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BUSINESS CASE: CYBER KIDS

CYBER SAFE KIDS

TEAM CYBER KIDS (EH6)
CHRISTOPHER DI-NOZZI AND EILIDH DEVINE

ABERTAY UNIVERSITY
DUNDEE, DD1 1HG

DATE: 15/12/2020

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1. Executive Summary

This business case has been created as a response to the proposal from Dr Suzanne Prior which requested the designing and development of a cyber security education website for young children. This business case will demonstrate how the 'Cyber Safe Kids' project will meet and exceed the requirements put forth, the benefits that this project will bring, the exact goals of the project, the features that our solution will include and reasoning as to why our solution is the best option. It will also include an overview of the project, strategic alignment, cost benefit analysis, alternatives analysis and approvals.

1.1. Issue

The Scottish Curriculum for Excellence (2020) is the standardized basis of education for Scottish children from age 3 to 18. While it includes education around best cyber security practices, this information is not up to the standard that it should be when it is considered how quickly computers have become an everyday element for children. It lacks vital information for children to stay safe online and teaches this all in the wrong order. For example, children are first taught to make weak passwords and then retaught how to make strong passwords at a later date, completely invalidating their initial education into the subject. As the number of children using the internet increases dramatically, so must education around staying safe and best practices to keep these children safe and instill good habits as they graduate into the working world where they will likely use a computer on a daily basis. Any external resources that currently exist do not do an acceptable job of addressing these issues, either being too outdated and/or not engaging or fun for a child to use. Dr Prior has spent a considerable amount of time researching the issues in current cyber security education aimed at children and creating considerably better material for primary school aged kids. However, this information still needs to be presented in a way that children can easily access and consume. In its current state as white papers, it does not benefit children at all. Therefore, this information that Dr Prior has curated will be used as a basis for the website.

1.2. Anticipated Outcomes

Creating a website to educate children between the ages of five to nine will enable a new generation of kids to be educated and aware around the issues of cyber security. They will be able to use it as a foundation of learning around online safety and security, and it will fully supplement any poor education they may receive in school around the topic. Having educational content targeted to certain age ranges will allow children of a variety of ages to develop their knowledge and start learning how to be self-sufficient learners using online resources. This is something they will likely do for the rest of their lives. An added bonus is that anyone can access the content at any time and over a

multitude of device types since it will be free and open to everyone. The parents and teachers will also benefit, knowing exactly what their child has been learning online and being reassured that solid groundwork is being laid down for their child's cyber education. They will also be able to monitor the child's progress and be assured that they are spending their time online in a safe and productive environment.

1.3. Recommendation

The best way to present this content in an accessible manner is by creating a web application that is usable on both conventional computers (desktops and laptops) as well as tablet devices, which are increasingly common in classrooms and the hands of children. This approach allows anyone to use it as long as they have an appropriate device and an internet connection. It will be relevantly cheap to develop and maintain, especially when compared to creating an IOS/Android/Desktop application. It will be developed with industry standard web technologies thus making future maintenance and upgrades much more straightforward. A few of the ways that this solution will gain the desired results are:

- Content will be divided into various age categories, allowing the user to get the exact level of teaching they need for the education level.
- The web application will be responsive meaning that it will work just as well on a tablet device as it will on a traditional laptop or desktop computer.
- Parents or teachers will register on behalf of their children, giving them control over what content the child can access. They can also monitor the progress their child is making on their various lessons.

1.4. Justification

There is currently one other project, also created by Dr Prior, that aims to meet a similar brief. This is the 'Cyber Squad' project that consists of three different videos and a few different downloadable resources (CyberSquad, 2020).

Compared to "Cyber Squad", our project will supply:

- Significantly more education content.
- A more interactive way to learn through quizzes.
- Support for parents and teachers to monitor their children's progress.
- An account system, allowing a user to pick up where they left off.

There are also similar projects online that aim to educate children around cyber security best practices in an easy-to-understand way. Almost all of these sites that we examined were outdated in either style or content, but often both. These websites have failed to stay up to date with best practices for both security and design and therefore are practically useless for children to learn from. Our solution will have a clean, modern and easy to use design that works on multiple device types and provides age categorized education to children.
By not implementing this project, the educational content that has been prepared will be left in its academic form and will not be easily accessible by parents, teachers and children.

1.5. Team Experience

While our team is new, our members have vast experience in the creation and deployment of modern web applications. They all have formal education in best practices for creating responsive, secure and easy to use websites for the next generation of the internet. They also all have their own specialties, from knowledge around modern JavaScript libraries to the ability to perform in-depth security tests. Jack Lamb, the lead designer and front-end programmer, has vast experience in designing, creating and delivering bespoke websites for clients. You can contact the team via the project manager, Selina Fahy at 1801153@abertay.ac.uk.

2. BUSINESS CASE ANALYSIS TEAM AND STAKEHOLDERS

2.1. Business Case Analysis Team

The following individuals comprise the business case analysis team:

Role	Description	Name/Title
Analyze and create sections 1 through 3	Provides Section 1 through 3 of the Business Case	Christopher Di-Nozzi, Business Case analysis team
Analyze and create sections 4 through 8	Manages the business case and project team	Eilidh Devine, Business Case analysis team

2.2. Project Team

The following individuals comprise the project team:

Role	Description	Name/Title
Frontend Implementation and General Design	Implement elements of the website and provide the overall design.	Jack Lamb, Project team

Role	Description	Name/Title
Frontend Implementation and Responsive Design	Implement elements of the website and ensure a responsive design.	Christopher Di-Nozzi, Project Team
Frontend Implementation and Accessibility	Implement elements of the website and ensure the website is accessible for those with disabilities.	Marc Kydd, Project Team
Backend SQL	Responsible for designing and implementing the backend SQL database.	Eilidh Devine, Project Team
Backend PHP	Responsible for designing and implementing the backend PHP.	Selina Fahy, Project Team
Backend General and Security	Responsible for assisting with SQL and PHP design and implementation and ensuring both are being done securely.	James Wood, Project Team

2.3. Client and External/Internal Stakeholders

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

Role	Description	Name/Title
Client (Abertay University)	Sponsor for project	Dr Suzanne Prior, Abertay University Professor

3. Problem Definition

3.1. Problem Statement

Dr Prior has been focusing her cyber security research on how best to educate the next generation of computer users in their early years of development, particularly ages five to nine. As time goes on and technology continues to rapidly grow in popularity and use case, the importance of high-quality cyber security education cannot be overstated. The current cyber security education provided in Scotland by the curriculum for excellence (2020) is lacking in up-to-date content. It does not properly equip children with the proper tools to stay safe online. There currently exists no solution in Scotland to resolve this issue and provide children with up-to-date and engaging cyber security education.

Additionally, cyber security education is a niche topic that often requires an expert to teach properly. This is something that cannot be expected of teachers to know without being taught specifically and is currently lacking in most teaching courses.

3.2. Organizational Impact

The 'Cyber Safe Kids' project will impact our client, Dr Prior, in a few different ways. The following outlines a high-level description of how the organization, processes, roles and responsibilities, and hardware and software will be affected as a result of the project implementation:

- Processes: Ater implementing our solution, processes will be created as to how new content can be added to the site, how feedback can be gathered and how the infrastructure of the site can be updated and maintained as time goes on. Many of these processes will revolve around the administration section of the web application.

- Roles and Responsibilities: When the solution is implemented, it will require continued maintenance to keep up with security standards and accessibility best practices. However, the solution will be developed in a way to keep these tasks to a minimum, ideally meaning that manual changes or updates will only be needed in the event of a critical security patch issued by the vendor of any of the technology used in the website structure.

- Hardware and Software: While no licenses should be required for either software or hardware, these items will have to be maintained for security reasons and best practice.

3.3. Technology Integration and/or Migration

The implementation of this solution should not require the migration of any legacy system, as all the systems will be built from the ground up by our team. This means that brand new technologies will have to be integrated and configured for the implementation of this solution. The following is a very high-level overview of the technologies that need to be implemented and the order in which this will be done:

1. Adequate server hardware will have to be sourced; this is currently planned to be provided by the University of Abertay's own server system named Mayar.

2. Appropriate server software will have to be installed and configured into said hardware.

3. The solution will then be uploaded, stored and run by this software on this hardware and tested for a production release.

4. Once the solution has been tested to a level where both the team and the client are happy with it, it will be released and maintained on the same hardware it was tested on.

4. Project Overview

The 'Cyber Safe Kids' project overview will give insight into how the project will address Dr Prior's project brief. The overview consists of a project description, goals and objectives for the 'Cyber Safe Kids' project, project performance criteria, project assumptions, constraints, and major milestones. As the project is approved and moves on to further stages, each of these areas will be expanded on in more detail in the project plan.

4.1. Project Description

The website will consist of the following main components:

- Age-based educational pages about password security and other cyber security topics
- Quizzes based on the content from the educational pages
- Account functionality with teacher/parent monitoring
- Admin panel where content can be added/edited/removed

Once the main components have been implemented, the following additional components will be added:

- A mascot for the website (either two (one male, one female) or gender neutral)
- Miscellaneous pages e.g., legal pages

The 'Cyber Safe Kids' project will evaluate various modern cyber security websites and examine different website designs and features in order to create a cyber security website that will fit the needs of the client. This will be completed by choosing a design that is accessible, attractive and interesting for the target demographic, primary school aged children. Once the design has been chosen, the project team will implement the website using a systematic approach and the project will only be completed once the website is functional and fulfils the client's requirements.

The purpose of the 'Cyber Safe Kids' Project is to educate young children about the ever-growing threats in the cyber security world and help them to protect themselves against them. The central focus of the website is to educate children on the importance of having good password security e.g., how to create a strong password and not to re-use passwords over multiple accounts.

4.2. Business Goals and Objectives

The 'Cyber Safe Kids' Project directly supports several of the goals and objectives established by Abertay University. The following table lists the client's goals and objectives that the 'Cyber Safe Kids' Project supports and how it supports them:

Business Goal/Objectives	Description
Educating young children about password security	The main goal of the project is to inform primary school aged children about the importance of having strong password security and the issues that could occur if they have weak password security.
Making a strong, secure website	The website needs to securely hold the user's information using the most up to date methods.
Ensuring the website is accessible	The website's demographic is for young children. The website needs to be designed using a simple to follow way so that the children will be able to easily use and navigate through the website.

4.3. Project Performance

The following table lists the key resources, processes, or services and details their expected outcomes in measuring the performance of the 'Cyber Safe Kids' Project. These measures will be evaluated and expanded upon in more detail in the project plan.

Key Resource/Process/Service	Performance Measure
Retainment of knowledge	For each cyber security topic, there will be a quiz to check if the user has retained what they have learned through using the website. From the results of the quizzes, the team will be able to measure the efficiency of the website.
User Feedback	There will be a feedback section on the website where users of the site, be it the children or the parents/teachers, can leave their feedback on the site. This will help the team determine if anything needs adjusted or removed from the site.

4.4. Project Assumptions

The following assumptions [1] apply to the 'Cyber Safe Kids' Project. The known project assumptions may change as the project plan progresses, if so, they will be added to this list.

- Once the project proposal is approved, the scope of the project will not change.
- Access to the hardware/software necessary for the project will be given.
- The team will follow the Waterfall methodology throughout the development of the project.

- The project will follow the relevant regulations for the project e.g., the Data Protection Act.
- The costs for the project will stay the same as the initially projected costs
- When needed, the client will provide the team the support they need to be able to complete the project.
- After completion of the development of the project, end users will be available to test the website within a certain timeframe.

4.5. Project Constraints

The following constraints [2] apply to the 'Cyber Safe Kids' Project. The known constraints may change as the project plan progresses, if so, they will be added to this list.

- There is a set amount of time that the team must complete the project within.
- There will be a limited budget that the team will work with.
- The team will need to agree on a set methodology and not differ from it.
- There will be legalities that the team will need to comply with – Data Protection Act, etc.
- The team cannot meet in person with each other or the client. All interactions between the team and the client will be administered online.
- Creation of the website will be done internally by the team rather than by external developers or vendors, this means that there will be limited support from the providers of the hardware/software that the team will be using.

4.6. Major Project Milestones

The following are the major project milestones identified at this time. As the project planning progresses and the time schedule is developed, the project milestones and their target completion dates will be altered and finalized in order to create the baseline schedule for the project.

Milestones/Deliverables	Target Date
Project Plan Review and Completion	15/12/2020
Project Kickoff	25/01/2021
Website Design and Database Design	01/02/2021
Client Discussion	08/02/2021
Database Implementation	15/02/2021
Backend Functionality	22/03/2021

Milestones/Deliverables	Target Date
Web Page Creation	05/04/2021
Closeout/Project Completion	19/04/2021

5. Strategic Alignment

The 'Cyber Safe Kids' Project is in direct support of several of Abertay University's Strategic Plans. By supporting the following parts of their strategic plans, this project will increase our impact on cyber security education and increase the teams' skills with digital technology.

Plan	Goal	Relationship to Project
Abertay RKE Strategy 2020-25 for Security, Equality and Social Justice [3]	Upholding security and resilience in a time of increasing threats and socio-technical disruption	This project will educate young children on the importance of becoming resilient and protected from the ever-growing number of online dangers.
2020 - 2025 Abertay University Strategic Plan [4]	Innovative use of digital technology	Currently there is no clear leader within cyber security websites for educating children. This project aims to create a website that fills that gap in the market.

6. Cost Benefit Analysis

The following table lays out the cost benefit analysis for the 'Cyber Safe Kids' Project which labels the actions the team will take for their financing of the project. The table describes the whether the action will be a cost or a saving for the client, a description of the action and the cost of the action throughout the three-month duration of the project. The bottom of the table shows the net costs ([5] & [6]) over the project duration.

Action	Action Type	Description	Cost (- indicates anticipated savings)
Frontend developers (x3)	Cost	Total cost for 10-week contract (150 hours) for all three frontend developers.	£9,000.00
Backend developers (x3)	Cost	Total cost for a 10-week contract (150 hours) for all three backend developers.	£12,600.00
Designer (x1)	Cost	Total cost for a 2-week contract (30 hours) for a website designer.	£450.00
Website Testers (x2)	Cost	Total cost for a 2-week contract (30 hours) for a website quality tester and a website security tester.	£900.00
Project Discount	Savings	The client was given a discount which removed 20% of the cost from each contract.	-£4,590.00

Net Costs			**£18,360.00**

While the project will not result in any financial benefit for the client, there are non-financial benefits such as having a functional and secure website which is customized to fit their needs, being able to educate children and spreading awareness of the importance of password security and other important cyber security topics.

7. Alternatives Analysis

While the 'Cyber Kids' team has chosen to implement the solution for the project, the following alternatives were considered that would address the business problem. The team did not choose to select one of these alternatives for the reasons shown below.

No Project (Status Quo)	**Reasons for Not Selecting Alternative**
Leave the client without a website, having to use current cyber security websites instead.	• Team has the knowledge and skills to create the website • Does not allow the client to have a custom website with their requirements
Alternative Option	**Reasons for Not Selecting Alternative**
Outsource the implementation of the website to an external source.	• Significantly increases cost of the project • Team already has the expertise needed for the project
Alternative Option	**Reasons for Not Selecting Alternative**
The team creates a mobile application (IOS/Android) rather than a web application.	• Increases the cost of the project • Team has expertise in creating websites rather than in creating applications • The mobile application would be less accessible than a website • Mobile applications would require more maintenance than a website

8. Approvals

The following signatures indicate that those signing it understand the purpose of this business case. Through signing this document, you approve of the proposed 'Cyber Safe Kids' project that is outlined in this business case. Furthermore, signing this document allows for the team to move forward in development of a formal project in alignment with the plans provided in this document.

Approver Name	**Title**	**Signature**	**Date**

Prior, S.	Client (Abertay University)	Suzanne Prior	14/12/20

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PROJECT MANAGEMENT PLAN: CYBER KIDS

CYBER SAFE KIDS

TEAM CYBER KIDS (EH6)
JACK LAMB, JAMES WOOD, MARC KYDD AND SELINA FAHY

ABERTAY UNIVERSITY
DUNDEE, DD1 1HG

DATE: 15/12/2020

9. Introduction

Cyber Kids has recently approved the Cyber Safe Kids project to teach younger children how to stay safe online. This project will result in the development of a website that will make use of tools and unique learning materials to achieve our objective. We believe the current technologies and services used in Scotland are not up to standard. Cyber Kids' expertise on cybersecurity will help create a unique service targeted towards young children unlike any service on the curriculum.

Cyber Kids plan to build a website that teaches young children key information on cybersecurity, specifically password security, whilst giving parents/teachers the ability to see what their children have learned. A parent/teacher portal will be available illustrating the completed sections, the current section and quiz scores their children has set. Coupling this with pastel colours and easy-to-read English will increase engagement from our users.

The main objective of the "Cyber Safe Kids" project is for our users to retain their knowledge. This will be achieved using quizzes at the end of each subject area. We will couple this with a reward system. Once a user has passed a quiz, they will be given points on their user portal. We believe this will increase retention because their hard work has achieved a reward that they can showcase to other users.

The website will have an admin panel to add, remove or modify parts of the website with ease. This will ensure novice administrative users will still be able to change aspects of the website after the project has been handed over to our project sponsor.

10. Project Management Approach

The Project Manager for Cyber Kids, Selina Fahy, has the responsibility for executing this project with strict accordance to this Project Plan. Cyber Kids has been split into two key groups: backend development and frontend development. Our frontend team are Chris Di-Nozzi, Jack Lamb and Marc Kydd. Our backend team are Eilidh Devine, James Wood and Selina Fahy. Cyber Kids testing team will be all team members including the project manager, and our technical writing team will be all team members including the project manager. Our quality assurance team will be James Wood and Jack Lamb. Selina Fahy will work with all teams ensuring execution of our Project Plan. Funding decisions will be made reviewed by our project manager and then passed onto Dr. Suzanne Prior. Any delegation of approval will be taken to our project sponsor in coordination with our project manager.

The team will adopt a Waterfall approach. Our team has a planned extensively for the development stage and each member understands their role in the creation of the website. The team has a clear structure of our backend, frontend, and design teams, and all are clear on the objective of the project. Considering our project team is small and the complexity of the website, we believe waterfall is better than apposing life cycle approaches. Keeping the development of "Cyber Safe Kids" in stages allows for our project manager to manage our small team better.

The Waterfall approach also benefits Cyber Kids team since we can relay what stage of the development we are on to our project sponsor. This will help our team have a better relationship with Dr. Prior. It also benefits the team members as it ensures no team members are unsure of what their next step is in the development.

Cyber Kids will adopt a bottom-up estimation method. We will use this method to give us a more accurate version of events as it estimates from the lowest level while involving each team member in the budget-making process. We believe involving our team is the budget-making process will motivate them to reach our project goals and give them a sense of pride in helping towards our budget estimates.

11. Project Scope and Milestone List

The scope of the "Cyber Safe Kids" project will be as follows: an admin panel, login system, account page, content pages, filtering of content based on age bracket or progress, avatar functionality and quiz functionality. The admin panel will allow admins to add, modify or remove content on the website. The login system will allow adults to create accounts for their youngsters. The account page will show users their progress and information related to their account. The content pages will have easy-to-read information about cybersecurity and password security. The quiz functionality will be a test for users to move onto new content. This scope also includes the analysis, design, build and final handover to our project sponsor.

The website will comply with all legal and ISO standards: ISO/IEC/IEEE 12207:2017 (Systems and software engineering – Software life cycle process), ISO/IEC/IEEE 90003:2018 (Software engineering – Guidelines for the application of ISO 9001:2015 to computer software), ISO/IEC/IEEE 23026:2015 (Systems and software engineering – Engineering and management of websites for systems, software, and services information) and ISO/IEC 40500:2012 (Information technology – W3C Web Content Accessibility Guidelines (WCAG) 2.0). The website will follow the General Data Protection Act that was set by the European Data Protection Regulation as applicable of May 25th, 2018. The scope of this project will also include a document containing how the website can be interacted with.

The scope of the “Cyber Safe Kids” project does not include further changes to the website after the project has successfully been handed over to the project sponsor by Cyber Kids. However, the admin panel can be used to modify the website after the handover of the project. It does not include the collection of sensitive information from users on the site. The project will only collect data from users about their name and email.

The “Cyber Safe Kids” project will only be worked on internally and none of the project will be outsourced. The “Cyber Safe Kids” website will be work on all common web browsers and will not require any further software.

The major milestones are listed below. We have set out dates of major milestones that end a key area in development. These are also related to the end of a project stage in Waterfall methodology. This stage is when the team will move onto the next stage in development. We have a full list of our milestones located on our Gantt chart (Appendix B) where we have details on our week-by-week structure. If there are any scheduling delays the project manager will handle the situation by discussing with team members and the project sponsor. If the milestone dates change this will communicated to the team members via the project manager.

Milestone	Description	Date
Complete Project Plan and Initial Handover	Completion of the project plan and handed over to the client.	15/12/2020
Complete Cyber Safe Kids Design	This is the design for the website and the functionality it will have. This also includes the handover of the design document to the client. It will detail information on the design of the website.	1/02/2021
Complete Cyber Safe Kids Database Implementation	The database will be implemented in preparation for finalisation of website code	15/02/2021
Complete Cyber Safe Kids Frontend and Backend Functionality/Code	The code for the website will be complete. This includes all primary and secondary pages, and functionality on the website.	05/04/2021
Cyber Safe Kids Testing and Debugging	The website will undergo a testing stage to ensure there are no bugs on the website.	12/04/2021
Cyber Kids Final Client Discussion	A meeting will be held with all team members, including the project manager, with the client. Cyber Kids will ask questions surrounding the websites functionality to ensure the client is satisfied. Any further changes the client wishes to see will be handled over the next coming weeks.	19/04/2021
Cyber Kids Project Completion	Closeout of project. This also includes the handover of the user manual. This will include how a user will navigate the website and the intricacies and functionality of the website.	04 /05/2021

The following products will be handed over to the client:

Product	Description	Date

Documentation	The documentation will outline the implemented changes.	xx/xx/xx
User manual	Information on usage of the website.	xx/xx/xx
Design Document	Information on the design of the website	Xx/xx/xx

12. Work Breakdown Structure (WBS)

The WBS for the Cyber Kids Project has been created to ensure workers do not exceed 15-hour work weeks. This decision was created through unanimous decision of all workers and our Project Manager. We came to this decision from previous knowledge of past projects. You can find our Work Breakdown Structure in Appendix A.

The WBS was crafted over meetings with all team members and our manager. This schedule was drawn up on a Gantt Chart, checked by Dr. Suzanne Prior and approved. If a change must be made, we will strictly follow our Change Management Plan. This will be led by our Project Manager who will examine the change and brief the workers on its impact. All team members and project manager will hold a review, craft a change, and determine whether the impact will have a major or minor effect on the project. If it is a major effect, we will consult our project client for review and approval of the proposed change.

Cost and Schedule Performance Index will be reported on a biweekly basis by the project manager to the client. Cyber Kids will follow the WBS and the Gantt chart strictly and the project manager will notify the client if Cyber Kids are ahead of schedule or behind schedule. However, in the instance Cyber Kids fall behind a CPI of 0.8 or a SPI of 0.8 the project manager will consult the client about suitable changes to the criteria of the web application.

13. Change Management Plan

A change management plan is in motion at any company it is designed to prevent any errors while helping the company look at the different positives and negatives. While making the changes, a suitable timeframe with minimal margin for serious error and delay should be considered. This is followed by a few key steps which are as follows.

1. Demonstrate the reasons for change.

First on the change management plan is a reason for the change. This will be displayed with clear reasoning as well as conveying how it will be better for the company. This should be clearly defined with points on how the change was considered in the first place and why it was needed at the time of the proposal.

2. Determine the scope of the change.

The task of looking at the scope allows any company to convey how the change will have affected the project in areas like job roles, standard human error, policies and possibly the business structure in general with things like workflow and other deadlines for work.

3. Identify the team for the job.

The team being used for the job must be shown to the person looking for the change and the team must display why they have chosen this team for the task and it must be approved by the project manager. This allows the company to prevent changes and make sure that any higher ups are happy with a credible team to handle the job of the change.

4. Display milestones and deadlines.

The team and company doing the change must clarify deadlines and milestones for the changes before the work is started to allow the company to know when the work will be finished to allow them to dedicate the team to other tasks.

5. Implement change

After the change has been through the company change management and has been approved it will allow the team to configure and add the change to the business. All processes of the change would then be logged by the project manager for the change.

14. Communications Management Plan

The communication management plan sets the communication protocols for the project as a whole and will guide the team towards how any communication underneath the net of company work should be executed in a successful and controlled manner. These are commonly used in the workplace to allow superiors to understand what, when and why something is happening. With this section there will be insight into the structure of how communication meetings are happening and the structure of events going into the meetings.

The project manager oversees the meeting and makes sure that the give given is utilized for efficient and productive results on behalf for the company. This will be done by following a set line of topics that get covered in order while taking questions and completing work around the topic in this time.

Communication Type	*Description*	*Frequency*	*Format*	*Participants/ Distribution*	*Deliverable/ Product*	*Owner*

Study channel (Everyday Access)	Study channel functioning through discord where logs Are kept and allows colleagues to discuss work in a nonprofessional environment	Daily	Application : Discord	Project team and project manager.	Development of project and development of teamwork through social channel.	Project Manager
Weekly Project Team Meeting (Thursday)	Meeting to discuss with client or continue to work on project.	Weekly	Microsoft Teams (Affected by Covid)	Project Team and project Manager	Updated and progressed work	Project Manager
Weekly Log	A team log of activity of the team and progress to give to superiors to have an idea of project development.	Weekly	Document (Word)	Project manager, Team, and Client	Status and Metric Presentation	Project Manager
Mid-week meeting (Monday)	Mid-week meeting continuing discussions and topics	Weekly	Microsoft teams (Affected by Covid)	Project manager and team.	Progressed work of project and proof reading and team evaluation for quality check	Project Manager

Name	Title	E mail
Dr Suzanne Prior	Client	s.prior@abertay.ac.uk
Selina Fahy	Project Manager	1801153@uad.ac.uk
James Wood	Team Member	1902545@uad.ac.uk
Eilidh Devine	Team Member	1801540@uad.ac.uk
Marc Kydd	Team Member	1800511@uad.ac.uk
Christopher Di-Nozzi	Team Member	1800317@uad.ac.uk
Jack Lamb	Team Member	1801724@uad.ac.uk

As for the current Pandemic Crisis most of the group work has been done with colleagues working from home. Work has been stored in a GitHub Organization Repository with discussion of the work being kept on Microsoft Teams and Discord.

15. Cost Management Plan

The project manager is in charge and oversees for the management and reporting the projects costs throughout the process. The project manager will then report the monthly cost report in a meeting with stakeholders/clients to display where the budget is going through out of the project. This meeting includes changes to the costs, maintenance costs and decisions/changes that will financially affect the project.

Project Maintenance:
The project will be maintained to the point where all cost changes are documented and tallied to control overall spending as well as making sure budget is line with the formally agreed budget. The decisions of budgets made will be portrayed over the CPI and SPI graphs to help view any possible any deviations in future spending. Any major issues will require a change request. (Specified on Page 27).

Topic Monitoring:
On a regular basis the project manager will oversee looking at the process of tasks and overseeing whether the task in question is on schedule and will be finished in time with the Gantt chart finish date. If under any circumstance the project tasks fall behind due dates the project, there will be a negative deviance towards the production of work and the project manager in some cases may need to propose to the stakeholders/clients a change management plan to allow the development of the project to remain on time.

Correcting values:
As mentioned, if there are budgeting or time constraints the project manager will need to convey the reasoning for these constraints as well as reporting the spending figures every month. If there is serious detriment to the CPI and the SPI (Yellow or red status of either 10%-20% variance) respectively the changes will then be reported weekly to get more frequently dated results to monitor and display the results of the changes being made to see their immediate results towards deadlines and budgets.

16. Procurement Management Plan

The procurement management plan is an outline of all purchase requirements needed to carry out and fulfill content needed for the project. The Project Manager oversees the procurement process as any means of procurement will need to be approved by the client.

The process plan of procurement is as follows:

1. Gather what needs to be procured and why.

The contents of what needs to be procured will be gathered and discussed with the team working on the project and will be managed by the course manager by figuring out why the purchase must be made and if it justified to bring up to the client. Things to be considered would be the cost, duration to gather the content you are procuring as well as why it is necessary to the completion of the project.

2. Risks

When looking at procuring more content its standard to evaluate all the risks and possible problems that can occur with the change. The project manager would have covered this in the project team and will need to evaluate all possible problems and explain the risks to the client/stakeholders like if there will be time constraints with the project delivery.

3. Get approval from the client/stakeholders

When the team have decided what is needed to be Procured for the project, the project manager must attend a meeting with the client/stakeholders and explain why the contents will be needed for the project. This should be conveyed with appropriate reasoning that was discussed with the project team and all relevant changes and costs are covered with the client/stakeholder. If the client/stakeholder agree to approve the procurement costs and changes the process can continue.

4. Bids

After the procurement proposal is approved the contents needed will be sent as a Request for proposal (RFP) to the supplier who will in turn respond with costs, delivery time to allow the team to know when the contents will be delivered and ready for use. If the terms are okay with the covered terms with the client/stakeholders, the order can go ahead and can be implemented into your project.

17. Project Scope Management Plan

To ensure that gold-plating does not occur during the course of development and that the Stakeholder receives deliverables that match those initially agreed upon, it is vital that the scope of the project be clearly defined (Mathur, A., n.d.). This responsibility of outlining and maintaining the scope of the "Cyber Safe Kids" project - before and during development - will be handled by Team Member Marc. Given that the sole deliverable of the project is the "Cyber Safe Kids" Website, a detailed breakdown (via Work Breakdown Structure) of the individual components that said Website comprises of is included in Appendix A and discussed further in the accompanying Sections 10 and 11. By extensively detailing each component prior to development starting, this can drastically reduce the risk of delays given that discussion will have already been held regarding the direction of the project. This pre-planned approach reduces ambiguity on what to do next and ensures that the time allocated for development is actively spent working according to the plan.

In order to ensure that the completion of the project is possible within the allotted timescale, frequent and thorough reviewal of the project components was carried out. This continual process of refinement lead to a project scope that will not only exceed the expectations of stakeholders and users, but that is still manageable within the allotted timeframe. Ultimately, the confirmed scope will result in a deliverable that offers a simple, engaging, and effective user experience that is free of extraneous features, thereby allowing for seamless scaling and responsiveness to the potential needs of Stakeholder in the future.

As the project progresses, additional refinement to the project scope may be suggested and discussed by other team members with final internal approval by Marc. In the event a change to the project scope is approved internally, the proposed change will then be submitted to the project stakeholder for final discussion/confirmation before being implemented. In doing so this helps to ensure that unnecessary features are not added which may hinder or slow the rate of progress. A complete detailing of the approach for which changes are proposed, discussed, and implemented is outlined further in Section 13.

Acceptance of the project deliverable will be the responsibility of Project Manager Selina with acceptance being based on a collaborative reviewal process. These final checks will be carried out by reviewing the individual components that comprise the finished deliverable and assessing them against the quality metrics outlined in Section 19 and Appendix D. With all metrics met to an established acceptable level, the project will be considered completed and submitted to the project Stakeholder.

18. Schedule Management Plan

When working to a set deadline, effective time management with regards to workforce and resource allocation is vital (Strange, J., 2020). As such, to ensure timely delivery, project scheduling will be created and handled by Team Member Marc via a Gantt chart and Precedence network. In order to allow the progress and state of the project to be monitored at any given time, each component needed to produce the deliverable will be divided into respective frontend and backend tasks. In doing so, this will allow members of each division to easily check what tasks are on-going and upcoming. Stakeholders will also have a means of monitoring the progress of the project as it moves closer to completion.

The ability to easily monitor project progress will also be extended upon, and supported, by integrating a structured communication strategy that allows topic or component centered meetings to be held on a consistent basis. In doing so this allows the team to discuss issues of varying scope without creating confusion or unnecessary tangents. A comprehensive outline of this communication approach is outlined in Section 14.

Where possible, tasks will be overlapped to ensure that each division is always able to be doing meaningful work with regards to moving the project forward. This will be furthered by allowing members to flow between each division as necessary depending on the needs of the given components currently being worked on; A flexibility that allows that any given component of the project is always able to receive the workforce it requires to be completed in a timely manner.

This focus on working on tasks concurrently will also help to ensure that progress is made quickly by minimizing down-time between one task being completed and another starting. Ultimately, adopting this approach will allow for a development schedule that is not only fast-paced but also responsive to any changing needs of the project Stakeholder and able to cope with unlikely but ever-possible delays during development.

In the unlikely event of a delay, time has been allowed for in the Precedence Network to give the component in question time to recover and fall back in line with the timeline established for other components. This allowance was created by shortening the time allowed for on non-critical components in the event of a late-start while ensuring that the allocated critical component time was not affected. In doing so this ensures that the Stakeholder still receives a deliverable that is of expected quality, contains the agreed features, and has not been submitted late.

A Gantt chart and Precedence Network with Critical Path detailing this approach has been provided in Appendix B.

As stated, the progress of the project will primarily be tracked using a Gantt chart and Precedence Network; As a secondary means of measuring project completion however, key development milestones will be determined in order to ensure that critical components are being completed in a timely manner.

An excerpt of the key milestones in the project timeline which will be used to measure performance and progress include:

- Confirmation of the site design with the project Stakeholder by Week 2.
- Functional account creation with database persistence by Week 4.
- Work beginning on “primary” pages such as those allowing users to select topics and account related pages by Week 5.
- Final testing and review beginning in Week 9 and concluding by Week 12.

A halfway-point meeting will also be held with the project Stakeholder during Week 6 to demo the current state of the project and receive feedback or changes the Stakeholder may like to suggest. It is also at this point that further discussion may be held regarding the progress of the project and on any changes to scope or time-allocation that may be necessary in the unlikely event of a delay. Should the project be ahead of schedule however, the halfway point could also be utilised to extend the final review process and further enhance the quality of already completed components.

19. Quality Management Plan

Continuous collaborative discussion, both internally and with stakeholders, will be central to ensuring a quality final product. Overseeing project quality will be Team Member Marc who is responsible for compiling a Quality Management Plan along with assuring said plan is adhered to by members. A consistent level of quality will be ensured by having the Team Members Marc and Jack work alongside each other to track ongoing developments and standards; In turn Project Manager Selina will also be responsible for communicating such information to the Project Sponsors. To offer more concrete data, Team Members Marc and Jack will advise on recommended tools and methodologies for tracking quality and standards in order to set a quality baseline.

Where applicable, a session between all members will be held to determine whether a given item adheres to the project quality standards before being finalized as complete. With regards to such a process, it will be Selina who shall ensure that all project components are finalized before project submission.

In order to offer a timeline of project quality, an extension will be made to the Weekly Log to include a Quality Control and Assurance Log (Workfront.com. 2020.) outlining what work was

completed the preceding week and its' compliance with quality metrics outlined below and discussed in detail in Appendix D.

Although the sole deliverable of the project is the Cyber Safe Kids Website, detailing of the components and areas of note that the website consists of are listed below, in doing so this offers a means by which quality can still be measured:

Quality Metric	Quality Threshold	Responsibility Of
Accessibility	Common accessibility issues are addressed (Colour blindness, decreased vision, alternative input systems etc.).	Marc
Engagement	Ensuring that users actively enjoy using the service.	Jack
Suitability	Content is displayed in a manner relevant to the target age bracket.	Selina
Reliability	Ensuring consistent uptime for users, pages act in an expected and reliable manner.	Eilidh
Security	Databases, user input etc. Is stored and handled correctly.	James
Ease of use	Site content is responsive to the user's device of choice.	Christopher

Although the metrics stated above will be used on a weekly basis, they generally only ensure a baseline level of quality that a component must meet in order to be considered acceptable. As such, in order to ensure a level of quality that is not only exceptional but verifiable, routine checks will be performed upon completion of a component to review its compliance with relevant standards/laws etc. To ensure that no component is overlooked, group members have been assigned to various staple standards and regulations to ensure there is a dedicated overseer responsible for assessing the compliance of a component against a given standard/regulation.

Legal Aspect	Responsibility Of
GDPR	James
ISO 12207	Jack/James
ISO 90003	Jack
ISO 9001	Marc

ISO 23026	Jack /Eilidh
ISO 40500	Marc / Christopher

20. Risk Management Plan

The means for managing risks for the 'Cyber Safe Kids' Project includes an efficient process by which the project team identifies, assesses, and ranks various risks. It will be a top priority that the project team determines risks ahead of implementations in order to ensure our team is on the right track for project completion and plan ahead in order to avoid future issues. The most likely and highest impact risks were added to the project schedule to ensure that all team members take the necessary steps to make sure that these risks will not affect the project. Team members will provide status updates on their assigned risks in the bi-weekly project team meetings.

Alongside the completion of the project, the project manager will evaluate each risk as well as the management process. Based on this evaluation, the project manager will discuss improvements that can be made to the risk management process for future projects. These improvements will be a basis of assessments for future projects.

The main 3 risks for this project are; possible complications with software or the language while building the website, miscommunication between the team members and team to client, and potential time management issues, given the request for the website to be built from scratch, it is very possible for the estimated time to be slightly under what it might actually take to build the full website.
Further details can be obtained from the risk assessment in Appendix C.

21. Staffing, Resource and costs

21.1. Staffing

The 'Cyber Safe Kids' Project will consist of a flat structure (7 Types of Organizational Structures, 2020), all team members will work on their respective areas designated and will make a report to the project manager, who will relay the appropriate information to the client. All work will be performed internally. Staffing requirements for the 'Cyber Safe Kids' Project include the following:

Project Manager (1 position) – responsible for managing the majority of the 'Cyber Safe Kids' Project. The Project Manager is responsible for working with the team members to plan and create the project, as well as manage all variances, tracking and reporting, communication, staffing, and internal coordination with the client.

Frontend Website Programmers (3 positions) – responsible for oversight of the frontend coding and programming tasks for the 'Cyber Safe Kids' Project as well as ensuring functionality is compliant with quality standards. The frontend website programmers will be managed by the Project Manager.

Backend Website Programmers (3 positions) – responsible for the backend (databases, etc.) coding and programming for the 'Cyber Safe Kids' Project. All coding and programming tasks will be reviewed by the project manager before implementation. The backend website programmers will be managed by the Project Manager.

Quality Specialist (2 position) – responsible for assisting the Project Manager in creating quality control and assurance standards. The Quality Specialists is also responsible for ensuring all corresponding testing is complete. The Quality Specialists will be managed by the Project Manager.

Testing Specialist (1 positions) – responsible for assurance logs throughout the project and ensuring all corresponding testing is complete. Testing for functionality and security. The testing specialist will be managed by the Project Manager.

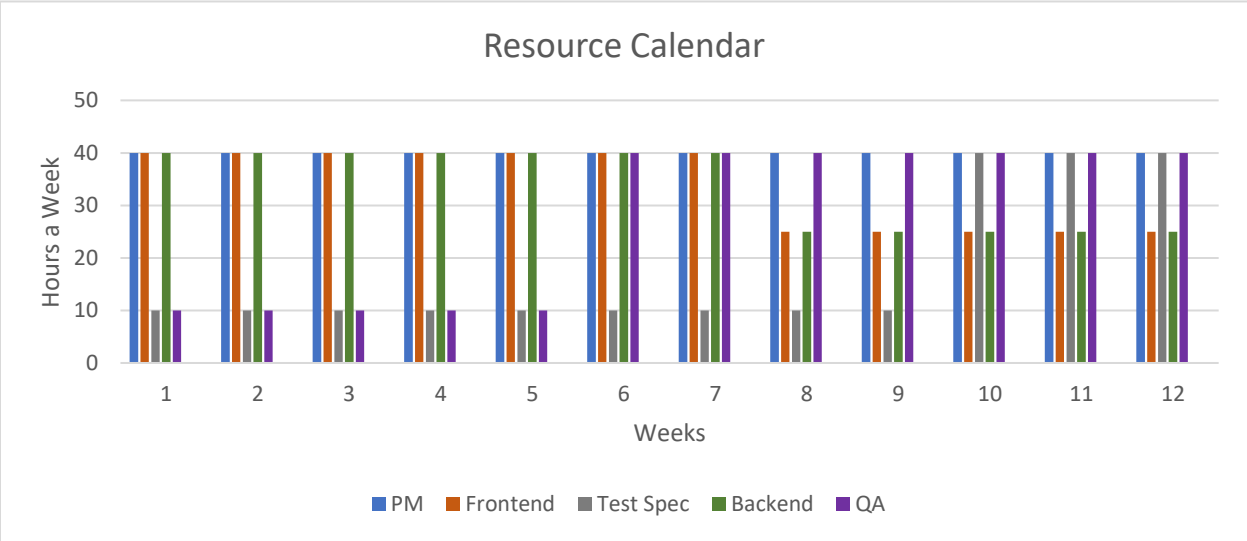
Designer (1 position) – responsible for creating the design in order to meet the quality standards as well as to have it be compatible with the target market (primary school children). The designer will have to report to the project manager.

The Project Manager will negotiate with all necessary parties, including the client, in order to identify and assign resources for the 'Cyber Safe Kids' Project.

All team members are responsible for working with the Project Manager to manage risk, manage schedule, identify requirements, and create reports.

21.2. RESOURCES

The 'Cyber Safe Kids' Project will require all project team members for the entire duration of the project although levels of effort will vary as the project progresses. The Project is scheduled to last 3 months with standard 40 hour work weeks. If a project team member is not required for a full 40 hour work week at any point during the project, their efforts outside of the 'Cyber Safe Kids' Project will be at the discretion of the Project Manager.



In the above Resource Calendar, it can be seen the estimated duration of the hours that each project area is predicted to take. As stated before, the staple amount of hours being 40 hours a week.

Equipment required would be;

Equipment	Who will use it	How long it will be used for
Server access (MariaDB)	Frontend and Backend	Whole project duration
Computers	Whole team	Whole project duration
Internet access	Whole team	Whole project duration
Webserver	Frontend and Backend	Whole project duration
Programming software	Whole team	Whole project duration

Labour required would be;

Labour	Estimated time of work
Project Manager	Whole project duration
Designer	2 weeks
Quality tester	2 weeks
Security tester	2 weeks
Developers	Whole project duration

21.3. Cost:

The cost baseline for the Cyber Safe Kids project includes all budgeted costs for the successful completion of the project.

Project Phase	Budgeted Total	Comments
Overall	£18,360.00	Estimated overall costs for the 'Cyber Safe Kids' website.
Design	£450.00	Total estimated costs for the 'Cyber Safe Kids' conceptual design.
Coding	£21,600.00	Includes the estimated work hours for the coding aspect of the 'Cyber Safe Kids' website.
– Backend	£12,600.00	Breakdown of the major sectors of the coding.
– Front end	£9,000.00	Breakdown of the major sectors of the coding.
Testing	£900.00	Includes the estimated work hours for the various testing of the 'Cyber Safe Kids' website.

22. Quality Baseline

The 'Cyber Safe Kids' Project must meet the quality standards established in the quality baseline. The below table will become the foundation which provides the acceptable quality levels of the 'Cyber Safe Kids' Project. The website must meet or exceed the quality baseline values in order to achieve success (14 Important Website Performance Metrics You Should Be Analyzing - KeyCDN, 2020), (Essentials, 2020).

Item	Acceptable Level	Comments
Standards	Follow best HTML standards.	Following proper documentations to ensure the best HTML practices.
Compatibility	No errors associated with running website with compatible browsers.	Running tests using different browser types.

Integrity Check	All internal links are working or redirected to the new URL.	Testing all links and updating them as they change.
Connection time/Time to first byte	The website loads in a timely manner with little to no delays.	Running tests and optimizing code.

A detailed quality metric is provided in Appendix D.

SPONSOR ACCEPTANCE

Approved by the Project Sponsor

Suzanne Prior

_____ Date: 14/12/20

Dr Suzanne Prior
Stakeholder

APPENDIX A: WORK BREAKDOWN STRUCTURE

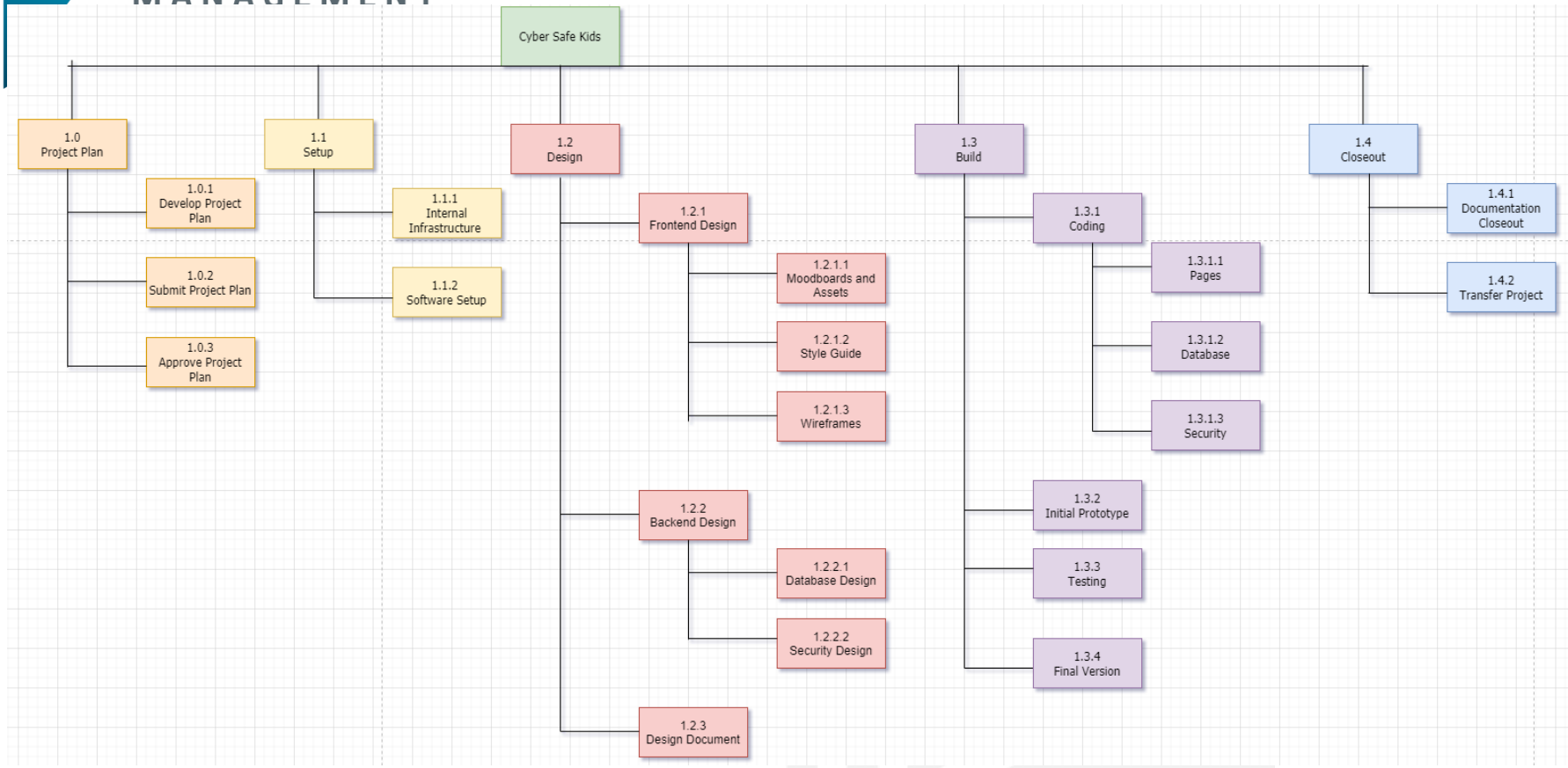
INTRODUCTION

The WBS is below. It is a deliverable-oriented breakdown of a project into smaller components. WBS is formed through branches. Each branch is a step through development and each branch has several WBS elements. WBS elements state what Cyber Kids will do in each branch with an order from 1.0 to 1.4.2 (1.0 being the earliest stage and 1.4.2 being the latest).

OUTLINE VIEW

1. Cyber Safe Kids
    - 1.0 Project Plan
        - 1.0.1 Develop Project Plan
        - 1.0.2 Submit Project Plan
        - 1.0.3 Approve Project Plan
    - 1.1 Setup
        - 1.1.1 Internal Infrastructure
        - 1.1.2 Software Setup
    - 1.2 Execution
        - 1.2.1 Frontend Design
            - 1.2.1.1 Mood boards and Assets
            - 1.2.1.2 Style Guide
            - 1.2.1.3 Wireframes
        - 1.2.2 Backend Design
            - 1.2.2.1 Database Design
            - 1.2.2.2 Security Design
        - 1.2.3 Design Document
    - 1.3 Build
        - 1.3.1 Coding
            - 1.3.1.1 Pages
            - 1.3.1.2 Database

TREE STRUCTURE VIEW



GLOSSARY OF TERMS

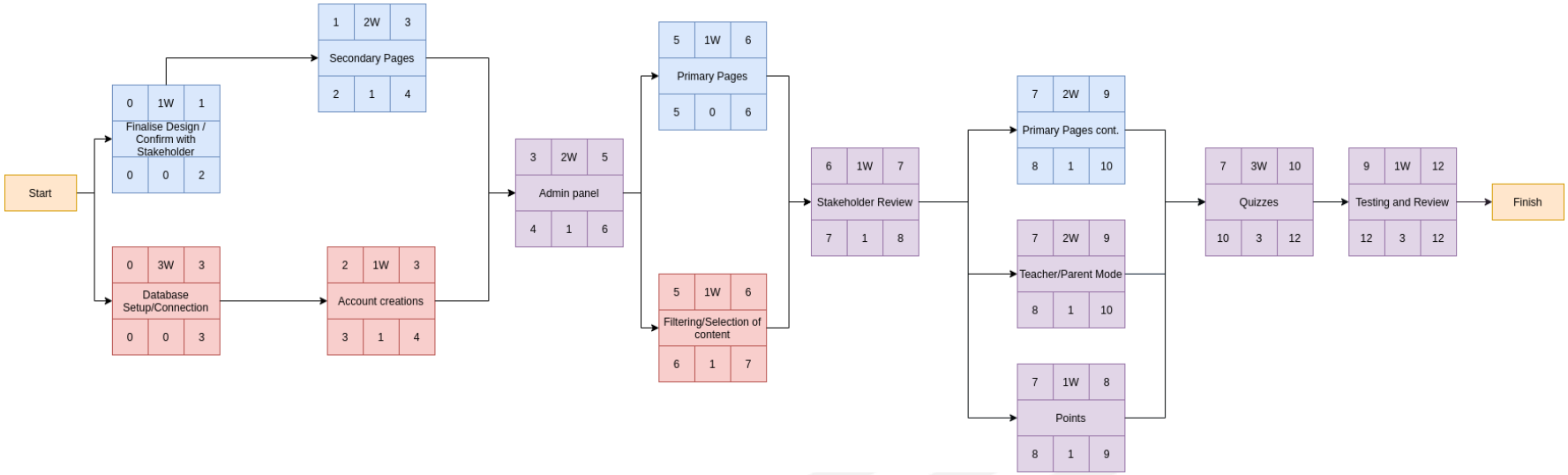
WBS Branch: A different stage in development.
WBS Element: A singular component of each branch.

APPENDIX B: GANTT CHART AND PRECEDENCE NETWORK

GANTT CHART

CW2 Tentative Gantt Chart												
Activity	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Finalise Design / Confirm With Stakeholder	Joint	Joint										
Database Setup and Connection	Backend	Backend	Backend									
Account Creation		Backend	Backend	Backend								
Secondary pages (Landing pages, About pages, feedback page)			Frontend	Frontend	Frontend							
Admin Panel			Backend	Backend	Backend		Frontend					
Filtering/Selection of Content					Backend							
Primary pages (Account creation, Topic selection, Quizzes)					Frontend		Frontend	Frontend				
Halfway Stakeholder Review Meeting						Joint						
Teacher/Parent Mode (Design and Implementation)							Backend	Backend	Frontend			
Quizzes							Backend	Backend	Frontend	Frontend		
Points (Design and Implementation)								Joint				
Testing and Reviewal									Backend	Backend	Joint	Joint

PRECEDENCE NETWORK WITH IDENTIFICATION OF CRITICAL PATH



APPENDIX C: RISK ASSESSMENT

TOP THREE RISKS

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

R1 - Communication failure:
It is possible for miscommunications between team members, which can lead to possible delays in the project, as well as can cause incorrect functions or styles to be created or used. In order to keep this from happening the project manager will keep all members up to date about the plan as well as any possible changes to the project so that everyone is on the same page and the final project meets all expectations. This can also encompass lack of communication between the team and the client. This risk will be approached with scheduled meetings with the client. The project manager will also be in charge of keeping the communications up to date.

R2: Cross-platform compatibility:
With the coding of the website, it is possible that –with constant updates occurring – it is possible that not all devices or web browsers will be compatible with the website. Although the team will take great efforts in order to make it so that the website will be accessible from the most common browsers and operating systems that kids use currently.

R3 - Personnel Shortfalls:
Due to small grouping and possible limited training, it is possible that the team does not have the necessary staff meet all deadlines which can result in a delay to the project schedule. The project manager will mitigate this risk by working with the team members to create an accommodating work schedule to compensate for the personnel shortage.

Other risks identified and how they are addressed are:

R4 - Late Changes to Requirements:
It is possible that during the building of the website, Dr. Prior may request changes to the content or the build of the website. Though, this may not always have a negative impact on the schedule, depending on what the changes are and when these changes are requested, it does have the possibility to have a significant negative impact. To mitigate this risk stockholder discussions and meeting points have been added to the planned schedule in order to create an excellent flow of communication between the team and the client.

R5 - Development technically too difficult:

A select few of the team have practical experience with one of the frameworks that will be used. This may mean that the other frontend team members may lack the appropriate knowledge in regards to creating a fully functional website. In order to address this risk, the project manager will create training sessions that will allow for the experienced team members to share their knowledge with the framework and give other team members the opportunity to work with it.

R6 - Users not being able to navigate the site if it isn't user friendly enough:
This risk may cause the target market (kids aged 10 and below) to become frustrated and may no longer wish to use our website. To address this risk the website will be tested by others for usability, as well as being checked by our website quality assessor.

R7 - Mayar Server instability:
Due to the nature of the system and the amount of users that are accessing it, it is possible that the server that we will be using can crash or take an exceedingly longer amount of time to upload and present our website for viewing than is thought. To avoid this the project manager will keep contact with both the client and the service desk of the server that will be used and attempt to resolve any issues that arise.

R8 - Unrealistic Time Estimations:
Though there has been a 3-month time estimation, it is possible for issues, errors, changes, and many other unpredicted circumstances to arise and cause for drastic changes in the amount of time that will be taken in order to complete the website to the expected standards. The project manager will keep contact with the corresponding parties in order to communicate such possibilities and find the quick and reliable solutions.

R9 - Gold Plating:
Through implementations of functions that were not requested, in order to make the website more appealing, can take a large amount of time. In order to make sure that this does not negatively affect the project, the project manager will strictly enforce time restrictions that will allow for the developers to create the necessary functions as well as possible additions, however keeping to the schedule in order to allow for the project to be completed in time.

R10: You will not get all text contents for new website:
This will hold back the development of the educational aspect of the website, given that it was originally stated "all content will be provided". However, in order to stop this from negatively affecting the project, extra time will be allocated to research in order to fill the gap.

Risk Probability-Impact Matrix

Probability of Risk				
	High	R9	R1	
	Moderate		R3, R6, R7	R2
	Low	R10	R8	R5 R4
		Low	Moderate	High

Impact of Risk

APPENDIX D: QUALITY METRICS

Based on the appropriate topics regarding the project, a set of quality metrics have been established for the Cyber Safe Kids project. These metrics had been reviewed and approved with the project manager and the client as being appropriate for customers:

a. **Compatibility:** In order to maintain the level of quality throughout the project, Cyber Safe Kids will establish a quality metric of controlling and maintaining the project remains fully compatible. This will be a primary target throughout the development process. This topic will be reviewed thoroughly and enforced by the project Manager as to prevent any issues with the quality of this topic later to avoid any deadline complications or having to deal with issues later.

b. **Integrity check:** Integrity checking is the method of looking at the stored data and comparing the said data to previous version for detection of any changes. Because of the contents being provided by the website it is essential to the outlook of the project to have current and check the integrity of the data being provided to the users. The project manager will oversee providing a data integrity test schedule that encourages the project team to validate the data and confirm all info is up to date.

c. **Cost of Quality:** The cost of Quality or CoQ is a methodology to decipher the extent of how the resources are used to prevent poor quality. Having the details of the cost of quality allows the project to be able to determine the potential funding and savings that can be made on materials to produce the said content. Implementing process improvements allows the project team to be utilized to the best of their ability for the most cost-efficient price. This metric is done by taking the Appraisal costs, Cost of poor quality, Prevention costs and maintenance costs into account. This metric allows the client/stakeholders to understand the optimal amount of money to be spent on the project for the best result in finances. The project manager will report the findings monthly to gather an idea of how money can be saved, and assets can be optimized to the projects advantage.

Metric	Standard	Frequency	Report
Compatibility	9/10	Per prototype	Monthly Quality Management Review (QMR)
Integrity Check	9/10	Per prototype	Monthly QMR
Cost of Quality	8/10 or higher with no individual score below 7	Per prototype	Monthly QMR

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