Lab 2

Selected Project: Automated Payroll System

Faculty of Engineering and Applied Science

SOFE 3650U: Software Project Management | CRN: 74667 | Section: 006 | Group: 10

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Jordan Frost Hagedorn(100828122)

Ontario Tech University

Oshawa, Ontario

jordan.hagedorn@ontariotechu.net

Noah Toma (100825559)

Ontario Tech University

Oshawa, Ontario

noah.toma@ontariotechu.net

Dmitri Rios Nadeau (100783206)

Ontario Tech University

Oshawa, Ontario

ericdmitri.riosnadeau@ontariotechu.net

Github Repo: https://github.com/D-aces/Software_Project_Management_Labs

Class Repo: https://github.com/SoftwareProjectManagementUOIT/lab-2-noto-21

Introduction

Employers commonly express interest in the ability to track employee work hours through digital means, as it presents a utilitarian solution to the challenge that payroll-related affairs often pose. Accomplishing this via a central hub, such as through dedicated computer terminals or punch card systems, may introduce undesirable delays and allow for inaccuracy. Therefore, a more automated payroll system would be optimal, as it would cause delays to be mitigated and potential negative externalities to be accounted for more robustly through harnessing the power of mobile devices.

This automated payroll system would ensure that:

1. Working hours are accurately measured, through login/logout timestamps.
2. Employee identity is valid, by capturing employee credentials (Employee ID + Password) and photograph during both login and logout procedures.
3. Employee attendance records are reliable, in capturing the GPS location of the device during login/logout procedures as well as continuously during a shift (every five minutes).

These three key facets of the technology would allow administrative staff to collect accurate data and utilise it to effortlessly perform payroll calculations. In terms of the interface, administrative staff will be able to access these services through a web application. This will allow for the creation of employee profiles, management of salary details, and access to the aforementioned information collected by employee mobile devices.

Project Objectives

- ↪ Simplify logging hours for employees by providing access to a simple Android application that will allow employees to log in anywhere on workplace property.
- ↪ Simplify tracking, managing and navigating records for admins by providing a web application that will allow admins to access, alter, filter and monitor employee data.
- ↪ Improve the accuracy of record keeping for admins by removing externalities / human interference like logging inaccurate work hours or having proxy attendance.
- ↪ Provide an objective standard for tracking employee attendance and hours by collecting more employee data.
- ↪ Provide transparency to both employees and admins when calculating the pay by providing login session information (E.g. photos, location and time logged) to both actors.

Measures of Project Success

- The system contains a functional backend for exposing services and handling specific requests for Android devices and specific requests for the web interface.
- The system contains a functional database that keeps track of employee profiles, working hours, most recent location data and a pointer to the latest photo.
- The system accurately projects employee data to the admin without fraudulent results to ensure each worker is paid properly for their work.
- The system has a frontend web interface that allows admins to manage all aspects of employee data.
- The system has a frontend Android interface that allows employees to log working hours and collect data (E.g. images, location).
- The system calculates each employee's salary (including taxes, overtime, etc) and distributes the correct salary to each employee.

Necessary Project Infrastructure

1. Database Server (On-premise)
    a. A database server is required to store information gathered for future analysis.
    b. The databases should be on-premise in order to ensure the security of the data.
    c. As well, it is not necessary for all employee data to be stored in the cloud, since each branch only needs to be concerned with its own employees. Therefore, storing employee data at each location would enhance the speed and reduce the storage requirement of the system.
2. Backend Server (Cloud)
    a. A backend server is needed in order to facilitate the operation of the system. In order to manage all employee sign in processes across branches, it is necessary to assign the backend to the cloud.
    b. Since the operations undertaken are the same in each instance, it would be more efficient in terms of space to have a remote backend that is reachable by each employee, as opposed to a local backend at each physical location.
3. Redundancy-Related Systems: Backups for the Backend Server and Database Server
    a. These are to ensure uptime is maintained in the event of a service outage due to failure, blackouts, or otherwise.
4. Third-party services
    a. Server services, such as those provided by Oracle and Amazon, will be required in order to facilitate remote backend operations and local server functionality.

b. Front end services will be needed to design the UI of the Android application, specifically various Java/JS frameworks.
c. Security services will be integrated with the system to ensure the sanctity of the data.