SIMATS ENGINEERING

Engineer to Excel

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Saveetha Institute of Medical And Technical Sciences

(Declared as Deemed to be University under Section 3 of UGC Act 1956)

Department of Computer Science and Engineering

CSA4002 –Management Information Systems for Green Energy

MIS for Construction Project Management

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Date of Submission:

Abstract

The project focuses on developing a Management Information System (MIS) for Construction Project Management to improve project tracking and resource allocation. The system tracks project timelines, material usage, and workforce allocation while generating real-time progress reports and budget tracking. It helps reduce project delays and improve cost variance to below 10%, enhancing overall resource management. The solution is implemented using Flask, Chart.js, and SQLite, providing an interactive dashboard for real-time data visualization and decision-making.

•**Problem:**

Inefficient project tracking and cost overruns.

•**Purpose:**

Develop a system to track project timelines, material usage, and workforce allocation.

•**Outcome:**

Improved resource management, reduced project delays, and real-time budget tracking.

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Introduction

- **Background:**
  Construction projects face delays and cost overruns due to poor tracking.

- **Objective:**
  Build an MIS to track and manage project progress.

- **Significance:**
  Enhance efficiency and cost control.

- **Scope:**
  10+ projects with real-time monitoring.

- **Methodology:**
  Flask (Python), Chart.js, HTML, CSS, and SQLite.

Problem Identification and Analysis

- **Problem:**
  Poor resource allocation and budget overruns.

- **Evidence:**
  High variance (>10%) in budget and schedule slippage.

- **Stakeholders:**
  Project Managers, Engineers, Workforce.

- **Findings:**
  Lack of real-time visibility in project progress and costs.

Solution Design and Implementation

•**Design:**

Flask-based web app with data visualization using Chart.js.

•**Tools:**

Flask, SQLite, Chart.js, HTML, CSS, JavaScript.

•**Solution:**

- Real-time data entry
- Dynamic chart updates
- Resource and budget prediction

Results and Recommendations

- **Results:**
-
✓ Improved resource allocation
✓ Reduced project delays (<10%)
✓ Accurate real-time budget tracking

- **Challenges:**
  Data sync issues during updates.

- **Recommendations:**
  Improve prediction model accuracy and UI.

CODING-1

1. **Backend (Flask)** – app.py

Developed using Flask framework.Handles API requests for data fetching, updating, and processing.Manages CSV-based project data storage and updates in real-time.Key

Functionalities:

✓ Load project data from CSV.
✓ Adjust resources based on user input.
✓ Predict budget using dynamic calculations.
✓ Return real-time data for chart updates.

CODING-2

2. Frontend – dashboard.html

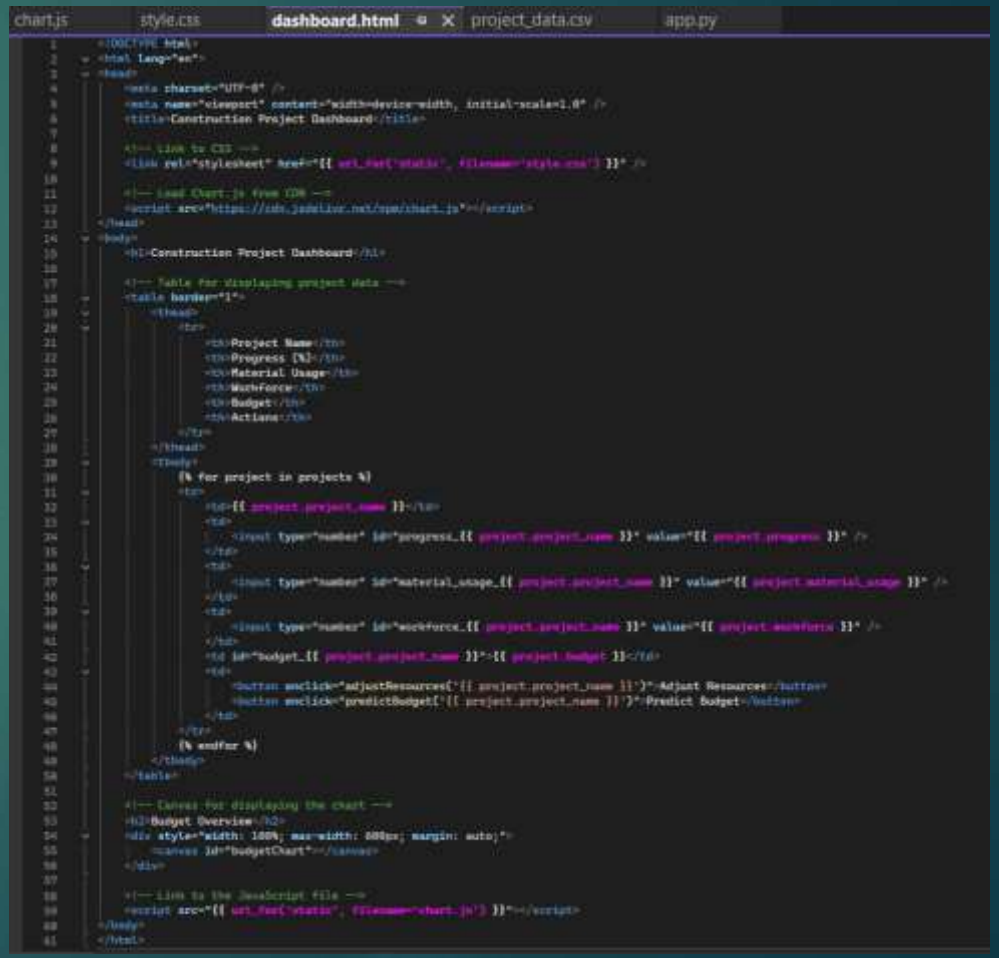
Built with HTML + CSS + JavaScript.Uses Chart.js for real-time chart updates.Includes user interaction for adjusting data and predicting budget.

Key Features:

✓ Editable table for real-time input.

✓ Action buttons to adjust resources and predict budget.

✓ Real-time data updates reflected in the chart.



CODING-3

3. Chart Integration – chart.js

Uses Chart.js for real-time visualization.Dynamically updates when table data is adjusted.

Key Functionalities:

✓ Load data from Flask backend

✓ Update chart directly without reload

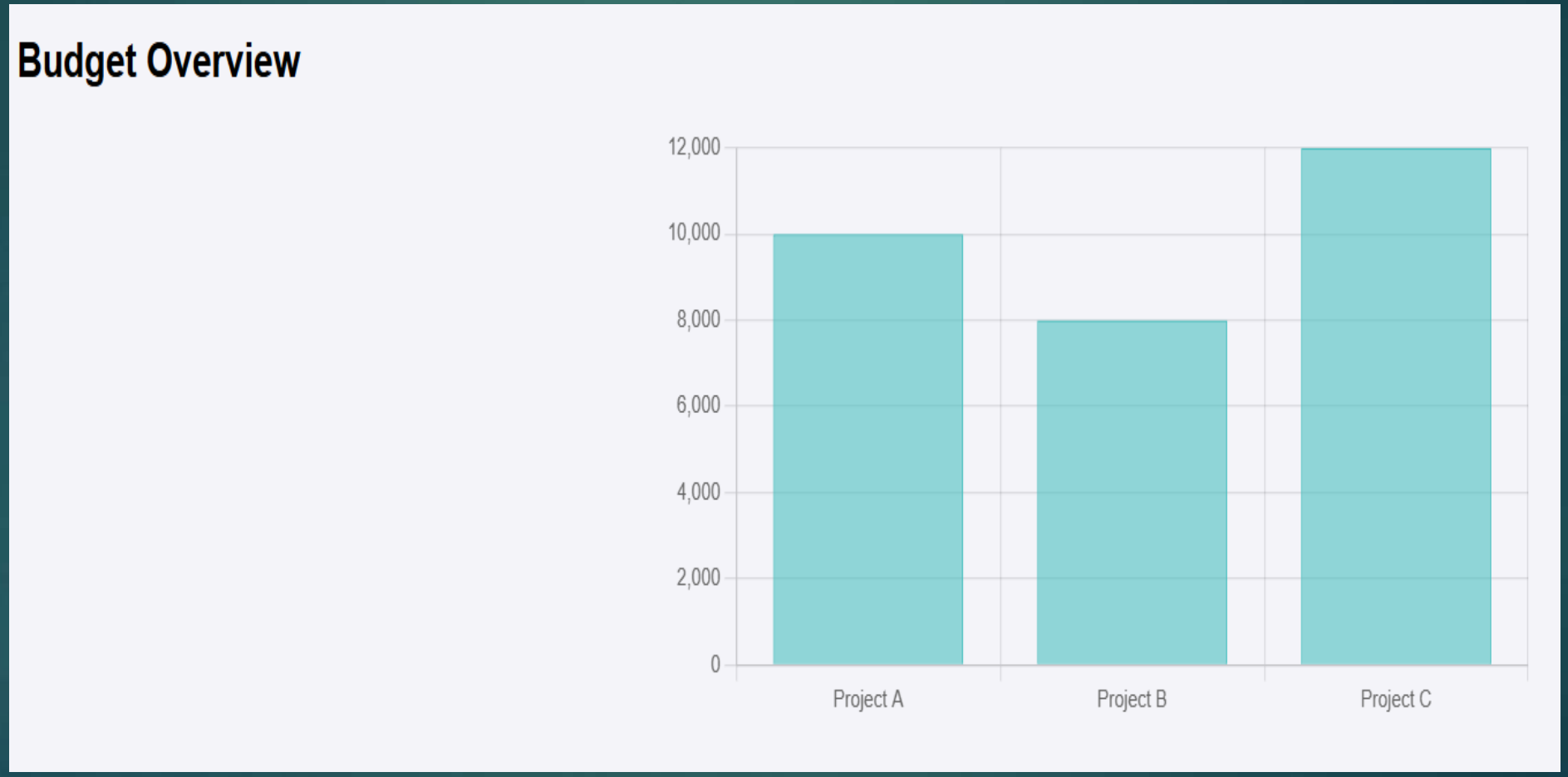
✓ Smooth transition for real-time effect

OUTPUT
DASHBOARD OVERVIEW

Project Name	Progress (%)	Material Usage	Workforce	Budget
Project A	75	124	20	10000
Project B	50	100	10	8000
Project C	90	140	23	12000

OUTPUT

CHART



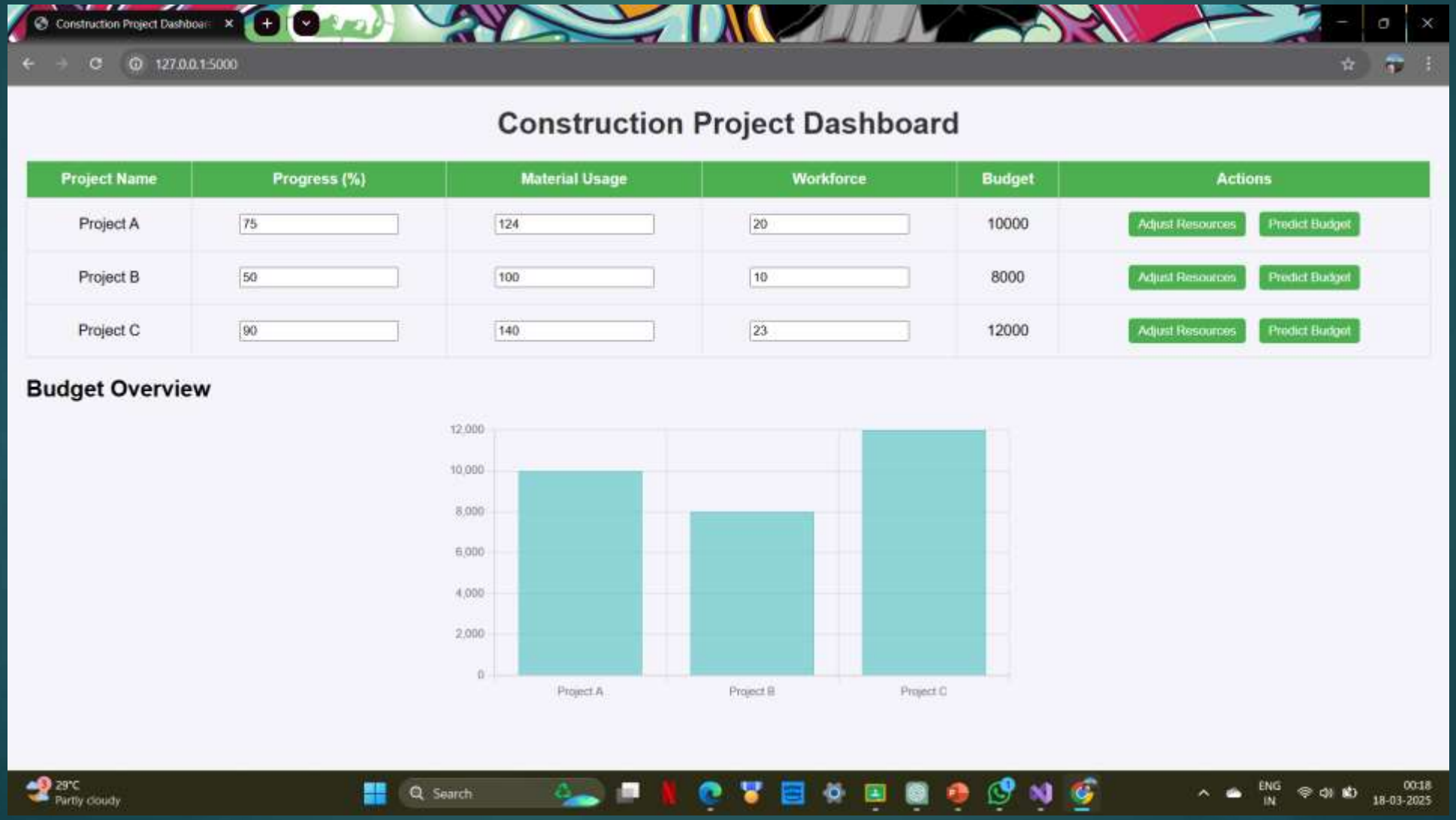
OUTPUT

ADJUSTMENT

Construction Project Dashboard

Project Name	Progress (%)	Material Usage	Workforce	Budget	Actions
Project A	75	124	20	10000	Adjust Resources Predict Budget
Project B	50	100	10	8000	Adjust Resources Predict Budget
Project C	90	140	23	12000	Adjust Resources Predict Budget

OUTPUT
FINAL



Reflection on Learning and Development

- **Learning:**
  Flask, REST API, Chart.js, and real-time updates.

- **Challenges:**
  Chart re-rendering and API sync.

- **Skills:**
  Backend and frontend integration, data visualization.

- **Industry Insight:**
  Importance of real-time MIS for large-scale projects.

Conclusion

- **Findings:**
  Real-time MIS improved cost tracking and project efficiency.

- **Importance:**
  Enhanced decision-making for project managers.

- **Future:**
  Add AI-based predictions and automated resource adjustment.

References

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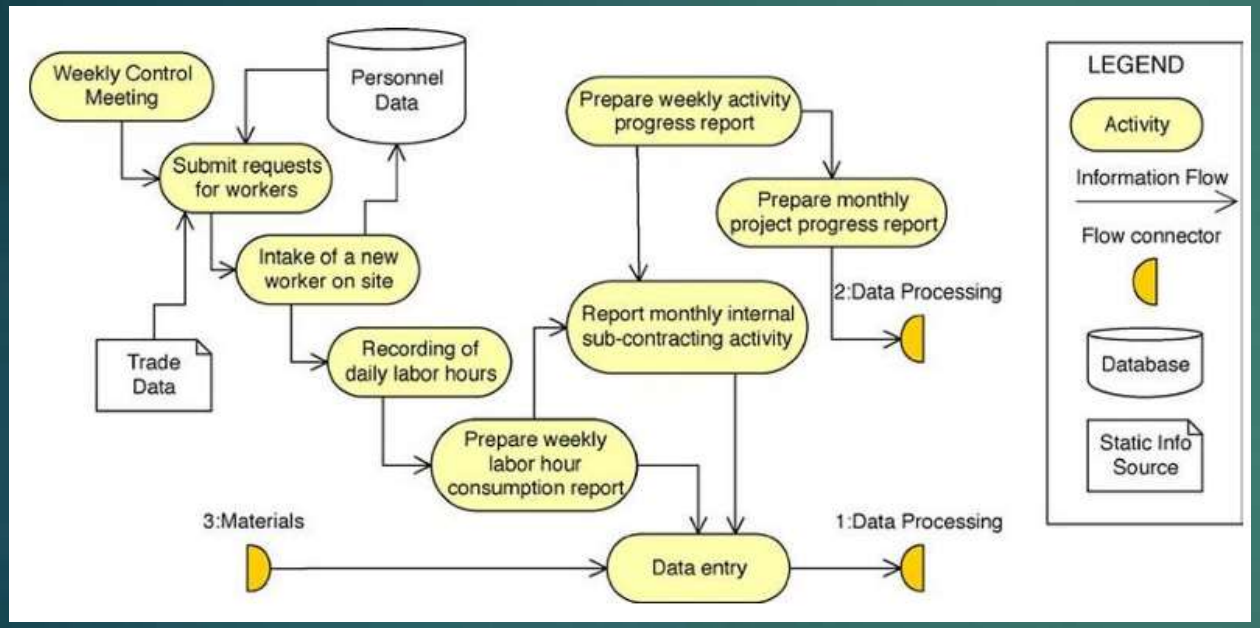
•Lee, S. K., & Yu, J. H. (2012). Success model of project management information system in construction. *Automation in construction*, *25*, 82-93.

•Scherer, R. J., & Schapke, S. E. (2011). A distributed multi-model-based management information system for simulation and decision-making on construction projects. *Advanced Engineering Informatics*, *25*(4), 582-599.

Appendices

System architecture diagram



Data Flow Diagram