

TITLE PAGE:

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CASE STUDY in - *font: 14pt*

COMP 106 – Application Development and Emerging Technologies - *font: 14pt*

SUBMITTED BY: - *font: 12pt*

MEMBERS, (Alphabetically Arrange)

Surname, First name, MI - *font: 12pt*

SUBMITTED TO: - *font: 12pt*

Engr. Racquel Cortez, MIT - *font: 12pt*

CONTENT:

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I. INTRODUCTION

- **Rationale**

Need: Identifying the Problem:

- What is the *problem, gap, or challenge* that needs to be solved?
- What *data or evidence* supports the urgency of this issue?
- Who are the *stakeholders affected* by this problem?

Example:

Metro Manila's traffic congestion causes an estimated economic loss of ₱3.5 billion daily. Current traffic management systems rely on manual interventions, leading to inefficiencies and delays. There is a need for real-time traffic monitoring and decision-support system to optimize urban mobility.

Solution: Your Proposed Approach:

- What specific *technology, method, or innovation* will address the problem?
- How does this solution *directly tackle the identified need*?

Example:

This research develops an AI-powered real-time traffic congestion analysis system that integrates data from CCTV cameras, GPS, and road sensors. The system will provide predictive analytics and decision-support tools for city planners to implement dynamic traffic adjustments.

Differentiation: What Makes it Unique?

- How is your approach *different from existing solutions*?
- What *new technology, method, or insight* does your project bring?

Example:

Unlike existing traffic systems that rely solely on pre-set traffic signals, our model uses machine learning-based real-time adaptation. This enables instant adjustments to road conditions, compared to static traffic light systems.

Benefit: Expected Impact

- Who will benefit from this research (government, industries, citizens, Pasig Community)?
- What are the expected *economic, environmental, or social impacts*?
- How will the research contribute to *national development goals*?

Example:

By optimizing traffic flow, this system can support reduction of fuel consumption and carbon emissions, improve public transport efficiency, and save millions in daily economic losses. The project aligns with the DOST Smart City Initiative and contributes to sustainable urban mobility solutions.

Example Introduction for **Proposed Project: FlowTrack: AI Traffic Monitoring Mobile App**

Metro Manila's traffic congestion causes an estimated economic loss of ₱3.5 billion daily. Current traffic management systems rely on manual interventions, leading to inefficiencies and delays. There is a need for real-time traffic monitoring and decision-support system to optimize urban mobility. This research develops an AI-powered real-time traffic congestion analysis system that integrates data from CCTV cameras, GPS, and road sensors.

The mobile app will provide predictive analytics and decision-support tools for city planners to implement dynamic traffic adjustments. By optimizing traffic flow, this system can support reduction of fuel consumption and carbon emissions, improve public transport efficiency, and save millions in daily economic losses. The project aligns with the DOST Smart City Initiative and contributes to sustainable urban mobility solutions.

- Objectives**

General Objective: The broad goal of the study

Specific Objectives: The step-by-step aims to achieve the general objectives

Example:

General Objective: To develop a mobile app that shows real-time traffic updates and suggests better routes using AI.

Specific Objectives:

- To create a mobile app that displays live traffic updates using data from GPS and road sensors.
- To use basic AI techniques to predict traffic congestion and suggest alternative routes.
- To test the app’s accuracy in showing traffic conditions and its ease of use for beginners and commuters.

- Theoretical Framework**

Explains fundamental principles, theories, or models that the supports or guides the study

Example:

- Big data analytics framework for real-time governance
- Traffic flow Theory
- System thinking approach

Tips:

- Cite previous research on existing theories and similar applications
- Use diagrams or conceptual models
- Dashboard Test and validate the system in a pilot city

II. Review of Related Literatures

Write at least 2 Review of Related Literatures that summarizes the following:

- Identifies **what is already known** and **what gaps remain**
- Justifies the **need for the study**
- Supports the **theoretical framework** and **methodology**

Review of Literature

Tips:

- Use tables to summarize related literature

Study	Findings	Gap	AI Technique/Tool Used	Locality
Smith et al. (2020)	AI can optimize traffic lights to reduce congestion.	Does not account for real-time data from multiple sources.	Reinforcement Learning for Adaptive Traffic Signals	New York, USA
Lee & Chang (2021)	Open data improves city efficiency and public service delivery.	Lack of real-time dashboards integrating multiple urban systems.	Data Mining & Predictive Analytics	Seoul, South Korea
Martinez et al. (2022)	Machine learning models predict peak congestion times accurately.	Focused on highway traffic only, not inner-city roads.	Decision Tree-Based Traffic Forecasting	Madrid, Spain
Tan et al. (2023)	AI-powered CCTV analytics enhances public safety.	No integration with public transportation monitoring.	Computer Vision & Object Detection	Singapore
Rivera & Santos (2024)	Predictive models improve emergency response time by 30%.	Not tested in flood-prone urban areas.	AI-Powered GIS & Real-Time Data Analytics	Manila, Philippines

III. Methodology

Write a paragraph that explain the following (if applicable)

- Research design (e.g., experimental, survey, simulation)
- Data sources and collection methods
- Data analysis techniques
- Validation
- Tools and software
- Ethics considerations

IV. **RESULTS and DISCUSSION**

Provide an overview of how the case study is structured and the key sections or topics that are part of the application being developed. Provide a diagram/prototype/screenshot, that provides a clear guide to understand the application.

- **Screenshots**

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- **Summary of Evaluation**

- Prepare an evaluation sheet (for at least 10 users) that will assess the mobile app using a Likert scale rating from 1 to 5, where:
 - 1 = Strongly Disagree
 - 2 = Disagree
 - 3 = Neutral
 - 4 = Agree
 - 5 = Strongly Agree
- Include the following evaluation criteria:
 1. Functionality — The app performs its intended tasks correctly and completely.
 2. Reliability — The app operates without crashing or errors during use.
 3. Efficiency — The app responds quickly and uses resources (battery, data) appropriately.
 4. Usability — The app is easy to understand, navigate, and use.
- Summarize the results of the evaluation

V. **CODE DOCUMENTATION**

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Add clear and concise comments at the beginning of each class, method, and complex code block to explain their purpose, behavior, and any relevant assumptions. Use Javadoc-style comments for public classes and methods to generate comprehensive documentation. Ensure that the code adheres to a consistent coding style and naming conventions

- Java Files
- XML files