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**Fingerprint Attendance System**

**G-KSOFGH84 BSc in Software Development**

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Submitted Date:

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**Abstract**

For our final year project, we were trying to do an application that all colleges could use to sign people into lectures and get attendance in a more modern and technological way. We wanted to get rid of the old pen and paper approach of signing into lectures and wanted everyone to be able to just get on their phone and sign in quick and easy. We created a simple and easy to use application using Android studio and java as well as Mongo DB and NodeJS for online and offline synchronization.

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**1. Introduction**

This project is for our final year in Software Development in Applied Project and Minor Dissertation. This project will allow students to sign into their lectures using their phones finger print scanner. We are using Java as our programming language, Couch and Pouch databases for online and offline synchronization and we will be developing the application for Android. The reason we are developing this app is to stop students from signing in their colleagues during lectures that they are not in, as well as creating statistics for each student’s attendance rate.

Our motive was to involve students into lectures as much as possible and in the era of technology, where students are on their phones every day, they will be also able to use them to sign into lectures daily without lecturers having to pass around a sign in sheet.

For this project we decided to go with android development using Java and MongoDB, even though we have tried different languages and different databases, we felt that going with native development will be the most ideal way of doing this application.

**GitHub**

The project files can be viewed here: <https://github.com/Sarlianth/fingerprint-auth>

In this repository you can find all the files and source code that are used to run the application as well as the .apk file which allows for easy installation on android devices.

**2. Methodology**:

At the beginning of the project we set out to do the project in Angular JS and Boostrap but we ran into many problems with both of these approaches so in the end we decided to go with java and native development, which turned out to be much more possible and realistic to do for the scope of our project. Each team member was assigned different areas of the project in order to divide the work evenly.

**4. Technology Review**

**4.1 Java**

Java making its first appearance in 1995, is a general-purpose programming language that is concurrent, object-oriented and class-based. It was developed with the intention of WORA which is write once, run anywhere, meaning that the compiled code written by the programmer can be ran on all devices that support java without having to recompile the code.

**4.2 Android**

Android is a mobile operating system used in Smartphones, Tablets, Smart TV’s, Cars and Smartwatches first released in 2008 and was developed by Google. The operating system was based off Linux Kernel and other open source software that was suitable for touch screens.

Android allows for easy installation of applications on mobile devices using the .apk files that can be easily created which is why we have chosen it as our base platform for our application as iOS requires too much licensing and is not open source.

**4.3 Android Studio**

Android Studio is the official integrated development environment(IDE) for the Android OS. It’s a free and open source development kit for anyone to download and use. Android studio is a replacement to the Eclipse Android Development Tools.

**4.4 MongoDB**

MongoDB is a free, open- source database which can be used cross platform. It goes under the NoSQL database category which is more of a document-oriented database system. MongoDB’s initial release date was February 2009. We have chosen MongoDB as our database because it is a very good database for indexing it’s files which makes it easy to search through when looking for a specific piece of information, it can store files as well as data, its very good at replicating its files for back up purposes.

**4.5 Nodejs**

NodeJS developed by Joyent and Node.js developers is an open source JavaScript run-time environment that executes server-side JavaScript code

**Research**:

At the beginning of our project we started researching angular js and when we started development we started running into errors that we couldn’t figure out so we then decided to change the language and moved to java where our research also changed and we started to understand how to make our project. All technologies and API’s were researched to the point where we understood them on such level that we were able to develop the application with less problems.

**Planning**:

At the start we decided to pair up and discuss our project ideas and eventually we came to the conclusion we wanted to do something for the college, so the idea came to us when we were always signing in on a sheet of paper and none of us had a pen so we thought, why not make an application for a phone since everyone always has a phone, for signing into lectures.

**Meetings**:

We decided to meet twice a week if possible and work on the project for as long as we could. We always went to each other’s houses where we could work without any distractions and concentrate of work as much as possible. Each week we worked even the smallest amount just to have work done and not put ourselves behind.

**Problems**:

As stated above we had problems with AngularJS since we were not very familiar with the language and it was hard for us to learn it in such a short period of time to the point where we understood it. After long research and trial and error we decided not to go with AngularJS since it was too problematic and we were going to do something we all knew and were able to help each other with.

**Language and Technologies**:

When looking at the project idea we wanted to develop something for android since that is what we all have and decided that the best language for developing android applications is Java since for years Java is a well working language with android and java is a language we all know and love to code in since we have been doing it since first year of our course. Next was a database for our project and we did enough research to figure out that mongoDB will go best with Java and android since it’s light and easy to use. As for the choice of the platform on which the application is based on, we chose android for a few reasons: 1.Is that we three have been using android for years, 2. When researching development for IOS it became apparent that IOS has many restrictions when it comes to their biometric scanner and publishing to the store 3. Research has shown that a huge amount of phone users on the market are android users for many consecutive years.