Table 1: Revision History

Date	**Developer(s)**	**Change**
April 5	Rupinder Nagra	Wrote project overview and Key Accomplishments
April 5	Jonathan Cels	Wrote Key Problem Areas
April 5	Joshua Chapman	What Would you Do Differently Next Time

Reflection Report on Chess Connect

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In this reflection report, we delve into the challenges and successes encountered while developing a solution aimed at bridging the divide between over-the-board and online chess experiences. We try to understand the critical factors that influenced the outcome and identify strategies for refining our approach to ensure the success in future endeavors.

1 Project Overview

The Chess Connect project allows two users to play a game of chess on a physical board with the information being transmitted to an online web application over Bluetooth. Currently, there is no way for players to seamlessly switch between playing on a physical board and playing online, but Chess Connect intends to change this by creating a central platform that will provide flexibility and remove barriers for new players looking to learn the game.

2 Key Accomplishments

Integrating the best of both worlds, the purpose of our project was to bridge the gap between over-the-board and online chess experiences, while overcoming challenges and celebrating our progress along the way.

2.1 Iterative Growth Through Prototyping

The team successfully developed prototypes for the proof of concept, revision 0 and final demonstration that clearly outlined the progress made and the future issues to tackle. From the birth of the project prototypes were developed to test hardware implementations to measure pieces and display information to the user. This early development allowed the team to reach an efficient implementation early and test. The proof of concept correctly identified all of the foreseeable major issues with the project and demonstrate their functionality.

As well, the team worked hard to create a nearly fully capable prototype for the revision 0. This allowed them to focus their efforts effectively on tasks that benefit the project.

2.2 Implementation of continuous integration

The team worked efficiently due to its use of continuous integration between the hardware and software elements of the project. The project contained elements of web software, embedded software and hardware to integrate. Each member of the team was tasked with development of one of these sections and there were constant meetings to verify the integration of the components. This allowed the team to divide and effectively work on multiple parts of the project at once.

2.3 Fully functional software

The software being completely functional is a significant accomplishment. It means that the coding, design, and implementation of the software are efficient and effective. This is a critical component in creating a seamless experience for users who want to integrate their over-the-board and online play.

2.4 Identification of potential issues

Although the hardware did not function during the live demo, this failure provides valuable information on potential problems that need to be addressed. The team can now investigate the issue, identify the root cause, and implement necessary improvements to ensure a stable and reliable product.

2.5 Proof of concept

Despite the hardware not functioning at the live demo, the team has established the concept of integrating over-the-board and online play as a viable and desirable solution. This opens up opportunities for further development and refinement of the product.

2.6 Team collaboration and problem-solving

The team's ability to get the hardware working, even for a short period, and the software fully functional reflects effective collaboration and problem-solving skills. This bodes well for addressing the current issue with the hardware and for tackling future challenges in the project.

3 Key Problem Areas

Exploring the challenges encountered during the development of an innovative chess solution, we reflect on the factors that contributed to the hardware issues

and examine the lessons learned to ensure future success in merging over-the-board and online chess experiences.

3.1 Lack of leadership and management

After the first semester of work, the team failed to meet as often and work together on tasks. This was due to a lack of leadership in the team and then a failure of delegation of work. Proper meetings consistently would allow the team to function more efficiently and integration of the project could progress more smoothly.

3.2 Insufficient testing and troubleshooting

While there were known hardware issues before the live demo, it appears that these problems were not adequately addressed, leaving the hardware vulnerable to failure when presented in a live setting. This was also the case with the software, where we did not adequately test it due to the dependency of it on the hardware, leading to inconsistent results.

3.3 Limited contingency planning

It seems there was no backup plan or alternative hardware setup available during the live demo. Having a contingency plan in place could have helped mitigate the impact of hardware failures for the live demo.

3.4 Fragile connections

The loose wires in the breadboard led to unstable connections and components, such as the LCD screen, ceasing to function. This further impacted the hardware's reliability and performance for the live demo.

4 What Would you Do Differently Next Time

In light of the challenges faced during the development of this project, here are some suggestions on what could be done differently next time to ensure a more successful outcome:

4.1 Marketing of Chess Connect

Chess Connect combines the markets of online chess and physical chess. This includes professionals and home users. To professional players they are often forced to play on a standardized playing surface and pieces which Chess Connect does not satisfy. Therefore, Chess Connect must target home users and amateurs and the price must reflect this. The team aims to produce the product for a price of 300$, which is a reasonable price compared to the rest of the market of electronic chess boards.

4.2 Opt for a more robust hardware setup

Replace breadboards with a more reliable solution, such as a custom-designed printed circuit board (PCB) or soldered connections, to minimize loose wires and improve the stability of the hardware components.

4.3 Conduct thorough testing and troubleshooting

Perform extensive tests and simulations under various conditions to identify potential hardware and software issues. Address these issues proactively to ensure a more reliable system during live demonstrations and real-world usage.

4.4 Implement redundancy

Introduce redundancy in critical hardware components, such as having a backup microcontroller or additional connections. This would help minimize the impact of a single component's failure on the overall system.

4.5 Seek expert advice or mentorship

Consult with experienced professionals or mentors who have successfully developed similar projects. Their insights can help guide the team in addressing challenges and identifying potential pitfalls early in the development process.

By adopting these strategies, the team can learn from the previous experience, improve the overall design and reliability of the project, and increase the likelihood of a successful outcome in future iterations.