GAMIFICATION TOOL FOR TEACHING CYBERSECURITY

FINAL REPORT

BY

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Contents

Introduction:

In this document I will talk about my progress and experience from the start of the project to the very last day. I will detail what I have learned and what I am happy to have gained from the project. The document will also contain some missed expectations and issues that affected the application.

1) Problems Encountered/Solutions:

Problem One [Hardware]:

There were a number of problems I encountered with my project that slowed down the progress of my application. The first problem I had come across was hardware. My machine really struggled to run the build of application because android studio recommends that you use a virtual device to test the build, but the emulator was using up a lot of the RAM causing it to crash very frequently.

There are a number of devices that android studio allows you to test your application on, with the aims of emulating phone calls, notifications, text messages and accessing play store. The best option for me was to buy a physical android device.

The external device (Google Pixel 4A) solved my issues and was a new phone for me in the process to test the application efficiently.

Problem Two [Topics]:

My plan was to try and have the topics/module within the application, but I could not find any solution to this issue. I initially would have liked for the end-user to view the slides as PDF within the application just to keep everything in the one place, but this implementation proved very difficult for me as I did not have the required skill for this.

I decided to look through the reviews of applications similar to mine and found out a lot of end users did not like how restricted the view of the information was and were unable to see what they were reading. This led me to the solution of hosting the topics on an external website called SlideShare.net and create

shorten URLs directly to the slides. This way users can view it on their phone with the link or even download it to their device if they really want to.

Problem Three [Game Mechanics]:

At the beginning of making this application I had hoped to implement the score system, statistics, and leader boards, but I struggled a lot with getting them to work without breaking the other elements of my application. This was a frustrating time as I had to resort to different YouTube videos and tutorials on the issue which was consuming a lot of my time. I had a lot of mini projects in my other modules that contributed to the time consumption, so I decided to progress with the quiz to get more added to the application.

Problem Four [Extended Phishing Feature]:

I had a chat with my supervisor James Egan about different ideas I could use as an interesting feature for the application. I went for the phishing assessment where a user can sign up to a phishing email test via Google Forms link on the application with their personal information.

My plan was to use Kali Linux to create a scheduled email script using crontab to send one to three different phishing emails to the user registered and allow them to identify if the email was real or fake.

I had tried using the 'sendmail' package but that had not worked so I tried it with 'mpack' but again I was having issues. I had used crontab before in my Computer Forensics module, so it was just a matter of refreshing myself with it, but a persistent error kept stopping the emails from sending.

2) Achievements/Learning Process:

In the beginning of my project, I did not have any knowledge on android application development. My supervisor James Egan recommended some good places to research and start learning about android development and Kotlin. During the first semester and Christmas holidays, I started doing some beginner Kotlin courses and watched handful of YouTube tutorials to get me at good starting point with Android Studio. My expectation was not very high as I had not developed an android application before and the closest thing to that would have been a secure notepad from 3rd year or a calculator in 2nd year, so the challenge was a difficult one.

I am happy to have gotten the opportunity to learn so much about android development and expand my knowledge through Udemy courses, YouTube tutorials and the Android Studio/Kotlin/Firebase documentation as this made up the bulk of my work. I spent most of my time reading documentation and

trying to fix errors, but I was learning as I developed the application and have taken in what kind of work goes into developing an application properly which was a personal goal of mine.

In regards to exam questions on the application I had to use lecture notes from topics in our second- and third-year modules. It only dawned on me as I was creating the questions that I would have to go through the slides to create questions that were not too technical for demonstration purposes, this allowed me to refresh my knowledge on secure systems and cyber legislation even though it took up a lot of my time.

3) What I did not achieve:

I would consider the final state of the application to be a missed achievement. I had hoped for a more interactive quiz that would show the users progression as he/she went through the quiz application. The user interface I would have wanted would be more modern but because of time constraints I had to keep it basic.

4) What I would do differently if I started again:

Starting again I would have set up a strict project plan for the software development.
I probably would have tried to invest in a new computer/laptop instead of a new phone as that was part of my thinking when I bought the Android device. My machine contributed to some of the issues I was having with frequent freezing and troubleshooting issues.

Time management was the biggest contributing factor to the setbacks as I was juggling other big assignments in other modules throughout the year. I would have definitely allocated a lot of time for the software development as I feel a lot of time ran away from me and is the main reason for my inability to complete the remaining features I set out.
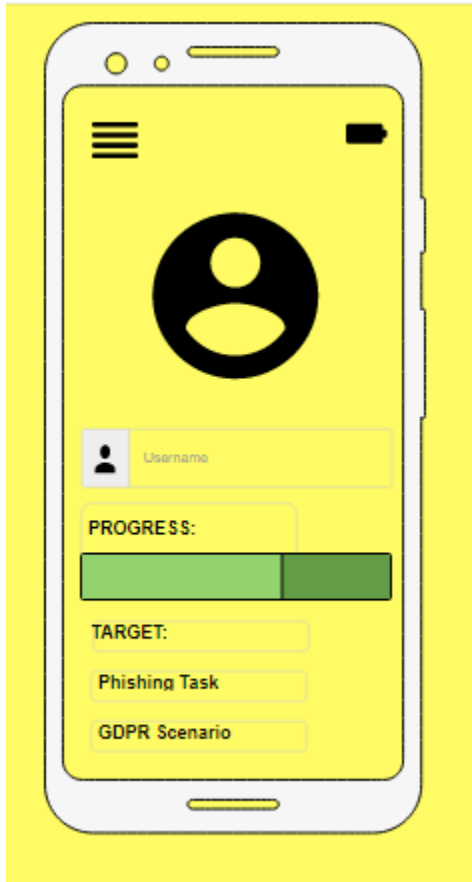
5) Different from Original Report

Figure 5.1

This was the original wireframe of the main menu after logging in but due to time constraints in relation to software development, the functionality was not completed.

6) Acknowledgment

I would like to thank my supervisor James Egan for his continuous support and ideas throughout the year.

I would also like to thank my friends Luke Halley, Jack Hooton-Byrne, Martin Pagtakhan and Thomas Jordan for their support and allowing to test some elements of my application during the frustrating periods of the project.