# Reflective Report

## Bulletproof Team Management Calendar Application

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# Abstract

Our client, Bulletproof, is an AWS cloud solution consulting company based in Auckland that specializes in Amazon Web Services (AWS). They had been using a physical whiteboard to represent a weekly schedule of team members, showing which member works for which client on which day. They wanted to utilize the tool and had been looking online for products like their physical weekly calendar. They found popular online tools being too complex for them and wanted us to build an easy-to-use web-based application that could replace their physical whiteboard calendar.

# Acknowledgements

Tristan Kells – A teammate who leads the team and often take charges to do more work and do the most documentations

Daniel Wood – A teammate who is very talented in designing and communicate well with the client

Kenneth Johnson – A supervisor of this project who consistently offered valuable advice on our documents and the project process

Bulletproof – A client of this project who supported us in upskilling by providing Linux academy and AWS accounts, and spared time for meetings to give us feedbacks on the product

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# INTRODUCTION

Bulletproof is an AWS cloud solution consulting company based in Auckland that specializes in Amazon Web Services (AWS). They had been using a physical whiteboard to represent a weekly schedule of team members, showing which member works for which client on which day. They wanted to utilize the tool and had been looking online for products like their physical weekly calendar. They found popular online tools like Google Calendar, Jira, and Mondaay.com being too complex for them. Those products have too many features that they do not need. So, they wanted us to build a web-based application that is as simple as having features only they need to replace their physical whiteboard calendar.

At the early stage of the project, the minimum viable product(MVP) was to make an add-on web application for Jira, a project management tool they have been using, making the application accessible and easy-to-use.

Later, it was found out that Jira add-on does not support mobile compatibility, which makes the product not accessible through mobile devices. They regarded the mobile accessibility necessary, so the product goal had changed to developing a standalone web application that supports mobile as well.

Originally, a weekly calendar was their only requirement. Later, they added a monthly view to the requirement, and we successfully implemented the feature as well.

The project had to be developed with popular and basic languages which are HTML, CSS, and Javascript for front-end, and PHP and Mysql for back-end. There are more popular and powerful languages like Angular and React, but it was considered as not viable option for the project's team. All this project's members had been just started taking a web development class which was their first learning of web-based languages, and Javascript and PHP were used in that class.

The web application had to be deployed on an AWS server. Since they are an AWS cloud consulting company, it would be easier for them to manage the application

through AWS server. To deploy a web application on an AWS server, at least basic knowledge of AWS concepts and how some of its services are working are required. Bulletproof provided us Linux Academy accounts which are normally paid services to access online courses for Linux, AWS, Microsoft Azure, and it helped us to upskill our knowledge of AWS and how to deploy a web application on AWS server.

The most important aspect of the product is being user-friendly, and we tried to achieve this by consistently having a meeting with the client. By adapting and following Agile Scrum methodology, we were able to adjust goals and scope to meet the changing requirements from Bulletproof.

# PROJECT EVALUATION

In the original project proposal, we identified key milestones of the project, which are that the web application will be optimized for mobile use, have encrypted login functionality, be able to generate client table, be editable, and be able to display a consulting table.

| **Achievement outlined in original project proposal** | **Eventual Achievement** | **Evaluation** |
|---|---|---|
| Optimized for mobile use | The product can access through mobile and able to perform all necessary features as it can on the computer. | It is successfully met with the client requirement, but if there is more time the design could be even more optimized to be mobile user-friendly |
| Have encrypted login functionality | We implemented a login system with full functionality.<br>- User needs username and password<br>- User can reset password via email if password is forgotten<br>- User can register a new account<br>- The password is encrypted in a secured format | All functionalities the client needed are implemented, and all tests were successfully conducted |
| Be able to generate client table | User can generate client in the management page, | All the requirements are met |

| | | |
|---|---|---|
| | and it is implemented in t he main page as well to meet the changed client r equirement | |
| Be editable | User should be able to ed it everything in the produ ct.<br>-user should be able to e dit client<br>- user should be able to edit consultant<br>- user should be able to edit table allocations | Editing is implemented in a user-friendly way. It is f ast and does not refresh t he page. |
| be able to display a con sulting table | Initially, only a weekly view was required, but later, a monthly view table is added to the requirement | Both the weekly and mon thly view are implemented and met by the client re quirement |

This project is to replace use of their physical whiteboard as a weekly calendar with a user-friendly web application. The product of this project has successfully replaced it, and already has been using by the client. There is no significance to mention in the short term, but in the long term, delivering the product has made every consultant in Bulletproof able to access their consulting table with their devices.

# LINK BETWEEN THEORY AND PRACTICE

In the middle of the development progress, the necessity of adapting and following the modern way in coding is realized, to collaborate works easily and safely. As more functionalities are added and the product pages are getting complicated, functions and variables that are defined in a casual way formed like a stone tower, and when we are trying to fix an error in one function, other things used to fell as well. From the International conference held by Ma and his colleagues, we grab an idea on how to solve the problem. For example, by getting rid of long parameters in functions, and by making functions dependent only when necessary, we could refactor the code in easy way to detect and fix bugs (Ma, Chen, Zhou, Xu 2016).

After the refactoring, we needed to set the standard in the way of coding. If not, we would have had to refactor again and again. We decided to learn and follow some of Javascript design patterns, introduced in a book written by Osmani. For example, we followed the module pattern and made the most of functions in a module, providing consistency and privacy to coding (Osmani, 2017).

The most important aspect of the product is being user-friendly. To achieve that, having regular meetings with the client throughout the development progress is required. We adapted Agile Scrum methodology and found that it suits well with our team and the situation we had had. Bulletproof had changes in persons we meet for this project. At first, it was James Burton who started the project and was the person we meet in Bulletproof, but he left the company, and then it was Craig, and then changed again to Grant. They all had similar but different thoughts and viewpoints in the product, and throughout the project, the project requirements consistently had been changed. By following Agile practices, we were able to overcome the difficulties. We kept regular meetings with the client, and we were able to identify changes in scope and goals early enough. Then, we were able to quickly achieve the goals by dividing into sprints by its priority and focus on the most important ones first.

According to Ozierańska's case study of the critical factors of Scrum, a small number of team members and short distance from team members are some of positive factors in Scrum implementation, while the possibility to work remotely is one of negative ones (Ozierańska 2016). Since we are a team of three and all are AUT students, we were able to deliver functionalities at a greater pace with Scrum practices, but it was not possible for us to meet often to do coding. It made harder to collaborate our works and coding, and possibly caused the need of code refactoring.

# PERSONAL AND PROFESSIONAL DEVELOPMENT

All team members in this project had no knowledge or experience regarding web development before the beginning of the project. We all took a web development class in the same semester with the R&D part 1, and we were able to gain professional knowledge of Javascript and PHP, necessary programming languages for the project as we progress the project. From the second semester of the project, we all had learned enough to build a web application that meets all client's requirements.

None of team members had knowledge of AWS before. Thankfully, Bulletproof gave us accounts for online learning courses called Linux Academy, and we were able to use the resources to learn how to setup AWS server and deploy a web application on it. We installed LAMP stack on EC2 and used RDS for a database to successfully deploy the product on the server.

We had a lack of experience in development in general. In the beginning of the project, we all had lack of experience in problem solving, developing software solutions, and engaging with client. It was the first time we had a client. However, we researched about Agile Scrum practices, code refactoring, and Javascript design patterns to improve our skills. Also, thanks to our clients who gladly spare some time to regular meetings and gave us valuable feedbacks about not only the product, but also things we need to know.

Through the development process, we also gained experience on useful software like Github, Jira, Winscp, Putty, and Heidisql. We also changed our developing tool to Visual Studio Code, and it made our lives much easier in automatically merging our files and uploading on Github .

We used Javascript and PHP in developing the product, which are said to be old and outdated by some developers. In future, we might need to learn more popular and modern languages like Angular and React to replace them. Also, we only used a small portion of Jquery, which is a Javascript library allowing for easier development,

because we were just learning Javascript. In the future, we would like to make use of such libraries and frameworks more.

We used an EC2 instance to deploy a web application on the server, but it is the simplest service in AWS. There are Elastic beanstalks and Lambda for allowing more features on the server, which might be options to learn in future.

### EVALUATION OF THE TEAM ROLES, THE EFFECTIVENESS OF THE TEAM MEMBERS, AND OWN INTERACTION WITH TEAM MEMBERS

Tristan Kells is the team lead. He arranged team meetings, took responsible of development, and making documentations like meeting minutes, sprint planning and review

Daniel Wood took responsible of design part, and client meetings

Junha Yu took responsible of development

All had worked well in their role and helped each other in needed.

We had no disagreement in making decisions. We all presented in every meetings. Communication between us was through messenger and went well. We divided our works pretty much evenly and delivered well. I personally enjoyed working with them. Especially, Tristan Kells worked hard, and it used to happen that there is nothing much left for me to do.

# SUMMARY

Bulletproof wanted a web application to replace their use of physical whiteboard as a weekly calendar. We delivered it not only having initially required features, but also has all the extra requirements the client needed. The product is optimized for mobile, has encrypted login feature, is able to generate clients, is able to view in monthly table, and every data is editable. Also, the design of the product, including icons, colors, and blind mode, successfully met the client requirement.

Through this project, we gained a priceless experience on Agile Scrum practices. We learned about problem solving, developing software solutions, and engaging with clients. It all went well under having sprints, product backlog, sprint planning and review.

We learned about code refactoring, Javascript design patterns, and useful tools that help us to collaborate and manage our works.

Our web development skills improved on this project. From knowing nothing at the beginning of the project, we continuously upskilled Javascript, PHP, CSS, and AWS. In the end, we delivered a product successfully.

All team members collaborated, participated, and communicated well and did their job successfully. It was nice to work with them.

It was a very good opportunity for me to experience what a professional development would be like, and I am thankful that AUT gives this kind of opportunity.

# REFERENCE

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