



Evaluation and Reflection

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Chapter 1

Introduction

This document is made as a separation from the thesis graduation report of the author, as per the requirement stated in the Graduation Project Manual of NHL Stenden ICT & Information Technology Bachelor department in Emmen branch in the year 2023-2204. However, this document is still regarded as a part of the graduation thesis report, and should be read in conjunction with the main report.

The purpose of this document is to evaluate and provide in-depth analysis of the product, the process undertaken, and outline the competencies and the author's own functioning that takes place during the graduation project from the author's point of view. This document n will be divided into two sections, as the name suggests. The first section will discuss more about the overview of the project, whilst the second section will discuss the evaluation of the project. Both will be written in a subjective way, as it reflects on the author's own opinion and experience during the project.

Chapter 2

Evaluation and Reflection

2.1 Evaluation

The assignment had a high level of complexity, as it utilizes many number of frameworks and tools, the infrastructure analysis that has been done, the Design Patterns and software architectural pattern thought and created to solve potential complex problems consisting of both new and existing functionalities, and ultimately the creation of test strategy that would improve the quality of the delivered product.

2.1.1 The Process

What went well

The number one factor of my completion of this project was that the company already know what they wanted from the project. Whenever I was confused and needed answers, I could always ask the Company Supervisor and the Stakeholders, and they always pointed me to the right direction. The project objectives were already clear from the beginning, so the Analysis phase did not take long because there was no miscommunication or confusion between the company and me. And I feel like the SCRUM methodology that is used in the company was very effective, as we had fewer meetings than the normal SCRUM methodology, so we had more time to work on the project. The SentinelOne API itself is also very well-designed and easy to use, and the documentation that they provided was very clear and concise.

What could be improved

During the development of this project there were a few things that could have been done better. The first one was me trying to solve the issues that I have that have been taking too much time to solve. For example, there was an instance where in the JSON response, one of the fields only contains 4 types of answer in the form of Strings. In my mind, it was a logical thing to do to implement enumerations to that specific class of the response type, but in reality casting that variable as an enum, as opposed to a String, makes it way messier and difficult to work with due to the extra steps that need to be taken. Additionally, there were some times when I felt that some pages need to use Stream Builder because of the data fetched, it turns out that my Supervisor does not recommend it because the data does not change that often and that it would be heavy on the application. So I needed to revert to the previous solution, which was using Future Builder, and I wasted some time there because implementing a Stream Builder took some time for me to understand. In conclusion, instead of deciding to do the engineering of the application all my own, I feel it would be better if I consult to my Company Supervisor first before making the decision, and therefore consuming my time to do it.

As for what would I do differently on the future, I would not focus too much on fixing one of the issues that I currently have, instead I would put that aside first and try to finish as much as possible by doing other tasks in the Product Backlog. I would also be less hesitant to ask for help from the Senior Developers when encountering an issue that has taken a long time to solve.

2.1.2 The Product

What am I proud of

For the end-product, I am very proud to the fact that I have achieved the project goal and even exceeded that by implementing the pages that were needed and doing optional features that were on lower priority in the Backlog. This also means that I have completed the project in just enough time for me to debug my part of the application as a whole, and managed to solve all the existing bugs and features regarding responsiveness to other screen sizes.

What could be improved in the product

On the back-end, I made several cloud functions for the integration of SentinelOne API, storing user preferences, downloading auto-generated reports in PDF, and updating the SentinelOne API key every month. However, there is one function specifically that is a result from compacting multiple functions into one, which is the function that fetches all data related to SentinelOne. This could cause that function alone to have over 4,000 requests on one user alone as I was often calling the function during the development. Combining the fact that about all Q-ICT clients are going to use this application to see their SentinelOne data, this could easily exceed the 4,000 requests that I have managed to make in one day. I have looked into it, and for Firebase Cloud Function version 2.0 there were no limitation to how many requests that can be made in a day. Also, the pricing would not get impacted by a lot as it will increase the cost by 0.40 USD per 1,000,000 requests. Initially, I came across this idea of combining everything into a single function because how similar it is to write a function that fetches different data from SentinelOne, so I thought that it would comply to the DRY (Don't repeat yourself) software development practice as there were fewer code duplicates. However, in the end, I think it is better to have a separation of concern in the function, so it would not contain a big line of logic in the code and one function would not have a very large number of requests per day.

As for the front-end, I have managed to test the application for bugs and different screen sizes on different devices. However, there are still some pages that are overflowing especially on tablet sizes like iPad Pro where the resolution would be 1024x1366. Therefore, there will still be layout breaks if tested to all mobile screens because some layout will not adjust properly to different screen sizes, causing elements to overlap, misalign, or not be displayed correctly. We also have not tested the responsiveness on a very large screen like 1440x2560, so additional problems can be expected such as pixelation issue that will makesome visual elements appear blurry or blocky in a big screen because they are not rendered at a high enough resolution for larger screens.

2.2 Reflection

Before starting the graduation work placement project, I was excited to go back to Q-ICT and particularly have the same Company Supervisor who guided me for my previous work placement. This time I have asked Q-ICT to give me with an assignment that has more cybersecurity focus on it, and I was thrilled when they tasked me in integrating SentinelOne, one of the most known cybersecurity platform, into their internal application.

Overall, I am very satisfied of what I have achieved, and proud of the final product that I have delivered to the company. The task that I have done indeed bring much value to the company, as it will serve at least as a proof of concept if the company wishes to further develop the integration. Even though that most of the technologies that I have used are not new to me, regarding Flutter and Node.js, I still managed to have learned a lot, especially regarding Firebase features especially regarding Cloud functions and Firestore database, Algolia, SentinelOne REST API connection, storing sessions in the backend, and the overall cybersecurity and networking theoretical concepts.

2.2.1 Functioning

This project marks my second time working with this organization, the first being my initial internship project, which took place in September 2023 to February 2024. We did not change our working methodology a lot in the department that I was working in, so I was already familiar with the way the company works and function as an organization. However, there was one thing new that was not implemented during my first time working here which was Code Review and working with other developers as my first internship was a stand-alone project, and we did not have any other intern colleagues back then. Overall, I feel like this organization has taught me a lot in working in a professional environment, having to work in teams in Agile SCRUM methodology, and learn how to properly communicate a message across other developers and learning how to solve problems together.

Overall, I have to say that the objective that was set in the Graduation Project Description in the beginning of the project was achieved, using the proposition written in the Project Plan.

2.2.2 Competencies

In this section, I am going to use the SWOT analysis to evaluate my competencies that I have shown during the development of this project.

1. **Strengths:** Without getting much into the technical details, there were several times when bugs were introduced which was the results of merging from different branches, and my Company Supervisor and I were trying to solve it. My Company Supervisor, obviously, needed some time to read and understand my code as it was a large and complex codebase. There were more than several instances where I was able to solve the bugs faster than my Supervisor. There were also several instances where I could solve issues without the help of my Supervisor with my own solution. That overall already proves that I have a good problem-solving ability in the team. I additionally, I learn about new things fast, and I only ask questions that were expectable without overdoing it.
2. **Weaknesses:** Based on what my Company Supervisor has told me in the Feedback Form, I need to improve my socialization and communication with other employees outside the department that I am working in. I also have noticed this myself, as there were the language barrier especially in the way I speak English, and also cultural differences which make me appear that I am not that approachable. Additionally, the next weakness is going to contradict the previous one, but once I get to know someone, I tend to talk too much with them, decreasing the productivity of the team. This only applies to the people inside my department. There were multiple instances that I wasted almost an entire day of work just talking to my colleagues without accomplishing anything. I also tend to get more comfortable too soon, making me say things that are unprofessional to say in the workplace for potential customers to hear.
3. **Opportunities:** There have been so many moments of genuine opportunity and growth for me when working on this project. Mainly, I honed my Flutter, Node.js, and NoSQL skill even more, with the usage of linting and going into more depth with the Dart language, especially in making a visualization from the data of `Map<String, int>`. I also learned new things such as how to use Algolia and Firebase as the cloud computing service to help me with the back-end infrastructure of the project.
4. **Threats:** The threats that were encountered that could have hindered my performance in the project success was about the lack of technical skill I have regarding Firebase and Flutter as a whole. I am still completely new to Flutter framework and I realize that the code that I have written is not perfect and could be improved upon. The main objective of the project was achieved, however some polishing still needed to be done as not all features that I had in mind when designing this project were implemented.

I am also further going to describe one particular situation in STAR method to describe the competencies by applying my skills and knowledge to this particular situation.

1. **Situation:** Implement User Preference regarding their widget of choice, types of column headers, pagination, and types of data they want to be displayed.
2. **Task:** The user preferences needed to be stored in a collection where it will be obvious to whom the preferences belong to, the data needs to be correct or else the mapping will fail, and the preferences need to be fetched every time the user logs in to the application. The preferences also need to be updated every time the user changes their preferences. The SentinelOne data is also needed to be fetched based on either the company site account or the individual account.
3. **Action:** Created 2 types of collection in the Cloud Firestore. One is for storing the user preference and one is for storing the SentinelOne data based on the company in which the user belongs to. Both collections will store the combination of User ID and Company Site ID. The types of visualization graphics, the widget title, and the data type is stored in one document containing a specific user ID. They are stored in either a array of String or a Map of String to String. Therefore, it ensures that the user can add, edit, delete widgets according to their will, and their last preferences will be stored and retrieved the next time they log in. The customization for tables are also there, such as the names of table header columns and the pagination. SentinelOne data is also stored and differentiated in Cloud Firestore based on the company site, so that users from different companies can only see their own data.
4. **Result:** The user preference is finally implemented in the project, therefore the essence of widget customization for SentinelOne data visualization in the QaaS App is achieved.