Name: Joseph Troughton

Group: 23

**Personal Reflection Statement**

**Introduction**

Our project focuses on designing an Internet of Things (IoT) database service for Farfields, a company specializing in low-cost satellite communications for sensors. We were tasked with creating a database to track items installed by client companies, primarily sensors. This database is essential for storing critical information about these devices, such as installation details, specifications, and software versions. It also simplifies essential operational tasks like maintenance scheduling, alerts (e.g., battery warnings, retesting reminders), and identifying devices requiring software updates for security or compatibility. By addressing these needs, our database solution supports Farfields' mission to enhance efficiency and reliability in managing sensor networks. It is also essential that back end service are also sufficiently secure so whatever API or database that we end up using has to have some security features like service side encryption and securely integrate into existing system like LoRaWAN (Long Range Wide Area Network) protocols used in IoT applications

**Lessons Learned**

This project has been a valuable learning experience, particularly in terms of effective communication and project adaptability. Entering the project, I already understood the importance of consistent feedback and communication to meet client expectations. We adopted an agile approach, holding short meetings with the client every one to two weeks to review progress, discuss requirements, and explore new ideas.

However, this is my first experience working collaboratively on a project of this scale, and I encountered challenges in maintaining effective team communication. For instance, during the Christmas holidays, our team struggled with coordination, leading to some confusion about the project’s direction. A notable example was our front-end developer switching from Flutter to React due to usability issues. Although we had discussed this possibility earlier, I wasn’t fully aware of the change until later, which required me to adjust my plans.

Additionally, I learned the importance of balancing ambition with practicality. Initially, I designed an ambitious database system that combined Firebase Realtime and Firestore databases to optimize responsiveness and long-term data storage. However, upon deeper analysis, I realized this approach would significantly increase running costs and code complexity. I revised my plan to use only Firestore, which provides sufficient real-time support, robust querying capabilities, and lower operational costs while ensuring scalability and flexibility.

**Contributions**

Our team is structured into three roles: Tom focuses on front-end development, I concentrate on back-end development, and Niko serves as the team leader, handling client communication and documentation while assisting as needed. My primary contributions have been in back-end development planning and preparation.

I have not yet contributed extensive coding but have set up the Firebase modules to enable seamless interaction. My main focus has been on designing the database with scalability, flexibility, and long-term cost-effectiveness in mind. To achieve this, I created small code snippets and prototypes to test potential implementations, refining the database setup based on the requirements and constraints identified during client meetings.

One of my key contributions was responding to the client’s request to integrate Single Sign-On (SSO) functionality using Google Sign-In. Additionally, I designed a link table to function as an audit log, tracking data submissions through external services. These features were incorporated to enhance user convenience and ensure accountability in data management.

**Personal Growth**

This project has significantly enhanced my understanding of team dynamics and the value of leveraging individual strengths in collaborative efforts. Working on a large-scale project with defined roles helped me appreciate the importance of task delegation and specialization.

Interacting with an external client was a new and refreshing experience for me. It required professionalism, clear communication, and the ability to interpret and implement client feedback effectively. These experiences have improved my communication and interpretation skills, which I can apply in both professional and personal contexts. Additionally, navigating challenges like adapting to changes in technology and project scope has reinforced my ability to remain flexible and solutions-oriented.

**Goals for Semester 2**

Semester 2 will provide me with an opportunity to focus more intensively on back-end development, which aligns closely with my interests and expertise. While Semester 1 was heavily focused on front-end prototyping, Semester 2’s sprints will shift toward developing and integrating the back-end systems with the prototype front end.

To prepare for this transition, I aim to move beyond the documentation and research/testing phase into a fully development-focused role. My primary goal is to contribute directly to the development of the back end, ensuring seamless integration with the front-end systems. Additionally, I plan to refine my time management and coordination skills to address the communication challenges we faced in Semester 1. By setting clear personal deadlines and staying closely aligned with team updates, I aim to avoid delays and confusion.

Finally, I want to continue building on the technical and soft skills I’ve developed, particularly in adapting to new requirements and technologies. This will help me contribute more effectively to our team’s success and prepare me for future collaborative projects.

**Conclusion**

This semester has been an eye-opening experience, providing me with practical insights into collaborative development, client communication, and balancing technical ambition with real-world constraints. My contributions in back-end planning and database design have laid a strong foundation for the project, and I look forward to building on this foundation in Semester 2. By addressing the challenges of communication and diving deeper into back-end development, I am eager to contribute more effectively and grow both technically and personally.

Appendix - Evidence

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| **Significant Event Mentioned** | **Git Commit Hash/ Trello Card (deck and card)/ Meeting Minutes (date and point)** |
| *Design Initial Backend Write Up* | *Completed Deck – Card (Emergency Changes)* |
| *Refined Backend Write Up* | *Minutes on 2 December 2024 – Section Client Discussion, Point 2* |
| *Presentation* | *Date: 2 December 2024, Git Commit Hash: 4bd1c0f* |
| *Initial Firebase Setup* |  |