Hostel Outing Request Automation using WhatsApp Chatbot & n8n

# Project Overview

This project automates the student outing request process in a college hostel environment using WhatsApp, n8n workflows, Google Sheets, and QR code verification. It is designed to streamline the process of raising, approving, and tracking student outings while ensuring safety, transparency, and operational efficiency.

# Objective

To build a seamless, secure, and automated system that allows students to request outing permissions and ensures timely approvals from parents and wardens, while providing an easy mechanism for gate verification using QR codes.

# Tech Stack

- n8n (Workflow automation platform)

- WhatsApp Cloud API (for messaging and approvals)

- Google Sheets API (for data storage and logging)

- QRServer API (for generating QR codes)

- Webhook (for gate scan logging)

# Google Sheets Structure

1. Student Database Sheet:

- Student Name

- Phone Number

- Parent Name

- Parent Number

- Hostel Name

- Warden Number

- Student ID

- Current Status

2. Outing Requests Sheet:

- Name

- From

- To

- Reason

- Approval Status

- Student ID

3. In and Out Logs Sheet:

- Register No

- Name

- In/Out

- Time

# Workflow Breakdown

1. Student Sends Message

2. Bot Collects Request Info

3. Approval Sequence

4. QR Code Generation

5. QR Code Scan at Gate

# Error Handling

- Invalid Phone Numbers: Bot responds with “You're not registered. Please contact the warden.”

- Timeout from Parents or Wardens: Auto-reject request after 24 hours or configurable timeout.

- Unmatched QR Codes at Gate: Show message “Invalid or expired QR code.”

- Duplicate Requests: Prevent new request if one is already Pending or Approved.

- Approval Rejection: If either Parent or Warden rejects, notify student and stop the flow.

# Edge Cases to Consider

- Student sending incomplete details

- Request raised with overlapping date range

- Parent or Warden unavailable (alternate contact mechanism)

- Multiple outing requests submitted before approval

- QR code reused or forged (use token-based expiry)

- Internet issues causing delayed webhook triggers

# Developer Notes

- Maintain data integrity by always updating sheets through n8n.

- Use expression-based mapping in n8n to avoid hardcoding.

- Add retry mechanism for failed WhatsApp API calls.

- Use webhook testing tools like Postman for local testing.

# Future Enhancements

- Email-based backup notification system

- Admin dashboard using Google Data Studio or Firebase

- OTP-based parent/warden verification

- Daily and weekly reports to admin

- Integration with RFID systems at gate

# Maintainer

Haswanth Kumar Kurevella

Email: haswanthkurevella@gmail.com

College: SRKR Engineering College

Domain: Workflow Automation | Chatbots | Campus Tech