Software Requirements Specification

For

ScheduFlex

Version 1.0

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Table of Contents

1. Introduction

Government schools are the most critical part of Sri Lankan society. Teachers play the most essential role in the education system. To reach the vision of education, teachers must teach at their best, and students must learn properly.

Members of the tutorial staff of schools (teachers) are also employees of the Sri Lankan government. Employment in Sri Lanka is governed by several Acts and Statutes. Under the Act, an employee is eligible for several types of holidays. Government school teachers are also eligible to get leave under the existing act. However, school administrations face problems in maintaining the learning environment in classrooms where teachers are unavailable. There are several reasons for assigning a teacher as a relief to a class such as maintaining the continuity of the learning-teaching process, securing the students, and covering the learning time of the students. In the manual process of assigning teachers as relief, there are a lot of challenges and difficulties that are identified. As a solution, we propose a system called ScheduFlex in which administrators can easily assign relief teachers and continue the learning-teaching process. ScheduFlex is designed to alleviate the administrative burden placed on school administrators and staff by providing an efficient and organized method for scheduling relief periods and the teachers.

1.1 Purpose

The purpose of "ScheduFlex" the Schedule-Optimization-Attendance-System is to streamline and automate the process of assigning relief periods for teachers within a school environment.

By implementing ScheduFlex,

- Enhance time management - Minimize mistakes and increase the effective allocation of relief periods without consuming a lot of time.
- Improve Administrative Efficiency - Reduce manual workload associated with relief period scheduling, allowing administrators to focus on other essential tasks.
- Increase teacher satisfaction - Facilitate fair and transparent assignment of relief periods, promoting teacher well-being and job satisfaction.

- Maintain continuous learning & teaching environment - Prioritize teachers who teach a particular class. It enables teachers to do extra lessons for those classes. If not, appoint a teacher with specific knowledge of the subject for that relief period.
- Increase Overall School Productivity: By computerizing the relief period assignment process, ScheduFlex aims to enhance overall productivity within the school environment, ultimately benefiting both teachers and students.

1.2 Intended Outcomes

The intended audience for the ScheduFlex encompasses various stakeholders within a government school.

- The administrative staff of the school: Administrative staff of the school including principals, vice-principals, and non-academic staff are responsible for overseeing staffing and scheduling processes.
- Teachers: Government school teachers to view their relief period schedules, request leave, and manage their availability.
- System Administrators (BinaryTrio Team): The IT team tasked with system installation, configuration, maintenance, and troubleshooting.
- Students and Parents: While not direct users of the system, students and parents may indirectly benefit from ScheduFlex ensuring consistent and effective classroom coverage.
- Human Resources Personnel: People who are involved in human resources management, and responsible for overseeing employee scheduling, leave management, and compliance with labor regulations.

1.3 Intended Use

The Schedule-Optimization-Attendance-System (ScheduFlex) is a system designed to streamline and computerize the process of assigning relief periods for teachers in government schools. It enables efficient scheduling based on predefined criteria such as availability, subject expertise, and workload. ScheduFlex also allows teachers to view their assigned relief periods, ensuring accurate scheduling and minimizing disruptions to classroom instruction. It also provides real-time monitoring and reporting capabilities, allowing school administrators to track

relief period assignments, and identify scheduling conflicts. The ScheduFlex aims to enhance operational efficiency, promote fairness and transparency in relief period assignments, and alleviate administrative burdens within the government school.

1.4 Product Scope

The system is designed to encompass a diverse array of functionalities aimed at streamlining various aspects of administrative and operational processes within the educational framework. These functionalities include automated data entry, facilitating the seamless input of information. Additionally, the system will offer capabilities for analyzing timetables and teachers' attendance reports, enabling administrators to efficiently manage schedules and staffing. Furthermore, it will provide insights by displaying unavailable teachers for each period and analyzing instances where specific teachers are not accessible. Moreover, the system will assist in identifying teachers available for assignment as relief during specific periods, enhancing flexibility in resource allocation. With real-time monitoring and reporting features, the system will offer administrators valuable insights and oversight, empowering them to make informed decisions promptly.

1.5 Definitions and Acronyms

- Schedule-Optimization-Attendance-System - ScheduFlex - The software solution being developed to automate and streamline the process of assigning relief periods for teachers within a government school environment.
- Relief Period: An absent teacher duty period is assigned when a teacher is released from his or her regular teaching duties.
- Free Period: The period when a teacher does not have a duty in his/her regular timetable.
- Administrator: Personnel responsible for overseeing the operation and management of the ScheduFlex, including school principals, vice-principals, and administrative staff.
- Teacher: Classroom instructor employed by the government school who utilizes ScheduFlex to view relief period schedules.

1.6 References

- https://docs.google.com/spreadsheets/d/14SzPx2PnwvHpA3e5BYOolVZbu_dXRr_KNFk4cCAaD6k/edit?usp=sharing
- https://www.desaram.com/

1.7 Document Conventions

This document conforms to IEEE format while the “Times New Roman” referencing style was followed for citations. Titles of the sections and subsections are denoted using bold typeface text. Terms specified in the glossary are indicated by highlighting.

2. Overall Description

2.1 User Needs

Product Perspective:

Schedule-Optimization-Attendance-System is the system of appointing a suitable teacher who has a free period during that period in the absence of the teacher assigned to a particular period. During the present day, most of the schools arrange this system manually.

When we analyzed this process, we identified that the present manual system is not reliable. This progress takes considerable time to analyze and generate a report. It usually takes at least two periods (around 2–3 hours). This is due to the difficulty in analyzing the attendance sheet and the timetables. Therefore, according to the analyzed information, BinaryTrio decided to computerize this manual process into ScheduFlex.

Product Functions:

The key features of the Schedule-Optimization-Attendance-System are,

- Analyzing timetables and teachers' attendance reports
- Displaying the unavailable teachers in each period.

- Analyzing periods in which the particular teacher is not available.
- Display of teachers available for assignment as relief in a particular period.

With this new system, we can get the following benefits:

- The new system can analyze and output information quickly.
- Always updating the system as per the attendance sheet.
- With the GUI users can navigate the system easily.

Project Goals:

- Appoint teachers quickly to empty periods.
- Minimizing the operator workload.
- Maintain a proper system for schedule optimization.

2.2 Design and Implementation Constraints

- Synchronization: The system will only be accessible through a microcomputer. No mobile devices can connect to the system.
- Language Requirements: Only the English language will be available in the system.
- There should be a good internet connection for uninterrupted service.

2.3 Assumptions and Dependencies

Assumptions:

- Regulatory Compliance: Assuming adherence to Ministry of Education rules, regulations and standards for data privacy and security
- System Performance: Assuming the system will handle the expected load of time tables and attendance details without performance degradation
- Reliability of Infrastructure: Assuming the reliability and uptime of servers, or hosting platforms used for the system.

Dependencies:

- Integration with other databases of school management systems for Attendance Information.
- Integration with fingerprint systems for attendance information.
- Integration with a staff member who in charge of short leaves.

3. System Features and Requirements

3.1 Functional Requirements

Administrator

- Manage entering teachers into timetable periods.
- Inform teachers about their daily schedule.

Teachers

- Inform the application's administrator if a teacher leaves early (Half Day).

Principal

- Receive a report from the application's administrator.

3.2 External Interface Requirements

The user interface (UI) design for the schedule optimization and attendance system has been meticulously crafted using Figma, a powerful tool that synergizes to deliver a seamless and visually appealing experience.

3.2.1 User Interfaces

Figma:

Figma has been an invaluable tool in shaping the user interface of our schedule optimization and attendance app. This cloud-based design platform has facilitated a collaborative design process,

allowing designers, developers, and stakeholders to work together in real-time. Figma's prototyping capabilities have enabled the creation of interactive prototypes and user flows, providing a tangible visualization of the user journey. This platform's flexibility has empowered our designers to explore different design concepts, iterate efficiently, and refine the UI iteratively.

3.2.2 Hardware Interfaces

In this system, we expect to implement it as a web-based application. So, any device can work with any kind of web browser except Internet Explorer. This system can also be accessed without any interruption. This system does not require a specific internet connection or additional CPU or GPU processing power. Normal data processing is accessible. As a device depends on a specific hardware specification for normal surfing, it will be the minimum hardware requirement for operating this program.

3.2.3 Software Interfaces

The Schedule Optimization and Attendance System runs on web browsers operating in Windows 7 or above, MAC OS, and Linux operating systems with progressive enhancement to enhance the HTML used to develop the system. The system uses MySQL for the database of the web application and HTML, CSS with React (JavaScript framework) for the front end. The 11 technologies such as Node.js and Next.js have been used to develop server-side communication with the software and the database.

3.2.4 Communications Interfaces

Users can operate the system through a web browser that uses HTTPS protocol. After the user gets access to the system, he or she will use the services available in the system.

3.3 System Features

3.3.1 Introduction

The schedule, optimization and attendance system is an intelligent platform designed to provide a user-friendly interface for the administrator who is in charge of SheduFlex. It aims to streamline data entry and improve overall efficiency.

3.3.2 Features

Filtering teachers' attendance.

- Administrators can filter teachers by separating present and absent teachers.
- Filtering available teachers for a given subject from present teachers for that day.

Assigning teachers for relief periods.

- Administrators can choose teachers according to subject and availability to assign to relief periods.

3.4 Non-functional Requirements

- The system should have an intuitive and user-friendly interface with a responsive design for various devices.
- Access controls should be implemented to ensure data privacy.
- All the processes should be efficient and easy to use.