APPENDIX 3-1a

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UNIVERSITI TEKNOLOGI PETRONAS

FORM 01A

FINAL YEAR PROJECT TITLE PROPOSAL

Project Title: Easy Parcel: IoT-Based Parcel Storage System for University Villages

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CGPA: 3.33 **Total Credit Hours This Semester:** 14

Area / specialization: IoT, Mobile App Development

Suggested supervisor (if any): _____

Collaborator(s) (if any) : _____

Problem Statement:

At the university, all parcels are centralized at a single location known as the ParcelHub, which is far from most student residential villages. This leads to long queues during peak hours, inconvenience for students without transport, and additional parking issues for those who drive. Moreover, students are required to pay extra charges to collect their parcels despite already paying for delivery fees, causing dissatisfaction. The current system lacks flexibility, cost-efficiency, and accessibility.

Objectives:

- To design and develop an IoT-based smart locker system for student villages to store small parcels securely.
- To build a mobile application for both students and couriers to manage locker access, track deliveries, and receive parcel notifications.
- To implement a random password lock system and barcode scanning for secure identification of parcel senders (couriers) and receivers (students).

Pre-requisite (if any):

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Short summary of the research project:

This project proposes a decentralized smart parcel locker system to be installed across university residential villages, aiming to reduce reliance on the centrally located ParcelHub. Each locker will be shared by housemates and designed specifically for small parcels. The system incorporates a secure password-based locking mechanism with OTP codes generated through a dedicated mobile application for both couriers and students. A camera module will activate only during locker access to ensure parcel security while minimizing energy use and data storage. The mobile app will also provide complete visibility over parcel transactions, including delivery and collection timestamps, user identification, and recorded visual logs.

To prevent locker overflow, the system will limit the number of active parcels per student. If a student exceeds the limit, any additional parcels will be redirected to the ParcelHub. Additionally, students will be required to collect their parcels within a specified timeframe (e.g., 15 to 30 minutes) failing which a fine will be imposed. This ensures efficient locker utilization and encourages timely collection, contributing to a more reliable, convenient, and student-friendly last-mile delivery experience.

Tools/equipment required:

Arduino Uno R3, ESP32, Android Studio, Sensors

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