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### Probable Discipline

Computer/IT, Electronics and Communication, Biomedical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH121

### Problem Statement

Monitoring of flood level at different part of river

### Name of Industry / Organisation

Irrigation sub division Amreli

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

Monitoring of flood level at different part of river

Irrigation department Amreli

Flood is most occurrence natural calamity in india. Same as for Gujarat around 42% life loss is just dueto flood related catastrophe.

Irrigation department

Amreli bring one problem regarding losses dueto crossing during havy water stream. We generally notice instant high water level around water causeway after rain. Now a days There is no any proper way to find flow of river and water level and relay all that data from critical locations to central flood disaster monitoring system.

We propose here one unique system by combination of electronic and it systems to measure flow and levels at different part of river and relay to central monitoring system

That system should also warn people around it like warning by siren and red like just like in railway system near crossing area.

If such data fetched in real time by central monitoring we better warn different part of district regarding road blockage safety tips alternative road and less life losses

### What Exact Problem is being Solved?

Monitoring of flood level at different part of river

Irrigation department Amreli

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### Users

### Expected Outcomes

All such department Monitoring of flood level at different part of river

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

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Irrigation department Amreli

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Amreli bring one problem regarding losses due to crossing during heavy water stream. We generally notice instant high water level around water causeway after rain. Now a days There is no any proper way to find flow of river and water level and relay all that data from critical locations to central flood disaster monitoring system.

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### Probable Discipline

Computer/IT, Electronics and Communication, Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH122

### Problem Statement

Design an inbuilt vehicle system which helps to stringent laws and a strict implementation of wearing helmet and tight the seat belt during two/ four wheel drive to make India's roads safe. As well, system must be user-friendly to carry helmet along with

### Name of Industry / Organisation

REGIONAL TRANSPORT OFFICE, BHUJ

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

According to the Motor Vehicles (Amendment) Bill 2016 which was passed earlier this year, riders caught without a helmet will have to pay a fine of ₹1000 and their driving license will be cancelled for three months. This amendment was a big step, as earlier the fine was only ₹100 only which did not serve as an effective deterrent.

However such steps are not sufficient. So, system described in problem statement is necessary.

### What Exact Problem is being Solved?

A recent study published by research scholars suggests that, about 15,000 lives across the world can be saved each year, if motorcyclists start wearing appropriate helmets. In coming years, almost lacs of people might die of motorcycle crashes. A figure that can be halved with appropriate measures and proper use of safety helmets."

1. To increase the road safety and stringent implementation of law by establishing the system which prevent the starting or running of vehicle(s) if preset conditions of vehicle drivers and passengers safety norms is not fulfilled.
2. To alarm / communicate the driver / traffic police about unsafe vehicle driving condition.
3. The system should be vehicle centred and not person centred.

### Users

All kind of motorcyclists, light motor vehicle road user and traffic police officials are expected to use this system to prevent accidents and promote confidence of "safe journey" in other road users such as cyclists, pedestrians, children, people with disabilities and older people.

### Expected Outcomes

The new system or device should alarm / communicate / regulate the driver / traffic police about unsafe vehicle driving condition with respect to following purpose.

1. Better Vehicle Control.
2. Improved Road User Behaviour.
3. Fulfilling Legal Requirements.
4. Regulating insurance claim in Accident Procedures.
5. Improvement in Motor Vehicle Technology.
6. Record keeping and analysis for improvement purpose.

### Potential Impact

By providing the solution to the given problem the society can be benefited in following ways.

1. Efficient handling of unsafe driving situations.
  2. Reduction in road accidents.
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# **Smart Gujarat For New India Hackathon 2019-20**

## **Problem Statements**

3. Increased safety of drivers, pedestrians and vehicles.
4. Saving in time, money and other resources.
5. Less legal work for RTO officials.
6. Insurance claim procedures can be simplified.
7. Increase in awareness about road safety among public.

### **Probable Discipline**

Computer/IT, Mechanical Engineering, Electrical Engineering, Civil Engineering, Automobile Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH123

### Problem Statement

Design system which measures the quantity piece wise which is accurate and better than the existing system.

### Name of Industry / Organisation

Gokul Enterprise

### Type Of Industry / Organisation

Small

### Challenge Description with Context

To create a device which can count any quantity piece wise rather than weight wise i.e if there are n shape of quantities then we count the number of pieces by weighing the pieces in chunk and then measure the weight of one piece after that we calculate the number of pieces by division method but when working with small weighted quantity there is sometimes difference in measurements of weight hence resulting into less/more number of pieces of quantity. So, to neglect that we need a better device to count quantity.

### What Exact Problem is being Solved?

The problem solved here are multiple as this device can be used by any company independent of their sector i.e they can be associated with metal industries , snacks industries or small manufacturing industries etc. This device will be helpful to each and every firm where counting is involved and is needed in precise manner. Also it saves human time as any other device because it takes lots of time to count quantity when they are in vast amount.

### Users

Industrial and Manufacturing personals.This device will be helpful to each and every firm where counting is involved and is needed in precise manner. Also it saves human time as any other device because it takes lots of time to count quantity when they are in vast amount.

### Expected Outcomes

To create a device which can count any quantity piece wise rather than weight wise i.e if there are n shape of quantities then we count the number of pieces by weighing the pieces in chunk and then measure the weight of one piece after that we calculate the number of pieces by division method but when working with small weighted quantity there is sometimes difference in measurements of weight hence resulting into less/more number of pieces of quantity. So, to neglect that we need a better device to count quantity.

### Potential Impact

It will have potential impact on manufacturing industries as they involve lots and lots of calculation and counting activities at each section of the process. So this device will help them save time and help their human resource to utilize this time into enhancing the quality of the product resulting into better and precise product. Also it will reduce the mental counting burden from their workers and at the same time industry will take another step towards automation.

### Probable Discipline

Computer/IT, Mechanical Engineering, Electrical Engineering, Electronics and Communication

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH124

### Problem Statement

Autonomous mining data and report making system

### Name of Industry / Organisation

Shri Yogi Krupa Metals

### Type Of Industry / Organisation

Small

### Challenge Description with Context

That is one industrial problem statement from Shri Yogi Krupa Metals located near by bhalgam District Morbi.

Work for such industry - mining stones from earth daily and after proper crushing and finishing distribute to different stake holders as per their requirements in different sizes.

Problem - now a days we as such industry keeping one person for managing all such activities. Manually keeping data record and preparing reports for all stakeholders

Solution-Develope one autonomous electronics and it solutions that will keep all such activities automatically. Electronics system will manage weight and categories work and software will store all data properly

That will also send reports to all stakeholders daily monthly and yearly basis

### What Exact Problem is being Solved?

That is one industrial problem statement from Shri Yogi Krupa Metals located near by bhalgam District Morbi.

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Solution-Develope one autonomous electronics and it solutions that will keep all such activities automatically. Electronics system will manage weight and categories work and software will store all data properly

That will also send reports to all stakeholders daily monthly and yearly basis

### Users

There is around 5000 such mining industry working in just one Gujarat state for different minerals. So we want one unique and flexible system that work for all such industry from small scale to large scale

### Expected Outcomes

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

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### Probable Discipline

Computer/IT, Mechanical Engineering, Electrical Engineering, Electronics and Communication

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH125

### Problem Statement

Design and Develop Low Cost Pyranometer using Micro-Controller.

### Name of Industry / Organisation

AVD TECHNOLOGIES

### Type Of Industry / Organisation

Small

### Challenge Description with Context

In market, the pyranometers available are very costly. But using latest micro-controller and sensors , it is possible for engineering students to design and develop smart and compact pyranometer. The newly designed pyranometer should record all data in some mobile app or software. It will be very useful for the research work in the area of solar energy. It is also useful for solar product industries.

### What Exact Problem is being Solved?

Check the possible application of newly available microcontroller for recording the solar radiation. Now a day , a smart and compact pyranometers are required for solar research and solar data collection for measuring the efficiency of solar products. It will also useful in environment science and space program. Currently the pyranometers available in the market are very costly and the continuous recording the radiation data ate difficult.

### Users

Weather station, solar research institute and solar equipment manufacturers will be the customs for this product. As we are dealing with the process control instrument and automation solution , I feel that using newly available micro-controllers and sensors student can develop as products.

### Expected Outcomes

- Low cost with recording facilities are prime factors for the marketability of the product.
- Different solutions are useful as per the use and application of the product.
- It must be compact and smart.
- It must be require less space and weight for ease of handling
- User friendly, Any one can easily use it and understand the function of it.
- Long life and durable.
- Solar energy is very useful for power generation and other thermal application , different specifications of product are possible.

### Potential Impact

It is very useful product for the solar industries and research work. This product can develop big international market. It is also play important role in the space program. It is very critical device for solar research work. It will reduce the cost of research in the solar field. Some other devices can be develop after successful testing of such POCs. Recording humidity and psychrometric properties of air will be possible with Micro-controllers.

### Probable Discipline

Computer/IT, Mechanical Engineering, Electronics and Communication

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH126

### Problem Statement

L.A. (Lightening Arrester) blasts due to lightening, high voltage surges, and switching surges and also Due to high temperature in summers.

### Name of Industry / Organisation

220 KV Sardargadh GETCO Sub Station

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

L.A. (Lightening Arrester) is used by transmitting company to protect transmission line from lightening, high voltage surges, and switching surges. But due to lightening, high voltage surges and switching surges and also Due to high temperature in summers sometimes its blasts. So transmission line and all substation equipments remains unprotected till L.A. (Lightening Arrester) is replaced. This condition will be challenging for engineers working at substation and also it is challenging in rainy seasons and if substation is located in areas which have longer rainy seasons.

### What Exact Problem is being Solved?

L.A. is located at a place from where transmission line enters the transmitting substation. So L.A. is the first equipments which has to encounter with lightening, high voltage surges and switching surges. It has to absorb energy of lightening, high voltage surges, and switching surges. L.A. is made up of layers of semiconductors. If these layers can not tolerate energy released by lightening, high voltage surges, and switching surges the L.A. blasts.

### Users

The very first user is usually Transmitting companies like GETCO, which has large numbers of substations to transmit electrical power to distributing companies. Secondly in some cities or in some places there are some Privet Limited transmitting companies which also transmit electrical power. Thirdly a industry which has its own generating station for their own need also comes under Users.

### Expected Outcomes

L.A. (Lightening Arrester) is very crucial equipment to protect the transmission line from lightening, high voltage surges and switching surges and also it is located at a place from where transmission line enters the transmitting substation. As electrical power is transmitted at vey high voltages switching surges also produces vey high voltages. So it is important to find the Exact reason and solution of L.A. blasting. After that we may able to eliminate this problem or we can reduce the frequency of L.A. (Lightening Arrester) blasting.

### Potential Impact

After solving the root cause of L.A. (Lightening Arrester) blasting we are able to save the cost which is involved in maintance or commission of a new L.A. (Lightening Arrester). So indirectly we are saving cost which is used to transmit electrical power and ultimately we can save Per Unit cost of electrical energy which is very beneficial to its end users. By reducing maintance of L.A. (Lightening Arrester) we will have huge saving in Man Hours also. Another impact of the solution is we will have better Power transfer Stability and Continuity.

### Probable Discipline

Electrical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH127

### Problem Statement

Investigate and propose solution for cable lug burning frequently due to corrosion in coastal area

### Name of Industry / Organisation

Bombay Minerals Limited

### Type Of Industry / Organisation

Small

### Challenge Description with Context

bombay minerals limited company located in village baraya taluka mundra kutch . it is small scale ceramic industry which manufactures raw material used to make transportation roads. in this industry cables are used to transfer power from one section to another section with the help of large cables. due to water corrosion cables of industry burned out many times. few days ago 400 sq mm \* 3.5 sq mm cable burned due to same problem.

### What Exact Problem is being Solved?

as per mentioned above problem Bombay minerals limited company normally use ring type lug joints which was affected due to rain water corrosion problem and they replaced lug joints with straight joints lugs and cover with fully water proof tape which reduces the effect of corrosion which is occurring due to rain water. there are many such ring type lug joints used in cables and the company has replaced all the ring type lug joints with straight joints.

### Users

in small scale industry, medium scale, large scale industry where underground cables are used to transfer large power. in industry where rain water gets accumulated in the ground from where underground cables pass.

### Expected Outcomes

students can understand the use of cables in small, medium, large scale industry

students can identify various types and size of lugs used for various cables

students can identify various faults that occur in cables

### Potential Impact

due to cable burnt problem supply of company interrupts and therefore process interrupts due to which there is large economical loss for the industry.

### Probable Discipline

Electrical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH128

### Problem Statement

55 kw vfd power card and firing circuit burned

### Name of Industry / Organisation

Bombay Minerals Limited

### Type Of Industry / Organisation

Small

### Challenge Description with Context

bombay minerals limited company located in village baraya taluka mundra kutch gujarat. it is small scale ceramic industry which manufacture raw material used to make transportation road. in this industry there are many induction motors are used which controls various mechanical machines by using vfd drive. for controlling this machine we need fast change of speed of induction motors. if the speed is not changed step wise then there is load on the dc bus bar of the system due to which the vfd power card and firing circuit get burned

### What Exact Problem is being Solved?

problem is being solved by replacing the vfd power card and firing circuit and changing the frequency of vfd step wise

### Users

in small scale industry, medium scale industry, large scale industry where speed control of induction motor is controlled by vfd drives.

### Expected Outcomes

students can understand the speed control of induction motor with the help of vfd

students can identify the fault in the firing circuit and vfd

### Potential Impact

due to the firing circuit burned problem the induction motor speed control is not possible and hence many process which are depending on induction motor gets stopped and hence there is large economical loss for the industry

### Probable Discipline

Electrical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH129

### Problem Statement

Cost Effective harmonic filters.

### Name of Industry / Organisation

CADILA Pharmaceuticals Ltd.

### Type Of Industry / Organisation

Corporate

### Challenge Description with Context

Many UPS, Variable frequency Drives, soft starters required to install in many applications in continuous plant industries like Pharmaceuticals, chemical, agro, food, textile etc.

They are the sources of harmonic generation. Because of harmonics, power quality disturbances, voltage deflection, neutral loading, requirement of higher capacity switchgears, life of switchgear decreases.

Also, for neutral loading and unbalancing in the power system occurs and life of distribution devices like transformer will also decreases.

Presently in market many devices like active filters, passive filters are available. But it leads to plant modifications and also its not cost effective solution. It also leads to shut down because of retrofication.

Hence, task is to find out cost effective harmonic filters.

### What Exact Problem is being Solved?

Use of UPS, Variable frequency Drives, soft starters etc. is going to increase day by day. Hence harmonic generation cannot be eliminated.

Problem solution is find out cost effective harmonic filters, which do not demand system modifications.

### Users

Pharmaceuticals, chemical, agro, food, textile and other continuous plant industries.

### Expected Outcomes

Cost effective harmonic filters if possible to install without system modification then it will benefit power system.

Reduction in Neutral current, increase in power quality, increase in life of switchgears, cost saving in switchgear cost.

### Potential Impact

Reduction in Neutral current, increase in power quality, increase in life of switchgears, cost saving in switchgear cost.

Hence, efficient operation of all continuous plant industries.

### Probable Discipline

Electrical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH130

### Problem Statement

Solution of leakage current problem on overhead lines and transformers on LT Distribution side.

### Name of Industry / Organisation

DGVCL VALSAD

### Type Of Industry / Organisation

Public Entities (Boards/Corporations/Panchayat/Government Societies etc)

### Challenge Description with Context

Leakage Current is defined as the current which flows through protective ground conductor to ground. In the absence of grounding or improper grounding connections, it is the current that could flow from any conductive part or the surface of non-conductive parts to ground if any conductive path was available (i.e. human body). There are always extraneous currents flowing in the safety ground conductor

In any electrical installation, some current will flow through the protective ground conductor to ground. This is usually called leakage current. Leakage current most commonly flows in the insulation surrounding conductors and in the filters protecting electronic equipment around the home or office. So what's the problem? On circuits protected by GFCIs (Ground Fault Current Interrupters), leakage current can cause unnecessary and intermittent tripping. In extreme cases, it can cause a rise in voltage on accessible conductive parts.

Insulation has both electrical resistance and capacitance—and it conducts current through both paths. Given the high resistance of insulation, very little current should actually leak. But, if the insulation is old or damaged, the resistance is lower and substantial current may flow. Additionally, longer conductors have a higher capacitance, causing more leakage current. That's why GFCI breaker manufacturers recommend one-way feeder length to be limited to 250 feet (76.2 m), maximum.

Electronic equipment, meanwhile, contains filters designed to protect against voltage surges and other disruptions. These filters typically have capacitors on the input, which adds to the overall capacitance of the wiring system and the overall level of leakage current.

There are two types of leakage currents: ac leakage and dc leakage. Dc leakage current usually applies only to end-product equipment, not to power supplies. Ac leakage current is caused by a parallel combination of capacitance and dc resistance between a Voltage source (ac line) and the grounded conductive parts of the equipment. The leakage caused by the dc resistance usually is insignificant compared to the ac impedance of various parallel capacitances. The capacitance may be intentional (such as in EMI filter capacitors) or unintentional. Some examples of unintentional capacitances are spacings on printed wiring boards, insulations between semiconductors and grounded heat sinks, and the primary-to-secondary capacitance of isolating transformers within the power supply. Consequences Earth Leakage current beyond 30mA can be lethal leading to death. 30mA sensitivity is required for protection in domestic applications where the person may come in direct contact with electric equipment in locations such as labs, schools, workshops etc. 100mA and 300mA protection is required where there is indirect contact or due to insulation failure in the cables.

### What Exact Problem is being Solved?

Measurement of leakage current

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

A meter specially designed for measuring leakage currents is used. The current flowing in the ground conductor is measured by connecting the meter in series with the grounding connection. For information processing equipment, the ground connection is opened and the current flowing to the neutral side of the power line is measured. For medical equipment, the current flowing to ground is measured. The meter may also be connected between the outputs of the power supply and ground. The test conditions include swapping the ac line and neutral connections, and turning power switches off and on while monitoring the current. The test is performed after the equipment has warmed to normal operating temperature and, in some cases, following certain test that cause abnormally high temperatures within the equipment. The intent is to identify and measure the worst-case leakage current. For very low leakage currents, the meter is replaced with a network consisting of either a resistor or a resistor and capacitor combination. The voltage drop across the network is then measured using a sensitive ac voltmeter. Ungrounded or double-insulated equipment is checked by connecting the meter between any touchable conductive part and ground. In the case of non-conductive housings, a copper foil of a specific size is placed on the housing, and the current flowing from it to ground is measured.

So how can you get your equipments protected from the leakage currents or how can you eliminate the effects of leakage current? Quantify the leakage current and then identify the source. One best way of going about this is to use Earth Leakage Relay (ELR). The Earth Leakage Relay with Core Balanced Current transformer provides protection from earth leakage with advance intimation (Pre-alarm) of impending occurrence of the event.

The user can proactively take action to avoid occurrence of any mishaps. Fixed time trip occurs when Earth Leakage Current exceeds the trip time which is programmable. In case of earth leakage the LED indicators will glow depending upon the percentage of programmed threshold value. For e.g. If the set level is 30mA and the leakage current is more than 15mA then green LED will start blinking which will provide a visual alert to the user. This empowers the user to take corrective actions before any accident. Core Balanced Current Transformer (CBCT) uses the technology of residual magnetic flux. All conductors to be protected shall pass through the core balance current transformer. The vector sum of all the currents should be equal to zero. Similar conceptual work is required to solve the problem.

## Users

Supply company and mankind will be benefitted against the issues of leakage current.

Most of the electrical installations nowadays are having loads that incorporate electronics. These electronic loads influence the electrical installation in various ways:

1. They generate harmonic distortion in the current they consume.
2. They generate current leakages at the mains frequency, 50Hz, and at higher frequencies under normal operating conditions.
3. As soon as they are connected to the electrical power supply they generate a leakage current point.
4. During an insulation fault, the leakage current might not be sinusoidal, but rather pulsating, for example.

Computers, washing machines, dishwashers, microwaves, mobile phone chargers, low consumption light bulbs, ceramic hobs, air conditioning units, electric vehicle chargers, dryers, machine tools etc.

At 50ma immediate cardiac arrest resulting in death can be observed.

At 1-10 ma prickling sensations are observed

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

At 20-30 ma Muscle contraction can cause respiratory paralysis.

At 70-100 ma the heart will not beat at steady rate.

So all the mankind will use at home a device to cope up against the issues of leakage current. the power supply company needs to update the distribution system protection against leakage current.

### Expected Outcomes

The students will try to solve the issue of leakage current that is very useful for supply company as well as for protections of human beings.

1 students can address the problem of leakage current at residence and office buildings and Industry.

2 The modification in protection devices with automation can be added for safety of of personal.

3 Existing DGVCL distribution system protection to be enhanced with appropriate protection against leakage current issues. Metering arrangements and sensors can be updated against the leakage current issues. These type of online conditional monitoring system is required for modern protection systems.

### Potential Impact

Leakage current vs. fault current

In addition to fuses and circuit breakers, today there is increasing use of residual current operated circuit breakers (also called RCDs, residual current devices) in electrical systems. Fuses protect electrical systems primarily against short circuits and fires, whereas RCDs provide for reliable protection of operating personnel. They register fault currents flowing to ground, for example caused by defective insulation, and cut them off before anyone can be harmed. The problem is that a RCD cannot distinguish between residual currents that arise in normal operation and those that occur due to dangerous fault currents. Frequency inverters in particular, which are needed for energy efficient operation of motors, cause large residual currents.

The term leakage current refers to current that flows to ground in a properly operating circuit or to an external conductive component. In other words, the current does not return through the neutral conductor. The same holds true for a fault current, which arises due to defective insulation between live conductors and flows back to ground. Even if a person directly touches a live conductor, the fault current flows to ground. An upstream RCD detects this fault current and immediately disconnects the circuit.

Such fault currents have a high resistive component as opposed to leakage currents, which predominately have a capacitive reactance. The RCD, however, cannot distinguish between the different types of ground currents. Thus, it can already trip when the sum of all leakage currents exceeds the trip value. This is also possible in normal operation even if there is no fault.

The amount of leakage current depends on the design of a drive system, on the grid voltage, the inverter's pulse-width modulation frequency, the length of cables and the interference filters being used. Furthermore, grid impedance and the system's grounding concept also play an important role.

Note:-Existing solutions has to be updated for resolving issues of leakage currents.

### Probable Discipline

Electrical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH131

### Problem Statement

Automatic meter reading and billing to issue monthly billing instead of bimonthly billing.

### Name of Industry / Organisation

DGVCL VALSAD

### Type Of Industry / Organisation

Public Entities (Boards/Corporations/Panchayat/Government Societies etc)

### Challenge Description with Context

In recent years, energy meter reading is manually taken and sends to the EB office and the user, which is the main problem. It is rectified by using GSM technology. It can be used for commercial applications. It can be developed as a primary meter, sub meter or used for other electric metering applications such as demand reduction.

Its open system design and easy worldwide development leads to output with real time data based on accurate measurement .This electric meter is designed to meet requirements for data on demand from multiple users. Traditional meters focus only on single user applications at fixed time intervals.

It is the right solution in today's complex energy market combining low cost, high accuracy, minimum cost of communications with real time data access and reporting. This sophisticated GSM enabled meter combines elements of simplicity, is highly functional and reduces overall ownership costs.

### What Exact Problem is being Solved?

Now a day the energy meter monitoring and taking the readings needs lot of manual power .It is also an urgent problem that the household wants to solve it because, the accuracy and real time of meter data copy affects the power system information level, management decisions and economic benefits. We overload electrical circuits it could cause a fire and load demand. The home appliances, which consume more power, cause an increase in the payment of excessive bills. Automatic Meter Reading (AMR) technologies in Electrical Utilities have been exploiting their own infrastructure to bill their customers in an efficient and economical way.

### Users

Electrical Utilities, DGVCL, PGVCL, UGVCL, MGVCL, Customers, Industries, Schools, college, Hotels, Hostels, Hospitals, schools, Banks etc..

### Expected Outcomes

Various electronic meters have been developed and are still being developed. However the use of GSM in this particular system provides numerous advantages over methods that have been previously used. Data transmission is charged at standard SMS rates, thus the charges are not based on the duration of data transmission. The cost efficient transmission of readings ensures that power consumption values can be transmitted more frequently to a remote station. The implications of being able to transmit readings more often are that energy utilities will be able to generate timely bills, better understand energy demand patterns, manage meter failures more efficiently and manage fraud better.

It can also store value of energy consumption by Time-Of-Use (TOU). This allows end users to identify how much energy was consumed during different periods of the day.

### Potential Impact

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Electrical Company Benefits

- Smart automated processes instead of manual work.
- Accurate information from the network load to optimize maintenance and investments.
- Customized rates and billing dates.
- Streamlined high bill investigations.

### Customer Benefits

- Precise consumption information.
- Clear and accurate billing.
- Automatic outage information and faster recovery.
- Better and faster customer service.
- Flag potential high consumption before customer gets a high bill.

### **Probable Discipline**

Electrical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH132

### Problem Statement

Design the Jig for PCB Through Hole Soldering

### Name of Industry / Organisation

DQ Motiontech Pvt. Ltd.

### Type Of Industry / Organisation

Small

### Challenge Description with Context

"In production of electronics circuits the through hole components take much time for soldering and

need one hand for holding the component and other for soldering. This process is time consuming hence costly too as it delays the production. By solving the problem, time of the process and power can be consumed very largely. This will affect economical as well as environmental aspects also in the power electronics industries. "

### What Exact Problem is being Solved?

"To make PCB JIG for a Power Electronics circuit having variety of components in dimension, that can fit as per PCB Design in the JIG. e.g. if a tray is made in such a way that all the components can place inside it then it will help very widely. This will reduce human efforts also. This will also increase the production speed for PCBs. There are numbers of components we are using in side one P C B to complete entire drive. Hence it will be useful "

### Users

Drives are generally used by all the industries now a days. With the help of drives many operations can be done very easily. During manufacturing such drives many industries like Power Electronics industries, Machine tools industries, Pump industries etc. Moreover, many researchers are also working in this direction.

### Expected Outcomes

"To make PCB JIG for a Power Electronics circuit having variety of components in dimension, that can fit as per PCB Design in the JIG. e.g. if a tray is made in such a way that all the components can place inside it then it will help very widely. This will reduce human efforts also. This will also increase the production speed for PCBs. There are numbers of components we are using in side one P C B to complete entire drive. Hence it will be useful "

### Potential Impact

Reduces error and stress of employees

"In production of electronics circuits the through hole components take much time for soldering and

need one hand for holding the component and other for soldering. This process is time consuming hence costly too as it delays the production. By solving the problem, time of the process and power can be consumed very largely. This will affect economical as well as environmental aspects also in the power electronics industries. "

### Probable Discipline

Electrical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH133

### Problem Statement

Efficient, cost effective solution for quick detection of location of fault in 11 kV agricultural feeders

### Name of Industry / Organisation

Eklavya ELECTRICALS

### Type Of Industry / Organisation

Small

### Challenge Description with Context

11 kv feeder fault finding in agricultural area is very difficult specially in rainy season. Some time it take 8 to 10 hours in various villages. It is challenging task for distribution company to find fault in agricultural culture area and people suffer from power interruptions for 10 to 12 hours which is not good for distribution company. Because the vision of company is to provide service excellence through providing continuous power supply.

### What Exact Problem is being Solved?

AG feeder 11 kv fault can find easily in long feeder 11 kv feeder fault finding in agricultural area is very difficult specially in rainy season. Some time it take 8 to 10 hours in various villages. It is challenging task for distribution company to find fault in agricultural culture area and people suffer from power interruptions for 10 to 12 hours which is not good for distribution company. Because the vision of company is to provide service excellence through providing continuous power supply.

### Users

All public of villages who use electricity in home and agricultural purpose. If we solve this problem all general public can get power restoration after finding fault within 2 to 3 hours. Specially in rainy season.

### Expected Outcomes

Fault can be detected in 2 to 3 hours in long 11 KV AG feeders 11 kv feeder fault finding in agricultural area is very difficult specially in rainy season. Some time it take 8 to 10 hours in various villages. It is challenging task for distribution company to find fault in agricultural culture area and people suffer from power interruptions for 10 to 12 hours which is not good for distribution company. Because the vision of company is to provide service excellence through providing continuous power supply.

### Potential Impact

11 kv feeder fault finding in agricultural area is very difficult specially in rainy season. Some time it take 8 to 10 hours in various villages. It is challenging task for distribution company to find fault in agricultural culture area and people suffer from power interruptions for 10 to 12 hours which is not good for distribution company. Because the vision of company is to provide service excellence through providing continuous power supply.

### Probable Discipline

Electrical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH134

### Problem Statement

Design of low cost cleaning mechanism to clean solar plate for roof top PV Solar

### Name of Industry / Organisation

Emisun Solar Pvt. Ltd.

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Today use of roof top PV solar is increasing day by day. So to increasing electrical output of solar, dust cleaning of plate is required. Because collection of irradiation is depend on solar plate cleaning. To small size terrace to install solar plate, mechanical structure is required. Due to install stand, the height of solar plate is increased. So it is very difficult to clean the plate in such height. so it is required some automatic low cost automatic cleaning mechanism to clean dust on solar plate.

### What Exact Problem is being Solved?

To make low cost automatic mechanism and installed on roof top solar plate to clean solar plate. By using low speed forward/reverse electrical motor such mechanism is possible. Otherwise either using of automatic water sprayer system solar glass cleaning is also possible. system was designed for cleaning the surface of the PV panels automatically to maximize the output of energy composed of a cleaning head and a drive system. The cleaning head has two cylindrical brushes traveling upward and downward along the panel surface edges by a pair of motorized trolleys to generate a clean PV panel. Electrostatics cleaning technology is named "Harvesting electricity". Electrostatic charge material is used on a transparent plastic sheet or glass that covers the solar panels. Sensors monitor dust levels and activate the system into cleaning mode.

### Users

For residential and industrial application of PV Solar. Rooftop solar has never been more affordable for home owners, business owners, and their communities. Such systems are especially helpful for mid to large scale residential and commercial buildings. very Appliance which requires electricity is supported by the power generated through solar rooftops. Air conditioners, coolers, TV, heaters and many more. The set-ups are for both commercial and residential buildings.

### Expected Outcomes

To reduce Electrical generation losses of PV solar and increase the generation of power for the PV panels. The efficiency of the solar panel can be increased by up to 50%. Our residential solar panel cleaning systems can help you to increase output by as much as 5 to 30%. Extremely effective and easy to use, our automatic cleaning systems work on solar panels from the industry's leading manufacturers

### Potential Impact

More electrical power generation developed and reduce cleaning maintenance. Demands manpower and is usually time consuming which may not be of suitable practice at large scale utility solar farms. So it will be reduce. Due to cleaning the dust and dust deposition on solar PV both increasing the efficiency of solar panel. Caring for your panels regularly with our solar panel washing systems will keep them working at maximum output. Furthermore, when you

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

use solar panel cleaning systems the rigors of manual cleaning are eliminated. Increased efficiency and less work

### **Probable Discipline**

Electrical Engineering



# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH135

### Problem Statement

Reduction of the weight of the Submersible pump.

### Name of Industry / Organisation

Endura Pump, AMEE Industry

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Reduction of the weight of the Submersible pump.

### What Exact Problem is being Solved?

Reduction of the weight of the Submersible pump.

### Users

Farmers

### Expected Outcomes

less weight submersible pump with same capacity

### Potential Impact

Reduction of the weight of the Submersible pump.

### Probable Discipline

Electrical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH136

### Problem Statement

Solar panel cleaning problem at regular intervals.

### Name of Industry / Organisation

EURO Solar Energy

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Today is the age of renewable energy solution. We know that efficiency of solar system drastically drops with dust accumulation on solar PV system. Solar panel cleaning problem at regular intervals. Therefore generation are decreasing due to dust on the solar panel output is decreasing. So make some arrangement to clean solar panel automatically at regular interval. The problem definition involves design and development of energy efficient and maintenance free solar panel cleaning system for Rooftop solar plant.

### What Exact Problem is being Solved?

Today is the age of renewable energy solution. We know that efficiency of solar system drastically drops with dust accumulation on solar PV system. Solar panel cleaning problem at regular intervals. Therefore generation are decreasing due to dust on the solar panel output is decreasing. So make some arrangement to clean solar panel automatically at regular interval. The problem definition involves design and development of energy efficient and maintenance free solar panel cleaning system for Rooftop solar plant.

### Users

There are many users of this type of system.

Like farmers uses it for their submersible pumps, commercial building uses it for energy generation for lighting purpose, residential people uses it for their household needs.

### Expected Outcomes

More energy generation with maintenance free solar panel. Today is the age of renewable energy solution. We know that efficiency of solar system drastically drops with dust accumulation on solar PV system. Solar panel cleaning problem at regular intervals. Therefore generation are decreasing due to dust on the solar panel output is decreasing. So make some arrangement to clean solar panel automatically at regular interval. The problem definition involves design and development of energy efficient and maintenance free solar panel cleaning system for Rooftop solar plant.

### Potential Impact

Today is the age of renewable energy solution. We know that efficiency of solar system drastically drops with dust accumulation on solar PV system. Solar panel cleaning problem at regular intervals. Therefore generation are decreasing due to dust on the solar panel output is decreasing. So make some arrangement to clean solar panel automatically at regular interval. The problem definition involves design and development of energy efficient and maintenance free solar panel cleaning system for Rooftop solar plant.

### Probable Discipline

Electrical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH137

### Problem Statement

Corrosion of HT or EHT conductor in coastal area

### Name of Industry / Organisation

Government Polytechnic, Navsari

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

Frequent fault occurred in transmission and distribution line in coastal area due to Corrosion in High Tension or Extra High Tension line conductor.

In this condition permanent fault observed in distribution and transmission line.so line availability and efficiency of distribution and transmission line decreased also increase of maintenance cost distribution and transmission line.

### What Exact Problem is being Solved?

Replace conducting material or change the property of a material used for conductor for reduce frequent fault occurred in transmission and distribution line in coastal area due to Corrosion in High Tension or Extra High Tension line conductor.Due to that permanent fault solve in distribution and transmission line.so line availability and efficiency of distribution and transmission line increased.

### Users

The following are users

- 1)Transmission companies
- 2) Distribution companies

### Expected Outcomes

By replacement of conducting material or change the property of a material used for conductor for reduce frequent fault occurred in transmission and distribution line in coastal area due to Corrosion in High Tension or Extra High Tension line conductor.Due to that permanent fault solve in distribution and transmission line.so line availability and efficiency of distribution and transmission line increased.

### Potential Impact

- 1) Fault reduced
- 2) Saving maintenance cost
- 3) Uninterrupted power supply
- 4) Reduced man power
- 5) Increase efficiency.

### Probable Discipline

Electrical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH138

### Problem Statement

1. What is the definition of Ultra Isolation Transformer?
2. How to reduce coupling capacitance between transformer windings and to bring it down to 0.005 pf or even less?
3. What would be the common mode rejection ratio for an ordinary transformer and

### Name of Industry / Organisation

Gujarat Plugin Device Pvt.Ltd

### Type Of Industry / Organisation Medium

### Challenge Description with Context

Distribution transformers are used extensively in power distribution sector. There are two winding kept around the 3 phase core of the transformer. These winding are known as High voltage and Low Voltage winding. There must be certain air gap or insulating material between them. Being a conductive material at different potential level, they offer certain amount of capacitance between them. If this capacitance is high, it provides charging path from one winding to another winding. Therefore, reduction of coupling capacitance between transformer winding is a major challenge.

### What Exact Problem is being Solved?

Distribution transformers are used extensively in power distribution sector. There are two winding kept around the 3 phase core of the transformer. These winding are known as High voltage and Low Voltage winding. There must be certain air gap or insulating material between them. Being a conductive material at different potential level, they offer certain amount of capacitance between them. If this capacitance is high, it provides charging path from one winding to another winding. Therefore, reduction of coupling capacitance between transformer winding is a major challenge. Reduction of coupling capacitance up to 0.005 pf or even less.

### Users

Distribution Transformers are used widely in utility sectors such as power distribution stations, pole mounted sub stations. It can be used also in academic purpose for research laboratories. It is most useful and necessary electrical appliance.

### Expected Outcomes

It will increase the efficiency, reliability and life span of the transformer. Small and medium scale industries manufacturing distribution transformers will be the immediate beneficiaries after the solution of this problem. Distribution Transformers are used widely in utility sectors such as power distribution stations, pole mounted sub stations. Overall GDP of our country is also increased due to effective utilization of material in design.

### Potential Impact

It will increase the efficiency, reliability and life span of the transformer. To a larger extent, it affects the overall economy of our nation. Small and medium scale industries manufacturing distribution transformers will be the immediate beneficiaries after the solution of this problem. Distribution Transformers are used widely in utility sectors such as power distribution stations, pole mounted sub stations.

### Probable Discipline

Electrical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH139

### Problem Statement

It has been observed that during connection of solar panel in residential premises. Tripping of ELCB is observed quite frequent and not much information available in literature about reasons of this. Till now it has been bypassed to avoid such tripping

### Name of Industry / Organisation

Inox Solar

### Type Of Industry / Organisation

Small

### Challenge Description with Context

It has been observed that during connection of solar panel in residential premises. Tripping of ELCB is observed quite frequent and not much information available in literature about reasons of this. Till now it has been bypassed to avoid such tripping. Research shows that Grid connection induces oscillations and sudden inrush of current but no devices or methodology has been developed to address this problem.

### What Exact Problem is being Solved?

Renewable energy integration with existing grid. Power quality comparison with between incoming grid and existing grid. Tripping of ELCB is observed quite frequent and not much information available in literature about reasons of this. Till now it has been bypassed to avoid such tripping. Research shows that Grid connection induces oscillations and sudden inrush of current but no devices or methodology has been developed to address this problem.

### Users

Residential and industrial consumers will be benefited with this innovation. because they are the end users. Renewable energy integration with existing grid. Power quality comparison with between incoming grid and existing grid. Tripping of ELCB is observed quite frequent and not much information available in literature about reasons of this. Till now it has been bypassed to avoid such tripping.

### Expected Outcomes

Easy to install solar panel with existing grid, Residential and industrial consumers will be benefited with this innovation. because they are the end users. Renewable energy integration with existing grid. Power quality comparison with between incoming grid and existing grid. Tripping of ELCB is observed quite frequent and not much information available in literature about reasons of this. sudden Inrush of current but no devices or methodology has been developed to address this problem.

### Potential Impact

Residential and industrial consumers will be benefited with this innovation. because they are the end users. Renewable energy integration with existing grid. Power quality comparison with between incoming grid and existing grid easy integration of source of energy. easy to install solar panel with existing grid, Residential and industrial consumers will be

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

benefited with this innovation. because they are the end users. Renewable energy integration with existing grid. Power quality comparison with between incoming grid and existing grid.

### **Probable Discipline**

Electrical Engineering

# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH140

### Problem Statement

Low Cost condition monitoring of 3-Phase induction motor on PC

### Name of Industry / Organisation

JP Technosoft

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Many Industrial Motors are installed in many in many applications in continuous plant industries like Pharmaceuticals, chemical, agro, food, textile etc.

The motor installed is main component of the process. Hence, continuous observation is a part of regular maintenance.

It is not possible all the time to visit each and every motor installed in whole industries. So, to keep constant watch on process, it is required to install device which gives constant data like winding temperature, vibration of shaft in X-Y direction. Different faults of an induction motor such as rotor, stator, bearing, vibration, air gap eccentricity and their different diagnosis techniques can be observed continuously.

Low cost monitoring of Induction motor is most important part in all industries. If such type of monitoring system will be prepared, it will create great revolution in industries. With such prototype one can get above mention data on PC or mobile also. With this technology we can keep a bird's eye view on different types of faults and their diagnostics' schemes.

Presently in market many such devices are available. But it leads to plant modifications and also its not cost effective solution. It also leads to shut down because of retrofication.

If this problem solved, then new Induction Motor will be prepared with this technology

Hence, task is to find out cost effective monitoring system.As mentioned earlier that, presently in market many such devices temperature sensors, vibration sensors etc are available. But it leads to plant modifications and also its not cost effective solution.

Hence, cost effective technology can be put in to the market with solution of such problem

### What Exact Problem is being Solved?

The different sensors are inserted in to Induction motor. These sensors are connected to external meters through wires or wireless. Hence constant monitoring will be possible.

### Users

Pharmaceuticals, chemical, agro, food, textile and other continuous plant industries where Induction motors are used.

### Expected Outcomes

Cost effective technology can be put in to the market with solution of such problem. with this technology preventive maintenance will be easy and cost effective.

### Potential Impact

Continuous monitoring will be possible at remote place or at the motor place.

Hence, efficient operation of all continuous plant industries.

### Probable Discipline

Electrical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH141

### Problem Statement

Issue of power quality at newly developing locations far from industrial area.

### Name of Industry / Organisation

Jyoti CNC Automation Ltd.

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

At remote or new developing location for industrial, like out of GIDC area, power quality is not good and supply level is also not consistent. CNC machine's input supply with disturbing harmonics are very dangerous and causing huge failure of drives and control electronics. This needs to address seriously to improve overall efficiency of industry. It will be required to develop filter like equipment that can sort out power quality like issues.

### What Exact Problem is being Solved?

To develop low cost harmonic filter to improve Power Quality. First of all we have to find out sources of power quality issues. We have to study the specifications of instruments which are been used in industries. We have to develop equipment which take power with lower quality process it and convert it to quality power. In this way we have to do one kind of filtration of impure power to have good quality power.

### Users

For Industrial Load as well as it may be useful to domestic appliances also. Because each and every equipment or instrument is made for some specification of power which it takes. If the power is not of desired quality its performance deteriorates. Industrial equipments are costlier and some times more sensitive to power supply disturbances. So industry is major user of such product.

### Expected Outcomes

To have availability of continuous and good Power Quality supply. Industry will have better productivity, lower rejection in products, better power utilization, less electricity bill, improved efficiency of instruments and equipments, longer life of instruments and machinery. Ultimately cost of product will lower down. It will ultimately benefit to end user or customer of industry or the society.

### Potential Impact

"Improvement in Power Quality. "To have availability of continuous and good Power Quality supply. Industry will have better productivity, lower rejection in products, better power utilization, less electricity bill, improved efficiency of instruments and equipments, longer life of instruments and machinery. Ultimately cost of product will lower down. It will ultimately benefit to end user or customer of industry or the society.

### Probable Discipline

Electrical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH142

### Problem Statement

Regarding problem facing in AC Servo Motor.

### Name of Industry / Organisation

K & DS Electronic Limited

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

Most of the servo drives are manufactured by foreign companies. also these drives are based on AC/DC motors. but recent development of motor technology have high potential and can be utilised to get better servo drive systems. There are many times delay for availability of products which are not made in india. The maintenance of such products becomes costlier. Traditional servo drive system have some issues of accuracy.

### What Exact Problem is being Solved?

To develop servo system based on advance motor. A servo drive system is to be developed locally which is of better accuracy than traditional servo drive system. For that exact requirements of industries are to be listed out and develop the drive system which fulfil the all requirements with comparatively lower cost and ease of maintenance. Making the system less costly is the prime problem to be solved.

### Users

For industrial applications. Such products are used in almost all industries. Specifically CNC machines, automobile industries, ceramic, cement and many other industries require high accuracy speed and positioning control.

### Expected Outcomes

Better Servo motor drive compared to conventional systems. First of all industries will have made in india product with higher performance than imported one. It will reduce their production cost. It will inturn benefit to the society as they will have low cost products. Sometimes there is delay to get imported machineries. It will also greatly reduce such delay for improving productivity of industry.

### Potential Impact

Low cost and highly reliable servo system for industrial application. It will reduce their production cost. It will inturn benefit to the society as they will have low cost products. Sometimes there is delay to get imported machineries. It will also greatly reduce such delay for improving productivity of industry. It will improve the economy of industry and as a whole our nation. Small unit will also afford such products.

### Probable Discipline

Electrical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH143

### Problem Statement

efficient energy storage systems for solar energy

### Name of Industry / Organisation

Navi energy

### Type Of Industry / Organisation

Small

### Challenge Description with Context

One serious drawback of solar energy is its intermittent availability. Like on grid, off grid hybrid system, etc. During sunny conditions energy production is high but as the sun sets and darkness occurs production will be minimum. The question remains how do we best store the energy which can be used later. Some current methods of storage have drawbacks, they use costly material and provide inadequate storage have low power density or involve complicated process. Here we define a problem for best energy storage which solves the issues of energy and power density and provides optimum storage

### What Exact Problem is being Solved?

The biggest problem with solar energy is that it is intermittent. Some argue this problem is easily overcome by storing any excess energy in batteries until it's needed at a later time. Further, battery advocates say, even though the bookcase-sized batteries required to store solar energy for a small home are expensive today, prices are falling and will continue to fall for some time. Energy density and power density with minimum maintenance has to be addressed. World is also looking for some excellent storage systems alternative

### Users

residential consumers, industrial consumers, schools, colleges, government buildings are the users. That's not a problem if the batteries are for ironing out the peaks and troughs of daily use. The trouble is that humanity's energy demand is skewed based on local seasons, which requires sometimes drawing on every available source, and sometimes not using much energy at all. Mumbai's peak energy demand is during the hottest days of summer, when people run air conditioners to survive. London's peak energy demand comes during the coldest days of winters, when people burn natural gas to heat their homes and offices.

### Expected Outcomes

Energy storage will play an increasingly critical role in the resilient grid of the future. Storage systems provide important services, including improving grid stability, providing backup power and allowing for greater integration of renewable resources. Today's dominant storage options have limitations that inhibit their use as long-duration solutions, particularly their high cost. Backup power is one example in which tens of hours of electrical energy storage would provide critical services during an extended grid outage associated with a storm or other event.

### Potential Impact

There are two solutions on the table for inter-seasonal energy storage, and they both involve massive investment in infrastructure: First, you could build so many solar panel fields or so many wind turbines that you could produce much more than 20 times the power of an average day. The upshot: you'd have much more excess energy on a low-demand day, but would at least be able to fill demand on peak-demand days. The second option is to get so

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

many batteries that they can store up enough excess energy that, even as they lose their charge, there's still enough power to get the grid through peak-demand days. So optimum solution is still awaited.

### **Probable Discipline**

Electrical Engineering

# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH144

### Problem Statement

Temperature Based Smart Fan Contro

### Name of Industry / Organisation

NILKANTH POWER

### Type Of Industry / Organisation

MSME

### Challenge Description with Context

Now a days people use Air conditioner and Fan simultaneously, actually it is not necessary to operate fan when Air conditioner is in working mode, this project gives idea to control fan in co-ordination with Air conditioner by using temperature control system , which will save valuable electrical energy. Which helps to save Electricity Bill.it is desirable to use fan when air conditioner in cut off mode , hence there should be a practice to operate fan when Air conditioner is in working mode, this project gives idea to control fan in co-ordination with Air conditioner by using temperature control system , which will save valuable electrical energy.this idea can save considerable amount of electricity in residential, commercial and industrial offices.

### What Exact Problem is being Solved?

Day by day use of electricity requirement drastically increased.

Now a days people use Air conditioner and Fan simultaneously, actually it is not necessary to operate fan when Air conditioner is in working mode, this project gives idea to control fan in co-ordination with Air conditioner by using temperature control system , which will save valuable electrical energy. Which helps to save Electricity Bill.

### Users

with the implementation of this logic we can benefit almost all sectors like residential, commercial and all kind of multiplexes and malls which are centrally air conditioned. We can apply this technology in all above segments.

### Expected Outcomes

Now a days people use Air conditioner and Fan simultaneously, it is desirable to use fan when air conditioner in cut off mode , hence there should be a practice to operate fan when Air conditioner is in working mode, this project gives idea to control fan in co-ordination with Air conditioner by using temperature control system , which will save valuable electrical energy. Which helps to save Electricity Bill.

### Potential Impact

it is desirable to use fan when air conditioner in cut off mode , hence there should be a practice to operate fan when Air conditioner is in working mode, this project gives idea to control fan in co-ordination with Air conditioner by using temperature control system , which will save valuable electrical energy.

this idea can save considerable amount of electricity in residential, commercial and industrial offices.

### Probable Discipline

Electrical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH145

### Problem Statement

While operating star-delta starter it is found that the cost of timer for the presently used starter is very high. It is needed to incorporate a timer which gives cost effective solution and while operation from star to delta mode if rated load on motor de

### Name of Industry / Organisation

OUM ELECHMECH PVT LTD

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

Many methods can be used to start large AC induction motors. Choices such as full voltage, reduced voltage either by autotransformer or wye-delta, a soft starter, or usage of an adjustable speed drive can all have potential advantages and trade offs. Reduced voltage starting can lower the starting torque and help prevent damage to the load. Additionally, power factor correction capacitors can be used to reduce the current, but care must be taken to size them properly. Here the problem is specifically formed to reduce the cost of timer of fully automatic star-delta starter for industry and modify Industrial star-delta starter such that when the load decreases below 40%, motor comes again in star-mode. One can use appropriate sensor and programming.

### What Exact Problem is being Solved?

In Industry 3-phase Induction motors is used in many applications. There are many types of starters used for controlling from stator side and rotor side. In case of using star-delta starter there are starters which can be categorized as semi-automatic and full automatic starter. The fully automatic starter has a timer application to switch over from star mode to delta mode. This can be replaced with a low cost timer circuit. Once starter is operated in delta mode and there is sudden decrease in load, it should come back to star mode. The costly relays with complete protection should be replaced by low cost programmable relays.

### Users

Industry, Institutes, colleges, Government Organisation etc. Three-phase AC induction motors are widely used in industrial and commercial applications. These are of two types, squirrel cage and slip ring motors. Squirrel cage motors are widely used due to their rugged construction and simple design. Slip ring motors require external resistors to have high starting torque

### Expected Outcomes

Students will be able to design a low cost and efficient star-delta starter. The three induction motors are commonly used in the industry

in large ranges from several kilowatts to thousands kilowatts.

These motors have been preferred due to its self starting capability, rugged construction, less maintenance, low cost etc. Three phase induction motor finds its application in almost all facets of life and thus its demand is high and it is thus advisable to design starter which is Industry applicable.

### Potential Impact

Due to their innately efficient characteristics, three phase induction motors are some of the most widely used electrical motors in India today! In fact, over 75% of the mechanical power

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harnessed by industries is due to three phase induction motors that bank upon– good speed regulation, operating characteristics, and sheer absence of commutators! What's more? They are also used in the agriculture industry. As a matter of fact, with the large-scale mechanization of farms, three-phase induction motors have gained prominence taking into account the electrical power requirement for carrying out farm renovations or expansions

### **Probable Discipline**

Electrical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH146

### Problem Statement

For all industries LT & HT switchgears comes with communication port, all the programmable relays, ACB's, VCB's are come with the threat of security concern. We need to minimise this threat from foreign agency in order to avoid major breakdown/ disaster.

### Name of Industry / Organisation

OUM ELECHMECH PVT LTD

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

As many industries required HT as well as LT loads, so it requires LT & HT configured switchgears and instruments. But all comes with communication port, all the programmable relays, ACB's, VCB's are come with the threat of security concern. They all industries used to minimise this threat from foreign agency in order to avoid major breakdown/ disaster, but we have to understand the way of work that how to solve problems. We have to resolve this problem in our way with different way with different methods.

### What Exact Problem is being Solved?

With new methods like real time monitoring system we can trek all data for solve problems and future prospects. Also with better programming, relays, ACB's, VCB's can be saved from the threat which is security concern. Also

we can take help of industries expert and research and development department of Industries to solved the problems. Make new design of switchgears, relays and breakers which will be useful to fulfill this industrial problems.

### Users

Users can be determined by the instrument which is related to listed products, heavy industries, Research and Development department of Industries as well as government organisations, small scale industry and organisations are the main users.

### Expected Outcomes

Outcome depending upon the way of work and manpower as well as new technology, so we can do better for fast work on those problems. As many industries required HT as well as LT loads, so it requires LT & HT configured switchgears and instruments, better programming and using real time monitoring system it is easy to work and get fast outcome as we expect. With help of industries expert and research and development department of Industries to solved the problems.

### Potential Impact

Take help of industries expert and research and development department of Industries to solved the problems. As many industries required HT as well as LT loads, so it requires LT & HT configured switchgears and instruments, better programming, using real time monitoring system and also as invite students, faculties and research fellow it is easy to work and get fast outcomes. It is good for industries if we can shared problems finding solutions with them.

### Probable Discipline

Electrical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH147

### Problem Statement

Drastic Drop in Solar Power generation in PV Modules

### Name of Industry / Organisation

Powertrac solar projects ltd.

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Solar panels and their components serve to be useful devices in the face of expensive and fast depleting energy sources. They transform solar energy into heat energy and electricity to be used in residential and commercial establishments. Like all other energy-producing devices, solar panel components are also prone to damages. Their faulty components are easy to recognize as they lead to diminished yields and less output from the solar installation. Fortunately, solar panel repairs can help in the resolution of most common problems that affect solar panels, provided they are performed in time by field experts.

Prior knowledge of the commonly occurring solar panel problems can alleviate the concerns of added investments in the form of new PV components. Given below are some issues that can make solar panels underperform or render them useless beyond repair.

### What Exact Problem is being Solved?

Alternatives Solution has been made to solve the problem

Solar energy is one of the most sustainable energy sources, converting light into electricity. Solar panels power buildings with electricity, allowing workers to carry on their day-to-day tasks with a renewable energy source. Equipping a facility with solar panels is one of the greenest actions to take within infrastructure. Not only are solar panels good for the environment—eliminating greenhouse gas emissions and declining the use of fossil fuel—they also save money on electric bills.

Solar panels do not work unvaryingly under all conditions and there are certain factors that can affect efficiency. Learn how to improve solar panel efficiency and increase your energy source with these four tips.

#### 1. Shade

Problem: Shade is a major inhibitor for solar panels, as it is a form of sun blockage. Shade is not necessarily equivalent to cloudy skies, although such days yield less productive electricity secretion from the panels, they do not entirely block them off from sunlight. Panels still receive sunlight and create the conversion, just a smaller one, under hazy conditions.

Why: The reason shade bars efficiency for solar panels lies in how they are installed internally with each other. A single panel has groupings of cells wired for increasing the voltage. If even a miniscule part of the panel has shade, the whole module will have less energy conversion.

Solution: True shade, or the one most harmful for solar panels, takes the form of nearby trees and infrastructural barriers like chimneys and vents. While it's nearly impossible to move a chimney, high-rising trees should be trimmed, if not removed altogether.

#### 2. Weather

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**Problem:** Weather conditions make up a major factor in solar panel performance. Snow and hail are pesky elements that inhibit solar panels, but not so much as to halt their operation entirely. Snow panels retain enough heat to melt off the snow lodged atop them, while hail cannot break through the solar panel glass, as most U.S. panels are equipped to withstand a hail stone 1" or smaller at 50+ mph. Surprisingly, warm temperature is a major deterrent to solar panel efficiency.

**Why:** Though rather odd, warm weather is not as conducive to energy conversion as one might think. A UK study found a 1.1% drop in solar panel conversion for every increase of degrees Celsius after 42 degrees, or 107 degrees Fahrenheit. The decrease in production occurs during summer weather, starting at 87-91 degrees Fahrenheit. The reason high temperatures cause this negative effect is because electricity production relies on the movement of electrons.

**Solution:** On hotter days, less energy is needed to excite the electrons so less energy is transferred from the sun to the solar cells. In short, cooler, sunny weather makes for the most effective solar panel efficiency.

### 3. Orientation

**Problem:** Solar panels facing a particular way, like east or north, are considered to have poor solar panel orientation.

**Why:** Solar panel orientation refers to the position of the solar panels in terms of direction. It can be problematic because they are reliant on sunlight and certain positions do not grant them the optimal sunlight.

**Solution:** Solar panels ought to be positioned in a way that allows the most amount of sunlight possible. In the U.S., they should be facing south. They also should face west, especially during peak power demands, which, as aforementioned, are in the summer.

There have been debates contending over which direction is better, south or west. Ultimately, solar panel orientation benefits by both westward and southward positioned panels. The only differences in conversion between the two orientations were in part responsible by the time period. For example, 3-7pm has the maximum sunlight conversion when the panels face west. During the summer, west-facing panels also received greater conversion. But annually, the best position was determined to be at around 219 degrees.

### 4. Upkeep

**Problem:** Solar panels are not invincible to common congestions like dust and dirt.

**Why:** These clogs block the solar cells, resulting in less sunlight exposure and lesser efficiency. They build up over time and the more blockage, the less effective the solar panels will be.

**Solution:** When it comes to the upkeep of solar panels, there is not much maintenance needed. Solar panel preservation calls for light maintenance like regular cleaning.

Dust can be removed via soapy water and wipes, and sometimes rain alone will clear out the dust perched on the module. There is no standard for cleaning frequency and determining how often you clean your solar panels is mainly dependent on their power output. As they age, cleaning them more regularly will keep them free of dirt, grime and other obstructions.

## Users

Solar PV EPC Company

Rooftop solar users

## Expected Outcomes

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

Solar panel efficiency is not dictated by the above factors alone. Solar panel efficiency is measured by ratings that depict the percentage of sunlight entering a panel that gets converted into electric energy. This is what's known as conversion rate.

The most common efficient solar panels are built with an 11-15% rating range. The most efficient solar panels have rates around 20.1%. As it currently stands, the most efficient solar cell has a lofty conversion rate of 44%. This is also due in part to a multi-junction concentrator. Solar panels with lower conversion rates will need more surface area to work as efficiently as solar panels.

### Potential Impact

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### Probable Discipline

Electrical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH148

### Problem Statement

Grid Voltage Fluctuations Due to Integration of Solar Power in Grid

### Name of Industry / Organisation

Powertrac solar projects ltd.

### Type Of Industry / Organisation

Small

### Challenge Description with Context

inverter goes into 'voltage-dependent power reduction' mode

In marginal cases your inverter may not trip off, but may reduce its power output instead as a way to cope with grid voltages that are a little too high.

When your inverter reduces its power due to high grid voltages it is in what's called "Volt-watt response mode". It has to do this to comply with the latest version of Australian Standard AS4777.2.

I knocked out this sketch to show what happens. Your inverter will start reducing power at 250V and reduce it linearly down to 20% as the voltage increases, tripping if it hits 265V.

### What Exact Problem is being Solved?

One case study that we can share comes from an installation in Perth. The below graph illustrates what is occurring during the day with high voltage. In this case, if power is going back to the grid (requiring a higher voltage), the production has been reduced slightly to bring the output voltage within limits

### Users

Solar PV EPC Company

Rooftop solar users

### Expected Outcomes

One term you may hear is "ramping". Ramping refers to the inverters ability to reduce its output marginally during times of high grid voltage. As mentioned, to push power back the inverter will add some voltage so whatever your incoming voltage is, if you have solar it will add up to 2% volt rise. The settings on your inverter are required by Australian standards to ensure grid quality and safety. As such when your inverter begins to approach these voltage limits it will ramp down to ensure shutdown is avoided. This will minimally affect your yield, in most instances by less the 3% over the course of a year. However not all inverters have the ability to ramp and in this instance if your inverter reaches the voltage limits it will disconnect and only reconnect when the grid has reduced to 253V.

### Potential Impact

One term you may hear is "ramping". Ramping refers to the inverters ability to reduce its output marginally during times of high grid voltage. As mentioned, to push power back the inverter will add some voltage so whatever your incoming voltage is, if you have solar it will add up to 2% volt rise. The settings on your inverter are required by Australian standards to ensure grid quality and safety. As such when your inverter begins to approach these voltage limits it will ramp down to ensure shutdown is avoided. This will minimally affect your yield, in most instances by less the 3% over the course of a year. However not all inverters have the

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## Problem Statements

ability to ramp and in this instance if your inverter reaches the voltage limits it will disconnect and only reconnect when the grid has reduced to 253V.

### **Probable Discipline**

Electrical Engineering

# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH149

### Problem Statement

Detecting and Measuring Pezo vibrations and find the fault/deviations in the wheel using a special techniques

### Name of Industry / Organisation

Precision Embedded Automation Solutions

### Type Of Industry / Organisation

MSME

### Challenge Description with Context

It is difficult to find fault/deviations in the wheel , there are different techniques to find fault/deviations, so challenge is to find best suitable technique for finding fault/deviations in the wheel. The pezo vibration method is widely used method to find fault/deviations in the wheel so it is required to implement this technique or any other possible solutions which is practical for this type of problem.

### What Exact Problem is being Solved?

There is increasing need to find fault/deviation in the wheel by the motor vehicle manufacturer and also practitioner. There must be certain techniques to find fault/deviations in the wheel. so problem is how to implement this technique effectively. The pezo vibration method is one of the technique which can be utilized for the problem. There can be other possible solution to implement the same. The possible solution must be economical and feasible for industry.

### Users

The user of the problem solution can be motor wheel alignment consultant who generally checks that if there is any fault/deviation in wheel and also suggest customer if any issue or need for replacement of any parts in vehicle, Also it is useful at Car service stations to see the condition of wheel and repair it.

### Expected Outcomes

The expected outcome of this is effective and economical technique to find fault/deviation in wheel. There can be many techniques to find fault/deviation in wheel , there is pezo vibration technique which can be utilized for the problem. The students are required to come with best possible solution of the above problem by using latest software and tools to find the solution. They may refer some literature available for same.

### Potential Impact

The impact of the given solution can be seen as it is useful for motor wheel alignment consultant who generally checks that if there is any fault/deviation in wheel and also suggest customer if any issue or need for replacement of any parts in vehicle, Also it is useful at Car service stations to see the condition of wheel and repair it. so The possible solution can be useful for motor wheel alignment consultant and Car service stations.

### Probable Discipline

Electrical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH150

### Problem Statement

Neutral Burning

### Name of Industry / Organisation

R S Industries

### Type Of Industry / Organisation

Small

### Challenge Description with Context

R S Industry is a panel manufacturing company has problem in machine due to problem of neutral burning issues. due to this issues industry facing the many problems like winding burning of welding machine ,bending machine, compressors. because of that their is problem in panel tripping also. lightning problem is also their. A loose neutral wire can cause abnormal arcing around its point of connection, usually resulting in the neutral wire becoming unusually hot, burning its insulation off and even causing damage to its surroundings. because of that they identify the exact solution of rectification.

### What Exact Problem is being Solved?

A loose neutral wire can cause abnormal arcing around its point of connection, usually resulting in the neutral wire becoming unusually hot, burning its insulation off and even causing damage to its surroundings. R S Industry is a panel manufacturing company has problem in machine due to problem of neutral burning issues. due to this issues industry facing the many problems like winding burning of welding machine ,bending machine, compressors. because of that they identify the exact solution of rectification.

### Users

after solving the neutral burning problem, company may get advantages of more production. even efficiency of that particular machine is also increase. and maintenance of the different machines may decrease and also the cost.

### Expected Outcomes

R S Industry is a panel manufacturing company has problem in machine due to problem of neutral burning issues. due to this issues industry facing the many problems like winding burning of welding machine ,bending machine, compressors. because of that they identify the exact solution of rectification. A loose neutral wire can cause abnormal arcing around its point of connection, usually resulting in the neutral wire becoming unusually hot, burning its insulation off and even causing damage to its surroundings.

### Potential Impact

R S Industry is a panel manufacturing company has problem in machine due to problem of neutral burning issues. due to this issues industry facing the many problems like winding burning of welding machine ,bending machine, compressors. because of that their is problem in panel tripping also.

lightning problem is also their. A loose neutral wire can cause abnormal arcing around its point of connection, usually resulting in the neutral wire becoming unusually hot, burning its insulation off and even causing damage to its surroundings. because of that they identify the exact solution of rectification. after giving the exact solution industries get the benefits.

### Probable Discipline

Electrical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH151

### Problem Statement

Troubleshooting of power network to overcome the problem of false tripping associated with Mud pumps considering the load pattern

### Name of Industry / Organisation

Saheb Organics

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Plant Has Multiple Mud Pumps with Different Capacity like 2HP, 5HP, etc. During Normal Every Things Work Fine But some time MCB Gets Trip and Mud Pump Stop Working. Plant Getting Supply from Two Way one from DG Set and One from GEB. If Pumps Working on DG Set or GEB Supply is going to trip and doesn't start. Need to send PUMP Motor for Repair. Sometimes During Working Normal Working the Acceleration of DG Set Increases.

### What Exact Problem is being Solved?

Need to avoid tripping of MCB and finding out the reason behind the sudden tripping of MCB and the Winding is getting damaged due to frequent tripping of PUMP Motor. Have taken the voltage measurement but everything looks perfect, the three-phase voltage will be in the range of 430volts. The Damage of Multiple Mud pump happens during a short period of time. There should be some system need to implement for detecting the Problem.

### Users

This problem may be faced by industrial sector where devices run on DG Set. The users who are using Mud Pump.

### Expected Outcomes

- 1.No Triping
2. No Overload
- 3.Auto Correction of parameter is they are changing
- 4.Advance Detection of Problem and Alarm system
- 5.Prevent from Winding Damage of Motor
6. MCB Tripping Correction

### Potential Impact

Need to avoid tripping of MCB and finding out the reason behind the sudden tripping of MCB and the Winding is getting damaged due to frequent tripping of PUMP Motor. Have taken the voltage measurement but everything looks perfect, the three-phase voltage will be in the range of 430volts. The Damage of Multiple Mud pump happens during a short period of time. There should be some system need to implement for detecting the Problem.

### Probable Discipline

Electrical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH152

### Problem Statement

Power Cable Internal fault detector

### Name of Industry / Organisation

SARJAN INDUSTRIES

### Type Of Industry / Organisation

small

### Challenge Description with Context

In Industries power cable internal fault detection is quite difficult and time consuming which can directly affect on the production and revenue, so we would like to solve this challenging problem. Cable faults are damage to cables which effect a resistance in the cable. If allowed to persist, this can lead to a voltage breakdown. There are different types of cable faults, which must first be classified before they can be located. The insulation of the cable plays a significant role in this. While paper-impregnated cables are particularly susceptible to external chemical and thermal influences, in high-voltage PE or XLPE cables the polyethylene insulation of the conductor is affected, leading to partial breakdowns and cracks that "eat away" the insulation.

### What Exact Problem is being Solved?

We will prepare a kit to detect power cable internal fault as soon as possible. A fault indicator is a device which provides visual or remote indication of a fault on the electric power system. Also called a faulted circuit indicator. Circuit used for locating faults in underground or underwater cables. It has been used for more than 100 years. One end of the faulted cable is connected. insulated cable and excavation are much higher than overhead construction. Faults in buried transmission lines take longer to locate and repair.

### Users

Industrial technicians, DISCOM technicians, engineers etc. The equipment shall be capable to deliver high output energy that is necessary to ascertain easily to condition and breaking down faults in power cables, joints and terminations and long cable network. The equipment should be capable of detection of faults in mix cables of PILC & XLPE.

### Expected Outcomes

We will prepare a kit for power cable internal fault detector which will indicate the types of fault and its location also. Cable fault location is the process of locating periodic faults, such as insulation faults in ... reflection method, which due to the burning short circuit results in a reversal of polarity. ... In 20 years that followed, over 2000 fault location vehicles were manufactured, more than half of which were intended for the former USSR.

### Potential Impact

Cable faults are damage to cables which effect a resistance in the cable. If allowed to persist, this can lead to a voltage breakdown. There are different types of cable faults, which must first be classified before they can be located. The insulation of the cable plays a significant role in this. Cable faults are damage to cables which affect a resistance in the cable. If allowed to persist, this can lead to a voltage breakdown. This fault occurs when the cable is insufficiently protected or mishandling at the time of laying of the cable underground, poor workmanship of cable jointing.

### Probable Discipline

Electrical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH153

### Problem Statement

Maintain power factor to a required value by automatic power factor (APFC) control panel even if all the connected equipments are correct in position.

### Name of Industry / Organisation

SHREE GAYATRI ELECTRICAL

### Type Of Industry / Organisation

Small

### Challenge Description with Context

The power demand is increasing day by day as the industrial load is increasing. Majority of load are inductive in nature in industries. In modern power network cater to a wide variety of electrical load and power electronics loads, which create a varying power demand on the supply system and pollute the system environment. It is necessary of automatic switching operation of the suitable capacitor depending upon the load fluctuations without manual intervention. It can be achieved by using APFC system which can maintain consistently high factor nearer to unity. Power factor is sensed by the CT & PT placed in line side. If output of CT is not accurate then Maintain power factor to a required value by automatic power factor (APFC) control panel can not achieve, even if all the connected equipments are correct in position. and it required ct replacement.

### What Exact Problem is being Solved?

In industry most of the load is inductive in nature which results in lagging power factor that is why there is loss and wastage of energy which results in high power bills and heavy penalties from electricity boards. If the load is uneven it is very difficult to maintain unity power factor. To overcome this difficulty APFC panel is used which maintains unity power factor. The Supply main terminals are connected to input of APFC Panel. Power factor is sensed by the CT & PT placed in line side. As the level of line voltage and current the capacitor banks are operated to archive calculated power factor by microprocessor based APFC relay. The appropriate capacitor bank will operate with respect to KVAR required to Achieve target PF by APFC panel. After it CT & PT will check the feedback from the switching capacitors. Finally Archived or targeted PF given to load.

So, Exact Problem is being Solved: if output of CT is not accurate then Maintain power factor to a required value by automatic power factor (APFC) control panel can not achieve, even if all the connected equipments are correct in position.

### Users

Automobile Industries, Cement Industries, Metal Industries.

Chemical & Fertilizer Plant, Pharmaceutical Industries.

Hospitals, Malls, Banks, IT Parks, Commercial Complexes.

Windmill, Power Stations, DG Stations, Crushers.

Railway / MES / Ordinance Workshops

### Expected Outcomes

Power factor correction can be extremely beneficial. Benefits include everything from reduced demand charges on your power system to increased load carrying capabilities in your existing circuits and overall reduced power system losses.

-Consistently high power factor under fluctuating loads.

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## Problem Statements

- Prevention of leading power factor
- Eliminate power factor penalty
- Lower energy consumption by reducing losses.
- Continuously sense and monitor load
- Automatically switch on/off relevant capacitors steps for consistent power factor.

### Potential Impact

Power factor correction can be extremely beneficial. Benefits include everything from reduced demand charges on your power system to increased load carrying capabilities in your existing circuits and overall reduced power system losses.

#### 1. Avoid Power Factor Penalties

Most industrial processing facilities use a large quantity of induction motors to drive their pumps, conveyors, and other machinery in the plant. These induction motors cause the power factor to be inherently low for most industrial facilities. Many electric utility companies assess a power factor penalty for lower power factor (usually below 0.80 or 0.85). Some also incentive high power factor (above 0.95, for example). By adding power factor correction, they can eliminate the power factor penalty from their bill.

#### 2. Reduced Demand Charges

Many electric utility companies charge for maximum metered demand based on either the highest registered demand in kilowatts (KW meter), or a percentage of the highest registered demand in KVA (KVA meter), whichever is greater. If the power factor is low, the percentage of the measured KVA will be significantly greater than the KW demand. Improving the power factor through power factor correction will therefore lower the demand charge, helping to reduce your electricity bill.

### Probable Discipline

Electrical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH154

### Problem Statement

To design best APFC with proper Algorithm for three phase Motor

### Name of Industry / Organisation

Shree Ram Electricals

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

In industry most of the load is inductive in nature which results in lagging power factor that is why there is loss and wastage of energy which results in high power bills and heavy penalties from electricity boards. If we design a single capacitor which is known as single compensation that there will be issue while motor is running other than full load. Similarly for group compensation also there will be an issue of selected capacitor value if all the motors are not on a particular bus. So optimum value of automatic power factor updated value is required. It can be designed and developed by students as Hackathon problem.

### What Exact Problem is being Solved?

Automatic power factor controller project is designed to improve power factor automatically whenever power factor falls below a certain level. As we know demand of electrical energy is increasing day by day. More and more inductive loads are being used in industry and domestic applications. Inductive loads are main reason for low power factor in power system. Therefore we need to develop a method to improve power factor automatically. Automatic power controller project provides solution to this problem. Low power factor includes unnecessary burden on power system and transmission lines. By improving power factor of power system automatically, power system efficiency can be improved. For motor it is desired to have best efficiency and power factor.

### Users

There are big Industrial and domestic consumer using three phase Induction motor. Improvement of power factor will certainly reduce the bill amount. It will also be useful to supplying authorities. There are many benefits of power factor control panel on industrial unit which can be for long term. However, it also depends on how the control panel manufacturer has built the product. The benefit can range from reducing the demand charges, eliminating the power factor penalty, increased system capacity and others. However, before we learn the benefits let us check what power factor is. Power factor is the ratio between the KW and KVA drawn by an electrical load. The measure allows knowing how effectively the current is being converted into usual work output.

### Expected Outcomes

Power factor correction can be extremely beneficial. Benefits include everything from reduced demand charges on your power system to increased load carrying capabilities in your existing circuits and overall reduced power system losses.

Most industrial processing facilities use a large quantity of induction motors to drive their pumps, conveyors, and other machinery in the plant. These induction motors cause the power factor to be inherently low for most industrial facilities. Many electric utility companies assess a power factor penalty for lower power factor (usually below 0.80 or 0.85). Some also incentive high power factor (above 0.95, for example). By adding power factor correction,

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

you can eliminate the power factor penalty from your bill.

### Potential Impact

Many electric utility companies charge for maximum metered demand based on either the highest registered demand in kilowatts (KW meter), or a percentage of the highest registered demand in KVA (KVA meter), whichever is greater. If the power factor is low, the percentage of the measured KVA will be significantly greater than the KW demand. Improving the power factor through power factor correction will therefore lower the demand charge, helping to reduce your electricity bill. Loads drawing reactive power also demand reactive current. Installing power factor correction capacitors at the end of existing circuits near the inductive loads reduces the current carried by each circuit. The reduction in current flow resulting from improved power factor may allow the circuit to carry new loads, saving the cost of upgrading the distribution network when extra capacity is required for additional machinery or equipment, saving your company thousands of dollars in unnecessary upgrade costs. In addition, the reduced current flow reduces resistive losses in the circuit.

### Probable Discipline

Electrical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH155

### Problem Statement

Supervisory Control for a dynamic power flow controller using modular approach (Implementation using PLC)

### Name of Industry / Organisation

SSM Infotech Solutions Pvt. Ltd.

### Type Of Industry / Organisation

Small

### Challenge Description with Context

At first it may seem easy to implement the supervisors in a PLC. It looks like merely a matter of making the PLC behave as a state machine. But, there are a number of problems in implementing the supervisors in sequential, synchronous device like a PLC. The straight forward way to represent a Supervisor is to assign variables to each state and event and represent the event transitions with a logical AND between the state and the even variables. After the transition, the next state is set and the previous state is reset. Problems like initialization and

many-to-one transitions are easily solved, but there are a number of more intricate problems.

1. Avalanche effect
2. Simultaneity of events
3. Choice
4. Inexact synchronization

### What Exact Problem is being Solved?

To model a Discrete Event System, in our case a Dynamic Power Flow Controller.

- to develop supervisors to the system using Supervisory Control Theory with a modular approach.
- to simulate the supervisors and the system to test proper functioning.
- automatic code generation for a PLC using ides2st software.
- to address some implementation problems of SCT and suggest solutions.

Our work mainly aims at proving that the complete automation of the SCT based controller design process is possible in the future.

### Users

Small Scale Industries,

Medium Scale industries, large scale industries where automation plants are installed.

### Expected Outcomes

The modeling of a DPFC using discrete event system approach is logical from the fact that the DPFC has a discrete switching nature. Solving the problem using conventional methods would have been confusing and difficult. The modular approach adopted resulted in supervisors with very less number of states making physical implementation possible.

The code generator will provide solutions to some of the problems like avalanche effect and inexact synchronization. The rising edge of signals was detected to avoid taking the signal into consideration in two consecutive scans even if the signal hadn't changed.

### Potential Impact

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

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### **Probable Discipline**

Electrical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH156

### Problem Statement

Development of automated, cost effective fire safety device for commercial/residential complex

### Name of Industry / Organisation

SWATI Engineering

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

automation system is very costly , Not applied in simple place like a class room, Also not awareness or any kind of knowledge for safety system to school level students as well as simple people. automation system is very costly , Not applied in simple place like a class room, Also not awareness or any kind of knowledge for safety system to school level students as well as simple people.

automation system is very costly , Not applied in simple place like a class room, Also not awareness or any kind of knowledge for safety system to school level students as well as simple people.

### What Exact Problem is being Solved?

Give an awareness for fire safety and make a cost effective automation system, it will prevent a dangerous events which was made in surat, Give an awareness for fire safety and make a cost effective automation system, it will prevent a dangerous events which was made in surat, Give an awareness for fire safety and make a cost effective automation system, it will prevent a dangerous events which was made in surat,

### Users

Normal people, students, parents, Working person, Normal people, students, parents, Working person, Normal people, students, parents, Working person, Normal people, students, parents, Working person, Normal people, students, parents, Working person

### Expected Outcomes

It will saves a life of innocent people and not make any kind of events like in surat, Because people life is so precious to us so make a system cost effective, and anybody can install in them place, It will saves a life of innocent people and not make any kind of events like in surat, Because people life is so precious to us so make a system cost effective, and anybody can install in them place,

### Potential Impact

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### Probable Discipline

Electrical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH157

### Problem Statement

To replace motor generator set used for double voltage-double frequency (dv-df) test in transformer testing by power electronics based converter.

### Name of Industry / Organisation

SYNERGY TRANSFORMERS PVT. LTD.

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

In transformer testing and manufacturing industries double voltage double frequency test is performed to measure and check insulation strength and temperature rise of transformer. To achieve this double voltage and double frequency conventionally motor generator set is used. These M-G sets are bulky, noisy and consumes more power hence inefficient. With the modern power electronics technology such M-G sets can be replaced by static converter.

### What Exact Problem is being Solved?

Conventional motor generator set used to produce double voltage and double frequency is to be replaced by static power electronic based converter. Hence saving in space, energy and noise reduction can be achieved. Such converter must be able to produce 830 voltage at the frequency of 100 Hz. Also the converter must be able to drive sufficient current that transformer may draw. Temperature rise of the converter need also be taken into account.

### Users

As explained above form such power electronics based converter could be improve the performance of the following industries.

Transformer testing industries

Transformer manufacturing industries

Technical Schools and colleges

### Expected Outcomes

Conventional motor generator set used to produce double voltage and double frequency is to be replaced by static power electronic based converter. Hence saving in space, energy and noise reduction can be achieved. Such converter must be able to produce 830 voltage at the frequency of 100 Hz. Also the converter must be able to drive sufficient current that transformer may draw. Temperature rise of the converter need also be taken into account.

### Potential Impact

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### Probable Discipline

Electrical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH158

### Problem Statement

Implementation of GSM based ON/OFF control of agricultural pump unit

### Name of Industry / Organisation

TECH SUN BIO

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

Irrigation system is critical in the development of agriculture of every country. It has been established that efficient irrigation processes have the potential of literally doubling the amount of food a farm processes.

Integrating modern technologies in irrigation management systems is one of the ways of enhancing the irrigation processes to optimize the use of water and electric power consumption.

The system however, depends on the timely application of the water pump operates via SMS.

### What Exact Problem is being Solved?

As we all know that India is an agriculture oriented country, now a day's our farmers are facing very difficulties in irrigating the land due to the lack of power supply or unable to get the required supply on-time. Required power supply to run the irrigation motor (3Phase) will get usually in night in villages, very hardly they get power in day time. So to turn on the motor someone has to go to the field and turn on. Keeping this in mind we came up with the concept called "Remote Water Pump Controller for Agriculture Using GSM". This can be used to turn ON and OFF the Motor Remotely.

### Users

There are so many applications for the proposed problem statement. Like say the farmers where they have a limited time of electricity, large scale organization. The system supports water management decision, which determines the controlling time for the process and monitoring the whole system through GSM module

### Expected Outcomes

After Developing this project, the user should not require to reach the location where the pump is installed. Individuals can also use this product to operate the water pump remotely. This system avoids over irrigation, under irrigation, top soil erosion and reduce the wastage of water. The main advantage is that the system's action can be changed according to the situation (crops, weather conditions, soil etc.). By implementing this system, agricultural, horticultural lands, parks, gardens, golf courses can be irrigated. Thus, this system is cheaper and efficient when compared to other type of automation system. In large scale applications, high sensitivity sensors can be implemented for large areas of agricultural lands. A stand by battery or solar cells can be implemented which comes into use in case of power cuts. A secondary pump can be used in case of failure of the pump.

### Potential Impact

Irrigation techniques in India are through the manual control in which the farmers irrigate the land at regular intervals. Manual operation of the routine practices in agriculture requires lot of attention and care. Also it is difficult to perform desired jobs efficiently and precisely

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## **Problem Statements**

Ultimately this may result in lower crop production, non-uniform growth and poor quality. The introduction of automation in irrigation system will result in increased application efficiency and drastically reduce labor requirement. The proposed system helps to monitor and control the irrigation system using a simple mobile phone. The automation includes distant control of motor operation using GSM

### **Probable Discipline**

Electrical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH159

### Problem Statement

Constant increasing legacy waste from daily usage. Around 35 TPD of waste (Dry/Wet Waste) is being generated in the city on average and there is already 25000 Tons of waste on Landfill site. Some of the organic waste is being processed in OWC (Organic was

### Name of Industry / Organisation

Valsad Nagarpalika

### Type Of Industry / Organisation

Public Entities (Boards/Corporations/Panchayat/Government Societies etc)

### Challenge Description with Context

There are major challenges of solid waste management in our cities/towns: (1) managing the continuous flow of solid waste on a daily basis, and (2) dealing with the legacy of neglect which has resulted in garbage heaps having been built up at dumpsites that were meant for waste processing and landfills (3) management of space is the biggest challenge, as aeration, stabilizing and screening mostly needs to be done within the boundaries of an already overloaded dumpsite.

### What Exact Problem is being Solved?

Legacy Waste has several ill-effects like generation of greenhouse gases, pollution of the entire ecosystem around the dump site, posing risk of uncontrollable fire, etc. Thus it is very critical to start working on clearing it today and ensuring that fresh waste is also handled accordingly. Corporation also needs to ensure that fresh waste generated in city is handled collected and processed separately.

For Dry Waste a Material Recovery Facility should be installed to recover maximum material for ensuring that our cities are Zero Waste to Landfill cities. Recyclable waste is sent to authorize recyclers and non-recyclable waste should be sent to hot mix plants for plastic roads or to P2F (Polymer to Fuel) plants or for co-processing to cement plants.

Wet waste should be processed to get compost/ bio-gas etc. Bio-medical waste, hazardous waste, e-waste, construction and debris waste, etc. should be sent to respective authorized disposal sites.

So I invite students to make some mechanism or system so waste should be separated during collected process. So that it could be sent directly according to its types and we achieve our goal of zero waste to landfill site.

### Users

General public, corporations, municipal corporations, Agencies, sanitary department, nagarpalika, citis/towns publics, hospitals...

General public, corporations, municipal corporations, General public

### Expected Outcomes

The people should be educated to realize the importance of source segregation at generation point as biodegradables, inert and recyclable material for proper waste management.

The waste should be treated as resource and formal recycling sector/industries be developed to recycle non-biodegradable recyclable component from the waste thereby providing employment to rag-pickers and absorb them in mainstream. Also a policy, fiscal intensive and development of quality standard for reuse and recycle of C&D waste be developed and notified so that producers dispose/reuse it as per guidelines, thereby reducing burden on

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landfill.

It is also very important to understand that to ensure that no such legacy waste is accumulated in future, all corporations should refrain from floating tenders for collection, handling, and processing of mixed waste.

### **Potential Impact**

corporations, municipal corporations should keep infrastructure required for collection, handling and processing different type of waste separately. There are various benefits attached to clearing dumpsites which need to be understood by corporation to speedily start work on it.

we achieve our goal of zero waste to landfill site and pollution free city/town (air, water, land).

### **Probable Discipline**

Electrical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH160

### Problem Statement

Diagnosis and prevention of faults in distribution transformers

### Name of Industry / Organisation

Vimal Electric Company

### Type Of Industry / Organisation

Small

### Challenge Description with Context

A distribution transformer or service transformer is a transformer that provides the final voltage transformation in the electric power distribution system, stepping down the voltage used in the distribution lines to the level used by the customer. [1] The invention of a practical efficient transformer made AC power distribution feasible; a system using distribution transformers was demonstrated as early as 1882.

If mounted on a utility pole, they are called pole-mount transformers. If the distribution lines are located at ground level or underground, distribution transformers are mounted on concrete pads and locked in steel cases, thus known as distribution tap pad-mount transformers.

Distribution transformers normally have ratings less than 200 kVA,[2] although some national standards can allow for units up to 5000 kVA to be described as distribution transformers. Since distribution transformers are energized for 24 hours a day (even when they don't carry any load), reducing iron losses has an important role in their design. As they usually don't operate at full load, they are designed to have maximum efficiency at lower loads. To have a better efficiency, voltage regulation in these transformers should be kept to a minimum. Hence they are designed to have small leakage reactance.

Distribution transformers are normally located at a service drop, where wires run from a utility pole or underground power lines to a customer's premises. They are often used for the power supply of facilities outside settlements, such as isolated houses, farmyards or pumping stations at voltages below 30 kV. Another application is the power supply of the overhead wire of railways electrified with AC. In this case single phase distribution transformers are used.[4]

The number of customers fed by a single distribution transformer varies depending on the number of customers in an area. Several homes may be fed off a single transformer in urban areas; rural distribution may require one transformer per customer. A large commercial or industrial complex will have multiple distribution transformers. In urban areas and neighborhoods where the primary distribution lines run underground, padmount transformers, transformers in locked metal enclosures mounted on a concreted pad, are used. Many large buildings have electric service provided at primary distribution voltage. These buildings have customer-owned transformers in the basement for step-down purposes.[4]

Distribution transformers are also found in the power collector networks of wind farms, where they step up power from each wind turbine to connect to a substation that may be several miles (kilometres) distant.[5]

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## Problem Statements

Considering the above context, the major challenges to prevent the fault in LV and HV winding damage and shortage of oil in transformer.

### What Exact Problem is being Solved?

Faults may occur in different parts and components of the transformer due to mechanical, electrical or thermal stress caused due to different conditions. Some of the most commonly occurring failures of the transformer and their causes are listed below.

#### 1. Winding failure

Windings are an important part of a transformer. In distribution side transformers there are commonly two windings. One on the primary side and the second on the secondary side. High voltage/low current flows in the primary side winding and through electromagnetic induction voltage is stepped down and current stepped up in the secondary side winding. These windings withstand dielectric, thermal and mechanical stress during this process. The faults that occur in the winding are due to these stresses. This causes the breaking of the windings or the burn-out. The winding fault PN number is usually between 6 to 30. A. Dielectric faults occur in the winding due to turn-to-turn insulation breakdown. These are the insulation between the turns of the winding. Insulation breakdown commonly occur due to high current and voltage which are high above the rated values. The breakdown of the insulation results in the flashover of the winding turns and cause short circuit. Two reasons for the high rating are

- i. Lightning impulse attack with no lightning arresters
- ii. Fault voltages

B. The windings are usually of copper. Due to the copper line resistance thermal losses occur. These thermal losses make hotspots in the winding due to bad or lack of maintenance. This over time causes wear and tear and the decrease of the physical strength up to the point of breaking of the winding. C. Mechanical faults are the distortion, loosening or displacement of the windings. This results in the decrease of the performance of the transformer and the tearing of the turn-to-turn ratio. The main reasons that cause this fault are the improper repair, bad maintenance, corrosion, manufacturing deficiencies, vibration and mechanical movement within the transformer.

#### 2. Bushing Failure

Bushes are insulating devices that insulate a high voltage electrical conductor to pass through an earth conductor. In

transformers it provides a current path through the tank wall. Inside the transformer paper insulators are used which are surrounded by oil that provides further insulation. Bushing failure usually occurs over time. Bushes failure PN number is between 24 to 48. Some of the main reasons for bushing failure are discussed below.

A. Loosening of conductors is caused by transformer vibrations which results in overheating. This heat damage

the insulating paper and the oil used.

B. Sudden high fault voltages causes partial discharge (breakdown of solid/liquid electrical insulators) which

damage the bushes and causes its degeneration and complete breakdown within hours.

C. Seal breaking of bushes happen due to ingress of water, aging or excessive dielectric losses. Due to this fault core failure of the transformer occurs.

D. Not replacing of old oil over long time or its deficiency due to leakage causes internal over-flashing.

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## Problem Statements

C. Old capacitors or burned-out capacitor in the motor causes the tap changer to fail to control its direction movement.

D. Regular use of the tap changer causes the spring in it to slowly become fragile over time and then finally break.

Because of this the tap changer is not able to change the turn ratio of the winding.

E. Breakdown of the motor in the tap changer because of over voltage or miss-use also causes the tap changer to fail to change the turn ratio of the winding.

### 4. Core failure

The transformers have laminated steel cores in the middle surrounded by the transformer windings. The function of the core is to concentrate the magnetic flux. Fault in the core directly affect the transformer windings, causing faults in them. The cores of the transformers are laminated to reduce eddy-current. The lamination of the core can become defected by poor maintenance, old oil or corrosion. The breakdown of the smallest part of the lamination results in increase of thermal heat due to eddy-current. The effects of this over heating are

A. The over-heating reaches the core surface which is in direct contact with the windings. As a result of this the windings are damaged by the heat.

B. This heat also damages the oil in the transformers resulting in the release of a gas from the oil that damages other

parts of the transformer. The PN number of the core failure is often 6.

### 5. Tank Failures

The function of the tank in the transformer is to be a container for the oil used in it. The oil in the tank is used for insulation and cooling. The tank can also be used as a support for other equipments of the transformer [8]. The PN number for the failure is 18. The fault in the tank occurs due to environmental stress, corrosion, high humidity and sun radiation resulting in leakage or cracks in the tank walls. From these leakages and cracks oil spill from the tank causing the reduction of oil.

A. The reduction in oil level results in the reduction of insulation in the transformer and affecting the windings.

B. The oil is also used for cooling purposes so the reduction of oil causes over-heating with damages different parts of the transformer.

### 6. Protection system Failure

The main function of the protection system is to protect the transformer from faults by first detecting the fault and then resolving it as fast as possible. If it cannot fix the fault, it isolates it so that it may not damage the transformer.

Protection systems include the Buchholz protection, pressure relief valve circuitry, surge protection and Sudden

Pressure Relays. This is the most occurring failure with a PN between 22 to 64.

A. Buchholz protection is a protective device that is sensitive to dielectric faults in the transformer. Overheating

of the relay occurs because of accumulation of gasses over time, which reduces its sensitivity to dielectric faults. Low level oil due to leakage causes the Buchholz protection to come into action even if there is not a fault which is not needed and waste of energy.

B. Pressure relief valve circuitry protects the transformer from exploding due to gas pressure. The gas pressure is

produced due to overheating of oil. Pressure relief valve circuitry slowly reduces the

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pressure of the gasses. Fault in this circuitry mainly occurs due to the spring init becoming fragile over time resulting in the circuitry not being able to reduce pressure quickly. This circuitry also fails when gas pressure increases quickly as this is only able to release pressure slowly.

C. Surge protector protects the transformer from over voltage by allowing specific magnitude of voltage to go to

transformer and for the rest alternate route is found. Failure in surge protection causes high voltage to pass to the windings which becomes damaged because of it . Moisture, heat and corrosion are the main reasons of the failure of surge protection as it causes overheating and short circuit in it.

D. Sudden Pressure Relays protects the transformers from blowing up from sudden exponential increase of gas pressure

[9]. If it fails to release the sudden pressure the transformer blows up. Relay fails due to humidity and moisture affecting its internal circuitry.

### 7. Cooling system failure

Cooling system reduces the heat produced in transformers due to copper and iron losses. The cooling system contains cooling fans, oil pumps and water-cooled heat exchangers. The failure in the cooling system causes the heat to build up in the transformer which effect different parts of the transformer and also causes more gas pressure to be built inside which may cause the transformer to blow. The PN is between 26 to 48. Some of the main reasons for failure are discussed below.

A. One of the biggest reasons of cooling system failure is leak in the oil/water pipes. This causes the reduction in the fluids which results in low heat exchange which is not good for the transformer. Leakage happens because of environmental stress, corrosion, high humidity and sun radiation.

B. Some failure occurs due to fault in the cooling fans which rush-in cool air into the tanks for cooling purpose. The fans create faults because of poor maintenance, over use or motor wear-out. Cooling system can perform wrong due to bad thermostats which measure the heat in the transformer. Faulty thermostats show wrong temperature causing the cooling system to operate accordingly and not in the way needed

### 3. Tap Changer Failure

The tap changer function in the transformer is to regulate the voltage level. This is done by either adding or removing turns from the secondary transformer winding. It is the most complex part of the transformer and also an important one. Even the smallest fault results in the wrong power output . The PN number is usually between 28 to 52. Some fault and causes are

A. In Run-Through fault the tap changer takes time and after a delay changes the turn ratio. The main reason for it is the relay responsible for the tap change has residue flux because of polluted oil, therefore taking time to change. The other reason for run-through fault is the spring becoming fragile over time.

B. Lack of maintenance causes the shaft connection between the tap and the motor driver of the tap changer to be not synchronous. Because of this the tap changer is not in the position where it needs to be.

## Users

Distribution transformers are normally located at a service drop, where wires run from a

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utility pole or underground power lines to a customer's premises. They are often used for the power supply of facilities outside settlements, such as isolated houses, farmyards or pumping stations at voltages below 30 kV. Another application is the power supply of the overhead wire of railways electrified with AC. In this case single phase distribution transformers are used.

The number of customers fed by a single distribution transformer varies depending on the number of customers in an area. Several homes may be fed off a single transformer in urban areas; rural distribution may require one transformer per customer. A large commercial or industrial complex will have multiple distribution transformers. In urban areas and neighborhoods where the primary distribution lines run underground, pad mount transformers in locked metal enclosures mounted on a concreted pad, are used. Many large buildings have electric service provided at primary distribution voltage. These buildings have customer-owned transformers in the basement for step-down purposes.

Distribution transformers are also found in the power collector networks of wind farms, where they step up power from each wind turbine to connect to a substation that may be several miles (kilometers) distant.

Summarily, we can state that every customers including domestic, industrial, agricultural and commercial are fed by the distribution transformers.

## Expected Outcomes

Web can find out various troubles and its cause and how to resolve it.

### 1. Winding failure:

Cause: Lightening, Short circuit, overload, Oil of low, dielectric strength, Foreign Material, Core insulation, break down,(Core, bolts, clamps, or between lamination)

Remedy: Usually, when a transformer winding fails, it is automatically disconnected from the power source by opening of the circuit breaker or fuse. Smoke or cooling liquid may be expelled from the core, accompanied by noise.

When there is any such evidence of a winding failure, the transformer should not be re energized at full rated voltage because this might result in additional internal damage. Also it would introduce a fire hazard in transformers. After disconnection from both source and load, the following observations and tests are recommended:

- External mechanical or electrical damage to bushing, leads, both heads, disconnection switches, or other accessories.
- Level of insulating liquid in all compartments.
- Temperature of insulating liquid wherever it can be measured. Winding failure
- Evidence of leakage of insulating liquid or sealing compound.

### 2. Bushing flashover

Cause: Lightening, Dirty bushings

Remedy : Provide adequate lightening Protection. Clean bushing porcelains, frequency depending on dirt accumulation.

### 3. High temperature

Cause: Over voltage, Over current, short circuited core, Highe ambient temperature, Improper cooling, Lowering oil level, sludge oil.

Remedy: Change the circuit voltage or transformer connections to avoid over excitation. If possible, reduce load. Heating can often be reduced by improving power factor of load. Check parallel circuits for circulating currents which maybe caused by improper ratios or

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## Problem Statements

impedances. Either improve ventilation or relocate transformer in lower ambient temperature. If unit is artificially cooled, make sure cooling is inadequate. Fill to proper level. Use filter press to wash off core and coils. Filter oil to remove sludge. Test for exciting current and no load loss. If high, inspect core and repair.

### 4. Leakage at gasket

Cause: Poor scarfed joints Insufficient or uneven Compression Improper preparation of gaskets and gasket surfaces.

Remedy: Make tight screw joints or gasket joints.

### 5. Leakage in welds

Cause: Shipping strains, imperfect weld

Remedy :Repair leaks in welds.

### 6. Pressure relief diaphragm cracked

Cause: Improper assembly. Mechanical damage

Remedy: Replace diaphragm. Inspect inside of pipe for evidence of rust or moisture. Be sure to

dry out transformer if there is a chance that drops of water may have settled directly on windings or other vulnerable locations, as oil test may not always reveal presence of free water.

### 7. Leakage through screw joints

Cause: Foreign material in threads Oval nipples Poor threads Improper filler Improper assembly Remedy: Make tight screw joints or gasket joints

## Potential Impact

The transformers are electrical devices used for energy transfer by electromagnetic induction between two or more circuits. Like all electrical devices faults also happen in the transformers which cause failures. One failure can cause many problems. A simple fault at the distributing end can cause black-out of power to the whole area. The fault can also be very dangerous as the transformers contain large quantity of oil in direct contact with high voltage components. This increases the risk of fire and explosions due to failures. Different faults are caused by different reasons, which all have different impacts on the power system. In this study some of the most commonly occurring failures are discussed with their causes and impacts. This important process of stepping-up and stepping-down of voltage and current is done by Transformers present at both ends of the power transmission and distribution.

To avoid major line losses in power transmission over long distances the voltage is step-up to 11kv and the current is stepdown as the power is transmitted to different parts of the country by long transmission lines.

The losses are mathematically represented by :

$$\text{Losses} = I.I.R \text{ (1)}$$

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Where  $I$  is current and  $R$  is the resistance. Longer the transmission-line more is the resistance.

For this reason the voltage is kept high and the current is kept low. After power reaches its destination through the transmission lines, the voltage is step-down from 11kv to 220v and the current is step-up [13]. It is then distributed to the consumer.

The transformers are one of the most expensive components in this network which makes it another reason for being very important. As an important component the study of the faults and failures of the transformer is also very important.

The distribution transformers are installed in every feeder to feed the customers. Now if we prevent /minimize the occurrence of faults in distribution transformer, the revenue loss in terms of money to be paid to repairer is minimum which ultimately benefited to distribution company. This repairing cost is levied from the customer by increasing the electricity tariff to customers. Hence if we decrease the maintenance cost of distribution transformer, the main benefit is that the tariff will not be increased up to mark level. The another impact is that when any transformer becomes faulty it has to keep out from the service and hence utility has to replace with healthy one. So reserve requirement of distribution transformer is high. Now if our distribution transformer experience minimal fault then the reserve requirement of distribution transformer is less and also continuity of supply is maintained.

In conclusion, we can say that by proper maintenance and regular checking of distribution transformers we can prevent the occurrence of faults.

### **Probable Discipline**

Electrical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH161

### Problem Statement

In the past decades, most of researches have focused in finding renewable energy resources which is environmental friendly and reduce the full dependency on the fossil fuel resources which is the main factor for global warming and environmental pollution.

### Name of Industry / Organisation

Virnit Automation

### Type Of Industry / Organisation

Small

### Challenge Description with Context

using conventional two level inverters for low as well as high power applications following are the challenges:

- 1) Number of output voltage level depends on number of DC sources,
- 2) Complex switching problem,
- 3) Increased conductive losses,
- 4) capacitor imbalance is very likely to occur,
- 5) only show in high frequency output voltage,
- 6) use of separate dc source

### What Exact Problem is being Solved?

- 1) High electrical stress on individual device.

Due to high voltage appear across individual devices like SCR, IGBT, GTO, MOSFET etc., in high voltage application. Voltage stress across it is very high in case of non-conducting state in high voltage application.

- 2) High Total Harmonic Distortion (THD).

At the time of switching of semiconductor devices, change in voltage level is comparatively high so large no. of harmonics are generated. Hence, total harmonic distortion is very high.

- 3) Radio interfacing.

Due to generation of large no. of harmonics and switching action take place at high voltage and high current electromagnetic noise produce which interact with radio signal. Hence, radio interface take place.

- 4) Large, costly and complex filter circuit is required.

All electrical device are designed to operate on pure sinusoidal or nearer to sinusoidal supply, but due to harmonics voltage and current waveform is distorted and to get approximate pure sine wave large filter is required.

- 5) High cost of switching device.

Due to high voltage appear across individual devices to withstand it the rating of devices should be high and due to high power rating the cost of device is high.

### Users

Small scale industries, medium scale industries, Large scale industries which requires the efficient and wide range of speed control of electrical motors, Industries or institute or any body who uses solar power plant. i.e. conversion of dc to ac.

### Expected Outcomes

- 1) In cascaded multilevel inverter more than one device is connected in series across the voltage source so total voltage is divided across all devices connected in series. Hence
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## Problem Statements

voltage appear across any individual device is reduce so electrical stress on devices also reduce.

2) In cascaded multilevel inverter voltage appear across switching devices is less so change in voltage level also less, hence less harmonics are generated during switching action.

3) In cascaded multilevel inverter comparatively low voltage and current is chopped so generated electromagnetic noise is low, hence radio interference is low.

4) The THD in output of multilevel inverter is low and power quality is good so filter requirement is reduced. Hence simple and small filter circuit is sufficient to supply voltage or current of approximate pure sine wave.

5) Due to low voltage appears across individual device, rating of device is reduced so cost of switching device is somewhat reduce.

### Potential Impact

the complexity of circuitry of multilevel inverter will increase with increase in output-level of inverter. Also the THD will reduce as number of step or level increase in output waveform. As there is low THD in output wave form means low harmonic distortion in output, hence the various losses occur in inverter as well as load is reduced so we can get high efficiency. Using Amplitude Modulation it is possible to use different semiconductor switches for each bridge according to power requirement and frequency of switching. Hence, it is most economical technique than other technique.

### Probable Discipline

Electrical Engineering

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## Problem Statements

### Problem ID

SGH162

### Problem Statement

Assistance Kit for Traffic Controller

### Name of Industry / Organisation

EXULT ENTERPRISE

### Type Of Industry / Organisation

MSME

### Challenge Description with Context

Assistance Kit for Traffic Controller which can help the traffic controller performing his/her duty on road 365\*24. The kit will protect them from severe sun stroke and rain with a portable umbrella, a water sprinkler attached with it for temperature & moisture control in sunny days. The Kit will be loaded with portable camera, Bluetooth, FM radio, Laser light beam etc. to enhance the performance of a traffic controller of a smart city.

We have contacted number of traffic wardens and traffic controller staff via our students to indentify the difficulties they are facing in performing their duties in advert atmospheric situations. They are suffering a lot specially in summer and in monsoon situations during sunny and rainy days. They have to perform their duties on road under the open sky with only a stick and helmet. If they are equipped with the portable kit which gives them mobile shelter as well technical assistance in all situations.

### What Exact Problem is being Solved?

Situational difficulties of a traffic controller in performing their duties in all weather conditions. As they are performing their duties in all weather situations 365days and 24 hours. They are suffering a lot specially in summer and in monsoon situations during sunny and rainy days. They have to perform their duties on road under the open sky with only a stick and helmet. If they are equipped with the portable kit which gives them mobile shelter as well technical assistance in all situations.

### Users

It can be used by all traffic controller staff of any state. it can used by the any of the persons who are performing their duties under open sky i.e. in field jobs and they can not leave their predefined positions.

### Expected Outcomes

Enhancement in performing duty during typical atmospheric situations. It also helps in proving the comfortable working environment to the field staff all departments such as traffic control department. It can results in the improved health of the staff of traffic department. By using this portable kit the traffic wardens can improve their duties in field in all manners. Specially in advert situations traffic controller can record the unexpected situations by using the cameras in this kit.

### Potential Impact

It can help the traffic controllers during their duties in odd locations as well Improved health of them. Enhancement in performing duty during typical atmospheric situations. It also helps in proving the comfortable working environment to the field staff all departments such as traffic control department. It can results in the improved health of the staff of traffic department. By using this portable kit the traffic wardens can improve their duties in field in all manners.

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### **Probable Discipline**

Electrical Engineering, Electronics and Communication

# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH163

### Problem Statement

Increase in the population itself increases the demand of electricity generation and supply. Many issues are faced by people due to several types of failures in electricity generation and distribution. It also requires a large infrastructural setup for po

### Name of Industry / Organisation

Greenfield Control System Pvt. Ltd.

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

Challenge is to develop the setup generate the adequate electricity through the footfall of people in a street. Conversion will be done from their kinetic energy generated by the movement into the electricity. After an successful execution of proper set-up, the next challenge is to work at the cost factor so that government departments can easily adopt the proposed solution. Work will be done to imprvovize the existing setup in order to generate more electricity after initial implementation of the setup to finalize the improved one.

### What Exact Problem is being Solved?

The main purpose is to develop eco friendly solution and infrastructural setup as a street lightening solution. It can be adopted by government and people in a wide manner after the succesful completion of the project. It will also have another advantages that such kind of power generation will reduce carbon emission, power losses in distribution. It will be more fruitful in larger crowded cities. More crowd will generate more electricity.

### Users

It can be implemented in crowdy streets, market places and into the shopping malls or all those places where average footfall is large in quantity. After successful implementation model can be adopted by Municipal Corporations, Mall owners and Private Firms. It will be directly beneficial to the common public.

### Expected Outcomes

A live model which show the genration of electricity through the footfall of the public and that electrcity is used to enlighten the lights. To provide a smart and cost effective solution for the electricity generation. This will require less man power to manage the infrastructure, it will directly generate the direct current so that the power generated can directly be used to enlighten the street lights.

### Potential Impact

It will reduce mainly a setup required in form of large infrastructure for electricity generation. It will be beneficial to municipal corporations and the people by adopting cost effective and eco friendly approach of power generation. In crowded malls this system can be implemented to generate energy when people are coming in it in a good quantity and then stored electricity will be used for power supply anytime. It will decline our electricity requirement from the traditional sources. It will also preserve the environment losses in several terms.

### Probable Discipline

Electrical Engineering, Electronics and Communication

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH164

### Problem Statement

in industry due to high power switching equipments like controlled rectifier , inverters, dual converters power quality decreases. All these equipments are source of harmonics. it ultimately make power factor poor.

it is require to design low harmonic

### Name of Industry / Organisation

Sahiba limited

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

Vienna rectifier is a kind of power converter with complicated operating constraints. Thus, it is difficult to control with conventional control strategies, especially during transients or under low power factor operation. This study proposes a hybrid control scheme with dual loops for the three-phase Vienna rectifier. In the outer loop, proportional-integral controller is designed to regulate the dc-link voltage and input reactive power. And in the inner loop, finite set model predictive control is utilized to control the input currents and maintain the neutral point voltage balance. To reduce the costs, an extended state observer is introduced to estimate the load current.

### What Exact Problem is being Solved?

minimization of current harmonic and improve power factor for balance -unbalance load condition.

Vienna rectifier is a kind of power converter with complicated operating constraints. Thus, it is difficult to control with conventional control strategies, especially during transients or under low power factor operation. This study proposes a hybrid control scheme with dual loops for the three-phase Vienna rectifier. In the outer loop, proportional-integral controller is designed to regulate the dc-link voltage and input reactive power. And in the inner loop, finite set model predictive control is utilized to control the input currents and maintain the neutral point voltage balance. To reduce the costs, an extended state observer is introduced to estimate the load current.

### Users

any power electronics company, electric vehicle charging station, telecommunication,oil, iron ore, timber, fish. Mining, quarrying, Involve the manufacture of raw materials, into another product by manual labour or machines

### Expected Outcomes

improved power quality.

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

Since electrical energy is the beating heart of industry, commerce and development, maintaining a quality status in the flow of electricity is vital. ... To that extent, to improve the quality of electrical energy, it is important to have an adequate understanding of its common problems.

1) good dynamic performance; 2) wide operating range and enhanced input reactive power capability; 3) lower computational burden; and 4) without the need of modulation method. The correctness and effectiveness of the proposed control scheme are verified by the simulation and experiment results.

### Potential Impact

best.

Harmonic frequencies in the power grid are a frequent cause of power quality problems. Harmonics in power systems result in increased heating in the equipment and conductors, misfiring in variable speed drives, and torque pulsations in motors.

Harmonics are caused by non-linear loads, that is loads that draw a non- sinusoidal current from a sinusoidal voltage source. Some examples of harmonic producing loads are electric arc furnaces, static VAR compensators, inverters, DC converters, switch-mode power supplies, and AC or DC motor drives.

all these problem by suitable circuit

### Probable Discipline

Electrical Engineering, Electronics and Communication

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH165

### Problem Statement

Development of a model for sensing of drainage water quality and recycling for miscellaneous household applications

### Name of Industry / Organisation

Shaktikrupa Automation

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Water Separation with effective Recycling Distribution System

For Domestic Use.

Water Recycling Drained water in residential use, water should be categorized in terms of quality by sensors & system. Then, divert it to the storage tanks & to the use of dedicated water. By means of these drained wastage water can be used in proper manner. hence save water caption will be proved in perfect manner.

These will be used in society for giving a new way to save nature (water).

### What Exact Problem is being Solved?

Water Separation with effective Recycling Distribution System

For Domestic Use.

Water Recycling Drained water in residential use, water should be categorized in terms of quality by sensors & system. Then, divert it to the storage tanks & to the use of dedicated water. By means of these drained wastage water can be used in proper manner. hence save water caption will be proved in perfect manner.

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### Users

Drained water in residential use, water should be categorized in terms of quality by sensors & system. Then, divert it to the storage tanks & to the use of dedicated water. By means of these drained wastage water can be used in proper manner. hence save water caption will be proved in perfect manner.

### Expected Outcomes

Water Recycling Drained water in residential use, water should be categorized in terms of quality by sensors & system. Then, divert it to the storage tanks & to the use of dedicated water. By means of these drained wastage water can be used in proper manner. hence save water caption will be proved in perfect manner.

These will be used in society for giving a new way to save nature (water).

### Potential Impact

Water Recycling Drained water in residential use, water should be categorized in terms of quality by sensors & system. Then, divert it to the storage tanks & to the use of dedicated water. By means of these drained wastage water can be used in proper manner. hence save water caption will be proved in perfect manner.

These will be used in society for giving a new way to save nature (water).

### Probable Discipline

Electrical Engineering, Electronics and Communication, Field Instruments

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH166

### Problem Statement

Develop an IoT enabled solution with Android application to give real-time parking space available on the Campus / City / Resident Societies

### Name of Industry / Organisation

A to Z INFOWAY LLP

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

The above mentioned will be applicable to those vehicles that have already registered in to the system and used the navigating system. But we also need to consider those vehicles which have not registered and are manually finding parking space and heading towards the same parking slot. Can you solve this problem? Develop a smart efficient application system to solve the problem related to real-time parking space.

### What Exact Problem is being Solved?

Whenever a person wants to find a parking space on the campus, he has already registered to the application using his user id and password. When he finds for the parking space, the server will send a response with the available parking details, real-time mapped directions and real-time parking space to allocate parking according to the size of the vehicle. The application would be smart enough to identify whether the car is heading towards the same parking space or not. If not, the application would re-route the same car to another nearest available parking space.

### Users

Public and Private residential sectors,  
Municipal corporation,  
Malls,  
Smart city solution

### Expected Outcomes

To reduce unnecessary chaos and traffic in the college campus,  
city, societies.

### Potential Impact

Managed parking system

Reduces terrific traffic problems

Keep data of users

### Probable Discipline

Electronics and Communication

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH167

### Problem Statement

Smart Street Light System (Monitoring, Maintenance) using IoT, Computer Vision and Machine Learning

### Name of Industry / Organisation

A to Z INFOWAY LLP

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

The system should have a smart light dimming module, which will use the following approaches: The first is based on visibility i.e. if the visibility is low, the intensity of light should be maximized. The second approach is to dim the light for the streets automatically when no movement is detected and it will automatically increase the intensity of light.

How does it detect movement in the rainy season?

### What Exact Problem is being Solved?

The system keeps a record of all the street lights such as the name of the area, pin code, number of light poles and number of poles which are in working conditions and it will store that information to the database.

The system will also found the faulty bulbs and sends the notification to the department to replace them.

### Users

Public and Private residential sectors,

Municipal corporation, Smart city solution

### Expected Outcomes

To save electricity and maintain all the bulbs and repair/replace it in case of faulty.

### Potential Impact

Managed street lights

Save huge amount of electricity

Enjoy effort free street light solution by predictive maintenance

### Probable Discipline

Electronics and Communication

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH168

### Problem Statement

Low Powered Battery Operated Data Logger

### Name of Industry / Organisation

Aarohi Embedded Systems Pvt. Ltd.

### Type Of Industry / Organisation

MSME

### Challenge Description with Context

The main challenge is to make a low powered data logger with IoT facility which can work on the battery backup minimum of around 4-5 years. It should be capable of sensing any physical quantity either analog or digital i.e. It should be universal in nature. Also should be having facility of storing data over cloud so that we can access it from anywhere in the world using internet facility. The wireless connectivity is desired using mobile communication.

### What Exact Problem is being Solved?

There is a vast requirement of data logging of various quantities in the field. But the fact is data loggers can only work when they are fed with electricity. Now there are many areas in the world where there is no electricity available or available for so much lesser time. At these kinds of places like desert, mines, under sea etc, if we want to have data logging of some quantities for then it becomes more difficult to arrange for the electricity. Another issue in those environmental conditions is to have recording and storage of the data acquired.

### Users

This product will be useful to many of the users like Scientists and Researchers, Weather forecasters, Miners etc who are always being in the need of logging of different parameters for different applications.

### Expected Outcomes

The minimum expected outcomes from the data logger solution are as follows:

It must be having wireless mobile connectivity with cloud.

It must be having battery backup of up to 4-5 years.

It must be light weighted and portable.

There should be one web service defined for this for the data logging on the cloud and access from it.

Also if possible there should be one android application which can show the data in mobiles.

### Potential Impact

This will facilitate scientist, researchers, forecasters etc to have data logging of their requirement in any condition and to have exact analysis of the data without putting anyone's life in danger. This will be having a larger market acceptance as this will be a generalized product which can be used in many industries as well as different domains of applications. Also it will be a advancement in the domain of IoT.

### Probable Discipline

Electronics and Communication

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH169

### Problem Statement

Bts battery health monitoring system

### Name of Industry / Organisation

Bharat Sanchar Nigam Limited

### Type Of Industry / Organisation

PSU

### Challenge Description with Context

Currently, bsnl bts runs on dc voltage. For that, they depend on battery backup. This battery degrades with time and eventually fails to provide enough battery backup to the system. During power outage. In addition to this, the above mentioned problem leads to sudden shutdown of other equipments in bts. This sudden unsafe shutdown leads to degradation of equipments life of all the equipments of bts.

### What Exact Problem is being Solved?

Central battery health monitoring system, as proposed here will solve all the above issues. This will help us to get battery health of all the btss under given bsc. This kind of central monitoring at bsc will help us replace poor health batteries on time. In addition to this, the above mentioned solution avoids sudden shutdown of other equipments in bts. We can provide safe shutdown in poor battery condition. Safe shutdown helps in avoiding degradation of equipments life of bts equipment.

### Users

BSNL Technical Staff (ttas & jtos), All Telecom Users. All General Public, All BSNL Workers, All other Telecom Sector Companies may also adopt the same Solution to benefit from the same. Whole Telecom Sector in General.

### Expected Outcomes

Proper Management of Battery backups at BTS will lead to improved Maintenance of BTS and hence proper Network Coverage. This kind of central monitoring at bsc will help us replace poor health batteries on time. In addition to this, the above mentioned solution avoids sudden shutdown of other equipments in bts. We can provide safe shutdown in poor battery condition. Safe shutdown helps in avoiding degradation of equipments life of bts equipment.

### Potential Impact

Impact on Telecom Staff and General Public. Proper Management of Battery backups at BTS will lead to improved Maintenance of BTS and hence proper Network Coverage. This kind of central monitoring at bsc will help us replace poor health batteries on time. In addition to this, the above mentioned solution avoids sudden shutdown of other equipments in bts. We can provide safe shutdown in poor battery condition.

### Probable Discipline

Electronics and Communication

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH170

### Problem Statement

Enhancing the Night Mode videos in surveillance system to improve identification of recorded objects.

### Name of Industry / Organisation

eInfochip

### Type Of Industry / Organisation

Corporate

### Challenge Description with Context

Computer vision based approach to convert surveillance camera's night time images to daytime.

Dataset : Dataset : Student can use any surveillance camera video/images

Computer vision based approach to convert surveillance camera's night time images to daytime.

Dataset : Dataset : Student can use any surveillance camera video/images

Computer vision based approach to convert surveillance camera's night time images to daytime.

Dataset : Dataset : Student can use any surveillance camera video/images

### What Exact Problem is being Solved?

This will create night vision mode to become day vision mode. Videos recorded over night will be seen as if it is day. This helps in many identification in crime, incidents in more details.

This will create night vision mode to become day vision mode. Videos recorded over night will be seen as if it is day. This helps in many identification in crime, incidents in more details.

This will create night vision mode to become day vision mode. Videos recorded over night will be seen as if it is day. This helps in many identification in crime, incidents in more details.

### Users

Crime, Defence, Govt, Malls.

### Expected Outcomes

Algorithm to go in to security systems.

### Potential Impact

Algorithm from India in to new application and wide applications

### Probable Discipline

Electronics and Communication

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH171

### Problem Statement

Noise reduction from Image for camera

### Name of Industry / Organisation

eInfochip

### Type Of Industry / Organisation

Corporate

### Challenge Description with Context

1.) Computer vision based program to remove various ambient (glare, under and over exposure and other noise) noise from surveillance camera.

Dataset : Student can use any surveillance camera video/images.

Refer following image : It is of under exposed and over exposed image

Note :

For all the above-mentioned problems, processing can be offline on server / cloud. Processing time is not the constrain, i.e. it can be non-real time system.

Quality and technique to overcome above-mentioned three problems statement will be considered for ranking.

### What Exact Problem is being Solved?

Removing noise from photo/video,

Note :

For all the above-mentioned problems, processing can be offline on server / cloud. Processing time is not the constrain, i.e. it can be non-real time system.

Quality and technique to overcome above-mentioned three problems statement will be considered for ranking.

### Users

Crime, Defence, Govt, Malls

### Expected Outcomes

Algorithm to go into security systems.

### Potential Impact

Algorithm from India in to new application and wide applications..

### Probable Discipline

Electronics and Communication

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH172

### Problem Statement

Video analytics for identifying cracks, anomalies through video and giving detailed feedback

### Name of Industry / Organisation

eInfochip

### Type Of Industry / Organisation

Corporate

### Challenge Description with Context

1.) Computer vision based techniques to detect cracks, swelling in Machine Parts.

Refer following image : It is a machine part with crack. The purpose of this program would be to detect cracks and such kind of anomalies that are captured by using inspection cameras.

Dataset and Test Images : Students can either generate the dataset or use readymade dataset from internet.

### What Exact Problem is being Solved?

Making video analytics more user useful but to identify risks. Create risk list and give as inputs to Video and it will identify. Examples of risks are Cracks, Cattle loss, Earth quake.

Dataset and Test Images : Students can either generate the dataset or use readymade dataset from internet.

### Users

Govt organizations,

### Expected Outcomes

Algorithm to go into security systems.

### Potential Impact

Algorithm from India in to new application and wide applications..

### Probable Discipline

Electronics and Communication

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH173

### Problem Statement

Intelligent War Fare/ Defence2.0

Create low cost Mobile jammer/Mass creater

Protocol for Multiple Drone in sky

Soldier detectors/enemy detectors

### Name of Industry / Organisation

eInfochip

### Type Of Industry / Organisation

Corporate

### Challenge Description with Context

Intelligent War Fare/Defence2.0

1. Create low cost Mobile jammer/Mass creater
2. Protocol for Multiple Drone in sky
3. Soldier detectors/enemy detectors

### What Exact Problem is being Solved?

1. Create low cost mobile jammer for key applications and smaller areas
- 2 . Intercommunication between Drones
2. Detect soldier from where fire has occurred.

### Users

Govt

### Expected Outcomes

Security devices

### Potential Impact

India can innovate new security devices

### Probable Discipline

Electronics and Communication

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH174

### Problem Statement

Automation in Physical Chip Design through Machine Learning

### Name of Industry / Organisation

eInfochip

### Type Of Industry / Organisation

Corporate

### Challenge Description with Context

Physical chip design is a step in the standard design cycle which follows after the circuit design. In Physical chip design, circuit representations of the components (devices and interconnects) of the design are converted into geometric representations of shapes. Physical chip design will ensure the required functioning of components when manufactured in the corresponding layers of materials. Physical chip design step is usually split into several sub-steps, which include both design and verification and validation of the layout. Chip designing involves lots of analysis and time consuming to debug violations as complexity of design is very high. Developing ML software system which automatically understand issue at each stage of designing. It will auto start other experiments based on machine understanding.

### What Exact Problem is being Solved?

Semiconductor and electronics companies face severe product schedule and other competitive pressures. Time consuming physical design process is biggest lacuna to produce solution in given time limit. Since nanometer VLSI design and manufacturing have extremely high complexity and gigantic data, machine learning algorithms are useful. Use of machine learning algorithms will automate complex chip designing procedure as chip designing involves lots of analysis and it is time consuming process. Developing machine learning software system which automatically understand issue at each stage of designing. It will auto start other experiments based on machine understanding.

### Users

VLSI and Embedded System Design Industries. Applications developed using VLSI technology and embedded systems.

### Expected Outcomes

Fast physical chip design due to machine learning algorithm

Students will learn application of machine learning algorithms to solve this real life issue of Physical Chip Design by tacking part in this Smart Gujarat for New India Hackathon and will also solve our problem Since modern VLSI circuits have billions of transistors/interconnects, machine learning algorithms will provide reasonably good abstraction and quality-of-result.

### Potential Impact

Major semiconductor industry crises is tools, people, time and risk. Trade off is cost and quality of design. Semiconductor and electronics companies are facing severe product schedule and other competitive pressures. Development of machine learning algorithm for faster physical chip design will relax them and will provide low latency in product design.

Machine learning algorithms once train, it will produce better quality chip design and reduce time of production

### Probable Discipline

Electronics and Communication

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH175

### Problem Statement

Traffic Clearance for Ambulance/(or other priority Vehicle) through Artificial Intelligence

### Name of Industry / Organisation

eInfochip

### Type Of Industry / Organisation

Corporate

### Challenge Description with Context

Traffic is the most critical problem in major cities in India. Sometimes emergency vehicle does not get route to reach at the destination due to heavy congestion on the road. Even if its desired, driver or owner of vehicle is in such a crucial position that he/she can not give space to such emergency vehicle. Emergency vehicle may be ambulance or fire-fighting equipment carrying vehicle, police van or disaster management vehicle. In emergency situation, vehicle should reach in time at proper destination but unfortunately traffic situation block that vehicle.

### What Exact Problem is being Solved?

In emergency situation like severe heat attack, pregnancy , accident, fire etc. it is necessary for a vehicle to reach at the destination in short time. In medical emergency, it is necessary to provide emergency medical treatment to the patient. It is necessary to reach at nearest and best hospital in time. Most of cities and even district place are having problem of traffic and due to which ambulance and other emergency vehicles are not getting free route to reach at the destination. Other Emergency occurs anywhere at any location, at any time, and in various ways will make one at risk such as fire. Fire fighting vehicle must reach in time to save life and property. These situations require a speedy response. So it is very crucial and important to establish direct, fast and efficient technique without delay. Artificial intelligence may help us to solve this real life challenge.

Users Patient, Fire brigade office, Hospitals, Police

### Expected Outcomes

Traffic congestion has grown to an alarming event in major cities across India. Ambulance Driver will select route to reach hospital. System will automatically control traffic light based on population of vehicle and based on priority on that route. (Controls entire area surrounding route). Other features like Ambulance arrival indication to surrounding vehicle will give extra benefit. Emergency vehicle will be able to reach at the destination in time. If emergency vehicle is ambulance, patient will get treatment in time. If emergency vehicle is fire fighting equipment it will be able to control fire. If emergency vehicle is police van, it will be able to control crime.

### Potential Impact

Vehicular traffic is endlessly increasing everywhere in the world and can cause terrible traffic congestion at intersections. This solution will allow emergency vehicle to get route during emergency situations. Traffic congestion and tidal flow are major facts that cause delay to ambulance. The loss of human life due to accident and delay in getting proper treatment must be avoided. In order to save human life from accidents and unnecessary delay due to traffic congestion will be avoided due to this solution and it will help to save precious human life.

### Probable Discipline

Electronics and Communication

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH176

### Problem Statement

IOT based digital notice board using node MCU (ESP 8266)

### Name of Industry / Organisation

Government Engineering College, Bharuch

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

In early days the universities were having the practice of hanging wooden Notice boards. This method of passing on the information was having various problems. We consider the case study of professional Colleges, where information is a vital key for knowing the updates of the campus. The challenge is to provide the access to notices, articles, images and videos quickly within the college premises and organization, also wherever and whenever they necessitate knowing.

### What Exact Problem is being Solved?

The major strength of the Electronic Notice Board developed, is an application that its usability is fully capable of passing relevant notices, announcements and keeping the users updated from time to time. The user is kept updated each time the E-Notice Board is uploaded based on their preferences with respect to the departments and categories. From this we can overcome the problems associated with the IOT technology used.

### Users

Colleges, Students, University, Corporate World.

### Expected Outcomes

By using the concept of this technology in the field of IOT we can make our communication well-organized and faster. We can display the messages with less errors and better efficiency. Time consumption & paper wastage is reduced. This method can be used very efficiently in establishments like high-tech restaurants to give the order, in shops offer discounts can be displayed, at all branches in colleges the students and staffs can be informed simultaneously at the same time. Also it can be set up at public transport places like railways, bus station, airport and also at road side for traffic control and in emergency situations like hospitals, temples etc. Its cost is low and it can be handled very easily. Using this application we can avoid the usage of papers hence cutting of trees for the purpose of papers is greatly reduced.

### Potential Impact

Time consumption & paper wastage is reduced. This method can be used very efficiently in establishments like high-tech restaurants to give the order, in shops offer discounts can be displayed, at

all branches in colleges the students and staffs can be informed simultaneously at the same time. Also it can be set up at public transport places like railways, bus station, airport and also at road side for traffic control and in emergency situations like hospitals, temples etc. Its cost is low and it can be handled very easily. Using this application we can avoid the usage of papers hence cutting

of trees for the purpose of papers is greatly reduced.

### Probable Discipline

Electronics and Communication

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH177

### Problem Statement

Fast Battery charging USB system for mobile handset

### Name of Industry / Organisation

Kirtan Technologies

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Design a Battery Management System that can charge from 5V Micro USB. Battery is 3.7 V LiPo. The final load for the system is GSM Module(SIM800/SIM900/M66). This module is required current burst at the time of Network registration. The battery management circuit should be capable enough to provide current burst. Normally this is achieved via 7.4 LiPo, but in our problem statement we want to achieve this with 3.7 V LiPo battery. Solution can be used in any product that have GSM Module and want a battery power system. GSM is a mobile communication modem; it stands for global system for mobile communication (GSM). GSM is an open and digital cellular technology used for transmitting mobile voice and data services operates at the 850MHz, 900MHz, 1800MHz and 1900MHz frequency bands. GSM system was developed as a digital system using time division multiple access (TDMA) technique for communication purpose. GSM Module(SIM800/SIM900/M66) module is required current burst at the time of Network registration. The battery management circuit should be capable enough to provide current burst.

### What Exact Problem is being Solved?

A GSM modem is a device which can be either a mobile phone or a modem device which can be used to make a computer or any other processor communicate over a network. A GSM modem requires a SIM card to be operated and operates over a network range subscribed by the network operator. It can be connected to a computer through serial, USB or Bluetooth connection. The battery management circuit should be capable enough to provide current burst and this is achieved via 7.4 LiPo, but in our problem statement we want to achieve this with 3.7 V LiPo battery.

### Users

The GSM mobile terminal has become one of the items that are constantly with us. Just like our wallet/purse, keys or watch, the GSM mobile terminal provides us a communication channel that enables us to communicate with the world. The requirement for a person to be reachable or to call anyone at any time is very appealing. Any product that have GSM Module(SIM800/SIM900/M66) and want a battery power system.

### Expected Outcomes

The battery management circuit should be capable enough to provide current burst and this is achieved this with 3.7 V LiPo battery. A GSM modem can also be a standard GSM mobile phone with the appropriate cable and software driver to connect to a serial port or USB port on your computer. GSM modem is usually preferable to a GSM mobile phone. The GSM modem has wide range of applications in transaction terminals, supply chain management, security applications, weather stations and GPRS mode remote data logging.

### Potential Impact

Battery Management System that can charge from 5V Micro USB with Battery is 3.7 V LiPo.

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

Features of GSM Module are Improved spectrum efficiency, international roaming, Compatibility with integrated services digital network (ISDN), Support for new services, SIM phonebook management, Fixed dialing number (FDN), Real time clock with alarm management, High-quality speech

Uses encryption to make phone calls more secure Short message service (SMS)

### Probable Discipline

Electronics and Communication

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH178

### Problem Statement

NDVI Camera - Building Crop Health Monitoring Camera with NDVI Index

### Name of Industry / Organisation

Teksun Microsys Pvt. Ltd.

### Type Of Industry / Organisation

Small

### Challenge Description with Context

NDVI camera monitors the crop health by capturing the image from farm. Once image have uploaded to the web app, it will automatically process into NDVI Database which will provide the insights of farming area. Explore different types of Camera and Camera filters. Image processing of camera, separate images, merge required image for NDVI processing. Calculate NDVI image and index. This device helps you to evaluating soil productivity and analyzing plant health.

### What Exact Problem is being Solved?

The task is challenging which automatically process into NDVI Database, continuous efforts required to solve it. Image processing of camera, separate images, merge required image for NDVI processing for Image ind Index. It suggests taking required action on problematic area of farm. Whether it is geographic location, plant population, soil fertility, it keeps you informed about everything before harvest.

### Users

Farmers and agricultural industry, where users are informed about everything before harvest. Help farmers to get maximum output from the farm by proper analysis of the farm to better quality of crop.

### Expected Outcomes

Project help farmers to get maximum output from the farm by proper analysis of the farm. So for society, we get better quality of crop, farmers can save their time and also increase crop yield. The Farmers and agricultural industry, the users are informed about everything before harvest. Geographic location, plant population, soil fertility are monitored. Benefits to both, the farmers and the environment.

### Potential Impact

Offers broad benefits to both, the farmers and the environment by minimizing the use of sprays, fertilizers, wastage of water. Increasing the yield from crops

Also help in land management, whether to use land for farming. Project help farmers to get maximum output from the farm by proper analysis of the farm. We get better quality of crop, farmers can save their time and also increase crop yield.

### Probable Discipline

Electronics and Communication

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH179

### Problem Statement

Water PH & Minerals Measurement - Building IoT Sensor which can measure Water PH & Minerals

### Name of Industry / Organisation

Teksun Microsys Pvt. Ltd.

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Water is a very vital natural resource. It is used to fulfill many purposes, from drinking to utilizing it in industries, and to irrigating fields. The problem of water contamination is widespread. It not only affects human beings but also has an enormous impact on the lives of flora and fauna. Fabricate a sensor such that it is unaffected by the changes in surroundings. Precise measurement of pH of water and minerals. Measurement of pathogens preset in the water. Treatment of water according to the purpose. Possible utilization of eliminated minerals in other fields.

### What Exact Problem is being Solved?

The scale of problem is very large; touching each and every living entity across the globe and various abiotic components of the environment. Through the development of an IoT Sensor, our aim is to measure pH and minerals concentration of water precisely. This can solve the following problems: pH of water can be determined and several steps can be taken for its treatment, The quality of water can be regulated, Minerals that are harmful for living beings can be detected and treated before entering in the food chain as well as into the human body.

### Users

The sensor will be useful for the farmers. Water supplying organizations. Industries and pharmaceuticals companies. Schools and Universities. Various Government Laboratories. Human and many other living things as a large part of the users.

### Expected Outcomes

Agriculture sector will bloom and better quality and hygienic crops will be cultivated. Many of the water borne diseases will be eradicated. Everyone will get potable water to drink. Conservation of Water to a great extent. It is used to fulfill many purposes, from drinking to utilizing it in industries, and to irrigating fields. Society will be able to deal with the problem of water scarcity. Abundant water will be available for the future generations.

### Potential Impact

Society will be able to deal with the problem of water scarcity. Abundant water will be available for the future generations. Sustainability environment maintenance and ultimately the Mother Earth to be saved. Electronics Industries and Economy at large will get boost up. More employment to be generated. Agriculture sector will bloom and better quality and hygienic crops will be cultivated. Many of the water borne diseases will be eradicated.

### Probable Discipline

Electronics and Communication

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH180

### Problem Statement

Improper medical waste management in most hospital and industries

### Name of Industry / Organisation

ICUBE TECHNOLOGIES

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

Medical Waste Generated During during diagnosis, treatment or surgery can be hazardous and may cause serious health issues. Medical waste management in hospital and industries is one of the challenging issue in our country.

Waste in industries and hospitals might not be trashed timely, which can contaminate environment, affecting to the people working in surrounding. One of the cause for increase in infectious diseases is improper medical waste management in hospitals / clinics / health centers etc...

According to WHO, deaths due to infectious diseases are increasing by 50,000 people every year with very high prevalence rate.

Medical care is vital for our life, but the waste generated during the diagnosis, treatment or surgery of human beings or in research activities represents a real problem when the waste is not collected on regular basis with proper management. It may include wastes like sharps, solid waste, disposables, anatomical waste, chemical waste, discarded medicines, food, etc. This waste is hazardous and may cause a serious threat to human health. Improper management of medical waste system causes serious environmental problems. So for preventing the problem of waste system in hospitals, clinics or in health centers, Medical Waste Management System using IOT can be used over the recent improper waste management system in hospital. The smart medical waste management system measures the level of waste in bins through sensor and then sends the corresponding information about the bin level to the concerned authority by means of communication. Wireless communication can be used for sending the information. For wireless communication, mobile application has been developed, and through that the authorized person can check the level of bins on regular basis of time or when any message has been received. After knowing the bin level status the authority can take desired action if required. The information can be accessed any where over the internet. This will reduce the time of the authorized person who is responsible for collecting waste as well as this will reduce the amount of infections in air due to contaminated waste.

The available solution to address this problem is available but not adopted due to various reasons at user and administrative ends.

We are looking for the solution with maximum acceptance by all its stakeholders at various levels. This smart medical waste management system will be useful in effective and timely disposal of the medical waste, thereby decreasing the overall health scenario.

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### What Exact Problem is being Solved?

Prevention of contamination in environment by hospitals and industries.

Medical Waste Generated During during diagnosis, treatment or surgery can be hazardous and may cause serious health issues. Medical waste management in hospital and industries is one of the challenging issue in our country.

Waste in industries and hospitals might no be trashed timely, which can contaminate environment, affecting to the people working in surrounding. One of the cause for increase in infectious diseases is improper medical waste management in hospitals / clinics / health centers etc...

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We are looking for the solution with maximum acceptance by all its stakeholders at various levels. This smart medical waste management system will be useful in effective and timely disposal of the medical waste, thereby decreasing the overall health scenario.

### Users

Government and Private Hospitals / clinics/ health centres  
Industries  
Medical colleges, research centers  
Blood banks

Medical Waste Generated During during diagnosis, treatment or surgery can be hazardous

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

and may cause serious health issues. Medical waste management in hospital and industries is one of the challenging issue in our country.

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The available solution to address this problem is available but not adopted due to various reasons at user and administrative ends.

We are looking for the solution with maximum acceptance by all its stakeholders at various levels. This smart medical waste management system will be useful in effective and timely disposal of the medical waste, thereby decreasing the overall health scenario.

### Expected Outcomes

- \* The level detection of waste bins and alert system
- \* Live communication of bin level to the concern persons
- \* Cost effective and easy to operate
- \* Clean environment in Hospital / Industries / etc...

Medical Waste Generated During during diagnosis, treatment or surgery can be hazardous and may cause serious health issues. Medical waste management in hospital and industries is one of the challenging issue in our country.

Waste in industries and hospitals might not be trashed timely, which can contaminate environment, affecting to the people working in surrounding. One of the causes for increase in infectious diseases is improper medical waste management in hospitals / clinics / health centres etc...

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

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### Potential Impact

Prevention of contamination in environment by hospitals and industries.

Medical Waste Generated During during diagnosis, treatment or surgery can be hazardous and may cause serious health issues. Medical waste management in hospital and industries is one of the challenging issue in our country.

Waste in industries and hospitals might no be trashed timely, which can contaminate environment, affecting to the people working in surrounding. One of the causes for increase in infectious diseases is improper medical waste management in hospitals / clinics / health centres etc...

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# **Smart Gujarat For New India Hackathon 2019-20**

## **Problem Statements**

be used for sending the information. For wireless communication, mobile application has been developed, and through that the authorised person can check the level of bins on regular basis of time or when any message has been received. After knowing the bin level status the authority can take desired action if required. The information can be accessed any where over the internet. This will reduce the time of the authorised person who is responsible for collecting waste as well as this will reduce the amount of infections in air due to contaminated waste.

The available solution to address this problem is available but not adopted due to various reasons at user and administrative ends.

We are looking for the solution with maximum acceptance by all its stakeholders at various levels. This smart medical waste management system will be useful in effective and timely disposal of the medical waste, thereby decreasing the overall health scenario.

### **Probable Discipline**

Electronics and Communication, Biomedical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH181

### Problem Statement

Design of ventilation & control system for silver melting furnace.

### Name of Industry / Organisation

Nisarg Enviro Cosultant

### Type Of Industry / Organisation

Small

### Challenge Description with Context

In silver melting furnace old silver jewelries, ornaments, utensils and other silver stuff are melt and silver bar is produces from it. As silver contain cadmium, during the melting process of old silver stuff fumes of cadmium oxides are emitted from the furnace and this cadmium oxides are very toxic to the workers and surrounding peoples. This kind of small scale silver melting furnace are very large in the numbers and create air pollution.

### What Exact Problem is being Solved?

Silver melting furnaces are small scale industries but they are very large in the numbers. Cadmium oxide dust released from the furnace and create the air pollution. To prevent the air pollution and to control the cadmium oxides dust enter into the environment some kind of low cost , efficient treatment technologies should be their. some special types of gaseous as well as particulate control equipment should be designed.

### Users

Such kind of technologies are equipment are very useful to the operators of silver melting furnaces, furnace manufactures, researchers, operators of metal recycle facilities, students and government agencies.

### Expected Outcomes

Special types of gaseous as well as particulate control equipment should be designed to control the cadmium oxides dust enter into the environment. other ways to reduce the impacts is to provide personal protective equipment to the workers or redesigning the furnace so that minimum fume is produce and to achieve all this detail study of the silver recycling process is carried out to understand the process chemistry.

### Potential Impact

There is sufficient evidence in humans for the carcinogenicity of cadmium and cadmium compounds. According to WHO Chronic cadmium exposure produces a wide variety of acute and chronic effects in humans. Cadmium accumulates in the human body and especially in the kidneys. According to the current knowledge kidney damage (renal tubular damage) is probably the critical health effect. If such kind of issues are unattended, health of the workers working over their and surrounding peoples may suffer from the kidney diseases.

### Probable Discipline

Environmental

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH182

### Problem Statement

Design for expansion of sewerage system for Valsad city.

### Name of Industry / Organisation

Valsad Nagarpalika

### Type Of Industry / Organisation

Public Entities (Boards/Corporations/Panchayat/Government Societies etc)

### Challenge Description with Context

The problem statement has been addressed by Valsad Nagarpalika under the mentorship of Shri. J. U. Vasava and Shri. Kantibhai Patel. Valsad is a city located near by sea having an approximate population of 2 lakhs. The existing sewerage sytem is a combined sewerage system, whereby storm water plays a significant role in the quantity of the sewerage. Valsad experiences heavy rainfall and extreme water logging conditions. The low lying areas get submerged in water when rainfall is heavy and flood like sitauations arise. Now in order to handle all these situations and to overcome the related problems, our sewerage system has to be efficient enough to withstand all the quantity of water as well as sewerage that may be added up oftenly. Presently, the sewerage system has a capacity of 11 MLD, which is not sufficient enough to carry the sewerage of the existing and floating population as well as storm water during monsoons.

### What Exact Problem is being Solved?

The problem can be solved by increasing the capacity of existing sewerage system by its expansion. There are two systems of sewerage; combined and separate. Valsad city has combined sewerage system, where stormwater comes into picture. Quantity comes into significance when it is to be carried underground through the sewers. Also, performance factors need to be evaluated for further unavoidable or probable situations.

### Users

All stakeholders from local level laymen to higher authorities. Each and every person of all stages will be helpful. Low lying areas get affected due to water logging during heavy rains. So, it will be helpful to them majorly.

### Expected Outcomes

Our expected outcome is that the pressure upon the existing system can be lightened and thus more better situations can be brought in. Ease and difficulty in expansion, Amount and availability of investment, Anticipated rate of population growth, Hydraulic constraints of the systems designed, and Life of the material and equipment; are certain factors that affects the design period of any sewerage system and allied outcomes.

### Potential Impact

The potential impact of this project will be upon the end users and industrialists who are often affected by the issues of its treatment and related effects. Once the expansion of the existing system is done, the relative and allied issues will get solved. Though financial investment will be more, the best part will be that there will be no stress on the sewers and thus it will be efficient enough to handle the future implications.

### Probable Discipline

Environmental Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH183

### Problem Statement

Development of environmentally sound strategies for solid waste management of Valsad city

### Name of Industry / Organisation

Valsad Nagarpalika

### Type Of Industry / Organisation

Public Entities (Boards/Corporations/Panchayat/Government Societies etc)

### Challenge Description with Context

Daily approximately 35 tons Municipal solid waste is generated from the Valsad city. The average elevation of town is 13 meter above the sea level and the Arabian sea lies to its west a km away from the center of the city and river Auranga flow through the north and north eastern boundary of Valsad. Identification of location of landfill site or treatment facilities are not in existence. So waste segregation and waste disposal is a major issue in Valsad city.

### What Exact Problem is being Solved?

In this Industrial Hackathon 2019 the problem which we will solve is to develop a strategy for solid waste management system for Valsad city. Using the current generation rate and prediction the future expansion and future solid waste generation rate, site location, capacity is landfill site, Waste collection and segregation strategy for efficient waste segregation and treatment of solid waste is suggested for proper management.

### Users

Citizen of Valsad city as well as Valsad nagar palika as a government Authority , owner of small and big commercial shop owner, service providers, agencies involved in waste collection and treatment work are the major users.

### Expected Outcomes

Solid Waste Management Strategy for Valsad City if developed we can create hygienic condition near and around dumping site as well as around the city, apart from this many tangible as well as intangible benefits such as resource recovery and biogas production is also attained by the authority. Due to the tourist place because of the sea facing location of Valsad city aesthetic appearance of city is also improved.

### Potential Impact

Untreated and unmanaged solid waste if dumped anywhere outskirts of the city because of the location major impact on ground water pollution, river water pollution and marine pollution is observed. because of the sea facing location and of city if beauty of shore or city is lost due to the unmanaged solid waste chances are there that revenue generated from tourism's activity is also decrease which one of the source of income of the people residing near the shore area.

### Probable Discipline

Environmental Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH184

### Problem Statement

Removal of refractory COD & Colour from treated effluent of Vapi CETP.

### Name of Industry / Organisation

Vapi Green Enviro Limited

### Type Of Industry / Organisation

Public Entities (Boards/Corporations/Panchayat/Government Societies etc)

### Challenge Description with Context

Common Effluent Treatment plant vapi operated by vapi green enviro LTD. is receiving industrial waste water from different industries like dyes and pigments industries, pharmaceutical industries, industries manufacturing bulk drugs, dyeing and printing industries, fertilizer industries etc. the waste water characteristic is complex because treated effluent parameter varies from industry to industry.

### What Exact Problem is being Solved?

Common Effluent Treatment plant vapi receives treated effluent from various types of industries and because of that waste water characteristic is complex and hourly as well as daily fluctuation in various waste water parameters such as BOD, COD, COLOUR, TDS, is received at treatment plant. In order to discharge effluent in the natural water body and to meet the regulatory requirement treatment option is required to remove refractory COD and colour.

### Users

various small and medium scale industries, Vapi green enviro Limited, near by other industries, government authorities, researchers, students, non government organizations, people who are involved in pollution prevention work etc are the major users.

### Expected Outcomes

treatment plant has pre defined influent waste water quality parameters for the treatment of waste water but it is very difficult to receive waste water having pre defined waste water quality parameters and it is very difficult to meet discharge norms given by the government authorities. available solutions are very expensive so removal technologies which are technically feasible and economically viable is the utmost requirement.

### Potential Impact

if treated waste water having high refractory COD and colour is discharged in near by natural water bodies chances are there that the discharged treated effluent deteriorates the quality of receiving water body. chances of bioaccumulation of non bio degradable organic material in the aquatic water system are also there. coloured water has problem if it is being consumed for domestic or other industrial purposes.

### Probable Discipline

environmental engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH185

### Problem Statement

Energy measurement and control system

### Name of Industry / Organisation

JP Technosoft

### Type Of Industry / Organisation

Small

### Challenge Description with Context

We have to make a system which measures the parameters like voltage,current, power,etc and have to store the measure values for further use,so mainly it's about energy auditing system by SCADA.Thus we will be designing a SCADA for data acquisition and measurement for electrical variables like power,voltage,current, resistance, frequency ,etc .we will use some energy meters for measurement and the data will be stored somewhere which can used afterwards.

### What Exact Problem is being Solved?

Industries required some kind of system that can measure the energy losses or say energy consumptions by their instruments and systems. Our project is to design a automatic system that measure such energy consumption and give that data to the industries.The values measured by our system are called data that are to be given to the users .Users can use this data as they want ,mostly because of this data acquisition system user will come to know about the energy consumption in the concern area.

### Users

Pharma industry, power plants, fertilizer industry, chemical industries, textile industry, office and cabins of any schools, colleges,software companies, laboratories, automobile industries, electric drives manufacturer and so on.

### Expected Outcomes

A SCADA system that would be able to measure some electrical variable like power,voltage,current,frequency, resistance, etc and stored the data that has been measured by the system ,somewhere which can be used when required.This data would be used by user whenever they want .User will be able to check the energy consumed at particular area by particular instrument so that they can modify it as per the their requirements.

### Potential Impact

There will be great impact of this system on industries as they will be able to find the problem where the energy is more consuming and than they will be able to find the solutions for the respective problems.power plants would be the most widely using area of this system as it would be great help to them by this SCADA system.Energy consumptions can be set a limit beyond which the instruments won't work.

### Probable Discipline

Instrumentation & Control

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH186

### Problem Statement

Repair and Reuse of Solenoid used in Embroidery machine

### Name of Industry / Organisation

Maruti Fashion

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Solenoid is a very essential part of the computerized Embroidery machine. The two problems associated with it are 1)at present it is being imported from China and 2) it is very costly. So in case of failure the solenoid is replaced by a new one as there is no alternative for repair and reuse of the same. The challenge is to repair and reuse once used solenoid there by reducing the cost and the dependency of market on the Chinese imported goods. Also reuse of solenoid will help in reducing the E-waste of the same.

### What Exact Problem is being Solved?

Solenoid is a very essential part of the computerized Embroidery machine. The two problems associated with it are 1)at present it is being imported from China and 2) it is very costly. So in case of failure the solenoid is replaced by a new one as there is no alternative for repair and reuse of the same. The challenge is to repair and reuse once used solenoid there by reducing the cost and the dependency of market on the Chinese imported goods. Also reuse of solenoid will help in reducing the E-waste of the same.

### Users

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### Expected Outcomes

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### Potential Impact

Solenoid is a very essential part of the computerized Embroidery machine. The two problems associated with it are 1)at present it is being imported from China and 2) it is very costly. So in case of failure the solenoid is replaced by a new one as there is no alternative for repair and reuse of the same. The challenge is to repair and reuse once used solenoid there by reducing the cost and the dependency of market on the Chinese imported goods. Also reuse of solenoid will help in reducing the E-waste of the same.

### Probable Discipline

Instrumentation & Control

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH187

### Problem Statement

Level Measurement of solids in ignite bunker (hopper)

### Name of Industry / Organisation

R.C. Engineers & Consultant

### Type Of Industry / Organisation

Small

### Challenge Description with Context

The level Measurement of solids in ignite bunker (hopper) remains a relatively difficult application in industry even today. Many Industries facing issues in level measurement of solid particles in bunker due to the shape is a big challenge, if they relocate the level measurement instruments (Transmitter) instead of the top-center of the bunker, then it becomes difficult to get accurate output from the transmitter due to the shape of the bunker. They also face some issue like as floating dust clouds in vicinity to the level sensing probe, inside temperature of bunker , etc.

### What Exact Problem is being Solved?

The solution lies in using an Radio Frequency Admittance level controller (instrument) with an extra strong material coated Rod Probe, An accurate measurement of this change affords an indirect measure of the level of solids in the hopper (ignite bunker). We needs to consider design concepts of level measurement probe, some mechanical consideration as well as electrical consideration to solve the problem in level measurement.

### Users

There are the numbers of process industries use level Measurement techniques for solids level measurement in bunker (Hopper) such as Cement industry, Power Plant industry, food and beverages industry, Chemical and Petro-Chemical Industry, Paint Industry, Steel Industry, fertilizer Industry.

### Expected Outcomes

Clearly, this solid level measurement in ignite bunker (Hopper) above mentioned users (process industry) will provide number of benefits to both the industry and maintenance team so they can reduce cost and maintenance cost of over all level measurement process of hopper. Students will be able to enhance their technical skills and empower their problem solving skill as well as their decision making skills.

### Potential Impact

Clearly, this solid level measurement in ignite bunker (Hopper) above mentioned users (process industry) will provide number of benefits to both the industry and maintenance team so they can reduce cost and maintenance cost of over all level measurement process of hopper. Students will be able to enhance their technical skills and empower their problem solving skill as well as their decision making skills.

### Probable Discipline

Instrumentation & Control

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH188

### Problem Statement

To develop RTU (Remote Transmission Unit) which takes Modbus data from field instrument and send it to our cloud server.

### Name of Industry / Organisation

R.C. Engineers & Consultant

### Type Of Industry / Organisation

Small

### Challenge Description with Context

RTU (Remote Transmission Unit) which takes Modbus data from field instrument and send it to cloud server but challenge is that particular RTU can understand any one data type so, we have to use different RTU for different field instruments which leads to increase in our stock inventory and later we face problem when any RTU need to be replaced on site and in case of failure of any field instrument.

### What Exact Problem is being Solved?

RTU (Remote Transmission Unit) which takes Modbus data from field instrument and send it to cloud server but in our case particular RTU can understand any one data type so, we have to use different RTU for different field instruments which leads to increase in our stock inventory. But if we can modify the programming of RTU in such a way that it can understand a particular data type from field instrument then we can reduce stock inventory which also reduces overall cost.

### Users

Water distribution system used by Municipal Corporation for domestic as well as industrial purposes. Other Industries where such RTU (Remote Transmission Unit) and field instruments are used can also get benefits from this.

### Expected Outcomes

RTU (Remote Transmission Unit) which takes Modbus data from field instrument and send it to cloud server but in our case particular RTU can understand any one data type, so we have to use different RTU for different field instruments which leads to increase in our stock inventory. By modifying the programming of RTU it is possible that it can understand a particular data type from field instrument then we can reduce stock inventory which also reduces overall cost and it will also leads to easy maintenance.

### Potential Impact

RTU (Remote Transmission Unit) which takes Modbus data from field instrument and send it to cloud server but in our case particular RTU can understand any one data type, so we have to use different RTU for different field instruments which leads to increase in our stock inventory. By modifying the programming of RTU it is possible that it can understand a particular data type from field instrument then we can reduce stock inventory which also reduces overall cost and it will also leads to easy maintenance.

### Probable Discipline

Instrumentation & Control

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH189

### Problem Statement

To increase the tool life While machining of SS304 (shaft) component in CNC Machine

### Name of Industry / Organisation

Active Enterprises

### Type Of Industry / Organisation

Small

### Challenge Description with Context

While machining of SS304 component red hot hardness of cutting tool decreases, Increase tool life is the major challenge of turning of SS304 austenatic grade stainless steel sharp the tip of carbide insert break away. i.e. wear of carbide insert takes place during CNC turning operation. In order to increase tool life required such an insert material should withstand the red hot hardness at the elevated temperature during the interface of job material and tool material in presence of appropriate cutting oil to minimize friction.

### What Exact Problem is being Solved?

While machining of SS304 component red hot hardness of cutting tool decreases, Increase tool life is the major challenge of turning of SS304 austenatic grade stainless steel sharp the tip of carbide insert break away. i.e. wear of carbide insert takes place during CNC turning operation. In order to increase tool life required such an insert material should withstand the red hot hardness at the elevated temperature during the interface of job material and tool material in presence of appropriate cutting oil to minimize friction.

### Users

Small scale industries having problem like machining of SS304 component red hot hardness of cutting tool decreases, Increase tool life is the major challenge of turning of SS304 austenatic grade stainless steel sharp the tip of carbide insert break away. i.e. wear of carbide insert takes place during CNC turning operation. In order to increase tool life required such an insert material should withstand the red hot hardness at the elevated temperature during the interface of job material and tool material in presence of appropriate cutting oil to minimize friction.

### Expected Outcomes

Increase tool life is the major challenge of turning of SS304 austenatic grade stainless steel sharp the tip of carbide insert break away. i.e. wear of carbide insert takes place during CNC turning operation. In order to increase tool life required such an insert material should withstand the red hot hardness at the elevated temperature during the interface of job material and tool material in presence of appropriate cutting oil to minimize friction.

### Potential Impact

Productivity increase by increase in tool life by solving problem like wear of carbide insert takes place during CNC turning operation. In order to increase tool life required such an insert material should withstand the red hot hardness at the elevated temperature during the interface of job material and tool material in presence of appropriate cutting oil to minimize friction. Increase tool life is the major challenge of turning of SS304 austenatic grade stainless steel sharp the tip of carbide insert break away.

### Probable Discipline

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH190

### Problem Statement

Inner and Outer race run out

### Name of Industry / Organisation

Austin Engineering Company Ltd.

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

Maximum axial or radial race wall thickness variation of an inner or outer bearing race. Run out influences the repeatable location variations of rotating components. Run out is a common defect occur during bearing manufacturing. Generally this error is generated due to improper grinding process. If a bearing having run out error much amount of noise and vibration produced during operation. Run out error can be checked by dial gauge.

### What Exact Problem is being Solved?

During the heat treatment process and grinding process, if the temp of races increase than its elastic limit, the races will change their shape minor from circular to oval. Run out is also created by improper surface grinding. The grinding process should be performed properly. Run out can be reduced by proper heat treatment, proper machining and grinding. Improper Heat treatment and grinding are the major reasons for run out.

### Users

Automobile, pump manufacturers, Electric motors manufacturers, Fan manufacturers, Aero space industries, machine tools manufacturers and concern industries, Turbine manufacturers, Two wheeler manufacturers

### Expected Outcomes

To reduce run out up to acceptance level. To produce exact circular bearing outer race. Error less production of bearing. Reduction in run out by proper machining and grinding parameters. Reduce run out by proper heat treatment temperature and other parameters. Production of bearing with least error and defect. Operate the bearing at predefined speed without noise and vibration. Suggest the best machining and grinding parameters .

### Potential Impact

Lower rejection rate, customer satisfaction, financial saving, smooth outer surface, Reduction in Run out error.

Reduction in run out by proper machining and grinding parameters.

Reduction in amount of run out by proper heat treatment temperature and other parameters.

Production of bearing with least error and defect.

Operation of the bearing at predefined speed without noise and vibration.

Suggest the best machining and grinding parameters .

### Probable Discipline

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH191

### Problem Statement

Develop an experimental setup of Atmospheric water generator (AWG) which can generate 30 Litres of water per day at 70% RH and 30°C temperature

### Name of Industry / Organisation

Balief Corporation

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Industry always require the water for several purposes. Also the water problem is there in industry. No work has been done so far to study the feasibility of AWG for the warm and humid regions of India. No one has not work on the Atmospheric water generator (AWG) to produce the water. Challenge is to produce 30 liter of water from the atmosphere and if possible then it can also obtain the hot as well as cold air

### What Exact Problem is being Solved?

Humidification and dehumidification is a system which can be used to produce the potable water. Simple example of the HDH (Humidification and Dehumidification) is a Air conditioning system. Water scarcity is everywhere in the world today and also a problem for the industry. Hence, industry always in a search of sustainable technology which can produce the water. Present system is a sustainable solution because it can produce the water from the atmosphere. It is a small system, if it is successfully solved then in future, it will be used for the several industry.

### Users

Water is a use for everybody i.e. domestic and industrial. But here the users are industry. They are always in search of sustainable solution of water. Alongwith the water, present system is also producing hot as well as cold air .

### Expected Outcomes

Water scarcity is one of the major issues which India is currently facing. About 600 million Indian population is facing high to extreme stress over water. By 2025, the per capita water availability will drop down to 1341 m<sup>3</sup> and to 1140 m<sup>3</sup> in 2050. As per NITI Aayog report on Composite Water Management Index (CWMI), about 600 million Indian population faces high to extreme water stress and nearly 2, 00,000 people dies every year due to inadequacy of safe water. Moreover many Indian states are blessed with humid climatic conditions round the year. Large amount of water is present in atmosphere which can fulfil daily needs of population

### Potential Impact

It is a sustainable solution to obtain the water from the atmosphere alongwith the hot and cold air production. Water scarcity is one of the severe and threatening issue which India is currently dealing with. Water demand has increased and even further going to be increased due to increasing population, industrialization and urbanization. This research surely delivers the design and development of the system which can able to generate 30 litres of water per day at 30°C and 70% relative humidity. Hence, it will be really a impressive research work for the country.

### Probable Discipline

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH192

### Problem Statement

To develop a plant trimmer for road side way fencing.

### Name of Industry / Organisation

Bhavsar Construction

### Type Of Industry / Organisation

Small

### Challenge Description with Context

The plant maintenance shall include watering, manuring, fertilizing, protection from pests and disease, sweeping, weeding, cultivation and trimming. To perform all the operation at a same time it requires adequate manpower, machinery and time. Among all the operation, trimming of plants at required shaping and sizing are consuming maximum time. Optimization of the trimming operation can reduce overall time requirement and reduce the laborious task by great means.

### What Exact Problem is being Solved?

In the road plantation maintenance, many workers must work on the roads for trimming of plants, which is quite risky and dangerous. For trimming if we have an automatic trimmer for cutting plants at predetermine shape and size, number of workers are reduced, and time required for the operation is drastically minimize. At a same time, they can reduce the traffic created by the maintenance activity because it only required one or two workers for a operation. The size and shape achieved by automatic trimmer will be accurate.

### Users

It can be used by taluka panchayats/ gram panchayats/ nagar palika for regular maintenance of plants at roadways. It can be used by local industries and organization for regular maintenance of gardens or plants at roadways inside the company campus. It can be moderately used in schools, hospitals, universities and by local companies or organization who takes a contract for maintenance of plants at roadways.

### Expected Outcomes

An automatic trimmer should reduce the operational time for maintenance. It also minimizes the manpower required for trimming of plants compare to manually operation of trimming. It increases the flexibility of operation and make less chaos on roads while working which ultimately reduced the traffic on the road. As an operation is optimized and required less time, it will increase the moral of the worker.

### Potential Impact

Use of automatic trimmer for road way plants will increase the profit for the company on a long run use. In the government organization like taluka panchayat, gram panchayat, nagar-palika, use of automatic trimmer will reduce lot of time for a worker and planning of maintenance will be flexible. Company can find more opportunities in scheduling operations of maintenance for workers. The uniformity in size, shape and accuracy achieved by automatic trimmer will bring nice aesthetic appearance to plants.

### Probable Discipline

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH193

### Problem Statement

Inclusion after Sand Casting

### Name of Industry / Organisation

Castech Foundry Pvt. Ltd.

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Sand inclusion and slag inclusion are also called as scab or blacking scab. They are inclusion defects. Looks like there are slag inside of metal castings. Sand inclusions can also be trapped under the casting surface in combination with metal oxides and slag's and only become visible during machining. Sand inclusion and slag inclusion are major defect produced in casting products. slag inclusion and sand inclusion should be controlled while performing casting process.

### What Exact Problem is being Solved?

while stripping of patterns and pouring molten metal break-up of mould sections due to uneven compaction of moulds. Slag and oxides occur when melting metals in the presence of oxygen, which also results as inclusion in sand castings. In addition to it too much turbulence when pouring and poor slag precipitation. Oxidation is the main reason for inclusion in sand casting. Necessary suggestions are given to solve this problem.

### Users

Pump manufacturers, Bearing Manufacturers, Valve Manufacturers, Steel Product Manufacturers, Machine Tool Manufacturers, Automobile manufacturers, steel Column and beam manufacturers, Turbine and rotary equipment manufacturers

### Expected Outcomes

An inclusion is a metal contamination of dross, if solid, or slag, if liquid. These usually are impurities in the pour metal (generally oxides, less frequently nitrides, carbides, or sulfides), material that is eroded from furnace or ladle linings, or contaminates from the mold. In the specific case of aluminum alloys, it is important to control the concentration of inclusions by measuring them in the liquid aluminum and taking actions to keep them to the required accepted level.

### Potential Impact

Lower rejection rate, Customer Satisfaction, Financial Savings, Smooth Finishing, Production of quality products, Implementation of Standardization, Production accuracy, Quality assurance, Zero defect product, Dimensional Stability, Lower re-work and lower machining allowances, Better cutting tool life, Lower machine maintenance, Inspection cost saving, Efficient use of man power, Improved casting yield, Overall casting strength is improved

### Probable Discipline

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH194

### Problem Statement

To design a develop a solar desalination system which is capable is providing around 20 litre distillate output with energy payback time less than 2 years and Cost of potable water per day is less than 0.50 INR/Litre.

### Name of Industry / Organisation

Chaudhary Designers and Fabricators

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Water connects every aspect of life. Access to safe water and sanitation can quickly turn problems into potential – empowering people with time for school and work, and contributing to improved health for women, children, and families around the world.

Today, 844 million people – 1 in 9 – lack access to safe water and 2.3 billion people – 1 in 3 – lack access to a toilet. These are the people we empower.

### What Exact Problem is being Solved?

Solar still is a simple device to convert the saline water into the potable water by use of solar energy. Generally it is not used as a potable water provider due to its average distillate output of 3 liter per day. Hence the solar still design and fabrication should be made in such a way that, it can produce distillate output of 20 litre per day and has cost is upto 20000 INR.

Also it should has lower energy payback time less than 2 years and lower cost of water per day (CPL) less than 0.50 INR/Litre

### Users

Potable water is a main requirement not only for the hould hold applications but also the industrial applications. All the living creatures require water for the drinking purpose.

Here our main users are the " small family" consists of 2 adult and 2 children and solar still should produce water around 20 litre per day

### Expected Outcomes

Safe drinking water is precious for healthy life but its availability is limited. Only ~3% of total water on the earth is fresh water. Less than 1% of the available fresh water is suitable for human and animal consumptions. Demand for fresh water is increasing due to increasing population and change of life style. Water is equally required for agricultural and industrial applications. Therefore, it has become essential to get fresh water from the underground salty water reserve or the ocean through desalination process. Potable water is a main problem in todays world. Also the solar energy available freely and the plenty of water is available in the ocean as saline water. Hence, saline water is converted into the potable water by use of solar energy with higher distillate output then it will be a great innovation in todays world. The potable water problem can be controlled by use of solar still.

### Potential Impact

Solar energy systems (photovoltaics, solar thermal, solar power) provide significant environmental benefits in comparison to the conventional energy sources, thus contributing, to the sustainable development of human

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

activities. Sometimes however, their wide

scale deployment has to face potential negative environmental implications. These potential problems seem to be a strong barrier for

a further dissemination of these systems in some consumers. If this solar still is made with 20000 INR and 20 Litre distillate output per day then it will be best potable water provider for domestic applications

### **Probable Discipline**

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH195

### Problem Statement

Problem in welding (Specially weld quality).

### Name of Industry / Organisation

Chem Process Systems Pvt. Ltd.

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

Quality of welding

They are the manufacturer of pressure vessels and process vessels related with refineries and other industries. Generally they are using TIG welding in pressure vessels. But they found the quality of welding is poor or generally find defects in it.

It is intended to give solution regarding the modification of welding process or other modifications if required, wish will improve the weld quality.

### What Exact Problem is being Solved?

Quality of welding

They are the manufacturer of pressure vessels and process vessels related with refineries and other industries. Generally they are using TIG welding in pressure vessels. But they found the quality of welding is poor or generally find defects in it.

It is intended to give solution regarding the modification of welding process or other modifications if required, wish will improve the weld quality.

### Users

Ultimate users are the all industry stakeholders who are associated with welding of pressure vessels and other process manufacturing industries. If ultimate stakeholder will get the appropriate solution which will improve the quality of welding then they will be benefited.

### Expected Outcomes

Quality of welding.

Ultimate users are the all industry stakeholders who are associated with welding of pressure vessels and other process manufacturing industries. If ultimate stakeholder will get the appropriate solution which will improve the quality of welding then they will be get benefited by implementing the same in their routine welding process. It is expected that the provided solution will able to solve the existing welding problem.

### Potential Impact

Ultimate users are the all industry stakeholders who are associated with welding of pressure vessels and other process manufacturing industries. If ultimate stakeholder will get the appropriate solution which will improve the quality of welding then they will be get benefited by implementing the same in their routine welding process. Ultimately the overall quality can be improved and life of products can be also improve with the expected out come.

### Probable Discipline

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH196

### Problem Statement

We are Distributors of all kind of Compressors ( Brand : Gardner Denver) used in industries. We are supplying air compressor like Reciprocating, Screw and Vane type air compressor. We also take AMC ( Annual maintenance Contract) for those compressors, whe

### Name of Industry / Organisation

Creative Treaders

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Generally Centrifugal compressor is used for low discharge and higher compression pressure. As the operating pressure is higher, heat generation is also higher which tends to damage piston, piston rings or compression rings critically. Due to wear and tear of piston ring (Compression ring and oil control ring), the lubricant oil is entering in cylinder which reduces compression ratio and decreases efficiency.

### What Exact Problem is being Solved?

Piston ring are used to ensure that by applying the correct pressure on cylinder wall or liner, a consistent layer of oil is maintained. Other ways in which piston rings are useful by preventing excessive heat building up inside the piston by transferring heat from the piston crown to cylinder. we can also increase strength of the piston rings by using various heat treatment process with different temperature.

### Users

Compressor is a machine which increases the pressure of a fluid by mechanically decreasing its volume. Reciprocating compressors are typically used where high compression ratios (ratio of discharge to suction pressures) are required per stage without high flow rates, and the process fluid is relatively dry.

### Expected Outcomes

Preventive maintenance is a routine process generally followed by any industry. It is very significant to follow the maintenance schedule on time without affecting the production cycle. By providing suitable solution we can avoid the wear and tear of piston rings, leakage of lubrication oil in cylinder and reduce the heat generated due to friction between piston and cylinder walls. It will ultimately increase the compression ratio.

### Potential Impact

By suitable solution the efficiency of reciprocating compressor is increased at the same time increase in compression ratio. The working cycle of compressor is increasing therefore the time interval for maintenance is increases. As heat produced is minimizes while working of compressor, the life of components used in compressor are increases. There will be reduction in noise production due to smooth and friction less working of reciprocating compressor.

### Probable Discipline

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH197

### Problem Statement

Design and development of a reciprocating air compressor to minimize overheating of cylinder head and maximize the performance of the compressor by suitably tuning governing parameters.

### Name of Industry / Organisation

Creative Treaders

### Type Of Industry / Organisation

Small

### Challenge Description with Context

A compressor is a mechanical device that increases the pressure of a gas by reducing its volume. A simple arrangement of cylinder and piston is used to compress fluid by increasing its pressure. As per chemical kinetics theory, with the increase in the pressure, molecules compresses and they start to move faster that raises the fluid temperature. When high head pressure or high compression ratio are required, back pressure in the cylinder increases significantly which results in overheating of compressor head. The overheating of compressor is an undesirable effect which results in deterioration of compressor performance. Therefore, there is a requirement of solution which solves the overheating issue without affecting the performance. Compressor works on simple principle but various parameters are affecting its performance. The parameters affecting compressor performance are suction and discharge pressure and temperature, fluid flow rate, back-pressure in cylinder, valve mechanism and various other factors. This parameters are dependent on each other, change in one parameter results in large deviation in performance. Selection of correct parameters for best performance without overheating is an iterative process.

### What Exact Problem is being Solved?

Generally, compressor working at high pressure ratios have back pressure issues. (Back pressure is the measure of flow resistance in pressure.) High back pressure in reciprocating compressor cylinder results in overheating of head, noise, vibration, and contamination of fluid. Overheating results in deterioration of performance which needs to be overcome. This also reduced the overall efficiency.

### Users

Air compressor are used in almost all the industries. To operate pneumatic operated machines like drill machine in automobile industry, to run furnace in fabrication industry, to compress refrigerant in refrigeration cycle and other various uses in workshops and small and medium industries.

### Expected Outcomes

By eliminating backpressure issue, overheating of head will be substantially reduced, which will result in less noise, vibration and no contamination of fluid without affecting performance of compressor. This will be reduce the friction problem also and indirectly piston ring wear/tear problem. Directly efficiency of the compressor will increase. Also reduce in temperature will increase the mass of air per unit volume with same pressure.

### Potential Impact

With overcoming of back pressure problem, operated temperature range will changed, which will improve the compressor efficiency And indirectly that will reduce the power consumption

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# **Smart Gujarat For New India Hackathon 2019-20**

## **Problem Statements**

for unit work. Less less temperature range, material selection criteria and dimension of the compressor will modified which will reduce the total cost of the compressor also..... With less back pressure less noise will generated.

### **Probable Discipline**

Mechanical Engineering

# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH198

### Problem Statement

Design and development of digital fuel level indicator for two wheels.

### Name of Industry / Organisation

Dr J N Mehta Government Polytechnic, Amreli

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

Two wheels like bike and scooters are the basic transportation facility used by most of the peoples. Now a days it is quick and easy way to find motorcycles, bikes and scooters as a personal use. Universal measuring method of filled fuel is the need of the day as different petrol pumps are using their measuring systems which had raised credibility issues among customers. So here we are developing the digital fuel indicator which can solve this issue with a figurative display. Hence the user can monitor and verify the amount of fuel filled in tank versus the amount displayed on fuel charging station.

### What Exact Problem is being Solved?

Currently there are cases that many fuel distributing companies are cheating their customers by filling less fuel than indicated on display and customer has no clue of exact quantity of fuel in his fuel tank. To encounter that issue a digital fuel meter is needed from which rider can monitor the exact amount of fuel for which he had paid and can raise the concern if the fraud had happened in case.

### Users

For this problem the stake holders are all who are using two wheeler like scooter, bike and motorcycles, also the fuel distributors, petroleum production firms and government are invariably involved.

### Expected Outcomes

The problem being addressed here is to design and development of digital fuel level indicator for two wheels. So at the end we would have a digital fuel measuring system working within the range of fuel tank for two wheeler which can accurately and precisely measure the exact amount of fuel being filled in the fuel tank at charging station. As it is digital the user can read and monitor easily without much skill.

### Potential Impact

The implications of the developed instrument have listed as following...

(1) The rider can have exact idea about the quantity filled in fuel tank at fuel charging station, so he gets the satisfaction for the money paid.

(2) No chances of fraud in case of amount of fuel filled at fuel charging station due to full proof monitoring system.

(3) Negligible skill required for measuring and monitoring the amount of fuel filled.

### Probable Discipline

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH199

### Problem Statement

Development of an optimized automatic cutter mechanism for manufacturing spoons using injection moulding machine.

### Name of Industry / Organisation

Endeavour Enterprise

### Type Of Industry / Organisation

Small

### Challenge Description with Context

We are the manufacturer of plastic spoon of 10ml of PP material using injection moulding machine. 16 spoons are produced in one stroke at a time as given in picture. Our per day production is 50000 pieces (3100 strokes avg) For separating out of spoon from runner manually is increasing manufacturing time. So, for increasing productivity we require one manual or automatic cutter through which in single stroke of the cutter, all 16 spoons should be separated out from the runner. Our per day production is 50000 pieces (3100 strokes avg) For separating out of spoon from runner manually is increasing manufacturing time. In single stroke of the cutter, all 16 spoons should be separated out from the runner. Cutter should be manually operated or automatically operated. In one minute cutter must operate more than two times for flexible working condition for operate. In cutter the cutting distance must be exact from the centre.

### What Exact Problem is being Solved?

They need to decrease the manufacturing time by reducing the spoon separation time from runner. Also they need to minimize the cost associated with labor required for sorting and separation. for increasing productivity we require one manual or automatic cutter through which in single stroke of the cutter, all 16 spoons should be separated out from the runner. Alignment of the finished product with runner must be exact.

### Users

Can use by pharmaceutical industries, Chemical industries and Public. It Can be also highly consumable by detergent making industries and house hold applications. It is also preferable by biological industries.

### Expected Outcomes

Our per day production is 50000 pieces (3100 strokes avg) For separating out of spoon from runner manually is increasing manufacturing time. In single stroke of the cutter, all 16 spoons should be separated out from the runner. Cutter should be manually operated or automatically operated. In one minute cutter must operate more than two times for flexible working condition for operate. In cutter the cutting distance must be exact from the centre.

### Potential Impact

They need to decrease the manufacturing time by reducing the spoon separation time from runner. Also they need to minimize the cost associated with labor required for sorting and separation. for increasing productivity we require one manual or automatic cutter through which in single stroke of the cutter, all 16 spoons should be separated out from the runner. All 16 spoons should be separated out from the runner.

### Probable Discipline

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH200

### Problem Statement

To establish heat treatment process for maximizing torque transmitting capacity of a shaft without any permanent deformation.

### Name of Industry / Organisation

Essential Power Transmission Pvt. Ltd.

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

To establish heat treatment process for maximizing torque transmitting capacity of a shaft without any permanent deformation. Shaft materials to be work with are 18CrNiMo7-6, 20MnCr5, En36, En24 and En9. The physical property of interest is toughness and endurance limit, which needs to be improved. Theses shaft are used in gear transmission systems where service life and high torque transmission are prime concern.

### What Exact Problem is being Solved?

For particular material by modifying its metallurgical structure its desire physical properties can be achieved within some constrained limits. The modification of these property can be achieved by heat treatment process. Shaft materials such as 18CrNiMo7-6, 20MnCr5, En36, En24 and En9 some of the frequently used materials among machine tool industries. Maximizing torque transmitting capacity of shaft is always desirable for any machine tool industry.

### Users

Users of this problems can be listed as almost all mechanical industries which are doing machining of rotating parts. These users can be MSME, small, Medium or Large Firm as scale of organization will not affect the problem.

### Expected Outcomes

One of the outcome may be an improved heat treatment cycle with its all operational parameters for specific material. The reduction of heat treatment cycle time having almost same physical properties as existing practice can also improve production rate. An alternate coating or modified machining cycle. An alternate heat treatment procedure apart from full hardening + austempering can also be suggested.

### Potential Impact

Upon finding solution for said problem, not only the our organization but mechanical industry as whole can benefited. The shorter (faster) heat treatment cycle can save time and money of an organization. The alternate cycle which can maximizing torque transmitting capacity of a shaft without any permanent deformation will increase life of shaft. The solution will not be constrained or limited to shaft only and applicable to other rotating components also.

### Probable Discipline

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH201

### Problem Statement

Design a stand to keep solar plate at appropriate angle for solar fence guard.

### Name of Industry / Organisation

Esukar Solution PVT. LTD.

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Solar plate when placed in farm it require specific arrangement for getting maximum output, but people are unaware of proper arrangement to place plate in farm, so if we can make stand such as it can be placed directly at proper angle, without any adjustment and for getting maximum output from it by placing at appropriate angle.

### What Exact Problem is being Solved?

1. To make stand for plate with appropriate angle which can be placed directly without any adjustment to angle.

### Users

For residential and industrial application of PV Solar.

### Expected Outcomes

To get maximum output from cell for every user those who are unaware of angle of solar plate.

### Potential Impact

Solar Fence gaurd can work properly due to this arrangement.

### Probable Discipline

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH202

### Problem Statement

Increase Production Capacity by 15% without buying new equipment.

### Name of Industry / Organisation

FCG FLAMEPROOF CONTROL GEARS (P) LTD.

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

Improve OEE upto 85% through 100% proactive Maintenance

- Improve the productivity through Preventive Maintenance
- Increase the life span of machinery by Reduced MTTR & Increased MTBF.

By developing such software Industries can get following benefits also,

- Protection of assets
- Increase equipment life span
- Improve system reliability
- Reduce cost of replacement
- Step up production

Software must have these features:

- List of Equipments with detailed specification.
- Equipment History Record.
- List of critical Spares of each machine with stock ledger
- Preventive Maintenance Scheduling/Monitoring/intimation / Auto reminders. (i.e. Reminders

are set to

notify the responsible users for any upcoming planned activities like PM, spare parts replacements, oil

change etc..)

- Equipment Breakdown Intimation/Tracking/Monitoring
- Break down analysis report (CAPA analysis, cost & time loss)
- MTTR & MTBF Monitoring (mean time to repair / Mean time between failures)

Solution bank/guide for regular faults.

· Dashboard: scheduled preventive maintenance, overdue schedule, unplanned breakdown, equipment downtime reports, MTTR & MTBF.

### What Exact Problem is being Solved?

Improve OEE upto 85% through 100% proactive Maintenance

- Improve the productivity through Preventive Maintenance
- Increase the life span of machinery by Reduced MTTR & Increased MTBF.

By developing such software Industries can get following benefits also,

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- Increase equipment life span
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- Reduce cost of replacement
- Step up production

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- List of Equipments with detailed specification.
-

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## Problem Statements

- Equipment History Record.
  - List of critical Spares of each machine with stock ledger
  - Preventive Maintenance Scheduling/Monitoring/intimation / Auto reminders. (i.e. Reminders are set to notify the responsible users for any upcoming planned activities like PM, spare parts replacements, oil change etc..)
  - Equipment Breakdown Intimation/Tracking/Monitoring
  - Break down analysis report (CAPA analysis, cost & time loss)
  - MTTR & MTBF Monitoring (mean time to repair / Mean time between failures)
- Solution bank/guide for regular faults.
- Dashboard: scheduled preventive maintenance, overdue schedule, unplanned breakdown, equipment downtime reports, MTTR & MTBF.

### Users

small and Medium scale industry, Manufacturing units, Plants needing Preventive maintenance.

The goal of a successful preventive maintenance program is to establish consistent practices designed to improve the performance and safety of the equipment at your property. Moreover, the planned maintenance of equipment will help to improve equipment life and avoid any unplanned maintenance activity

### Expected Outcomes

Software must have these features:

- List of Equipments with detailed specification.
  - Equipment History Record.
  - List of critical Spares of each machine with stock ledger
  - Preventive Maintenance Scheduling/Monitoring/intimation / Auto reminders. (i.e. Reminders are set to notify the responsible users for any upcoming planned activities like PM, spare parts replacements, oil change etc..)
  - Equipment Breakdown Intimation/Tracking/Monitoring
  - Break down analysis report (CAPA analysis, cost & time loss)
  - MTTR & MTBF Monitoring (mean time to repair / Mean time between failures)
- Solution bank/guide for regular faults.
- Dashboard: scheduled preventive maintenance, overdue schedule, unplanned breakdown, equipment downtime reports, MTTR & MTBF.

### Potential Impact

Preventive maintenance is an important part of facilities management. The goal of a successful preventive maintenance program is to establish consistent practices designed to improve the performance and safety of the equipment at your property.

Moreover, the planned maintenance of equipment will help to improve equipment life and avoid any unplanned maintenance activity. A successful preventive maintenance program is dependent on the cooperation of all the parties involved. Engineering managers must rely on the knowledge, ideas, and contributions of all the maintenance personnel at the property.

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

Unfortunately, the implementation of a preventive maintenance program can be time consuming and costly. This creates constant debate as to whether a preventive maintenance program is worth installing. Will all the man hours and money invested in the program outweigh emergency repairs? From our years of experience, we believe that when the program is properly operated the benefits exceed the costs.

Here are other important benefits of a properly operated preventive maintenance program:

Equipment downtime is decreased and the number of major repairs are reduced

Better conservation of assets and increased life expectancy of assets, thereby eliminating premature replacement of machinery and equipment

Reduced overtime costs and more economical use of maintenance workers due to working on a scheduled basis instead of a crash basis to repair breakdowns

Timely, routine repairs circumvent fewer large-scale repairs

Improved safety and quality conditions for everyone

### **Probable Discipline**

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH203

### Problem Statement

SOLAR STILL(convert saline water into potable water by solar and other aids.)

### Name of Industry / Organisation

Government Polytechnic, Navsari

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

Villages near Costal area having a problem of getting potable water and usable is high. By use of Solar Still device, conversion rate of distilled water from saline water is low. our challenge is to increase rate of quantity of distilled water from saline water by developing efficient solar still device.

### What Exact Problem is being Solved?

we can make low pressure inside solar still which will rise rate of evaporation. evaporated water is not condensing during a day time because of direct ray of solar. so condensation of water vapour is much due to low pressure. so it is isolated from device and will condense.

### Users

Village people around costal area.

### Expected Outcomes

High quantity of distilled water will be produced by new device mechanism.

### Potential Impact

User may be able to produce potable as well as usable water. so water consumption may be decrease.

### Probable Discipline

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH204

### Problem Statement

SOLAR PANEL CLEANING ISSUE

### Name of Industry / Organisation

Government Polytechnic, Rajkot

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

DUE TO DUST SETTLE ON SOLAR PANEL AND MOISTURE CONTENT IN ATMOSPHERE SETTLE ON PANEL, SOLAR RAYS CANT REACH ON SOLAR PANEL EFFECTIVELY , SOLE EFFECT OF THAT CONDITION IS REDUCE OVERALL PERFORMANCE OF SOLAR PANEL, IN ORDER TO GET BETTER PERFORMANCE OF SOLAR PANEL AND REDUCE THE PAYBACK PERIOD ,IT NEEDS TO CLEAN FREQUENTLY HENCE THE DESIGN IS PROPOSED TO PROVIDE PERIODIC CLEAN USING THE PROPOSED DEVICE.

### What Exact Problem is being Solved?

THE MEASURED PERFORMANCE OF SOLAR PANEL IS FOUND LESS THAN DESIGNED CONDITION DUE TO DUST SETTLE ON SOLAR PANEL AND MOISTURE CONTENT IN ATMOSPHERE SETTLE ON PANEL. THE PROBLEM IS IDENTIFIED AND SOLUTION IS PROPOSED WITH SOLAR CLEANING MECHANISM IN SUCH A WAY THAT REDUCE MAN POWER REQUIREMENT . THE MECHANISM IS PREPARED TO PROVIDE PERIODIC CLEANING OF SOLAR PANEL. IT UTILIZES THERMAL AND SOLAR RADIATION ENERGY.

### Users

INDIVIDUAL, INDUSTRY,HOSPITALS, HOTELS, RESTAURANTS, EDUCATION INSTITUTES, HOUSING SOCIETY, HIGH RISE BUILDINGS, SOLAR FARMS, SOLAR POWER PLANTS, RUFF TOP SYSTEM AT VARIOUS LOCATION , HIGHWAY AND FOREST ZONE LIGHTING.

### Expected Outcomes

THE PERFORMANCE OF SOLAR PANEL WILL IMPROVE BY THIS PROPOSED MECHANISM THAT REDUCE MAN POWER REQUIREMENT. LIFE OF SOLAR PANEL ALSO INCREASES. EFFECTIVENESS OF SOLAR PANEL IS ALSO IMPROVED BY PROPOSED MECHANISM. RELIABILITY AND DURABILITY IMPROVE BY REGULAR CLEANING. MANPOWER IS ALSO REDUCED BY PROPOSED MECHANISM. REDUCE PAYBACK PERIOD , REDUCE REQUIREMENT OF PERIODIC OBSERVATION OF SOLAR PANEL FOR DUST LAYER.

### Potential Impact

THE PERFORMANCE OF SOLAR PANEL WILL SOLVED BY THIS PROPOSED MECHANISM. LIFE OF SOLAR PANEL ALSO INCREASES. EFFECTIVENESS OF SOLAR PANEL IS ALSO SOLVED BY PROPOSED MECHANISM. RELIABILITY AND DURABILITY SOLVED BY REGULAR CLEANING. MANPOWER IS ALSO REDUCED BY PROPOSED MECHANISM AND INCREASE THE POWER GENERATION CAPACITY OF PANEL AND IN LONG TERM WILL SAVE HUGE AMOUNT OF MONEY AND CONSERVING THE ENVIRONMENT ISSUE.

### Probable Discipline

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH205

### Problem Statement

Development of Dust collector in manufacturing unit of ceramic industries otherwise Development of conveyor belt structure for removing dust inside plant

### Name of Industry / Organisation

Jai Ganesh Vitrified Pvt. Ltd.

### Type Of Industry / Organisation

Small

### Challenge Description with Context

The Ceramics industries in Morbi which is the second largest ceramic cluster in the world; that has generated huge employment for both skilled and unskilled labour. So most of workers worked in ceramic industries faces occupational health hazards due to dust particles. According to survey not only workers but also their family members and people living in surrounding area facing dust pollution and health related hazards and issues such as respiratory problems like asthma, cough, headache, shortness of breath, cough, skin problems etc. Some study also reveals that dust pollution may also cause lungs cancer. There is no any provision for collection of dust at present.

### What Exact Problem is being Solved?

The solution is development of new low cost dust collector which is manufactured with locally available material which can be afforded by small and medium scale ceramic industries. We know in developing countries like India we are continuously facing health issues due to lack of literacy and poverty. Most of workers from ceramic industry are not covered by any health insurance. For this our efforts are to develop cost effective, low maintenance dust collector for ceramic industry which collect dust generated at various stages of ceramics manufacturing & it can be reused.

### Users

In Ceramic Industries such as ceramic wall tiles manufacturers, vitrified floor tiles manufacturers, porcelain floor tiles manufacturers, sanitary ware manufacturers, ceramic crockery ware manufacturers, ceramic refractories and insulator manufacturers.

### Expected Outcomes

There are many workers facing respiratory problems like asthma, cough etc. Other facts observed during studies are as follows: 1. Most workers are suffered from headache, shortness of breath, cough. 2. And some people suffer from lungs cancer. So for them to Develop a dust collector which can be used in manufacturing unit of ceramics to reduce cost of maintenance and keep healthy environment.

### Potential Impact

To develop low cost , low maintenance dust collector for ceramic industry which Collecte dust generated at various stages of ceramics manufacturing, it Reduce in environmental pollution caused by dust & its reuse in ceramics manufacturing & Reduce structure maintenance in ceramic manufacturing units. So developing dust collector being benefiecial to reduce cost of maintenance and keep healthy environment.

### Probable Discipline

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH206

### Problem Statement

Automatic glass cleaning system for solar pv module for plate

### Name of Industry / Organisation

JJ PV SOLAR

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Solar PV cell gets dirty due to placed in open space, which reduce effectiveness / efficiency of solar plate. So, it is required to clean the plate regularly. Currently its been cleaned up by water injection manually. Wastage of water and man power requirement are the two main problem. But still it doesn't get clean properly, so their requirement is some automatic system which can clean the glass regularly by sensing dust.

### What Exact Problem is being Solved?

1. To make automatic dust cleaning mechanism with sensors, which can be placed easily on solar plate. 2.To make solar glass of such kind on which dust cannot stick and effectiveness / efficiency can also be improved.

### Users

In every industries and domestic application of Solar plates

### Expected Outcomes

Improved Efficiency of Solar PV cell.

### Potential Impact

More energy can be developed, and improved design can reduce wastage of water as well man power required for the maintenance of solar pv cell.

### Probable Discipline

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH207

### Problem Statement

Joining copper plate to aluminium plate using brazing or soldering without defects

### Name of Industry / Organisation

Keepsake Engineering Consultancy Pvt. Ltd.

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Electrical and thermal conductivity of copper is slightly lower than silver but about one and a half times that of aluminium. For many industrial applications we have to weld, braze or solder copper with aluminium. But, because of the high difference in the thermal conductivities of the two metals, brazed or welded joints will have defects like improper fusion, penetration and may be other defects like porosity.

Some ways must be devised for successful welding and brazing of copper and aluminium.

### What Exact Problem is being Solved?

Brazing and soldering are the metal joining processes to join two different metals. Because of the high difference in the thermal conductivities of the two metals, brazed or welded joints will have defects like improper fusion, penetration and may be other defects like porosity

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### Users

Pharmaceutical industries , Petrochemical industries, pressure vessel manufacturing industries, fabrication industries, heat exchanger manufacturing industries, food processing industries .

### Expected Outcomes

The expected outcome or the solution to the problem will result in soldered or brazed joint of copper and aluminium plates with proper fusion, better penetration and reduced defects like porosity.

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### Potential Impact

The method/procedure suggested as a solution can be very useful to the brazing and soldering application widely used in different industries like Pharmaceutical industries , Petrochemical industries, pressure vessel manufacturing industries, fabrication industries, heat exchanger manufacturing industries, food processing industries. .

### Probable Discipline

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH208

### Problem Statement

Improve Weld penetration in MIG process by changing shielding gas

### Name of Industry / Organisation

Keepsake Engineering Consultancy Pvt. Ltd.

### Type Of Industry / Organisation

Small

### Challenge Description with Context

MIG (GMAW) welding is welding with shielding gas and a solid wire electrode which produces a clean, slag-free weld without the need to continually stop welding to replace the electrode, as in Stick welding. Penetration control in MIG is critical. As heat input being constant, changes in shielding gas can help in improving fusion depth and uniformity. Different shielding gases like Argon, Argon-Carbon Dioxide and Argon-Helium can be used.

### What Exact Problem is being Solved?

Weld penetration in MIG welding depends on number of parameters. One of the significant parameter is the type of shielding gas used in the process. By varying the shielding gas with the same heat input penetration can be controlled. Here, Variation in fusion depth and weld uniformity are required to be improved. .

### Users

Pharmaceutical industries , Petrochemical industries, pressure vessel manufacturing industries, fabrication industries, Shipbuilding industries. .

### Expected Outcomes

It is expected that, the solution suggested will maintain the weld parameters as per WPS (welding Procedure Specifications) yet achieve the perfect weld joint by improving Variation in fusion depth and weld uniformity.

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### Potential Impact

The obtained solution can be very useful to the MIG welding in wide range of application in different industries like Pharmaceutical industries , Petrochemical industries, pressure vessel manufacturing industries, fabrication industries.

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### Probable Discipline

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH209

### Problem Statement

Increasing the efficiency of the blasting shop & Improving Components Quality.

### Name of Industry / Organisation

KHS Machinery Pvt.Limited

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

In KHS we are using shot blasting process for SS and Mild Steel components. At present set up is meant separate for both material. In SS Grit blasting the big challenge is of collection of grit after blasting operation. This reduces the blasting shop efficiency as it is time consuming to collect grit. There is a scope of improvement in blasting shop throughput and improving component quality.

Increasing the efficiency of the Blasting shop and Improving Components quality.

### What Exact Problem is being Solved?

In KHS we are using shot blasting process for SS and Mild Steel components. At present set up is meant separate for both material. In SS Grit blasting the big challenge is of collection of grit after blasting operation. This reduces the blasting shop efficiency as it is time consuming to collect grit. There is a scope of improvement in blasting shop throughput and improving component quality.

In SS Grit Blasting the big challenge is of collection of grit after blasting operation.

### Users

All mechanical company using sand blasting operation. it is useful for casting and forging industry also. It is also useful for painting industry. It is useful for filling and packaging industry.

### Expected Outcomes

Increase efficiency of sand blasting operation. improve quality of blasting components. better workmanship. saving of grit during blasting operation.

### Potential Impact

Improve quality of components. better surface finish. improve productivity. optimize use of grit in blasting operation. Increase efficiency of sand blasting operation. better workmanship.

### Probable Discipline

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH210

### Problem Statement

Setting up a mechanism for predictive maintenance for utility equipment's like pump, compressors, cranes etc.

### Name of Industry / Organisation

KHS Machinery Pvt.Limited

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

In Machine shop many equipment's are required for preventive maintenance. KHS as well defined preventive maintenance schedule. Still some sudden break down observed. KHS is interested to find solution as predictive maintenance along with preventive maintenance. It helps to run plant machinery without shut down. For predictive maintenance need data for periodic maintenance and real operating condition

### What Exact Problem is being Solved?

KHS as well defined preventive maintenance schedule. Still some sudden break down observed. KHS is interested to find solution as predictive maintenance along with preventive maintenance. In Machine shop many equipment's are required for preventive maintenance. It helps to run plant machinery without shut down.

### Users

All mechanical Industries which are using utility equipment's.

Filling an Packaging industries. Painting industries.

### Expected Outcomes

Setting better mechanism for predictive maintenance for utility equipment's like pump, compressors, cranes etc. It helps to run plant machinery without shut down.

### Potential Impact

Increase service life of all utility equipment's. to avoid sudden breakdown of machines. Efficient utilization of utility equipment's.

It helps to run plant machinery without shut down.

### Probable Discipline

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH211

### Problem Statement

Elimination of blowholes and porosity casting defects from heavy casted flanges made up of cast steel CO2 Sand casting operation

### Name of Industry / Organisation

Kirti Alloys Steel Cast

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Elimination of blowholes and porosity casting defects from heavy casted flanges made up of cast steel by CO2 Sand casting operation is needed. Many casting defects originate during pouring and filling because of interactions between molten metal and air. As metal flows from the ladle through the pouring basin, sprue, runner, and into the mold, oxide films, air bubbles, and gas from cores can be entrained and degrade casting appearance and properties

### What Exact Problem is being Solved?

Inspection of the castings showed that shrinkage porosity and blowholes was developing in the heavy casted flanges at intersection of flange and hub. Elimination of these casting defects by means of design modification or process parameter modification or both can be carried out. This is to be done in order to improve casting appearance and physical properties. As Large shrinkage cavities can undermine the integrity of the casting and may cause it to eventually break under stress

### Users

Users of this problems can be listed as Sand Casting foundries and its allied casting design firms. These users can be MSME, small, Medium or Large Firm as scale of organization will not affect the persistent problem.

### Expected Outcomes

One of the outcome may be some means of ability to watch metal flow into a mould as an aid to understanding and eliminating defect formation. Development of computer simulation methodology to address specific casting process and solidification of particular material. Casting Design modification strategy and process parameter values to eliminate defect. Step by step systematic casting making instructions.

### Potential Impact

Upon finding solution for said defects elimination, the company can reduce their rejection rate, reduce scape, reduce waste time, increase production rate and increase productivity. The product will have good casting appearance and better mechanical properties. The company might have to improve their production and design methods which lead them to cope up with the recent market and technology demands in order to thrive and survive in competitive environment.

### Probable Discipline

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH212

### Problem Statement

To develop an Attachment for Machining of Angular (Y-Type) Pneumatic Valve on Lathe Machine

### Name of Industry / Organisation

M/s. BHOOMI ENGINEERING

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Difficult to hold angular shaped pneumatic valve on lathe machine which is being used in u type Jet Dyeing machine used in Textile industry for its maintenance or resizing. To be specific these problem is being taken by a very small scale workshop having 3-4 lathe machines, grinding machine etc. After considerable working period the valve internal tapping will be worn out which lead continuous leakage of steam in turn the energy loss and loss of money. To avoid this situation refinishing and resizing process of internal groove has been done on the valve.

### What Exact Problem is being Solved?

Development of some holding device or attachment on lathe machine for Angular or Y - type of pneumatic valve for it's maintenance is essential as after long time of its usage in adverse industrial environment this air control valves are not being worked accurately due to worn out internal tapping which leads to disturbance in process parameters, directional flow and rate of flow due to leakage of working fluid-steam. If the pneumatic valve is too big for the application, there will be the problem of wasting air and money. If it's too small, the actuator will not function properly. Hence reconditioning of pneumatic valves becomes essential to retain its functional parameters.

### Users

All mechanical workshop who deals with the re powering, refinishing, resizing or mechanical maintenance of various mechanical parts like valves, pumps, threads, shafts, crank shaft, cam shaft, engine block, barrel, piston, cylinders, key ways etc..

### Expected Outcomes

Development of such attachment, device or fixture which can able to hold the angular valve/ Y -type pneumatic valve which is been loaded on Lathe machine chuck to make possible it to keep in position during various mechanical operations like tapping, threading, lapping, resizing to regain the original dimensions of the pneumatic valve, to ascertain that the solution provide accurate functionality in a very consistent and unfailing manner.

### Potential Impact

It will be useful for small scale industry to do various mechanical operation using lathe machine on Angular or Y - type of pneumatic valve precisely which can ascertain accurate functionality in a very consistent and unfailing manner while being used in hard-wearing and work in adverse industrial situations which are highly corroding at every process plant in this case for Jet Dyeing machine used in textile industry.

### Probable Discipline

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH213

### Problem Statement

Selection of materials for worm and worm wheel gears such that the manufacturing cost of the gears may be minimized.

### Name of Industry / Organisation

National motors mfg. co

### Type Of Industry / Organisation

Small

### Challenge Description with Context

The National motors and Gears is the manufacturer of motors and Gear situated at Sachin, Surat. It is problems on the raw material cost for the production of gears. The company is using currently 20MnCr50 for worm shaft and PB2 i.e. Phosphorus Bronze). The worm shaft is case Hardened 55 to 60 HRC with 0.9 to 1.0 mm case depth. In this process the used material has higher cost. Hence the company face hike in the total costing of gears. Therefore it is required that it can be replaced with some low cost material which can lower the total costing.

### What Exact Problem is being Solved?

The company is using currently 20MnCr50 for worm shaft and PB2 i.e. Phosphorus Bronze). The worm shaft is case Hardened 55 to 60 HRC with 0.9 to 1.0 mm case depth. In this process the used material has higher cost. Hence the company face hike in the total costing of gears. Therefore it is required that it can be replaced with some low cost material which can lower the total costing. Further it also required the exact reason for the the new replaced material for its application as a good replacement of currently used material.

### Users

All the gear and motors users which includes mechanical, electrical auto mobile industries. Further it also affect the home appliances industries where small gear systems are used as an assemble components.

### Expected Outcomes

The total cost of gear production will decrease if the problem can be resolved. Which ultimately affect of the gear using products applicable in mechanical, electrical, automobile and home appliance industry.

Thus for the problem though on direct observation found related to mechanical industries, but it is not limited to the single boundary, it is has impact on multi discipline. The solution of the problem may release many limitation on production/manufacturing and make enable to the company to sustain in markets against the cheap but lower quality products.

### Potential Impact

The suggested appropriate solution will fulfill the requirement of the company and hence provides a cheap alternate on manufacturing side. Hence it has potential impact on products applicable in mechanical, electrical, automobile and home appliance industry. it is has impact on multi discipline. Some low cost material is sought to be there to reduce the total costing. The financial decrease in on manufacturing side will be beneficial for the manufacturer as well as the user of the product.

### Probable Discipline

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH214

### Problem Statement

Alternative arrangement for reducing neogrit consumption in drier with some mechanical process for Aviko ball scanning machine.

### Name of Industry / Organisation

NHB BALL & ROLLER LTD

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

Aviko is a ball scanning machine which required clean and nett balls to scanning the ball inspection up to 100%. In the ball manufacturing, after the grinding process, lapping process has been performed. as in aviko machine, the centrifugal drier is using neogrit material for drying agent. The consumption of this neogrit is too high in single lapping which reduces the accuracy of surface finish and also increasing cycle time and productivity is decreased. so another method for reducing the consumption of neogrit in the drier with some mechanical process is acceptable.

### What Exact Problem is being Solved?

In the ball manufacturing, the surface finish is essential quality to be required. During lapping process in the aviko machine, drying of ball must be in good quality. The drying agent neogrit consumption is very high in single lapping process. As a result the cost of drying agent is increased and cycle time is also increased. Which reducing productivity. If some another alternative is used in lapping process in such a way that the consumption is reduced than it will increase the productivity.

### Users

Balls are considered as per one of the most important rolling elements in the bearing. Any rotation which we can see around starting from simple fan to scooters, cars, trucks, domestic application like mixture, washing machine, grinder, heavy earth moving equipment trucks and defense equipment like tanks. This is a very important fact that nothing can rotate without bearing and balls are one of the important elements in rotating ball bearing.

### Expected Outcomes

The geometrical parameter for ball must be maintained during lapping process. The ball should be net and clean with good surface finish with acceptance of 100 percentage in aviko machine. Consumption of neogrit material as a drying agent is minimum. The cycle time should be minimum so that productivity is increased. Lapping operation should give the balls as a bright finish, compact surface and tolerance required by the customer.

### Potential Impact

By means of this process of lapping the surface finish in the ball should be in good quality and geometrical and design parameter of the ball should be maintained. So the rejection ratio of the products in aviko machine should be minimized. The cycle time of process in lapping and aviko machine with centrifugal drier is also decreased and the drying agent neogrit consumption is also reduced. Which increased overall productivity.

### Probable Discipline

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH215

### Problem Statement

Implementation of Value stream mapping in drill manufacturing industry

### Name of Industry / Organisation

P Parmar Drill Machine

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

Store department is very important in any organization, In P'Parmar Industry They keep details of Raw material, Scrap and Stock in store department. In P'Parmar there is no arrangement to keep Raw material safe and also there is no stock department. As there is no stock department and machines are at long distance, it consumes more time and cost of production. Workers have to face many problems to work. There is also no arrangement of keep Product material after machining and its kept on workplace of worker so worker can feel very bad to work and there is also trouble in making of assembly. Machine lay-out is very important to increase productivity and decrease production cost and also production time. In P'Parmar Ind. right machine arrangement is required.

### What Exact Problem is being Solved?

DETAILED DESCRIPTION OF PROBLEM STORE: Store department is very important in any origination, In P'Parmar Industry They were kept detail of Raw material, Scrap and Stock in store department. RAW-MATERIAL: In P'Parmar there is no arrangement of Raw material to kccp safe and also there is no stock department of stock, There for Machining of Raw material consume more time because of machine's are at long distance so it will turn in to more production cost due to there is no stock department. Worker has to face many problems to work PRODUCT MATERIAL: There is also no arrangement of keep Product material after machining an it also kept on workplace of worker so worker can feel very bed to work and there is also trouble of making of assembly. Machine lay-out is very important to increase productivity and decrease t production cost and also production time. In P'Parmar Ind. There is not right a way to arrange a machine.

\*EXample

After the milling process there is a odd a arrangement of process and not to fix for work piece to which way to go so it will turning to more production time and high production cost and due to the incomplete foundation the machine there are less accuracy and efficiency There is no acCurate Foundation of machine in this industry. So during the Machining. Machine was vibrating so it refers to make right foundation of all machines in this Industry. Worker has to wait long time for fluid and coolant because a there is a Do space of to store fluid and coolant and it will change in high production cost. In this Industry is not work for 3 shifts. So product will not make in right quantity then company not achieve its product target so it be come customer complain and can not take new order There is no arrangement in of Recycling of fluid and coolant and also the fluid in Industry. Is very poor quality if Industry use will recycling fluids then it reducing production cost. The casting are use for to make a product are taking from long distance so it will consume more time For painting there is not sufficiency machine. so it consume more time to consume a more product

### Users

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

Manufacturers Customers

### **Expected Outcomes**

productivity improvement by implementation of Value stream mapping

Due to use of value stream mapping we can improve process ability and reduce materials movement to reduce the loss of profit

### **Potential Impact**

Due to use of value stream mapping we can improve process ability and reduce materials movement to reduce the loss of profit

### **Probable Discipline**

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH216

### Problem Statement

COMPANY MANUFACTURING A CYLINDRICAL GRINDING MACHINE. COMPANY IS FACING PROBLEM OF NOT GETTING UNIFORM DIAMETER ACROSS THE LENGTH AFTER GRINDING OPERATION.

### Name of Industry / Organisation

PITRODA UTILITY INDUSTRIES

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

NOT GETTING UNIFORM DIAMETER ACROSS THE LENGTH

### What Exact Problem is being Solved?

LINEARITY OF CENTER

STRAIGHTNESS OF GUIDEWAY

### Users

VARIOUS MANUFACTURING INDUSTRIES

### Expected Outcomes

ACCURACY OF MACHINE WILL BE INCREASED

### Potential Impact

VALUE OF THE MACHINE WILL BE INCREASED

### Probable Discipline

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH217

### Problem Statement

Company is manufacturing a cylindrical grinding machine. Company is facing problem of backlash error in their feed wheel

### Name of Industry / Organisation

Pitroda utility industries

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

Backlash error in feed wheel

jerk in table while sliding.

### What Exact Problem is being Solved?

Removal of backlash error

### Users

Various manufacturing industries

### Expected Outcomes

Zero backlash error in feed wheel

### Potential Impact

Smooth running of feed wheel.

no jerk while operating feed wheel.

### Probable Discipline

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH218

### Problem Statement

Sometime automatically change distance between two rollers.

### Name of Industry / Organisation

Powertrac packaging Private Limited

### Type Of Industry / Organisation

Small

### Challenge Description with Context

We visited powertrac packaging industry. This industry have a lots of machine like die punching machine colour printing machine etc. Operators are facing such type of problem like automatically rised pressure between two roller minimum requirement to operate this machine is 400 degree centigrade. When operator is working on this machine roller pressure too high and our packages to thin so product strength is low it cannot be carried high load.

### What Exact Problem is being Solved?

We are trying to solve this problem like,we can change a pressure between two rollers we will replace manually with hydraulic or pneumatic system. If we used hydraulic jack to solve this problem may be maintain proper distance between two roller. And also Create hole in cover by using drill machine and use nut and screw to fix this roller. So hydraulic system is a suitable for machine because it's easily to maintain distance between two roller.

### Users

operators name is narrotam bhai and their contact number is 9904826930.

This machine is manually but industry modified this machine and convert into CNC machine and also required minimum 400 degree centigrade to operate this machine.And half looks glue while that doesn't look half.

### Expected Outcomes

Whatever changes we have made in view of the problem "how to solve any problem related to industry or machine."also can be said "problem based learning". Also increase industry's productivity and easily maintain distance between two roller with hydraulic Jack in low cost. .

### Potential Impact

After we change,it may be accurate more than for old mechanism,and more work can be achieved at a lower cost. Required hydraulic Jack maintenance and fluid for hydraulic Jack.The method is closely related to some of the methods used in identifying potential faults in complex systems.and easily maintain distance between two roller with hydraulic Jack.

### Probable Discipline

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH219

### Problem Statement

Design and fabrication of Compact Solar Desalination System for Arid Region of Gujarat

### Name of Industry / Organisation

PRUTHVI SOLAR ENERGY

### Type Of Industry / Organisation

Small

### Challenge Description with Context

It is very difficult to find the standard parameters which are affecting the design of solar desalination system. In the experiment result of solar still, different parameters like glass angle, depth of water in basin and wind velocity are studied but the output of the system was found very less.

It is possible to find out the other effective system for the solar desalination which will give better output. Solar desalination system will play very crucial role in the smart city project.

### What Exact Problem is being Solved?

Design and fabricate a compact solar desalination system.

Solar water heaters are available in market with different standards. It is available with 250 litres capacity with the price of 15000 Rs. Solar water heaters with different capacity are also successfully installed and giving better results. Same thing is possible for compact solar desalination system.

It is very challenging thing to design an effective and compact solar desalination system for arid region of Gujarat.

### Users

1. Domestic need of arid and oceanic region of Gujarat
2. Hospitals need for drinking water and other medical use.
3. Automobile Industries need for cooling water and battery charging
4. Small offices
5. Research work

### Expected Outcomes

- Produce low cost distil water for some industrial need.
- Increase the use of low grade energy for desalination.
- Provide maintenance free desalination plant for the arid and oceanic region.
- It is also useful for medical need.
- It can use locally available materials.
- It is an environment friendly technology.
- We can use local peoples and machinery for fabrication.
- Solar thermal technologies can play very important role.

### Potential Impact

- It will give low cost drinking water using environment friendly technologies.
  - Reduce the need of huge infrastructure for supply of drinking water.
  - Reduce the frequent maintenance of the system.
  - The agricultural and industrial growth will increase.
  - The need of electricity will decrease.
  - Balance growth of each part of state is possible.
-

# **Smart Gujarat For New India Hackathon 2019-20**

## **Problem Statements**

- Low cost and maintenance free system can be developed

### **Probable Discipline**

Mechanical Engineering

# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH220

### Problem Statement

To develop an material selection process for die and punch to cut hollow section H.R grade tubes.

### Name of Industry / Organisation

SARJAN INDUSTRIES

### Type Of Industry / Organisation

Small

### Challenge Description with Context

We are unable to define appropriate material of die punch to cut hollow section H.R grade tubes.

- Ø Die punch material ?
- Ø Hardening & tempering issue ?
- Ø Quality of die punch material ?
- Ø Improve design of die punch ?

The objective of this project is to develop an material selection process for die and punch based on theory and practical knowledge so result will be in line with expectation.

### What Exact Problem is being Solved?

A die is a specialized tool used in manufacturing industries to cut or shape material mostly using a press. Like molds, dies are generally customized to the item they are used to create. Products made with dies range from simple paper clips to complex pieces used in advanced technology. The selection of proper materials is fundamental to engineering design. Engineering materials are many hence a formalized selection process is required to select a reliable material for die.

### Users

same industry and other industry which are using pipe cutting and bending product industry like automotive industry. Pulp and paper industry. Steel industry. Shipbuilding industry.

Aerospace industry. Defense industry

### Expected Outcomes

The outcomes are the changes or results that the organization expects to be achieved after the successful completion of this issue. The outcomes could be qualitative many die parameter affect the quality of sheet metal like die radius co effeciant of friction punch radius die and punch clearance, bend allowance and many more.Engineering materials are many hence a formalized selection process is required to select a reliable material for die.

### Potential Impact

after solving of this issue quality of the product increase drastically and industries can get its advantage in production of same product. Its reputation is increasing in market and can improve quality of product along with production rate. Also industries can increase its profit level. They can reduce production time for manufacturing of the product so manufacturing cost of product become economical. Punch and die life can be also increased by proper selection of material.

### Probable Discipline

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH221

### Problem Statement

To develop a mechanism to maintain constant travel velocity of welding rod and maintain constant arc gap for Arc welding process.

### Name of Industry / Organisation

Tandel Engineering

### Type Of Industry / Organisation

Small

### Challenge Description with Context

In arc welding process depending on the machine control, phase, road material and strength required, the velocity of welding road with respect to the fixed plate and arc gap bet<sup>n</sup> welding road and plate is predetermined. In manual operation to maintain such a predetermined state of process throughout the whole welding joint is extremely problematic. Device must include the fixture of welding road with feeding mechanism of welding road towards the plate as the road is get consumed through the process and it also maintain the constant travel of welding road with constant gap bet welding road and plate throughout the joint.

### What Exact Problem is being Solved?

In manual arc welding process to control over a constant working condition is practically impossible. Any skilled worker cannot achieve the same constant velocity of welding road and cannot maintain the exact same gap bet<sup>n</sup> the welding road and the plate while perform the welding operation. When velocity of welding road is higher and gap between the welding road and the plate is increased, there will be shallow penetration in the material and thin welding joint is formed, vice versa. In the mechanism velocity of welding road and arc gap will be maintained constant during the joint, so the strength produced in the welding joint is uniform.

### Users

Mechanism can be useful in the all fabrication industries where the strength and accuracy are required in the welding joint. Mechanism is valuable in automobile sector, Agriculture equipment manufacturing, Pressure vessel manufacturing industries, Ship construction industries etc.

### Expected Outcomes

Better Accuracy and strength are achieved by using this mechanism since constant velocity of welding rod and constant gap between the road and the plate is achieved. As the constant gap between the welding road and the plate is achieved by this mechanism, the various defect like blow holes, cracks or void formation can be reduced. The penetration of weld road will remain constant throughout the welding joint which create uniform weld joint.

### Potential Impact

By means of this mechanism the weld time for welding operation is predetermined straightforwardly as a result job sequencing will be easy and flexible. By automatic feeding mechanism the effort required by any worker will be minimized therefore accuracy of welding process is increase. Productivity of organization is increased with the better accuracy of work. As the welding joint produced using this mechanism is uniform throughout, the consumption of welding rod is decreased which ultimately minimize the costing.

### Probable Discipline

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# **Smart Gujarat For New India Hackathon 2019-20**

## **Problem Statements**

Mechanical Engineering



# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH222

### Problem Statement

Need to optimize the stroke length of the Ejector of a plastic Injection Moulding Machine.

### Name of Industry / Organisation

UMA ENGINEERING

### Type Of Industry / Organisation

MSME

### Challenge Description with Context

We make many types of engineering plastic products in plastic injection moulding machine. In plastic injection moulding machine due to limit of EJECTOR STROKE we can not eject the job fully out from cavity inspite of job is in plastisizing capacity. e.g.- Consider that our machine plastisizing capacity is of 60 gm and ejector stroke length is of 50 mm. Now we want to make a job of 40 gm and it's length is 70 mm, So our machine is capable weightwise to mould this job of 40 gm, but lengthwise is not possible to eject the job from cavity due to short stroke length of ejector. Therefore 20 mm job will remain in cavity and job shall not fall down due to stroke limit of ejector. This is the problem of ejector.

### What Exact Problem is being Solved?

Exactly our problem is being solved about plastic injection moulding machine ejector. Because of ejector we can not eject under machinability safe product. At that time product is made under maximum machine mould filling capacity but cause of high lenght of product, so product is not ejected from plastic injection moulding machine mould cavity, because of ejector stroke length is fix as machine capacity.

### Users

After solving this problem, users not needs to eject workpiece manually from plastic injection moulding machine mould cavity. This solution save users time and give some rest to operator during two cycle of moulding process.

### Expected Outcomes

By solving this problem we can able to save time and make more production in less time. With solving this problem we can able to make many types of longer job in one machine without using another big machine or other machining process. By solving this problem we can make our machinery more efficient, perfect and capable. After solving this problem we can able to make human resource more powerful, because of the job is not eject manually form mould cavity.

### Potential Impact

After solving this problem, we can receive many types of potential impact. e.g.- After solving this problem we can able to make our machinery more perfect, more capable to eject many types of job which is not eject from mould cavity automatically, because of more job length. Ejector stroke length is not sufficient to eject long job, so we can able to eject longer job from mould cavity. Then after solving this problem, we can able to make our machinery more speedy and more latest.

### Probable Discipline

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH223

### Problem Statement

To reduce air formation from ammonia during operating condition of VCR system for enhance the cooling effect.

### Name of Industry / Organisation

Umiya Ice Factory

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Ammonia refrigeration is one of the older types of refrigeration that is still used today. While the average person doesn't realize it, just about all food and drinks that are purchased have been kept cold using ammonia refrigeration at some point along the way. This is because it is a reliable and efficient refrigerant with years of safe, proven utility, While ammonia is not commonly used in air conditioning units anymore, it is still very common for cold storage of food and in many industries that require this type of cooling. Today ammonia is mostly used for larger scale cooling requirements such as college campus dorm room air conditioning, large office buildings, hospitals, airports, hotels, and more.

Actually in ice plant, there is a vapour compression cycle ,in which ammonia is being used as refrigerant , by using mathematical calculation , students has to calculate the optimum pressure and temperature values, for this particular problem . which gives the boundary values. Means pressure and temperature must not be fall below the calculated values. Otherwise air formation would start and air will accumulate at the top portion of circuit pipe line , means it will deteriorate the performance of VCR

### What Exact Problem is being Solved?

Actually in ice plant, there is a vapour compression cycle ,in which ammonia is being used as refrigerant , by using mathematical calculation , students has to calculate the optimum pressure and temperature values, for this particular problem . which gives the boundary values. Means pressure and temperature must not be fall below the calculated values. Otherwise air formation would start and air will accumulate at the top portion of circuit pipe line , means it will deteriorate the performance of VCR

### Users

Water Chilling Plant  
Brine Chilling Plant  
Cold Storage  
Deep Freezing Chamber  
Gas Liquification Plants  
Ice Plant  
Freezing Complex  
Dairy farm  
beverage factory  
vegetable freezing plant  
chemical storage,  
CO2 liquefaction freezing complex,  
Fisheries etc.

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Expected Outcomes

Optimum pressure value

Optimum temperature value

safety of operator will be ensured

operating cost reduction of refrigerant

save in electricity bill

overall operating cost reduction

get more profit on product

It will give standard guide line to operator for performing safe operation for whole ammonia plant.

Less number of attendant are required for same plant

overall efficiency will increase

Increase ease of operation

### Potential Impact

optimum values of pressure and temperature for particular ammonia plant will be finalized.

Results will help in safety point of view.

it will also give standard guide line to operator for performing safe operation for whole ammonia plant.

Required refrigerant quantity can be also minimized with solution of the same problem.

ultimately it will cut down the price of required refrigerant.

Less number of attendant are required for same plant

### Probable Discipline

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH224

### Problem Statement

To reduce Production Cost and Production time of Electro Discharge Wire Cut Machine used for die making.

### Name of Industry / Organisation

Varniraj Wire Cut

### Type Of Industry / Organisation

Small

### Challenge Description with Context

In the electro discharge wire cut machine, when there are many jobs to be made of same dimensions, time required to make a die is the key factor. If the time required to make the die is very large than the overall production time increases accordingly. Which eventually affects the overall production cost and overall production time.

This is even bigger issue if the industry is a small industry. In this problem, the industry is small and hence we are trying to reduce the production time and production cost.

### What Exact Problem is being Solved?

The actual problem is related with the preparation of die. Wire cut process is very slow. If a block of 50x50 mm is required to be cut from a raw material of 200x100 mm size, it takes 5 hours to prepare a die.

Here we are making an effort to cut that 50x50 block from raw material of 200x100 mm size in minimum possible time with changes in program. Also accuracy up to 10 micron is desirable during the process.

### Users

Many industries, small and large in the area around Udhna GIDC in Surat requires such parts with higher accuracy in dimensions and complex shapes. Many textile industries from Sachin and Udhna areas of Surat are also regular users.

### Expected Outcomes

A program and design of the die which will save time in preparation and will offer accuracy around 10 microns.

Right now the time required to make a die is 5 hours. Even if the corners of the raw material are used, the time required remains 2 hours.

The 50x50 block from raw material of 200x100 mm size in will possibly be cut within an hour with changes in program. Also accuracy up to 10 micron is desirable during the process.

### Potential Impact

The industry owner is losing customers and failing to fulfill orders timely. If the solution works fine, the time of preparing the die will be reduced to half. This will reduce the overall production time of the small industry and eventually it will decrease the production cost. This will be a huge boost up for a small industry. It might increase its number of customers and at the same time it will increase the number of jobs prepared.

### Probable Discipline

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH225

### Problem Statement

Overcome the problem of bending of strip due to punching of slots in power press

### Name of Industry / Organisation

Vianci Enterprise

### Type Of Industry / Organisation

MSME

### Challenge Description with Context

The problem is related to the punching of multiple slots at equal intervals cut by punch press on a metal strip. Different thickness of strips are being punched at one of the edges of strip using die and punch on a punch press. As the strip passes after punching, the strip bends towards one of the sides. The video shows the punching press used for the operations .

### What Exact Problem is being Solved?

Due to the bending of strips, after the punching operation, it requires straightening of strips. This leads to the extra work and addition time required for straightening of strips .

### Users

Manufacturing industries, Fabrication industries, Sheet metal industries, Automobile industries, Metal furniture industries

### Expected Outcomes

To avoid the problem of bending, an universal attachment, on the existing punching press, is required to minimize the bending of strips irrespective of size and thickness of strips.

### Potential Impact

The solution of the problem will result in Saving of energy, unproductive time and human effort in the Manufacturing industries, Fabrication industries, Sheet metal industries, Automobile industries, Metal furniture industries.

### Probable Discipline

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH226

### Problem Statement

DESIGN AND FABRICATION OF HUMAN POWERED TREADMILL TRICYCLE

### Name of Industry / Organisation

Zenn System, Ahmedabad

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Exercise is inevitable to keep health in good status. In this project we study the treadmill exercise outdoor and their effect on health. Also we enlisted the advantages and disadvantages of treadmill cycle exercise. One of the most popular types of home as well as outdoor exercise equipment is the treadmill cycle, which provides a straightforward, efficient aerobic workout. For many, treadmills are a good choice to begin a new exercise routine because walking is well tolerated by most individuals regardless of fitness level and for most back conditions. As strength and endurance are developed, the treadmill bicycle can be used for jogging or for interval training. The modern challenge faced with the global energy situation is the growing energy demand and the strong dependence on unsustainable fossil fuels. Another concurrent issue is the adverse health and socioeconomic implications of adult obesity. Human Power Generation, which uses metabolized human energy to generate electrical power, could potentially address both these challenges. The treadmill, one of the most popular exercise machines, presently consumes large amounts of energy while dissipating a majority as heat. The purpose of this thesis project was to design and develop a human powered treadmill generator and determine its power generation potential. A heavy duty rechargeable battery pack was used to store the generated energy and additional components to measure the generated power were included. Supporting power is produced by battery which is charged by movement of cycle and solar energy.

### What Exact Problem is being Solved?

DESIGN AND FABRICATION OF TREADMILL TRICYCLE - Design and Fabrication of Treadmill Cycle with Solar Charging Option

Human Power Generation, which uses metabolized human energy to generate electrical power, could potentially address both these challenges. The treadmill, one of the most popular exercise machines, presently consumes large amounts of energy while dissipating a majority as heat. The purpose of this thesis project was to design and develop a human powered treadmill generator and determine its power generation potential. A heavy duty rechargeable battery pack was used to store the generated energy and additional components to measure the generated power were included. Supporting power is produced by battery which is charged by movement of cycle and solar energy.

### Users

One of the most popular types of home as well as outdoor exercise equipment is the treadmill cycle, which provides a straightforward, efficient aerobic workout. For many, treadmills are a good choice to begin a new exercise routine because walking is well tolerated by most individuals regardless of fitness level and for most back conditions. As strength and endurance are developed, the treadmill bicycle can be used for jogging or for interval training. The modern challenge faced with the global energy situation is the growing energy

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

demand and the strong dependence on unsustainable fossil fuels. So People used tread mill for exercise simultaneously it charge the cycle .It can be use by people who have to do regular exercises on treadmill.

### Expected Outcomes

Human Power Generation, which uses metabolized human energy to generate electrical power, could potentially address both these challenges. The treadmill, one of the most popular exercise machines, presently consumes large amounts of energy while dissipating a majority as heat. The purpose of this thesis project was to design and develop a human powered treadmill generator and determine its power generation potential. A heavy duty rechargeable battery pack was used to store the generated energy and additional components to measure the generated power were included. Supporting power is produced by battery which is charged by movement of cycle and solar energy.

### Potential Impact

Save Energy

Exercises Equipment

Mobile application Vehicle design

By designing such kind of equipment we can save the energy as well as we can solve the purpose of exercises. This type of vehicle can be used for mobile application of transportation. We can add the heavy duty rechargeable battery pack and store the energy also which we can use for other applications also.

### Probable Discipline

Mechanical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH227

### Problem Statement

Washing pump is bulky and it needs to be dragged to washing station, and every time water connections are to be done.

### Name of Industry / Organisation

Dr J N Mehta Government Polytechnic, Amreli

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

A solution is required for transportation of heavy pump . Automobile engineering is having a washing station ,which was made by students but the washing pump is very heavy and bulky and it is difficult to transport this pump from automobile department to washing station. Hence the challenge is to develop some solution that will solve this problem and make the pump useful and accessible in simple manner.

### What Exact Problem is being Solved?

A solution is required for transportation of heavy pump . Automobile engineering is having a washing station ,which was made by students but the washing pump is very heavy and bulky and it is difficult to transport this pump from automobile department to washing station. Hence the challenge is to develop some solution that will solve this problem and make the pump useful and accessible in simple manner.

### Users

This washing station was designed and developed by the students of automobile engineering. The station is having a platform for washing of vehicles and a pump with washing gun. So users for this system will be students and staff of dr j n mehta government polytechnic.

### Expected Outcomes

This washing station was designed and developed by the students of automobile engineering. The station is having a platform for washing of vehicles and a pump with washing gun.the expected out come for this problem is to develop some solution that will solve this problem and make the pump useful and accessible in simple manner so that every time it is not required to transport from department to washing station.

### Potential Impact

The solution of the problem will reduce the amount of work and time required.this washing station was designed and developed by the students of automobile engineering. The station is having a platform for washing of vehicles and a pump with washing gun.the expected out come for this problem is to develop some solution that will solve this problem and make the pump useful and accessible in simple manner so that every time it is not required to transport from department to washing station.

### Probable Discipline

Mechanical Engineering, Automobile Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH228

### Problem Statement

Optimization of weight and cost of Type 1 CNG storage tank

### Name of Industry / Organisation

Neet-Vasant Private Limited

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Compressed Natural Gas (CNG) is a fossil fuel substitute for petrol, diesel and propane fuel. If not burnt then it produces greenhouse gases, but if it is burnt, it is an environmentally more clean alternative to other fuels and much safer than other fuels in the event of a spill. CNG vehicles produce the fewest emissions than any other motor fuel. It may also be mixed with biogas, produced from landfills or wastewater, which does not increase the concentration of carbon in the atmosphere. CNG cylinders can be made of steel, aluminium, or plastic. Many countries in the world, including our own India, have abundant reserves of natural gas. CNG is as prevalent as petroleum products. It is the cleanest burning fuel operating today having less vehicle maintenance and longer engine life.

Presently in India, Type-1 CNG cylinders are being installed in CNG vehicles. Type-1 technology cylinders are made of MS & thus are very heavy (i.e. to store 10 KG of CNG at 200 Barg, the weight of cylinders is approx. 60-70 KG). Higher weight of cylinder is a dead weight the vehicle carries all the time & the same reduces the fuel economy of vehicle.

Type-3 & Type-4 Cylinders are made of Aluminium + Carbonfibre & HDPE + Carbonfibre respectively, which are approx. 1/3rd of the weight of the type 1 cylinders but the cost of type 3 & type 4 cylinders is almost 2 to 3 times of type-1 cylinders.

India is 3rd largest in the world in terms of owning 3.5 Million CNG vehicles (all with Type-1 Cylinders) after China & Iran. Since India is most polluted country in the world, adaptation to cleaner fuels is vital. CNG is 25-30% cleaner than petrol & diesel and APM priced CNG is 100% India produced and thus It's 100% cheaper than Petrol & Diesel in terms of Rs. / KM terms. The cost of conversion from Petrol to CNG car is just 50,000 to 70,000 extra. The lower conversion cost helps adaptation to CNG but higher dead weight & higher cost of type-3 & type-4 cylinders creates hurdles in adaptation to CNG.

With the changing times, the cost of batteries & the total cost of battery electrical vehicles are going down, the higher cost of type-3 & Type-4 cylinders and higher weight of Type-1 cylinders are making way tough for CNG vehicle adoption & easy for electrical vehicles.

### What Exact Problem is being Solved?

Compressed Natural Gas (CNG) is a fossil fuel substitute for petrol, diesel and propane fuel. If not burnt then it produces greenhouse gases, but if it is burnt, it is an environmentally more clean alternative to other fuels and much safer than other fuels in the event of a spill. CNG vehicles produce the fewest emissions than any other motor fuel. It may also be mixed with biogas, produced from landfills or wastewater, which does not increase the concentration of carbon in the atmosphere. CNG cylinders can be made of steel, aluminium, or plastic. Many countries in the world, including our own India, have abundant reserves of natural gas. CNG is as prevalent as petroleum products. It is the cleanest burning fuel operating today having less vehicle maintenance and longer engine life.

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

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With the changing times, the cost of batteries & the total cost of battery electrical vehicles are going down, the higher cost of type-3 & Type-4 cylinders and higher weight of Type-1 cylinders are making way tough for CNG vehicle adoption & easy for electrical vehicles.

### Users

Compressed Natural Gas (CNG) is a fossil fuel substitute for petrol, diesel and propane fuel. If not burnt then it produces greenhouse gases, but if it is burnt, it is an environmentally more clean alternative to other fuels and much safer than other fuels in the event of a spill. CNG vehicles produce the fewest emissions than any other motor fuel. It may also be mixed with biogas, produced from landfills or wastewater, which does not increase the concentration of carbon in the atmosphere. CNG cylinders can be made of steel, aluminium, or plastic. Many countries in the world, including our own India, have abundant reserves of natural gas. CNG is as prevalent as petroleum products. It is the cleanest burning fuel operating today having less vehicle maintenance and longer engine life.

Presently in India, Type-1 CNG cylinders are being installed in CNG vehicles. Type-1 technology cylinders are made of MS & thus are very heavy (i.e. to store 10 KG of CNG at 200 Barg, the weight of cylinders is approx. 60-70 KG). Higher weight of cylinder is a dead weight the vehicle carries all the time & the same reduces the fuel economy of vehicle.

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With the changing times, the cost of batteries & the total cost of battery electrical vehicles are going down, the higher cost of type-3 & Type-4 cylinders and higher weight of Type-1 cylinders are making way tough for CNG vehicle adoption & easy for electrical vehicles.

### Expected Outcomes

Reduced weight of CNG storage cylinder & it's unit cost.

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

Compressed Natural Gas (CNG) is a fossil fuel substitute for petrol, diesel and propane fuel. If not burnt then it produces greenhouse gases, but if it is burnt, it is an environmentally more clean alternative to other fuels and much safer than other fuels in the event of a spill. CNG vehicles produce the fewest emissions than any other motor fuel. It may also be mixed with biogas, produced from landfills or wastewater, which does not increase the concentration of carbon in the atmosphere. CNG cylinders can be made of steel, aluminium, or plastic. Many countries in the world, including our own India, have abundant reserves of natural gas. CNG is as prevalent as petroleum products. It is the cleanest burning fuel operating today having less vehicle maintenance and longer engine life.

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With the changing times, the cost of batteries & the total cost of battery electrical vehicles are going down, the higher cost of type-3 & Type-4 cylinders and higher weight of Type-1 cylinders are making way tough for CNG vehicle adoption & easy for electrical vehicles.

### Potential Impact

Reduced weight of CNG cylinders will increase the fuel efficiency of vehicles & reduced cost of composite cylinders will help convert more vehicle to CNG. in total, the higher the CNG vehicles, lesser the pollution & lesser the crude oil import for petrol & diesel.

Compressed Natural Gas (CNG) is a fossil fuel substitute for petrol, diesel and propane fuel. If not burnt then it produces greenhouse gases, but if it is burnt, it is an environmentally more clean alternative to other fuels and much safer than other fuels in the event of a spill. CNG vehicles produce the fewest emissions than any other motor fuel. It may also be mixed with biogas, produced from landfills or wastewater, which does not increase the concentration of carbon in the atmosphere. CNG cylinders can be made of steel, aluminium, or plastic. Many countries in the world, including our own India, have abundant reserves of natural gas. CNG is as prevalent as petroleum products. It is the cleanest burning fuel operating today having less vehicle maintenance and longer engine life.

Presently in India, Type-1 CNG cylinders are being installed in CNG vehicles. Type-1 technology cylinders are made of MS & thus are very heavy (i.e. to store 10 KG of CNG at 200 Barg, the weight of cylinders is approx. 60-70 KG). Higher weight of cylinder is a dead weight the vehicle carries all the time & the same reduces the fuel economy of vehicle.

Type-3 & Type-4 Cylinders are made of Aluminium + Carbonfibre & HDPE + Carbonfibre respectively, which are approx. 1/3rd of the weight of the type 1 cylinders but the cost of

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

type 3 & type 4 cylinders is almost 2 to 3 times of type-1 cylinders.

India is 3rd largest in the world in terms of owning 3.5 Million CNG vehicles (all with Type-1 Cylinders) after China & Iran. Since India is most polluted country in the world, adaptation to cleaner fuels is vital. CNG is 25-30% cleaner than petrol & diesel and APM priced CNG is 100% India produced and thus It's 100% cheaper than Petrol & Diesel in terms of Rs. / KM terms. The cost of conversion from Petrol to CNG car is just 50,000 to 70,000 extra. The lower conversion cost helps adaptation to CNG but higher dead weight & higher cost of type-3 & type-4 cylinders creates hurdles in adaptation to CNG.

With the changing times, the cost of batteries & the total cost of battery electrical vehicles are going down, the higher cost of type-3 & Type-4 cylinders and higher weight of Type-1 cylinders are making way tough for CNG vehicle adoption & easy for electrical vehicles.

### **Probable Discipline**

Mechanical Engineering, Automobile Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH229

### Problem Statement

the cleaning mechanism should be adaptable for different size of PV modules.

### Name of Industry / Organisation

Aditya Photovoltaics

### Type Of Industry / Organisation

MSME

### Challenge Description with Context

Facing severe issues regarding cleaning of small-scale pv solar systems. So, we are in a requirement of a basic cleaning system that can get a customer free from the tedious work of cleaning them manually.

points on focus: • the basic requirement is the system designed should be cost effective and should work in every weather conditions. • the cleaning system as well as its shadow shouldn't cover any part of the pv module.

The dirt and dust deposition on Solar Photovoltaic module severely hampers the intensity of solar rays falling on the Photovoltaic module resulting into reduced power output. Being located on the roof, it is quite inconvenient for user to clean this system regularly. The challenge is to design and develop cost effective and maintenance free residential Solar PV module cleaning system which can be easily and conveniently operated by residential user.

### What Exact Problem is being Solved?

Keeping in mind the challenge description, the cost effective and maintenance free Solar Photovoltaic module cleaning system is highly required. The solution should be able to provide an access to the user for easy and convenient way to remove dust and dirt. The cleaning mechanism should be easy to get integrated with fabrication structure without directly or indirectly affecting the Solar PV performance.

### Users

The solution should be able to cater small and medium sized systems i.e. upto 10 kW. The proposed solution can be extremely helpful for residential and small commercial purposes. This solution will also be helpful for other Solar PV module manufacturers.

### Expected Outcomes

The proposed cleaning mechanism should be cost effective, maintenance free and easy to operate in all weather conditions. It should be in a position to cover entire surface area of Solar Photovoltaic system. Moreover, the cleaning mechanism should take care of future expansion in already installed existing Solar Photovoltaic system. To an extent possible, the cleaning mechanism should be adaptable for different size of PV modules.

### Potential Impact

The Government is nowadays, emphasizing tremendously on usage of standalone Solar Photovoltaic systems. The Solar Photovoltaic systems should be in a position to provide their rated output for maximum duration (Approx 25 years). The dirt and dust are the main enemies of Solar Photovoltaic Cell as they cover surface area resulting into reduced electricity generation. The cleaning mechanism should be able to provide an efficient way resulting into working of Solar Photovoltaic System close to its maximum rated efficiency.

### Probable Discipline

Mechanical Engineering, Electrical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH230

### Problem Statement

Automatic Water Distribution System

### Name of Industry / Organisation

Government Polytechnic, Palanpur

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

More than 20 water tank is available in collage campus. This tank is supplying water to the individual building. This all tank get the water from centrally distribution system through overhead tank (Approximate height: 12m, 50000 Liter). Due to so many tank we did not get sufficient pressure at the same time thats why we need to fill one tank only at time and then after closing the valve of that tank on the another tank valve. So need to develop automatic system to fill the each water tank at the same time or simultaneously.

### What Exact Problem is being Solved?

Need to control the supply of water to the so many tank at time. We need to check the availability of water in overhead tank, if it is available then only valve of individual tank can be open, otherwise switch on the motor of sump (Approximate 25000 liter) to supply the water to overhead tank but at the same time need to check the availability of water in sump, if it empty (Certain Level) Then switch on the bore well motor.

### Users

Hostel, Education Buildings (Collage), Hospital, Shopping Center, Residence Area, Big Administrative Offices etc. Where need to control supply of water from source to utility point. The area where water is available in land at very low level (Dry Places Like Banaskantha) their need to control the wastage of water by controlling the overflow of overhead tank.

### Expected Outcomes

The advancement of engineering and technology, process automation has come into reality with satisfying accuracy. This has reduce chances of the human errors and also helped decrease the need of the human interference. In the management of resources like water a human negligence cause wastage of large volume of water or an error in the supply management can deny basic facilities to people. With the current existing system of water for domestic purpose, there are quite common cases will utility of water and there is a need of automation or controlling of supply water .This project helps to automatically controlling of supply water from the authorities and get alert regarding it which helps in proper utilization of it. This will help the masses to fill up there water tank even case of unusual timing of supply with automated procedures. Also the automation helps to reduce the waste of water when water tank is filled. So that is possible for judicial usages of water especially dry area.

### Potential Impact

By solving the problem with this novelty we come out with the very economical solution of water supply control. With this method supply the water very efficiently with out wastage of various resources and make sure that the water is available at the time of requirement. This method create large impact on availability of water in a dry places like banaskantha ,kutch,etc. Automatic Water Distribution System ensures to avoid wastage of water and also reduces time. Due to the use of Arduino Uno it is possible to monitor and control the whole

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## **Problem Statements**

system from the central control room. The reduction of the operating cost as well as reduction in the water losses is achieved by the implementation of an intelligent control system.

### **Probable Discipline**

Mechanical Engineering, Electrical Engineering

# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH231

### Problem Statement

COST EFFECTIVE AND EFFICIENT WAY OF SMALL DOMESTIC ROOF TOP SOLAR PANEL CLEANING MECHANISM TO MAINTAIN THE SOLAR ENERGY CONVERSION EFFICIENCY OF SOLAR PANEL.

### Name of Industry / Organisation

Inox Solar

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Installation of roof top solar panel has been trending these days due to government efforts and individual awareness. But day by day reduction in production due to difficulty in cleaning and removal of dust is major drawback. If simple cost effective solution is made to address these issue we can observe boost in demand for the product. Cleaning of solar panels

### What Exact Problem is being Solved?

making of robot to clean solar panel, Cleaning of solar panels, Installation of roof top solar panel has been trending these days due to government efforts and individual awareness.

But day by day reduction in production due to difficulty in cleaning and removal of dust is major drawback.

If simple cost effective solution is made to address these issue we can observe boost in demand for the product. That derated capacity of our renewable energy will be large benefit to our society

### Users

residential and industrial making of robot to clean solar panel, Cleaning of solar panels, Installation of roof top solar panel has been trending these days due to government efforts and individual awareness. But day by day reduction in production due to difficulty in cleaning and removal of dust is major drawback.

### Expected Outcomes

Making of robot to clean solar panel, Cleaning of solar panels, Installation of roof top solar panel has been trending these days due to government efforts and individual awareness.

But day by day reduction in production due to difficulty in cleaning and removal of dust is major drawback. If simple cost effective solution is made to address these issue we can observe boost in demand for the product. That derated capacity of our renewable energy will be large benefit to our society

### Potential Impact

Making of robot to clean solar panel, Cleaning of solar panels, Installation of roof top solar panel has been trending these days due to government efforts and individual awareness.

But day by day reduction in production due to difficulty in cleaning and removal of dust is major drawback. If simple cost effective solution is made to address these issue we can observe boost in demand for the product. That derated capacity of our renewable energy will be large benefit to our society

### Probable Discipline

Mechanical Engineering, Electrical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH232

### Problem Statement

Development of an energy efficient and cost effective gem/diamond cutting tool/machine to replace laser based cutting machine.

### Name of Industry / Organisation

Forever Technology

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Gem, jewelry and diamond industry is booming industry. Many types of gems and diamond cutting and polishing works are carried out for making rough gems and diamonds in to fine polished diamonds. For this processes different cutting instruments are used. Many small and large scale industries are using laser machine technique. In this process we need to stick the gem with base and than apply laser beam on the gem or diamond to crack it as per the better size and minimum weight loss.

### What Exact Problem is being Solved?

In this process we need to stick the gem with base and than apply laser beam on the gem or diamond to crack it as per the better size and minimum weight loss. In this process we use to cut the diamond and than send to polishing work. but in this laser technique we require some well trained staff and costly instruments. if any other possibility of using different machinery or solution. It will be made easy for many of us.

### Users

Diamond industry, gem and jewelry industry, workers, merchants and other people who use to cut and polish the diamonds. There are millions of people and institutions around the globe who are willing to invest in diamonds. Many individuals and organizations are very natural gems buyers and users. Fashion industry people are also stock holders of this problem.

### Expected Outcomes

After the problem identification and analysis one can prepare some handy instrument or chemical or physico-chemical method of cutting the gems or diamond. This process or technique may generate new entrepreneurs in this field. It will also possible to cut down the cost of diamond cutting and polishing. This may be handy tools which can be used for this process in better way by semi skilled or unskilled people too.

### Potential Impact

It is impact full for the diamond industry as well as for the fashion and jewelry industry too. If this problem statement is solved than it is possible to carry out the cutting and polishing work with less time consumption and also it will be cost effective for the industry. This process will also save energy and protract environment by eco friendly method or technique. The workers in this industry will also benefited by getting this solution. This small and big both types of diamond industry can have this product impactful. it will also help fot cutting different types of diamond cutting.

### Probable Discipline

Mechanical Engineering, Electrical Engineering, Electronics and Communication, Chemical Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH233

### Problem Statement

Design and Development of Underground Network Detecting Device

### Name of Industry / Organisation

Bharat Sanchar Nigam Limited

### Type Of Industry / Organisation

PSU

### Challenge Description with Context

BSNL own a large unarmoured optical fibre network of more than thousands of kilometers deployed. They provide connectivity through backbone and access networks, backhaul and local loop, and national and international connections. They provide connectivity solutions to all kinds of customers in a flexible and secure way, monitored 24×7. BSNL using unarmoured OFC for communication between one location to another location. It become difficult to find out the daily when it breaks and also to trace out the old working cable rout. BSNL is having route diagram of the OFC but due to different type of development works, it become difficult to search out the route.

### What Exact Problem is being Solved?

1. To find the location of underground broken unarmoured o.f.c. when it breaks due to natural or any other causes. 2. To provide the precautionary alarm during the digging the earth for different kinds of developmental work to prevent the breaking of this cable. 3. It is important for bsnl to provide uninterrupted communication services like voice call and internet to all their subscribers during all kind of seasons and at all kind locations across the different part of country without any lose of signals.

### Users

Fibre optics is a major building block in the telecommunication infrastructure. With the explosion of information traffic due to the Internet, electronic commerce, computer networks, multimedia, voice, data, and video, the need for a transmission medium with the bandwidth capabilities for handling such vast amounts of information is paramount. Fibre optics, with its comparatively infinite bandwidth, has proven to be the solution.

### Expected Outcomes

BSNL needs to have the mechanism / system / device or set of devices, hardware or software based solution which can address their fault finding of underground unarmoured optical fibre cable related problems. The solution should be user friendly, accurate, effective, economical and portable. Device should be sturdy, robust and all weather proof.

The system should be able to locate the fault location (longitude, latitude and depth from earth) with reference to route map available.

### Potential Impact

In the competitive business environment, it is important for us to provide the highest quality, guaranteed, with incredible high bandwidth coverage of Internet, electronic commerce, computer networks, multimedia, voice, data, and video services throughout the country.

Any interruption in our services may lead to loss of revenue, loss of customers' trust and reputation and also reduction in market share.

### Probable Discipline

Mechanical Engineering, Electronics and Communication, Civil Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH234

### Problem Statement

Porosity in plastic extrusion process

### Name of Industry / Organisation

Vrundavan Polymers Private Limited

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Plastics extrusion is a high-volume manufacturing process in which raw plastic is melted and formed into a continuous profile. Extrusion produces items such as pipe/tubing, weatherstripping, fencing, deck railings, window frames, plastic films and sheeting, thermoplastic coatings, and wire insulation. Porosity in plastic extruded product may occur due to improper heat and pressure plastic during extrusion process. due to this porosity overall strength of plastic product decrease.

### What Exact Problem is being Solved?

Plastics extrusion is a high-volume manufacturing process in which raw plastic is melted and formed into a continuous profile. Extrusion produces items such as pipe/tubing, weatherstripping, fencing, deck railings, window frames, plastic films and sheeting, thermoplastic coatings, and wire insulation. Porosity in plastic extruded product may occur due to improper heat and pressure plastic during extrusion process.

### Users

All plastic molding related small and medium scale company. Plastics extrusion is a high-volume manufacturing process in which raw plastic is melted and formed into a continuous profile. Extrusion produces items such as pipe/tubing, weatherstripping, fencing, deck railings, window frames, plastic films and sheeting, thermoplastic coatings, and wire insulation.

### Expected Outcomes

Proper combination of heat and pressure during melting of plastic grains in plastic extrusion process can solve this problem up-to some extent. As pressure and heating can be change during plastic extrusion process. Even the proper selection of material of plastic grain may solve the problem up-to some extent. Apart from this there may be some other suggestion from expert to solve this problem related to porosity in extruded product.

### Potential Impact

Solution of this problem may lead to reduction in production cost. It may reduce the requirement of raw material as it reduce the wastage of plastic material. overall it reduce the production cost of company and profitability of company. There are numbers of small and medium scale company in our country. Solution of this problem may result in overall reduction in wastage of plastic during extrusion process and increase strength of extruded product.

### Probable Discipline

Mechanical Engineering, Plastic Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH235

### Problem Statement

Environmental Solutions for Marble Quarry

### Name of Industry / Organisation

ASHIRWAD MARBLES

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

The determination of the impacts of mining activities on environment is a quite an important issue in sustainable development and managements of the available resources. Marble mining is a part of the industrialization process, these industries provides employment for hundreds of people within communities and the nation at large. Nevertheless, as marble mining progresses, the destruction of ecosystem continues, which results in environmental deterioration such as deforestation, pollution of soil, water and air and exposure of the top soil leading to its leaching and erosion. The pollution of surrounding surface and ground water can also result from marble mining. The particulates that are dispersed from the quarries to the surrounding environment can cause an extensive accumulation of Calcium and Magnesium compounds in the soils, sediments, water and vegetation's within the area.

Solutions are invited for a careful management of mining processes and the control of energy and materials flows. The study should identify strategies aiming to implement a system for the re-use of the waste through the development of new networks of local factories that reuse residuals deriving by marble and stone extraction and cutting. It should provide research ideas for other marble districts which have goals for sustainable development and improvement of the local environment that could be a stimulus to allow new synergies for the local economy.

### What Exact Problem is being Solved?

The problems deals with the theme of environmental issues connected to marble quarries, focusing the attention on extraction processes, on waste disposal of this activity and on transports. Unfortunately in this area uncontrolled processes are leading to serious environmental emergencies. The study aims to emphasize the negative consequences due to extraction process, transports development and the production of high quantities of residuals.

### Users

In general, the natural environment is composed of the land/soil, water and air. The release of any industrial wastes into any one of these components or the excessive modification of one of these components of the environment results in pollution and the presence of these pollutants affects the natural balance of the environment which in turn affects the quality of the environment (land, water, air) thus affecting plants, animals and human life.

### Expected Outcomes

The situation could be improved through a careful management of mining processes and the control of energy and materials flows. The study identifies strategies aiming to implement a system for the re-use of the waste through the development of new networks of local factories that reuse residuals deriving by marble and stone extraction and cutting. It provides research ideas for other marble districts which have goals for sustainable development. The scenarios presented, if pursued, could imply a very positive change that could greatly

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

improve the local environment and that could be a stimulus to allow new synergies for the local economy.

### **Potential Impact**

Fine particles of slurry (with size less than 363 micron) become air borne and cause air pollution. Marble slurry affects productivity of land due to decreased porosity, water absorption, water percolation. Slurry dumped areas cannot support vegetation and remain degraded. The slurry is carried away to rivers, drains, roads and water bodies, affecting the quality of water, reducing storage capacities and damaging aquifer lives.

### **Probable Discipline**

Mining Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH236

### Problem Statement

UTILIZATION OF MARBLE WASTE

### Name of Industry / Organisation

ASHIRWAD MARBLES

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

India is largest marble producer around 90 % compare to World. Approximately 30 to 40 percent of the marble waste generated during the extraction of marble blocks. Slurry is a huge amount of marble waste generated during processing and quarrying. NOW, the attempts were made to utilize it effectively with creative idea by manufacturing constructional material for the benefit of the society and reduce the environmental pollution.

### What Exact Problem is being Solved?

The efforts were made to utilize this slurry waste for the manufacturing of building constructional material. e.g. Bricks, Paver blocks, etc. The bricks were casted with sand and cement with different proportions and found the compressive strength and water absorption of the materials. The results were matched with Bureau of Indian Standards by which we can replace the manufacturing material and made it effectively.

### Users

The Bricks is generally used for the building and construction purposes. It will be very much useful if alternative material found for casting of bricks and may meet the Indian standards than utilize it Civil and Construction work.

### Expected Outcomes

The outcomes of the project is that effective utilization of marble waste and found new alternative materials for the manufacturing of building materials by which can reduce the environmental issues. Natural resources are limited and hard to found. The technique must be evolved by which new materials will identified and it is best option to utilize the waste to helps the society and reducing environmental issues.

### Potential Impact

The potential impact of the project is that to minimize the waste and using it effectively for manufacturing for the building materials the land consumption to store and reduce the surrounding environment. Waste creates Air, Land and Water pollution of the surrounding environment. To reduce these issues and make a good habitat for the society to utilize these mineral wastes, effectively, make productive material for the use.

### Probable Discipline

Mining Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH237

### Problem Statement

Trip optimisation of quarry tippers to enhance productivity

### Name of Industry / Organisation

M/s. Bajarang Stone Quarry Works

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Excess cycle time is the main key issues for reduction in production rate in mining industries. It may lead high losses in terms of money and time. Behaviour of manpower involved in the operations also creates influence on trip efficiency. It is obvious that quarry roads and exploration cut profile may effect of the output of engaged. Trip schedule may also effect by origin and destination work culture pattern.

### What Exact Problem is being Solved?

In the quarry industry time delay and accidents frequently occurred due to improper trip scheduling. This study identifies optimum solution for quarry industry through trip optimisation. Solution will gain cost and time benefits inline with increasing production rate. Behaviour pattern of operators and workers can be rectified in context of efficient output. Mining industry losses can be reduced with effective trip scheduling.

### Users

Black trap quarry owners and similar, transporters, Building contractors, Coarse aggregate manufacturer, building material suppliers, Mining Contractors, Road contractors, Government sectors(Department of mining, highways, road and buildings)

### Expected Outcomes

Outcome of the study may beneficial to the stakeholders of black trap mining industry in Gujarat as well as in other states of India. Improvement in productivity can be achieved through reducing trip cycle time. Cost can be saved in terms of numbers of trip. Trip can be finished within optimal time. Efficiency of the machinery can be increased. It may reduce workplace accidents also. Overall project profitability can be achieved.

### Potential Impact

Trip optimisation can cater better usage of resources of the quarry or mine industry. Ideal time can be saved for other purposes. Behaviour of workers and operators may cater better productivity during stipulated schedule. Time and cost losses may reduce in terms of vehicle efficiency and operator behaviour. Overall project will gain long term growth with financial benefits. It may specify equipment availability for other uses.

### Probable Discipline

Mining Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH238

### Problem Statement

Estimation of Sodium Laureth Sulfate (SLS/SLES) in soap containing formulation by Uv Spectroscopy or Colorimetry

### Name of Industry / Organisation

Elegant Cosmed Pvt Ltd

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Development of UV or colorimetric method for estimation of Sodium Laureth Sulfate (SLES) in soap solutions or formulation with accurate and precise results.

### What Exact Problem is being Solved?

Estimation of Sodium Laureth Sulfate (SLES) in soap formulation is difficult with simple analytical method. Development of UV or colorimetric method for estimation of Sodium Laureth Sulfate (SLES) in soap solutions or formulation with accurate and precise results is need of small scale industry.

### Users

Cosmetic industry, Pharma industry and Soap Industry

### Expected Outcomes

UV/Vis spectroscopy is routinely used in analytical chemistry for the quantitative determination of different analytes, such as transition metal ions, highly conjugated organic compounds, and biological macromolecules. Simple and economical method development for estimation of SLS or SLES in soap solution and such other formulation will help many small industry and cosmetic industry.

### Potential Impact

This problem solution will provide an easy, simple and economical estimation method for SLS/SLES estimation in soap and cosmetic formulation

### Probable Discipline

Pharmacy

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH239

### Problem Statement

Improve stability of Clavulanic Acid in finished solid oral dosage form

### Name of Industry / Organisation

Sarathi Pharma

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Clavulanic acid is a  $\beta$ -lactam drug that functions as a mechanism-based  $\beta$ -lactamase inhibitor. While not effective by itself as an antibiotic, when combined with penicillin-group antibiotics, it can overcome antibiotic resistance in bacteria that secrete  $\beta$ -lactamase, which otherwise inactivates most penicillins.

In its most common form, the potassium salt "potassium clavulanate" is combined with amoxicillin & ticarcillin

Easy, economic and Simple solution to Improve stability of Clavulanic Acid in finished solid oral dosage form needed to provide safe and economical drug formulation containing clavulanic acid

### What Exact Problem is being Solved?

The success of an effective formulation can be evaluated only through the stability studies. Stability testing is a routine procedure performed at various stages of product development. In early stages, accelerated stability testing, at relatively high temperatures and/or humidities can be used as a "worst case" evaluation to determine what kind of degradation products may be found after long term storage. Stability of a pharmaceutical preparation can be defined as "the capability of a particular formulation (dosage form or drug product) in a specific container – closure system to remain within its physical, chemical, microbiological, therapeutic and toxicological specification through out its shelf

life."(1)Clavulanic acid (CA) is a  $\beta$ -lactam antibiotic that alone exhibits only weak antibacterial activity, but is a potent inhibitor of  $\beta$ -lactamases enzymes. For this reason, it is used as a therapeutic in conjunction with penicillins and cephalosporins. However, it is a well-known fact that it is unstable not only during its production phase but also during downstream processing.

### Users

Pharma Industry

### Expected Outcomes

The solution to the current problem can improve efficacy and patient compliance in antibiotic therapy when co-administered with clavulanic acid or potassium clavulanate

### Potential Impact

Solution to this technical problem will improve antibiotic formulation and will also provide economical drug formulation for patients

### Probable Discipline

Pharmacy

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH240

### Problem Statement

Formulation development of curcumin dispersible tablet

### Name of Industry / Organisation

U-Liva Nutrition

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Turmeric is a flowering plant, *Curcuma longa* of the ginger family, Zingiberaceae, the roots of which are used in cooking. The plant is a perennial, rhizomatous, herbaceous plant native to the Indian subcontinent and Southeast Asia. Plants are gathered each year for their rhizomes, some for propagation in the following season and some for consumption. The rhizomes are used fresh or boiled in water and dried, after which they are ground into a deep orange-yellow powder commonly used as a coloring and flavoring agent in many Asian cuisines, especially for curries, as well as for dyeing. Turmeric powder has a warm, bitter, black pepper-like flavor and earthy, mustard-like aroma. Although long used in Ayurvedic medicine, where it is also known as haridra.

Turmeric grows wild in the forests of South and Southeast Asia, where it is collected for use in Indian traditional medicine. In Eastern India, the plant is used as one of the nine components of navapatrika along with young plantain or banana plant, taro leaves, barley (jayanti), wood apple (bilva), pomegranate (darimba), asoka, manaka (Arum), or manakochu, and rice paddy. turmeric powder use for embellishment of body, clothing, utensils, and ceremonial uses

Dosage form is a mean used for the delivery of drug to a living body.

In order to get the desired effect, the drug should be delivered to its site of action at such rate and concentration to achieve the maximum therapeutic effect and minimum adverse effect. Since oral route is still widely accepted route but having a common drawback of difficulty in swallowing of tablets and capsules. Oral dispersible tablets a novel approach in drug delivery systems that are now a day's more focused in formulation world, and laid a new path that, helped the patients to build their compliance level with the therapy, also reduced the cost and ease the administration especially in case of pediatrics and geriatrics.

Quick absorption, rapid onset of action and reduction in drug loss properties are the basic advantages of dispersible dosage form.

Ease of administration to patients who refuse to swallow a tablet, such as pediatric and geriatric patients and, psychiatric patients. Convenience in administration of drug and accurate dosing as compared to liquid formulations.

Formulation development of curcumin dispersible tablet will have Ease of administration to patients who refuse to swallow a tablet, such as pediatric and geriatric patients and, psychiatric patients. Convenience in the administration of curcumin and accurate dosing as compared to other formulations

### What Exact Problem is being Solved?

Ease of administration to patients who refuse to swallow a tablet, such as pediatric and geriatric patients and, psychiatric patients. Convenience in the administration of a drug and accurate dosing as compared to liquid formulations. Formulation development of curcumin

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

dispersible tablet will have Ease of administration to patients who refuse to swallow a tablet, such as pediatric and geriatric patients and, psychiatric patients. Convenience in the administration of curcumin and accurate dosing as compared to other formulations

### Users

Pharma Industry, Herbal Medicine, Ayurvedic Drug manufacturer

### Expected Outcomes

Formulation development of curcumin dispersible tablet will provide a novel solution for solubility problems associated with curcumin and will establish a foundation for use of other ayurvedic formulations

### Potential Impact

The solution to the current problem with novel dispersible formulation will be newer patentable technology for curcumin containing formulation. Formulation development of curcumin dispersible tablet will provide a novel solution for solubility problems associated with curcumin and will establish a foundation for use of other ayurvedic formulations

### Probable Discipline

Pharmacy

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH241

### Problem Statement

Reducing Cooling time 'Cost Effectively' for thick wall products to get optimum production

### Name of Industry / Organisation

MAS Products

### Type Of Industry / Organisation

MSME

### Challenge Description with Context

Reducing Cooling time cost effectively to get optimum production for thick wall product

### What Exact Problem is being Solved?

Effective mold cooling design specifically in insert area of product

### Users

Commodity, House hold, Agriculture & Engineering Industry

### Expected Outcomes

Cooling design has to significantly reduce cycle time for thick wall product

### Potential Impact

Overall Cycle time will be reduced hence improve production rate, reduce production cost and save the energy

### Probable Discipline

Plastic Technology

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH242

### Problem Statement

Reducing overall raw material cost by adding fillers without affecting the product mechanical strength

### Name of Industry / Organisation

Soni TechnoPlast

### Type Of Industry / Organisation

Small

### Challenge Description with Context

To reduce the over all cost of raw material

### What Exact Problem is being Solved?

Adding Filler to the virgin material without affecting its mechanical properties

### Users

Commodity, Agriculture & Engineering Application users

### Expected Outcomes

Optimum virgin material to filler ratio will be available for improving mechanical properties as well as reducing cost

### Potential Impact

Industry will be benefited in terms of lowering raw material cost and improving properties

### Probable Discipline

Plastic Technology

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH243

### Problem Statement

Automation and Replanning of Investment casting process to improve process cycle time.

### Name of Industry / Organisation

Hi-Tech Artificial Limbs Pvt. Ltd.

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

In design and selection of a wax material there are many competing factors which need to be considered, this paper has attempted to provide a small insight into the challenges and some unique solutions that were adopted to overcome these challenges. The design of any material is a two-way process involving not just the manufacturer but critical feedback from the customer and it is essential that foundries and suppliers work together to ensure the best possible wax performance to overcome both the challenges of today and the challenges that our industry will face tomorrow.& The Re-planing of industry is too difficult that to big challenges.

### What Exact Problem is being Solved?

Investment casting in maintained its position as a leader in the investment casting industry by its focus on the highly dynamic and specialized field of automation. Cumulating decades of experience in automation, experts from key disciplines such as industrial drafting, robotics, electronics and software engineering work together to create customized automation solutions for foundries across the world. We analyze your unique situation and offer you a personalized integrated automation solution.

### Users

Investment casting is used in the aerospace and power generation industries to produce turbine blades with complex shapes or cooling systems. Blades produced by investment casting can include single-crystal (SX), directionally solidified (DS), or conventional equiaxed blades. Investment casting is also widely used by firearms manufacturers to fabricate firearm receivers, triggers, hammers, and other precision parts at low cost.

Other industries that use standard investment-cast parts include military, medical, commercial and automotive. With the increased availability of higher-resolution 3D printers, 3D printing has begun to be used to make much larger sacrificial molds used in investment casting. Planetary Resources has used the technique to print the mold for a new small satellite, which is then dipped in ceramic to form the investment cast for a titanium space bus with integral propellant tank and embedded cable routing.

### Expected Outcomes

Value stream mapping tool can be used effectively in any kind of sectors as it is a world class manufacturing tool. The analyzed study is case study in die cast industry. The prime objective is to elimination of waste in a value stream. In this study Value Stream Analysis tool is used to identify non-value added activities. Current state map is plotted to assess current status. Waste elimination techniques are presented and future state map is also preferred for improvement. The results of study shows 15% waste reduction in non-value added activities from the value stream, hence total cycle time is reduced by 6.146%. Integration of VSM with Simulation software will help to analyze the system properly. Value Stream Mapping is

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

visualization tool used to find the opportunity to improve the productivity

### **Potential Impact**

The technique itself has tremendous advantages in the production of quality components and the key benefits of accuracy, versatility and integrity. As a result the process is one of the most economic methods of forming a wide range of metal components. Environmental and economic pressures have, however, resulted in a need for the industry to improve current casting quality, reduce manufacturing costs and explore new markets for the process. Optimisation of the mechanical and physical properties of the ceramic shell will be fundamental to achieving these aims. This paper sets out to summarise ceramic developments currently being implemented and to explore possible methods for the improvement of shell performance.

### **Probable Discipline**

Production engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH244

### Problem Statement

To investigate and minimization corrosion in the wall of fire extinguisher

### Name of Industry / Organisation

KNAX Fire Fighters Pvt. Ltd.

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Corrosion on the inner wall of fire extinguisher is now uncontrollable and we will try to solve the problems related to the corrosion in the fire extinguisher.

Some methods are available but they are too costly so now we want to develop a New method by using better parameters

Other problem is the material management

If we use a other material than it's not capable as a fire extinguisher material

### What Exact Problem is being Solved?

Plastic coating treatments helps to solve the problem and plastic coating have so many methods But plastic is reactive method It directly reacts with the base metal so appropriate plastic coating must be required Other coating is partially preferable because some have not proper anti corrosive properties and some have not basic natural properties

So with help of proper plastic coating and coating on inner wall it may be solve

### Users

Majority public like Petroleum industries , Casting industry , Machining industry , Automobile industry, Chemical industry , Service industry Hotel Vehicles , Tool industry Furniture industry , Textile industry

### Expected Outcomes

As discussed above we reduce corrosion by using proper materials and proper techniques of materials coating and lamination

If we used wrong materials,then chances to reactions between two material that directly affect with the quality and standards

Now by using plastic coating method at least we reduce the corrosive nature

And decrease chance of internal formation of inner materials and walls at the inner wall

### Potential Impact

Currently project is under development so

We try a different methods

We try different experiences

We feel material with its priority of wall

We read one of the research baki

Our internal and industrial guide follows our work

If we were wrong then we are try other method

And one day will one important method can resolve the all questions related to the corrosion problem in the fire extinguisher

### Probable Discipline

Production Engineering

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH245

### Problem Statement

Design and development of a tool/mechanism to remove built-up edge during drilling operation.

### Name of Industry / Organisation

Intex CAD/CAM

### Type Of Industry / Organisation

Small

### Challenge Description with Context

Drilling is the operation of producing a cylindrical hole of required diameter and depth by removing metal by the rotating edge of a cutting tool called drill. Drilling is one of the simplest methods of producing a hole. Drilling does not produce an accurate hole in a workpiece. The internal surface of the hole generated by drilling becomes rough and the hole is always slightly oversize due to vibration of the spindle and the drill. A hole made by a drill of size 12mm will measure approximately upto 12.125mm and by a drill of size 22mm will measure upto 22.5mm. When any drilling operation done, there is always a built up edge on opposite phase/side of the drilling operation.

### What Exact Problem is being Solved?

When any drilling operation done, there is always a built up edge on opposite phase/side of the drilling operation. So, it is required to Design a tool/mechanism which can remove built up edge at the end of drilling operation. Currently after drilling operation, it is required to do extra operation to remove built up edge. So, if any tool/mechanism can be develop which can remove built up edge during the same operation, machining time of the process will be reduce.

### Users

manufacturer of machine parts, job work industries

### Expected Outcomes

Tool/mechanism should be design which can remove built up edge at the end of drilling operation. No extra operation should be required to remove built up edge.

### Potential Impact

It can reduce machining time of the product. Ultimately save money and resources.

### Probable Discipline

Production/Mechanical

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH246

### Problem Statement

Anti static transparent silicone rubber

### Name of Industry / Organisation

DentAct Solution Pvt Ltd

### Type Of Industry / Organisation

Small

### Challenge Description with Context

There is a problem related to anti-static property of silicone rubber in which the major challenge is transparency achievement of it. When printing on electronic components and devices, a possible discharge from a charged pad can result in sensitive circuits failing. Such a reaction can lead to the damage of the devices.

### What Exact Problem is being Solved?

We are trying to solve the problem related to static charge which is developed on the surface of silicone rubber during the flow of material or fluid through out the tube or hose and may be generated by the triboelectric effect or by a noncontact process using a high voltage power source. The elastomer has excellent release properties when printing on organic and inorganic surfaces as well as a clear transfer of the printing ink which enables a highly detailed reproduction of the master image. Moreover, the silicone elastomers of the CHT group have outstanding mechanical and chemical stabilities.

### Users

- General purpose
- For electronic equipment
- Automobile rubber parts
- Pharmaceutical industry

For electric/electronic equipment, office equipment, automobiles, and other applications requiring rubber parts with antistatic properties.

### Expected Outcomes

We are expecting antistatic property in the range of  $10^{10}$ - $10^{11}$   $\Omega$ /sq meter and transparency about 80%(translucent).

Improve the properties like Antistatic

High definition transfer

- Excellent tear strength
- Excellent chemical stability
- Excellent tensile strength
- Excellent release
- Various shore hardness available
- Easy handling

In pad printing it is important to achieve a clear, reproducible print with defined outlines and a complete colour fill. Static charges may impair the printing process in the following ways:

### Potential Impact

Antistatic property eliminates build up of static electric charge and transparency of it's major requirement of pharmaceutical industries. we can use it in number of application like General purpose

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

- For electronic equipment
- Automobile rubber parts
- Pharmaceutical industry

For electric/electronic equipment, office equipment, automobiles, and other applications requiring rubber parts with anti-static properties.

### **Probable Discipline**

Rubber Technology

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH247

### Problem Statement

Improvement in chemical resistance of silicone rubber for FDA tubing application

### Name of Industry / Organisation

Pravin Rubber & Engg works

### Type Of Industry / Organisation

Medium

### Challenge Description with Context

Flexible elastomers are critical to the development of new and innovative medical devices, providing sealing, gasketing, and fluid transfer properties not possible with most other materials. Silicone elastomers in particular have played a major role in the materials development portion of this initiative. By using inputs not typically associated with allergenic responses, and avoiding introduction of migratory plasticizers, silicone elastomer have expanded in areas traditionally served by lower cost materials such as PVC and latex. Silicone tubing is typically used in applications such as catheters, drains, feeding tubes, and peristaltic pumps where biological compatibility is a key requirement.

### What Exact Problem is being Solved?

While dimensional tolerances on ID and wall thickness for extruded tubing can be held to within several thousandths of an inch, cyclical variation is possible with a continuous extrusion process. Liquid injection-molded silicone elastomer offer an alternative for making high quality, cost-effective parts and have recently been used to make a silicone rubber tube for disposable peristaltic-pump cartridges used for internal feeding. Liquid silicone elastomer are two-component, platinum cured, pump able silicones that can be molded and cured at elevated temperatures using injection-molding machines that process thermo set materials. In contrast to extrusion, molding allows for complex part geometry and exacting dimensions resulting in improved pump-delivery accuracy. Closely controlling the tube geometry may enable creative new pump designs with improved portability and excellent fluid delivery performance. As a result, liquid silicone elastomers provide tubing manufacturers with additional options to consider in many future tubing applications.

### Users

Medical grade silicone tubing are designed for the use in a variety of clinical and laboratory appliances.

Non-reactive to body tissue & various fluids

Un-adherence to tissue

Un-affected by most water soluble materials

Made from medical grade silicone which conforms to

a. USP class VI requirements

b. Complies with FDA 21 CFR 77.2600

Sterilisable by steam, ethylene oxide & irradiation

Retains physical properties in extreme heat & cold : -80° to 250°c (-110° to -----480°F

Resists oxidation, ozone & radiation

Does not support bacterial growth

### Expected Outcomes

Reusable -- will withstand repeated sterilization. Nonreactive to body tissues and fluids.

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

Translucent natural color for visual contact with the flow. Odorless, Tasteless, and Inert.

All ingredients are non-toxic and FDA-sanctioned for use with food contact surfaces

We are a renowned Silicone Tubing Manufacturer and Exporter from India. We present silicone transparent tubing which can resist temperature up from -116°C to + 315°C. Our transparent silicone tubing is completely unaffected by most of the water soluble materials. We offer silicone transparent tubing which is highly resistant to UV Ultra violet) radiations. Due to the excellent flexibility, our silicone transparent tubing is weirdly used in different industrial fields. We present silicone transparent tubing at the most rock bottom price.

### Potential Impact

Easy installation and routing

Translucency

Visual confirmation of flow

High-temperature resistance

Autoclave able with long service life

High resilience and elastic memory

Flow accuracy and pump life

Biocompatibility

Essentially no allergenic, non thrombogenic, and low odor

Chemical resistance

Compatible with most clean in place line cleaners

Process ability

Conducive to clean-room manufacturing methods

### Probable Discipline

Rubber Technology

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH248

### Problem Statement

Streakiness in Denim fabric

### Name of Industry / Organisation

Government Polytechnic For Girls, Surat

### Type Of Industry / Organisation

Government Department

### Challenge Description with Context

To come out from the problem of Streakiness in the indigo-dyed denim fabric. Streakiness can occur due to dyeing, weaving, finishing problems. Creel arrangement is a vital factor in the rope dyeing process. The creel arrangement has to be set exactly count by count or set by set.

Fabric wetting ability sometimes causes the line mark problem in denim fabric. So, it should always be checked the wetting ability in mercerize or pre-wetting bath, dye bath, etc.

Dyeing parameter like GPL, Hydro percentage, PH should be aligned with the program.

Machine roller pressure should be optimum with the parameters. Because pressure variation occurs the line mark fault in the denim fabric.

Every part of the machine should be cleaned regularly, because the dirt, grime, etc. are clung with the machine parts which actually lead to the streaky or line mark problems.

### What Exact Problem is being Solved?

The possible solution for this problem can be from the following:-

1. Fabric wetting ability improved During the preparatory process. So, it should always be checked the wetting ability in mercerize or pre-wetting bath, dye bath, etc.
2. Dyeing parameter like GPL, Hydro percentage, PH should be aligned with the program.
3. Machine roller pressure should be optimum with the parameters. Because pressure variation occurs the line mark fault in the denim fabric.

### Users

Demin Fabric manufacturing industries. Export house, Garment making industries. Dyeing & Printing Mills, Processors, Etc. Buyers like GAP, Levis, & other potential sellers. Wrangler, Lee, Spiker, Pe Pe jeans, etc

### Expected Outcomes

Evenness of dyeing, known as levelness, is an important quality in the dyeing of all forms of natural and synthetic fibers. It may be attained by control of dyeing conditions—that is, by agitation to ensure proper contact between dye liquor and substance being dyed and roller evenness also results in good, uniform, even dyeing throughout the fabric lots. Also, there will be less variation between dyeing of different batches.

### Potential Impact

Streakiness is one of the major problem, which could be resolved for first-grade quality material in the industry. Evenness of dyeing, known as levelness, is an important quality in the dyeing of all forms of natural and synthetic fibers. It may be attained by control of dyeing conditions. Streakiness can occur due to dyeing, weaving, finishing problems. Creel arrangement is a vital factor in the rope dyeing process, which can be handled out by controlling the parameters.

### Probable Discipline

Textile

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# Smart Gujarat For New India Hackathon 2019-20

## Problem Statements

### Problem ID

SGH249

### Problem Statement

Problem regarding bowing and skewing

### Name of Industry / Organisation

EMPIRE HANDLOOM

### Type Of Industry / Organisation

Small

### Challenge Description with Context

We are manufacturers of handloom products. We get the products manufactured right from raw cotton to finished & packed ones in order to cater to different markets' requirement.

### What Exact Problem is being Solved?

Since we have been dealing into high width fabrics for a long time now, the critical issue that we face and are yet unable to completely eradicate is bowing and skewing in the finished fabric. It could be due to something related to stenter. Due to this, the finished products design gets skewed sometimes and doesn't meet the exact requirements.

### Users

Consumers

### Expected Outcomes

Solving the issue of bowing and skewing

### Potential Impact

Quality enhancement

### Probable Discipline

Textile Engineering

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