



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

SECD2523 DATABASE

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Phase 2:

Project Proposal & Database Requirement

Lecturer:

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Table of Content

1.0 Introduction.....	3
2.0 Proposed System Data Flow Diagram.....	4 - 7
2.1 Logical Diagram.....	4 - 5
2.2 Physical Diagram.....	6 - 7
3.0 Data and Transaction Requirements.....	8 - 9
3.1 Suggested Business Rules.....	8
3.2 Proposed Data and Transaction Details.....	8 - 9
4.0 Database Conceptual Design.....	
4.1 Conceptual Entity-Relationship Diagram.....	
4.2 Enhanced Entity-Relationship Diagram.....	
5.0 Data Dictionary.....	
6.0 Conclusion.....	

1.0 Introduction

This report represents Phase 2: Database Conceptual Design for the One Stop Parcel Centre (OPC) Parcel Service System at Universiti Teknologi Malaysia (UTM). Following the requirement analysis conducted in Phase 1, the primary objective of this phase is to translate the gathered user requirements and business rules into a formal database model.

This phase focuses on the structural design of the database, specifically the creation of the Entity-Relationship Diagram (ERD) and the Enhanced Entity-Relationship Diagram (EERD). These diagrams serve as the blueprint for the system, visually representing the entities—such as Students, Parcels, and Staff—and the complex relationships between them.

Additionally, this report details the Data Dictionary, which provides a comprehensive reference for all data elements, ensuring consistency in data types, constraints, and definitions. By the end of this phase, a solid conceptual foundation will be established, paving the way for the physical implementation of the database in the subsequent development stages.

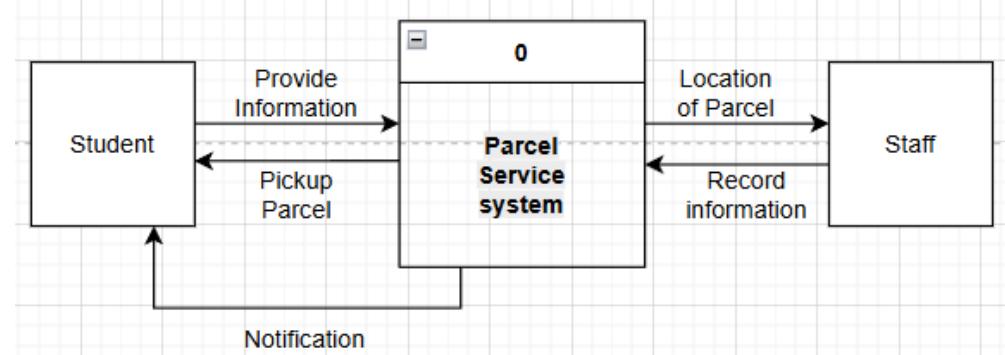
2.0 Proposed System Data Flow Diagram (DFD)

Before we begin analyzing and understanding the data and requirements needed to build the proposed system, we should visualize the data flow within the system using a Data Flow Diagram (DFD). This helps stakeholders quickly and easily understand the data flow within the system, as well as the necessary requirements to achieve the functions or features of the proposed system.

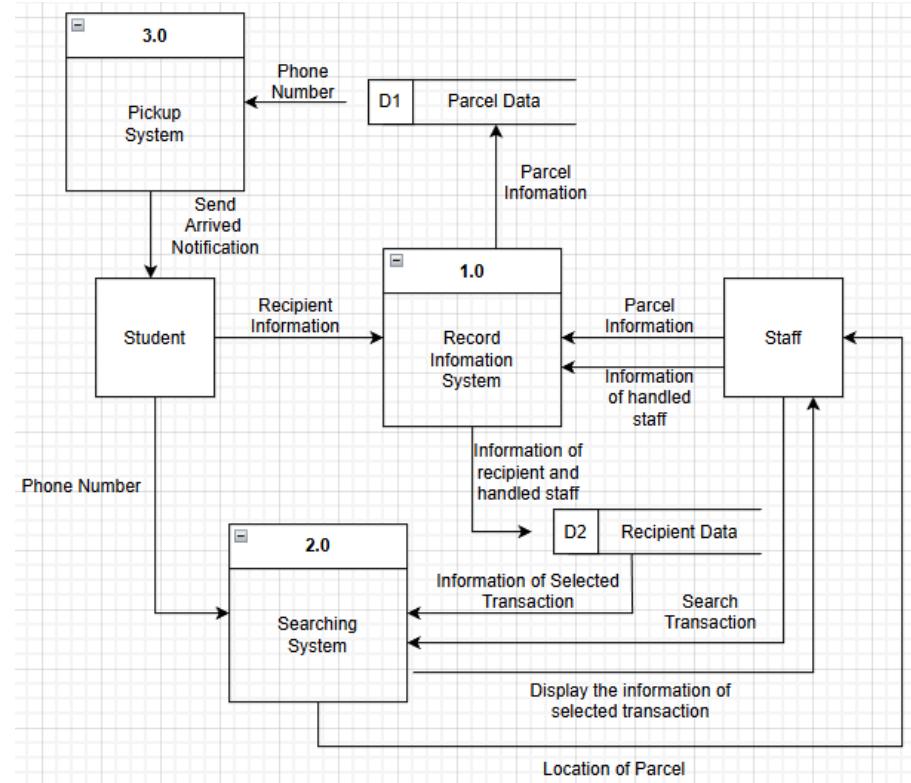
2.1 Logical Diagram

First, we start with a logical diagram which represents the business logic of our proposed system without going into technical implementation details.

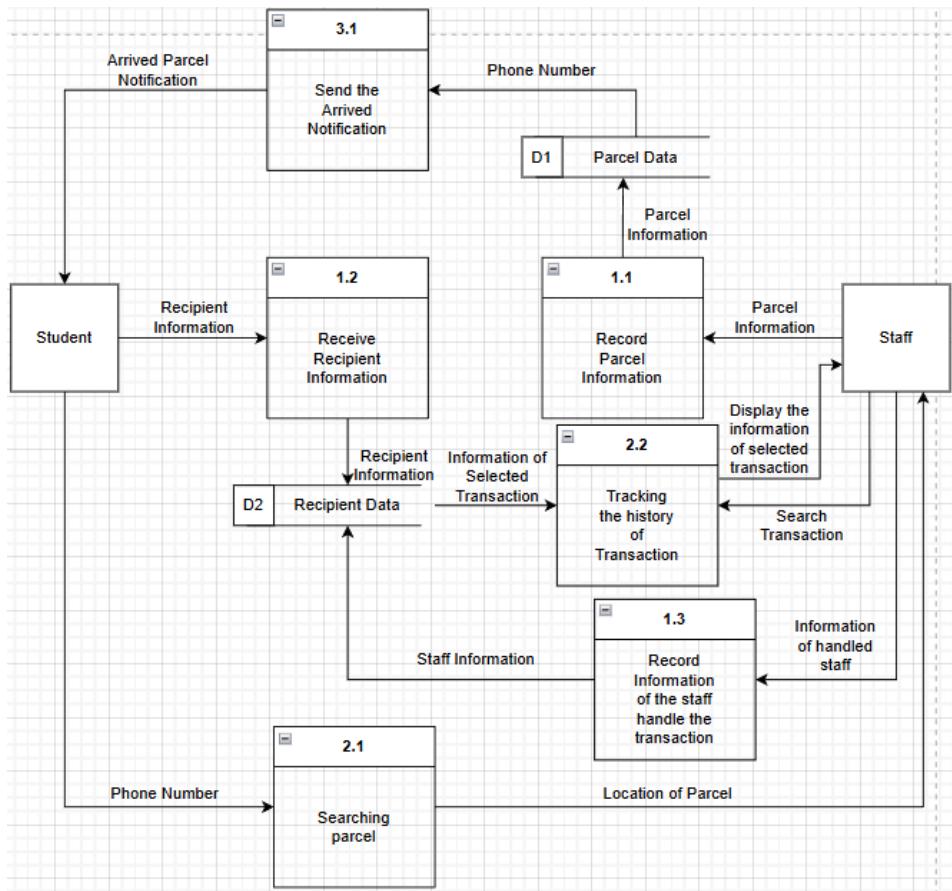
2.1.1 Context Diagram



2.1.2 Level 0 Diagram



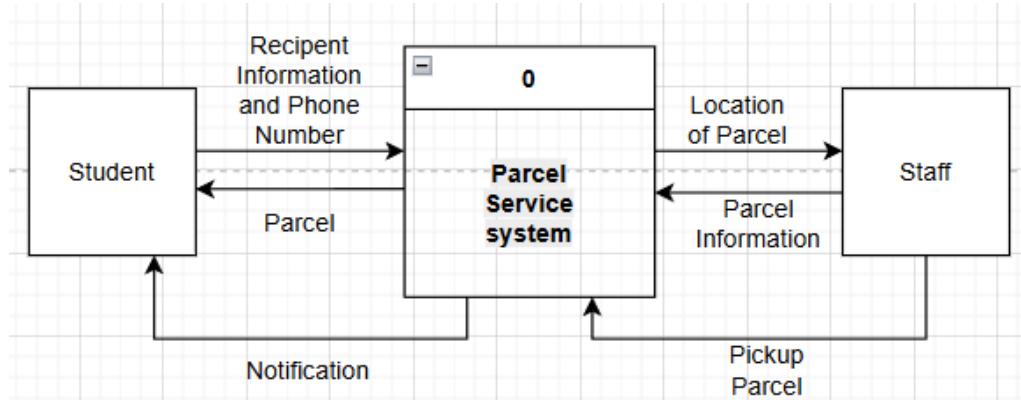
2.1.3 Child Diagram



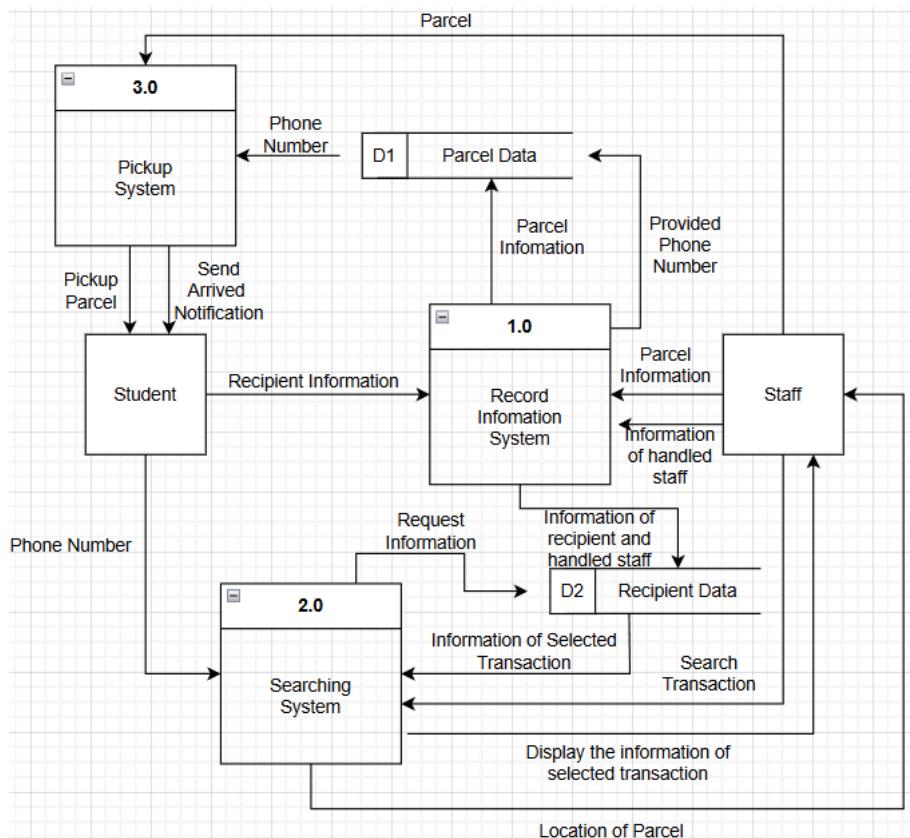
2.2 Physical Diagram

The physical diagram represents the implementation method of the proposed system in the real-world which includes the technical implementation details. It will explain the systems, databases and operations used.

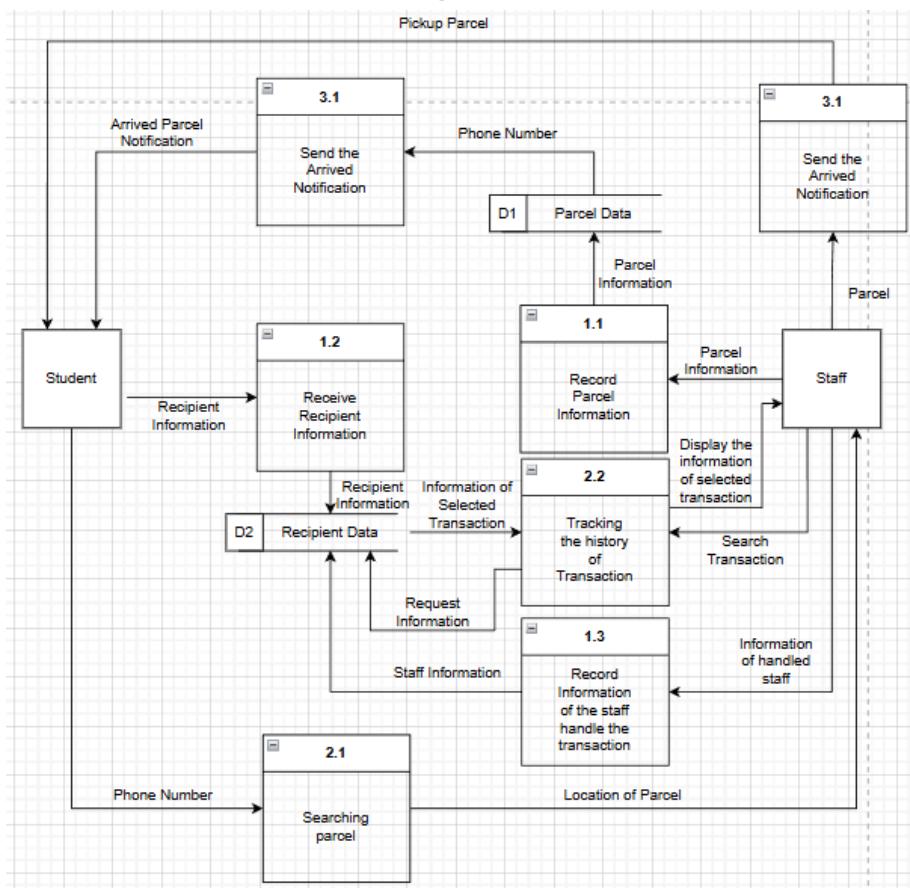
2.2.1 Context Diagram



2.2.2 Level 0 Diagram



2.2.3 Child Diagram



3.0 Data and Transactional Requirements

3.1 Suggested Business Rules

ID	Rule Statement	Category
B-001	Information regarding parcel that has arrived need to be inputted to the system	Constraint
B-002	A "ready for pickup" notification will be sent after the parcel is received in the system	Action
B-003	Recipient need to have a registered whatsapp number to get the parcel notifications	Constraint
B-004	Receiver of the parcel need to have the information regarding the ordered parcel	Validation
B-005	A "Reminder" notification is sent if the parcel remains uncollected after 48 hours.	Derivation

3.2 Proposed Data and Transaction Details

1. Parcel Entities

ParcelID , Courier Name, Parcel Type, Arrival Date, Storage Location, Status, StudentID

2. Student Entities

StudentID, Name, Matric Number, Email, Phone Number

3. Staff Entities

StaffID , Name, Position, Login Credential, ActivityLog

4. Support Entities

- **Notification:**

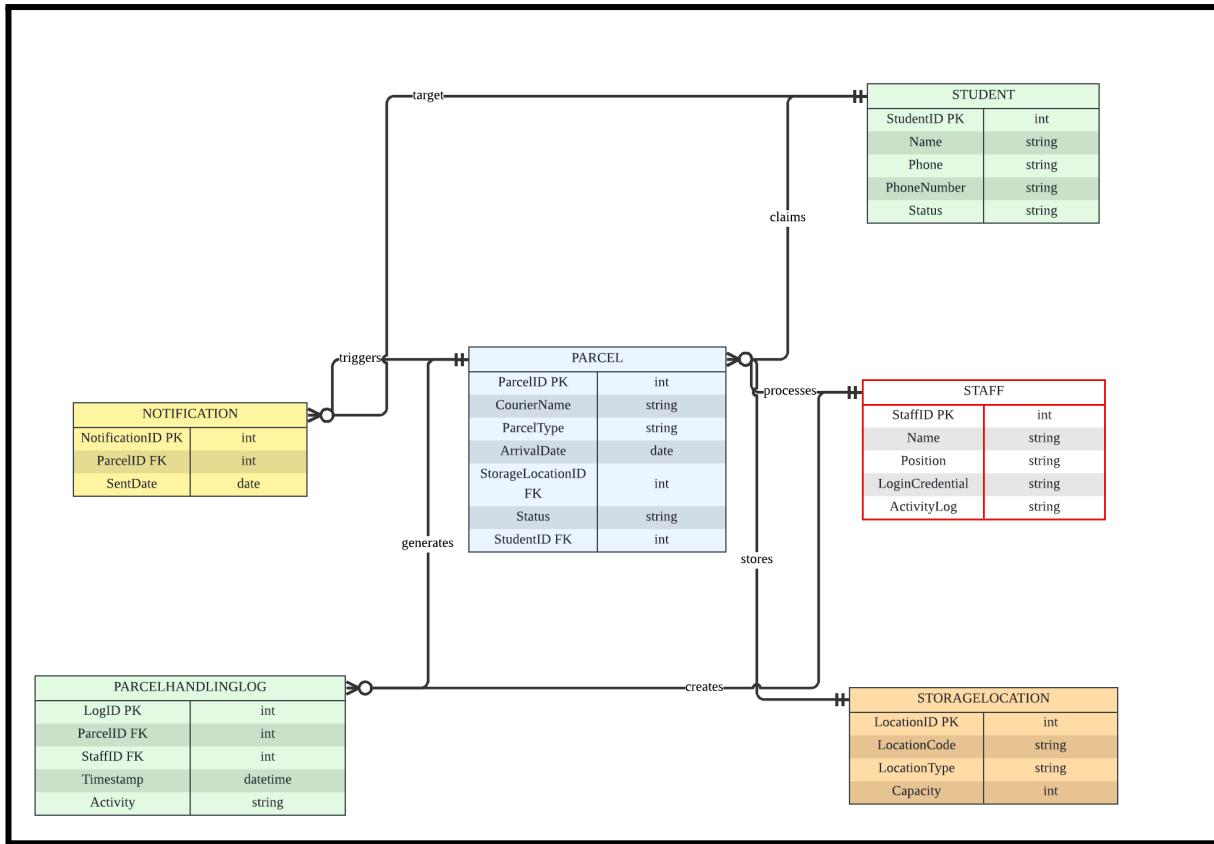
NotificationID , ParcelID , Sent Date, Notification Type (Email/SMS), Status

- **Parcel Handling Log entities**

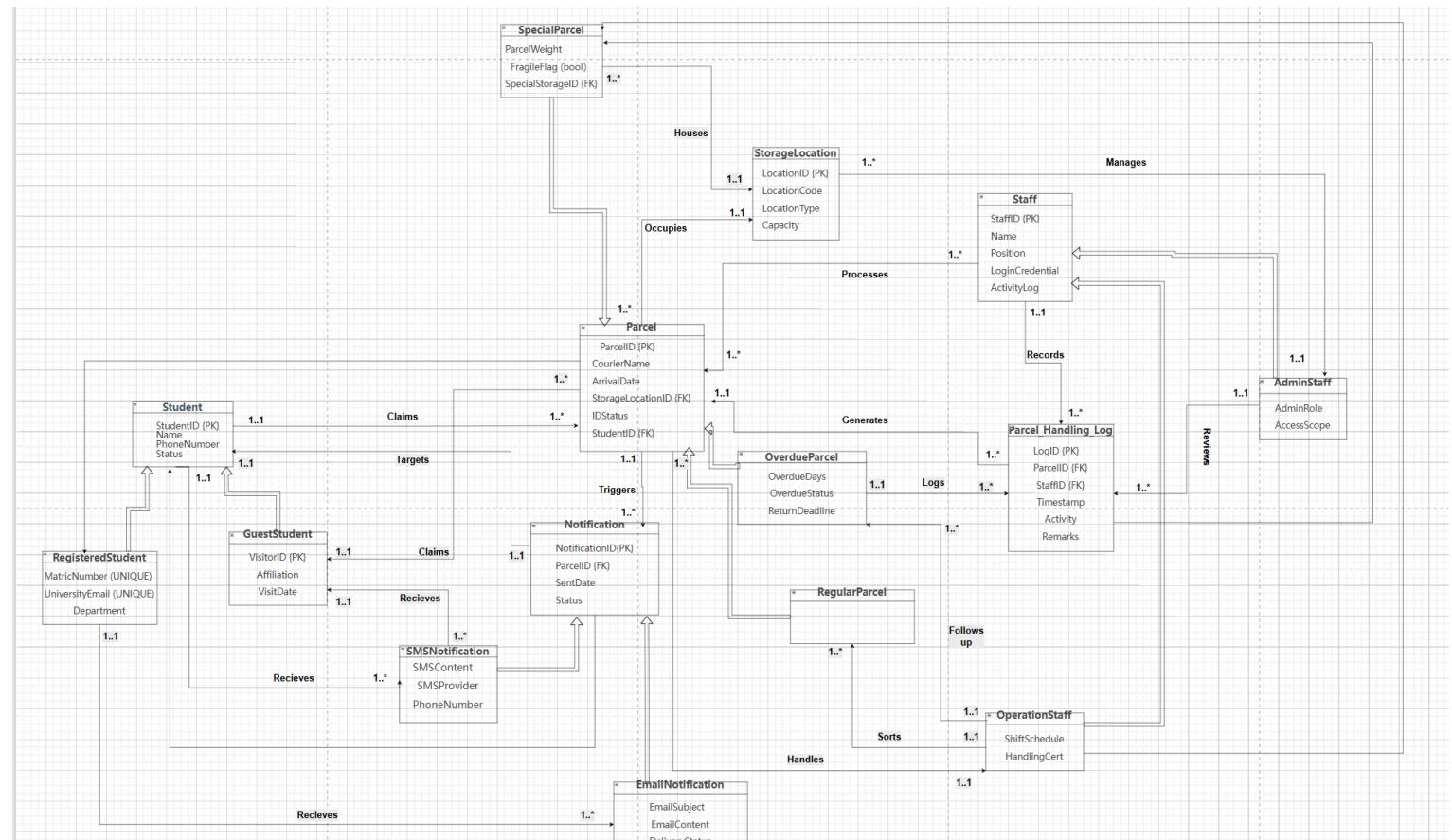
LogID , ParcelID , StaffID , Timestamp, Activity
(Receive/Update/Collect/Return)

4.0 Database Conceptual Design

4.1 Conceptional Entity-Relationship Diagram (ERD)



4.2 Enhanced Entity-Relationship Diagram (EERD)



5.0 Data Dictionary

5.1 Table: STUDENT

5.2 Table: STAFF

5.0 Data Dictionary

5.1 Table: STUDENT

5.2 Table:

5.3 Table: PARCEL

5.4 Table: NOTIFICATION

5.5 Table: PARCEL_HANDLING_LOG

6.0 Conclusion/Summary

In conclusion, Phase 2 has successfully translated the operational requirements of the One Stop Parcel Centre into a structured Conceptual Database Design. By identifying five primary entities—Student, Parcel, Staff, Storage Location, and Notification Log—we have established a framework that addresses the core inefficiencies of the manual system, such as lost records and delayed notifications.

The use of UML notation for the ERD and EERD ensures that multiplicities and business rules are clearly defined, providing a reliable guide for the subsequent logical design and physical implementation phases. With the data dictionary now complete, the project is positioned to move toward creating a database that ensures data integrity, minimizes redundancy, and improves the overall parcel retrieval experience for UTM students.