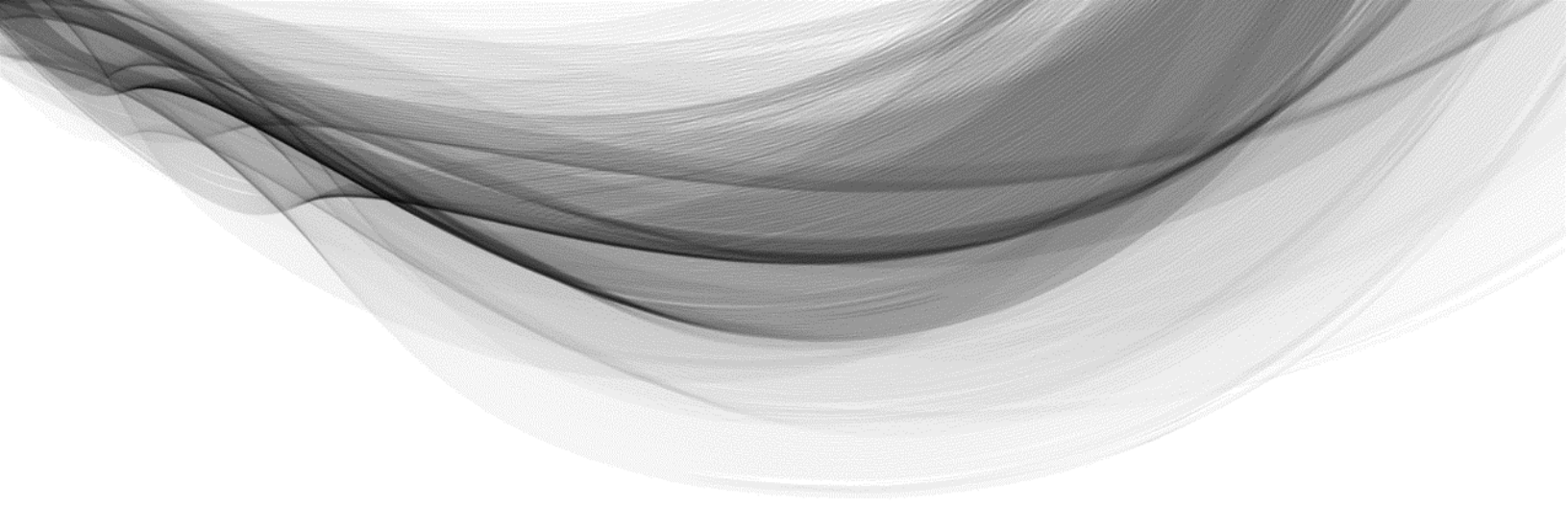




Assignment 2: Practical & Professional Development

L5 - Changemakers: Creativity and Value Creation

Module Code: ACCB5033

BSc Computing (Software Engineering)

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1. Introduction

This report evaluates the implementation of a Counter-Strike 2 (CS2) inventory valuation tool, building upon the initial research and design documented within ACCA5033 Assignment 1: Innovation & Project Management. Counter-Strike 2 is a leading competitive first person shooter [1], featuring a wide range of in game cosmetic items. The tool aims to provide a realistic estimation for the value of a user's in-game items, including cosmetics such as weapon skins, stickers and charms. The report evaluates initial design feedback, document the practical implementation, analyses the project enterprise potential and reflects upon the overall development process.

2. Practical Development / Implementation

This section documents initial data collection and feedback gathered during earlier development of the CS2 Inventory Valuation Tool. This feedback is first evaluated, before the application's key implemented features are outlined alongside screenshots, with analysis of how the findings informed improvements within the project.

2.1 Initial Feedback

Feedback for the initial design of the project was collected using a Google Form which can be found within Appendix A. Questions presented to the survey's participants placed a focus on both the designs user-interface (UI) and its proposed features, including filtering and item information.

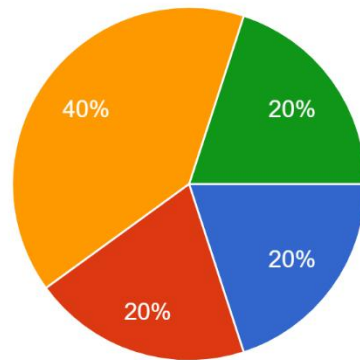
Participants were first asked questions regarding their familiarity with the CS2 market and existing inventory valuation tools, as shown in Figure 1. This helped to provide useful context for interpreting their later responses.

Participants were then shown a screenshot of the initial design for the inventory interface made within Figma, a popular tool for individuals to create, share and test website designs [2], and asked how intuitive they found the UI. As shown in Figure 3, most participants found the interface to be relatively intuitive, although some users identified issues regarding visual polish, unnecessary information and accessibility for new users.

Finally, participants were asked which proposed features were of the most importance to them. Accurate pricing data ranked the highest, while pricing history, inspect links, price trends and varied filtering tools followed closely behind as shown in Figure 3. In-game screenshots received no votes and were therefore no longer considered for implementation. A final open-ended question allowed users to identify any missing features. This revealed a gap within the initial Figma design, as one response expected a dedicated inspect-link button within the item interface, a design decision that had been previously overlooked.

How familiar are you with the CS2 market?

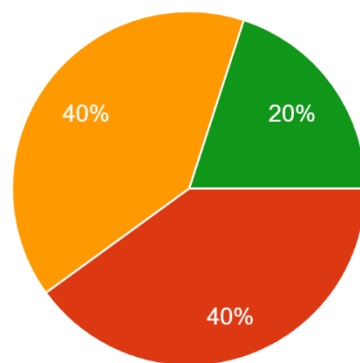
5 responses



- I am unfamiliar with the CS2 market.
- I have heard about the CS2 market.
- I follow the CS2 market.
- I actively participate in the CS2 market economy.

How likely are you to use a Counter-Strike 2 Inventory Valuation Tool?

5 responses

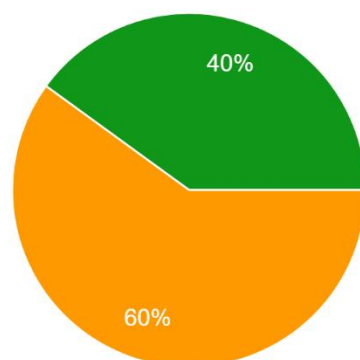


- Never
- Highly Unlikely
- Likely
- Highly Likely

[Figure. 1: Familiarity with CS2 Market and Valuation Tools Answers]

How intuitive do you find the inventory interface?

5 responses

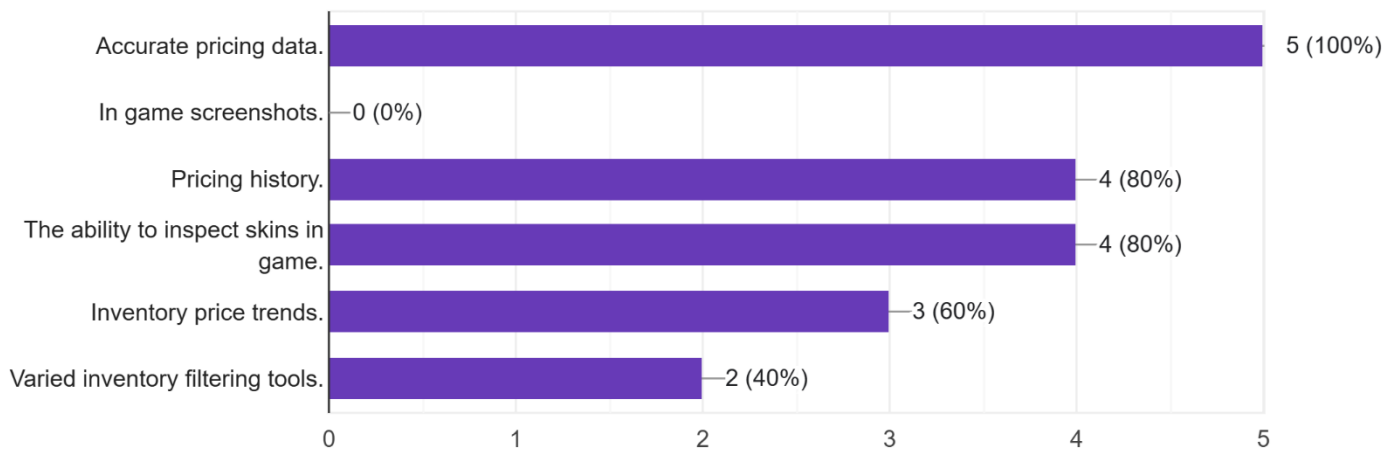


- The current design is unintuitive.
- The current design needs improvement.
- The current design needs minor improvement.
- The current design is intuitive.

[Figure. 2: Initial Interface Design Intuitiveness Answers]

What features are most important to you? Select all that apply.

5 responses



[Figure. 3: Initial Interface Design Feature Importance Answers]

2.2 Implementation

This section evaluates how the earlier design for the CS2 Inventory Valuation Tool was implemented. It outlines the main technologies used, features developed, and the limitations encountered during implementation. The full source code can be found within the GitHub repository under Appendix B alongside a video demonstration within Appendix C [3].

2.2.1 Application Overview:

The CS2 Inventory Valuation Tool was implemented as a web-based application using the following technologies presented in Table 1.

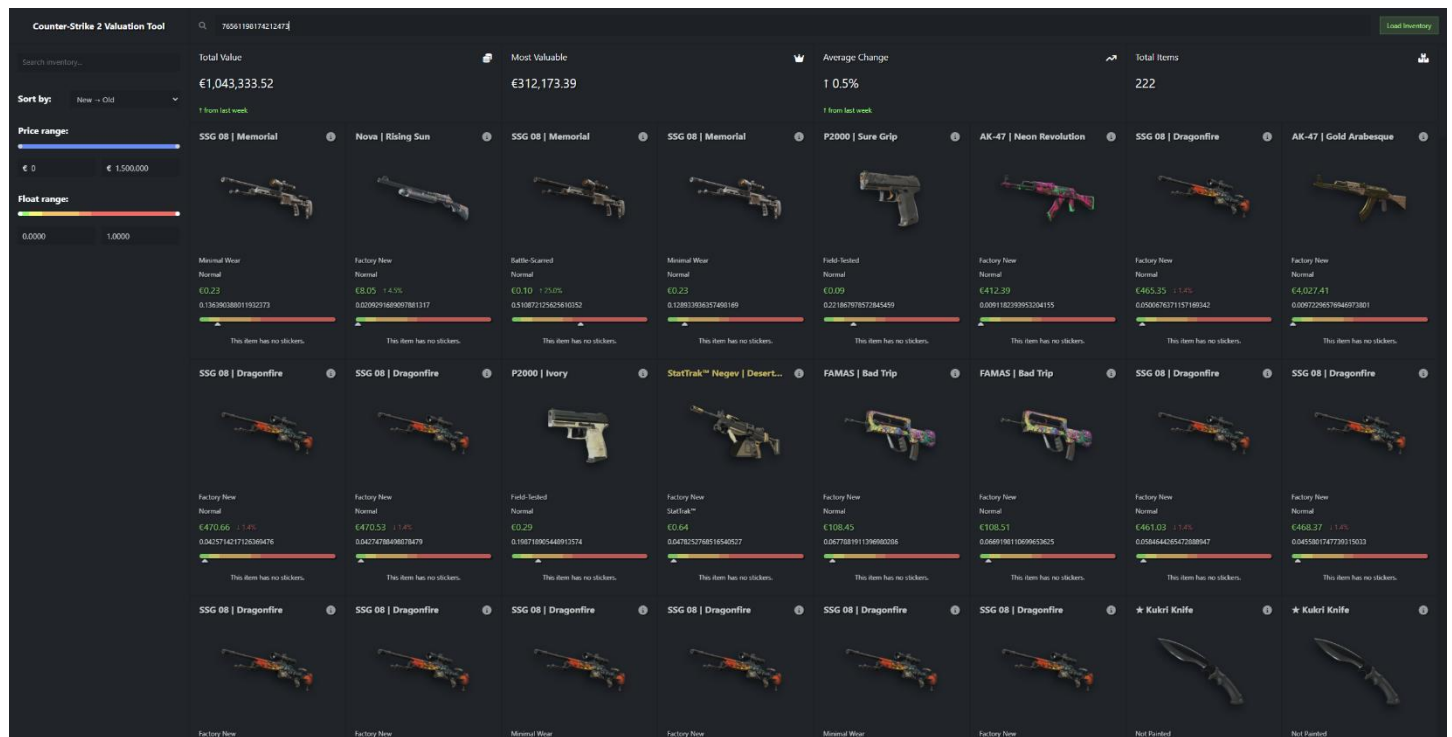
Technology	Purpose
HTML	Structuring the UI
CSS	Styling the UI
JavaScript	Frontend interactivity (user search, item sorting)
Node.js	Backend runtime environment
Express	Backend routing and API handling
CS2 Inspect Link Serializer	Extracting item-specific inspect data
SQL	Storing and retrieving cached Skinport API item pricing data

[Table 1: Implemented Technologies Table]

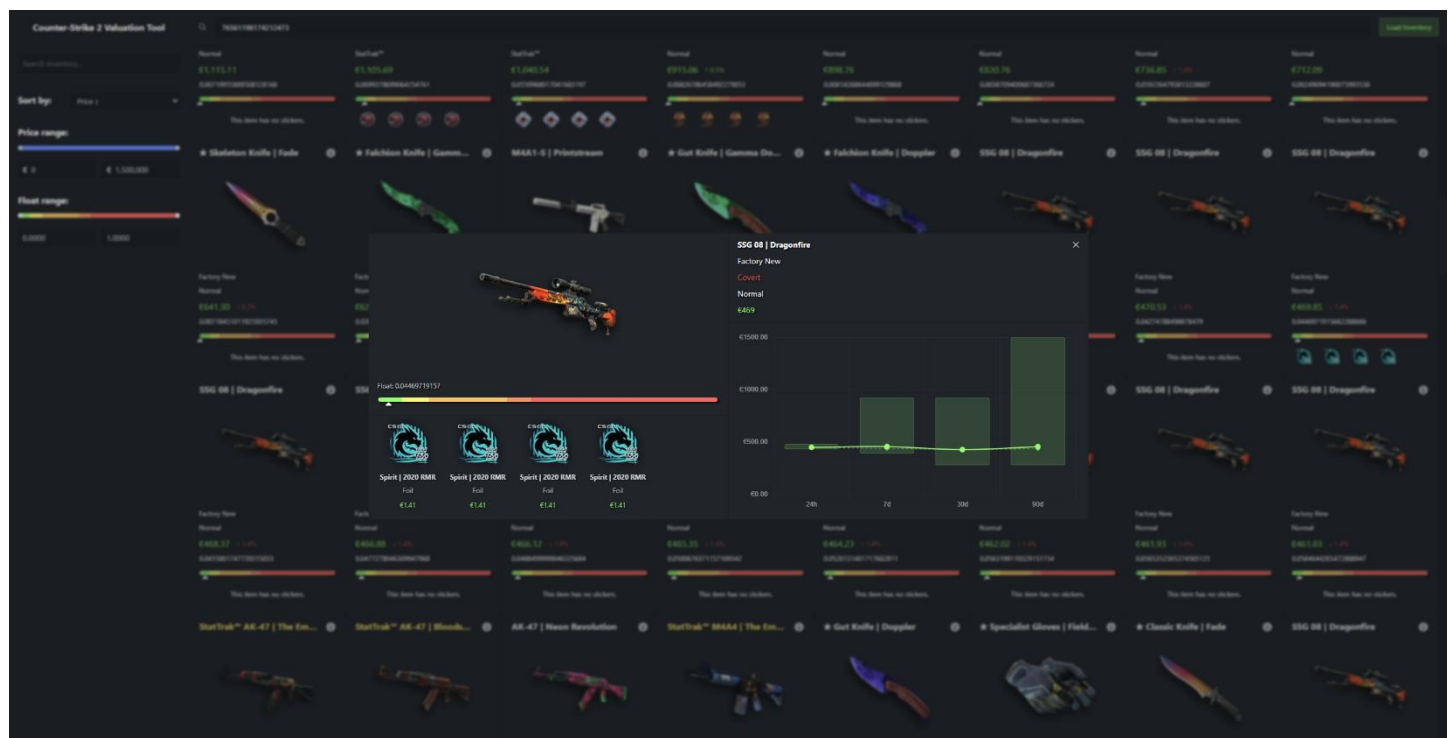
This combination allowed the application to retrieve, manipulate and present user inventory data while supporting item valuation logic based on current market prices and item-specific attributes such as floats, stickers and charms.

2.2.2 Implemented Features:

The main implemented features of the web application are the inventory and item interface. The inventory interface shown in Figure 4 displays a user's CS2 items using a CSS grid layout, allowing item attributes such as images, names, conditions, floats and estimated prices to be presented in a readable manner. Cached Skinport API data was also used in order to show changes in an item's price over time, building upon data provided by the Steam Web API [4].



[Figure 4: Implemented Inventory Interface Page]



[Figure 5: Implemented Item Modal]

Filtering functionality was also implemented in order to improve usability for users with larger inventories as shown in Figure 4. This allows users to locate specific items based on an item's name, date, price and float. The price slider was made exponential in order to ensure its usability for users with less valuable inventories. A detailed item modal was also developed as shown in Figure 5. The modal contains a graph implemented using Chart.js, communicating an item's price over multiple time periods.

The item pricing logic was one of the most important parts of the implementation, as accurate pricing data was ranked as the most sought-after feature within initial feedback. The simplified valuation model can be summarised as:

Final Price = (Base Price x Float Multiplier) + Sticker Value + Charm Value

The base price of an item is taken from the SQL database before the float multiplier shown in Figure 6 adjusts for exceptionally high or low floats.

```
21  if (float <= 0.07) {
22      floatMultiplier = 1 + 0.25 * Math.exp(-float * 40);
23      floatCategory = float <= 0.01 ? "Very Low Float" : "Low Float";
24  } else if (float >= 0.85) {
25      floatMultiplier = 1 + 0.2 * Math.exp((float - 1) * -15);
26      floatCategory = float >= 0.95 ? "Very High Float" : "High Float";
27  }
```

[Figure 6: Float Multiplier Logic]

Sticker value is then calculated by adding a percentage of each sticker's market value to the total price, with higher value stickers contributing a larger amount as shown in Figure 7.

```
29      if (price < 5) multiplier = 0.15;
30      else if (price < 50) multiplier = 0.3;
31      else if (price < 500) multiplier = 0.4;
32      else multiplier = 0.6;
33
34      total += price * multiplier;
35  }
```

[Figure 7: Sticker Value Logic]

Charms within CS2 are unique in their ability to be removed, unlike stickers. This means a fixed 65% of a charms value is applied to the total weapon price as shown in Figure 8.

```
40  function calculateCharmValue(charms, cosmeticMap) {
41      let total = 0;
42
43      for (const charm of charms || []) {
44          const data = cosmeticMap.get(charm);
45          const price = Number(data?.selected_price || 0);
46
47          total += price * 0.65;
48      }
49      return total;
50  }
```

[Figure 8: Charm Value Logic]

This approach to item valuation provides a more accurate estimate of an item's price in comparison to the base price alone, however the results still remain an estimate rather than a guaranteed sale price.

2.2.3 Implementation Limitations:

One limitation of the applications implementation is that patterns are not considered for the vast majority of items. This was due to the lack of comprehensive data regarding rare patterns across the thousands of items within CS2. This was partly addressed within doppler variants, a paint finish commonly found on knives. CS2 Inspect Link Serializer was used to extract the pattern index of "doppler" skins so that rare ruby, sapphire, emerald and black pearl variants could be priced accurately.

3. Enterprise and Innovation

This section evaluates the enterprise potential of the CS2 Inventory Valuation tool, considering how the project could be developed into a potential technology start-up. This includes building the brand with a name and logo, alongside financial aspects such as the businesses type, strategy and funding initiatives. Artificial Intelligence is later used to create a political, economic, social and technological (PEST) analysis.

3.1 Building the Brand

As the proposed start-up would operate within the United Kingdom, it would need to follow GOV.UK naming requirements. This means the name could not be the similar or the same as any other registered company and would need to end in “Limited” or “Ltd” [5].

Potential names related to the brand could include:

- Skins Stats Ltd
- Skin Scope Ltd
- CS-IQ Ltd
- Inventory Analytics Ltd
- Trade Stats Ltd

These names focus on the applications function, communicating its purpose to new users, which is an important consideration when naming a business [6]. CS-IQ Ltd was initially selected as the preferred brand name as it reflects the nature of the valuation tool while being short and memorable. However, this name was already in use by another UK based company. Therefore, the proposed name was changed to CS2-IQ Ltd, which was accepted during the company name availability check on the GOV.UK website.

Once a name was selected, a logo was created featuring the CS2-IQ brand name within a magnifying glass. This helps communicate the purpose of the application as the tool is designed to inspect and analyse a user’s inventory data. The logo was made a soft blue in order to match the websites theme as shown in Figure 9.



[Figure 9: CS2-IQ Logo Design]

3.2 Business Type, Strategy and Funding

CS2-IQ would operate as a Private Limited Company (Ltd) limited by shares. This is appropriate as the project would aim to generate profit via its web application as opposed to operating as a charity or non-profit organisation [4]. GOV.UK identifies two types of limited company, limited by shares and limited by guarantee, with the choice depending on the company's ownership structure and whether it intends to make profit. In this case, a company limited by shares suits CS2-IQ Ltd as ownership is split by those who have bought shares, and the shareholder's liability is limited to the original amount invested into the company [7].

Within CS2-IQ's Ltd business strategy, the following mission statement would be implemented:

"CS2-IQ Ltd's mission is to provide users with accurate and transparent inventory valuations, helping individuals make informed decisions when trading or selling virtual items within CS2."

The main objectives of the company would be to:

- Provide accurate pricing estimations.
- Promote responsible trading.
- Develop premium features for subscribed users.

Core values of CS2-IQ Ltd would include:

- Transparency: Explain how item valuations are estimated
- Accuracy: Provide accurate price estimations
- Responsible trading: Support informed decisions.

To fund CS2-IQ Ltd, a freemium model would be implemented, where core inventory valuation features are provided for free and more in-depth analysis, such as graphs and pattern valuation, would be restricted to paying subscribers. This would be suitable as it reduces the barrier to entry for new users, while generating revenue from individuals who require more advanced functionality [8].

3.3 PEST Analysis

Using artificial intelligence (AI), a PEST analysis of CS2-IQ was generated and can be found within Appendix D. This has been further analysed to identify external factors affecting CS2-IQ Ltd.

A major technological risk for CS2-IQ Ltd would be its dependence on third-party platforms, meaning any changes to Steam Web API access, terms or availability could affect the tool's functionality [9]. Valve, the owner of both the Steam market and CS2, represents a potentially disruptive threat. If CS2-IQ Ltd's features were to be implemented into Steam, the user base of CS2-IQ could decrease significantly. This means the website would have to find a way to differentiate itself with more advanced features.

An economic risk to CS2-IQ is Skinport's API becoming a paid model. This would increase the operational cost of the application and could pose as a significant risk if funding is low.

As CS2 has a relatively young player base, the UK's Age Appropriate Design Code (Children's Code) should be considered. This means Data Protection Impact Assessment (DPIA) should be undertaken, and it should be ensured the application is age appropriate [10].

4. Project Feedback and Reflection

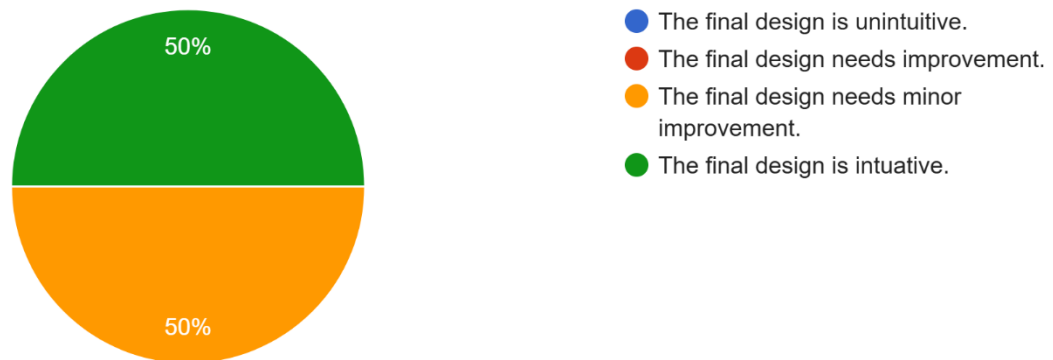
This section outlines the practical feedback for the final implementation, while reflecting upon the management of the project, the skills it helped develop and the Positive Social Impact (PSI) on society.

4.1 Practical Feedback

Feedback on practical implementation of the CS2 Inventory Valuation Tool was collected using a Google Form, included in appendix E. Similar to the design feedback survey, participants were asked if they were familiar with the CS2 market and existing valuation tools first. As shown in Figure 10, participants were then asked how intuitive they found the final inventory interface implementation, with responses split between minor improvements needed and the design being intuitive.

How intuitive do you find the design of the final inventory interface implementation?

2 responses



[Figure 10: Final Interface Implementation Form Answers]

Explain your previous answer regarding implementation quality.

2 responses

I think the initial design was rather good, the final design improved upon it in my eyes, to give an example, I like the change made to the float bar on the left side, where going from lines to dots it more clearly tells the user that they can move them to get the desired max/min float ranges.

the design was well implemented, even improved

[Figure 11: Implementation Quality Form Answers]

After several comparative questions participants were asked to explain their answers regarding implementation quality. Despite the small sample size, the responses provided positive feedback in relation to the tool's implementation, noting improved filter bars and usability. However, the findings were nonconclusive due to the limited number of responses.

4.2 Project Progress Diary

Project progress was documented using provided progress forms which can be found within Appendix F. Looking back on the project, I would not have rushed into the implementation so quickly after the completion of Assignment 1. A significant amount of time over the following week was spent working on the web application and eventually led to burnout. This contributed to more work being done towards the end of the project as showcased within the progress reports, leaving less time for testing and troubleshooting and refining the application. If I were to undertake this project again, I would try to align my time management more closely with the Gantt Chart created during planning, ensuring feedback collection, testing and documentation were completed earlier.

4.3 Skills

Throughout the project I developed a range of skills, both technical and professional. I improved my understanding of frontend development, utilising Figma to first design the UI, before using it as a reference for implementation. I also became more comfortable using open-source GitHub repositories, such as CS2 Inspect Link Serializer, using the provided documentation to decode inspect links and return pattern indexes.

The project also improved my problem-solving and critical thinking abilities, particularly when designing the valuation function, which required further maths for the exponential float price considerations. In addition to this, collecting user feedback gave me an alternative perspective, helping me evaluate and improve upon my original design decisions. Finally, the enterprise section provided new insight into the operations of technology start-ups, improving my understanding of legal implications.

4.4 Positive Social impact

The CS2 Inventory Valuation tool could have a positive social impact by helping users make more informed decisions when trading or selling items within their CS2 inventories. This has the ability to reduce potential losses from scams or limited knowledge, potentially saving individuals from losing significant amounts of real-world money. More broadly, the skills developed during this project could later be used to solve practical problems for users.

5. Conclusion

In conclusion, the CS2 Inventory Valuation Tool successfully demonstrates the production of a web application designed to estimate the value of a CS2 inventory. Feedback collected during the project helped to build upon initial design idea, leading to a coherent final implementation utilizing modern web development technologies such as Node.JS.

From an enterprise perspective, CS2-IQ Ltd was proposed as a private limited technology start-up, using a freemium model to fund operational costs and employees. After a PEST analysis, it was found the project faces several limitations, including third-party dependence and potential competition from Valve. Despite these limitations, the project successfully demonstrates how an idea can be developed into a functional solution with realistic potential, while building a strong foundation for future improvement.

10. References

- [1] “Counter-Strike 2 on Steam,” *store.steampowered.com*.
https://store.steampowered.com/app/730/CounterStrike_2/ (Accessed May. 6)
- [2] “What is Figma?,” *Figma Learn - Help Center*, 2025. <https://help.figma.com/hc/en-us/articles/14563969806359-What-is-Figma?> (Accessed May. 6)
- [3] “About repositories - GitHub Docs,” *GitHub Docs*, 2026. <https://docs.github.com/en/repositories/creating-and-managing-repositories/about-repositories> (accessed May. 7).
- [4] “Getting started | Skinport REST API,” *Skinport.com*, 2025. <https://docs.skinport.com/> (accessed May. 7).
- [5] GOV.UK, “Set up a Private Limited Company,” *GOV.UK*. <https://www.gov.uk/limited-company-formation/choose-company-name> (Accessed May. 3)
- [6] *Starlingbank.com*, 2024. <https://www.starlingbank.com/resources/business-guides/choosing-a-business-name/> (Accessed May. 3)
- [7] UWTSD, *Changemakers: Creativity & Value Creation – Assignment 2: Task 2: Enterprise & Innovation*, lecture-tutorial slides, University of Wales Trinity Saint David, 2026. (Accessed May. 4)
- [8] OpenAI’s ChatGPT, private communication, May 2026. (Accessed May. 4)
- [9] “Steam Community :: Steam Web API Terms of Use,” *Steamcommunity.com*, 2026. <https://steamcommunity.com/dev/apiterms> (accessed May. 7).
- [10] “Code standards,” *ico.org.uk*, May 19, 2023. <https://ico.org.uk/for-organisations/uk-gdpr-guidance-and-resources/childrens-information/childrens-code-guidance-and-resources/age-appropriate-design-a-code-of-practice-for-online-services/code-standards/> (Accessed May. 6)

10. Appendix

Appendix A: https://docs.google.com/spreadsheets/d/1RDL_qNHSeKuPRD84KcC-9ifybLbNBAXOQK06anQaQFc/edit?usp=sharing

Appendix B: <https://github.com/JacxbMo/CS2-Inventory-Valuation-Tool>

Appendix C: <https://www.youtube.com/watch?v=FHMHYEVpNz4>

Appendix D: <https://drive.google.com/file/d/1xzcZO-KAefvLv4C7JWWaJdb8pvo4lGfx/view?usp=sharing>

Appendix E:
https://docs.google.com/spreadsheets/d/1LoIEczoxwTly0aP4ad_tWNezUcTtN2LYVve9dKQzAUg/edit?usp=sharing

Appendix F:

Date: 20/03/2026

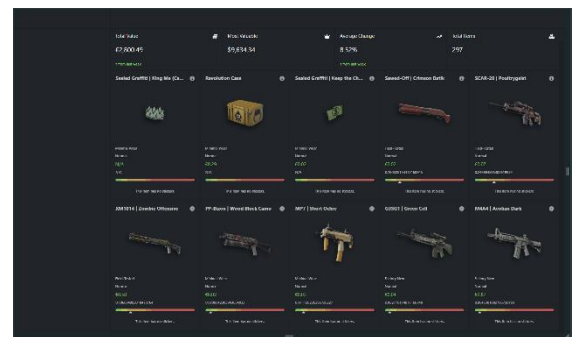
Progress:

- Implemented General UI + Steam API + Pricing

Actions:

1. Complete UI

Next review date: 27/03/2026.



Date: 17/04/2026

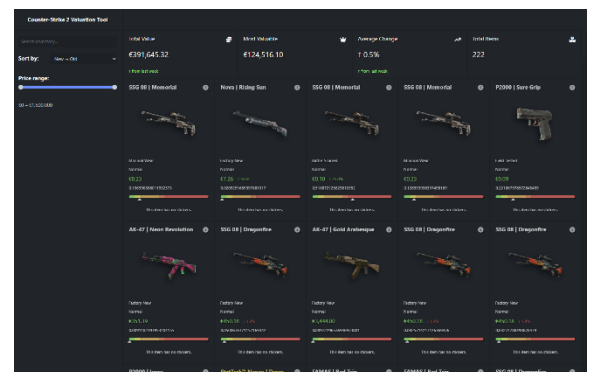
Progress:

- Completion of UI + Initial Filters

Actions:

1. Pattern Based Pricing

Next review date: 24/04/2026.



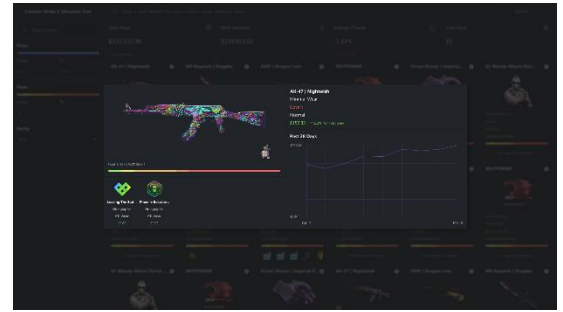
Date: 28/04/2026

Progress:

- Initial Modal Implementation + Some Pattern Detection

Actions:

1. Graphs
2. Final Polish



Next review date: 05/05/2026.

Date: 04/05/2026

Progress:

- Completed Application

Actions:

1. GitHub Repository
2. Demonstration

Next review date: 24/04/2026.

