St. Francis Institute of Technology
Department of Information Technology
BE Major Project
ITM 701
Topic Final Presentation

EZ-SWAP FOR EV

Group No. 22

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DOMAIN: IOT & ELECTRIC VEHICLE

INTRODUCTION

1. EV’S AS THE FUTURE
2. Charging Time More, Ride Time Less
3. EZ-SWAP : IOT based Battery Swapping System

LITERATURE REVIEW [1]

Title

A Survey of Battery Swapping Stations for Electric Vehicles: Operation Modes and Decision Scenarios

Advantages

- *Comprehensive Survey.*
- *Operation Modes Analysis.*
- *Decision Scenarios Evaluation.*

Gaps Identified

- *Limited focus on Technical Implementation*
- *Lack of Empirical Analysis*
- *Limited Discussion on challenges and limitation*

LITERATURE REVIEW [2]

Methodology

Sizing and Locating Planning of EV Centralized-Battery-Charging-Station Considering Battery Logistics System.

Advantages

- *Comprehensive Approach.*
- *Consideration of Battery Logistics.*
- *Mathematical Modelling and Optimization.*

Gaps Identified

- *Limited Scope*
- *Complexity of Models*
- *ack of Real World Validation*

LITERATURE REVIEW [3]

Title

Battery Swapping Technology

Advantages

- *Reduction in Carbon Emissions*
- *Novel Approach.*
- *Ideal for Long-Distance Travel.*

Gaps Identified

- *Technical Details*
- *Cost and Infrastructure*
- *Safety and Standards*
- *Charging Efficiency*
- *Real-World Testing*

LITERATURE REVIEW [3]

Title

Battery Swapping Technology

Advantages

- *Reduction in Carbon Emissions*
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- *Ideal for Long-Distance Travel.*

Gaps Identified

- *Technical Details*
- *Cost and Infrastructure*
- *Safety and Standards*
- *Charging Efficiency*
- *Real-World Testing*

LITERATURE REVIEW [4]

Title

A Monte Carlo Simulation Approach to Evaluate Service Capacities of EV Charging and Battery Swapping Stations

Advantages

- *Comprehensive Evaluation Method.*
- *Realistic Modelling.*
- *Flexibility Analysis.*

Gaps Identified

- *Limited Scope*
- *Lack of Real World Validation*
- *Narrow Discussion on results*

LITERATURE REVIEW [5]

Title

Electric Vehicles Battery Management Network Using Blockchain IoT

Advantages

- *Integration of Blockchain and IoT*
- *Enhancing EV Infrastructure*
- *Payment Efficiency*

Gaps Identified

- *Data Processing is time consuming.*
- *Scalability*
- *Security of data*

LITERATURE REVIEW [6]

Title

An IoT Monitoring and Control Platform for Museum Content Conservation

Advantages

- *Efficient Data Collection*
- *Energy Efficiency.*
- *Visitor Comfort*

Gaps Identified

- *Network Reliability*
- *Cost and Infrastructure*
- *Safety and Standards*

LITERATURE REVIEW [7]

Title

Sensing Technologies: A Review

Advantages

- *Comprehensive Review*
- *Focus on Critical Capabilities.*
- *Discussion of Key Parameters.*

Gaps Identified

- *Specific Examples*
- *Costing*
- *Safety Standards*

LITERATURE REVIEW [8]

Title

Electric Vehicle Battery Swapping-Charging System in Power Generation Scheduling for Managing Ambient Air Quality and Human Health Conditions

Advantages

- *Reduction in Carbon Emissions*
- *Novel Approach.*
- *Ideal for Long-Distance Travel.*

Gaps Identified

- *Scalability*
- *Technical Details*
- *Cost and Infrastructure*
- *Safety and Standards*
- *Real-World Testing*

LITERATURE REVIEW [9]

Title

Battery Management System Design (BMS) for Lithium-Ion Batteries

Advantages

- *Highlighting the Importance of Lithium-Ion Batteries*
- *Complexity of Lithium-Ion Battery Use.*
- *identifies the critical issue of ensuring that lithium-ion batteries used in series have matching voltage levels.*

Gaps Identified

- *Technical Details*
- *BMS Infrastructure*
- *Real-World Testing*

PROBLEM STATEMENT

The aim of this project is to develop “EZswap” - a low-cost, IoT-based battery-swapping station to address the challenges faced by electric vehicle (EV) owners with regards to EV charging infrastructure that suffers from long charging times, limited availability of charging stations, and range anxiety among users. EZ-SWAP for EV aims to bridge this gap by offering a quick and effortless alternative to traditional charging methods.

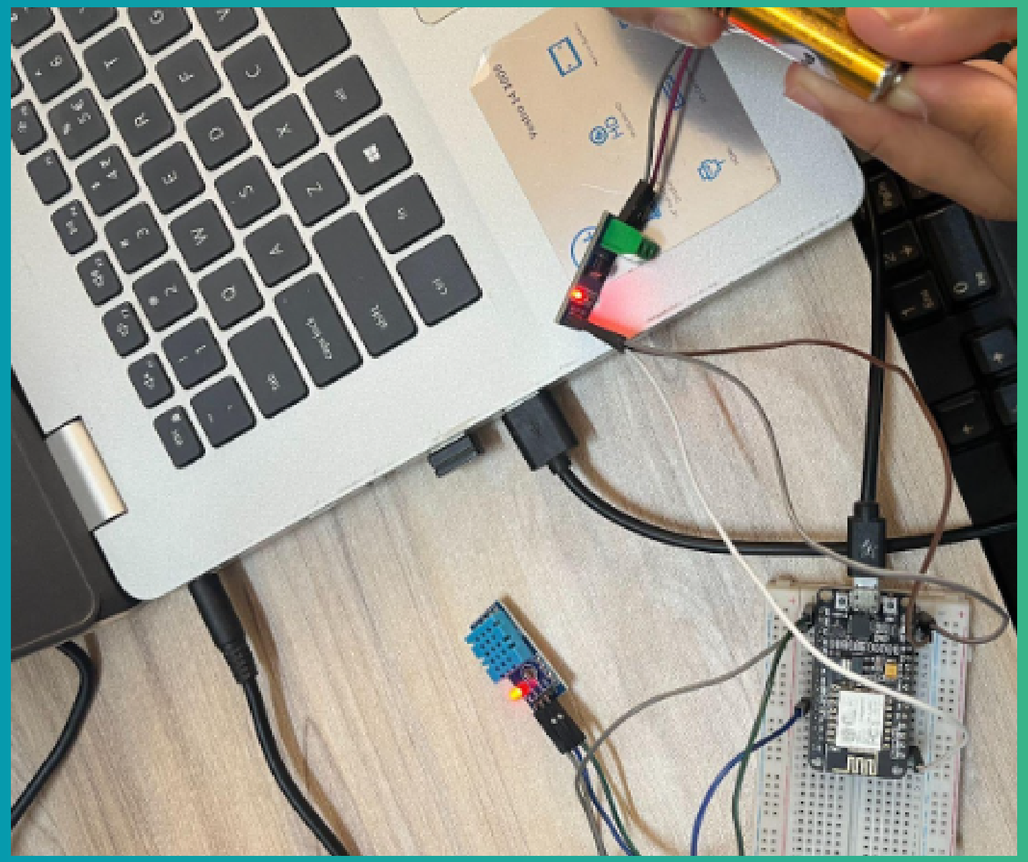
PROPOSED SOLUTION METHODOLOGY

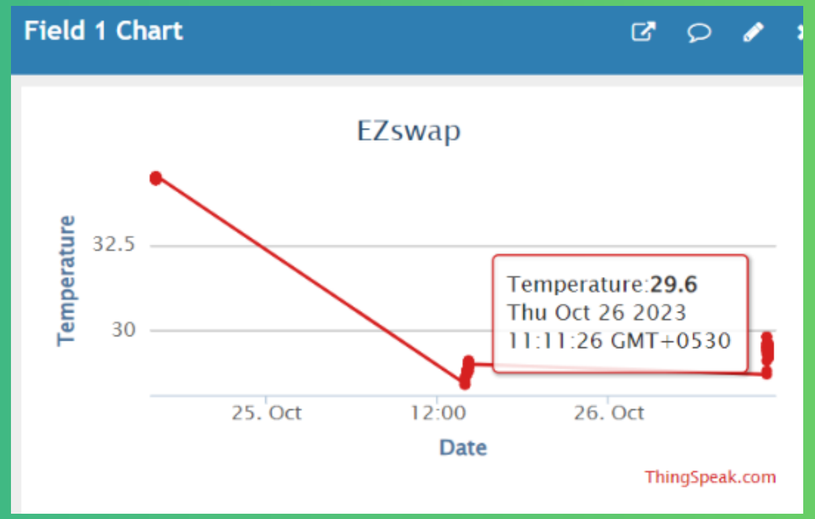
- **Easy** Battery Swapping
- Sensors for **Security Monitoring**
- User-friendly **Website**

SCOPE

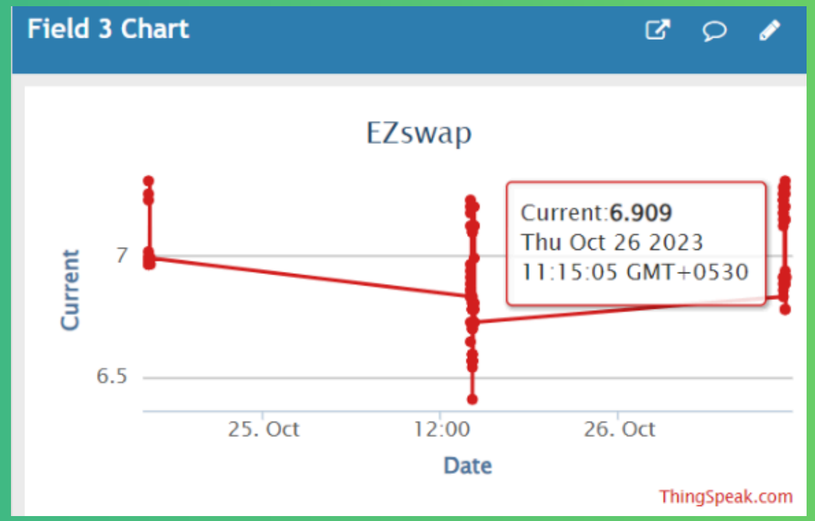
- *INFRASTRUCTURE INTEGRATION*
- *AUTOMATED SWAPPING PROCESS*
- *BUSINESS MODELS AND ECONOMIC VIABILITY*
- *REAL TIME MONITORING*
- *USER ACCEPTANCE AND ADOPTION FACTORS*

SEM 7 OVERVIEW



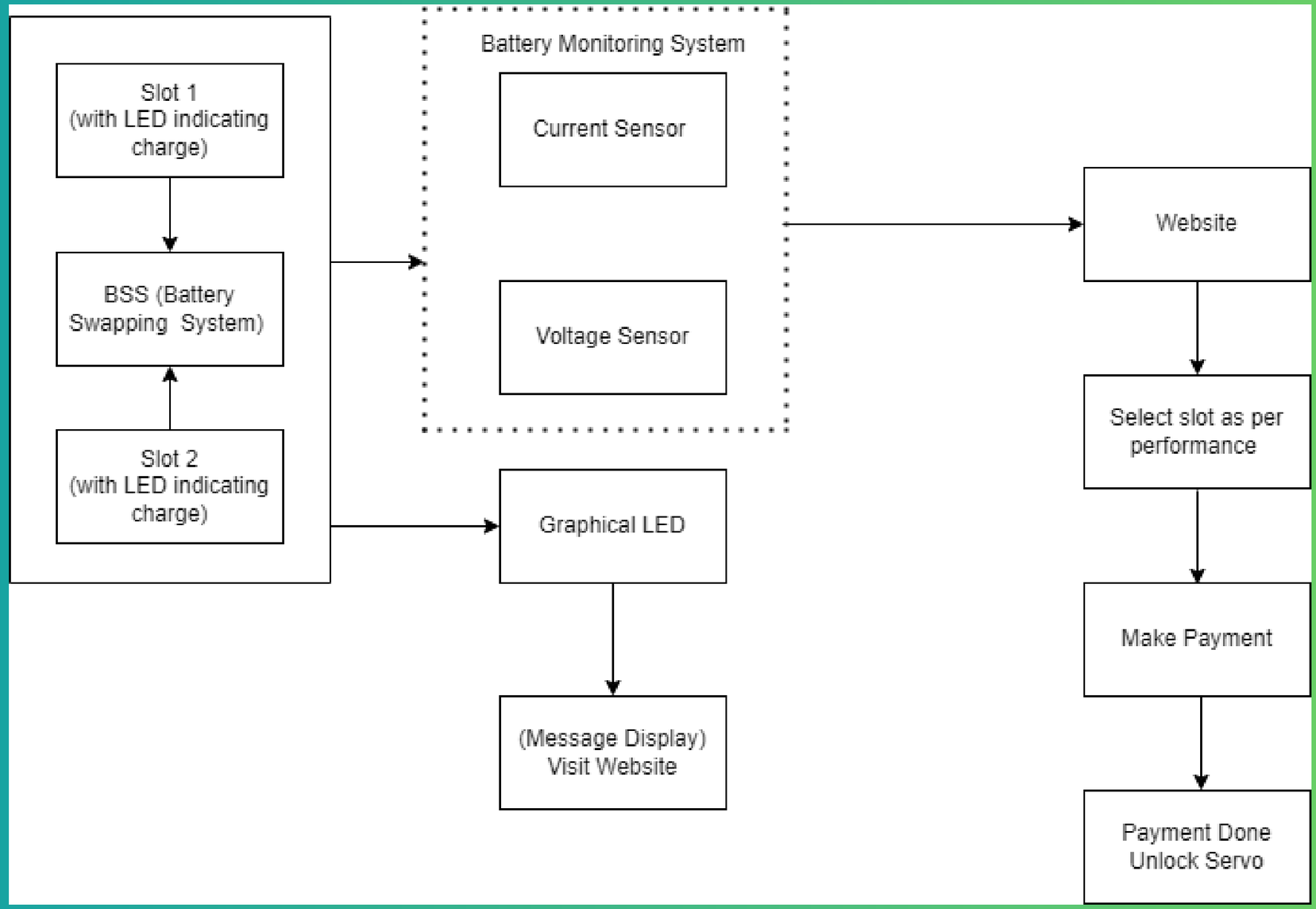


Temperature Vs Time

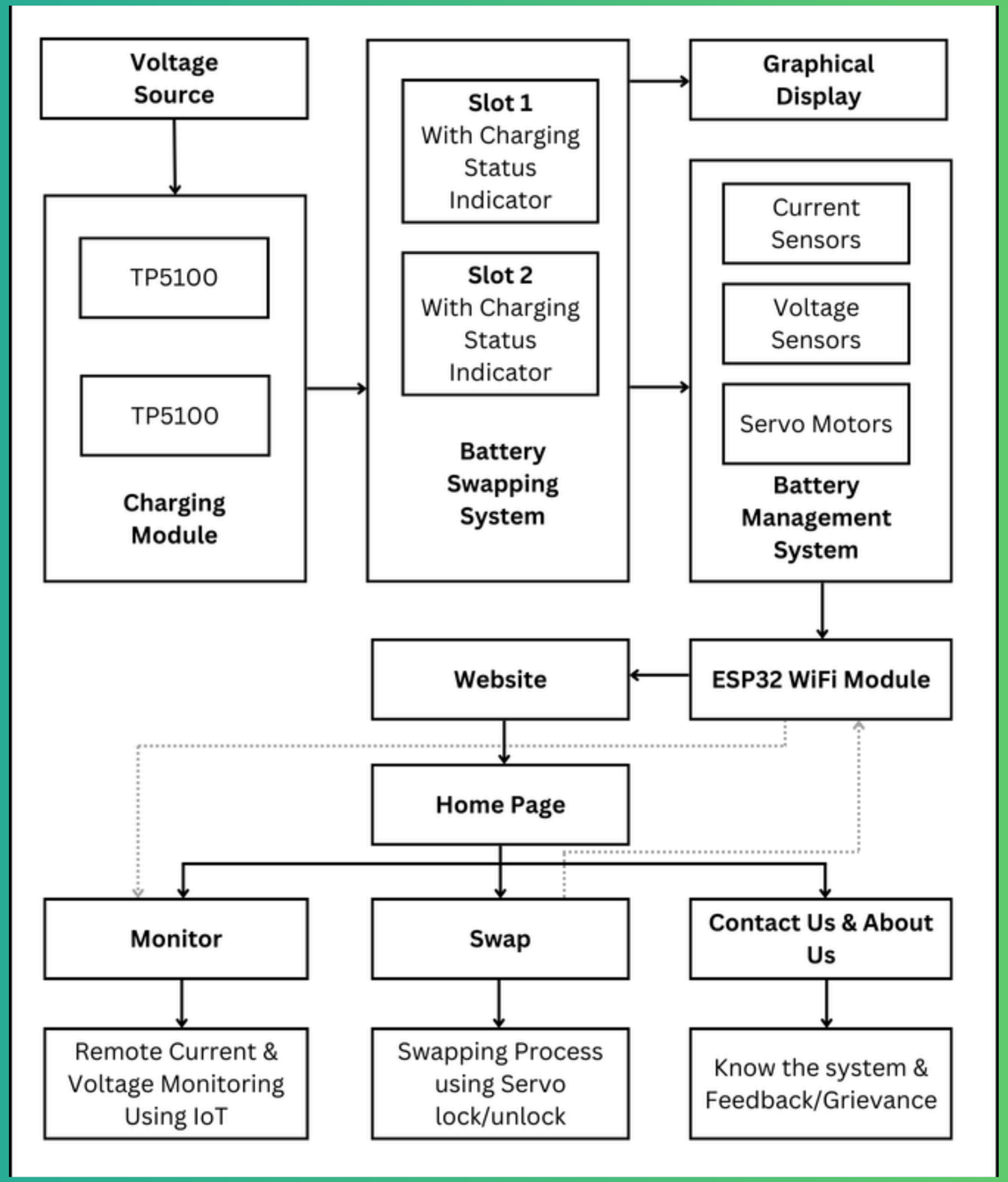


Current Vs Time

SYSTEM FLOW


Slot 1
(with LED indicating charge)
BSS (Battery Swapping System)
Slot 2
(with LED indicating charge)
Battery Monitoring System
Current Sensor
Voltage Sensor
Graphical LED
(Message Display)
Visit Website
Website
Select slot as per performance
Make Payment
Payment Done
Unlock Servo

BLOCK DIAGRAM :



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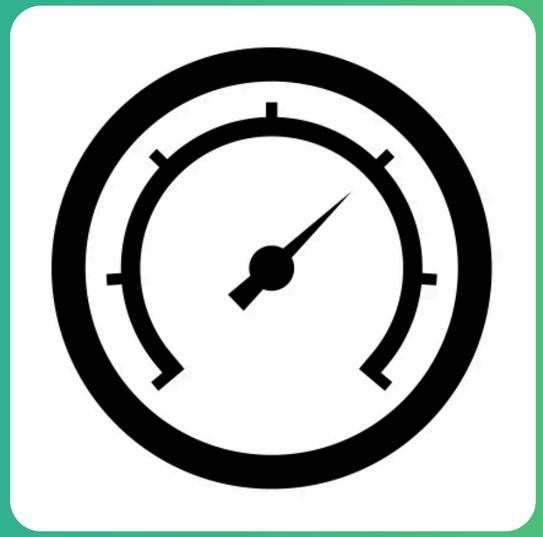
CONCLUSION:

TIME SAVING



REDUCED RANGE ANXIETY

PROMOTING SUSTAINABLE DEVELOPMENT

THANK YOU

RIDE MORE

WAIT LESS