

Kat Scan

Attendance Application

Feasibility Report

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By Abbigale Crump, Cameron Miller, Preston Truong, and Jose Veloza

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Executive Summary

The proceeding web application is intended for use at universities and colleges by faculty members as a system to quickly record, organize, save and print attendance in class. University faculty will be represented by Sam Houston State University's Dr. Islam for reference during our project. The primary client will be Dr. Islam. The goal of the development team is to craft a web based application that works quickly and efficiently to produce a QR code posted by the faculty member that can then be scanned by students, who will be directed to the website to log in. Upon logging in, the students will then be able to take their attendance with just one click of a button. Many classes currently still require paper attendance reports to be passed out and signed by the students every day. The system aims to not only cut down on time it takes to complete recording of attendance but also provide a convenient way to manipulate that data, be less distracting for students during lecture, and cut down on university costs for paper and printer ink.

Functional Requirements

I.) Student Faculty Login

The website will be required to have a secure login as well as two different user credentials; "Faculty" and "Student". The "Faculty" user needs to be able to generate the QR code, select the amount of time that the code is usable, be able to access the list of students that have been recorded, and manipulate that data.

The "Student" user must be able to log into their account, scan the posted QR code, and have their attendance recorded quickly and reliably.

Create Account

First Name

Last Name

Username

Password

Confirm Password

Email Address

☐ Faculty Member

☐ Student

SUBMIT

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Welcome, First Name Last Name

Profile Settings

Logout

Home

Create Course

View Reports

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Generate QR Code

Upon clicking this button a QR Code will be generated for the specified course and will be displayed via a popup window

II.) QR Code

The system will be able to generate a QR code, as well as allow the "Faculty" user to set a timer for how long the generated QR code is available for scanning.

III.) Database

Our system is to save recorded attendance to a database that can then be accessed, manipulated, and printed by the "Faculty" user. Reliability will be prioritized, but it should also be accomplished in a reasonable amount of time.

IV.) Security

Students cheating the system and marking themselves present when not is a concern this system will address. By utilizing geofencing, the software will prevent truant users from scanning the QR code outside the classroom. "Faculty" users can also generate QR codes with one-time keys and limit the time of availability of the QR codes as a measure of security.

Non-Functional Requirements

I.) Timing

The user will expect our software to function at a reasonable pace. It cannot be noticeably delayed. There should be a minimum amount of crashes, slow transitions, or freezing.

II.) Webpage Server

The application will be web based and will require a server to run on.

III.) Reliability

The QR code generation should work seamlessly and the recording of “Student” user attendance should be done so reliably and without error, so as to avoid **not** recording a “Student” user when that user should have been recorded.

Process to Follow

I.) Agile

For this project, the team has chosen to follow the Agile method for the software development lifecycle model. Agile is flexible, low risk and is well suited for the type of development cycles that are required for this application. The team plans to have two week sprints with the goal of different portions of the application being completed by the end of each sprint and ready for iteration release. Standup meetings will be held twice a week and at the end of each sprint the team will perform demos of the work completed up to that point.

Technical Feasibility

I.) The Languages We’re Using

The team plans to use React and JavaScript for the programming languages. JavaScript is primarily used for web-based applications and web browsers. JavaScript is also used on servers in addition to the Web. That is why this tool is a great addition to the project’s development. With React, developers can build user interfaces on many platforms, making it extremely flexible. Furthermore, React makes it easy to create web components, which will allow the team to be more efficient with time.

II.) Database

MySQL will be the primary database that is used to store the attendance records. The team chose to use SQL because of its versatility

and ease of use. The team has also had experience with MySQL which will speed up the development time tremendously.

III.) Why VSCode?

Visual Studio Code is a popular code editor that has a great GitHub Repositories extension. It allows users to quickly browse, search, edit, and commit to any Github repository directly from within the editor. Another great function is that it gives developers the option of either typing Git commands out in the terminal or using the Git source control to add, stage, and commit files. VS code has endless amounts of helpful extensions such as ESLint, Prettier, and Live Share. Live Share will be very beneficial for the team, as it will allow team members to live code together. This can be useful in training and just simply working on complex tasks together.

IV.) How we should generate the QR Code

The QR code will be a dynamic QR code and will be generated through QR Tiger, a paid QR code generator service. The team chose a dynamic QR code because it has cleaner URL's, takes less time to scan, and will overall make the experience a lot smoother.

V.) Faculty vs. Student

The website will have two different credential systems, as stated in **Functional Requirements**, with the Faculty user being able to generate QR codes and record attendance data. The Student user will be able to log into their account, and record their attendance utilizing the QR code generated by the Faculty user.

VI.) Report Generation

A database will be used to store attendance reports as part of the project. The team will provide the organizers (faculty) with the ability to print that information for their convenience within the website.

VII.) Security (Geofencing)

In order to prevent users from signing in outside of class, the team plans to use the campus IP assignment system for our login and attendance tracking. Attendees would be required to sign in via the campus' WiFi to ensure security in that aspect.

Visibility

I.) Communication and Transparency

The development team will meet with each other at minimum once a week at a prior specified time to go over progress each member is working on during the iterative period. The team will also be communicating with our primary client, Dr. Islam, to receive feedback and criticism as iterations reach completion; as a means to further hone our craft and reach client satisfaction.

Risk Analysis

I.) Difficulty learning the language

Each team member possesses knowledge of various languages, however the team has chosen to use React and JavaScript. No one on the team has coded in these languages before, so learning the languages could pose as an obstruction to the final product. Due to this, it may become a time sink that stresses the timeline.

II.) Security measures may not be good enough

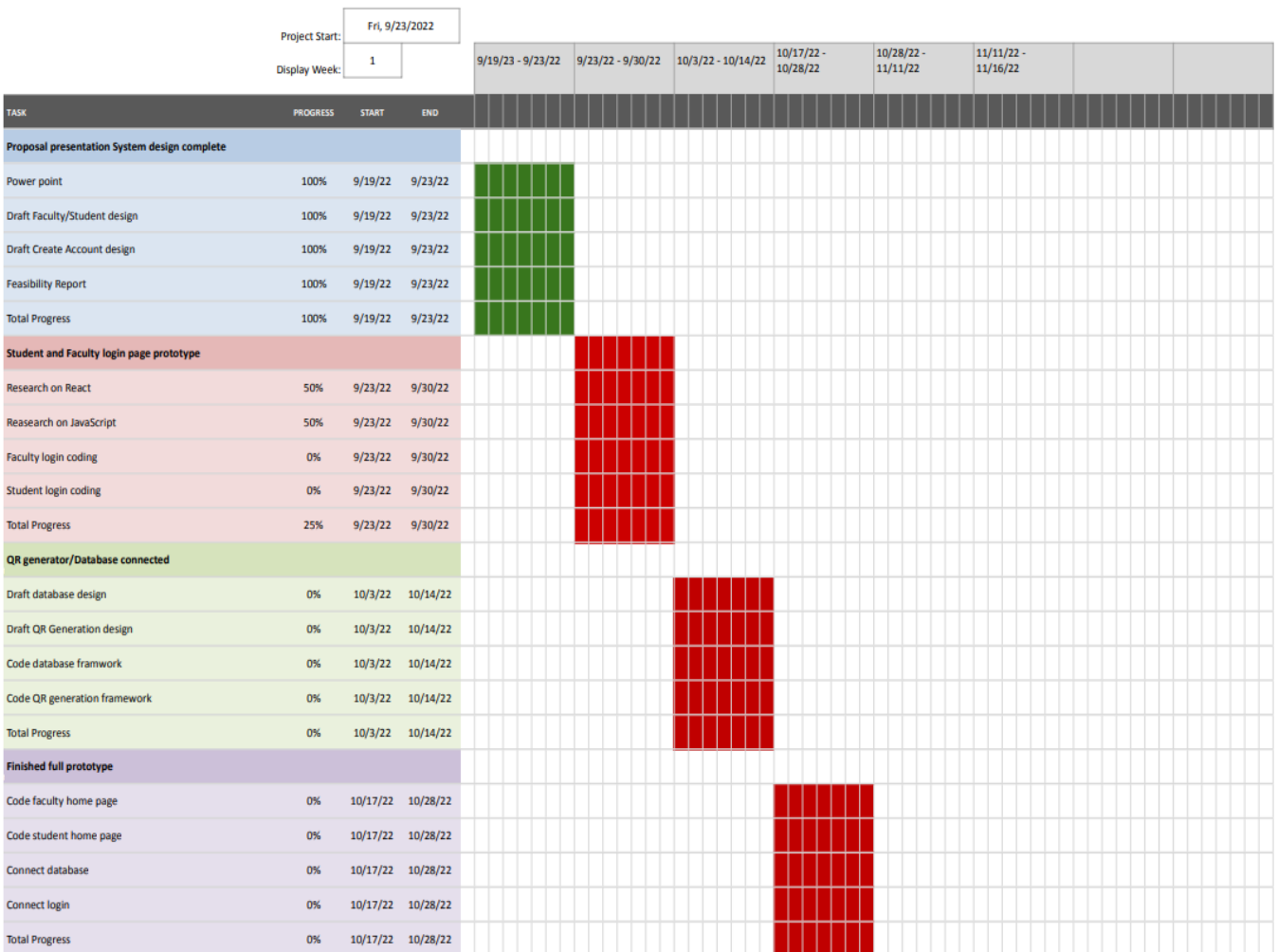
No member of the team is a cybersecurity major and lacks the skills to provide and implement robust security measures to the web application. The development team will be providing a login system for users, as well as allow Faculty users to set timers on the availability of the QR codes to help cut down on the amount of truant Students recorded present.

III.) Slow Progress

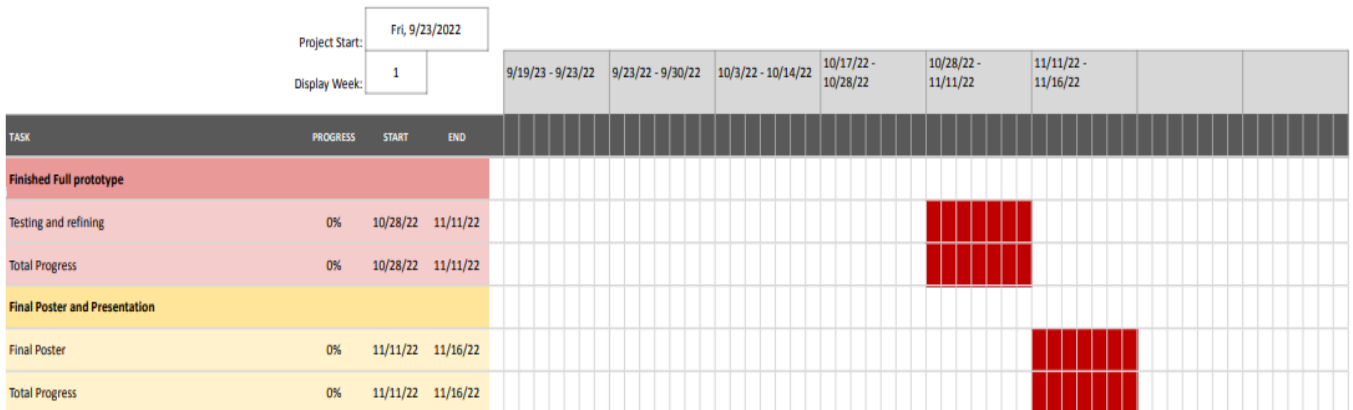
It may be difficult for the team members to work together, given that this is their first time working on a project of this scale. Things like scheduling, miscommunication and the underestimation of challenges may slow down the pace of progress in development.

Timeline Diagram

Kat Scan



Kat Scan



Conclusion

From the results of the Feasibility report, the team finds that the Kat Scan project is feasible in terms of technical requirements, time allotted, and skill of the team members. The team already has in place a regular meeting schedule wherein the development team brainstorms, designs, and will begin implementing on a weekly basis. All members have regularly *attended* the scheduled meetings and are willing to learn the currently unknown skills required to reach project completion. The conclusion of the presented feasibility report is to proceed with the iteration of this Software Engineering project.