
Contactless Clock-In Application for Workplaces

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Abstract

Covid-19 has brought the world to a standstill for the past year and many workplaces have been forced to close down for fear of transmitting and contracting the virus. This virus can be spread easily by surface contact, which can be near impossible to avoid at many workplaces that are unable to work remotely.

A particular area that is regularly accessed by all the members of a workplace, usually at the same time on a daily basis, is the clock-in system. This can result in the transmission of Covid-19 between employees and managers, leading to them not being able to work, the business losing money and also possible deaths.

We are developing an app that will remove the need for employees to clock in to work at the same place and instead clock in and out using their own smartphone. The user of our app can only clock in when they enter the workplace, via their GPS location.

They will also have to confirm they are an employee of the workplace using a facial recognition system, via their front-facing camera. Employee clock-in times will be recorded for the manager to view, thus replacing the need for a physical clock in system. For employees that may not have access to a smartphone, a camera will be set up by reception to allow them to clock in safely.

Authors The authors of this project are Ryan Higgins, Daniel Gallagher, Jack McNamee and Shane McCormack who are three fourth year students studying for a Bachelors of Science Honours Degree in Computing in Software Development in the GMIT Dublin Road campus

Acknowledgements

The authors would like to thank

Important Links

1 - Link to Dissertation:

[https://github.com/ryanhiggins11/FINAL-YEAR-PROJECT/blob/master/
Paperwork/Dissertation.pdf](https://github.com/ryanhiggins11/FINAL-YEAR-PROJECT/blob/master/Paperwork/Dissertation.pdf)

2 - Link to Code:

[https://github.com/ryanhiggins11/FINAL-YEAR-PROJECT/tree/master/
kotlin-app](https://github.com/ryanhiggins11/FINAL-YEAR-PROJECT/tree/master/kotlin-app)

3 - Link to README:

[https://github.com/ryanhiggins11/FINAL-YEAR-PROJECT/blob/master/
README.md](https://github.com/ryanhiggins11/FINAL-YEAR-PROJECT/blob/master/README.md)

4 - Link To Screencast:

Chapter 1

Introduction

For our project, we wanted to make an application that allows employees to clock in via their smartphone to help prevent the transmission of Covid-19 in the workplace. The employee will only be able to clock in when they are in the workplace and will have to use their front-facing camera to confirm they are an employee. The clock in times will be recorded for the manager to view, thus removing the need for a physical clock-in system

1.1 Idea

At the beginning of 4th, the last year in software development we were given the task of coming up with an idea worthy and suitable for a level 8 final year project. We knew that whatever we needed to come up with must have certain requirements, using multiple different technologies, languages and it had to challenge our knowledge and skills that we had learned in previous years.

With this year being all remote learning it meant that we couldn't meet in person so we were advised at the start of the year to either work by ourselves or to form a team. To start off this project we decided to form a team which consists of four of us. When we decided our team we then had to start thinking of ideas and we done so much brainstorming of different ideas but we wanted to keep our idea topical to what is going on in the world. This is where the breakthrough happened early into our college year.

It was during a team meeting that we had came up with the idea of designing an application for workplaces that would stop big queues of people all using the same clock in machine especially with Covid 19. After many long discussions, research and teams calls we decided that we were going to pursue this idea.

We needed to find the right environment for this application. We had used angular and ionic in previous modules but we had never really delved into the environment in much detail and thus we were very intrigued in the environment and learning about the inner workings and its plugins

****Need to add in more stuff here about the environment and why we chose and why we chose app****

1.1.1 Technologies we used

Chapter 2

The Application

- Provide a context for your project.
- Set out the objectives of the project
- Briefly list each chapter / section and provide a 1-2 line description of what each section contains.
- List the resource URL (GitHub address) for the project and provide a brief list of the main elements at the URL.

Chapter 3

Chapter Summaries

3.1 Introduction

3.2 Research

3.3 Methodology

3.4 System Design

3.5 Conclusion

Chapter 4

Research

4.1 Covid-19

4.2 Clock-In Methods

4.3 Spread of covid

4.4 Workplace Covid

4.5 Privacy

4.6 Facial Recognition

Chapter 5

Frameworks

- 5.1 Kotlin
- 5.2 MongoDB
- 5.3 Firebase
- 5.4 MYSQL
- 5.5 Android

Chapter 6

Phones

6.1 Front Cameras

6.2 Facial Recognition

Chapter 7

Survey

7.1 Survey Questions

7.2 Survey Results

7.3 Reflections on survey

Chapter 8

Methodology

8.1 Overview

8.1.1 Using Agile

8.2 Sprint 1

8.2.1 Work allocation

8.2.2 Frameworks, Technologies and Languages

8.2.3 GitHub Repository

8.3 Sprint 2

8.3.1 Scope

8.3.2 Researching Application

8.3.3 Designing Application

8.4 Sprint 3

8.4.1 Testing and Debugging

8.4.2 ..

8.4.3 ..

8.5 Sprint 4

8.5.1 Deploying

8.5.2 ..

8.5.3 ..

Chapter 9

System Design

9.1 Project Design

9.2 Application Design

9.3 Log In and Sign Up

9.4 Facial Recognition

9.5 Database

9.6 Manager Access

Chapter 10

Conclusion

10.1 Objectives and Goals

10.2 Retrospective of this project

10.3 Improvements

Chapter 11

System Evaluation

11.1 Testing

11.2 Application Performance

11.3 Limitation Issues

Chapter 12

Appendices

12.1 Installation Guide

12.2 Plugins

12.3 Platforms

12.4 Running the application

12.5 Application Images

Bibliography