IS53007D: Computing Project (2017-18)
Computer Science BSc
Goldsmiths College, University of London

Preliminary Project Report

Jordan Brannan - 33482272

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Supervisor - Dr. James Ohene-Djan

This document outlines the preliminary project report for my 3rd year Computer Science project.

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Introduction

The initial concept for the project was to create an anonymous messaging mobile application using end to end encryption. However, after speaking to Dr James Ohene-Djan (my supervisor), we discussed how the project could be altered slightly to have a more prominent and positive impact amongst a variety of different sectors instead of for the general consumer. The most relevant sector that the new version of the application could be applied to is schools. The new concept however would retain aspects of the original idea by keeping end to end encryption within the platform. After this discussion, it was decided that the project was to have a mobile messaging application where users, such as pupils of a school, would be able to message institutions anonymously and the messages sent would then be encrypted to ensure this anonymity. The institutions that opt to use this anonymous messaging platform would have a web application to interact with their users, all messages sent from the web application would be easily monitored amongst all institution representatives and accounted for.

The project itself is not work-related and will be made available for any institution but the primary focus will be schools, in which it is believed the application could be used to assist in the active campaign to combat bullying. To achieve this, relevant courses from my degree programme include;

Computer Security - An end to end encryption algorithm will be used, which is likely to be based off of RSA's algorithm.

Advanced Algorithms - A compression algorithm will be used to reduce the amount of storage required for the data.

Digital Ventures Creation - Which demonstrated the fundamental basics on how to take an initial concept to a potentially profitable business.

Aims & Objectives

As previously mentioned, the primary aim of the project is to understand and create an anonymous platform where users are able to speak to representatives of an institution freely. Schools being the main focus, the ultimate intention of the project would be to have a positive impact amongst pupils in regards to the overall prevention of bullying. The project is however, not limited to schools and could be applied in a multitude of different sectors such as the police, human resources and travel reviews. If the platform proves to be successful with schools, expansion into these areas will be the next significant focus. The final deliverables for the project are as follows;

Project Report - 12000 - 15000 words detailing how the project was completed and the overall results.

Testing & Evaluation Report - Testing and evaluating the software using multiple testing methods.

Web Application - A working web application where institutions are able to register and create their own portal.

Mobile Applications - A working mobile application for iOS and Android users, so that they are able to communicate with representatives of the institutions.

Methods

The methods to achieve the above stated deliverables are split into the following subsections to show what all of the resources that may be required will be used for.

Programming Languages

SQL/MongoDB - *SQL or MongoDB will be used for the database to store user information for institutions and messages between the mobile application and the web application.*

Java - *Java will be used for the algorithmic implementation for compression and encryption of all messages. Although Ionic Frameworks will be used to assist in the mobile application development, Java may also be required to customise the Android application.*

PHP - *PHP will be used as the base for the back end of the web application.*

JavaScript - *Javascript will be used for the front end to ensure the web application is responsive as a Single Page Application. The basis of the JavaScript code will be taken from a template and referenced, however a good understanding of the language will be required to make adjustments and make customisations.*

HTML5/CSS - *HTML5/CSS will be used in combination with JavaScript for the User Interface. The basis of this will also be provided by the template, however adjustments will also need to be made.*

Swift - *Although Ionic Frameworks will also be used to assist the development for the iOS application, a basic understanding of Swift may be required to customise the application.*

Software

Adobe Photoshop - *Photoshop will be used to create high fidelity digital prototypes for the user interface of both applications.*

Android Studio - *Android Studio may be used to customise the application created with Ionic Frameworks further, however this is unlikely to be used.*

IntelliJ IDE - *IntelliJ will be used for the implementation of both the RSA encryption algorithm and Huffman Encoding algorithm with Java.*

Algorithms

RSA Encryption - *The RSA encryption algorithm will be used for the encryption of all messages that are sent between the mobile and web applications. Public and private keys will be generated when an institution registers and when a new message to the institution is initiated.*

Huffman Encoding - *The Huffman encoding algorithm will be used to compress all messages that are sent between the mobile and web applications to reduce storage space.*

Other

MockFlow - *MockFlow will be used to create early stage digital prototypes quickly to understand the user experience of the applications.*

ThemeForest - *ThemeForest will be providing the template for the web application. The exact one that will be used is to be confirmed but it's likely to be the "Luxury" Template.*

Ionic Framework - *Ionic Framework will be used to build the basis of the native mobile applications.*

Survey Monkey - *Survey Monkey will be used to generate a survey which will be deployed within a volunteering school to gather relevant information regarding the user experience and assist with the development and testing phase of the project.*

Project Plan

The following table details all of the milestones to be achieved, the progress of these milestones and when these tasks need to be initiated and completed by.

Milestone	Description	Progress	Start Date	End Date
Research			**12/01/17**	**03/01/18**
Background Material	Research background material in context to the project.	Complete	12/01/17	01/01/18
3rd Party Material	Identify any 3rd Party Material required and understand how to implement/use such material.	Complete	01/01/18	02/01/18
Survey	Construct and deploy a survey to identify the problems with which the project will address.	In Progress	02/01/18	03/01/18
Mobile & Web Application			**02/01/18**	**04/27/18**
User Interface	User interface to be completed for the Web Application and Mobile Application.	In Progress	02/01/18	03/01/18
Database Design	A database schema will be constructed and both the database and User Interface will then be uploaded to Igor or hosted on Amazon Web Services.	Not Started	03/01/18	03/16/18
Algorithms Implementation	Implement RSA and Huffman Encoding algorithms.	Not Started	03/16/18	03/30/18
Testing	Extensive quality assurance will be carried out and documented to remove minor errors on both applications.	Not Started	03/30/18	04/13/18
Refine & Refactor	Refine and refactor the final code for both applications so the code is readable and efficient.	Not Started	04/13/18	04/27/18
Report			**12/02/17**	**05/08/18**
Project Proposal	Initial proposal demonstrating the intent of the project.	Complete	12/02/17	12/15/17
Preliminary Project Report	A preliminary report to document the progression of the project.	Complete	02/01/18	02/16/18
Title & Contents	The title and contents page for the final report.	Complete	02/01/18	02/14/18
Introduction	An introduction to project, stating the aims and objectives of the project.	In Progress	02/14/18	03/01/18
Literature Review	A literature review explaining the existing context in which the project had been developed.	Not Started	03/01/18	03/15/18
Methods	The methods chosen and justifications for these methods.	Not Started	03/15/18	03/30/18

Results	The results of the project and the success of the project.	Not Started	03/31/18	05/01/18
Discussion	Discussion over the results of the project and how they can be interpreted.	Not Started	04/11/18	05/01/18
Conclusion	An in depth summary of the project.	Not Started	04/19/18	05/01/18

The following Gantt chart illustrates a visual representation for the progression of the project.

	Task Name	Q4			Q1			Q2			Q3		
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	**Research**							Research					
2	Background Material					Background Material							
3	3rd Party Software					3rd Party Software							
4	Survey					Survey							
5	**Mobile & Web Application**							Mobile & Web Application					
6	User Interface					User Interface							
7	Database Design						Database Design						
8	Algorithms Implementation						Algorithms Implementation						
9	Testing							Testing					
10	Refine & Refactor							Refine & Refactor					
11	**Report**							Report					
12	Project Proposal				Project Proposal								
13	Preliminary Project Report					Preliminary Project Report							
14	Title & Contents					Title & Contents							
15	Introduction					Introduction							
16	Literature Review						Literature Review						
17	Methods						Methods						
18	Results							Results					
19	Discussion							Discussion					
20	Conclusion							Conclusion					

Progress to Date

As stated within the Project Plan, the work that has been completed at this point is split into three sections. The first section, "Research", shows that the background research and 3rd party materials have been completed. Background research includes; using and understanding how similar applications work, understanding anonymity techniques and encryption algorithms and how mobile and web applications are able to access the same database. 3rd party materials are particularly important as almost all of them are fundamental for the development of the applications to progress.

The second section, "Mobile & Web Applications", shows that the User Interface task is in progress. This milestone has several steps to complete. Thus far, a paper prototype and a low fidelity digital prototype have been completed. The paper prototype was initially sketched to understand how users of both applications would interact with the platforms and what elements would need to be implemented into them. Once a final paper prototype had been decided, these paper prototypes were then made into low fidelity digital prototypes using MockFlow.

The last section, "Report" only has basic information completed such as the Title Page & Contents alongside the initial project proposal and the preliminary report.

Planned Work

As previously mentioned, the most recent development in the project has been the user interface prototyping stage. An initial paper prototype has been completed, alongside an early stage digital prototype. The next stage of this is to create high fidelity digital prototypes by using Adobe Photoshop. Once this prototype stage has been completed, the designs will be used to start development on the mobile and web applications. Once the designs have been implemented as a working prototype, this will conclude the initial User Interface stage and the next step in the development cycle will be to work on the database design to implement with the UI.

In terms of the report and research areas of the project, a survey is currently being created using SurveyMonkey's online survey creator and initial contact with a school has been made. The next step in this area is to have the relevant representative of the school sign a consent form to approve the survey and then to gather data from it. The next area of focus for the project report will be the Introduction section.

Appendix

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