

# 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:

**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 1:15 PM, 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:

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- **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.
- **Administrator (Support Role):** An administrative role that is not involved in this daily process. They are responsible for configuring the system's business rules (e.g., setting the "Gate Punch-in" requirement) and reviewing university-wide analytics.

#### 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:

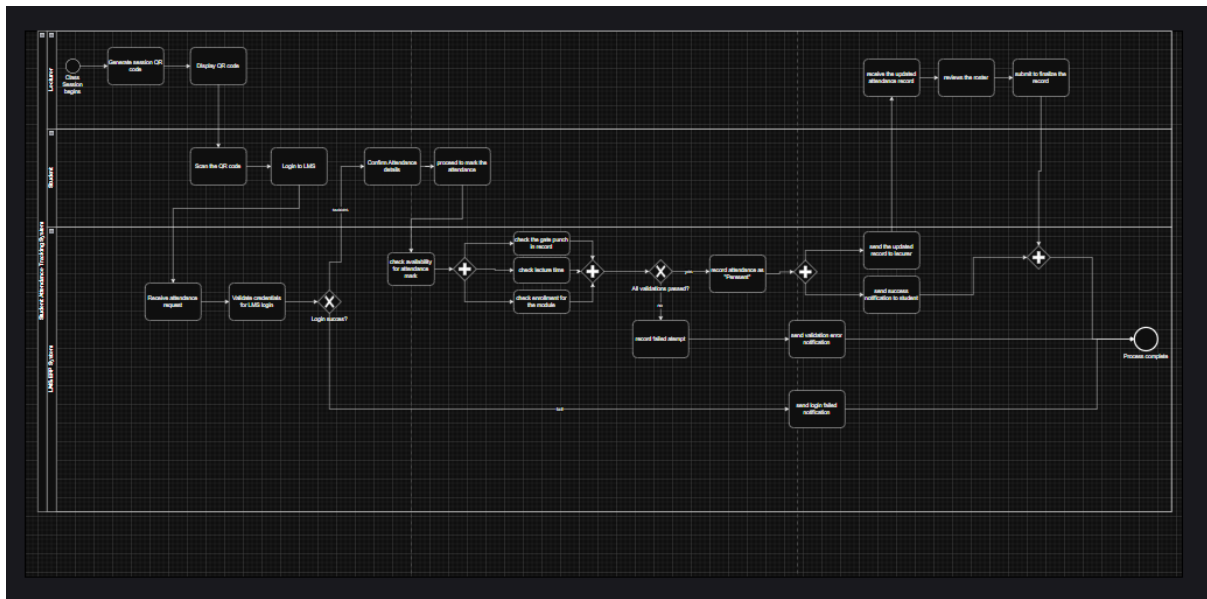
- **Lecturer:**
  1. The process begins when the **Class Session Begins** (Start Event).
  2. The Lecturer logs into the LMS/ERP.
  3. Selects "Generate Session QR Code" for the correct class.
  4. Displays the unique QR code on the projector screen for students.
- **Student:**
  1. Scans the QR code 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 failed message 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 if 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 as 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](https://drive.google.com/file/d/1vcRdCF5F5TCuc0BHns_6JJ-9jScGLp7_/view?usp=sharing)



## 5. Group Members

Name	ID
RAVM Perera	32953
IACS Thilakarathna	32231
AGR Chathuranga	33051
SS Munasinghe	32847
UGU Rashmika	32362
WMMD Weerasundara	32483
MDR Dilinda	32218
AA Anoaf	34185
PMMB Bandara	33126