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**NATIONAL UNIVERSITY FAIRVIEW**

**College of Engineering and Technology  
Bachelor of Science in Information Technology**

**with Specialization in Mobile and Internet Technology**

**Smart Fare: Automating modern public utility jeepney (MPUJ) Payment with an Innovative Fare Collection System**

Project Documentation Submitted to the Faculty of

Bachelor of Science in Information Technology

National University Fairview

In Partial Fulfillment of the Requirements for

PROJMAN – PROJECT MANAGEMENT

By

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# Project Charter

This Charter formally authorizes the Fare Collection Project to develop and implement a Smart Fare Collection System for the use in the NOVADECI Transport Service. This includes the electronic fare collection method that will allow passengers to pay fare using contactless payment options. The system aims to reduce fare evasion and enhance revenue management for the transit authority. A project plan will be developed and submitted to the Project Sponsor for approval.

## Project Purpose/Justification

For the benefit of our client, Novaliches Development Cooperative (NOVADECI), in better managing and organizing the fares for the transportation service, our team will work closely with the client to design, develop, and deploy an efficient and user-friendly system to improve the client's fare collection process and enhance the customers' ease of use, security, and dependability. Lastly, our team will support the client's business objectives and meet customer needs.

### Business Need

Due to the industry's dynamic nature, NOVADECI Transport Service faces a growing demand for efficient public transportation services. Inefficiencies, operational issues, and consumer dissatisfaction plague the current fare-collecting system. Peak hours can lead to extended waiting times, compromising the customer experience. Fraudulent actions within the manual system pose a significant financial risk, threatening the organization's revenue stream and long-term economic viability. The increasing expenses related to fare-collecting, such as personnel management, also pose challenges. The long-term sustainability of NOVADECI relies on operational optimization and cost-reduction strategies. Customer dissatisfaction with the current system could lead to a decline in ridership and undermine the company's standing as a reliable transportation service provider. Adopting a Smart Fare Collection System is a technical advancement and a strategic need to navigate the changing dynamics of public transportation and maintain a competitive edge. This project addresses this significant business need and aligns NOVADECI with contemporary transportation methodologies.

### 3.1.2. Business Objectives

NOVADECI has established multiple business objectives to steer its operations and accomplish its mission. First, it seeks to promote prudence and savings mobilization among its members, fostering a culture of fiscal responsibility and easing the formation of capital for individuals. In addition, NOVADECI aims to generate funds to lend to its members in support of their productive endeavors and providential requirements. In addition, the organization is committed to providing a vast array of products and services and meeting member needs, including hospitalization, market management, accountancy services, education, funeral arrangements, and transportation facilities.

NOVADECI seeks to promote and expand additional services that appeal to the requirements of its members, such as enhanced hospitalization services, improved market management systems, dependable accountancy services, quality education, comprehensive memorial services, and convenient transportation options. By actively pursuing these business objectives, NOVADECI intends to contribute to its members' well-being and prosperity by providing financial assistance and essential products and services.

# 3.2. Project Description

This project focuses on the need of the Novaliches Development Cooperative (NOVADECI) transport service to adopt their Modern Public Utility Jeepneys payment system to be more effective on managing and collecting passenger fees with an innovative technology-based system. The project will eliminate the need to manually collect fares, which results in a procedure that is not only quicker but also more efficient and dependable.

To facilitate the client's fare collection and enhance the service's accessibility, security, and reliability for the client's consumers, a user-friendly and effective system will be created, developed, and implemented. This project seeks to develop an Automated Fare Collection System to provide Modern Public Utility Jeepney drivers and passengers with inconvenient experiences.

### 3.2.1. Project Objectives and Success Criteria

Project Objective:

A smart fee collecting system's main goal is to increase the effectiveness of fare collection by decreasing passenger queues and facilitating quick vehicle boarding and disembarking.

The project's goal is to establish a system which NOVADECI Transport Service may use to monitor fare income more effectively, eliminate fare evasion, and lessen acts of fraud, all of which will lead to increased income.

### 3.2.2. Success Criteria:

For this proposal to reach its full potential, the following objectives must be observed throughout the execution of the project:

* Expense Reduction: Achieve a 20% reduction in the client's wage expenses related to fare collection within the first 3 months of implementing the Smart Fare project.
* Fare Loss Minimization: Successfully reduce fare losses by 10% within the first 3 months of implementing the Smart Fare project.
* Centralized Document Management: Establish a fully functional centralized system for managing all fare-related documents from the Smart Fare Device within the first 3 months of project implementation.
* Cash Flow Increase: Realize a 10% increase in cash flow within the first 3 months of implementing the Smart Fare project.

These success criteria provide clear and measurable objectives for evaluating the project's performance and effectiveness in achieving the specified goals.

### 3.2.3. Requirements

### 3.2.4. Constraints

### 3.2.5. Assumptions

### 3.2.6. Preliminary Scope Statement

This project's scope includes developing a system that will collect fare payment alongside its data for the Modern Public Utility Jeepneys of the NOVADECI. The system will consist of the following features:

* Implement NFC for the payment method: Implement a GCash and Paymaya electronic wallet for contactless and cardless payments. To integrate GCash and PayMaya as payment options for your smart fare project, you must register merchant accounts with both platforms, implement their APIs into your system, and handle server-side and client-side integration, including error handling and security. GCash utilizes DragonPay for its Philippine payment gateway. PayMaya also has its mobile payment gateway mechanism.
* Monitor the daily income: The team will create a database to contain transaction information, logic to process payments, income calculations and updates based on finalized transactions, and a dashboard from which to view and produce reports.
* Monitor the estimated time of the passenger’s pick-up and drop-off location: The team will create a database to contain transaction information, logic to process payments, income calculations and updates based on finalized transactions, and a dashboard from which to view and produce reports.
* Monitor the daily and weekly number of passengers: Track successful transactions and record passenger information in a database. Implement logic to count and aggregate the number of passengers within daily and weekly intervals and give reporting capabilities or statistics to monitor and show the passenger counts.
* Display the rates of drop-off locations: Our team will maintain a database or configuration file containing rates for drop-off locations, fetch the relevant rates depending on the specified drop-off location, and display them on the mobile application interface. They will also ensure that the rates are readily updated if any changes or adjustments are made.

In terms of programming languages and software the team will use Microsoft Visual Studio as the main programming platform and the languages that will be utilize are:

* NFC Payment Integration: Utilize Java or Kotlin for Android development to leverage the native NFC capabilities of Android devices, enabling secure payment transactions.
* Backend Development and Database Management: PHP can be used for the backend development, implementing business logic, income monitoring, and connecting with the MySQL or PostgreSQL database. PHP's database extensions (MySQLi or PDO) facilitate data storage, retrieval, and management.
* Mobile Application Development: Employ Java or Kotlin for Android and Swift or Objective-C for iOS to create the mobile application that integrates with NFC, monitors pick-up and drop-off locations, tracks daily and weekly passenger counts, and displays drop-off location rates.

The project will be considered complete upon successful deployment of the Payment system and the features that are expected to be implemented with the project.

# 3.3 Risks

The development of a project involves multiple risks. The following are potential risks that could arise from this project:

* Data privacy concerns: It is necessary to have proper data security methods, to adhere to regulations regarding privacy, and to establish transparent handling of information guidelines.
* System Integration Failure: The recently implemented Smart Fare System could cause service interruptions and inconveniences.
* Network Connectivity Issues: Inconsistent or unstable might interfere with immediate communication between equipment and result in expenditure errors, interruptions, or inaccurate fare estimates.
* Hardware/Software Compatibility problems:  With the compatibility across various hardware parts, software variations, or OS versions, which can lead to infrastructure failure or restricted operation.
* Service Interruptions: May cause passengers to experience difficulties because of unexpected service interruptions, system repairs, or updates that may affect the smart fare collection system's functionality and dependability.

# 3.4 Project Deliverables

# 3.5 Summary Milestone Schedule

# 3.6 Budget Summary

# 3.7 Project Approval Requirements

The project sponsor, Mr. Mark Anthony Quion, will decide if the project is successfully completed based on the fulfillment of every deliverable and objectives as stated in the project charter. Prior going further, any modifications from the agreed-on factors must get the Project Sponsor's approval. The Project Sponsor will be signing off on the project, confirming its authorization and the effective ending of the project, after each deliverable has been fulfilled and all terms were successfully fulfilled.

# 3.8. Project Manager

# 3.9. Authorization