ERP Module Analysis Report: Attendance Tracking

1. High-Level Business Processes (Entire ERP System)

A university's Enterprise Resource Planning (ERP) system integrates all core institutional processes. These can be grouped into Academic & Student Management (handling the student lifecycle from admissions and enrollment to student records, attendance, and grading), Financial & Administrative Management (handling student fees, staff payroll, and procurement), and Campus Operations & Support (managing facilities like hostels, libraries, and gate access control).

2. Attendance Tracking Module Analysis

Module Description

Purpose:

The Attendance Tracking module is designed to accurately, efficiently, and securely monitor and record student attendance. Its primary purpose is to automate data collection by linking a student's verified physical presence on campus with their secure, real-time check-in to a specific lecture. This provides a reliable, non-repudiable record of attendance, enforces university engagement policies, and supplies critical data to other academic modules.

Key Functions:

- **Real-time Data Capture:** Allows a lecturer to generate a unique QR code for a specific class session, which remains valid for the entire lecture duration.
- **Secure Authentication:** Requires each student to log in to the central LMS/ERP system *after* scanning the code to validate their identity before any further action is taken.
- **Campus Presence Validation:** Integrates directly with the university's **Gate Access Control System**. The module will *only* accept an attendance marking if the student's ID card has been "punched in" at a campus entry gate on the same day.
- **Academic Rule Validation:** Automatically validates that the student's check-in attempt is occurring *during* the scheduled start and end time of that specific lecture and that the student is *officially enrolled* in that class section.

Use Case:

A "BP ERP" lecture is scheduled from 1:00 PM to 04:00 PM. The Lecturer displays the session's QR code at 03:50 PM.

- **Scenario 1 (Success):** A student punches their ID at the gate at 9:30 AM. At 10:15 AM, they scan the code, enter their correct password, and tap "Confirm." The system validates their login (Success), then validates their gate-punch (Success), time

(Success), and enrollment (Success). The student receives a "Success: You are marked present" message.

- **Scenario 2 (Login Failure):** A student scans the code and enters the wrong password. The system validates their credentials, which fails. The process stops, and the student receives a "Login Failed: Please check your password" message. No other validations are performed.
- **Scenario 3 (Validation Failure):** A student at home gets a picture of the QR code and scans it. They enter their correct password (Login Success). The system then proceeds to the next checks: Gate Punch-in (Fail), Time (Success), Enrollment (Success). Because the gate check failed, the process sends a "You are outside the university premises. This action will be reported" message.

3. Users & Detailed Process Workflow

3.1 Key Users and Roles

The following key users are the primary actors in this attendance capture process:

- **Student:** The end-user whose attendance is tracked. They are responsible for scanning the QR code, authenticating, and confirming their presence. They also receive real-time status notifications.
- **Lecturer / Instructor:** The academic staff member who initiates and controls the attendance session by generating and displaying the QR code for their specific class.
- **LMS/ERP System:** A non-human actor that serves as the "brain" of the operation. It generates the code, validates credentials, runs all parallel business rules, and stores the final record.

3.2 Module Sub-Process: Real-time Attendance Capture

This section details the step-by-step workflow for the module's primary business process, from the perspective of each user.

Activities by User:

- **Lecturer:**
    1. The process begins when the **Class Session Begins** (Start Event).
    2. The Lecturer logs into the LMS/ERP.
    3. Selects "Generate Session QR Code" for the correct class.
    4. Displays the unique QR code on the projector screen for students.
- **Student:**
    1. Scans the QR code displayed by the Lecturer.
    2. Is redirected to the LMS portal and performs the "Log in & Confirm Attendance" task by entering credentials and tapping "Confirm."
    3. Waits, and then "Receives Status" (a final confirmation or error message).
- **LMS/ERP System (System Actor):**
    1. Receives the "Log in & Confirm Attendance" request from the student.
    2. Validate credentials by checking username and password
    3. **Gateway (XOR):**login success?

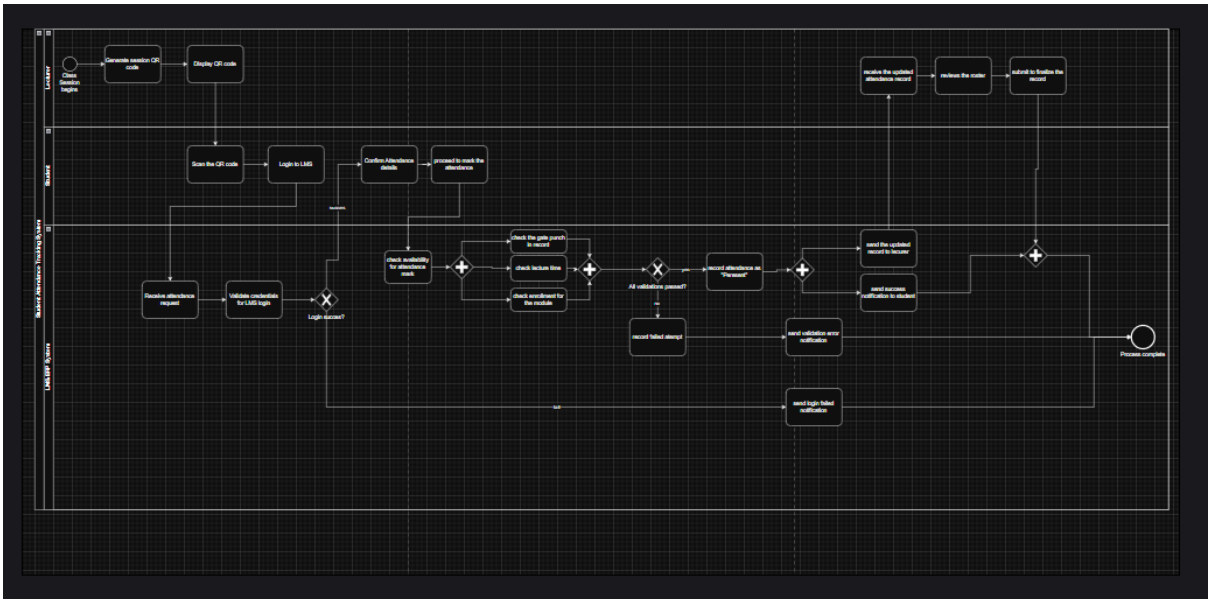
- **[NO] Path:**
  - Send login filed massage to student
  - Record the failed attempt
  - Process proceeds to the End Event.
- **[YES] Path:**
  - **Gateway (AND - Split):** Triggers three validation tasks in parallel.
  - **Task 1:**check gate punch in records (Queries Gate Access System).
  - **Task 2:** check f the lecture time is matching (Queries Timetable Module).
  - **Task 3:**check the student enrollment to the module (Queries Student Records Module).
  - **Gateway (AND - Join):** Waits for all three checks to complete.
  - **Gateway (XOR):** check if all the validations passed
  - **[YES] Path:**
    - **Task:** record attendance ass present
    - **Task:** send success notification to student.
  - **[NO] Path:**
    - **Task:**send validation failed notification(e.g., "No gate punch-in found" - message sent to student).

4. Ends the process by sending all notifications and storing records for future needs.

4. Business Process Model & Notation (BPMN)

Access Link:

https://drive.google.com/file/d/1vcRdCF5F5TCuc0BHns_6JJ-9jScGLp7_/view?usp=sharing



5. Group Members

Name	ID
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SS Munasinghe	32847
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