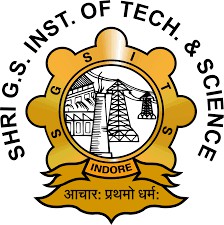
# Documentation



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

**Skill Development Lab**

**SESSION – 2024-25**

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**Project Title :** Automated WhatsApp Messaging System for Student Attendance

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# Introduction

This document outlines the design and development of an Automated WhatsApp Messaging System that reads student attendance data from a provided file (Excel), processes it, and sends messages to parents or guardians when a student's attendance is below a threshold(75%).

# Project Overview

## Objective

The primary goal of this project is to automate the process of notifying parents about their ward's attendance status through WhatsApp messages.

## Scope

* + Extract student data from an Excel file.
  + Identify students whose attendance percentage is below a set threshold(75%).
  + Automatically send a WhatsApp message to the parents of these students.

# System Requirements

## Functional Requirements

* Upload and process Excel or PDF files containing student attendance data.
* Extract student contact details and attendance percentages.
* Send WhatsApp messages based on attendance data.
* Ensure a user-friendly interface for administrators to manage messaging.

## Non-Functional Requirements

* + System should be scalable to handle large volumes of data.
  + Ensure data security and privacy.
  + Provide a user-friendly interface.

# Architecture

## Overview

* + **Frontend**: Web-based interface for file upload and process initiation (HTML, CSS).
  + **Backend**: A Node.js server that manages file processing, Python script execution for WhatsApp automation (Selenium), and messaging.

# User Interface Design

## Wireframes

* + **Dashboard: A page where the admin can upload the student file and initiate the messaging process.**

# Features and Functionality

**Attendance Processing**

* Upload files in PDF/Excel format.
* Extract student attendance and contact details.
* Process and filter students whose attendance is below a threshold.

## Automated Messaging:

* Use WhatsApp Web automation (Selenium) to send customized messages to parents.

**Logging**

* Log the status of sent messages and any errors encountered during processing.

# Security

* Implement role-based access control to limit access to the system.
* Secure data transmission using HTTPS.
* Protect sensitive student data and contact information.

# Deployment

## Free Resources for Deployment

* + **Frontend**: Deploy using [Vercel](https://vercel.com/).
  + **Link** - <https://attendance-sdl.vercel.app/>

## Continuous Integration/Continuous Deployment (CI/CD)

* + Use GitHub Actions for automated testing and deployment.

# Testing

## Testing Strategies

* + **Unit Testing**: Test individual components for correctness.
  + **Integration Testing**: Ensure different parts of the system work together.
  + **User Acceptance Testing**: Validate functionality with end-users.

# Maintenance

* + Monitor application performance and errors.
  + Regularly update dependencies and apply security patches.
  + Gather user feedback for ongoing improvements.

# Future Enhancements

* + Add support for other messaging platforms (e.g., SMS, email).
  + Develop a mobile app for real-time notifications and monitoring.
  + Implement machine learning to predict attendance trends and issue warnings before reaching critical levels.