School of Computing

Year 4 Project Proposal Form

SECTION A

Project Title: Online Passport Application System
Student Name: Stephen McDonagh
Student ID: 14518233 Stream: CASE4
Project Supervisor Name: Alistair Sutherland

[Note: It is the student's responsibility to ensure that the Supervisor accepts your project and this is only recognised once the Supervisor assigns herself/himself via the project dashboard. Project proposals without an assigned Supervisor will not be accepted for presentation to the Approval Panel.]

SECTION B

Proposal Description – using the following headings:

General area covered by the project

- Front-end development
- Back-end development
- Image processing (more specifically facial detection & feature detection)
- Code deployment to AWS
- Chatbot training & Integration into frontend

Outline of the proposed project

- **Background - where the ideas came from**
  After my internship, I realised that most jobs are looking for a frontend/ backend developer for building web-applications. I soon realised that I had no full stack experience and that during my 4th year project I wanted to try and learn as much as possible about this. My 3rd year project had given me experience on working on a large project but by choosing to do a game it didn't give me the chance to learn about web development.
- **Achievements - what functions it provides, who the users will be**
  Ability for users to order a passport online. The user will be able to track the progress of their application. The user will be emailed out a confirmation number to an email address of their choice and using this they can track how soon their passport will be delivered. There will be a chatbot available to answer questions the user might have about their application, such as 'where can I find my PPS number?' or 'how long does delivery take?'.
- **Justification - why/when/where/how it will be useful**
  I chose to do a web application because i wanted to learn how to build an end to end application. I feel that with this idea there will be a lot to learn and a lot of tough tasks involved such as identifying facial features and learning how to train and integrate a chatbot into my application.
- **Programming language(s) - List the proposed language(s) to be used**
  - Frontend: Angular5
  - Backend: Java & SQL
- **Programming tools / Tech stack – e.g. compiler, database, web server, etc.**

- Development:
  - Microsoft sql server 2016
  - Jenkins – CI/CD tool
  - Maven?
  - Intellij
  - AWS
- Testing:
  - Junit
  - Selenium
  - Mockito

- **Learning Challenges - List the main new things (technologies, languages, tools, etc) that you will have to learn**
  - Frontend: I have no experience with frontend technologies so as part of this project I will need to learn how to use Angular5.

  - Facial detection: As part of the application the user will need to input an image. As passport photos need to be a high standard, I will need to learn how to check if eyes are open and mouth is closed. In my opinion this will be one of the most difficult parts of my project. From my research I have seen OpenCV could be useful to use for facial detection.

  - Chatbot: As chatbots are being used more and more, I would like to include one in my application to enhance user experience. I plan to user either API.AI or MS Bot framework to help with this.

  - AWS: I would like to deploy my application to an AWS EC2 instance, this is also something I have never done and will take some time to learn how to do correctly.

  - Continuous Integration/Continuous Deployment: On my 3rd year project we used Gitlab to store our project but we never set up any pipelines to run builds or tests on code we just committed. So as part of this project I want learn how to use CI/CD. I plan to use Jenkins or GitLab's CI/CD tool to do a build, test and then deploy of new code that has been committed. I feel this would be beneficial for when I get out of college.

  - Google SMTP server: I would like to send email confirmations to my users once an application is completed. From my research I will be able to use Google's SMTP server to help with this, this is another feature which I believe users would appreciate.

- **Hardware / software platform - State the hardware and software platform for development**
  - Windows machine.
  - Visual Studio code & Intellij IDE
  - MS SQL database
  - AWS- deployment to EC2 instance

- **Special hardware / software requirements - Describe any special requirements**.

  - N/A