BUSINESS CASE: FLAWS IN PASSWORD DATA

TEAM CODERONA
CATRIONA KIRKWOOD, CONLAN BEARD, PETER CAPTAIN, RODERICK ROZALINA, STUART BROWN AND TIA COTTON

ABERTAY UNIVERSITY
DUNDEE, DD1 1HG

DATE: 15/12/2020

TEAM MEMBER	SECTION
PETER CAPTAIN	1-3
TIA COTTON	4-8
RODERICK ROZALINA	9-12 + APPENDIX A
CATRIONA KIRKWOOD	13-16 + APPENDIX D
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1. EXECUTIVE SUMMARY (P.C)

The project plan was developed in response to Dr Ethan Bayne's interest in developing an Application Programming Interface (API) for password strength checking that could be used by universities and their numerous applications. This proposal will detail, in depth how the Coderona team will address the current cyber-sphere, all the threats that passwords must face and justifying the implementation of all recommendations made by leading government agencies and cybersecurity organizations in relation to strong and safe password creation. This proposal will also outline and analyse the goals, assumptions and alternative options and practices to this project.

1.1. Issue

Current trends including the current pandemic have forced more and more users onto online applications that require password authentication to access and use safely. Because of these expanding user bases the need for more stronger passwords which has been a topic of debate for decades has become a full-blown necessity and requirement for many applications and online services. As a website includes more and more users, so too does the potential damage a password breach can do. Sites such as university websites provide an alluring and lucrative target for attackers. Whilst the core framework of a university and indeed its many in house applications may be secure from more high level attacks online such as Denial of Service or Injection attacks, the first level of defence against basic threats is a good password that allows a user or the administrator quick and secure access to their account and associated systems whilst keeping an attacker guessing what aforementioned password might be, indefinitely. However, there is an inherent weakness in all passwords, that is, the fact they must be created and used by a human being. This weakness is one we, the Coderona team hope to eliminate through use of our integrated API in their systems, such as their browser. By using this API, any university user, of any age or experience will help strengthen their password to such a point where the benefit to both the university and end user is apparent. The user's task of creating a strong password becomes much easier and as a result the overall security of the universities systems have been improved.

1.2. Anticipated Outcomes

With the use of the API universities will have the tool they need to help mitigate a lack of user understanding surrounding passwords and help strengthen the overall systems and mitigate threats that are associated with their user verification systems, helping reduce the likelihood a breach may occur as a result of any possible intrusion involving a faulty password. It will also help reduce the time that a user or administrator is concerned with password management and creation. Our API will help any user create a strong password will be able to defeat the two predominant factors and risks involved in password creation. The first being password complexity. This is the human factor involved with password creation. Passwords of low complexity are easily remembered, by both the user and someone who may catch a glimpse of the user entering their password. The second is length, which is associated the machine aspect of passwords. Brute forcing, a technique where every possible character combination is plugged into a system will break a short password in next to no time with current technology.

1.3. Recommendation

Through an investigation into various alternatives, such as several methods of 2FA as well as different articles of guidance it was decided that there was a lack of plugins designed to be compatible not only with universities, but for people of all ages, backgrounds and abilities. Listed below is Coderona's approach to solve this problem, improving the first line of defence for many accounts not just being used in universities, but users worldwide. The API will blend the best practices in password creation, suggestions and programming integration methodologies to produce an API that can guide any user to a more secure password. This plugin will be compatible with popular browsers and will thus enable any user to quickly access a utility that is easy to use and helps them secure their digital lives.

- Students and teaching staff alike will have a password utility at the tips of their fingers, available via any of the most popular web browsers, meaning that they can easily access a secure password.
- Users can immediately receive feedback on a given password which will help them decide if they want to use the password given or a stronger and more improved one.
- The feedback will be that based upon a comparison of the user's input to that of password best practices.
- Feedback will help educate the user about any flaws that are picked up when analysing the user's password

1.4. Justification

The implementation of the API into users' browsers should ultimately result in a more secure system overall. With user accounts being defended by a well-engineered password that has been created to conform with the best practices that tackle password breaking techniques such as brute forcing and shoulder surfing, the universities policy of keeping its members and their details safe a more manageable task. Whilst there are alternatives that exist that deal with managing passwords, Coderona's solution was used as the team, who primarily consist of students, compliment the university goal of furthering the prospects of students. Another benefit of the solution proposed by the Coderona team is that compared to other alternatives, the level of risk and cost of production and upkeep is greater than Coderona's solution.

- improving the less than 50% who do not use strong passwords to protect their account
- educating 15% of users who do not know how to better protect themselves online
- Reducing the likelihood of a data breach occurring
- Reducing the likelihood of attackers gaining authenticated access to accounts

1.5. Team Experience

Coderona may be a relatively new initiative, but our small team is well experienced in the creation of programmed solutions that any user can use. Our development team has experience working in fast paced environments where they have created numerous web applications and hard coded solutions in user accessible formats. Our previous clients include the University of Abertay. You can contact the Coderona team at passroculus@coderona.com.

2. Business Case Analysis Team and Stakeholders (P.C)

2.1. Business Case Analysis Team

The following individuals comprise the business case analysis team:

Role	Description	Name/Title
Project Planner	Responsible for Risk Management, Staffing Costs, Quality Baseline	Con Beard, Project Team
Project Planner	Responsible for Project Scope, Schedule and Quality Planning	Stuart Brown, Project Team
Project Planner	Responsible for Executive Summary, Business Case Analysis Team Management, Stakeholder management, Problem Definition.	Peter Captain, Project Team
Project Planner	Responsible for the Project Overview as well as liaising with the client and the project team	Tia Cotton, Project Team, Product Owner
Project Planner	Responsible for the change management, communications, cost management and procurement plans.	Catriona Kirkwood, Project Team
Project Planner	Responsible for developing the introduction, project management approach, project scope and milestone list as well as the work breakdown structure.	Roderick Rozalina, Project Team

2.2. Project Team

The following individuals comprise the project team, but the roles are subject to change depending on circumstances:

Role	Description	Name/Title
Programmer / Designer, Technology Support	Responsible for coding and designing the system, responsible for supporting technological matters	Con Beard, Project Team
Programmer / Designer, Communications	Responsible for coding and designing the system, responsible for team communications	Stuart Brown, Project Team
Programmer / Designer, Graphic Communication	Responsible for coding and designing the system, responsible for interface design and manuals / pictorial guides.	Peter Captain, Project Team
Programmer / Designer, Product Owner	Responsible for coding and designing the system, responsible for liaising with the client and the rest of the project team	Tia Cotton, Project Team, Product Owner
Programmer / Designer, Updates	Responsible for coding and designing the system, responsible for the roll out of updates into the solution	Catriona Kirkwood, Project Team
Programmer / Designer, Quality Control and Documentation	Responsible for coding and designing the system, responsible for the quality control and documenting the production.	Roderick Rozalina, Project Team

2.3. Client and External/Internal Stakeholders

In addition to the client listed below we have identified the following stakeholder:

Role	Description	Name/Title
Client (Abertay University)	Sponsor for project	Dr Ethan Bayne

3. Problem Definition (P.C)

3.1. Problem Statement

Abertay University is a university situated in Central Dundee. Since its break-away from the University of Dundee, Abertay was long since known as a leading technical college before it became a University in 1994. Since then it has become the world's first University to offer a computer games course, in 1997, followed by the world's first Ethical Hacking Degree in 2006. As a result, Abertay has been growing at the forefront of computing technologies in Scotland. With this growth the need for more resilient account management has also grown, ensuring that every member of staff and its enrolled students are sufficiently protected from the dangers lurking online. Whilst the University may have excellent cyber security infrastructure, protecting it from high level and technical attacks such as typical DDOS attacks, threats are evolving to target the more vulnerable parts of the system. A strong password is quite literally the key to this infrastructure, as in; a poor password results in poor overall security. When this link is targeted and fails, then the rest of the system can fail. Password cracking is more advanced than it has ever been before, with many techniques that exist out there to nullify password protection, keeping a strong password has never been more important, especially to a target as big as the university.

3.2. Organizational Impact

Coderona's solution aims to strengthen the vital aspects of Abertay's security infrastructure, with minimal disruption to existing legacy systems:

Accounts:	User Accounts are the ultimate end goal for any attacker. User accounts contain all personal details and information, so protecting them must be a top priority. Users should be asked to install the add on to help achieve this.
Tools:	The use of the Coderona's solution requires little training. The add on is very intuitive and aims to educate the user. The benefit of being a web browser add on means that the user should already be familiar with some add-ons.
Roles:	No extra staff should be required for effective running of the add on, however appointing a member of staff, likely from the universities admission to assume the responsibility of promoting the browser add on to the wider university population is advisable.

Hardware - It is not expected that the university will need to procure more hardware, an existing server can be used to feed the API its breach list to compare the user input to.

Software - Given that most user accounts that are accessed online will be accessed via a common browser, users of other browsers may encounter difficulty trying to access it. Users may need advance warning should they wish to use our solution.

3.3. Technology Integration and/or Migration

In order to fully utilize the potential of the browser extension, the new add on will require a plan for implementation. A phased approach to tackle this issue and make it as easy as possible for any university users to make the most of the extension is listed below

Phase 1 - Creation of the back-end system, such as the server that holds all breach data, should be set up and tested.

Phase 2 - Release of the browser add on should be advertised, a team responsible for answering inquiries regarding the input of sensitive data (the passwords themselves) into our add on should be on hand to answer any concerns.

Phase 3 - Release of the browser add on should also be accompanied by tutorials regarding how to get and use it effectively.

Phase 4 - User feedback from the following week / month should then be collated so the add on can be upgraded

Phase 5 - As the browser extension ages the server that holds the breach data should be continually fed relevant breach data to ensure the add on returns the correct analysis of passwords.

4. PROJECT OVERVIEW (T.C)

The project overview will explain how Coderona aim to produce an all-in-one password strength checker called Passroclus, that will be suitable for our client's needs. Within the overview is; a project description, goals and objectives, performance, assumptions, constraints and milestones that Coderona have identified throughout the planning phase. These key areas will likely be improved upon as we continue to the development phase if the project is approved.

4.1. Project Description

Coderona aim to design and build a bespoke solution for Abertay University's staff and students that will allow them to check the strength of their password either by using a browser add-on and website. Coderona will do this by developing an API (Application Programming Interface) that will serve the relevant password information to the website and add-on. The website and browser add-on will then display the strength of the password to the user in an easy and friendly matter that is accessible to everyone.

The password strength checker, Passroclus, will have extra utilities such as a password creator and a breach checker. Passroclus will guide the user through creating a strong password, with the user being able to set certain requisites, such as numbers, lower/uppercase characters and symbols. The breach checker function will check the user's password against a wide range of known breaches, as well as passwords that are on standard password cracking wordlists. This will ensure that their current password is not compromised – if so, the user will be prompted to use our password creator, to make a more secure password.

This project will raise awareness of insecure passwords and will re-educate users on what a strong password consists of. Passroclus will mean that more users are aware of the importance of having a secure password as well as having a better understanding of how to create a strong password. This will hopefully prevent more people becoming susceptible to having their passwords stolen, guessed or cracked. This should result in the client having to spend less time and money re-educating users that have faulty passwords. The time and money that the Passroclus project is saving the client, can be reallocated to other areas of the business. The users will also be able to use this knowledge outside of the business, meaning that they are less likely to be victims of fraud and identity theft from attackers using their password to access personal accounts/information.

In order to gain a better understanding of how users will interact with the product, Coderona will carry out user surveys. These surveys will commence before, during and after the development of the solution, they will ask users questions based on their current knowledge of password security. They will also ask the user about prior use of password tools and their opinion on the Passroclus product. The team will also carry out research into existing password solutions and see what they are lacking for users. Coderona will also investigate the most used browsers by users, so that the browser add-on will be usable for most users.

4.2. Business Goals and Objectives

The business goals that the project will achieve are: -

Business Goals	Description
Improve public knowledge of secure passwords and computer security in general	Passroclus will educate user's about password security in an easy and digestible way
Reduce number of people falling victim to cyber-related crime	With more and more people learning how to keep their passwords safe, there should be less people falling victim to fraud, identity theft and other forms of cybercrime.
Provide an all-in-one utility for users to stay safe online	User's will be able to check their password strength, if their password is a commonly used one, if it's been in any breaches and if necessary, help the user create a new, strong password that meets current guidance.
Create an updated and dynamic solution that will adapt to everchanging guidance	Passroclus will aim to be as relevant as possible and ensure that it has up-to date information, so users aren't receiving out of date advice/information.

4.3. Project Performance

Coderona have identified how to measure the performance and outcomes of the project, these resources and processes are summarised in the table below, however they will be expanded upon in further detail, within the project plan.

Key Resources	Performance Measure
Education	The website and browser add-on will educate users on the best way to keep their password secure in an easy and friendly manner.
Time Saved	IT Staff will be able to spend more time on other issues, as user's will be less likely to request password changes/resets as they will have a strong and memorable password.
Deterrence	If most of the user's passwords are secure, it is likely to deter attackers who would attempt to guess/crack user's passwords as they are unlikely to be successful.
Money Saved	As users are less likely to be victims of cybercrime, they are also less likely to lose money to criminals – this also means the business will save money as they won't have to spend as much training users about secure password management.

4.4. Project Assumptions

Coderona have discussed the project assumptions that will need to be taken into consideration for Passroclus. This list will be reviewed and adapted as required during the planning phase of this project - as well as any other assumptions that the team identify.

- Passroclus will be hosted by the university's own web server.
- Passroclus will be used by the staff and students of the university.
- There is the possibility of the tool becoming commercial and being rolled out to a wider range of customers.
- There will be no monetary cost for the development of the tool.
- The team will require some preliminary training for the development of the API and Browser Development.

4.5. Project Constraints

Listed below are constraints that Coderona have identified that could affect the project, these constraints have been expanded upon to give the client a better understanding of each one. During the planning phase of the project it is likely that more constraints will be identified, these will be added to the list below.

- Each member of the team is working from home which means external factors such as internet, personal hardware and software issues can cause issues
- Due to the ongoing pandemic, there may be illnesses/grievances that mean team members will be absent from the project for a short while
- As the team are university students, the use of free and open source tools is likely to be used rather than expensive and more specialised tools.
- Coderona will carry out research into API's and browser add-on development, due to lack of experience in these areas.
- Team members may have other commitments, such as work, family and other coursework modules, which means there will be less time available for project development.

4.6. Major Project Milestones

As part of the planning process, Coderona have identified the major project milestones of the Passroclus development phase. These milestones are not final and are subject to change as the planning phase continues. The milestones will be finalised before the development phase begins.

Milestones/Deliverables	Target Date
API Development – Endpoint Building	26/01/2021
API Development – Securing and Encryption	26/01/2021
API Development – Error Handling	02/02/2021
API Development - Testing	02/02/2021
API Development - Documentation	10/02/2021
Browser Add-On - Planning	15/02/2021
Browser Add-on – Development	19/02/2021
Browser Add-on – Testing	24/02/2021
Browser Add-on – Documentation	03/03/2021

Milestones/Deliverables	Target Date
Website Development - Sitemap	04/05/2021
Website Development – Front-End Design	12/03/2021
Website Development – Back-End Design	12/03/2021
Website Development – Testing & Debugging	18/03/2021

5. Strategic Alignment (T.C)

The Passroclus project allows Abertay's Strategic Plan to be achieved by supporting the goals that Abertay have set. These goals are supported both by the project itself as well as the team working together to develop the project. Passroclus will allow Abertay University to meet these goals and improve as a university and business.

Plan	Goal	Relationship to Project
Abertay Strategic Plan 2020-2025	"To offer transformational opportunities to everyone who has the ability to benefit from Abertay's approach to university education."	The Passroclus project means that everyone within Abertay University will be able to benefit from the product that Abertay students have planned and developed.
Abertay Strategic Plan 2020-2025	"To inspire and enable our students, staff and graduates to achieve their full potential and to have a positive impact on the world around us."	The Passroclus project will allow each member of the team to gain and develop new skills as well as being able to share experiences and knowledge with the team. The final product will also have a positive impact on the university and its students, staff and visitors.
Abertay Strategic Plan 2020-2025	"To prepare students for the world of work and a life of learning"	By working as a team to plan and develop a product for a client, this project allows the team to gain experience and understanding of team working in the world of work.

6. Cost Benefit Analysis (T.C)

The table below will document the benefits and savings that the Passroclus project will provide in the first year. These will be measured in both time and financial benefits/savings.

Action	Action Type	Description	First year costs (- indicates anticipated savings)
Hiring Coderona to develop Passroclus	Cost	Cost of the team is set at £14 an hour, with six team members. The team aim to work for ten hours each week for twelve weeks, which would cost the client £10,080 for the duration of the project.	£10,080 (Only for first 12 weeks.)
Server Costs	Savings	The estimated costs that Coderona have calculated for the running costs of the server with the product are £280. The product will not be heavy on usage or requirements and the client already has large servers in place that the product can be installed on.	£840.00
Not using a commercial password manager/checker	Savings	These are the estimated savings from not buying a commercial tool. My1Login charges £2 a user, per month. There are approximately 4,500 students per annum and 173 staff members.	-£112,152.00
IT department spending less time and money resetting passwords, dealing with password breaches, password security issues.	Savings	IT staff spending less time and money dealing with password issues within the organisation. According to infosecurity magazine, single password reset can cost approximately £50.	-£700,000.00
Net First Year Savings			**£801,232.00**

As the project is built using free and open-source materials and tools, as well as utilising pre-existing equipment – the only cost that occurs is for Coderona's services. The net savings is an approximate range of what the client will save each year. Coderona will only charge the client around £10,080 for the twelve weeks of work and £840 per annum or £70 each month to store the product on the universities pre-existing servers. The Passroclus

project will save Abertay University at least £801,232.00 in the first year of the product being installed and in use. This has a positive result for the university with no loss being occurred and being able to save money from costly areas such as the IT department.

7. Alternatives Analysis (T.C)

The alternative solutions listed in the table below have been considered as possible alternatives to the client's problem. These solutions were considered non-viable for various reasons which will be explained beside each.

No Project (Status Quo)	**Reasons For Not Selecting Alternative**
No password checker	• Users continuing to use poor passwords • IT Team having to reset forgotten passwords and educate user's that have poor passwords • User's aren't learning about password hygiene
Alternative Option	**Reasons For Not Selecting Alternative**
Use an already existing solution (haveibeenpwned, Kaspersky password checker, dashlane password checker)	• Expensive to integrate into university systems • Doesn't educate user's on password hygiene, just is password strength is poor • One tool simply checks if breached or poor strength, not multi-tool solution

8. Approvals (T.C)

The signatures of the individual listed below is the formal indication that the client is happy to proceed with the project. Signing this document states that you, as the client, approve this project proposal and that Coderona can begin to create the proposed project on behalf of Abertay University.

Approver Name	**Title**	**Signature**	**Date**
Ethan Bayne	Client (Abertay University)		15/12/2020

PROJECT MANAGEMENT PLAN: PASSROCLUS

TEAM CODERONA
CATRIONA KIRKWOOD, CONLAN BEARD, PETER CAPTAIN, RODERICK ROZALINA, STUART BROWN AND TIA COTTON

ABERTAY UNIVERSITY
DUNDEE, DD1 1HG

DATE: 15/12/2020

9. Introduction (R.R.)

Abertay University has given the approval to commence the Passroclus project to the Coderona team. The aim of this project is the creation of a password strength checker which aids in educating users on their choice of passwords upon registering on a new site. The primary strategy of providing this service is by educating users on their password usage, increasing their knowledge on password strengths and complexity, we can mitigate the effectiveness of a breach and render automated brute-force attacks useless.

10. Project Management Approach (R.R.)

The Product Owner, Tia Cotton is responsible for overseeing the execution and managing of the project according to the project plan. Task are assigned to the team members prior to execution. The ones responsible for technical documentation, testing, and coding are Roderick Rozalina, Catriona Kirkwood, Stuart Brown, Peter Captain and Conlan Beard respectively. The product owner will aid with resources dedicated to the project at hand and ensure that everyone is up to date with the plans and will be discussed, reviewed and adjusted on a timely basis if necessary.

The Coderona members will utilize the Scrum methodology in which we have time to engage in each task and ensuring that it is completed before moving on to the following task. Weekly evaluations and meetings will be conducted to effectively communicate any changes needed before finalizing a task, after a sprint.

11. Project Scope and Milestone List(R.R.)

The scope of Passroclus Password checker incorporates intricate planning, user-friendly design and extensive development and testing within the scope. It will utilize industry known security standards as well to ensure that it remains relevant with the everchanging technological landscape. Documentation and manuals will be included upon release of the software. Finalization of the project will commence when all areas of the software have been adequately tested, documented and package for distribution.

The entirety of the Passroclus project will be developed internally and will be run with any browser of choice.

The following chart below list the important milestones for the Passroclus Project. It consists of project milestones that's needed in order to accurately plan out the duration of the project and not overseeing any important phases that need to be included to ensure quality and assurance for the project. Subtasks are not included in the Work Breakdown Structure (WBS, see appendix A) but will aid in the completion of the major milestones listed below. If a delay has occurred, which may potentially impact the completion date of the project, the product owner will be quickly alerted and will rectify any issues in order to reach the planned completion date. The product owner must ensure proper communication with the team to meet a total agreement to any changes made.

Milestones/Deliverables	Target Date
API Development – Endpoint Building	26/01/2021
API Development – Securing and Encryption	26/01/2021
API Development – Error Handling	02/02/2021
API Development - Testing	02/02/2021
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Website Development – Front-End Design	12/03/2021
Website Development – Back-End Design	12/03/2021
Website Development – Testing & Debugging	18/03/2021

The following products will be handed over to the client:

Product	Description	Date
Documentation	The Documentation will outline the usage and functionality of the software.	19/04/21
User manual	Information on usage, tutorials and function descriptions	23/04/21

12.Work Breakdown Structure (WBS)(R.R.)

The WBS for the Passroclus Project consists of a deliverable with a certain amount of subtask that must be met before completing the task. The project phases can be seen here and were comprised with efficiency and logic in mind. Every deliverable consists of approximately 10 hours each and some weeks will vary depending on the task. (See WBS chart in Appendix A)

The Passroclus Project schedule was created with aid from the WBS. A significant amount of input was placed in the logical structure of the WBS to make it transferable to the Gantt Chart. The project schedule was created and will be maintained with use of Gantt Project software. The product owner has complete control over the altering of the schedule.

Any changes made to the schedule will be discussed during the discussion process. If the time management controls exceed the scheduled time planned, a change request will be signed by the project team and handed to the product owner. The product owner will then proceed with a team discussion to determine the impact, risk and schedule to explore possibilities of remedial. If the impact exceeds the boundary conditions, then the project sponsor will be notified for review and eventual approval. The Passroclus boundaries agreed on are +/- 0.1 will be cautionary and +/- 0.2 will be considered critical. Critical action will be required if the boundaries exceed 0.2.

13.Change Management Plan (CK)

The following steps outline Coderona's change control process, this is applicable to all projects and will be used on the Passroclus project.

Step 1: Need for change identified
Any stakeholder is permitted to submit a Coderona change request form to the product owner. This should provide a clear understanding of why the applicant feels a change is necessary.

Step 2: Change request is recorded in the change request register
All change requests submitted during the project are logged by the product owner.

Step 3: Establish the impact of the proposed change
The product owner, project team, and the applicant will assess what impact the proposed change would have on the project in terms of schedule, scope, risk and cost.

Step 4: Change request is submitted to the Change Control Board (CCB)
The product owner submits the change request and impact analysis to the CCB for evaluation.

Step 5: Decision arrived at by CCB
The CCB will consider all information submitted and reach a decision on whether to approve or deny the change.

Step 6: Implement change
Should the change be approved, the product owner will update all affected aspects of the project plan and communicate the amendments to the team and stakeholders.

Throughout the Passroclus project, any stakeholder or team member is permitted to make a change request application. The CBB will be led by the project sponsor and the proposed change, and any implications for the project schedule, cost and scope must be authorised by them. The product owner will log the details of all change requests in the change control register, regardless of whether the change is approved or declined.

14. Communications Management Plan (CK)

The communications management plan details the communications structure for the Passroclus project. This will guide the communications for the entirety of the project and will be updated should communication requirements change. The plan comprises of a communications matrix which details the communication requirements, format and frequency that are necessary for the success of the project, and a project team directory which provides contact information for all team members involved in the development of Passroclus.

Due to current government guidelines regarding the ongoing global pandemic, no meetings can be conducted in person. The guidelines will be closely monitored, and should they change, the communications management plan will be adjusted accordingly. It is the responsibility of the product owner to ensure that the project remains in compliance with government guidelines.

It is the responsibility of the product owner to ensure effective communications are maintained throughout the Passroclus project. The communications matrix is documented below, this will guide the communication in terms of what information is required to be communicated, when it should be communicated, and who should communicate that information to who. The owner of all items listed in the communications matrix is the product owner.

Communications Matrix

Communication Type	Description	Frequency	Format	Participants/ Distribution	Deliverable/ Product
Sprint Evaluation (Sprint Review)	Assess current sprint backlog and progress to next if complete	Biweekly	Microsoft Teams Voice Call	Project Team	Updated Sprint Backlog
Weekly Project Team Meeting (Weekly Scrum Meeting)	Evaluate progress and update action register accordingly, quality metrics discussed at alternate meetings	Weekly	Microsoft Teams Voice Call	Project Team	Updated Product Board
Weekly Progress Report (Sprint Review)	Summary of project progress posted in project channel	Weekly	Microsoft Teams	Project Sponsor, Team and Stakeholders	Progress Report
Project Monthly Status	Present metrics, budget and status to team and sponsor	Monthly	Email	Project Sponsor, Team, and Stakeholders	Status Report
Project Gate Reviews (Sprint Review)	Completion of project phase and begin next phase	As Needed	Microsoft Teams Voice Call	Project Sponsor, Team and Stakeholders	Phase completion report and begin next phase
Technical/Creative Design Review	Review of any technical or creative designs within the project	As Needed	Microsoft Teams Voice Call	Project Team	Technical Design Package
Project Documents	Sharing of work for input and or approval posted in project channel	As Needed	Microsoft Teams	Project Team	Advice or approval

Project Team Directory

Name	Title	Email / Microsoft Teams Call
Tia Cotton	Product Owner, Programmer / Designer	1602119@abertay.ac.uk
Con Beard	Technology Support, Programmer / Designer	1903487@abertay.ac.uk
Stuart Brown	Communications, Programmer / Designer	1803060@abertay.ac.uk
Peter Captain	Graphic Communication, Programmer / Designer	1800326@abertay.ac.uk
Catriona Kirkwood	Updates, Programmer / Designer	1803015@abertay.ac.uk
Roderick Rozalina	Quality Control and Documentation, Programmer / Designer	1800047@abertay.ac.uk

Communications Conduct

Meetings:
A meeting agenda will be circulated by the product owner at least two days prior to any scheduled meeting, and all participants are expected to examine the agenda before the meeting. Participants must arrive at each meeting on time, and in the unlikely event of a situation arising that prevents them from attending, apologies must be sent as soon as possible. Due to the current inability to meet in person, each participant must consider distractions in their own environment and these must be minimised wherever possible. The timekeeper will ensure that all project meetings are conducted according to the times outlined in the agenda, and the recorder will take notes to deliver to the team upon the cessation of the meeting. The recorded minutes will be communicated no later than 24 hours after the completion of the meeting.

Email:
All emails regarding the Passroclus project must be professional, free of errors, and concise. Communication of information by email should be carried out according to the communications matrix with relevant content shared with the appropriate team members. Document attachments should be generated in Microsoft Office in accordance with Coderona company

policy. Emails containing concerns or issues should include any relevant background information to provide context to the point being raised and provide a suggestion on how the issue could be rectified. Any emails relevant to the project direction should include the product owner.

Informal Communications:
Informal communication is essential to the success of the project, however, any updates or concerns that are identified during informal discussion between team members must be communicated to the product owner to allow for any necessary action to be taken.

15. Cost Management Plan (CK)

Management and reporting on the cost of the Passroclus project will be the responsibility of the product owner. Costs will be monitored using earned value calculations. Accounting for any cost deviations will be the responsibility of the product owner, they will also make suggestions on bringing the project back within budget. The project sponsor has full authority over the budget and any decisions pertaining to the overall budget, or budget recovery must be approved by them.

The largest financial cost for the project is the rate of pay for the team, this is based on an hourly rate of £14 which has been derived from the average graduate salary of a software developer in the UK; £28,000. It is anticipated that each team member will work for ten hours per week, this equates to a total of £10,080 for the entirety of the project. The other cost that will be incurred is the server cost which is anticipated to be £70 per month, totalling £280.

Control accounts for the Passroclus project will be updated weekly with the cost for the current week being included in the total. Costs will be rounded to the nearest pound or whole hour.

Cost and schedule performance indexes (CPI and SPI) will be used to track the performance of the project. The status of any individual cost that varies by +/- 0.1 in the CPI and SPI will be changed to cautionary, and the overall budget will be analysed. Should there be little or no impact to the overall cost of the project, it may be determined that no action is required. This could be the case should extra work hours have been required during one sprint, for example if a technical issue arose. In that situation it may be possible to bring the cost of the project back on track in the following sprint. Individual costs varying by +/- 0.2 in the CPI and SPI will be given a critical status. Action will be required from the product owner in order to correct and bring the CPI and SPI within the allowable variance. Corrective action will require a project change request and must be approved in line with the change management plan prior to implementation.

The product owner will compile current earned value calculations prior to the monthly project status meetings and present these at the meeting. Variances that do not have cautionary or critical status but are predicted to do so by the next project status meeting will be reported to the project sponsor immediately.

16. Procurement Management Plan (CK)

The product owner will oversee and manage all procurement activities on the Passroclus project. This project is anticipated to require minimal to no procurement and therefore all procurement actions must be approved by the project sponsor.

Should a need for procurement arise, the product owner will identify any items or services required with the help of the project team. Thereafter, the product owner will ensure that the procurements are assessed by the Program Management Office (PMO) and delivered to the contracts and purchasing groups. The procurement actions will then be evaluated by the contracts and purchasing groups who will determine the most appropriate way to acquire the items or services required. This may be by purchasing or making the items, once determined, the contracts and purchasing groups will begin the process of supplier selection, purchasing, and contracting.

In the event of a procurement being required on the Passroclus project, the product owner will be responsible for the management of any chosen supplier or external resource. The product owner will evaluate the performance of the supplier and the delivery of the necessary items, and relay this to the contracts and purchasing groups.

17. Project Scope Management Plan (SB)

Scope management for Coderona's, Passroclus project will be the responsibility of the Scrum master. As a 'Team' Coderona will make use of alternating SCRUM masters allowing for each member of the 'Team' to gain experience in holding this post. A Gannt chart and WBS (Work Breakdown Structure) will aid in the definition of the projects scope. The Gannt can be seen in Appendix B and the latter in Appendix A.

The scope will be measured on a continuous basis as our sprints will last two weeks with bi-weekly meetings, totalling four meetings per sprint. This ensures communication between the 'Team' remains exceptional, also allowing for the 'Team' to collectively know where everyone stands at a given point in development with regards to the scope.

Product owner, SCRUM Master and the development team will have the ability to request scope changes, this can be discussed during sprint meetings. Allowing for a quick resolution to

such requests. The product owner will establish the priority level of such changes and include these into the backlog accordingly. The preparation period before a sprint meeting takes place can be used to allow for the decision as to whether a new requirement should be part of the sprint meeting, with lower priority requirements remaining in the backlog for future concern. It must be noted, however that scope changes should be avoided at best unless necessary as many conditions will need to be considered on the impact of such changes to the to the schedule, quality, resources, cost and risks of the project.

The project client will have to formally accept the final deliverables of the project, the client will base the acceptance of the completed Passroclus project on the user testing, whitepaper and any other project documentation.

18.Schedule Management Plan (SB)

The schedule for Coderona's project will be dictated by using the Gantt chart shown in Appendix B. This chart helps with time management greatly by visualizing the timescale of all the defined project milestones.

The Gantt assisted in the creation of a precedence network which defined the importance of the project workflow, with a start and end point. The critical path was then identified within the precedence network this path follows the most important milestones within the development of Passroclus. Technological research begins the path, since none of our development team have taken part in the creation of a browser extension for chrome, an understanding of the technologies involved in the process is required.

Once a general understanding has been achieved, wireframes can be created to aid the design process and user interface. The most critical and multifaceted point of development can then begin once a design has been approved. This part of the path involves the development of the API that will support the browser extension, it is hoped that these can be developed in tangent however the chrome extension will not function until the API is fully working. It is expected that most of the development time will be spent on this.

User testing will then allow for any bugs that may have been missed during development testing to be identified and give an insight into the user experience from a range of different backgrounds. Finally, the compiling of documentation including the whitepaper and user guide can be produced, permitting for the final package to handed over for approval from the client.

With Regards to meetings Coderona will use the Microsoft teams' calendar to schedule these as it would make sense to keep the calendar on the same tool as our main means of

communication. Teams also has reminder notifications that can be send out for scheduled meetings which can be helpful as schedules can be busy.

Sprint burndown charts will also be actioned as these make the work of the team visible. The chart shows the rate at which the work in that current sprint has been completed and how much work still must be done, visually showing the progress towards the goal as user stories are completed.

With the identification of a critical path via the help of a precedence network, Coderona can approximate the overall time to develop Passroclus. Coderona can also focus the development on the more important milestones therefore, safeguarding the delivery of Passroclus within the deadline.

19. Quality Management Plan (SB)

Each member of Coderona will take part in quality assurance. Due to Passroclus being a password educational tool, security and reliability are of the upmost importance to the Coderona team. Security and encryption have been prioritized when developing the API to guarantee that these protocols are implemented early into development.

The quality of the product will be managed during meetings and where the Coderona team will keep each member motivated and up to speed on the current tasks at hand, the biweekly meeting schedule will ensure that the timescale is met with a quality baseline included.

To ensure the deliver highest quality end deliverable, testing will take place throughout the entire development phase. This has been accounted for in the Gantt chart, as it is a very crucial that time is given to testing in order to identify any issues and bugs. Testing will also help guarantee reliability and consistency as the product must adhere to certain standards that will be later discussed. As a 'Team' is also important to ensure that the readability and maintainability of the source code is streamlined, this will allow for the 'Team' to pick up on each other's work without any issues and much affect to time cost.

As development comes to an end user testing will be used to visualize how users utilize the product and to identify any bugs that might not have come up during in house testing. Coderona need to adhere to Abertay's Research Code of Conduct when it comes to user testing. Although with the current climate it is hard to predict if this will be possible to take place due to COVID-19 restrictions, however it can be achieved digitally through the same communication avenues discussed earlier in this document.

Passroclus must adhere to many laws and standards as the tool will be used by Abertay University, the reputation of this institution needs to be protected. The 'Team' had considered using a known respected industry standard when it comes to testing.

One standard that came up when researching was the ISO/IEC 29119. This standard was created and devised by the ISO who are an international standards organization made up of 165 national bodies around the world, the standards devised cover many different industries. However, there are some draw backs to this testing standard with many arguing that the standard focuses far too heavily on needless documentation and distracts from the actual act of testing a piece of software. As a 'Team' it was decided against following such a standard as it would more than likely weigh the group down.

Coderona's test plan must then ensure that Passroclus makes the grade. This will mean testing the tool to check that it meets the requirements that were defined at the start of the process, one of these being whether the input performs as it should do. Another factor would be making sure the encryption side is solid ensuring no password data leaks. The browser extension would need to be tested on Microsoft edge to ensure compatibility. A Plan of greater detail will be worked on during technical research in development.

A Legal issue that the 'Team' must ensure Passroclus adheres to is GDPR, this is due to the nature of our product. As sated earlier in this section, security and encryption is of upmost importance to everyone on the Coderona team. The 'Team' are confident that we will avoid storing any data on both the front end and back end of Passroclus this will help avoid any issues with GDPR compliance and data protection.

Accessibility will also be of the upmost importance for Coderona, it is important that anyone who studies at Abertay university is able to utilize and benefit from Passroclus. The use of Colours must be inclusive to those with vision impairments. The information fed back to the user will also have to precise and avoid lots of technical terminology that the average user might not pick up on. The use of a tool called Wave will help with evaluating the accessibility of our product.

With regards to the use of open-source tools and existing libraries to aid in the development of Passroclus, as the project has a timescale that must be met these options may be utilized in order to save time on more crucial parts of development such as security. It is critical to avoid anything that could be interpreted as plagiarism or be classed as theft under the 'Copyright, Designs and Patents Act 1988'. To prevent this any piece of code that has not been written by the development team will be credited and written permission from the owner will also be obtained from the owner if at any point necessary.

Overall rigorous testing at each stage of development as well as constant communication between the 'Team' with regards to the scope will ensure that Passroclus meets the deliverable deadline with minimum wastage and the highest quality handed over to the client.

20. Risk Management Plan (TC)

Coderona's approach to risk management for Project Passroclus was methodical, precise, and started extremely early in the planning stages of development. By starting early and outlaying all potential risks the project could face in the future, we attempted to ensure that by the time we start developing the program, we can mitigate all of these risks and have a concrete plan for each problem should they ever arise. At every weekly meeting during project development, all our team members will bring forth any worries they have moving forward, and any issues they think will impede the development time or overall quality of the finished product. By having new risks brought forth on a weekly basis, we can be much more prepared for the future of development and ensure that there are no nasty surprises during development. Humans, however, are pessimistic by nature and tend to exacerbate their worries. To stop the risks piling up with lesser issues that could be ironed out as they arise, our team will vote on each issue brought forth and whether we view it as a serious concern or not.

Once we have a fully developed product, our team plans on reviewing what problems did arise, and assess how we managed to tackle them. By assessing our successes and failures of risk mitigation and problem solving, we will develop a stronger foundation of knowledge that will help all of us deal with these problems faster and more efficiently in the future.

Further details can be obtained from the Risk Assessment in Appendix C.

21. Staffing, Resource and Cost (TC)

Staffing:

The staff roles for Project Passroclus are as follows:

Product Owner: This is the highest role in the hierarchy of our group. The product owner is responsible for enforcing our time constraints and handing us our tasks. They are responsible for tracking our performance in our tasks and assigning us to roles they think best fit our skillset. They can also veto or enforce the ideas and plans brought forth by other members in the group.

Scrum Master: This role will be assigned to the member of our team with the most expertise in coding, and they will be responsible for overseeing and leading the main development on the website and browser extension. They will also be responsible for relaying any risks with

development put forward by other programmers, as well as any issues they themselves feel like they could run into to the rest of the team at meetings.

Programmer: This role will be given to two people, and they will be responsible for coding the Passroclus website and browser extension. They will also be responsible for relaying any issues they find to the Scrum Master, as well as any roadblocks that they are likely to hit during development.

Quality Tester: This person will be responsible for testing both the website and browser extension, as well as tracking the quality of the overall project. They will be responsible for recording and documenting test results, as well as reporting the quality of the project on a bi-weekly basis to the group and notifying the programmers of any concerns they have regarding overall quality.

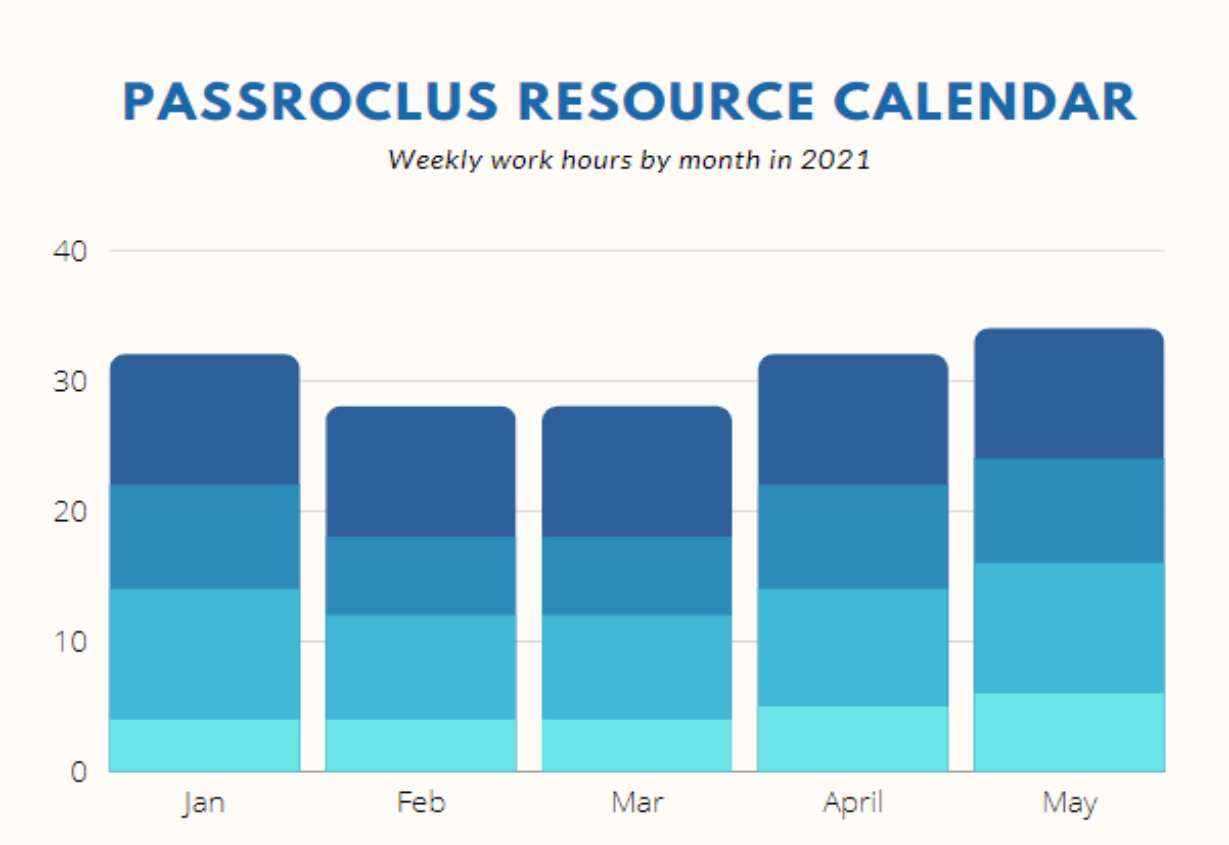
Technical Writer: This person will be responsible for collating all documentation retaining to the Passroclus project, as well as taking the minutes for each weekly meeting.

The Product Owner of Passroclus will oversee handing out these roles, however the team will rank what they believe are their best skills in a strongest to weakest format. By doing this, it is more than likely that members of the team will be assigned to roles they can best fulfil.

Resource:

The level of work required on each part of the project will change depending on roles assigned, as well as how far into development the project is. For a project like Passroclus to exceed at a high quality, it is scheduled to be in development for six months, with the average work week being around 10 hours long due to the team having prior engagements with other work tasks. Included below is a projected resource calendar moving forward. The following colour index shows what colours represent the hours of each role.

	Programmer
	Product Owner
	Lead Programmer
	Technical Writer


PASSROCLUS RESOURCE CALENDAR
Weekly work hours by month in 2021
40
30
20
10
0
Jan
Feb
Mar
April
May

Cost:

Listed below is the overall cost breakdown for the Passroclus Project, this will include the overall work hours and any other additional costs required for the completion of the project. Please note that once development has been completed, the monthly £70 server costs must be paid every month to keep the website online.
Total pay for hours worked: £10,080
Total server costs: £280
Total cost overall: £10,360

Project Phase	Budgeted Total	Comments
Planning	£910	The collated total pay for this section of the project plus £70 for one month of server hosting
Design	£1,680	The collated total pay for this section of the project. (Note: No server hosting costs for this section, as there would still be 2-3 weeks of server hosting available to us.)
Coding	£3,430	The collated total pay for this section of the project plus another month of server hosting
Testing	£3,430	The collated total pay for this section of the project plus another month of server hosting
Transition and Closeout	£910	The collated total pay for this section of the project and another month of server hosting

22.Quality Baseline (TC)

For us to happily release Passroclus into the world, it must first meet a rigorous set of quality checks before release. This quality baseline assures you, the client, that the product we create is up to par with other competing software currently on the market. A detailed quality list is as follows.

Item	Acceptable Level	Comments
User Friendly GUI	For the GUI to be acceptable, it must be both visually pleasing as well as accessible to those with disabilities such as colour blindness or those who are suffering from other varying degrees of blindness.	Analyse fonts and colour schemes that would be easier for those with visual impairments to access
Cross Platform Compatibility	The website should be accessible on all market dominated web browsers, as well as have a mobile version to allow ease of access for mobile users.	Utilize Bootstrap to ensure that the webpage can run on mobile.
Succinct user guide	The website and extension should guide users through the process, as well as give detailed but easy to understand feedback to user input. This feedback would include things like what the user has done correct when creating a secure password, as well as changes they could make to create a much more secure password.	Ensure that no complex terminology is used in the user guide.

SPONSOR ACCEPTANCE

Approved by the Project Sponsor:

_____ Date: 15/12/2020

Ethan Bayne
On Behalf of Abertay University

APPENDIX A: WORK BREAKDOWN STRUCTURE

INTRODUCTION

OUTLINE VIEW

The Work Breakdown Structure presented here represents all the work required to complete this project.

1. Password Strength Checker
    - 1.1 Planning
        - 1.1.1 Create Project Pitch
        - 1.1.2 Submit Project Pitch
        - 1.1.3 Develop Project Plan
        - 1.1.4 Submit Project Plan
    - 1.2 Analysis
        - 1.2.1 Verify & Validate User Requirements
        - 1.2.2 Carry out user analysis/research
        - 1.2.3 Carry out preliminary software research
        - 1.2.4 Procure Hardware/Software
        - 1.2.5 Install Development System
        - 1.2.6 Carry out design-related research (Accessibility/colors)
    - 1.3 Design
        - 1.3.1 Design API wireframe
        - 1.3.2 Design browser add-on wireframe
        - 1.3.3 Design website wireframe
    - 1.4 Build
        - 1.4.1 Build API
        - 1.4.2 Test API
        - 1.4.3 Build browser-add on
        - 1.4.4 Integrate and test add-on
        - 1.4.5 Build website
        - 1.4.6 Integrate and test website
        - 1.4.7 User testing of the product
    - 1.5 Handover
    - 1.5.1 Package product
    - 1.5.2 Create a user manual
    - 1.5.3 Create project whitepaper

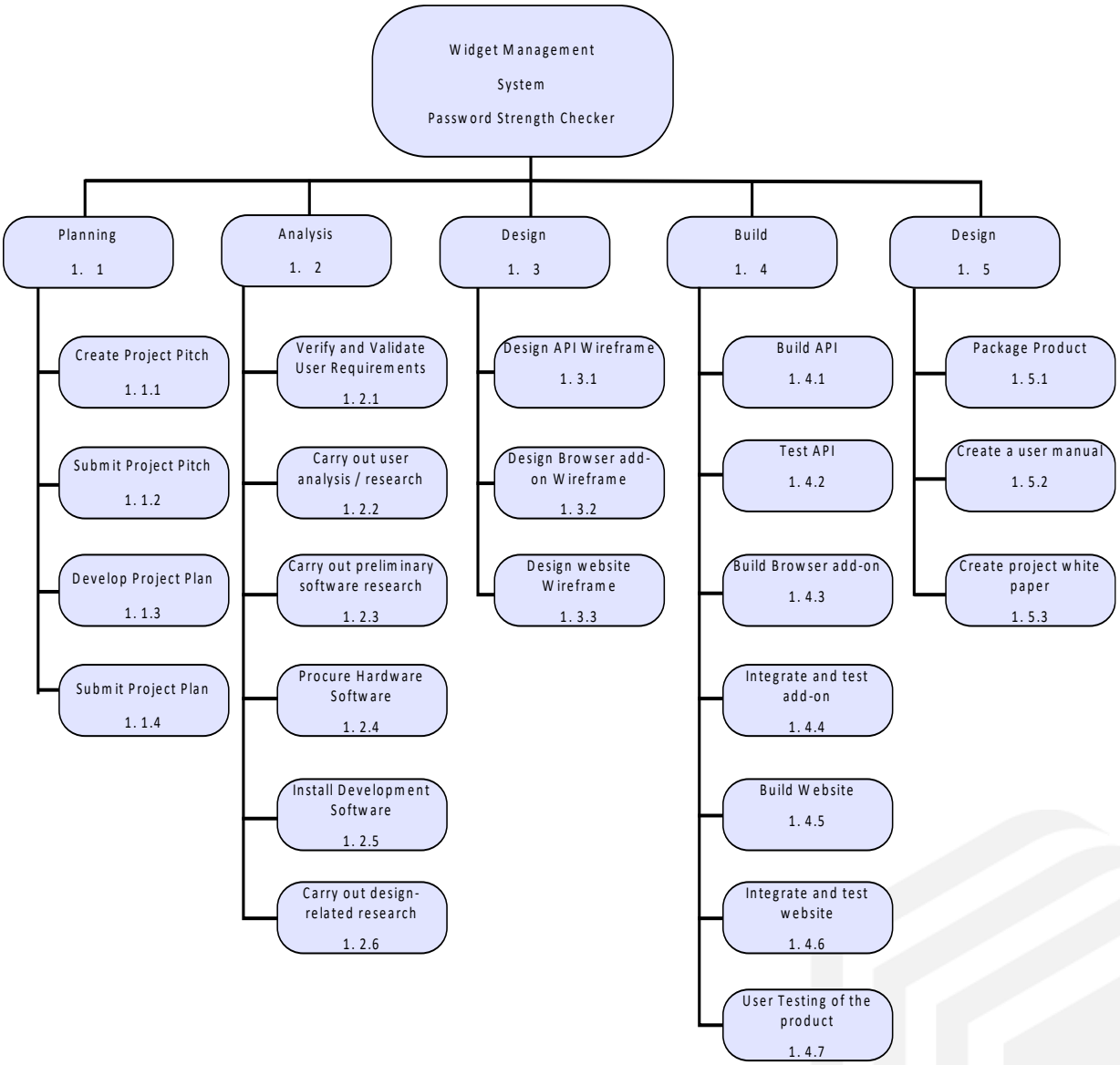
HIERARCHICAL STRUCTURE

Level	WBS Code	Element Name
1	1	Password Strength Checker
2	1.1	Planning
3	1.1.1	Create Project Pitch
3	1.1.2	Submit Project Pitch
3	1.1.3	Develop Project Plan
3	1.1.4	Submit Project Plan
2	1.2	Analysis
3	1.2.1	Verify & Validate User Requirements
3	1.2.2	Carry out user analysis/research
3	1.2.3	Carry out preliminary software research
3	1.2.4	Procure Hardware/Software
3	1.2.5	Install Development System
3	1.2.6	Carry out design-related research (Accessibility/colours)
2	1.3	Design
3	1.3.1	Design API wireframe
3	1.3.2	Design browser add-on wireframe
3	1.3.3	Design website wireframe
2	1.4	Build
3	1.4.1	Build API
3	1.4.2	Test API
3	1.4.3	Build browser-add on
3	1.4.4	Integrate and test add-on
3	1.4.5	Build website
3	1.4.6	Integrate and test website
3	1.4.7	User testing of the product
2	1.5	Handover
3	1.5.1	Package product
2	1.5.2	Create a user manual
3	1.5.3	Create project whitepaper

TABULAR VIEW

Level 1	Level 2	Level 3
1.Password Strength Checker	1.1 Initiation	1.1.1 Evaluation & Recommendations 1.1.2 Develop Project Charter 1.1.3 Deliverable: Submit Project Charter 1.1.4 Project Sponsor Reviews Project Charter 1.1.5 Project Charter Signed/Approved
	1.2 Planning	1.2.1 Create Preliminary Scope Statement 1.2.2 Determine Project Team 1.2.3 Project Team Kickoff Meeting 1.2.4 Develop Project Plan 1.2.5 Submit Project Plan 1.2.6 Milestone: Project Plan Approval
	1.3 Execution	1.3.1 Project Kickoff Meeting 1.3.2 Verify & Validate User Requirements 1.3.3 Design System 1.3.4 Procure Hardware/Software 1.3.5 Install Development System 1.3.6 Testing Phase 1.3.7 Install Live System 1.3.8 User Training 1.3.9 Go Live
	1.4 Control	1.4.1 Project Management 1.4.2 Project Status Meetings 1.4.3 Risk Management 1.4.4 Update Project Management Plan
	1.5 Closeout	1.5.1 Audit Procurement 1.5.2 Document Lessons Learned 1.5.3 Update Files/Records 1.5.4 Gain Formal Acceptance 1.5.5 Archive Files/Documents

TREE STRUCTURE VIEW



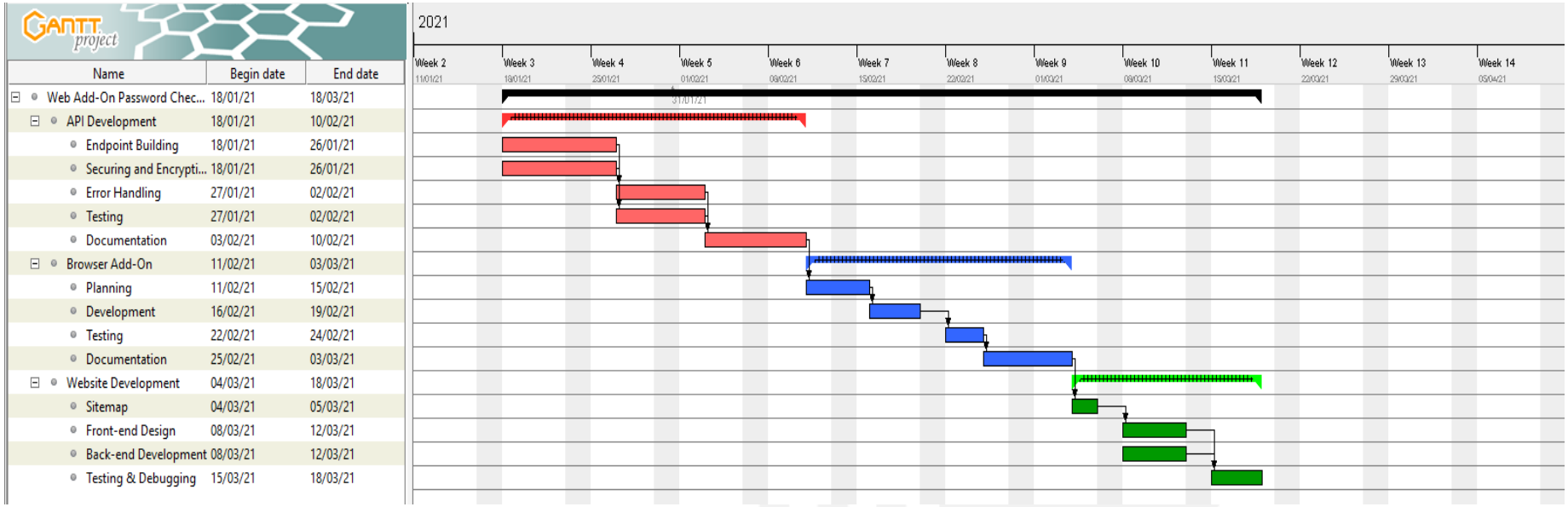
GLOSSARY OF TERMS

Term	Definition
API	Application Programming Interface, this tends to be in the form of a downloadable package that is compatible and interfaces with many different applications.
CCB	The Change Control Board is a committee led by the project sponsor which decides whether to approve a change to the project.
Coderona	Coderona is the name of the team in charge of development of the product.
COVID / COVID 19 / Coronavirus/The Current Pandemic	The coronavirus pandemic started as a result of a highly infectious disease spreading through the population from early 2020 onwards. Due to the infectious nature of the disease, remote working has been strongly encouraged, impacting how development teams worldwide operate
Coderona's Solution	This refers to the Passroclus project, (e.g., the associated API, browser add-on and the wider proposal).
CPI	Cost Performance Index measures the financial efficiency of the project.
Level of Effort	Level of Effort (LOE) is how much work is required to complete a task.
Passroclus	Passroclus is the name of the API for a browser extension and website that Coderona aims to develop.
PMO	Program Management Office is a department within the company that maintains standards for project management on company projects.
Product Backlog	The product backlog is a list of the tasks that are required to be completed in the development of the project. The product owner is in control of the product backlog and prioritises this as necessary.
Product Owner	The product owner is the team member that is the main communicator between the client and the team, they will oversee the progress of the project and work with the Scrum Master during the development phase.
Purchasing Group	Dr Ethan Bayne, a representative of The University of Abertay Dundee.
Scrum Master	The scrum master leads the sprint, determines how to manage the product backlog and enables the development team to meet their assigned goals.
SPI	Schedule Performance Index measures the actual progress against the project plan.

WBS	A deliverable based hierarchical breakdown of the work to be executed by the project team to accomplish the project objectives and required deliverables.
WBS Code	A unique identifier assigned to each element in a Work Breakdown Structure for the purpose of designating the elements hierarchical location within the WBS.
WBS Component	A component of a WBS which is located at any level. It can be a Work Package or a WBS Element as there's no restriction on what a WBS Component is.
WBS Element	A WBS Element is a single WBS component and its associated attributes located anywhere within a WBS. A WBS Element can contain work, or it can contain other WBS Elements or Work Packages.
Work Package	A Work Package is a deliverable or work component at the lowest level of its WBS branch.

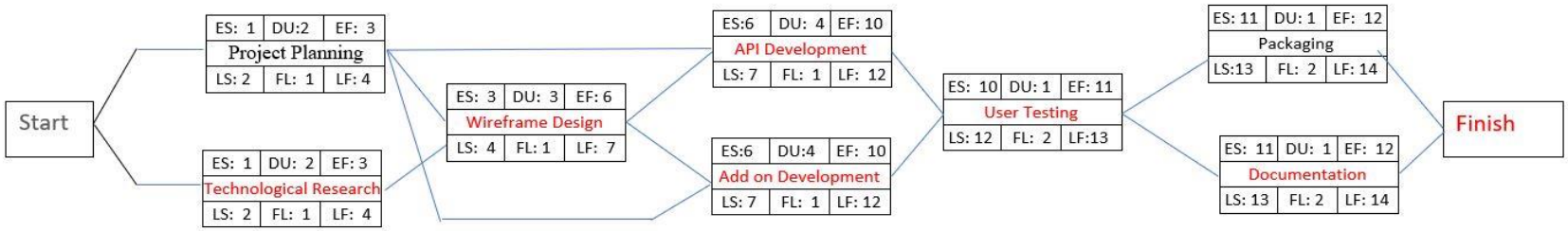
APPENDIX B: GANTT CHART AND PRECEDENCE NETWORK (SB)

GANTT CHART



Name	Begin date	End date
Web Add-On Password Chec...	18/01/21	18/03/21
API Development	18/01/21	10/02/21
Endpoint Building	18/01/21	26/01/21
Securing and Encrypti...	18/01/21	26/01/21
Error Handling	27/01/21	02/02/21
Testing	27/01/21	02/02/21
Documentation	03/02/21	10/02/21
Browser Add-On	11/02/21	03/03/21
Planning	11/02/21	15/02/21
Development	16/02/21	19/02/21
Testing	22/02/21	24/02/21
Documentation	25/02/21	03/03/21
Website Development	04/03/21	18/03/21
Sitemap	04/03/21	05/03/21
Front-end Design	08/03/21	12/03/21
Back-end Development	08/03/21	12/03/21
Testing & Debugging	15/03/21	18/03/21

PRECEDENCE NETWORK WITH IDENTIFICATION OF CRITICAL PATH



APPENDIX C: RISK ASSESSMENT (TC)

TOP THREE RISKS

The top three high probability and high impact risks to this project are:

R1: The COVID-19 Pandemic

Our largest issue at current time is an act of god. Due to the Pandemic and required social distancing and closure of our facilities, all our project members are currently working from home. Because of this, there are potential, and unavoidable risks associating with both physical and mental health, as well as financial risks. We cannot anticipate what the future has in store for us in this regard, and thus this issue will be the hardest to plan around and mitigate loss of time and effort.

R2: Lack of Knowledge

For a part of Project Passroclus, we will be developing a web browser extension version of the Passroclus site, allowing users to test password strength on the fly, without needing to head to the website whenever they wish to do so. The largest issue with this is a lack of knowledge when it comes to developing web browser extensions across the whole team. Depending on how quickly those working on the extension can come to grips with the modules and syntax unique to Chrome's extension creator will depend on how quickly this aspect of the project can be completed.

R3: Conflict of Interest

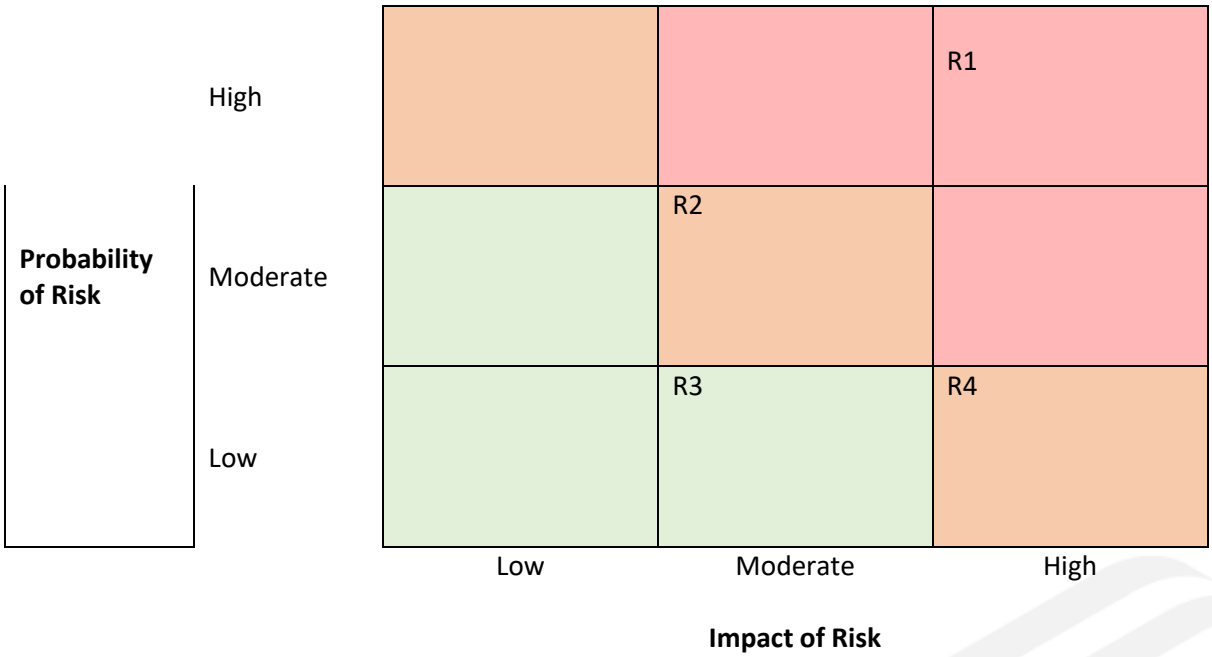
Due to the democratic nature of our group, where all members have equal right to speak their mind and all decisions coming to a vote, it could be that there are moments in the development plan where there is some conflict of interest amongst the members. To mitigate this, there should be one member of the team (more than likely the Project Leader) who has final authority on what decisions should be taken, should the vote be split down the middle.

Other risks identified and how they are addressed are:
R4: Accessibility Risk

When developing Passroclus, we must ensure that the libraries we may use to develop the

website, such as Bootstrap, must work on all commonly used Web Browsers. If we do not ensure this, we run the risk of having a portion of the prospective users of Passroclus being unable to use the website. However, due to the nature of this risk, If we fully research the libraries we are implementing, this risk is almost non-existent.

Risk Probability-Impact Matrix



APPENDIX D: QUALITY METRICS

The following quality metrics will be used to test the quality of the Passroclus product during its development. These metrics have been selected based on customer requirements and relevant industry standards. Many are scheduled to be performed fortnightly, this is due to the structure of the fortnightly sprints and should ensure that any quality issues are identified as early as possible and thus can be rectified quickly, keeping the project on track.

- Functionality: The functionality of the product will be tested regularly by the project team during the development stages. All aspects of the product will be tested using a wide range of inputs to simulate a variety of users. All tests must return the intended result, any anomalies will be investigated and rectified.

- Reliability: In order to ensure that the Passroclus product returns failure free, reliable results, load testing will be performed by the product team. This will involve repetition of the same user input to check that results are consistent.

- Usability: The usability of the product will be measured in two ways; the first is by regularly using the WAVE Web Accessibility Evaluation Tool which evaluates the accessibility of a web page. This will identify areas which can be improved to maximise the accessibility of the final product to users with disabilities and ensure that the product complies with accessibility laws outlined in the Equality Act 2010. The second measurement will be a ten item System Usability Scale questionnaire conducted during the user testing phase. The results of this will be used to evaluate the ease of use, and ultimately determine whether the product is ready for completion or requires some final modifications before release to the client.

- Efficiency: Stress testing will be conducted to analyse the performance of the product using levels greater than the expected patterns of use. This will reveal the level of use that the product is able to sustain, and any shortcomings should be rectified to ensure that the final product is able to efficiently meet user demand.

- Maintainability: The code for the Passroclus project will be kept as short as possible in order to maximise maintainability. The cyclomatic complexity test in Visual Studio assesses the code and gives a rating for this measurement. Another consideration is future updates should the advice of the National Cyber Security Centre change regarding passwords; all code pertaining to checks against password quality should be easy to update should it be necessary.

- Portability: The Passroclus project should be portable to multiple browsers. The project team will test the product on several browsers and with various versions of each at fortnightly intervals.

- Security: A vulnerability scan will be conducted fortnightly using the OWASP ZAP tool. This will identify any security risks and vulnerabilities within the application and source code.

Metric	Standard	Frequency	Report
Functionality	Unit test of software by project team	Fortnightly	Discussed at alternate team meetings
Reliability	Load testing by project team	Fortnightly	Discussed at alternate team meetings
Usability	WAVE Web Accessibility Evaluation Tool	Fortnightly	Evaluation by wave accessibility checker
	System Usability Scale	During user testing stage	Results of system Usability Scale (10 item survey)
Efficiency	Load testing by project team	Fortnightly	Discussed at alternate team meetings
Maintainability	Cyclomatic complexity test in Visual Studio	Monthly	Results generated in Visual Studio
Portability	Test on multiple browsers and versions by product team	Fortnightly	Discussed at alternate team meetings
Security	Vulnerability scan using OWASP ZAP	Fortnightly	Results generated by scan

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