# **Project Plan**

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## ICT & IC Information Technology Department Emmen

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## Introduction

This document provides a detailed description of the project planning, research, and execution of the author's graduation work placement in the client company, Q-ICT.

The graduation work placement will be executed on the behalf of NHL Stenden University of Applied Sciences, which is based in the north of the Netherlands and offers a large variety of courses in both Dutch and English. The schooling has a heavy emphasis on group and practical project-based work, supported by a thorough theoretical education.

This document is created as one of the necessary requirements to submit to the School Supervisor within the first 2 weeks after the author started his graduation project. This document represents one of the essential prerequisites for the author's successful completion of the graduation work placement project of NHL Stenden at the ICT & IC Information Technology Department in Emmen, serving as one of the mandatory requirements therein to achieve his bachelor's degree.

With NHL Stenden being an international educational institution, there are campuses across the country as well as abroad. The one of relevance for this project is in Emmen and offers four international courses, ICT & IC Information Technology course is one of which. This graduation project will be solely undertaken by the author of this document, a 4th year international IT student to complete his 4 years study of ICT in Stenden.

As the details of this commission have yet to be finalized, this document is subject to change and any alterations will be shared promptly and marked accordingly.

## 1.1 Layout of the Project Plan

General information: Provides an overview of both the sponsoring organizations well as the organization in which the project is to be carried out. Project objectives: Consists of the objectives which are determined by Q-ICT as well as the projects' intended results. Project activities: Defines the tasks that need to be performed for the realization of the project, while taking into consideration the prioritization of certain tasks based on significance.

- 1. Project boundaries: States the project boundaries and the project duration.
- 2. Products and Interim Results: Specifies the products and results, which extends non-physical products such as client meetings.
- 3. Quality: Provides an overview of how the quality of the work will be monitored and eventually assessed.
- 4. Project Organization: Comprised of organizational information regarding the author and Q-ICT and its inner workings, as well as details regarding the correspondence with the sponsoring organization.

- 5. Planning and Scheduling: will show the schedule of tasks to be done as well as their dependence on other tasks for their completion or quality. Including various charts and diagrams, it will outline the time-scope as well as the desired time-consumption of the tasks.
- 6. Costs and Benefits: Discusses the time and resources required, while taking the benefits of the sponsoring organization into consideration.
- 7. Risk Analysis: Gives a detailed account of potential internal and external risks.

# **Project Objectives**

The primary objective of this assignment is to design and develop a new functionality on top of an existing application that can monitor Q-ICT and its client's networks and endpoints, then visualize and display the data. The feature should allow Q-ICT to control what data can be displayed to their users based on their tags.

The specific objectives of the project are considered as follows:

- 1. An in-depth research report about SentinelOne and its EDR capabilities and the current technologies behind the QaaS app
- 2. A dashboard module within the QaaS App that connects to SentinelOne API and Management Console, fully operational
- 3. To ensure that the product is scalable and can be easily adapted to accommodate future changes and additions to Q-ICT's product line.
- 4. To make the visualization of the returned data from the API calls in the form of JSON for user-friendliness.
- 5. To ensure that the product access is secure, adhering to all cybersecurity best practices, and that all sensitive data is protected from unauthorized access or manipulation.
- 6. To deliver the project on time (90 working days), within spec, and to the satisfaction of the project stakeholders.

# **Project Activities**

Project Activities details all activities sorted by category that are needed to successfully complete the project.

## 3.1 Planning

- 1. Initial contact with Q-ICT (via e-mail and/or LinkedIn).
- 2. Receive the assignment description from Q-ICT, make a definitive version of the Description of the Graduation Project based on the received information.
- 3. Make an initial version of the research topic, main question, and 4 research sub-questions and add it to the Description of the Graduation Project document.
- 4. Send the definitive version of Description of the Graduation Project document to graduation.ict-ct-emmen@nhlstenden.com and to get it approved.
- 5. After making sure that all the requirements to start the graduation project are met, send the Notification Form document to graduation.ict-ct-emmen@nhlstenden.com to notify them that the author has officially started his graduation work placement and to receive a graduation School Supervisor assigned to the author from the Graduation Committee.
- 6. Receive a School Supervisor and set up a physical/online meeting with him/her to discuss the graduation work placement and receive feedback.
- 7. Complete and sign the NDA of the graduation project between NHL Stenden and Q-ICT, along with getting the NDA the signatures of Niels Dorm and the Company Supervisor.
- 8. Triplicate the NDA, so that the school, the author, and Q-ICT can keep the document.
- 9. Make a draft version of this document (Project Plan)
- 10. Discuss the draft version with the Company Supervisor.
- 11. If required, implement the changes proposed by the Company Supervisor.
- 12. Make a definitive Project Plan.
- 13. Make a definitive version of Research Proposal and Planning.
- 14. Send the definitive version of Project Plan, Research Proposal, and Planning to the assigned School Supervisor within 2 weeks of the initial date of the graduation work placement.

- 15. Create a GitHub repo and GCP account from Q-ICT, ensuring that the author obtains all necessary permissions to access Firebase cloud service products.
- 16. Gather information about the project, its boundaries, and goals.
- 17. Have meetings and interviews with the stakeholders and product owner to discuss and discover further boundaries and project specifics.
- 18. Research project planning & management, and the technical part of the research topic, study available materials.
- 19. Set up a project backlog and a SCRUM board in an online DevOps environment.
- 20. Write User Stories and Tasks.
- 21. Create Sprint backlogs based on user stories.
- 22. Receive the previous code and documentation from the previous iteration of this project.

### 3.2 Research

- 1. Gather information about the project commissioner.
- 2. Set up research thesis document on the agreed research topic.
- 3. Create a definitive version of the research topic, main question and 4 research sub-questions.
- 4. Discuss research questions with the Company and School Supervisor.
- 5. Analyze existing product done by the previous developers.
- 6. Look up programming resources and proprietary integrated development environments.
- 7. Brainstorming with Company Supervisor to define tasks for the product backlog.
- 8. Determine feasible tasks.
- 9. Determine out of scope tasks.
- 10. Determine out of range tasks.
- 11. Make a list of the proposed features.
- 12. Make a list with the required hardware if any.
- 13. Present the list and ideas to the Company Supervisor and Product Owner.
- 14. Create an advice report for the clients and stakeholders backed up by theory.
- 15. Discuss concepts, ideas, and tasks with the client.
- 16. Write down the findings and discussion in a research report document.
- 17. Analyse the feedback from the Company Supervisor.
- 18. Create a feature/task priority document, set up the Backlog board accordingly.
- 19. Discuss a draft variant of the Graduation Research Report to Company Supervisor.
- 20. Send the initial draft of the Graduation Research Report to School Supervisor and receive feedback.
- 21. Implement the feedback and/or task ideas from the client into the task list.
- 22. Discuss the final concept with Company Supervisor.

23. Finish the research phase and all related documents.

### 3.3 Design

- 1. Create a Definition of Done with the Company Supervisor.
- 2. Create the visual design of the platform.
- 3. Create a test plan, making sure the platform works as planned.
- 4. Create a document for User Stories, explaining what the system will do.
- 5. Create a User Manual, explaining to the users how to use the system.
- 6. Choose the required hardware.
- 7. Decide on fonts, color palette and other design elements.
- 8. Outlining required languages and components
- 9. Make a definitive choice of our concepts.
- 10. Sketch the final product.
- 11. Visualizing the final product with mock-ups (if applicable).

### 3.4 End Product

- 1. Finalize and use the definitive version of the concepts and tasks.
- 2. Develop the product.
- 3. Develop the responsiveness of the product.
- 4. Plan weekly sprints and sprints reviews.
- 5. Test the product according to Definition of Done requirements.
- 6. Implement the professional product in accordance with the frameworks and requirements of the stakeholders.
- 7. Make sure the professional product meets the given standards.
- 8. Respect the testing plan and scheduling.
- 9. Discuss and implement feedback coming out of the testing phase.
- 10. Make a report on the final product.
- 11. Wrap up all the documentation, proofread and finalize.

## 3.5 End-Presentation/ Colloquium

- 1. Clean up the project (code).
- 2. Sort and archive all documents.
- 3. Make sure the connections, the live version, the database, API connections, cloud functions, and other cloud services are working.
- 4. Collect essentials for the final presentation.

- 5. Build a coherent presentation detailing both the product and the road to achieving it.
- 6. Presenting the definitive product to the project commissioner (first and second school supervisors), as well as clients
- 7. Receive feedback and the grade for this graduation work placement.
- 8. Reflect on what has been done, and what could have been done better. (Retrospective)

## **SCRUM Activities**

This chapter will discuss the SCRUM activities that have been done during the development of this project. SCRUM is an agile work methodology used primarily in software development projects. The implementation of SCRUM in the project is as follows:

#### 4.0.1 SCRUM Roles

According to (Atlassian, n.d.), a SCRUM team consist of SCRUM master, Product Owner, and the SCRUM Team.

The Product Owner for this project will be the stakeholders of Q-ICT themselves, which mainly consists of the managers, the security department leader, and the Company Supervisor. They know exactly what they want to achieve with the project, and they make most of the user stories of the project.

The SCRUM Master would be the Company Supervisor who is responsible for facilitating the SCRUM board and ensuring that the project stays on track.

The development team consists only the author himself, who is responsible for the development of the project.

#### **4.0.2** Events

Events in SCRUM are time-boxed iterations, which means each iteration repeats these events and each event has its own time limit. The events used in this project are as follows:

#### **Sprint**

A sprint is a consistent iteration where User Stories are completed. It is usually about one or two weeks.

### **Planning Poker**

also known as SCRUM poker, is a consensus-based technique used by the author and the Company Supervisor, to estimate the effort or complexity of tasks in the Product Backlog.

### **Daily Stand-up**

Daily stand-up are short meetings, usually lasted around 15-45 minutes to ensure that everyone is aware of what others are doing. For this project, it serves more to tell the Product Owner what have the author done in the previous day. Except on Monday, the daily stand-up is scheduled at 09:30, usually done online in a Teams call.

### **Sprint Review**

It is a periodic meeting that happens at the end of every Sprint to show the client and the stakeholders the progress of the assignment so that they can either approve it or ask for changes. For this project, a sprint review is set every Monday at 09:00 for the Development team. This is where the Product Owner (Company Supervisor) checks if the sprint has been completed and implemented properly.

#### **Sprint Retrospective**

It is a meeting that happens after the Sprint Review to detect and improve a project's obstacles so that the same mistakes will not be made in future sprints. In this project, it is more like a private meeting between the author and the Product Owner to discuss what are the issues that the author has faced during the development of this project or to discuss any problems he faced within the organization as well.

#### 4.0.3 SCRUM Artefacts

They are the documents of value to provide transparency and Opportunities for inspection and adaptation. All of these documents were produced in this project to ensure adherence to the SCRUM principles. This document will only discuss their definitions, which are the following:

#### **Definition of Done**

A document stating that User Stories can be considered done when it has passed the stages written in the document. The author has created this document before the beginning of the Realization phase where it is agreed on and signed by both the author and Company Supervisor.

#### **Product Backlog**

Is a prioritized list of all the work that needs to be done for the product. It includes features, enhancements, bug fixes, technical work, and knowledge acquisition that are necessary to deliver a viable product. The product backlog are available in Azure DevOps environment of this project.

#### **Burndown Chart**

Is a visual representation of the work remaining versus time. It helps the author track progress during a sprint, and predict if the author will complete the work by the end of the sprint. It will be in form of a separate document that the author have created for himself, not in Azure DevOps

#### **Sprint Backlog**

Is a subset of product backlog, consisting of the items selected for the current sprint plus a plan for delivering them. The sprint backlog is available in the DevOps environment of this project.

# **Project Boundaries**

This chapter will give further insight into what the final product will consist of and what is not within the scope of this project. Should there be any changes to the scope of this project, this section will be updated accordingly.

### 5.1 Duration

The project will take place throughout period 4 of the fourth year of the author's study in NHL Stenden, incisively from 19 February 2024 to 24 June 2024. The duration of the project is 90 working days with a target of 40 hours per week. The author will carry out the project at the host company office building in Kapitein Nemostraat, Emmen.

## 5.2 Scope

No budget is given for this project.

The scope of the project is limited within SentinelOne capabilities as an EDR solution. This project is, in part, a continuation of feature development of an already existing application, the QaaS App. As this feature is a new addition to the software as per stakeholders request without the acknowledgement of the client, it is expected that the project will be carried further and improved upon in the future. It serves as the Minimum Viable Product (MVP) as the basis pilot module for SentinelOne dashboard in the QaaS App.

### 5.3 Resources

The author will be given a desk with a docking stations and 2 monitors at the office building of Q-ICT in Emmen. The author will have rights to access the company's network and SentinelOne environment and resources. The author will be provided a supervisor that knows the field of coding, the Senior Developer of Q-ICT, who will be responsible for guidance and supervision to the author during the project.

The technologies used for the implementation will be using the same framework and cloud solution for the current software, namely Flutter, which is in Dart, and Firebase, which is in Node.js with TypeScript/JavaScript, and a NoSQL database from Firestore. The student will be given an environment in Firebase, as well as other existing technologies that will make it into the integration like Algolia and Google Secret Manager.

## 5.4 Preconditions

Below are listed conditions that should be met for the project succeed:

- 1. The author needs to implement SCRUM Agile management framework in the project.
- 2. Deliver the required documents stated in the graduation project module book.

The author has been asked to develop the platform with scalability in mind, as this will not be the final iteration of this product and might be carried out further by other development teams of Q-ICT later down the line.

## **Producs and Interim Results**

Within this chapter, the expected deliverables and interim results of both periods are listed and briefly explained. This section will be updated should the need for further documentation or products arise during the project.

### 6.1 Documentation

The documentation of the project will be composed of a project plan, a research report, minutes of the most informative team meeting, advisory documentation based on the research report (potentially as part of one of the aforementioned documents), a product backlog made up of tasks based on the prepared user stories, user manuals and a project report.

The documentation of working hours is done by means of an Excel file that allows the author to enter their individual hours with a brief description what was achieved in that time. Based on the product backlog, that are updated and reviewed weekly, as well as detailed sprint backlogs are created for the realization phase.

## 6.2 Research and Concept Specifications

This will contain the different concepts thought of during the project and the definitive concept chosen with clear reasoning and arguments. These include - a study title, a working group and investigators, background and rationale, specific aims, and analysis framework.

Furthermore, extensive research will be conducted on scrum and knowledge management, and how they can be used in the realization of the project. This documentation will help to keep track of the progress of the overall product conceptualization and the intermediate products, that will be stated in the final project plan. The backbones of this will be represented by the research report, to ensure educated choices are made for the selection of methods and overall approach for the product development.

## 6.3 Design architecture

Software architecture refers to the fundamental structures of a software system and the discipline of creating such structures and systems. Each structure comprises software elements, relations among each other, and properties of both elements and relations.

The architecture of a software system is a metaphor, analogous to the architecture of a building. It functions as a blueprint for the system and the developing project, laying out the tasks necessary to be executed by the teams. Dif-

ferent ideas will be explored to see what fits the project the best, and a definitive choice will be made in consultation, together, with the clients.

The database architecture is provided by the client. Database architecture refers to the organization of data within a database system. It defines how data is stored, organized, and accessed by the users and applications that interact with the database.

## 6.4 Final Product

At the end of the agreed project allocated timeframe, a complete final product will have been delivered.

### 6.5 End Presentation

Once the allotted time for the project concludes, the results of which will be shared in a manner specified by both the client and the lecturers, to display the results as well as give a general insight into the project timeline and working methods.

### 6.6 Interim Products Overview

The table below shows the various documents that need to be finished during this period along with their respective deadlines.

Task	Deadline
Minutes / Documentation of important meetings/ Inter-	As needed
view transcript between the author and the stakeholders	
Daily Scrum meetings	Daily
Monthly Report Document (Accountability)	Monthly overview, fill in daily
Project Plan (Initial Version)	First 2 weeks of the Graduation Work Placement
Research Proposal	First 2 weeks of the Graduation Work Placement
Planning	First 2 weeks of the Graduation Work Placement
Product backlog	Week 1-2
Midterm evaluation	Week 4-5
Sprint review	Week 2-10
Sprint retrospective	Week 2-10
Sprint backlog	Week 1-10
Mutual Peer Evaluation	Week 10
Presentation of realization phase results	Week 10
Thesis: All research necessary for the realization phase	Week 9 (End of the Research Phase)
compiled in one document	
FO/SRS/PRS	Week 10 (first week of the Realization Phase)
Definition of Done	Per document
Code of Conduct	Week 10 (first week of the Realization Phase)
Version Control	

# Quality

### 7.1 End Product

The product of this project is to deliver a working, easily scalable and maintainable web application where the client can view the statistics of any machines they have produced, as well as their clients should be able to access these data of their machines. The information can be seen for each machine one by one and can also be visualized from a graph.

This web application must be easily accessible, each component must be created in a separate environment so that each part can be managed easily or scaled up if there is the need to, without breaking the rest of the features or containers.

Special attention needs to be put in the security aspect. Access must be limited to logged users, and each incident listed must be manually curated by approved users. The database must also be protected from any injections or security flaws and the data must be sanitized and uniformised, if possible. More info about the database structure can be found in the Database Architecture document.

### 7.2 Control

Code wise, everything will be managed in GitHub, as the author will follow the best practices of quality of code guidelines, which consists of several programming conventions such as Comment conventions, Indent style conventions, Line length conventions, Naming conventions, Programming practices and Programming principles and Ethics Principles. To control the quality of the code, uploading to the Main/Master branch requires the code review and authorization from the Company Supervisor, as checking the code pre-emptively will reduce unnecessary time spent fixing the program and thus delays. Changes to the upper branch are forbidden, each new update needs to be committed from a separate branch that has been pulled from the most current safe build.

The interim results such as documentation and various features of the program will be checked by all group members and proofread by the members delegated to this, and feedback will be requested from university staff and the client.

The communication from the author and the company supervisor will be on Teams, Outlook e-mails, and WhatsApp messages, but also physical meetings, in the building of Q-ICT. To make sure that the project is going smoothly, and both parties are on the same page regarding what is being created and what must be made, weekly report sessions will be held between the author and the Product Owner, with the possibility to the school's supervisor to join.

# **Research Quality Assessment**

The research quality was assessed using the following criteria:

#### Currency

Timeliness: The publication date of each source was checked, to ensure that the information is up-to-date. Depending on the research requirements, both contemporaneous materials and current accounts of historical events were taken into consideration.

#### Relevance

- 1. **Relevance**: The source was checked to ensure that it is relevant to the project. Journal articles were examined by perusing abstracts and introductory paragraphs, and the publication date was verified to confirm its applicability to the research needs. As EDR solutions are recently a new aspect of cybersecurity, the sources can be ensured to be up-to-date and relevant to the research. The aspect of data visualization can be dated up to 1981, therefore the author will be more focused on the recent material, dating up to 2010, as the audience of this data visualization has changed as well to be more modern and up-to-date.
- 2. **Source Selection**: the author ensured that the sources were selected from a variety of sources, including journal articles and websites.

#### Authority

- Credibility: the credentials of each source's author were evaluated to ensure their subject-matter expertise. Biographical reference sources and search engine queries, including tools such as Google Scholarly, were employed to obtain information on the writer's background and qualifications, and the context in which the source was written.
- 2. **Type of Source**: each source was classified as popular, scholarly, internal or trade, with a clear distinction between the different types of sources. Popular and most convenient sources, such as web articles, were used to gain a general understanding of the research topic. Trade sources, for instance publication standards, were used to gain a better understanding of the research topic and to identify the most relevant source. Scholarly sources, such as journal articles and publications, were used to gain a comprehensive understanding of the research topic and to identify the most relevant sources. Lastly, the internal sources were used to gain a comprehensive understanding of the requirements for the research and execution. Oher types of sources were often not taken into account, due to their irrelevancy and inadequacy, such as Wikipedia articles.

#### Accuracy

- 1. **Reliability**: to establish the reliability of each source, the facts and data were cross-referenced with other documents addressing the same subject.
- 2. **Validity**: the author assessed the validity of each source by examining the author's credentials, source, publication reputation, and the presence supporting the evidence. The author also considered the objectivity of each source to ensure that the information was presented in neutral manner.

#### **Purpose**

- 1. Purpose and Commercialism: the purpose of each source was scrutinized to determine its congruence with the research objectives. The author analysed whether the source aimed to persuade, informed, provide an overview, or incite controversy. Similarly, it was assessed whether the source contained advertisement or other forms of commercialism that might influence the information provided. The impact of commercial on the source's content was carefully evaluated. This led to exclusion of sources, such as blogs and personal opinions from web articles, that were deemed to be biased or unreliable, such as those were sponsored by a company or organization with a vested interest in the research topic due to commercial reasons.
- 2. **Intended Audience**: the author appraised the target audience of each source to ensure its suitability for the research objectives. The source author's style and the intended audience of the source were considered.
- 3. **Conclusion**: the author ensured that the sources were appropriately used and that the information was cited correctly, in accordance with the APA 7th Edition citation guidelines.

# **Project Organization**

## 9.1 Team member, product owner, and contact persons

There is only one member of the team, the author, along with 2 supervisors from Q-ICT and one supervisor from NHL Stenden.

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Robbert Remie	r.remie@qict.nl	Stakeholder	+31 20 330 2216
Frans Huijgens	@nhlstenden.com	School	
Niels Doorn		School Lecturer	

## 9.2 Availability

The author is available on working days between Mondays until Fridays between 08:30-17:00. He can be contacted by e-mail, Teams, WhatsApp, SMS, or a call. Outside of these times the author is not expected to be working on the project but may be reached out due to the flexibility of certain occasions, special occasions, i.e., shortly upcoming deadlines or goals not achieved according to the scrum or activity board. However, the deadline will be kept in mind and the working hours might be adjusted based on that.

Any of the absence days will have to be explained by the author with the Monthly Report. The author will decide how to proceed, putting the project completion as the main objective. Also, all hours that have been done must be recorded in the Monthly Report document with a brief description of what was achieved that will eventually be sent to School Supervisor.

### 9.3 Team roles

There are a couple of roles within this Graduation Work Placement:

1. The author himself is responsible for coordinating tasks within the group and making sure those tasks are completed on time and meet the quality expectations. Moreover, they are responsible for piloting the project in the

right direction and acting as a bridge in communicating between Q-ICT and the teachers. He also schedules meetings with the teachers and Company Supervisors if needed.

- 2. The author as the developer is focused on doing the tasks that he himself created.
- 3. The company supervisor as the SCRUM Master, is focused on facilitating the backlog among the developers, and making sure that the Scrum team carries out every sprint perfectly.
- 4. Product Owner defines the why is it worth to develop the product, who it is for, and what features, requirements should it contains, and to main the product backlog.

## 9.4 Reporting

The author will meet at least once a week for a Sprint Review and Sprint Retrospective (usually on Monday at 09:30, at the beginning of a new sprint) with the Company Supervisor to discuss progress for individual tasks and overall project progress. Moreover, both members get to speak up about their concerns about how progress has been made so far. This is to ensure that there are no unspoken conflicts or issues. This meeting usually takes about an hour. All this will be taken down from the 8 work hours that are required by the author daily.

Using the weekly quota, the author can then plan and adjust the needs of the project going forward. Furthermore, the author has decided to use Teams, Outlook, and WhatsApp as the main ways of communication. Outlook email has been chosen for official contacts between the author and the School Supervisor, with MS Teams as an alternative.

Furthermore, a Daily Standup with the Company Supervisor (and additional interns at his disposal) will be held every working day, with the maximum duration of 30 minutes. This usually takes place at 09:30. This Daily Standup is where the author would state what has been done the previous day, what are his plans for this day, and discuss any potential impediment that he is facing. This method will ensure transparency, collaboration, and adaptability within a real working environment, ultimately contributing to the successful delivery of the sprint goal working as a team.

Initially, during the research and documenting phase, a hybrid project planning method will be used. Whenever work must be done, tasks will be created and assigned to one or more team members along with a deadline. To keep track of current and past tasks, a SCRUM environment chosen by Q-ICT itself will be used, along individual tracking of hours and progress. At least 2 weekly meetings will take place where the tasks will be discussed, and new tasks will be added.

During the period when the SCRUM method is being used, the author is expected to keep his details up to date in his Monthly Reports, as well as accurately noting down what feature he has worked on. Once a sprint concludes, the sprint is reviewed together with the Company Supervisor and new user stories for the following one are selected based on the product backlog. This backlog is also updated with any new tasks that may have popped up during the sprint and unfinished tasks are updated and reentered.

Finally, the author came to an agreement to use GitHub as the digital tool for collaborating within the project group. This will enable a smooth workflow for the team members, as well as securing older product versions in case of a mishap. This platform will be able to show the working progress of the project, as well as keep track of the SCRUM tasks by using its Project feature. This method of work will be implemented during the developing stage of this project.

# Planning and Scheduling

As effective planning and scheduling are essential for delivering a high-quality software application within budget and on time, by taking a structured approach to project planning, the development can be ensured that it is working efficiently and effectively towards achieving the project objectives.

Below the prioritization of project deliverables, estimation of their timeframes and a Gantt chart depicting set time frames are described.

The graduation work placement project's duration is 90 working days, which makes up for about 18 weeks. The graduation project is split up into 2 parts, the Research phase, and the Realization phase. The Research phase is where the author will work more into the necessary documentations required as stated in the module book, and in the end will produce a Report. The Realization phase is where the author is more focused on the technical coding part of the project, working closely with the Company Supervisor in SCRUM and in the end will produce a working end-product as stated in the Graduation Project Description document.

Because of the nature of planning which is for time estimation and serves as a roadmap for the project, the author will assume that each phase of the project will take about 9 weeks, thus making up the total number of 18 working weeks. Please keep in mind that this plan is just for guiding the author through each phase of the project lifecycle and ensuring that all parties (Q-ICT and NHL Stenden) are aligned with the project goals, timeline, and expectations. Some future changes might be required as the author sees fit, as one cannot predict encountering random unpredictable risks, thus rendering the process development of this graduation work placement project.

## 10.1 Research Phase (26/February/2024-29/April/2024)

Code	Task	Weeks	Can only take place after
A	Graduation Work Placement	1	-
	Description		
В	Non-Disclosure Agreement	1	-
С	Graduation Project Notifica-	1	-
	tion Form		
D	Project Plan (draft version)	2	A, B, C
Е	Research Proposal	2	A, B, C
F	Research Thesis Report Pa-	6	A, B, C, D, E
	per Document		
G	Monthly Reports	1-9	-

Н	Interview Transcripts	5	-
I	Test Plan	7	G
J	Functional Design (FD)	8	D
K	Technical Design (TD)	8	D

## **10.2** Realization Phase (29/April/2024-08/July/2024)

Code	Task	Weeks	Can only take place after
A	Definition of Done	1	-
В	Product Backlog	Epics	2 - 9
С	Sprint Backlog	3	-
D	Research Document (final	8	G
	version)		
Е	Monthly reports	1-9	-
F	Sprint tasks	2-9	G
G	End-product	9	A
J	End-presentation	10	G
	(colloquium)		

It is important to note that unexpected hurdles may arise during the execution phase, leading to deviations from the original plan. These deviations may arise due to factors such as prolonged feedback and approvals from clients or situations where activities require more resources than initially anticipated as well as plain lack of knowledge. Therefore, it is crucial that the author and the planning remain flexible and provide enough room to accommodate changes as required to ensure successful project completion and school and Q-ICT satisfaction.

## **Cost and Benefits**

This chapter will discuss various costs and benefits relating to this project.

### 11.1 Cost

For this project the budget is set around 20€ per month in terms of resource consumption on the Firebase environment. However, should the author require anything in terms of software and/or cloud access, Q-ICT may provide this.

Building the project should not prove expensive since the product is a software application. The expenses may come with hosting and maintenance of the product, for which the author is not responsible.

### 11.2 Benefits

The project will provide benefits in terms of allowing Q-ICT, as well as its clients, to have data visualization of the gathered data for internal use or clients' usage. This functionality will ultimately enable the QaaS app to monitor their internal APIs and enable more automation as the new functionality will be a template for integrating their future APIs.

As for the author, building a web dashboard for a real client will provide the author with real-world experience and an opportunity to apply their knowledge and skills in a practical setting.

# **Risk Analysis**

This chapter handles the possible risks that may be encountered during the project and ways to handle the problems. This is visualized on the table below.

Risk	Possibility	Possible Outcome	Prevention	Measure taken
Graduation	Likely	The author will be	Not possible	
Work		forced to take		
Placement		extended periods in		
is not		his study in NHL		
finished on		Stenden Emmen		
time				
Contracting	Less likely	The author will have to	Maintain 1.5-	The author will
COVID-19		quarantine for 2	meter distance	have to work
		weeks, and the project	and use face	during down time
		will be set back.	masks when	not to fall behind,
			needed	getting vaccines
				and respecting
				measures
Common	Less likely	The author will be set	Good health	
illness		back for a moment.	care and	
			communicate	
			properly with	
			the Company	
			Supervisor	
Tasks not	Possible	Set back until tasks are	Proper planning	Sprint reviews,
finished on		finished	and time	plan next sprints
time			management	differently, issue
				warnings if other
				causes

Insufficient	Less likely	Set back until task	Actively ask	Plan next sprint
task		schedule is done	members for	accordingly
		correctly	document /	
			peer review,	
			proof-reading.	
Lack of	Less likely	The author might not	Research proper	Research what
technical		be able to realize	technical skills	skills the team is
knowledge		certain parts of the	needed, practice	lacking,
		project.	these and ask	
			for assistance if	
			needed	
Loss of data	Unlikely	Loss of data/files. The	Frequent back-	Restore files from
		amount depends on	ups / version	latest back-up/
		the most recent back-	control	revert to an
		up.		earlier version
Insufficient	Possible	End-product of lesser	Structured Test	Review test
testing		quality	Plans and	reports and run
			sufficient time	tests again
			to complete the	
			tests	
Hardware	Unlikely	Set back until	Actively check if	Order a new part
malfunction		hardware is replaced	hardware is in	as fast as possible
			working	and replace it
			condition	
Lack of	Possible	This will slow the	Frequent	Weekly meetings,
proper		development of the	communication	multiple ways of
communicat		project.	with the School	communication
ion with the			Supervisor,	and reaching out
			follow up	

School			emails,	
Supervisor			messages	
Supervisor			through	
			WhatsApp,	
			calling on the	
			phone in case of	
			emergency	
Security	Unlikely	Personal information	Testing for	Consultation
issues		could be stolen.	security issues.	regarding Secure
				Programming and
				following best
				security practices
Security	Possible	Update on the	Use newer,	Check for updates
issues on		libraries, or change the	community	and be sure that
the libraries		libraries	trusted libraries,	the libraries used
used			with frequent	can be applied in
			updates.	the future.
Additional	Possible	The progress will be	Good	The author will try
research		slowed down, causing	communication	to communicate
required by		troubles with keeping	between the	as efficiently as
the		the deadline.	author and the	possible with the
stakeholder			stakeholders.	client to avoid any
S				misunderstanding
Workload	Possible	Due to the possibility	Reassess	Plan sprints
Too Heavy		of the author being	progress	accordingly and
		unfamiliar with some	frequently and	have weekly
		of the subject matter,	communicate	sprints reviews.
		there is a possibility	any setbacks	
		there may be	with the	
		miscalculations		

regarding the sprint	Company	
planning	Supervisor	

Table 2: Risks

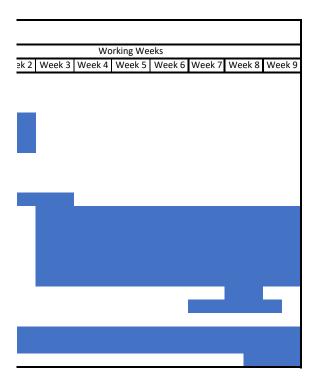
## Appendix

Gantt Chart

# **Appendix A**

# **Gantt Chart Research Page**

Research Phase Gantt Chart (26/February/2024 -	29/April/20	24)
Activities	Wee	ek 1 We
Graduation Project Description		
Graduation Project Notification Form		
NDA signed and triliplicate by 3 parties		
Research Proposal		
Project Plan		
Planning		
Interview with Company Supervisor, Stakeholders, Owner and Cybersecurity Consultant to determine requirements		
Setting up LaTeX environment for document editing		
Initial meeting with the School Lecturer to determine Requirement Analysis		
Set up Azure DevOps environment (developers and stakeholders account) & GCP Firebase E-mail Account		
Studying the QaaS app front-end (Flutter code)		
Studying the back-end code (Node.js server, Firebase console, cloud functions, and other services utilized)		
Studying and reading the SentinelOne API documentation		
Studying and reading the documentations of N-Central for API monitoring		
Studying and reading the documentations of Pax8 for API monitoring		
Studying and reading the documentations of Bodyguard for API monitoring		
Studying and reading the documentations of for API monitoring		
School Lecturer Visit		
Making SRS, FO, PRS, with Class Diagram, Sequence Diagram, Use Case Diagram, Activity Diagram (optional)		
Monthly Report		
Sprint Review for Company Supervisor		
Research Report excluding Realization, Conclusions & Recommendations, and Evaluation chapters		



# **Appendix B**

# **Gantt Chart Realization Page**

Realization P	hase Gantt Ch
Activities	Week 1
Determine Definition of Done with Company Supervisor	
Setting up the SCRUM board in Azure DevOps	
Determine Story Points	
Create Sprints	
Create Product Backlogs	
Create Burndown Charts	
Code in the front-end client-side Flutter test environment	
Code in the back-end server-side Node.js and Firebase cloud environment	
Updating Research Report and filling out the missing chapters	
Research Report check with Company Supervisor	
Daily Stand-ups	
Sprint Restrospective	
Sprint Review	
Unit Testing	
Bugs finding and fixing	
Finalizing the final product	
Deploy the final product in Firebase hosting	
Monthly Report	
Sprint Review document for Company Supervisor	
Research Report (initial draft)	
Research Report (final draft)	
End-presentation (colloquium)	

art (29/April/224 - 8/July/2024)										
	Working Weeks									
We	Week 2 Week 3 Week 4 Week 5 Week 6 Week 7 Week 8 Week 9									

