NETWORK HEALTH MONITORING APP

WATCH-DOG 7

Team Member	Sections
Megan	1. Executive summary 2. Business case analysis team and stakeholders 3. Problem definition
Cameron	4. Project Overview 5. Strategic Alignment 6. Cost Benefit Analysis 7. Alternatives Analysis 8. Approvals
Craig	9. Introduction 10. Project management approach 11. Project scope and milestone list 12. WBS + Appendix A
Jay	13. Change management plan 14. Communications management plan 15. Cost Management plan 16. Procurement plan + Appendix D
Josh	17. project scope management plan 18. Schedule management plan 19. Quality management planner
Andrew	20. Risk Management planner 21. Staffing, resource, and cost 22. Quality baseline
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1. Executive Summary 4
1.1 Issue 5
1.2 Anticipated Outcomes 5
1.3 Recommendation 7
1.4 Justification 7
1.5 Team Experience 8
2. Business Case Analysis Team and Stakeholders 9
2.1 Business Case Analysis Team 9
2.2 Project Team 9
2.3 Client and External/Internal Stakeholders 10
3. Problem Definition 10
3.1 Problem Statement 10
3.2 Organizational Impact 11
3.3 Technology Integration and/or Migration 11
4. Project Overview 12
4.1 Project Description 12
4.2 Business Goals and Objectives 12
4.3 Project Performance 13
4.4 Project Assumptions 13
4.5 Project Constraints 13
4.6 Major Project Milestones 14
5. Strategic Alignment 14
6. Cost Benefit Analysis 15
7. Alternatives Analysis 15
8. Approvals 16
9. Introduction 18
10. Project Management Approach 18
11. Project Scope and Milestone List 19
12. Work Breakdown Structure (WBS) 21
13. Change Management Plan 22
13.1 Change Proposal 22
13.2 Change Review 22
13.3 Change Order 23

13.4 Change Log 23
14. Communications Management Plan 24
14.1 Communication Matrix 24
14.2 Project Directory 25
14.3 Communication Protocol 25
15. Cost Management Plan 25
15.1 Responsibilities 26
15.2 Resource Planning 26
15.3 Cost Estimation 26
15.4 Budgeting 27
16. Procurement Management Plan 28
17. Project Scope Management Plan 29
18. Schedule Management Plan 31
19. Quality Management Plan 32
20. Risk Management Plan 35
21. Staffing, Resource and Cost 38
21. Quality Baseline 42
Sponsor Acceptance 43
APPENDIX A: Work Breakdown structure 44
Introduction 44
Tabular View 44
Glossary of Terms 45
APPENDIX B: Gantt Chart and Precedence Network 47
APPENDIX C: Risk Assessment 50
APPENDIX D: Quality Metrics 53
Quality Control Metrics Table 53
APPENDIX E: 54
Change Order 54
Change Log 55
Project Budget 56
References 58

1. Executive Summary

This project proposal was created in response to a request by Dr Ethan Bayne, a lecturer at Abertay University. The project is in relation to the creation of a new Network Health Monitoring Application. This new application will help penetration testers carry out network tests faster and more efficiently, with easy-to-understand results. The report will consist of two main sections, business case team and the project management planning team.

The business case section of this document will cover why the current development of the project is needed and why the project was chosen over other options. The project methodology will also be discussed and why it was chosen.

The business case will give a details description of the project, goals and objectives, project performance standards, project assumptions, constraints, and the project's major milestones. It will also include an overview of the project. This will provide a foundation for the project plan.

1.1 Issue

The role of an ethical hacking professional or pen testers is to assess the security of a computers network and websites. They look for potential vulnerabilities and weaknesses which may be contained within a computers network. If vulnerabilities are discovered, it is the pen testers job to inform the client and make them aware of the harm it may cause to the network if left. If a vulnerability is found in the network it can be exploited by a hacker which may result in the confidentiality, integrity, and availability of the data. Pen testers can evaluate the network by running different types of scans and by making use of many penetration-testing tools to find out the status of the network.

It has been identified that consultants and pen testers can often have a difficult time trying to determine the health of their client's network when dealing with small and medium sized businesses. This is because the small/medium sized businesses do not have sufficient network monitoring tools. Because of this Our client, Dr Ethan Bayne, a lecturer at Abertay University, has asked for the development of a new application which will assist testers to carry out networking tests quickly and efficiently.

1.2 Anticipated Outcomes

With the development of this new Network Heath Monitoring Application, it is anticipated that it will be the only tool that testers will need to carry out a full and in-depth analysis of a computers network system. The is because the tool will include everything necessary for the tester to carry out a complete assessment of the network. The tool is being designed with the intention to only be used by specialist personnel. The aim is for the new networking application to help speed up the process of network analysis and security and to be used on small and medium sized businesses.

The application tool will be portable. This means that the testers can take it to businesses with no networking tools and use it to test their network. The application will be user friendly with a visual graphical user interface (GUI). This is a beneficial feature to the application as it will allow for the tester to quickly see a visual representation of what is going on inside the network.

The application will have many features. One feature of the application will be that it will be able to differentiate between the different nodes that are on the network. Each node will be categorised into one of three options. The categories are –

- Servers
- Clients
- Network devices

By being able to categorise each node into one of the three options, it will mean that the tester is able to quickly identify if there is an issue and where it is coming from on the network. This is a benefit as it lowers the incident response time as the tester will not have to manually search the whole network to find where the weakness is in the network.

The application will scan all ports on the network and highlight which ones are open. This allows the tester to monitor the traffic on these ports and can see an overview to potential security risks if unnecessary ports are left open.

The network monitoring application will have a built-in network traffic controller and analyser. The function of this, is to monitor and track the levels of traffic that is passing through the network. If the application detects the traffic levels are much higher than what is expected, then the tester will be sent and alert to make them aware. Also, if any suspicious network traffic is identified coming in or going out of the network the application will have the ability to drop or quarantine any packets that fall outside of the rules set for the network.

A benefit of this new application is that it will have the ability to block-list domains. This will stop all traffic from those unwanted domains for entering the network that it is securing. As well as this it will have the ability to allow-list domains and the functionality to switch to an allowed list only policy which would only allow pre identified domains to be accessed and communicate with hosts within the protected network.

Lastly the application will include a security grading feature. This part of the application will allow the tester to generate different reports from all the scans and tests run on the network and gain an overall view of the networks health status.

1.3 Recommendation

Many project delivery plans were considered for this project. After much discussion with the team and the client, it was decided that the best methodology for our team and this project would be the agile methodology with an incremental delivery.

The agile methodology is an overarching term for a set of frameworks for project management. The methodology consists of self-organising teams, working based on the client wish list, having good communication with weekly meetings, and working in logical incremental steps.

The team feel that this is the best approach for this project as the methodology focuses on speed and breaks down the whole project into more manageable modules. We aim to complete a section of the project on a weekly to fortnightly basis. Each section will be classed as mini modules with their own design, creation, installation, testing and evaluation. Once a section of the project has been completed it will easily be slotted into the main project. The project will be built-up section by section.

The methodology will be beneficial for the both the team and the client as it will be clear to see how the project is coming together. This will give the client the confidence in the team's ability to provide high quality software week by week. The client will also be able to give feedback after each section.

This methodology allows for good communication and flexibility. The team will meet once a week for a few hours. In these meetings, discussions will take place as to what has, and what needs to be completed for that week.

It is expected that some sections may require more or less time than others, so by using this method, it allows for better time allocation to certain sections if needed.

1.4 Justification

The network health monitoring application project was chosen over other alternative projects because of what skills individual team members could offer. All team members have had experience with web applications, foot printing, network analysis and programming with a few different languages such as python and C++. These are all key elements in this project. Due to this, the team feel that they had the ability to successfully complete the project and produce a high-quality product.

The Network Health Monitoring Application project was also chosen because the team felt that with the creation of it, it could be used in the university in the future. Since the tool will scan for nodes and ports,

network traffic and security levels and be displayed on a graphical user interface, it will speed up how fast vulnerabilities and weaknesses can be spotted. This will reduce the time the students will have to spend running network tests.

1.5 Team Experience

Our team consists of seven, third year ethical students with a wide age range. We have a minimum of two years' experience in the ethical hacking field. We have all had different learning paths to get to this point in our learning. In the team, we have members who have been on the Ethical Hacking course from first year and we also have member who did a HNC and HND in cybersecurity. All members have different jobs and will have different skills that they can contribute to this project. We have a member in the group who has managed and developed a small site for a local business. Due to this we believe that we are in a particularly good position to meet the requirements of Dr Ethan Bayne. If there are any questions or queries the project manager, Craig Kantypowicz, can be contacted by email at 1702534@abertay.ac.uk.

2. Business Case Analysis Team and Stakeholders

2.1 Business Case Analysis Team

The following individuals are part of the business case analysis team:

Role	Description	Name/Title
Project Manager	Manages the business case and keeps the team focused on the project	Craig Kantypowicz

2.2 Project Team

The following individuals are part the project team:

Role	Description	Name/Title
Project Team Leader	The project team leader is responsible for keeping the rest of the team member focused and on track with the task.	Cameron Humber
Programmers	Programmers are responsible for creating the software section of the application.	Craig Kantypowicz Jay Holden Josh Hylton
Designers	The designers will be responsible for how the application will look have design how the GUI interface will look.	Megan Knight Cameron Humber
Testers	Testers will be responsible for testing all aspects of the application and look for any errors. If errors are found it will be the testers job to feedback to the programmers.	Andrew Jenkins Cameron Humber Craig Kantypowicz James Hossack Megan Knight

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	The client is the one who is wanting and funding the project.	Dr Ethan Bayne
University	The university may be interested in funding the project as it could be a useful tool they could have access to once fully developed.	Abertay University

3. Problem Definition

3.1 Problem Statement

Our client, Dr Ethan Bayne, who is a lecturer at Abertay university has discovered the issue that consultants and pen testers can often have a difficult time trying to determine the health of their client's network when dealing with small and medium businesses who may not have adequate network monitoring tools. Due to the lack of sufficient network monitoring tools, a business's computer network could be weak and vulnerable to an attack by a hacker, and they would not be aware of this.

It is so important for businesses to regularly monitor and test a networks security. This is to ensure that sensitive information is not at risk from being compromised or shared out outside parties. If a hacker can exploit a vulnerability on a network, they will be able to gain access to the whole network and take control of it. A cyber-attack on a business can be catastrophic. They could lose money, time, and their reputation.

3.2 Organizational Impact

When consultants and penetration testers carry out network scans on small or medium business, who may not have sufficient network monitoring tools to carry out a beneficial test. This makes it extremely difficult for tester to determine the health condition of the network.

By creating this new network health monitoring application will help solve this issue and make it much easier for penetration testers. This is because the application aims to be portable and used wherever its needed. This means the penetration tester can easily test a small or medium business and work out the status of a network and have a better gauge of what vulnerabilities, if any, need to be fixed.

The tool aims to be easily usable by professionals. Professional pen-testers should have a good understanding of how other network tools work. There will be very little training need to use the new tool.

3.3 Technology Integration and/or Migration

Since the aim of this tool is to have the ability to be a single tool with the capability to determine the health status of a network, all features of it should be very familiar to professionals in the penetration testing field. It will be slowly introduced to the environment. To make this a smooth transition, training documents will be written up, a user manual will be developed, and training videos will be released.

4. Project Overview

The project overview provides a summary of how the network health monitoring app is intended to address the problem provided to the team by Dr Ethan Bayne. It covers the project description, its goals and its objectives, the project performance standards that will be used, the projects assumptions and constraints as well as the major milestones of the project. By addressing these topics, the project overview will be able to provide a foundation for the expanded project plan found in the document below.

4.1 Project Description

The project will the design, implementation process and the delivery of a network health monitoring app to provide consultants and/or penetration testers a single centralised tool which is encompassing of scanning systems, health evaluation, traffic monitoring and visualized display in the form of a web based generated user interface. This resulting network health monitoring app can then be used as a replacement to or in conjunction with existing tools by a consultant/penetration tester when assessing network health.

The completed network health monitoring app will provide the ability to more easily determine network health when working with small or medium sized businesses (SMBs) that may not have existing or developed network monitoring process and software. This increase in ease will help to allow a consultant/penetration tester to provide analysis of the network health and will free up time in the process of network health analysis to conduct further directed investigation.

4.2 Business Goals and Objectives

The network health monitoring app will support the business goals as set out by the client and are addressed in the following table. The table is broken down into a list of the goals and objectives and how the network health monitoring app will address these:

Business Goal/Objectives	Description
Increase ease of determining the health of a network	Program's GUI will display health and issues determined by the automated systems
Provide a network monitoring tool to a small and medium businesses	Completed tool will be able to be used and deployed on any network

4.3 Project Performance

The below table addresses the performance measuring of the network health monitoring app by highlighting the key resources, processes or services and the expected outcomes for these. These measures will be further developed in the detailed project plan.

Key Resource/Process/Service	Performance Measure
Network Identification	The network health monitoring app is capable of locating, analysing and identifying all nodes present in the network and then categorising the detected nodes into servers, clients and network devices.
Traffic Analysis	The network health monitoring app is capable of identifying potentially harmful traffic between devices through traffic analysis to provide the user with warning.
Security Grader	The network health monitoring app is able to categorise devices as safe, low or high risk based on factors such as open ports,
Visualised interface	The network health monitoring app GUI is straightforward and simple to use for specialist personnel

4.4 Project Assumptions

The following list is of assumptions identified that will apply to the network health monitoring app project. This list will be revisited as more assumptions are identified.

- Funding is available for the development of the network health monitoring app.
- The project has adequate support and backing for its completion.

4.5 Project Constraints

The following list is of constraints that have been identified to apply to the network health monitoring app project. As more constraints are identified through the planning process, they will be added accordingly.

- As the development process will be completed internally and not by the product developers or vendors of any implemented tools, there will be limited support from hardware/software providers.
- A test environment will not be provided and will need to be produced to test the network health monitoring app.
- There will be a finite amount of time to complete the network health monitoring app which is shared by other coursework commitments.

4.6 Major Project Milestones

The following milestones for the network health monitoring app project are those that have currently been identified as being major milestones to its completion. As the project plan is developed and fleshed out, in particular the schedule, these dates will be adjusted and finalised as required.

Milestones/Deliverables	Target Completion
Project Kick-off	Week 1
Completion of the GUI shell	Week 4
Completion of the node identifier	Week 6
Completion of the port scanner module	Week 8
Completion of the network traffic analyser	Week 8
Internal testing completed	Week 12
Network Health Monitoring Application is completed	Week 12
Training Videos produced	Week 12
User Manual produced	Week 12

5. Strategic Alignment

The network health monitoring app project aims to support the strategic goals of the client, Dr Ethan Bayne. The following table addresses related plan, goals and relationship of how the network health monitoring app project can support these for the client.

Plan	Goal	Relationship to Project
2023 Strategic Plan for Network Health Management	Increase the ease of network health monitoring and investigation.	The project will involve the creation of a visualised tool that will be provide consolidated network health monitoring and basic investigation information to a user.
2023 Strategic Plan for Small and Medium Business Support	Provide a single centralised tool for Small and Medium Businesses to monitor their network.	The network health monitoring app will provide clear grading of network health as well as a detection feature which will assist network health monitoring.

6. Cost Benefit Analysis

This table illustrates the costs and benefits of the network health monitoring app project, what these actions will entail and whether they serve as a benefit or cost to the client.

Action	Action Type	Description
Project development	Cost	Costs for the design, development, implementation and production of support material for the product by the development team.
Network health monitoring with completed tool	Benefit	Small and medium businesses will be able to monitor their network health with the help of the network health monitoring app reducing the need for hiring or contracting specialists.
Reduce risk of undetected attacker	Benefit	Small and medium businesses will be better equipped to detect unauthorised network traffic such as that of an attacker by using the tool.
Lack of post completion support	Cost	The completed project will benefit from a dedicated support team should any issues arise with small and medium businesses using the tool on their network. This will require more in-depth documentation being created to alleviate this.

This shows that approval and subsequent completion of the network health monitoring app will present a beneficial opportunity for the client and will provide significant improvements that outweigh its potential detriments.

7. Alternatives Analysis

Alternative options to the network health monitoring app are provided below. The reasons for why alternative options are not selected are detailed in the table.

No Project (Status Quo)	Reasons For Not Selecting Alternative
Do not develop a tool for network health monitoring.	• Does not decrease the quantity of work required to maintain network health. • Does not simplify the process resulting in the need to acquire expertise to complete.
Alternative Option	**Reasons For Not Selecting Alternative**
Purchasing an off the shelf option.	• Increased, often subscription based, cost. • May not be open source presenting an unknown risk when deployed to the network. • May require increased technical expertise/understanding. • Cannot be modified with requested features.

8. APPROVALS

The below signatures indicate an understanding of the contents and purpose of this document by those named. By signing the document, you express your approval of the project as detailed, and that work may begin to develop a project in line with the details contained within this document.

Approver Name	Title	Signature	Date
Bayne, E.	Client		2022-12-08
Craig Kantypowicz	Project Manager		2022-12-11

PROJECT MANAGEMENT PLAN: NETWORK HEALTH MONITORING APP

WATCH-DOG 7
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9. Introduction

The client, Ethan Bayne, has approved Watch Dog 7 to begin working on the network health monitoring app project. This project will create a tool that can be run on any network to create a visualized network map and to scan for a range of vulnerabilities across it such as insecure traffic. This tool will be designed to be used where knowledge of a network is severely lacking. While many tools and approaches are available. There are few tools that collect this for a user in a way that is quick to understand and use. Watch Dog 7 can leverage its expertise in this field to provide a tool that will save the client a lot of time by creating an easy-to-understand knowledge base. Additionally, documentation and walkthrough videos will be provided for the finished application for training and general usage purposes.

Watch Dog 7 are a team of student developers who are studying the most up-to-date techniques and technologies in the cybersecurity field. These techniques have been developed through active tests on networks as well as the creation of software during their academic years. The familiarity of the team means that they are uniquely positioned to fulfil the network monitoring app project.

10. Project Management Approach

The team have chosen to approach this project with an agile methodology with an incremental delivery system. This was chosen as the structure of the project lends itself well to this approach. Except for the main framework, all the sections are modular in nature. Allowing the client to be a part of the testing process as the project proceeds. These will be delivered at the weekly meeting with progress updates keeping the client informed. As these modules will be completed concurrently, this approach allows for changes to be made if required without halting the progress of other areas of the project. Any changes in funding or project plan will be approved by the project sponsor which must be done in writing and be signed off on by both the project manager and the project sponsor.

Due to the modular approach. Tasks can be worked on in tandem with each other, increasing the speed of creation as well as flexibility as the increase in speed allows for more space for requirements to be changed if necessary. The individual work components have been estimated using a top-down method.

The team leader and project manager Craig Kantypowicz will be the person who will have final authority and responsibility for managing and carrying out the project plan. The team will consist of a group who will work as Software Engineers Andrew, Jenkins, Cameron Humber, James Hossack, Jay Holden, Josh Hylton and Megan Knight for the individual modules who will oversee all stages including analysis, design, implementation, testing and evaluating the implemented modules. They will work in part with the client to make sure that it is fit for

purpose. Additionally, the software engineers will be involved in the process of writing technical documentation for the clients' use.

The project team members will be individually responsible for reporting their progress to the project manager during the project. This information will be collated by the project manager who will be responsible for sharing this with the client during the weekly client meetings sharing both the progress and performance of the team.

11. Project Scope and Milestone List

The scope of the project includes individual modules that will go through their own planning, design, development and testing phases. When these modules are all complete, they will be given over to the client as part of the testing process. On completion and the project is tested, it will then be transitioned over to the client with all documentation included such as training videos and an instructional document.

The software will adhere to the following ISO standards.

- ISO 12207 – A framework that covers the software development life cycle. This identifies the tasks and expectations of the software through consultation with the stakeholders. To comply, the procedures and tasks must be clearly identified.
- ISO 29199 – is the framework that defines how software should be tested. It goes over how things are tested. How testing is measured. Techniques for testing and any unique definitions for the tests. To comply, testing sheets should be made as well as a fault sheet describing faults found through the testing process. When finished, a final report should be made to explain the findings.
- ISO 9126– This framework deals with the design standard of software. To do this, the framework covers six different objectives. Efficiency, the resources used by the software. The network health app will adhere to this by only running the modules it needs so as not to clog up the network. Portability describes if the software is transferable between multiple environments. To adhere to this, the program will be designed to be usable on any system that uses a web browser with all the files easily being moved by USB. Maintainability, which describes the ease with which the software can be changed or added too. The program will be designed modularly to allow for additional functionality to be added as well as for individual components to be easily accessed and modified. Usability described how easy it is for a user to pick up the software. The software will make it easy for professionals to collect the information they already look for with multiple ways of training and learning the software through manuals or tutorial videos. Reliability describes how dependable the software is. Through testing, it will be made sure that the program always gives the correct results.

Last is functionality, which describes the features present. Many different features will be added by default to allow for the easier gathering of important network information.

The network health monitoring application will be completely produced internally with no outsourcing. Additionally, there will be no changes to the client system required to use this application.

Below is a chart with a list of major milestones that will be adhered to with the date of completion. As these are the major milestones, some smaller milestones are not included but will be shown in the project schedule and WBS. Possible delays that might change these major milestone dates will be communicated with the project manager as soon as possible to attempt to mitigate delays. If changes to the completion date of major milestones are required, then a signed agreement must be made between the project leader and the client.

Milestone	***Description***	***Date***
Completion of the GUI shell	The GUI shell for the project will be completed and available and released to the client.	*Week 2*
Completion of the node identifier	The node identifier module will be completed and implemented for use by the client	Week 4
Completion of the port scanner module	The port scanner module will be completed and implemented for use by the client	Week 6
Completion of the network traffic analyzer	The network traffic analyzer module will be completed and implemented for use by the client	Week 8
Internal testing completed	At this stage, the completed program will have gone through internal testing and major bugs will have been patched out.	Week 8
Completion of documentation	All documentation will be completed including	Week 12

The project deliverables include the following

Product	**Description**	**Date**
Network Monitoring Application	The completed software projects.	Week 12
Training Videos	Information videos on common tasks that will be performed by the client	Week 12
User Manual	Information for the use of the completed software for users	Week 12

12. Work Breakdown Structure (WBS)

The Network Health Monitoring project has created work packages through consultation with individual team members and stakeholders. These packages will be at least 5 hours of work but will not exceed 30 hours.

The schedule for the network health application project has been created from the WBS and has been considered by the individual project members. The project sponsor has been approved by the project sponsor upon completion and review. Future changes put forward to change the schedule will go through Watch dog 7 change control process as laid out by the change management plan. The project manager and team will look at the impact of this change on the schedule, resources, risk and project scope as well as determining if the boundary condition has been exceeded. If it has been exceeded, then the change will need to be reviewed and approved by the project sponsor. This schedule will be maintained using word by the project manager. The boundary conditions are as follows

- Cost Performance indicator (CPI) is less than 0.8 or greater than 1.1
- Schedule Performance Indicator (SPI) is less than 0.8 or greater than 1.1

The full WBS structure is provided under appendix A

13. Change Management Plan

"A change management plan provides a framework to introduce any changes within a project allowing board members and stakeholders to assess changes before they are implemented (Bridges, 2022)". Having a change management plan in place will allow better control of any changes during the project that will consider the impact on all aspects such as cost, time frames, changes to project scope and the use of available resources. Being able to highlight anything affected by implementing a change will allow the board and stakeholders to weigh out any positive or negative outcomes introduced by the proposed changes to the project.

For this project, a change management plan has been devised to tackle any proposed changes to the development of the Network Health Monitoring Application. Any change introduced will have documentation and follow a procedure laid out in this section –

13.1 Change Proposal

The change proposal will allow any team members and stakeholders within the project to present a suggested change to the project plan. The proposal will be submitted to the project manager for review and discussed during a team meeting to allow a thorough assessment of the proposed change. The proposal will be a formal document that will clearly explain the changes being made to the project and will provide reasoning or any benefits for implementing this change.

13.2 Change Review

Following a change proposal being submitted to the project manager, the proposed change will be presented to the rest of the team during team meetings. These can be reviewed during the scheduled weekly team meetings, but more urgent cases can be scheduled for discussion accordingly. During the change review, all attended participants will assess the proposed change and identify any negative or positive impact it will have on the project. After discussion of the proposed change team members will need to approve or reject the proposal. If approved a "Change Order" will be signed off by the project manager.

13.3 Change Order

The change order (Appendix E: Change Order) will be a document that will outline how any change will be implemented into the project plan that will provide a detailed scope of the expectations from carrying out the tasks involved with executing an approved change. The change order will need to –

- Project any anticipated costs involved and clarify if this will affect the projects given budget.
- Identify any adjustments to the project timeline and provide details of accommodation to the project's milestones and work breakdown structure.
- Outline any modification to the allocation of the project's resources. For example, this can be identifying the allocation of team members needed to work on implementing a change to the project.
- The final detail in the change order will be to provide an expected completion of this change after accounting for all the other points listed in the document.

13.4 Change Log

This document will be utilised throughout the entire change management process to track changes throughout the project. The change log will document changes from when they were put forward in the change proposal and keep a record of the change proposals' approval/rejection status decided during the change review. Following this, details from the change order will be inserted into the change log to allocate resources and provide a schedule for the allocated time approved to work on changes. The change log will lastly provide the status of implementing the change providing information to identify if a change is on track, running late or completed. The project's Change Log document is referenced in (Appendix E: Change Log).

14. Communications Management Plan

"The communication management plan will establish effective communication between all stakeholders within the project and establish the preferred channels or platforms for all members to discuss certain aspects of the project (Lucid Content Team, 2022)". This plan is important for all parties involved in the project as it will provide a structured and scheduled approach to convey information to all members and the client. The communication management plan sets out to provide a reference of lines for communication between each team member through a directory and will provide the appropriate channels and schedules for informal and formal communications using the "Communication Matrix".

14.1 Communication Matrix

Communication Type	Description	Frequency	Format	Participants/ Distribution	Deliverable/ Product	Owner
Informal Social Communication	Provide team members with a platform to socialise and provide support to one another	As Needed	Microsoft Teams "Teams Group Chat"	Team and Project Manager	Peer-to-peer support	Project Manager
Weekly Project Team Meeting	Scheduled team meetings to discuss the progress of the project	Weekly Wednesday 3-5 pm	In Person	Team and Project Manager	Update progress for project deliverables and milestones	Project Manager
Weekly Client Meetings	Scheduled available time to discuss the project with the client	Weekly Wednesdays between 4-5 pm	In Person	Team, Project Manager, and Client	Progress reporting and showcase development	Project Manager
Activity Logs	Team member's activity reporting	Weekly	Upload to Mylearing space	Team and Project Manager	Progress reports for individual team members	Project Manager

14.2 Project Directory

This directory will provide contact details for all stakeholders involved in the development of the project.

Name	Title	Email
Ethan Bayne	Project Client	e.bayne@abertay.ac.uk
Craig Kantypowicz	Project Manager	1702534@uad.ac.uk
Cameron Humber	Project Team Leader	2000423@uad.ac.uk
Jay Holden	Programmer	22012757@uad.ac.uk
Josh Hylton	Programmer	2102458@abertay.ac.uk
Megan Knight	Designer	1901024@abertay.ac.uk
Andrew Jenkins	Tester	2004984@abertay.ac.uk
James Hossack	Tester	2001346@abertay.ac.uk

14.3 Communication Protocol

Communication amongst the team out of weekly meetings can be conducted via Microsoft Teams in the project group chat to discuss the development and technical aspects of the project. Any formal communication i.e., change proposals, risk assessments or sensitive information must be sent to the project manager by email.

When it comes to contacting the client outside of the scheduled weekly client meetings this can be brought to the attention of the project manager and the project manager can decide to contact the client directly or allow a member of the team to contact the client if more appropriate. Other information such as the project files and documentation will be uploaded onto teams so all members can have access and collaborate on their work remotely.

15. Cost Management Plan

The project's cost management plan will provide a suitable strategy for managing the budgeting within the project. This plan aims to implement a structure that ensures the cost does not exceed the given budget for the entire project by allocating funds methodically through effective staffing, time management and resource allocation. "The cost management plan also provides transparency of the cost involved and will provide a means to track tasks in line with available funds in the budget (Keup, 2022)".

15.1 Responsibilities

In terms of managing costs, the project manager will be responsible for managing the funds throughout the project duration. The project manager will oversee project spending to control any costs, this means the project manager will have full authority over any changes to how funds are spent within the project. Furthermore, the project manager will have the responsibility of communicating any changes to spending for the project to the client for their approval during weekly client meetings.

15.2 Resource Planning

With the use of the work breakdown structure illustrated in (Appendix A) resources will be allocated towards working hours and staff needed to complete each phase of the project. The resource plan will take a hierarchal approach determining the cost of resources needed for the most critical parts of the project first and then determining resources needed for less critical activities listed in the work breakdown structure. Planning resources in this manner will provide more accurate cost estimation for budgeting each phase and implementing cost controls throughout the project.

15.3 Cost Estimation

"Cost estimation will be conducted by the three-point estimating method as this provides contingencies for the most likely outcome based on the predictions between a best-case scenario and the project utilising all the available working hours to create a median between the two (Lee, 2022)". The best-case scenario or optimistic estimate is calculated first by determining the total predicted cost per hour worked for every staff member over the course of the project which has been determined to be 12 weeks to complete, and the amount of time the team needs to work to complete a package that has been determined as "packages will be at least 5 hours of work but will not exceed 30 hours (12. Work Breakdown Structure (WBS)". This means that the best-case scenario is each member of staff works a 5-hour week that can be predicted as follows –

Optimistic Estimate

Developers x6	Hourly Rate (£p/hour)
	£90.00
Project Manager	Hourly Rate (£p/hour)
	£21.75
Total for 5-hour Work Week	
	£558.60
12 Week Total	
	£6,703.20

For a worst-case scenario or a pessimistic estimate, the calculation is similar but instead, every member of staff puts in 30 hours of work per week.

Pessimistic Estimate

Developers x6	Hourly Rate (£p/hour)
	£90.00
Project Manager	Hourly Rate (£p/hour)
	£21.75
Total for 30-hour Work Week	
	£3,352.50
12 Week Total	
	£40,230.00

Now both an optimistic and pessimistic estimate has been established a median of hours worked between the two calculates as each member of staff putting in about 17.5 hours of work per week. With this calculation, it will be possible to have a realistic estimate of how much the project will cost.

Realistic Estimate

Developers x6	Hourly Rate (£p/hour)
	£90.00
Project Manager	Hourly Rate (£p/hour)
	£21.75
Total for 17.5-hour Work Week	
	£1955.63
12 Week Total	
	£23,467.50

15.4 Budgeting

With the use of the project milestones and work breakdown structure illustrated in (11. Project Scope and Milestones List) a budget for the entire project has been developed to divide the total estimated cost into the different development stages for this project. See (Appendix E: Project Budget) for the full budgeting breakdown for the entire project.

16. Procurement Management Plan

For this project, there should not be a necessity to procure any more resources or materials to complete the Network Monitoring Application as all the necessary equipment is already available to all staff. In the event, any procurement is needed any member of the team can bring this to the attention of the project manager to determine if this procurement is necessary to aid the project. The Project manager will need to assess the value of any items or services being requested and determine if acquiring items or services will have an impactful solution that will justify its procurement. If the procurement can be justified the project manager will need to assess the cost of the purchase and if there is room in the project budget for the purchase of any items, goods or services, the purchase can be made by the project manager. Any purchases made using the project budget will need to be documented and filed with copies of any invoices, purchase orders or receipts.

17. Project Scope Management Plan

Responsibilities within Scope Management

The scope for the Network Health Monitoring App project will be defined by the Work Breakdown Structure, Milestone List and Project Scope Statement. These sections of the proposal will contain all the information controlling and limiting the scope planned for the project. It will be the responsibility of the Project Manager to manage and control the scope for the project. All necessary documentation for the project will be created and approved by the Project Manager, Project Sponsor and the Project Stakeholders, and these documents will include the project objectives and goals, which will give a greater understanding of the required deliverables, scope and help control scope management.

After all tests, documentation and functionality have been provided to and demonstrated to the Project Sponsor they will be responsible for accepting the final project application. The Project Sponsor, after formally accepting the final product, will then become solely responsible for maintaining and updating the software application.

Changes in Scope

Only the Project Manager will have the authority to apply changes to the scope of the project. All changes to the scope of the project should be presented to the entire project team before being approved. Doing this will ensure that all changes to scope will be fully understood by all project members and will allow all members to comment or dispute changes to scope. This will mitigate any changes in scope that might negatively impact works or creations within the project and will allow for greater analysis of the changes that are being promoted.

After the Project Manager has received and analysed all the feedback on the proposed scope changes, they will make the final decision on moving forward with the changes in scope or to drop them. If the Project Manager decides to move forward with the changes in scope, they will then approach the Project Sponsor and show the suggested changes in scope with all the feedback that has been presented to them from the other project team members. If the Project Manager decides to drop the proposed changes in scope, they will be required to notify the Project Sponsors of their decision and provide them with the feedback from the other project team members.

Measure and Verify Scope

The scope will define what the basic requirements of the project are and the upper limits of what is expected to be created within the project. This will be done to make sure that the product is functional to the required but not over engineered beyond what is necessary to complete the project to a high standard. Methods of measuring and verifying scope integrity:

- Quality Checklists
  - These checklists will be used to make sure the different modules within the project are up to the scope standard.
- Work Performance Measurements
  - These will be used to track the team members performance and make sure that times scales are still accurate for different sections of the project.
- Scope Baselines
  - These checklists will be used to make sure the different modules being created within the project are up to the scope standard.

Task Completion Checklist

The task completion checklist will be used to mark what is required by each module to be accepted as a completed module. This checklist will be created by the Project Manager and completion of the checklist will help to make sure all project and project modules do not fall outside of scope. This document will be the sole responsibility of the Project Manager and used by them to keep track of all project deliverables.

18. Schedule Management Plan

The schedules for the Network Health Monitoring App project will be created and maintained using Microsoft Word, Excel and PowerPoint.

Form of Schedules

The types of schedules that will be used during the project will be listed below with a description of their use:

- **Gantt Chart** - The Gantt chart will be used to show what each team member will be doing, the duration they are expected to take to complete the task and the time scheduled during the project for them to do this.
- **Work Breakdown Structure** - The Work Breakdown Structure will breakdown the project modules into smaller tasks which are easier to manage and assign. It will dissect the project into phases, deliverables and work packages, incrementally based on hierarchy.
- **Precedence Network** - The Precedence Network schedule will set out how long each task should take, which tasks require others to be completed before they can begin, which tasks and task paths are critical to be completed on time in order to keep up with the schedule, and the additional time buffers(floats) that other task can be afforded.

Schedule Creation

The Project Sponsor will be responsible for approving finals schedules, this will be done once all the schedule documentation has been made and presented to them with a reasonable and justifiable timeline.

All schedules will be made with the input of the Project Manager and Project Team Members with the intention for the greatest accuracy possible usings and comparing different team members ideas on timeframes for tasks. This will aim to reduce occurrences of large over or under timescale estimates.

The Project Manager and Project Team Members will all participate in creating the work packages, phases, deliverables and milestones, this will give all members of the project team a deep understand of the breakdown of tasks and a greater understanding of the expected output. The Project Manager and Project Sponsor will have the final say on all work packages, phases, deliverables and milestones.

Work assignments will be assigned by the Project Manager with contributions and feedback assessments from all team members. This will aim to have each task assigned to the most competent or suitable team member.

Milestones

The milestones of the project show the important steps that need to be taken within the project and having a breakdown of these critical achievements helps to keep the project on track. Setting target dates to achieve these milestones will be used to keep a general overview of the progress of the project. A list of these milestones is below:

- Completion of the GUI shell
- Completion of the node identifier
- Completion of the port scanner module
- Completion of the network traffic analyser
- Completion of security grader
- Internal testing completed
- Completion of documentation

19. Quality Management Plan

Quality Responsibilities

All Project Team Members have a responsibility to actively maintain the quality of the work done within the project. Is will also be the responsibility of all Project Team Members to assess the quality of any work packages or deliverables that are relevant to tasks assigned to them. Once the project is completed it will be the final responsibility of all Project Team Members to check the quality of the entire project before signing off that they are happy with the final product. Any deviations from the required level of quality must be reported to the Project Manager if found by any of the Project Team Members.

All feedback will be recorded regarding these quality assessments, and it will be the Project Manager who is responsible to choose when the final products standard has been met. It will also be the responsibility of the Project Manager to periodically document the level of quality being achieved within the project. They will be required to work with the team members to ensure a high level of quality. When Milestones and Work Performance Measurements are met the Project Manager will be required to complete the relevant Quality Checklists and Scope Baselines. If any

deliverables or work packages are found to be sub-standard then the Project Manager will be required return the work to the Project Team Member with details on why the quality is not up to specification and what is required to bring it up to the required standard of quality.

Once the standard had been met it will be passed on to the Project Sponsor with all unresolved feedback and they will have the final decision of signing off on the project.

International Standards

The main standard that will be used to quality manage of the project is the **ISO 25010:2011**. This international standard is *"A product quality model composed of eight characteristics that relate to static properties of software and dynamic properties of the computer system."* (International Organization for Standards, 2017). The eight main characteristics and the subcategories the standard is composed of are:

- Functional Suitability
  - Functional Correctness
  - Functional Completeness
  - Functional Appropriateness
- Performance Efficiency
  - Resource Utilization
  - Capacity
  - Time Behaviour
- Compatibility
  - Co-Existence
  - Interoperability
- Usability
  - Appropriateness Recognizability
  - Learnability
  - Operability
  - User Error Protection
  - User Interface Aesthetics
  - Accessibility
- Reliability
  - Maturity
  - Availability
  - Fault Tolerance
  - Recoverability
- Security
  - Confidentiality

- Integrity
- Non-repudiation
- Accountability
- Authenticity

- Maintainability
  - Modularity
  - Reusability
  - Analysability
  - Modifiability
  - Testability
- Portability
  - Adaptability
  - Installability
  - Replacability

The documentation created from the use of this ISO should be created during the early development stage of the project by the Project Manager and used throughout the project to access that the baselines for quality of the project are being met.

Computer Misuse Act 1990

This product is intended for use in a controlled and permitted environment. Users of the product are responsible for making sure their use fall within the Computer Misuse Act 1990 as some functionality when used outside of a permitted environment may break rules within this legislation. This should be notified to any users of the product at the beginning of each use.

GDPR

This product is intended for use in a controlled and permitted environment and users within these networks should be notified that their activities within the network are being monitored and analysed. The software could in some situations breach GDPR if users are not made aware of its application. This can be resolved either by contracts or terms and conditions that are required to access or use the network.

20. Risk Management Plan

Every project involves some degree of risk. Risk Management is the process of:

- Risk Identification
- Risk Evaluation
- Risk Handling
- Risk Controlling

This Risk management plan defines possible risks and how they will be managed for the CMP308 project.

This Risk management plan will also include a risk analysis metric to assess the impact and probability of risks.

The plan will also outline strategies to be used if a risk does arise.

The project team and stakeholders have approved, acknowledged, and signed the risk management plan. See Appendix C.

RISK IDENTIFICATION

The risk identification process will include the project leader, project team, and stakeholders.

Risks must be identified and dealt with within the project life cycle as early as possible. The risk identification process must be completed throughout, specifically during crucial milestones.

While evaluating potential risks, consideration must be given to project deliverables, assumptions, constraints, and cost/effort estimates.

An essential tool in any project management methodology is the Risk Management log. This allows the recording of identified risks, the analysis of the score in the risk analysis matrix, and the mitigation strategies put into place if the risk might materialize.

A Risk Management Log should be kept and updated regularly throughout the project's life.

See Appendix C for a list of identified risks that could impact the project and the risk log.

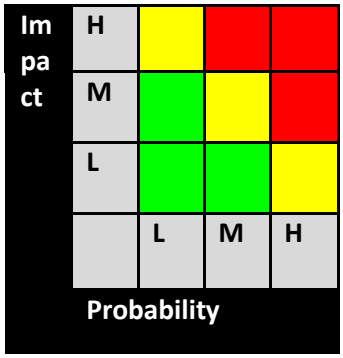
RISK EVALUATION

All risks identified will be analysed to determine the impact that each could have on the project. The team will determine the priority of each risk and establish a plan to deal with them.

QUANTITIVE RISK ANALYSIS

The project team chose to use a quantitative risk analysis rather than a qualitative one, as it gave a better understanding of the risk and possible impact on a modern project.

The probability and impact of each risk will be assessed by the project team using the following approach:



Probability

- High – Greater than *70%*
- Medium – Between *30%* and *70%*
- Low – Below *30%*

Impact

- High – Risk that has the potential to impact project performance
- Medium Risk that has the potential to slightly impact project performance
- Low – Risk that has relatively little impact on cost, schedule, or performance

Any risk within the high or medium zone will have a risk response plan.

See Appendix C for the risk analysis matrix and detailed analysis of the main three risks to the project.

RISK OCCURRENCE TIME FRAME

A risk occurrence time frame was discussed with the project team, and this will identify the timeframe that a risk is likely to materialize.

This will give the team time to consider the risk management plan effectively and allow efficient use of the controls.

See Appendix C for the risk occurrence time frame.

RISK HANDLING

Each risk identified as high, or medium will have a designated team member to monitor and assess the risk throughout the project life cycle. This will ensure that mitigation can be implemented as effectively as possible.

The strategy that will be implemented to address each risk will be one of the following:

- Avoid – Eliminate the risk
- Mitigate* - Lowering the probability of risk occurrence
- Accept – Lowering the impact on the project

The strategy will be recorded in the risk log and monitored by the team leader.

*To mitigate a high or medium risk, an action plan must be implemented, describing actions to be taken should the risk materialise and how the impact will be minimised.

See Appendix C for the details of how risks will be responded to during the project.

RISK CONTROLLING

Existing risks should be monitored carefully and assessed if required.

Possible risks and quantitative risk levels should be tracked throughout the project and assessed at every stage to identify any new risks and how to respond to them.

Any changes to the project should be discussed with the project leader and assessed for possible risks that could impact the project

21. Staffing, Resource and Cost

The team will operate under a projected organisational structure, with the project manager responsible for any final decisions made during the project. The team consists of seven members with the following roles:

Project Manager (1 position)

The project manager will be responsible for the following during the project:

- Assigning tasks to team members
- Tracking the progress of the project
- Ensuring communication between team members and different teams
- Reports
- Client reporting and communication
- Identifying and reporting risks thought the project
- Ensuring that the project stays within the scope
- Signing off any changes to project scope or requirements

Project team leader (1 position)

The project manager will be responsible for the following during the project:

- Splitting work between team members
- Ensuring communication between team members
- Ensuring communication between teams
- Hold team meetings and communicate requests and progress to the project manager
- Ensuring teams stay within scope and communicating this to the project leader
- Identifying and reporting risks thought the project

Programmer (2 positions)

The programmer will be responsible for the following during the project:

- Coding tasks involved in the project
- Ensuring that work completed is within the scope and compliant with the overall spec
- Responsible for any design tasks involved in the project
- Ensuring the front-end GUI meets client specs and stays within the scope
- Identifying and reporting risks thought the project

Designer (1 position)

The Designer will be responsible for the following during the project:

- Ensuring the final frontend product meets clients' specs
- Communicating any design changes to the project manager and programmer
- Ensuring design stays within the scope and capabilities of the programmer
- Identifying and reporting risks thought the project

Tester (2 positions)

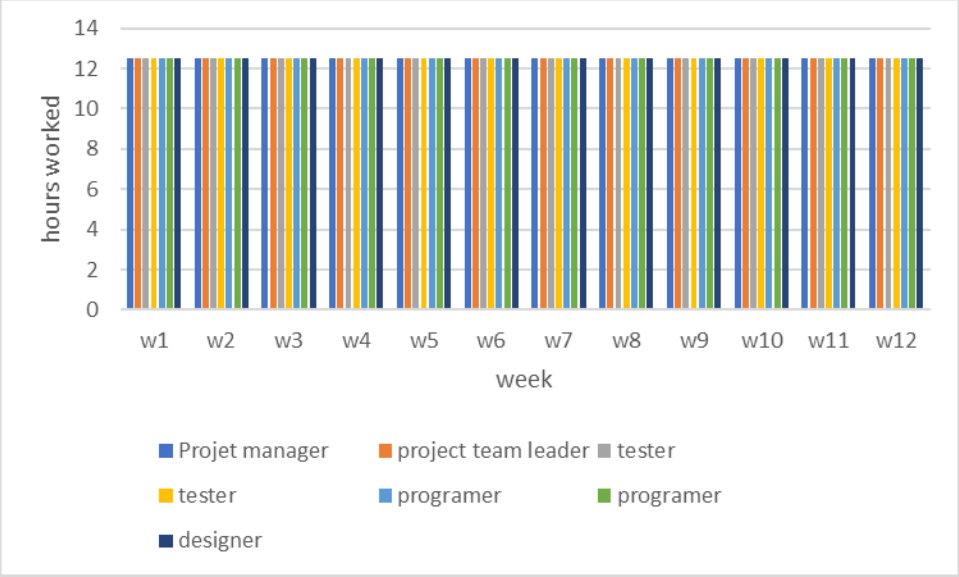
The Testers will be responsible for the following during the project:

- All testing and bug finding during the project
- Ensuring the work completed is fully functional and meets client expectations.
- Ensuring the final product is free from any bugs
- Document and report bugs that are found
- Identifying and reporting risks thought the project

Resources

The project is scheduled to last 12 weeks, and all members are required throughout the project. The project will work under a 12.5-hour work week; this was discussed with the team members and team leader, and it was agreed that this would allow enough time for team members to invest in the other modules being undertaken. If time is split equally between all three modules, this would equal an average working week of 40 hours.

The work schedule is shown below in the resource calendar for each role within the team. This is subject to change depending on tasks taking longer or being completed faster than expected.



The hours agreed on are in place, as this will ensure that each team member contributes equally to the project.

The total working hours for the team are 1050. This is displayed within a Gantt chart in Appendix B.

The recourses to be used during the project implementation stage can be assigned to free and paid resources.

Free resources:

Nmap - Nmap is a network scanner created by Gordon Lyon. Nmap is used to discover hosts and services on a computer network by sending packets and analyzing the responses. Nmap provides several features for probing computer networks, including host discovery and service and operating system detection. (Wikipedia)

Cost

The cost baseline below will cover all costs incurred by the project. The costs are calculated by researching the average wage of a graduate in each position and multiplying by the agreed number of hours each team member will work on the project.

Each hourly rate is calculated using a 40-hour working week.

- Project Manager - £45,191 annually, £21.72 an hour. (Indeed)
- Developer - £31,367 annually, £15.00 an hour. (payscale)

Phase of project	Budgeted Total	Working hours
Plan review and completion	1,396.87	1week
Project management/project kick-off	1,396.87	1 week
Design Phase	2,793.75	2 weeks
Implementation	8,381.25	6weeks
Testing/finalizing paperwork	2793.75	2weeks
Totals	16,762.5	12weeks

21. QUALITY BASELINE

The quality baseline will outline the quality objectives that should be met for the project implementation. The client has agreed to the conditions listed. The team will use this baseline for decision-making during the project. For the successful completion of the project there, needs must be met.

Condition	Quality baseline objective
User-friendly GUI	Straightforward and easy-to-use GUI intended for specialist personnel.
Map every node on the network	Locate and analyze each node on the network, and categorize them into servers, clients, and network devices
Easy visual identification of security risks	Visual alerts for any security risks that have been identified
black-and-white list of specific IP addresses	Ability to add IP addresses to whitelist if safe and blacklist if known as a threat.

SPONSOR ACCEPTANCE

Approved by the Project Sponsor**:**

Date: 2022-12-08

Dr Ethan Bayne
Programme Leader of BSc Cybersecurity and Lecturer

APPENDIX A: WORK BREAKDOWN STRUCTURE

INTRODUCTION

The work breakdown structure shows all the required work to be done during the projects duration and informs the project.

Tabular View

Level 1	Level 2	Level 3
1 Network Health Monitoring Applicaiton	1.1 GUI Shell creation	1.1.1 Analysis of requirements 1.1.2 Design of the shell 1.1.3 Implementation of design 1.1.4 Testing of solution 1.1.5 Review of solution by project sponsor 1.1.6 Project charter signed and approved
	1.2 Node Identifier Creation	1.1.1 Analysis of requirements 1.1.2 Design 1.1.3 Implementation of design 1.1.4 Testing of solution 1.1.5 Implementation of the completed module 1.1.6 Review of solution by project sponsor 1.1.7 Project charter signed and approved
	1.3 Port Scanner Creation	1.1.1 Analysis of requirements 1.1.2 Design 1.1.3 Implementation of design 1.1.4 Testing of solution 1.1.5 Implementation of the completed module 1.1.6 Review of solution by project sponsor 1.1.7 Project charter signed and approved
	1.4 Internal Testing	1.1.1 Explorative testing 1.1.2 Test case execution 1.1.3 Bug fixes with manual regression testing 1.1.4 Explorative testing with the client 1.1.5 Delivery of the application
	1.5 Documentation phase	1.5.1 Creation of user manual 1.5.2 Creation of training videos 1.5.3 Testing of material with client 1.5.4 Delivery of all documentation to the client

GLOSSARY OF TERMS

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.
Work Package:	Work packages define the lowest ring of work possible which is the smallest unit of work possible
WBS Element:	A WBS element defines any component on the WBS as well as any further elements or work packages connected to it on lower levels.
WBS Component:	A Components in a WBS define any section present on the WBS diagram be that a work Package or an element.

Tree Structure View

APPENDIX B: GANTT CHART AND PRECEDENCE NETWORK

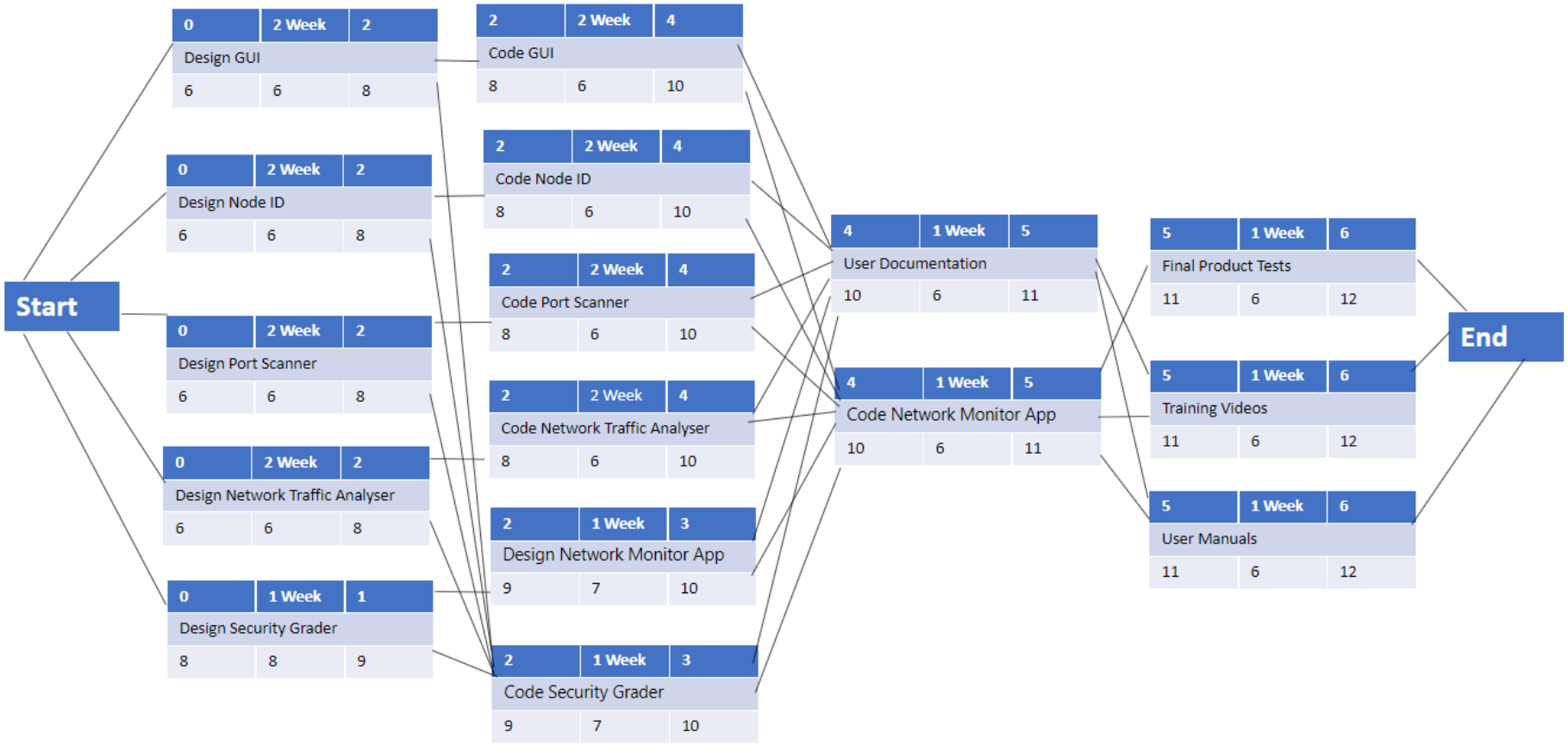
GANTT CHART

Time / 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
Design Network Monitor Application												
Design GUI												
Design Node Identifier												
Design Port Scanner												
Design Network Traffic Analyser												
Design Security Grader												
Code GUI												
Test & Document GUI												
GUI Quality Checklist												
Code Node Identifier												
Test & Document Node Identifier												
Node Identifier Quality Checklist												
Code Port Scanner												
Test & Document Port Scanner												
Port Scanner Quality Checklist												
Code Network Traffic Analyser												
Test & Document Network Traffic Analyser												

Time **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
Network Traffic Analyser Quality Checklist												
Code Security Grader												
Test & Document Security Grader												
Security Grader Quality Checklist												
Code Network Monitor Application												
Test & Document Network Monitor Application												
Network Monitor Application Quality Checklist												
Completion of Documentation												
Create Training Videos												
Create User Manuals												

Craig	Cameron	Jay	Josh	Megan	Andrew	James

PRECEDENCE NETWORK



APPENDIX C: RISK ASSESSMENT

Risks log:

Risk number	Risk description
R1	Changes to project
R2	Cost overruns
R3	Scope creep
R4	Stakeholder dissatisfaction
R5	Low team member participation
R6	Technical issues

Risk analysis matrix:

R1- MITIGATE changes to the project will be reported to the project manager. They will analyse the change requested, enter it into the risk analysis matrix, and decide on the action from that point.

R2- Cost overrun is unlikely and does not need a current plan to counter it.

R3- MITIGATE scope creep will be mitigated by documenting the project requirements. Any changes will be reported to the project manager and accessed and managed accordingly. A clear project schedule will be put into place. The scope will be clearly defined with the stakeholders. Make sure all team members are briefed on the scope of the project.

Three main risks were identified –

R4- MITIGATE stakeholder dissatisfaction was identified as a high-impact risk that could impact the project's overall success.

The mitigation for this risk involves regularly updating and receiving feedback from stakeholders and getting a clear and defined scope for the project.

The project team and project manager will have a weekly meeting with the stakeholders to discuss the project's progress to ensure that it is within the scope and will meet the specifications set out in the project plan.

R5 – MITIGATE It was identified that low team member participation within the project would significantly impact the project and the performance of team members. This was identified as likely to happen from past experiences managing and involvement in projects.
The mitigation for this risk involves keeping team members updated via teams if they cannot attend in person. We are having weekly team meetings and keeping track of team members with low participation.

The project manager will report any team member who is not participating and update the other members on the progress of their section of the project.

R6- AVOID technical issues within the project were identified as a high-impact risk that could impact the overall project.

Technical issues include the test network not functioning as intended or the test network being too small.

Mitigation was put into place to minizine the effect of this. The network being used has been tested previously and is working as intended. There will be several test networks downloaded that are available to use in the event of one failing.

If any problems arise with the test network, the network creator will be contacted to discuss and resolve them promptly.

The team has permission to test the tool on the University Abertay hack lab network. This network is substantially more extensive than the test network being used.

RISK OCCURRENCE TIME FRAME:

Identified risk	The projected time frame for risk
R1	Now until the end of the project
R2	Weeks 5 until the end of week 10
R3	Weeks 5 until the end of week 10
R4	Weeks 3 until the end of week 10
R5	Now until the end of the project
R6	Weeks 5 until the end of the project

RISK MANAGEMENT PLAN APPROVAL:

The undersigned acknowledges the risk management plan. The undersigned will approve any changes to the plan.

Signature: _____ Date: _____

Print Name: _____

Title: _____

Role: _____

Signature: _____ Date: _____

Print Name: _____

Title: _____

Role: _____

Signature: _____ Date: _____

Print Name: _____

Title: _____

Role: _____

Signature: _____ Date: _____

Print Name: _____

Title: _____

Role: _____

APPENDIX D: QUALITY METRICS

With the Network Health Monitor, the Quality Baseline has been established in section (22. Quality Baseline) and the conditions highlighted in this section will be used as a metric to measure the quality of the application.

a. **User-Friendly GUI:** One of the main focuses of this application is to allow the Network Health Monitoring Application to be easy to use for IT professionals. Measuring this metric can be subjective depending on who uses it, but this will be tested during the testing phase by the project testers who will rate the GUI between a score of 1-10.

b. **Map Every Node on the Network:** This function is one of the integral components for the application to work as the Network Health Monitor needs to be able to identify all nodes on the network for it to function successfully. This will be tested by the project tester during the testing phase and will need to be 100% functional before completion.

c. **Easy Visual Identification of Security Risk:** The application needs to be able to alert the user of any known security risks identified on the network. This will be a critical function as failure to bring attention to any potential threats can be a risk. The application will need to notify the user and this notification will need to be emphasised.

d. **Blacklist and Whitelist Specific IP Addresses:** This function is one of the integral components for the application to work as the Network Health Monitor needs to be able to categorise IP addresses based on the potential threat they are to the network and add them to a blacklist if the IP is deemed untrustworthy based of parameters. This will be tested by the project tester during the testing phase and will need to be 100% functional before completion.

e.

Quality Control Metrics Table

Metric	Standard	Frequency	Report
User-Friendly GUI	Score 1 -10 ≥ 8 Pass	Testing Phase	Weekly Meetings
Map every node on the network	100% Functional	Testing Phase	Weekly Meetings
Easy visual identification of security risks	Score 1 – 10 ≥ 9 Pass	Testing Phase	Weekly Meetings
Blacklist and whitelist specific IP addresses	100% Functional	Testing Phase	Weekly Meetings

APPENDIX E:

Change Order

CHANGE ORDER			
Project:			
Order No:		**Date:**	

Change Proposed:
Reason for Change/Benefits:

Change Duration:	**Tasks:**
Start Date:	
Completion Date:	
Change to WBS:	

Resource Allocation:			
Staff Allocation:		**Hrs:**	
Cost Details :			
			Total (£):

Change Log

Change Order No:	Description	Proposal Date:	Expected Completion:	Status:	Allocated Staff:	Work Begins:	Work Completed:	Signed

Project Budget

Cost Estimate		
		£23,467.50
Project Phase	Work Tasks	Allocated Budget
GUI Shell creation	1.1.1 Analysis of requirements 1.1.2 Design of the shell 1.1.3 Implementation of design 1.1.4 Testing of solution 1.1.5 Review of solution by project sponsor 1.1.6 Project charter signed and approved	3,911.25
Node Identifier Creation	1.1.1 Analysis of requirements 1.1.2 Design 1.1.3 Implementation of design 1.1.4 Testing of solution 1.1.5 Implementation of the completed module 1.1.6 Review of solution by project sponsor 1.1.7 Project charter signed and approved	3,911.25
Port Scanner Creation	1.1.1 Analysis of requirements 1.1.2 Design 1.1.3 Implementation of design 1.1.4 Testing of solution 1.1.5 Implementation of the completed module 1.1.6 Review of solution by project sponsor 1.1.7 Project charter signed and approved	3,911.25
Network Traffic Analyzer Creation	1.1.1 Analysis of requirements 1.1.2 Design 1.1.3 Implementation of design 1.1.4 Testing of solution 1.1.5 Implementation of the completed module 1.1.6 Review of solution by project sponsor 1.1.7 Project charter signed and approved	3,911.25
Internal Testing	1.1.1 Explorative testing 1.1.2 Test case execution 1.1.3 Bug fixes with manual regression testing 1.1.4 Explorative testing with the client 1.1.5 Delivery of the application	3,911.25
Documentation Phase	1.5.1 Creation of user manual 1.5.2 Creation of training videos	3,911.25

	1.5.3 Testing of material with client 1.5.4 Delivery of all documentation to the client	

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