

# Campus E – Pass System



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**Project Proposal**  
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## **System name:** Campus Bus E-Pass System

### ❖ What is the purpose of the system/application? Why is it needed? What should it do?

**Answer:** The Campus Bus E-Pass System aims to modernize student transportation by replacing physical bus passes with a digital E-Pass, addressing inefficiencies in the current system. It's needed to simplify access to campus buses, making travel between campuses for courses more convenient and eco-friendly. The system will enable students to apply for, refill, and manage their E-Passes online, offering real-time bus schedules and digital receipt tracking. This solution enhances the student experience by streamlining transportation management and promoting sustainability through reduced physical pass usage.

### ❖ Who are the users and what are their information needs?

**Answer:** The primary users of the Campus Bus E-Pass System are the students of the university, particularly those who require frequent inter-campus travel to attend elective courses or specific department classes, such as Computer Science/Technology students going to the Science Campus to attend their science courses.

## **Student's Information Needs:**

- **E-Pass Application and Management:** Students need a straightforward way to apply for, recharge, and check the balance of their E-Pass.
- **Bus Schedules and Routes:** Access to real-time bus schedules and routes is crucial for planning their travel efficiently between campuses.
- **Transaction Records:** They require access to their transaction histories, including E-Pass refills and usage, for personal record-keeping and budget management.
- **Barcode Information:** Since each E-Pass is associated with a unique barcode for scanning upon bus entry, students need to access this barcode within the application.
- **Reward Points:** For students participating in the reward points program, information on accrued points and how they can be redeemed is necessary.

Additionally, **administrative staff** and **bus service managers** could be considered secondary users, as they may need access to system data for monitoring usage patterns, managing bus schedules, and ensuring the system's overall efficiency. Their information needs would focus on aggregated data for decision-making, such as ridership statistics, peak travel times, and financial reports related to E-Pass transactions.

### ❖ What are the problems the system should solve?

**Answer:** The Campus Bus E-Pass System is designed to solve several problems associated with the traditional bus pass system, enhancing the transportation experience for university students. Here are the key problems it aims to address:

- **Inefficiency and Inconvenience:** The current process of obtaining, using, and managing physical bus passes is time-consuming and cumbersome for students, who must manually apply for and renew their passes regularly.
- **Environmental Impact:** The production and disposal of physical bus passes contribute to environmental waste. By moving to a digital system, the university can significantly reduce its carbon footprint and promote sustainability.
- **Limited Accessibility:** Students may face difficulties in purchasing or refilling their bus passes outside of administrative office hours, limiting their access to campus transportation when they need it most.
- **Risk of Loss or Damage:** Physical bus passes can be easily lost, stolen, or damaged, potentially leaving students stranded or forcing them to incur additional costs for replacement.
- **Administrative Overhead:** The manual processing of bus pass applications and renewals requires significant administrative effort and resources, which could be better utilized elsewhere.
- **Inadequate Data for Decision Making:** The lack of comprehensive data on bus pass usage and student travel patterns hampers the university's ability to make informed decisions about bus services and campus transportation policies.

### ❖ What input data is available to the application?

**Answer:** The Campus Bus E-Pass System will have access to a variety of input data, derived from the university's existing databases and the interactions of users (students) with the application. This includes:

#### ✚ **User Data:**

- **Personal Information:** Names, university IDs, and department affiliations of students to facilitate identification and ensure that the E-Pass is issued to the correct individual.
- **Login Credentials:** Usernames and passwords for authentication purposes, ensuring secure access to the system.

#### ✚ **Student Academic and Campus Information:**

- **Course Enrollments:** Information on the courses students are enrolled in, including those requiring travel between campuses, to validate the need for an E-Pass.
- **Campus Affiliation:** Details about the primary and secondary campuses of students to tailor the bus services according to their needs.

#### ✚ **E-Pass Data:**

- **Application Details:** Information submitted by students when applying for an E-Pass, such as preferred package type and initial refill amount.
- **Refill Transactions:** Data on when and how much the E-Pass is refilled, including payment method details.

#### **Financial Transactions:**

- **Payment Information:** Details of payments made for E-Pass refills, including transaction dates, amounts, and payment methods.
- **Receipt Data:** Generated data for each transaction, providing users with proof of payment and refills.

#### **Barcode Data:**

- **Barcode Assignments:** Unique barcode identifiers are assigned to each student's E-Pass for scanning and validation upon boarding a bus.

#### **Reward Points Data:**

- **Points Accumulated:** Information on the reward points earned by students for using the E-Pass, including points earned per trip and total points available for redemption.

### ❖ What kind of information should be stored in the system?

The Campus Bus E-Pass System should store essential information for effective management and user convenience, including:

1. **User Profiles:** Student names, university IDs, contact details, and encrypted login credentials.
2. **E-Pass Details:** Application data, balance, and refill history.
3. **Transaction Records:** Details of E-Pass refills including dates, amounts, and payment methods.
5. **Barcode Data:** Unique barcodes linked to each E-Pass for scanning and validation.
6. **Reward Points:** Information on points earned and redeemed by students.

### ❖ What kind of information can be retrieved from your system?

From the Campus Bus E-Pass System, users and administrators can retrieve a range of important information tailored for efficient management and usage of the E-Pass, including:

#### **1. E-Pass Details:**

- Information on the current balance and validity of the E-Pass.
- Refill history along with detailed transaction receipts.

#### **2. User Transactions:**

- Comprehensive records of all E-Pass refills, including transaction dates, amounts, and payment methods used.

- Details on reward points accrued through the use of the E-Pass, including how they were earned and options for redemption.

### 3. Barcode Information:

- Specific barcode data associated with each E-Pass for scanning and boarding verification.

### 4. Usage Statistics:

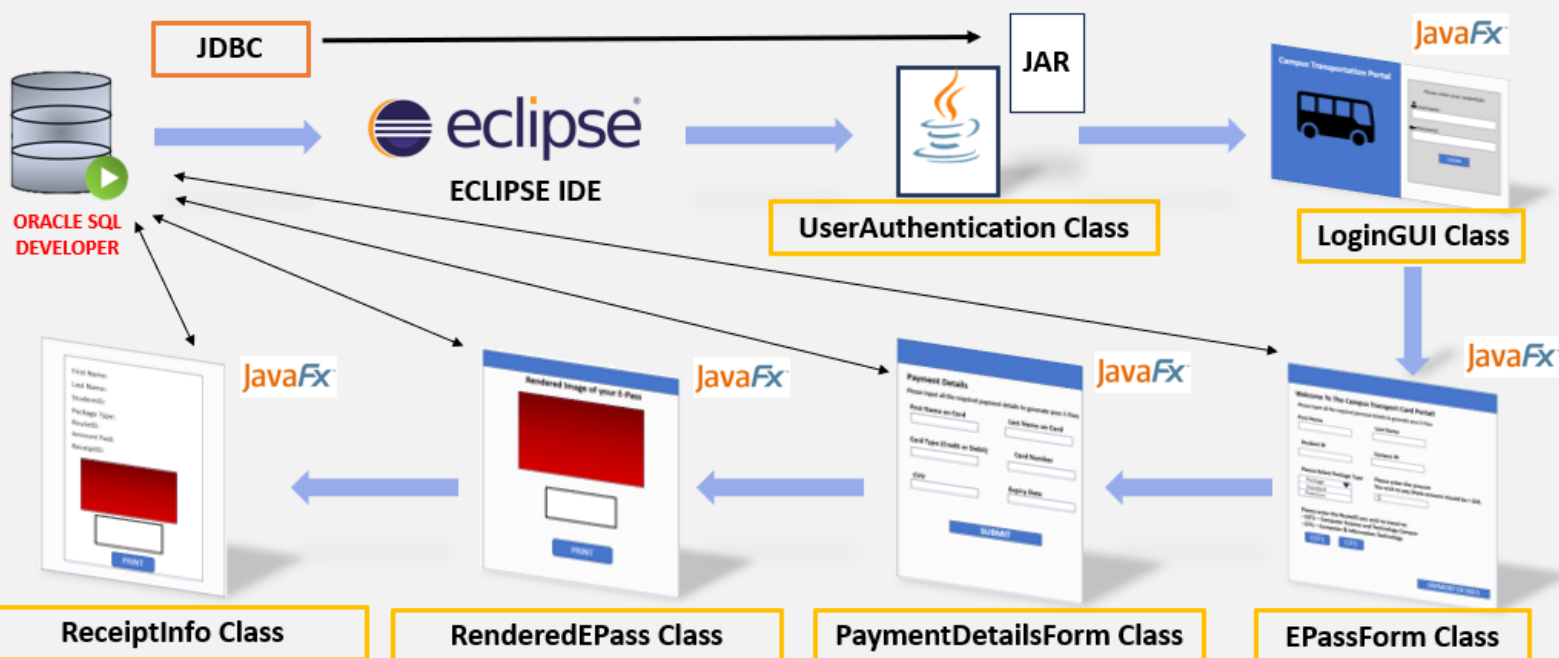
- Access to historical data on E-Pass usage, offering insights into individual travel patterns and frequencies.

The Campus Bus E-Pass System offers comprehensive information on each student's E-Pass, including details about the card itself, such as its balance and validity. It tracks and displays the number of times the card has been refilled, providing a complete history of refill transactions. Additionally, the system presents detailed transaction information, encompassing dates, amounts, and methods of payment, ensuring students have full visibility over their campus transportation expenses and activities. This holistic approach allows for efficient management and oversight of the E-Pass, enhancing convenience and security for the student user base.

**The Class Diagram and Entity Relationship Diagram are attached in the zip file.**

**This will be the system that will be developed for the project.**

## HIGH – LEVEL APPLICATION DIAGRAM (STUDENT SYSTEM)



**This system (ADMIN SYSTEM) will not be incorporated into the project.** The purpose of this diagram is to showcase how the **Username**s and the **Password**s of the **Students** are inserted into the database. The students will log in directly to the system rather than creating an account.

## HIGH – LEVEL APPLICATION DIAGRAM (ADMIN SYSTEM)

