



B.Sc. in Computer Science

Project Nuggets

Final Report

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December 2020

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Abstract

User experience (UX) research is valuable for companies, especially companies like CCP that develop MMO (Massively Multiplayer Online) games. Information and data from UX research is not always utilized to its full potential. Often employees are reluctant to read long research reports, especially if they only need a small bit of information from that research. The researchers often do not remember every detail of their former research from some years ago, which results in companies sometimes repeating the same research, which costs both time and money. Consequently, data from user research is not carried between teams and departments, and that valuable qualitative research knowledge is not utilized to its full potential. When conducting UX research, often unexpected important information comes to light. Even if that information is not essential for the specific research, it can be valuable for another team and department. This information is primarily at risk of getting lost.

This project was conducted by three students from the University of Reykjavik in collaboration with CCP Games. The project aimed to find a way to democratize UX research within the company. The solution was to build a system where employees could document and access atomized bites or "nuggets" of information from UX research in a comfortable and accessible manner. This report covers the analysis of the problem at hand, the solution, and the design process, which then lead to the programming of the system.

Útdráttur

Rannsóknir á notendaupplifun eru mjög dýrmætar fyrir fyrirtæki, sérstaklega fyrirtæki sem þróa fjölnotendaspilunarleiki (e. MMO) líkt og CCP gerir. Upplýsingar og gögn úr þessum rannsóknum eru ekki alltaf nýttar til hins allra ýtrasta. Starfsfólk er heldur ekki alltaf tilbúið til þess að lesa langar rannsóknarskýrslur, sérstaklega ef það vantar aðeins mjög lítinn bita af upplýsingum um rannsóknina. Þeir sem framkvæma rannsóknirnar geta ekki munað hvert einasta smáatriði úr rannsóknunum sem voru framkvæmdar fyrir einhverjum árum og það leiðir stundum til þess að fyrirtæki endurtaki sömu rannsóknirnar, það kostar bæði tíma og peninga. Gögn úr þessum rannsóknum dreifast oft ekki milli teyma og deilda og mikilvæg þekking úr eigindlegum rannsóknum er ekki nýtt eins vel og hægt væri. Við prófanir á notendaupplifun, koma oft upp óvæntar niðurstöður. Jafnvel þótt þær upplýsingar reynist ekki mikilvægar fyrir rannsóknina sem verið er að framkvæmda, þá gætu upplýsingarnar verið mjög gagnlegar fyrir annað teymi eða aðra deild. Slík gögn eru í sérstakri hættu á að týnast.

Þetta verkefni var unnið af þremur nemendum úr Háskólanum í Reykjavík í samstarfi við CCP Games. Markmið verkefnisins var að finna leið til þess að auðvelda aðgengi að niðurstöðum úr rannsóknum á notendaupplifun innan fyrirtækisins. Lausnin var að búa til kerfi þar sem starfsmenn gætu skráð og nálgast litla bita eða "nuggets" af upplýsingum úr þessum rannsóknum, á auðveldan og þægilegan máta. Þessi skýrsla inniheldur greiningu á vandamálinu, lausnina og hönnunarferlið sem síðan leiddi til þróunar á kerfinu.

Preface

This research report is a part of a final project in B.Sc. Computer Science at the University of Reykjavík. The project was in collaboration with CCP Games, an Icelandic video game developer based in Reykjavík. The project is worth 12 ECTS credits and was worked on between August 2020 and December 2020.

The project's outcome is a website that allows CCP employees to consume atomized bites or "nuggets" of information from UX research within the company. Our involvement stemmed from our interest in web development, UX research, Human-Computer Interaction, and it's part in the video game development process. We sincerely express our gratitude to Josh and Vignir at CCP Games for their advice, guidance, and support throughout the semester. This has been a true learning experience.

Project Review - Project Nuggets

CCP Reviewers:

Josh Rivers, Player Researcher

Vignir Örn Guðmundsson, Director of Operations

Working together with Björk Sigurjónsdóttir, Kristín Sóley K. Ingvarsdóttir, and Sandra Björk Arnarsdóttir to realize ‘Project Nuggets’ has been a positive experience characterized by professionalism, expediency, and careful attention to detail. Overall, the team’s output is successful and matches the expectations set out at the beginning of the collaborative endeavor. The realization of a democratized research database with easily-understood and digested research ‘nuggets’ holds great value for CCP Games and its present initiatives as regards user experience research.

Collaborating with ‘Team Nuggets’ has been collegial, professional, and marked by clear communication throughout the project’s duration. Although establishing access to internal platforms at CCP proved a minor hurdle at the outset of the project, once established, said platforms ensured that the team communicated often with both Josh and Vignir about blockers to their progress and the current state of the desired output. Meetings were held regularly wherein Team Nuggets posed project-relevant questions while pointing to potential and existing blockers such as content needed from CCP in order to realize the project output. As with any project, there were minor miscommunications at times, but these were quickly rectified and resolved without any impact to the project’s timeline, output, or team sentiment.

The output itself, a fully realized website from which CCP employees will be able to search for and find research ‘nuggets’ meets the expectations set at the beginning of the collaboration, particularly given the restraints of time and labor hours. ‘Team Nuggets’ went above and beyond in spending their time on realizing the output and this time and effort is evident in the end result. While there are a few small deviations from the original project plan, most notably the search function operating largely on the basis of nugget ‘tags’ instead of a more generic search algorithm, these deviations are minor and were reviewed with Josh and Vignir upon implementation. In short, while the output of the project could use

to be improved ever so slightly, as is true of any project in games or beyond, these areas of potential improvement are the result of the team achieving their initial output goals with aplomb, resulting in an incredibly valuable platform for CCP's research efforts that will be implemented in Q1 of 2021 for internal use.

'Project Nuggets' was a highly successful collaboration and we at CCP Games are delighted to have taken part.

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1 Introduction

For this final project, the deliverables are this report, a requirement analysis report, design report, testing report and the system that was developed. The reports entail the research, analysis, and design for that system. The initial idea for this system came from CCP Games' need to utilize their user experience (UX) research fully. CCP needs to evolve with their players to keep them engaged, keeping them playing the game. EVE Online is an MMO (Massively Multiplayer Online) game that can take some time getting into. Therefore, CCP needs to keep an eye out for incoming new players and analyze why they might feel overwhelmed. That way, they can recruit and hold on to new players. These analytics rely heavily on user research and the ability to analyze the new players' emotional state.

The first step in the process of making the system was to analyze the problem at hand and find the best way to solve it. This report covers the main steps taken before the actual development of the system. First, it covers the methods used and the tech stack for the application. It then summarizes the requirement analysis for the system and prototype sketches and user tests in wireframe design and mediate design. At last, part of the detailed design is provided and discussed.

1.1 Methods

The team started the project by using the Scrum methodology but discovered rather quickly that their way of working was more in line with the Kanban methodology. Subsequently, the team shifted the work process to Kanban. Kanban focuses mostly on the reduction of waste in any kind of things. Kanban's principles are; visualize work, limit work in process, focus on flow, and continuous improvement [1]. The team still maintained their idea about the hours spent on the project as sprints since they planned the hours in parallel with the initially planned sprints. The team used Trello to track everything, make sure there weren't too many ongoing projects, and visualize everything in the backlog. Trello is a web-based Kanban-style list-making application. The Trello board was divided into four categories, which are specified in the Tech-Stack chapter.

1.2 About the application

The project entails atomizing and democratizing UX research within CCP. The system allows CCP employees to search this database with ease for atomized bites or “nuggets” of information. Each “nugget” is tagged and processed in a way that makes sense for the development process within CCP. Gathering all these facts, insights, and results will immensely aid in the process of forming hypotheses about UX without personal bias. It will offer insights into not only statistics regarding UX research within CCP but emotions as well.

1.3 Tech-Stack

This chapter covers the main combination of technologies used to build and run the application.

1.3.1 Trello

The Trello board was divided into four categories, as was mentioned in the Kanban discussion. The backlog entails a list of all tasks that are to be done. Up Next has the tasks that should be next on the schedule. That category can only have three tasks at any given time. The Work In Progress category, or WOP, are the tasks the team is currently working on. It can only have four tasks at any given time. It is not allowed to move a task from Up Next to WOP unless a task is cleared. When cleared, the tasks are moved to the Done category.

Table 1: Backlog categories

Nr.	List
1.	Backlog
2.	Up Next
3.	Work in Progress
4.	Done

1.3.2 GitHub

When multiple programmers are programming together with the same code, it is essential for collaboration to use version control. All of the team members have experience with GitHub, so the team decided to use that to keep track of changes. GitHub makes it possible for two or more team members to work on the same file simultaneously. Each change is then merged with the other changes and pushed into the repository, where every team member has access to it.

1.3.3 Visual Studio Code

The team's combined experience with Visual Studio Code was extensive and was therefore the first choice for IDE (Integrated Development Environment). It is very user-friendly and has many useful extensions. It is also integral that VS Code supports most operating systems since the team is implementing the application on different types of devices.

1.3.4 Database

For the database, the team decided to use Airtable.

Airtable is a spreadsheet-database hybrid, with the features of a database but applied to a spreadsheet. The fields in an Airtable table are similar to cells in a spreadsheet, but have types such as 'checkbox', 'phone number', and 'drop-down list', and can reference file attachments like images. Users can create a database, set up column types, add records, link tables to one another, collaborate, sort records and publish views to external websites [2].

The Polaris system from WeWork, which was analyzed as a similar system in *Project Nuggets - Requirement Analysis Report* [3], uses Airtable. After some research on Airtable, it seemed a good fit for this project as well. Airtable has a very easy-to-use API (Application Programming Interface) that will easily be integrated with any backend and frontend.

1.3.5 Backend and Frontend

It was intended that the system would be something CCP could maintain and add features to in the future. After seeking advice from experienced developers and talking to the contacts from CCP, the team decided that React + Typescript would be a good fit for the frontend of the system. Typescript is a language that builds on top of JavaScript, and React is a JavaScript library to build user interfaces. React + Typescript is becoming increasingly popular in web development. Team members have some experience with React and JavaScript, and CCP's web programmers also have experience with this combination. Typescript also helps to avoid bugs, that you can easily run into using JavaScript, by type-checking the code. React is popular for its reusable UI components, which allow you to change data without reloading the page. React is fast, scalable and the code is considered very readable. The team decided to use Node + Express for the backend, after they agreed on the frontend. Node + Express is easy to use, and there was no need for a complex backend.

2 Requirement Analysis

For the requirement analysis the team looked at similar products for inspiration, defined the user groups, the problem at hand, what impact the solution could have and the cost of inaction. Next a hypothesis was stated about the system and its usages. A discovery process was also included, where the main flow of the system was mapped out, a requirement list was generated and the first attempts at design were made with lightning demos.

Going over similar products, user group analysis and identifying the problem at hand, what impact the solution could have, and the cost of inaction was very informative and gave a much clearer picture of the system that was to be designed. After making assumptions about the system's usage, making a map of the system, forming a requirement list, and lightning demos and four-step sketches, the design preparation was well on its way.

The hypothesis summarizes the problem and solution. It combines the user group, the problem hypothesis, the solution hypothesis and the believed benefit. The hypothesis is stated below.

We bet that CCP developers and publishing team members are unable to quickly find and digest user research results during the sensing and discovery phases of development because said results are often 'buried' in lengthy reports and scattered across databases, and if we build a searchable 'research nugget' database with bite-sized, digestible research insights they will integrate using user research insights into their development processes, resulting in less duplicate research undertakings, more democratized access to research insights, and cross-departmental collaboration, ultimately leading to better decision making and more customer value.

What came out of the analysis process can be seen in further detail in *Project Nuggets - Requirement Analysis Report* [3].

3 Wireframe Prototypes

A prototype is used to put down design ideas, get an evaluation and feedback. It allows stakeholders to interact with it and visualize how the final product will look. There are three stages of prototyping

- Low-fidelity prototyping (paper prototypes and wireframe designs)
- Screen design/Mediate design (more details, color, fonts, texts, but not as detailed as the final product)
- Detailed design/High fidelity prototyping (looks like the final product but without all of the functionality) [4]

Low fidelity prototypes are paper prototypes and wireframes. Low fidelity prototypes are very useful because they are cheap, and it is easy to change the look without spending too much time on it. Low fidelity prototypes are not meant to be kept and integrated into the final product; they are used to explore ideas. Therefore, it is important that the design is flexible and encourage exploration and modification [5].

3.1 Design

Due to COVID-19 the team decided to make wireframes exclusively. The wireframe design that the team made was a visual guide that represented the websites skeletal framework [4]. It was made using Figma and did not have any colors or graphics. Below in figure 1 you can see the front page of the wireframe design of the website. The complete wireframe design can be seen in *Project Nuggets - Design Report* [6].

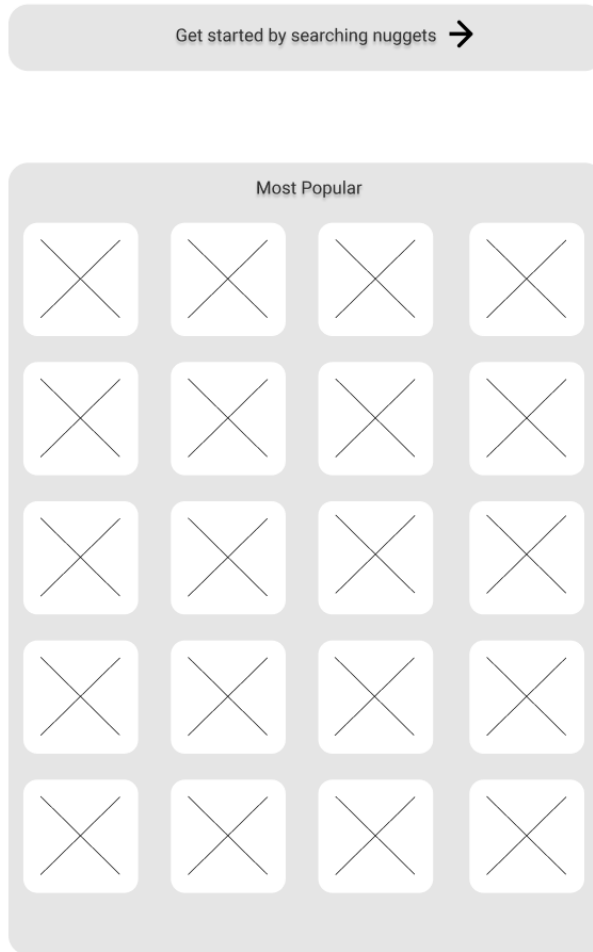


Figure 1: Wireframe design of front page

3.2 Testing

It was decided to do usability testing on the wireframes with the help of friends and family to get an idea of the system's flow and if any significant usability problems needed to be fixed before the prototypes were made and tested. The wireframe tests were done with the interaction tool in Figma. User tests were based on a script that included a short introduction, background questions, tasks to complete within the wireframe, and general questions

regarding the wireframe. Only one team member conducted each test and wrote down notes and comments. This method was chosen since the participants were not going to be actual users of the system, the purpose of this test was mainly to get a feeling of the website and whether the flow made sense. Generally, the participants found the system comfortable to use and understood the purpose of it. All of them had used a search engine before and knew the concept of it. Two of the participants had a bit of a problem solving the second task they were given, not because of the system, but because it was a *Figma wireframe* and didn't have all the necessary interactions the system was going to have. One user had a problem with task no. 5 but again just due to the interactions. Two users failed task no. 8 but that was primarily due to the way the task was worded.

The main problems found from the tests were lack of interactions and some confusion about the meaning of the words "Tabular" and "Playlist" when asked to switch from playlist view to tabular view. But the team was made aware that CCP employees were used to the term tabular so it was decided to keep that wording.

The results were deemed very useful, and there was no problem found regarding the system itself. To see the full summary and documentation of the wireframe user tests see *Project Nuggets - Prototype Testing Report* [7].

4 Mediate Design Prototypes

Stage two of prototyping, as mentioned before, is mediate design. The mediate design has colors, shapes, and sizes. Style is also used to support and enhance the functionality and the usage of the interface. It has much more functionality than the low fidelity prototypes, but not as much as the detailed design would have [4].

4.1 Design

The mediate design was done in Figma as well, and based on the results from the wireframe testing. Since most of the comments from the wireframe testing had to do with the system's interaction, the team decided to make the prototype as interactive as possible. The mediate design work took in total around 50 man hours. The goal was to make the prototype feel

similar to the real system, so the main flow through the system was set up as well as some alternative flows. The same story lines were used as in the wireframe section above but with updated tags. More information about the mediate design can be seen in detail in the design report, figure 2 shows one of the frames of the design.

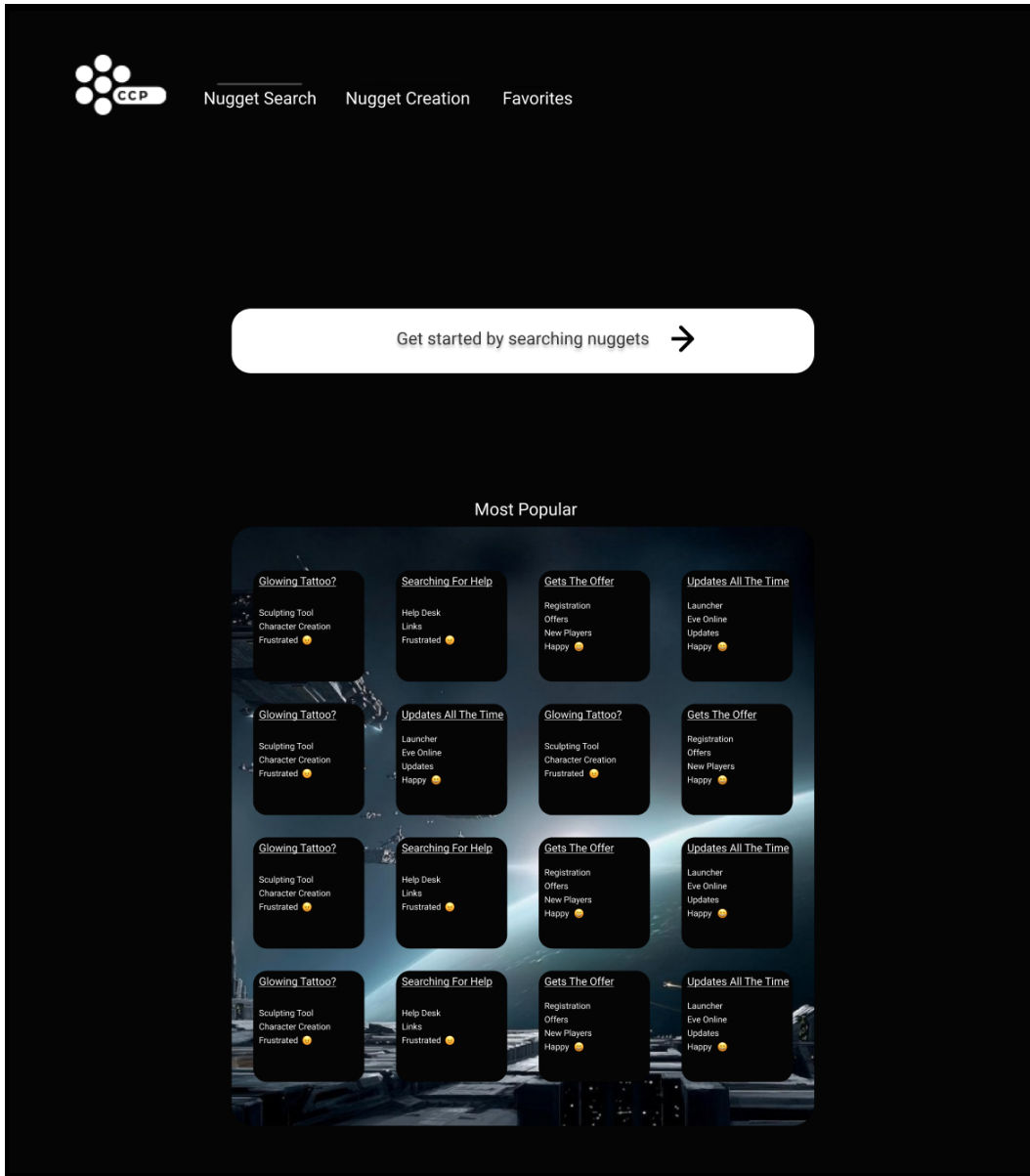


Figure 2: Mediate design of front page

4.2 Testing

The user tests were carried out with five employees from CCP, all of which were targeted users of the system. Due to restrictions related to the pandemic, the tests were done remotely through Microsoft Teams, and thus the user testing guide was written with that in mind. All team members were present while the tests took place. However, only one member had his camera on and conducted the test. The other team members had their mics muted, and the cameras turned off, but took notes and monitored if the task passed or failed for each participant. Usability goals for the system were defined from the User Testing Guide's tasks which can be seen in the *Project Nuggets - Prototype Testing Report* [7].

4.3 Results

The five user tests conducted went very well, and a lot of useful information was gathered that the team used to make the website more usable. There were only two tasks with a Pass from every participant, but Minor Struggle was pretty common in the other tasks.

Some of the usability goals for the tasks were unfulfilled, such as "90% of the users should be able to search for specific nuggets and view the result", but there were also some that were fulfilled, such as "The success rate for finding the search bar should be equal or higher than 90%".

Not all participants found the system easy to use. They found the system to have too many inconsistencies and that various functions in the system were poorly integrated. Therefore they did not feel confident using it. The average, summarized score for all participants was 73.25, the goal was to be at least 75, which means that the goal was not achieved. The major problem areas however had been identified.

Below in table 2 is an overview of the results of the user tasks that were presented to the participants of the tests. Each task was graded as a success, minor struggle, some struggle or fail. In table 3 is the status of the usability goals. The process in whole and complete results can be seen in more detail in the *Project Nuggets - Prototype Testing Report* [7].

Table 2: Task-List Results

	Playtester #1	Playtester #2	Playtester #3	Playtester #4	Playtester #5
1 Finding the Search Bar #1					
Task 1.1 Navigating to the search			Minor Struggle		
2 Finding Specific Nuggets #2					
Task 2.1 Searching by Tags, Emotion and Department	Minor struggle	Minor Struggle	Minor Struggle	Minor Struggle	Minor Struggle
Task 2.2 Describing the search results			Minor Struggle		
Task 2.3 Search for something new					
Task 2.4 Returning players and Account Recovery Nuggets		Major Struggle	Minor Struggle	Major Struggle	
Task 2.5 Changing to List form			Fail		Fail
Task 2.6 See nugget in more detail			Minor Struggle		Major Struggle
Task 2.7 Changing back to Playlist view					
Task 2.8 Finding nugget in the playlist	Minor Struggle	Minor Struggle			
Task 2.9 Most popular nuggets					Fail
Task 2.10 View as list			Fail		

Table 3: Usability Goals, Status

Nr.	Usability Goals	User Group	Priority (A/B/C)	Measurement	Value	Status
1	The success rate for finding the search bar should be equal or higher than 90%	Employees	A	Success Rate	95	Fulfilled
2	90% of users should be able to search for specific nuggets and view the result	Employees	A	Success Rate	75	Unfulfilled
3	100% of users that were able to search for specific nuggets should be able to clear the search and search for something new	Employees	A	Success Rate	100	Fulfilled
4	The average summarized score for all participants from the SUS questionnaire should be 75 or higher	Employees	A	Satisfaction Rate	73.25	Unfulfilled
5	100% of users should be able to find the playlist in the search results and click on nuggets in the playlist	Employees	A	Success Rate	80	Unfulfilled
6	80% of users should be able to find the most popular nuggets on the home page	Employees	B	Success Rate	80	Fulfilled

7	70% of users viewing their results in tabular view should be able to go back and view their results in playlist view	Employees	C	Success Rate	100	Fulfilled
8	70% of users should be able to view their search results in tabular view	Employees	C	Success Rate	60	Fulfilled
9	70% of users should be able to view the most popular nugget they clicked on in tabular view	Employees	C	Success Rate	80	Fulfilled

5 Detailed Design Prototypes

Following the user testing, many changes were made to the design. For example, it was decided that too much color was taking the focus from the data, so the new design was made with a white background with black font, which is optimal for information display, and grey, with color on the tags to give the different categories of the tags some contrast. The final design of the home page and viewing a nugget can be seen in figures 3 and 4. Screenshots of the home page and viewing one nugget of the programmed system can be seen in figure 5 and 6. Some of the text and images have been blurred due to the content being confidential.

The most noticeable change that was made was that the flow between different pages was simplified. Other changes that were made are, for example, the search bar; it was made more simple with only one line because that is something people are more used to, and team members felt that the older design with the different categories might have been too complicated. There was also an About section added to the site for those visiting the site for the first time and might not understand what it is about or what a nugget is. When viewing one nugget, the playlist's content to the right was also changed and displayed related nuggets instead of the rest of the search results. Which gives users an easy way of discovering new content. The final design and the changes that were made can be seen in more detail in *Project Nuggets - Prototype Design Report* [6].

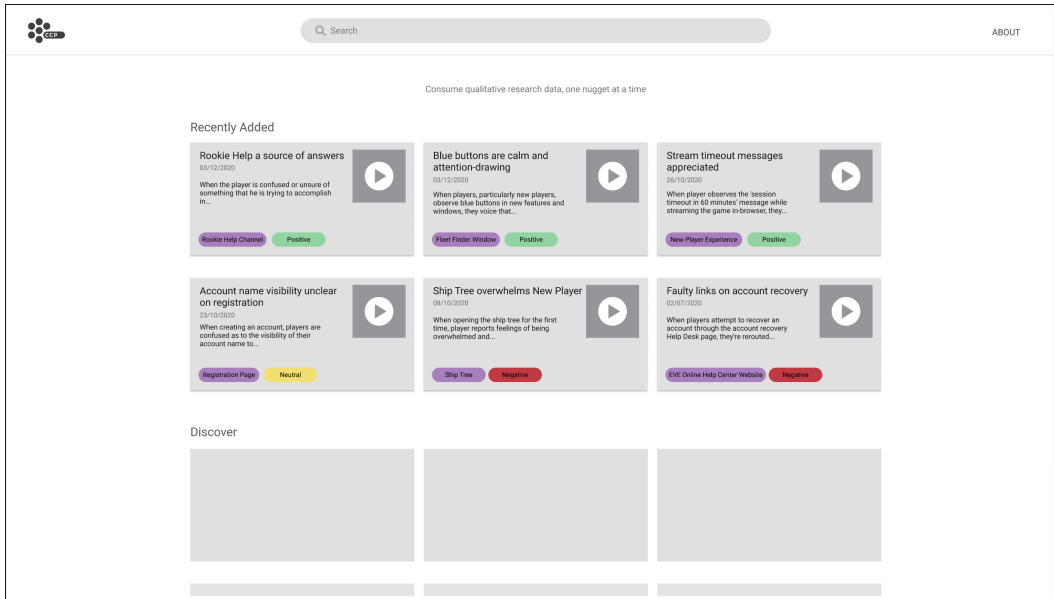


Figure 3: Final design of home page

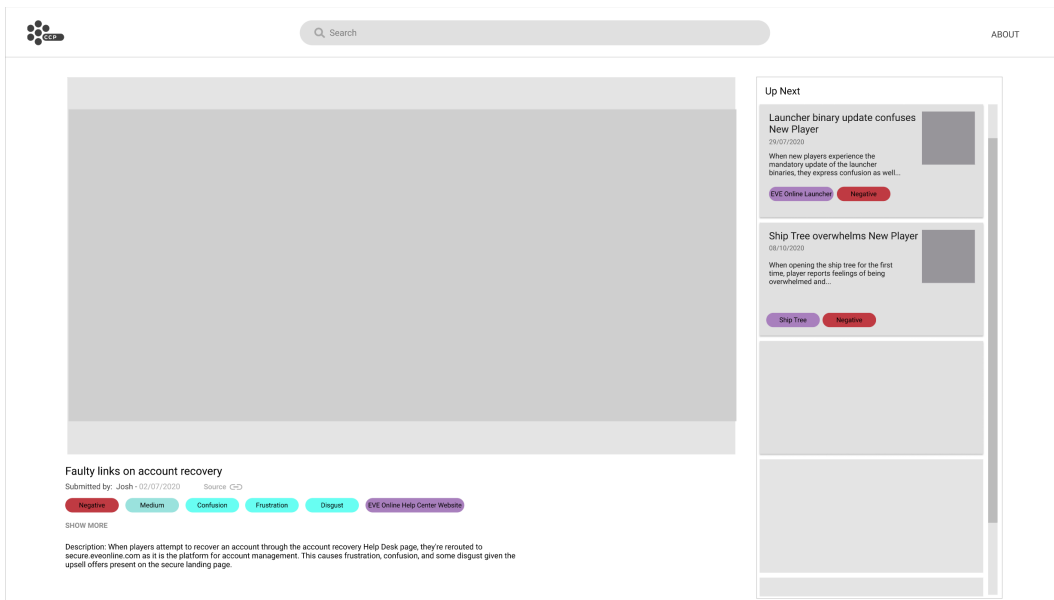


Figure 4: Final design showing one nugget

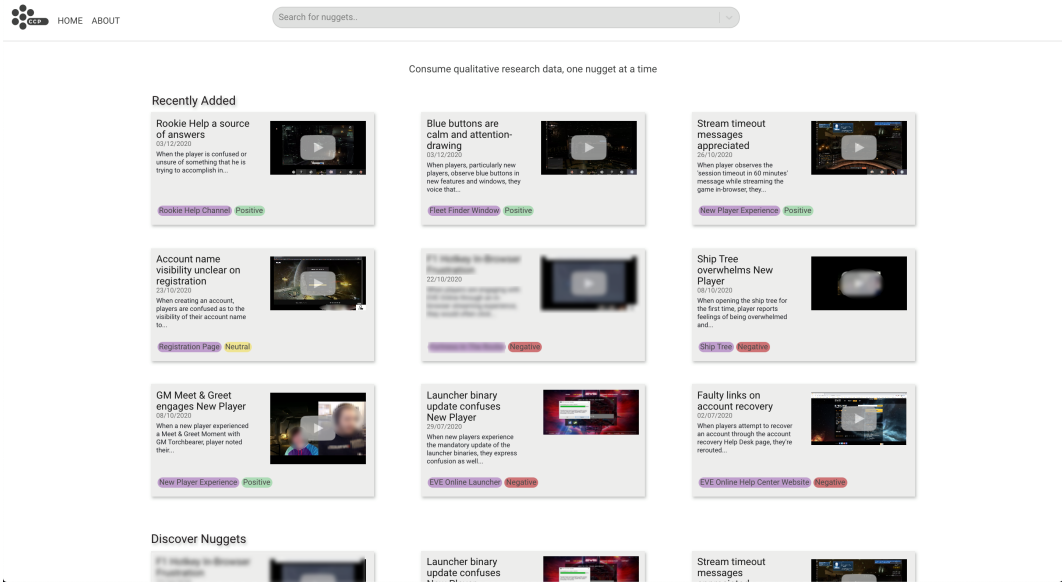


Figure 5: Front page in programmed site

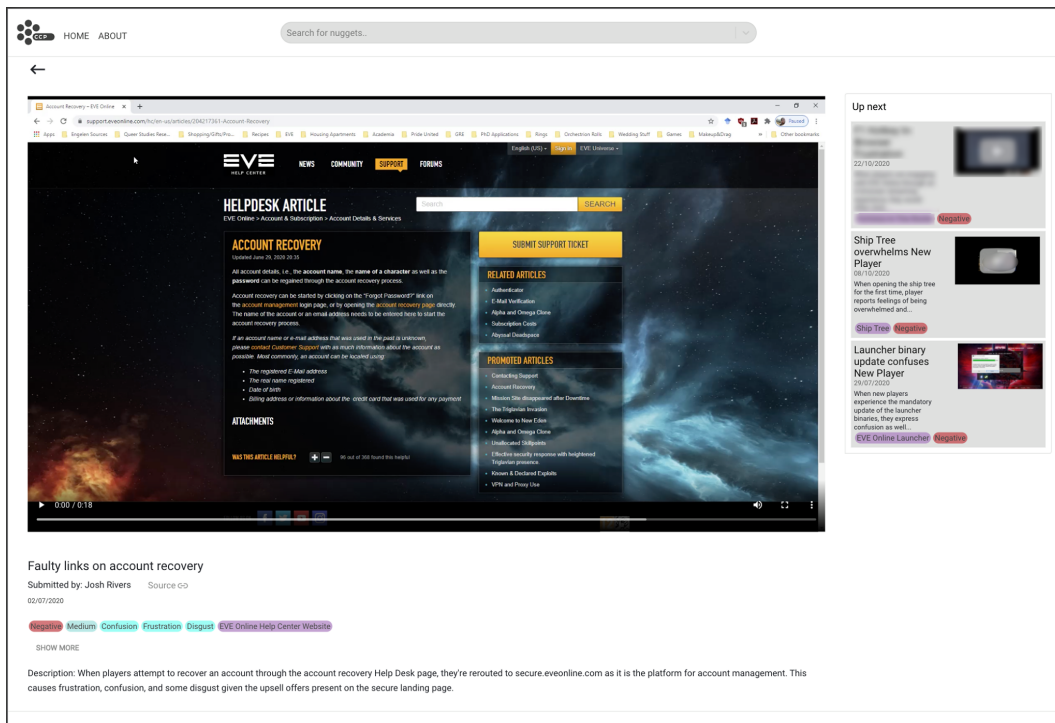


Figure 6: A nugget containing video media shown in programmed site

6 Conclusion

This project was done in two parts; the first part was about defining the problem at hand and then mapping out how to solve it. In the second part, the knowledge gained in the first part was used to develop the website. This report has covered the main steps taken in the first part of the project. It started by going over the methods used and what technology was chosen. Some companies offer systems for customers to use in similar ways as the website the team developed. Therefore similar products were studied for inspiration and to verify the need to make a system from scratch instead of buying this service elsewhere. After mapping out the user groups, the problem, impact, cost of delay, the solution, requirements, etc., the next steps were design. The design process started with team members making the four step sketches, leading to wireframe prototype design, mediate design prototypes, user testing, and the final design.

The team was able to implement all the most important features of the system they had set out to do. It was decided to implement the system in TypeScript and React because employees of CCP have experience with Typescript and React. It was intended that the system would be something they could maintain and add to in the future. For example, create a feature for employees to add their own nuggets, favorites, likes and comments section.

In the best of circumstances, it would have been great to have been able to make another usability test on the final outcome. But team members are confident that all of the work that went into the project's research part did deliver through to the final design and implementation.

Looking at the hypothesis that was written early in the process, it was stated that if a platform were provided for CCP employees, which offered easily searchable insights into atomized research bits or 'nuggets', it would result in less duplicate research undertakings, more democratized access to research insights, and cross-departmental collaboration, ultimately leading to better decision making and more customer value and would with it eliminate the problem of CCP developers and publishing teams being unable to quickly find and digest user research results during the sensing and discovery phases of development because said results are often 'buried' in lengthy reports and scattered across databases.

Reflecting on said statement together with the project review from CCP, it can be said that the platform that has been developed reaches the goal of offering more democratized access to research insights and being easily searchable. Since the platform has not been deployed, it is impossible to state with certainty that it has led to better decision making and less duplicate research, while the

team is optimistic that it will do so. The problem laid out, having to search through lengthy reports or databases to look for certain insights from studies, has successfully been eliminated.

The team members can attest that this whole process has been extremely rewarding and informative. The hope is that the system will positively impact the workflow within CCP by providing better access to the valuable information from their UX research.

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