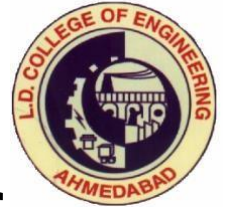


GUJARAT TECHNOLOGICAL UNIVERSITY

Chandkheda, Ahmedabad
Affiliated



L.D. COLLEGE OF ENGINEERING

A
Project Report
On

Solar Plant Monitoring using Audrino Device and Data Logger

Under subject of
DESIGN ENGINEERING – 2B
B. E. Semester – VI
(Electrical Branch)

Submitted by:

Sr. Name of Student

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Academic year
(2023-2024)

ACKNOWLEDGEMENT

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for his excellent guidance and supervision, which lead to the
completion of this Project. He was always there to help, providing
us with all the necessary resources and guidance which helped in
successful completion of this
project work.

We would like to greatly thanks to all respected faculty of
electrical department for their constant help & support
throughout the length of project...

Finally we like to thank all our friends who while working on
their respective projects created a great learning environment.
The time we spent together has been a great knowledgeable
experience.

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INTRODUCTION

Now a days solar plants are quite common in industries as well as residential power production many times to check power output from system is fine or not we have to go there manually to check it by this project we made small device which can be scalable to large projects to check power output of solar plants by just a click of mobile.

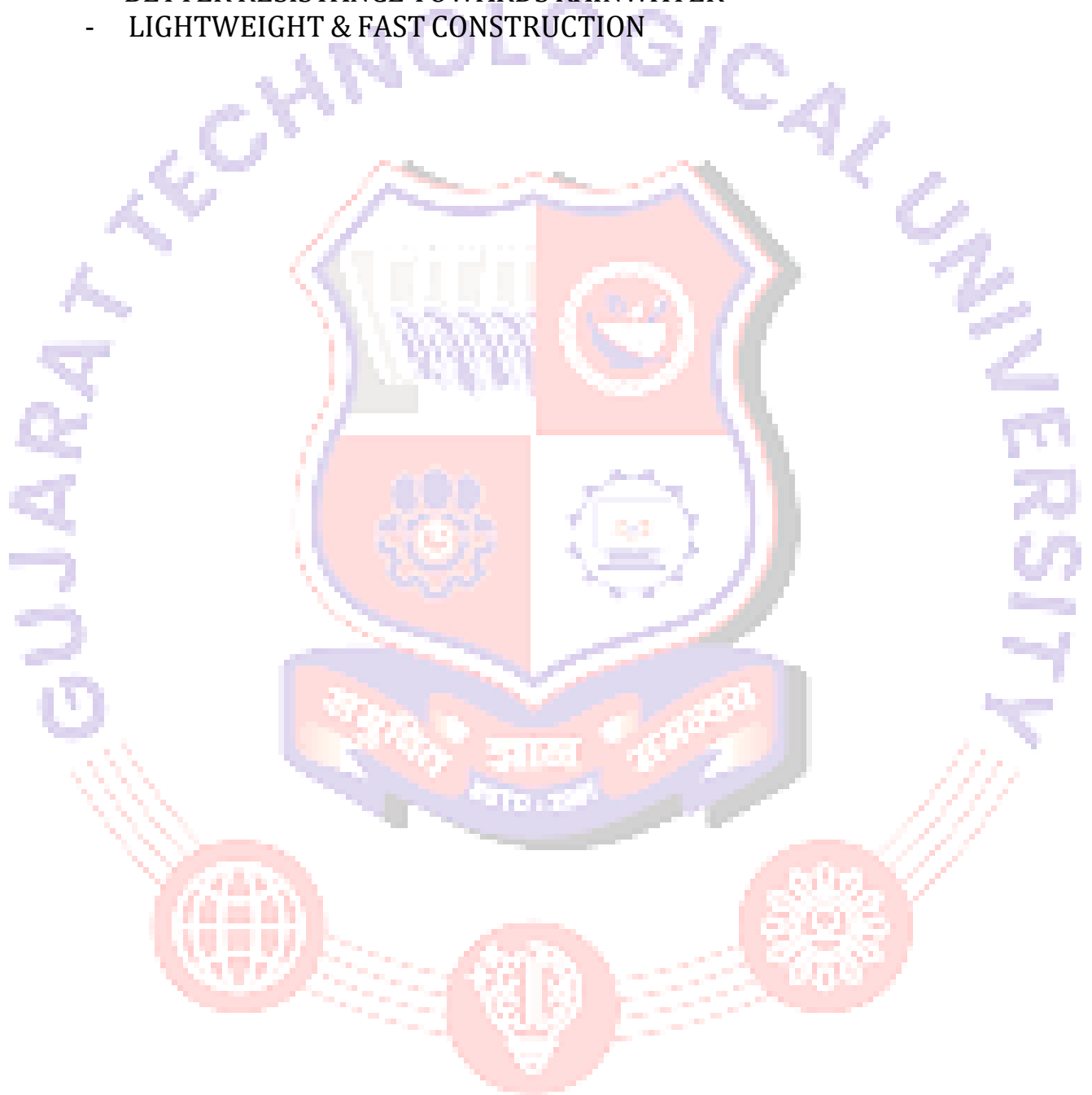
So we are making such a project with a data logger device to Monitor data as well as save it for future estimations.

List Of Components We Used:

Sr.no	Components Name	Description	Quantity
1	Arduino Board	Arduino UNO R3 development board	1
2	Temperature Sensor	LM35 Analog Temperature sensor	1
3	Fan	12 V DC fan	1
4	LCD Display	JHD 162A 16*2 LCD display	1
5	Potentiometer	10K	1
6	Transistor	2N2222 NPN Transistor	1
7	Resistor	1K	1
8	Diode	1N4007	1
9	Capacitor	10 uF capacitor	1
10	LED	5mm LED Any Color	1
11	Power Supply	12V Battery	1
12	Connecting Wires	Jumper Wires	20
13	Breadboard	-	1
14	Node MCU Esp8266 Wifi Module		1
15	ACS712 Current Sensor	To measure current	1
16	Voltage Sensor	To measure voltage	1
17	16- Channel Analog Multiplexer		1

ADVANTAGES

- Cost FRIENDLY CONSTRUCTION
- EASY MAINTENANCE & REPAIR
- BETTER RESISTANCE TOWARDS RAINWATER
- LIGHTWEIGHT & FAST CONSTRUCTION



SHEET 1 : AEIOU SUMMARY

AEIOU Summary :

Group ID: 413631 Date : Version :

Domain Name : Monitoring Solar Plant

Environment:	Interactions :	Objects :
<p>HUMIDITY</p> <p>SUNNY</p> <p>DESERT AREA</p> <p>ECO-FRIENDLY</p> <p>MOUNTAIN AREA</p> <p>CLEAN WEATHER</p> <p>PEACEFUL</p> <p>CLOUDY</p> <p>INTENSE SUNLIGHT</p> <p>SOUND OF GENERATOR</p>	<p>ELECTRICIAN</p> <p>SOLAR PANEL INDUSTRY</p> <p>WORKERS</p> <p>GOVT. OFFICE</p> <p>ELECTRONICS EXPERTS</p> <p>MECHANICAL ENGINEER</p> <p>POWER GRID</p> <p>D.T.S.C.O.M</p> <p>CODER</p> <p>FARMER</p>	<p>SOLAR PANELS</p> <p>DISPLAY</p> <p>L.D.R</p> <p>BATTERIES</p> <p>INVERTOR</p> <p>ALUMINUM POLE</p> <p>ARDUINO</p> <p>NODEMCU ESP8266</p> <p>VOLTAGE & CURRENT SENSOR</p> <p>LM35 TEMPERATURE SENSOR</p>
Activities :	Users :	
<p>WIRING</p> <p>WORKERS WORKING ON MACHINES</p> <p>TALKING WITH WORKERS</p> <p>CLEANING</p> <p>PLANTATION</p> <p>CIRCUIT DESIGN</p> <p>TALKING WITH BUSINESSMAN</p> <p>FENCING CONSTRUCTION</p> <p>TALKING WITH CUSTOMER</p> <p>DIGGING</p> <p>CONNECTING SOLAR PANELS</p> <p>CODING</p> <p>LOCAL PATROLLING</p> <p>WATER PUMPING</p> <p>INSTRUMENT PURCHASING</p>	<p>INDUSTRIES</p> <p>HOSPITALS</p> <p>COLLEGES</p> <p>FARMERS</p> <p>COMMERCIAL BUILDINGS</p> <p>GOVT. OFFICE</p> <p>GENCOS</p> <p>STREET LIGHTS</p> <p>SHOPPING CENTERS</p> <p>RAILWAY STATION</p> <p>BUS-STATION</p> <p>LOCAL PEOPLE</p>	

Activities:

- Wiring
- Circuit Design
- Coding
- Workers working on Machine
- Talking with Customer

Objects:

- Arduino
- Circuit Design
- Display
- Aluminum Pole
- L.D.R

Environment:

- Humidity
- Sunny Day
- Peaceful
- Cloudy
- Clean Weather

Interactions:

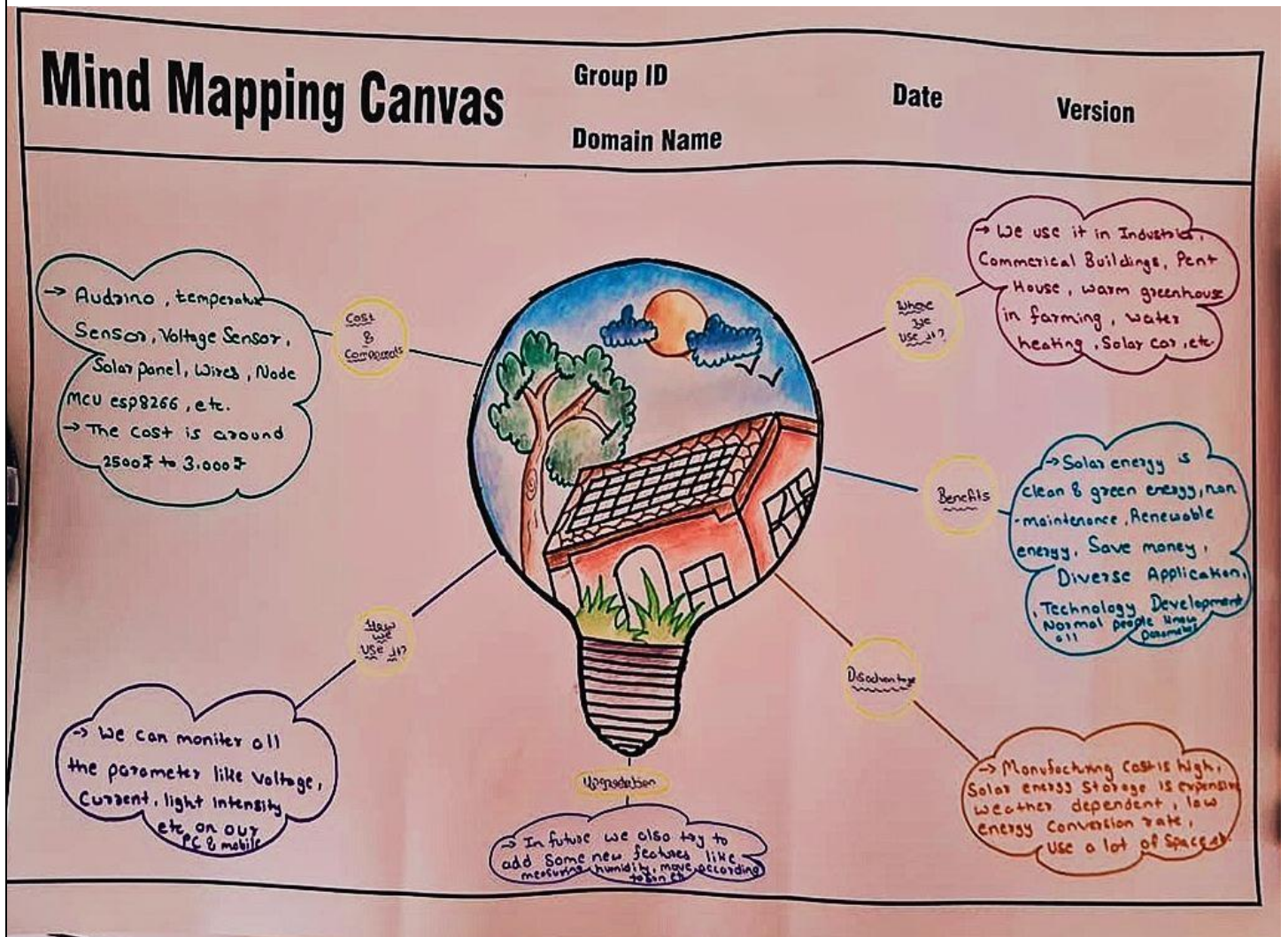
- Electrician
- Power Grid
- Coding
- Coder
- Farmer

Users:

- Industries
- Hospitals
- Colleges
- Farmers
- Bus-Station



MIND MAP CANVAS



SHEET 2: EMPATHY CANVAS

<p>Design For Date</p>	<p>Design By Version</p>																
<p>USER</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #FFC0CB;">INDUSTRIES</td> <td style="background-color: #FFFFE0;">COLLEGES</td> <td style="background-color: #FFFFE0;">GENCOS</td> </tr> <tr> <td style="background-color: #FFC0CB;">HOSPITAL</td> <td style="background-color: #FFFFE0;">COMMERCIAL BUILDINGS</td> <td style="background-color: #FFFFE0;">LOCAL PEOPLE</td> </tr> <tr> <td style="background-color: #FFC0CB;">FARMERS</td> <td style="background-color: #FFFFE0;">RAILWAY STATION</td> <td style="background-color: #FFFFE0;">GOVT. OFFICE</td> </tr> </table>	INDUSTRIES	COLLEGES	GENCOS	HOSPITAL	COMMERCIAL BUILDINGS	LOCAL PEOPLE	FARMERS	RAILWAY STATION	GOVT. OFFICE	<p>STAKEHOLDERS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #FFFFE0;">FARMERS</td> <td style="background-color: #FFC0CB;">ELECTRONIC PRODUCT SELLER</td> </tr> <tr> <td style="background-color: #FFFFE0;">ELECTRICIAN</td> <td style="background-color: #FFC0CB;">INVESTOR + DEVELOPER</td> </tr> <tr> <td style="background-color: #FFFFE0;">SHOPKEEPERS</td> <td style="background-color: #FFC0CB;">EMPLOYEES</td> </tr> </table>	FARMERS	ELECTRONIC PRODUCT SELLER	ELECTRICIAN	INVESTOR + DEVELOPER	SHOPKEEPERS	EMPLOYEES	
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HOSPITAL	COMMERCIAL BUILDINGS	LOCAL PEOPLE															
FARMERS	RAILWAY STATION	GOVT. OFFICE															
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CODING	TALKING WITH BUSSINESSMAN	DISCUSS WITH INVESTOR															
<p>STORY BOARDING</p> <p>HAPPY Rahul was planning to install solar panel his house. He heard about this device. He installed the monitor in with the solar panel to house. Now he can see every detail about panel from his pocket. This made his life very easy.</p> <p>HAPPY Maynor Ltd is company which generate greete amount of their power consumption from solar power. They heard about monitoring device. They installed it in compay. This prevented major malfunction and saved from many fault.</p> <p>SAD Elash Ltd lose so much money in a major fault. The line through the panel had a malfunction which went unnoticed which leads to the complete shutdown. This cost them very much.</p> <p>SAD Mayur works in private company. He thought of installing solar panel but avoided monitor because of cost. He installed solar panel in house. But he is paranoid about it's condition. He kept checking it and worried about fault.</p>																	

USERS

- ENGINEER
- PADASTRIALS
- WORKERS

STAKEHOLDER

- PUBLIC
- SHOPKEPEER
- ENGINEER

ACTIVITIES

- SLEEPING
- WATCHUNG TV
- EATING
- PASSING VEHICLES
- SERVING FOOD

STORY BOARDING

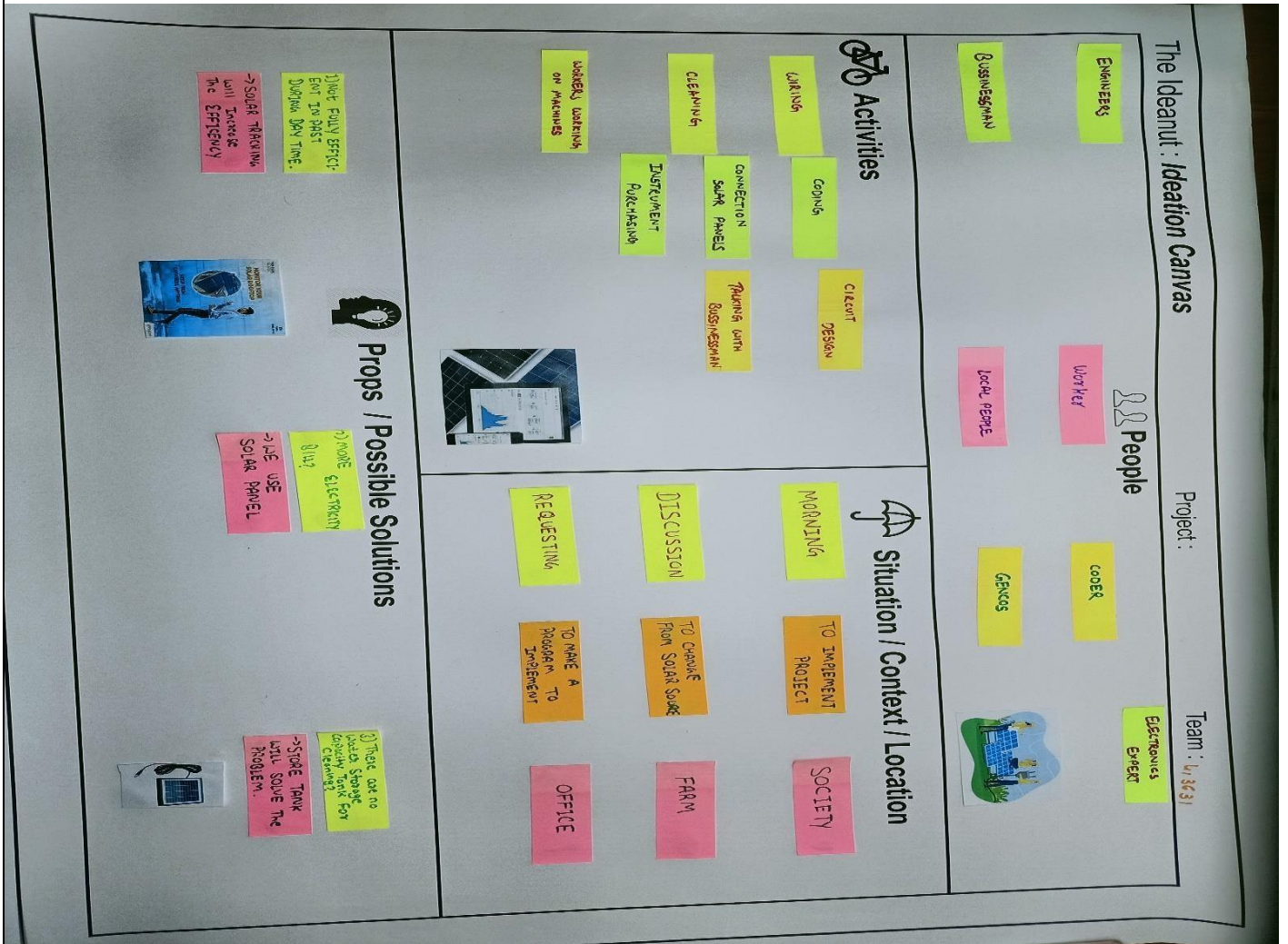
HAPPY

- IN MESS KITCHEN WE USE THIS PRODUCT AS AN EXHAUST FAN, SO WHENEVER WE START COOKING FOOD THE TEMPRATURE OF THE ROOM WILL INCREASE AND THEN AUTOMATICALLY THA FAN WILL TURN ON.

SAD

- SOMETIME IN SUMMER WHEN WE COME FROM OUTSIDE WE FEEL HOT DUE TO HIGH TEMPRATURE OUTSIDE, BUT THE TEMPRATUREINSIDE THE ROOM IS LOW SO THE FAN WILL NOT START WE WILL FELL UNCOMFORTABLE

SHEET 3: IDEATION CANVAS



Users:

- Engineers
- Worker
- Coder
- Local People

Activities:

- Wiring
- Hospitals
- Coding
- Circuit Design
- Cleaning

Situation:

- Morning
- Society
- Farm
- Office
- Discussion



SHEET 4: PRODUCT DEVELOPMENT CANVAS

Product Development Canvas (413631)

🔍 Purpose

What is the purpose of this concept you're developing?
Does it solve a problem, or it enhances a certain experience?
Is it serving a need or it is trying to create a new need or tap an untapped need?

Measuring Parameters
Reduce electrical Bill
Increase efficiency
Control or Regulation

⚓ Product Experience

Define what your customer should feel like when he uses your product / service? emotions, feelings would define his experience? feeling Convenience, or feeling of buying more with less (cost conscious) or feeling of greater security, safety etc.

Efficient Safe Ecofriendly

🔧 Product Functions

Functions are a products answer to user problems / need. They do something that user wants. They are often verbs in nature. Every function is powered by many features. Multitasking is a function. Browser tabs is a feature that powers the multitasking feature. A function can have one or more features powering it. Functions are very generic in nature, features are often more specific. Functions can be similar to product experience. Safety (product function) provides a feeling of safety (product experience)

Monitors Displays on different screens Display indirect Parameters

📦 Product Features

Product feature are specific. One of more features will power a function. AntiLock Brakes, Airbags are feature that power the safety function. Browser tabs, Apple's home button to multitask between apps are features powering the multitasking function. Each feature will have many components/sub components powering it. Sometimes a very popular component becomes a feature in itself. Like car stereo is a major components and a feature at the same time powering the in car entertainment function powering entertainment as a product experience.

High efficiency Suitable for all accurate

👤 People

Who is the key customer segment who will use this product /service or the end product of the concept you're pushing?
Write here about them, describe them a little.

Engineers
Business men
Coder
Electricians
Workers

⚙️ Components

Components build up the features. For a airbag it will comprise a list of component like bags, triggers etc. that go into making it. For a tabbed browser it will comprise of various chunks of code that will make the tabs work. In cases where the feature is a major component, you could list here the auxiliary components that are required to make the major component work. You can also list new adjustments and innovations you're planning here at the component level.

Solar panel Arduino Batteries
Display Sensors

☑️ Customer Revalidation

Once you're finished with your feature set, test with the customer / user if the features, functions are useful. Speak to the customer / user.

Effective
Expensive
Improve O/P
Not for daily use
Not Attractive

🧪 Reject, Redesign, Retain

Post customer validation, reject, those function or feature that the customers didn't find useful, Redesign those that were partially useful and retain those met the bar, iterate with this until all functions / features are accepted.

Affordable
Add extra Parameters
Mostly Industrial

Purpose:

- Measuring Parameter
- Increase Efficiency
- Control
- Reduce Electrical Bill

Product Functions:

- Displays On Different Screen
- Monitors Parameter
- Display Indirect Parameter

Product Features:

- High Efficiency
- Suitable for all
- Accurate

Components:

- Solar Panel
- Arduino
- Batteries
- Display

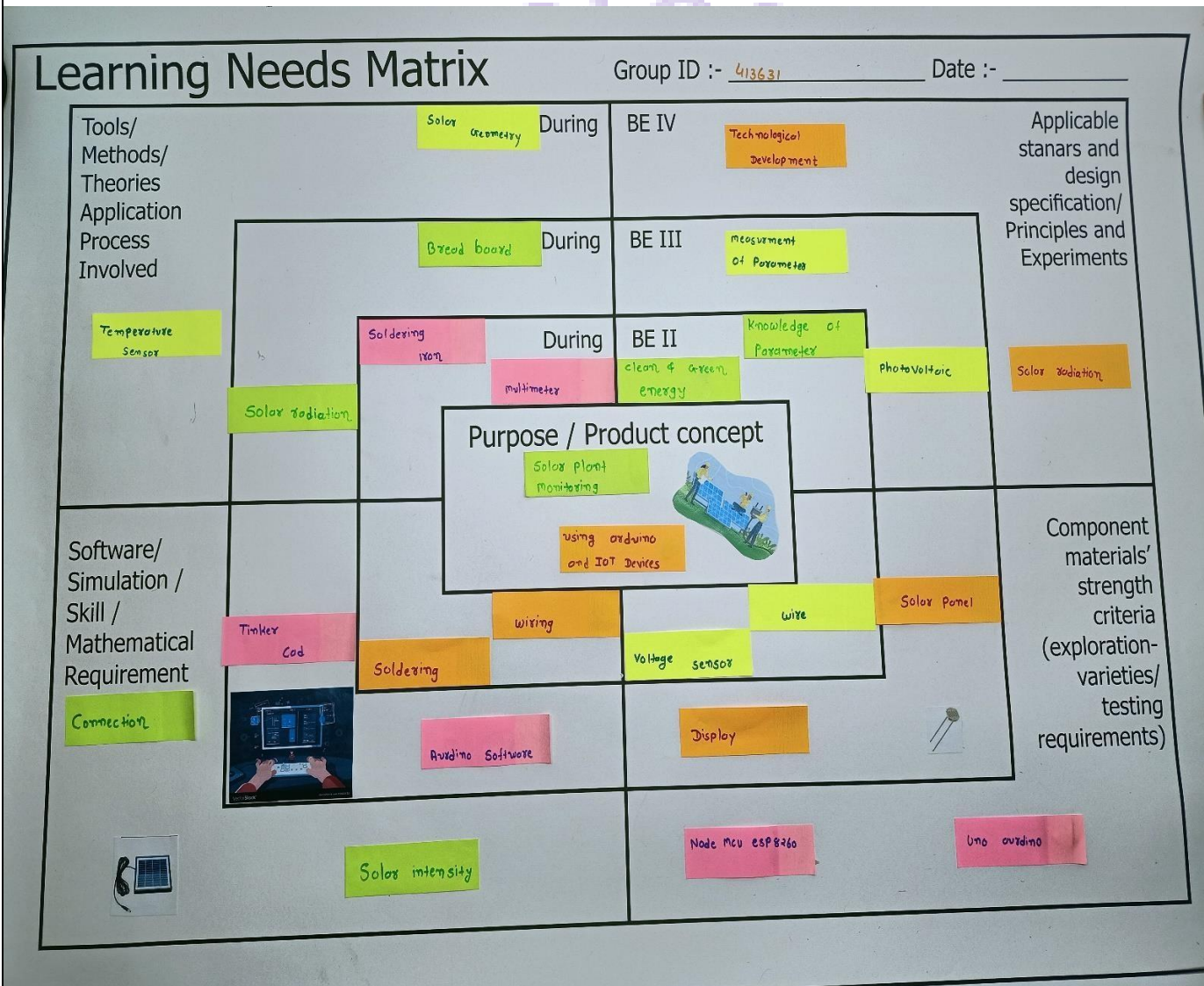
Customer Revalidation:

- Effective
- Expensive
- Improve output
- Not for daily User

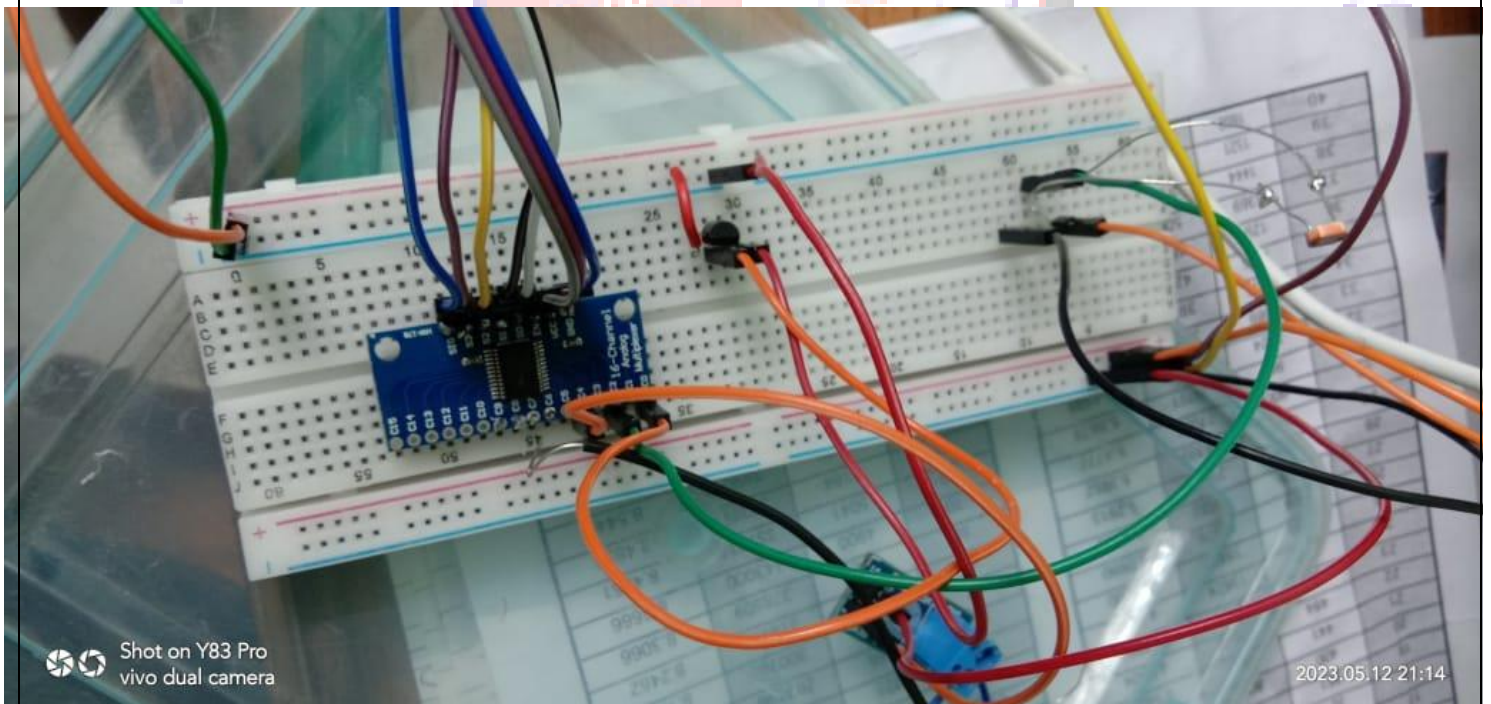
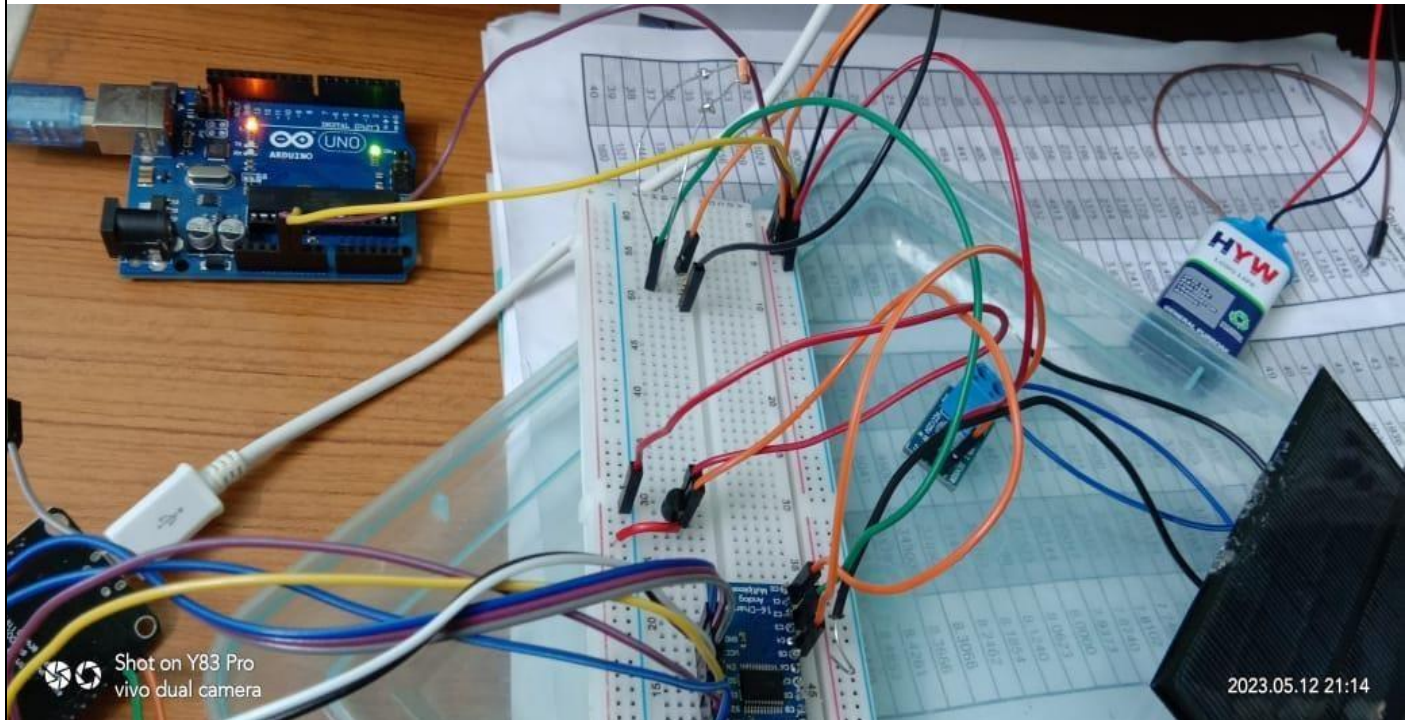
People:

- Engineers
- Electronics
- Coder

SHEET:5 LNM SHEET



PROTOTYPE

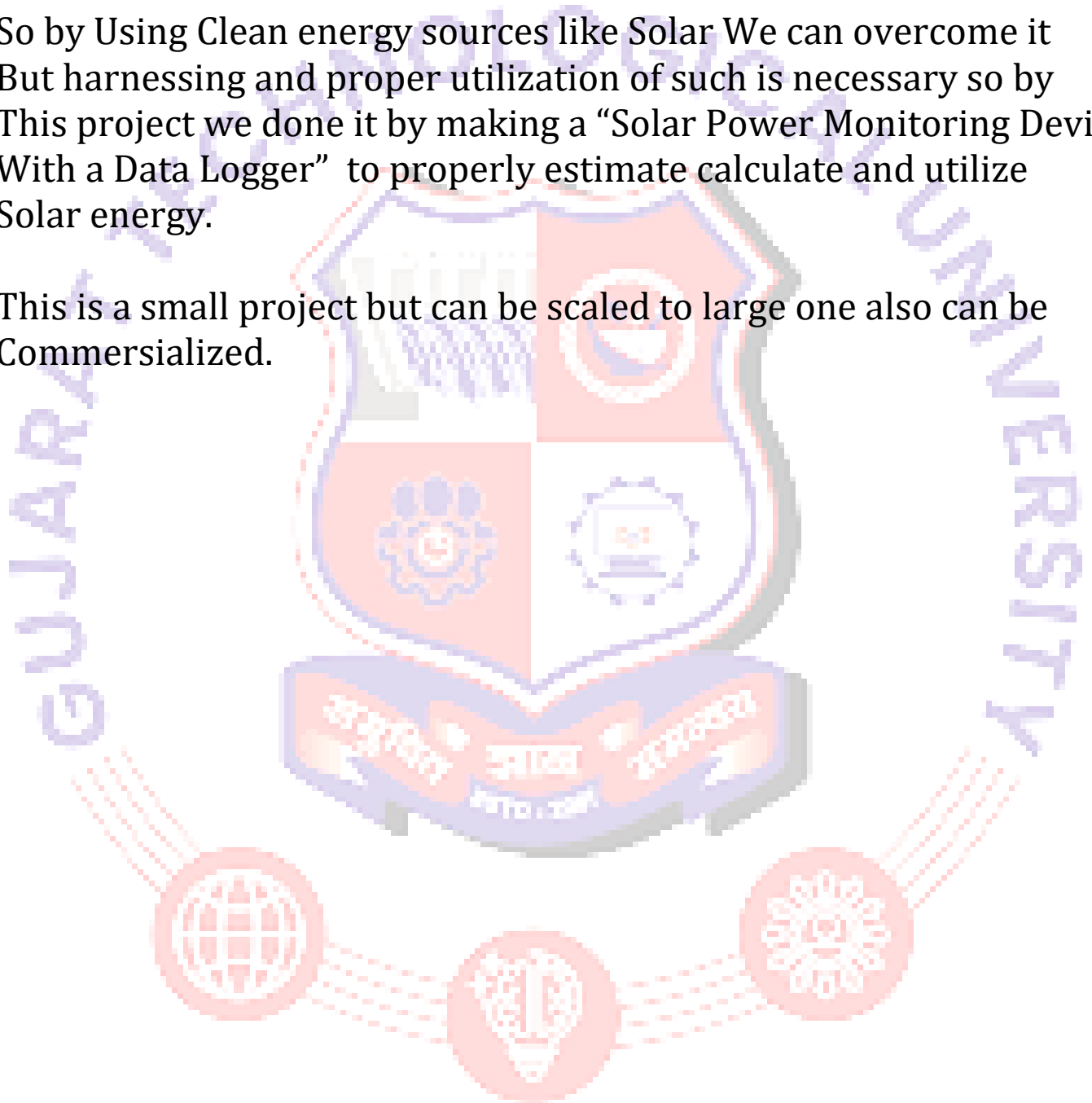


CONCLUSION

By performing this tasks and sheets we conclude that there are many problems faced by the people in future due to Pollution and there are also possible solutions for it.

So by Using Clean energy sources like Solar We can overcome it But harnessing and proper utilization of such is necessary so by This project we done it by making a “Solar Power Monitoring Device With a Data Logger” to properly estimate calculate and utilize Solar energy.

This is a small project but can be scaled to large one also can be Commercialized.



Thank You

