School of Computing

Year 4 Project Proposal Form

SECTION A – Proposal Details

Project Title: MiD (My Identity)
Student Name: Cillian Mc Neill
Student ID: 14352621
Stream: CASE
Project Supervisor Name: Geoff Hamilton

SECTION B - Proposal Description

Area Covered
This project is centred around digital identity through the block chain

Outline
The overall idea of the project came from my experience in the INTRA programme. My internship was spent at MasterCard, a worldwide payment processor. One of the problems in the financial industry is the issue with identity online. It's very easy to claim you are someone else and when a company as large as MasterCard and its partners have to be certain of someone's identity there can be no mistakes. This is where my project idea came from. If we can be certain of a person's identity anywhere in the world it would benefit both companies and individuals alike.

The functionality of the application will allow anyone to store and verify your identity through a simple mobile application. Registration will be in the form of a secure session with a verified institution (eg. Government) where they will verify the identity through a web interface. You will provide proof of your identity (eg. Driver's license) and they will either accept or reject it. Acceptance will be in the form of a publically available transaction on the block chain signed by the user and the accepting institution. Further proof can be added as another transaction. For example, your college can verify that your student number is tied to your identity or the passport authority can verify that your passport number is tied to you. Your information will only leave your device with your permission. The transactions between you and another institution are what's made public, nothing else.

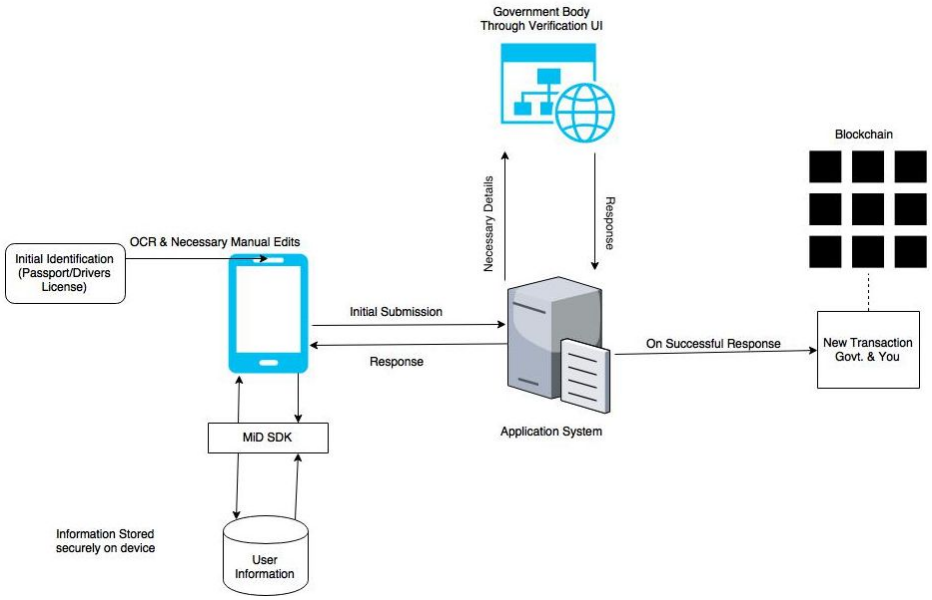

Figure 1 - Initial Registration Model

Its users are anyone that needs to prove who they are though this isn't limited to a human being either. If a pet or animal requires some form of identification by a governing body then there is no reason they can't use an identity engine like this. By having this we can remove the need for physical identity cards such as drivers' licenses or passports. It can be easily extended into the online world. Password-less logins, transaction verification, anything that requires someone to check your identity can be improved with this.

Identity is a major issue in today's society. There are massive problems with fraud, costing companies and individuals a lot of time and money. It shouldn't be an issue for someone to prove who they are and with this they can do just that. Initially it would act as an extension to current forms of identity but if traction is gained in this field there is no reason we can't do away with everything we have now and replace it with this, a more secure and robust solution.

Programming Languages
This will be a full end to end solution featuring both mobile and web based front-ends and a backend to connect it all together. The storage of data will be local on each device whereas verification details will be stored on a block chain implementation.
The mobile application will be done through Kotlin and Java while the web based application will be through Angular2. The backend solution will be through Java. The block chain implementation will be an extension of Hyperledger in Java.

Programming Tools
Mobile development will be done through the android SDK and run through a current android device. Web development will make use of Angular2 and be hosted through a Tomcat server. Backend work will be a spring application hosted on a separate Tomcat server. The block chain implementation will make heavy use of Hyperledger and its supporting documentation and run through a Docker container.

Learning Challenges
I have experience in mobile development but the SDK I'll have to create for the frontend to use will have to be very secure so that no user information is accessed without the user's permission. This will require a lot of learning on my part in the form of mobile cryptography methodologies.
The biggest hurdle in this project will be the usage of the block chain. This is a very new field and uses a lot of concepts I would not have learned before. A lot of my time will be spent learning the overall structure of block chains and the technology that goes into it.

Hardware/Software Platform
The entire application is made up of 4 components. Below is the component listing:

- Mobile Application
    - Android UI run through Android device **
    - Android SDK run through Android device
- Evaluation UI **
    - Angular2 UI run on Tomcat server
- Backend Server
    - Spring service run on Tomcat server
- Block Chain
    - Java/Go run through Docker container

** - These are the components that are required for a visual representation of data and functionality. While they're not entirely in scope for the identity engine they're necessary components to show what's possible and how organisations may make use of it

Special Hardware/Software Requirements
Every component in this project can be run and tested locally. There is no special requirements.