

CS 570 Introduction To Human-Computer Interaction
Spring 2022

PROJECT I: WEB-BASED SERVICES

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Improving Current Video Website

PROJECT I: WEB-BASED SERVICES

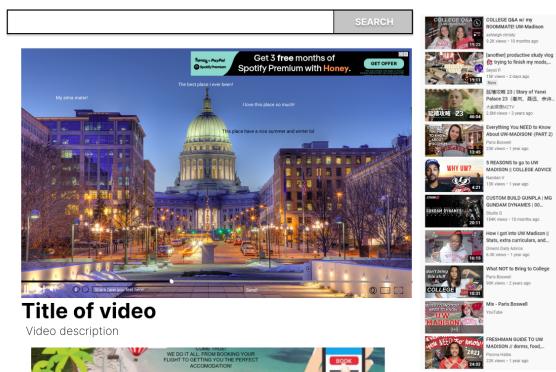
INTRODUCTION

Summary

In this web-based service project, our team focuses on improving users' experience on the video websites. There are two steps in our project.

First, we apply contextual inquiry to collect the data and find the breakdowns of the video website during the interview. We noticed there are two breakdowns and one potential improvement: 1) intrusion when users watch videos 2) users cannot control video quality and 3) add a function called "bullet chat".

Here is the current prototype of our "new video website".



Prototype

Based on the breakdowns and the improvements, we design this interface. We move the advertisements before or in the middle of the video to the right-top of the video, as well as add a button that allows users to control the quality. We also built a "bullet chat" function to improve user experiences.

The second process is that we apply the usability test to participants for our prototype. This is helpful to get the feedback from them and do modifications

and improvements for our "new video website".

Processes

The problem domain for our project was the video search: how the participants use their favorite video websites in order to search for or watch the videos. By conducting a successful contextual inquiry, we were able to objectively analyze the challenges and problems that the participants encountered when using different video websites or applications and propose reasonable solutions to improve the user experiences. The participants are not limited to Comp Sci 570 students, but the people whom we are comfortable with conducting interviews and people who search for videos on a daily basis. Due to the pandemic, we have decided to perform the interviews online, Zoom, and recorded them to ensure that we were capturing not only their responses but also their subtle behaviors.

During the interview, we asked three participants to search the videos in a way they normally do use their preferred websites. In this process, we observed their search patterns and habits and actively asked the questions to gain sufficient data. While most of the interview questions were prepared before the interview, we also asked follow-up questions. For example, when the participant discussed how he utilized the "suggested videos sections", we asked if the videos in suggested sections match with your interests or how he thinks about the ordering of the videos. As an apprentice, we conducted a strong contextual inquiry to obtain insights about the user's video tasks and discover the

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potential challenges that could arise during these tasks.

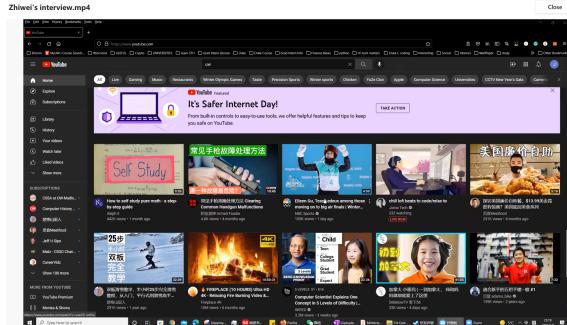


Figure 1. Zhiwei's CI interview



Figure 2. Heeyoon's CI interview



Figure 3. Bowen's CI interview

After the contextual inquiry research, our team designed a prototype for our “new video website” based on the feedback from participants and the data we collected from the interview. We noticed there are two

main breakdowns for the video websites we are working on, and have a potential idea about the improvement which is beneficial for the websites to improve user experience.

We designed one high-fidelity prototype for another three participants to do the usability test and get feedback and collect data from them. This process lets us do more improvements for the modification we did already for our own “new video websites” and modify the prototype we have.

PROJECT I: WEB-BASED SERVICES UNDERSTANDING

DATA SUMMARY

The data we obtained from our contextual inquiry was similar to what we expected in general. The video websites that our participants discussed include Youtube, Netflix, and Bilibili. One of our participants chose a unique video website, Bilibili, which allows us to compare with the popular websites and explore the advantages of Bilibili over others. This comparison also provides us the opportunity to learn about how people's preference of video websites differs by their habits and culture.

Specifically, the reason why this participant chose Bilibili was that most videos on Bilibili are in Chinese, and they focus on the preference of Chinese people; this indicates that the cultural factor is involved in his website selection. In general, we believe that it is important to understand the cultural differences between people and provide website features that can be enjoyed by our target customers.

Although our participants have different preferences on video websites, they all enjoy and are satisfied with certain features of the websites, including the search bar, structure of homepage and video page. For instance, the obvious and clear layout of the search bar located on the top allows the users to search new videos after watching in a much easier and simpler way (without going back to the main page). In addition, all participants love the video suggestion section that provides a list of videos that might trigger users' interests based on their search and watch history. The video page contains useful features like subtitles, video quality, speed of the video. In fact, the main reason why one of our participants chose Youtube over Netflix was that Youtube

allows its user to set the video quality, while Netflix does not.

On the contrary, the main breakdown occurs when the advertisements before or middle of the video disturb the users from watching even though they are not relatively long. One of the participants mentioned that it bothered him the most to watch content that was completely unrelated to the content of the video. Alternatively, another participant explained that one of the reasons he chose Bilibili instead of Youtube is because all the ads are positioned at the bottom of the video page, and most of the ads are related to the video. In conclusion, we think it is necessary to ensure the relevance of ads to the video content and make them not interrupt users from watching.

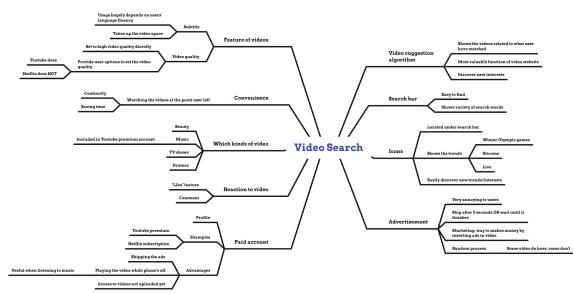


Figure 4. Heeyoon's affinity diagram

| Main Page | Search bar | Arrangement | Video page | Suggestion part | Behind the page |
|------------------------------|------------------|--------------------|--------------------------------------|---------------------------------|----------------------------|
| Top Interested | Obvious position | Unique | Useful functions (speed, pause, etc) | Most relative video first | Collect user data |
| Top news | Smart guess | Most popular first | Annoy advertisements | Latest video first (timeliness) | analyze users' preferences |
| Homepage sequence | Relative guess | | | | Intelligent recommendation |
| Private custom for each user | Efficiency | | | | |
| Obvious Hint | | | | | |
| Useful Functions | | | | | |
| Accessible | | | | | |

Figure 5. Zhiwei's affinity Diagram

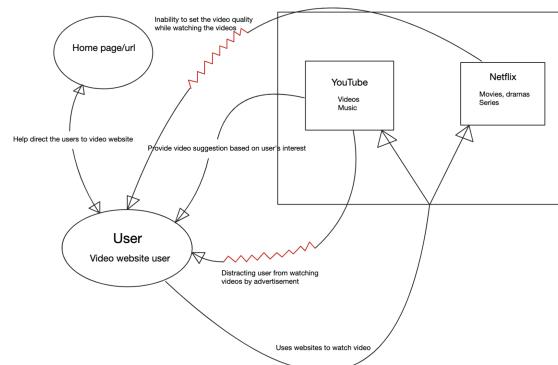
PROJECT I: WEB-BASED SERVICES UNDERSTANDING

| Recommendation System | Interaction | Video Page | General Suggestions |
|--|---|-----------------|-------------------------------------|
| Tag System | New feature: Bullet chat | Auto transcript | Narrow the range of target customer |
| Search bar suggestions | Support content creator: Coin and Like system | Subtitle | Short video section |
| Recommend video on Front page/Video page | | Speed | |
| | | | |

Figure 6. Bowen's affinity Diagram

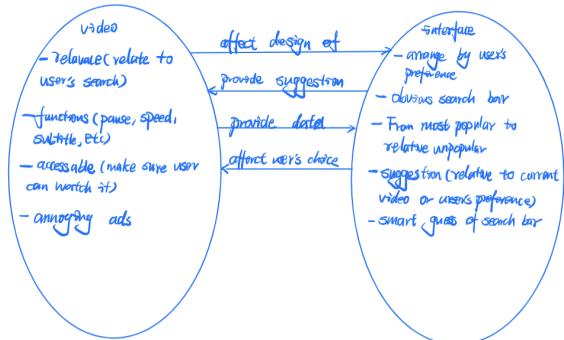
WORK MODELS

According to the **flow model**, we found out that all three charts discuss how the advertisement system negatively affects the users' video experiences. However, users enjoy the videos from the suggested video list, and their decisions about what to watch next are hugely influenced by this list. Lastly, when the user types something in the search bar, several keywords listed under the search bar help the users find their topics and provide more search options. Based on the interview, we successfully developed the flow model that focuses on the interaction between the user and video website and how different features of the website impact the users' perspectives.



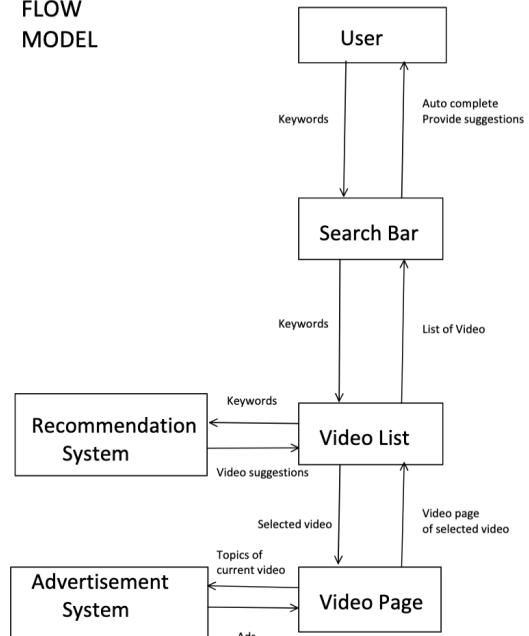
Heeyoon's flow model

Flow Model



Zhiwei's flow model

FLOW MODEL

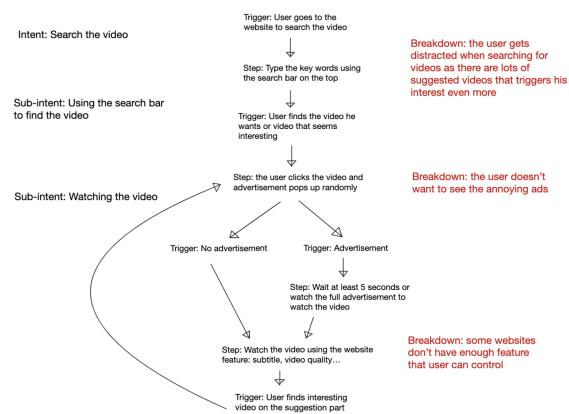


Bowen's flow model

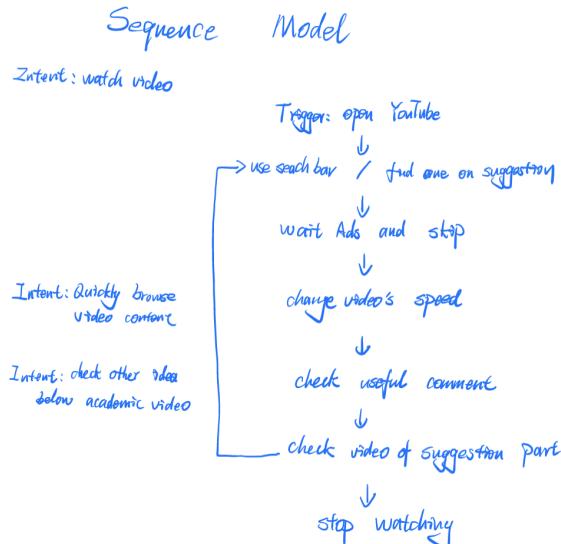
From the **sequence model** we developed, we found out that our participants use video websites to look for a specific topic or video, and they tend to watch other videos as well because the advertisement and video suggestions attract them to do so. Most of our participants agree that the suggested keyword in the search bar and

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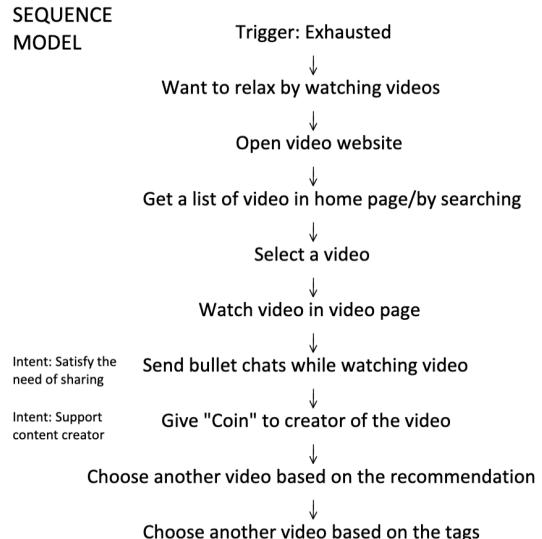
video suggestions are attractive features of the platform, but some of them believe that it can be a distraction when we want to focus on a single video. Furthermore, all our participants were unsatisfied with the advertisements before the video. The 5 to 30 seconds ads are likely to become a trigger that makes users stop watching videos or even stop using this platform.



Heeyoon's sequence model



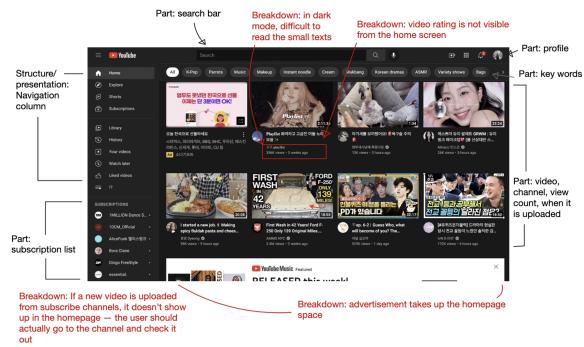
Zhiwei's sequence model



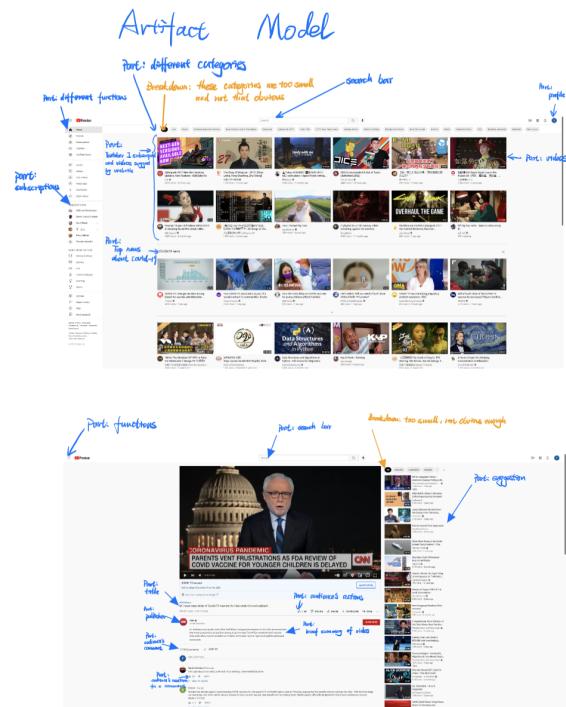
Bowen's sequence model

We observed the general structure and contents of the websites that users use to watch the videos based on the **artifact model**. One of our key findings is that the search bar is clearly visible and placed in an obvious position (which is at the top of the website) thus it is relatively easy to use the search bar. In addition to the search bar, the video suggestion list is obviously structured on the right side of the video page. Lastly, one of the data shows that there is bullet chat that allows users to communicate and interact with each other while watching the video. The breakdown occurred when we found out that the texts, including the title and keywords, are too small to view. The color of the texts was similar to the background (at least, in dark mode) which might be improved with the replacement of vivid-colored and bigger texts.

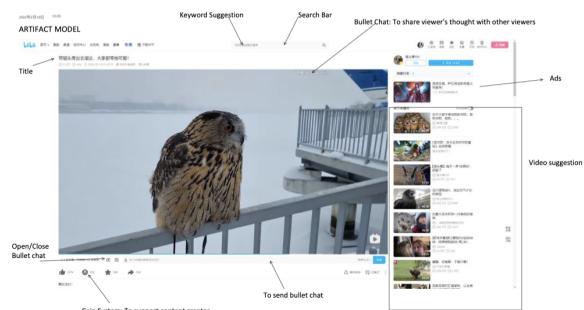
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Heeyoon's artificial model

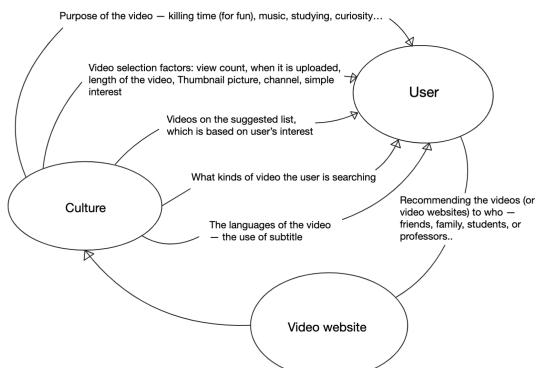


Zhiwei's artificial model



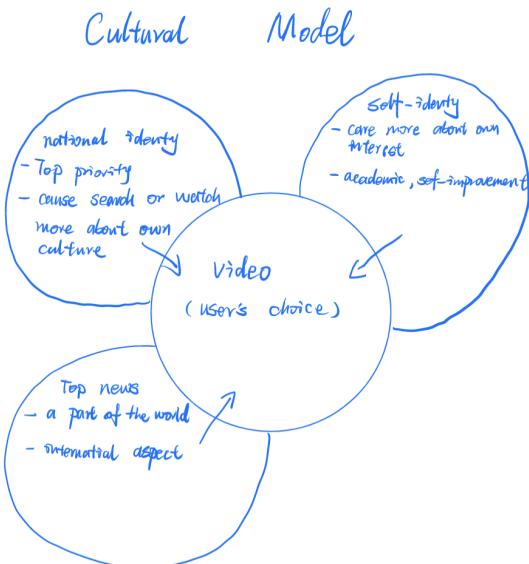
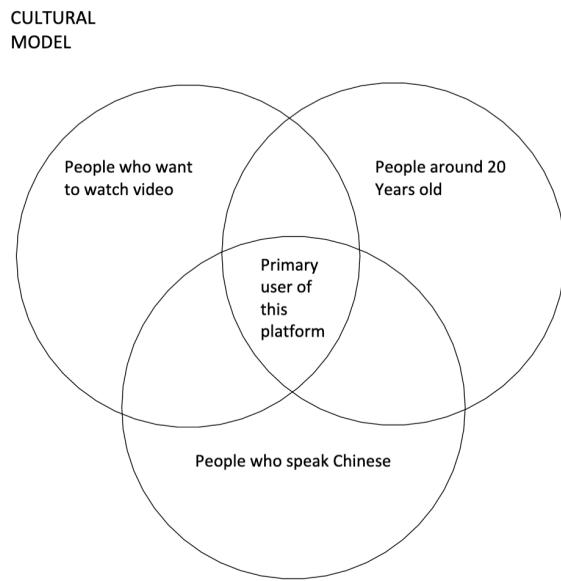
Bowen's artificial model

According to the definition of the **cultural model**, culture influences and defines participants' choices, expectations, values, etc. Through interviews with participants, the cultural model was a relatively personal model. It depends on the individual's subjective perceptions, such as the interviewer's cultural background, and self-identity. Personal principles or organizational discipline also influence model building. However, these indirectly affect individuals' subjective views of the video.



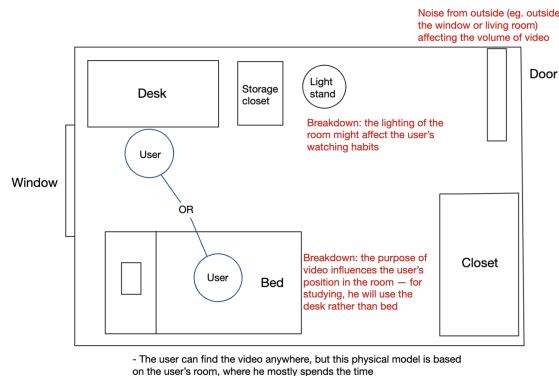
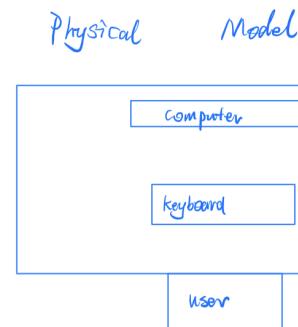
Heeyoon's cultural model

PROJECT I: WEB-BASED SERVICES UNDERSTANDING

*Zhiwei's cultural model**Bowen's cultural model*

The **physical model** is kind of limited during this special time. Due to the pandemic, two people of our group numbers only had the interview online by Zoom. As a result, the data of the physical model is limited for us. However, it is true that our participants tend to watch videos

through a smart device. The devices that they use are a computer, a cell phone, or a tablet, surrounded by lamps, etc. One of the group members had a chance to perform the interview in-person and discovered that the position of the participant depends on the type of video she is watching. For example, the participant chooses to sit at her desk when she watches a video to study. On the other hand, she watches a video on her bed when relaxing and killing time.

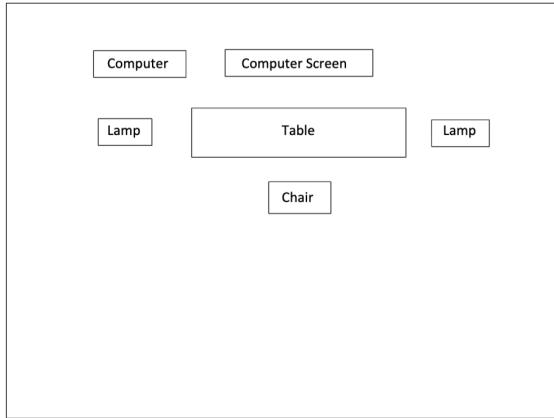
*Heeyoon's physical model*

the physical model's data is limited, because I had the interview through the Zoom.

Zhiwei's physical model

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PHYSICAL
MODEL



Bowen's physical model

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IDEATION

According to the data we collected from contextual inquiry, there were two main problems: disruptive advertising and auto video quality.

First of all, the participants are annoyed by the advertisements before or in the middle of the video. (Some of them can be skipped after waiting 5 seconds, while some of them cannot be skipped). The contents of the ads are totally irrelevant to the video content, and they negatively affect the users' video experiences. In order to solve this problem, we came up with a new design, which is the relocation of the ads to the corner of the screen, for example, a small window of the ad at the upper right corner. The ads remain at the same position and can be easily removed when the users click the "x" button of the ads.

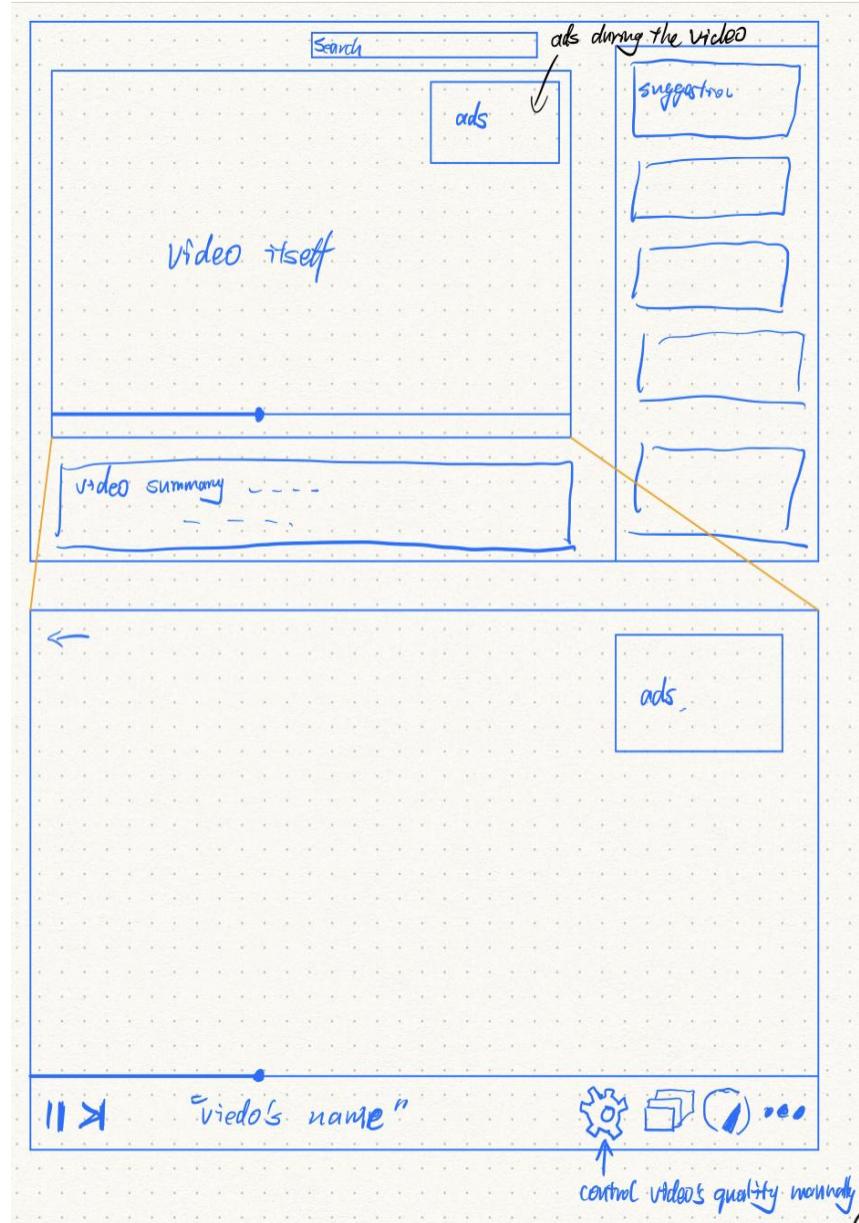
The other problem that arises from the contextual inquiry is the auto video quality. Some of the video websites, such as Netflix, automatically set the video quality by the network condition and don't provide the users' options to set the quality manually. For instance, if the wifi connection gets bad, the videos are in 240p or 360p, where the clarity of the video is greatly reduced. The potential solution would be the addition of a video feature, video quality. If the user sets the quality to high resolution with a poor internet connection, this causes a potential lagging or even pause of the video. However, the point of the feature is to give the users the "choices" to select what they want, thus having more control over the videos. In addition, adding a feature to save high-quality video could be another solution. Users can download and save high-quality videos when they have a strong internet connection and watch them offline.

Finally, the last design idea is the bullet chat, which acts as a live chat. During the contextual inquiry, we noticed that the participants do not usually utilize the "like" button and leave comments on the video. We concluded that this is considered as a lack of interaction between users. Therefore we tried to come up with a solution that maximizes the user interaction: bullet chat. Bullet chat is the new design that comes from the Chinese video website, Bilibili, and users can send comments at a specific time frame while watching the video. By implementing the bullet chat, the users are able to share their feelings and reactions about the video content.

PROJECT I: WEB-BASED SERVICES PROTOTYPING

This is a lo-fi prototype of our video websites. The prototype includes our design on two breakdowns that were mentioned by our participants during the contextual inquiry, which are about the annoying advertisements and the problem in which users are not able to control the quality of the video. Just like the layout of the upper part of the picture, we decided to remove the advertisement that will play at the beginning of the video. Instead, we put our advertisement in the upper right corner of the screen.

Just like the lower part of the picture, we added a button in the lower right corner of the screen that enabled the user to adjust the quality of the video. By implementing this, we can solve the problem of our second breakdown.

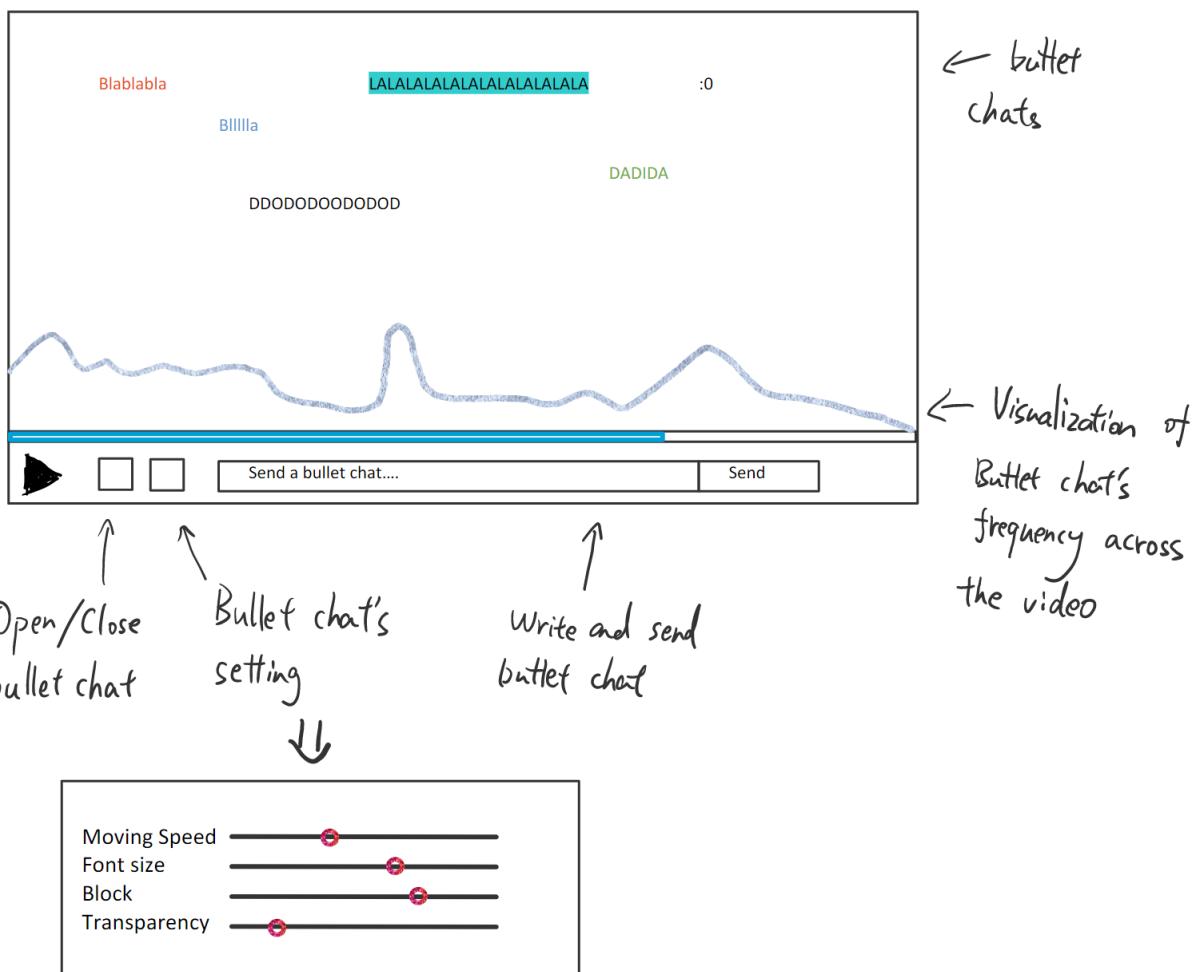


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PROTOTYPING

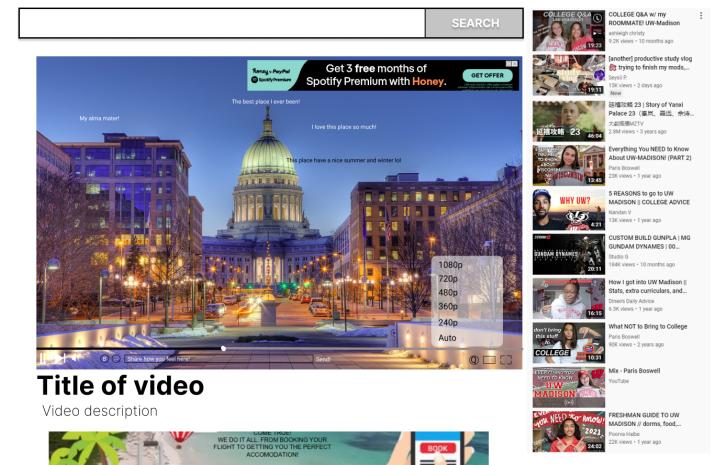
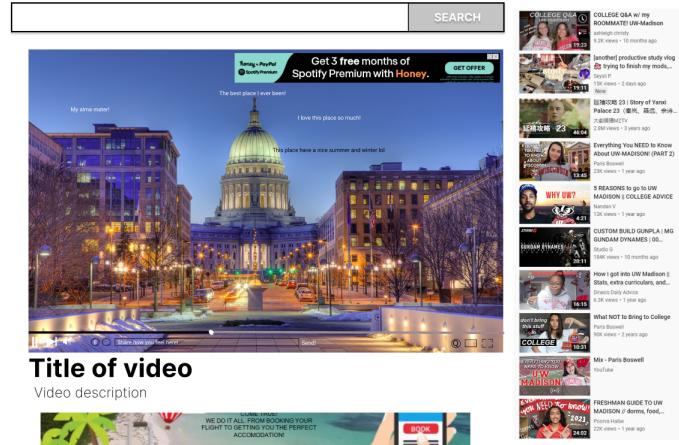
Below is the second part of our lo-fi prototype. This part of the prototype demonstrates the improvement we made to our video website. As you can see, there are several lines of words that are floating around on the screen. These words are called “bullet chat,” which are sent by the users who watched the video to share their thoughts and feelings regarding a specific part of the content in the video. Just like the comments near the picture, users can send chats by using the text bar at the bottom of the page. Also, users use the buttons in the lower-left corner to open or close the display action,

and change the settings of the bullet chat as well. The visualization of bullet chat’s frequency was abandoned after our discussion.



PROJECT I: WEB-BASED SERVICES PROTOTYPING

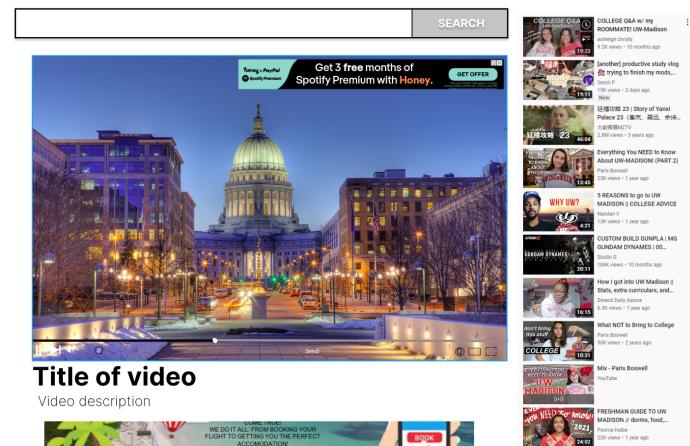
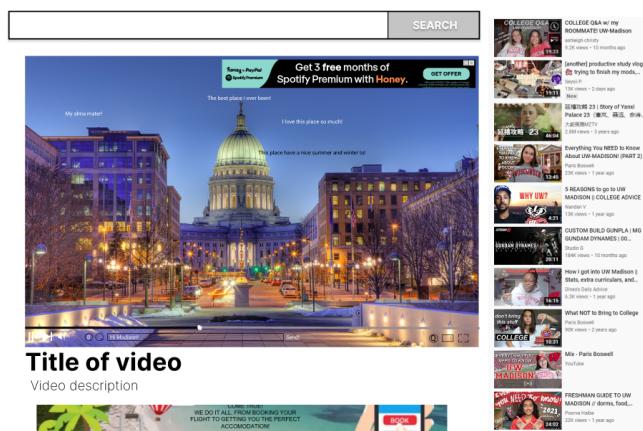
Below is a hi-fi prototype of our video website. The advertisement is in the upper right corner of the picture. The advertisement window is relatively small compared with the video page, so it is not likely to influence the viewing experience of users. Also, The advertisement is not mandatory during the video. Users can click the upper right corner of the advertisement window to close the advertisement. This design solves the problem of the first breakdown.



According to the above hi-fi prototype, there is a button on the bottom right corner of the video page. Users can use this button to adjust the quality of the video based on their preferences. The available qualities are between 240p to 1080p, and they may vary due to the difference in the source of the video. The default setting of quality is auto, whereas the system will automatically set the quality of the video based on users' device, internet speed, and the source of the video. This design solves the problem of the second breakdown.

PROJECT I: WEB-BASED SERVICES PROTOTYPING

Below is the hi-fi prototype, which demonstrates our design of bullet chat: A new feature added to our video website as an improvement. The bullet chats are words and sentences floating around in the upper part of the screen. The bullet chats were sent by the users who watched this video. It provides a way for users to share their feelings and communicate with each other asynchronously. To send the bullet chat, the user can use the text bar, which is located at the bottom of the screen, to compose the chat, and click the “send” button to send the chat. In this case, the user typed “Hi Madison” in the text bar.



The bullet chats feature might not be welcomed by anyone who uses a video website. Sometimes, people want to enjoy the content of the video without interruption. In this case, the user can choose to mute the bullet chat. According to our hi-fi prototype above, users can use the button in the bottom left corner to mute the chat. This picture shows the video page on which the user chooses to mute the bullet chat.

PROJECT I: WEB-BASED SERVICES PROTOTYPING

In addition, users can configure the settings of bullet chat. In this hi-fi prototype, users can adjust the moving speed, change the font size, configure the frequency, and manipulate the transparency of the bullet chat to ensure the best viewing experience for themselves. To be specific, the moving speed decide how fast the bullet chat floating through the screen; the font size changes the size of the bullet chat; the transparency can change the transparency of the bullet chat to avoid the bullet chat influencing the viewing experience negatively;

The frequency decides the number of bullet chats in a certain period of time. For example, if a user sets the frequency to 50 percent, the system will mute about 50 percent of the chat.

The users can change the setting by clicking the button in the bottom left corner and moving the white dots to change different settings from low to high.

Title of video

Video description

COME TRUE!
WE DO IT ALL. FROM BOOKING YOUR
FLIGHT TO GETTING YOU THE PERFECT
ACCOMMODATION!

BOOK

COLLEGE Q&A w/ my ROOMMATE! UW-Madison

ashleigh christy

9.2K views • 10 months ago

[another] productive study vlog

Seyssi P.

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Studio G

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Dime's Daily Advice

6.3K views • 1 year ago

What NOT to Bring to College

Paris Boswell

90K views • 2 years ago

Mix - Paris Boswell

YouTube

FRESHMAN GUIDE TO UW MADISON // dorms, food,...

Poornima Halbe

22K views • 1 year ago

PROJECT I: WEB-BASED SERVICES EVALUATION

After creating high-fidelity prototypes, we used a usability test to gather assessment data about effectiveness and learnability. The participants group was the same as the participant group of contextual inquiry, and we asked three tasks to perform: 1) Send something in the bullet chat 2) Change the bullet chat features, such as moving speed or frequency and 3) Set the video quality to 720p. These tasks were meant to inspect the new features we developed and discover potential issue regarding these features.

Methodology

This usability test will be somewhat exploratory but will also gather assessment data about the effectiveness, learnability, and the errors of the video website we designed, "www.V.com." The participants were the same three participants from the contextual inquiry. We will ask the participants to perform the three tasks based on our new design or features.

Session Outline and Timing

The test session will be 20 minutes long. We will use the first 5 minutes to introduce the overall usability test. Each task will take about 3~4 minutes. Lastly, we will use the last 5 minutes for post-test debriefing

Introduction to the Session:

Start with debriefing the purpose of this usability tests and informing the users about the tasks they are asked to perform. As a bullet chat feature is new to lots of users, it is important to take some time to explain about its function.

Tasks (10 mins)

1. Send something in the bullet chat
2. Change the bullet chat features
3. Set the video quality to 720p

Post-test Debriefing

1. Record and collect the data they provided
2. Ask about overall functionality, learnability, and satisfaction of the new design, compared to the original video websites
3. Follow up on any errors that came up with the participants

From the usability testing, we were able to gather four important points regarding the new design:

- A. Participants found difficulty in watching the video when there are too many bullet chats, covering the entire screen. Too many chats disturb the users from focusing on the videos.
- B. One of the participants recommended a new function of bullet chat, which is about quick access to the emojis. Instead of typing the reactions everytime, sending the emojis would be a faster and easier way to express her feelings and thoughts.
- C. The last theme on the bullet chat was the color change of bullet chat fonts. Since the default color of the chat fonts are either black or white, the participants sometimes found the chats dull and boring. It would be better if the bullet chat provides the users opportunities to customize and express individuality by changing the color of the font and adding the emojis.
- D. A few participants found difficulty in figuring out the function of each button. Since there is no direct instruction on what these buttons are and how they work, the participants seemed confused at first when they were performing the tasks, especially the second task (changing the bullet chat features).

PROJECT I: WEB-BASED SERVICES FINAL SOLUTION

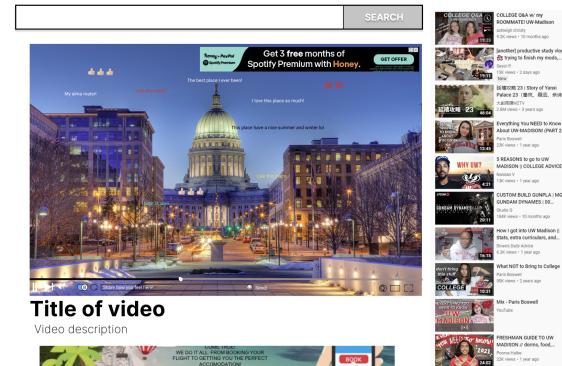
<https://www.figma.com/file/UwsUe5lMOjA0Q2ehANflg4/High-fidelity-prototype?node-id=31%3A2>

Here is the [LINK](#) to our final prototype.

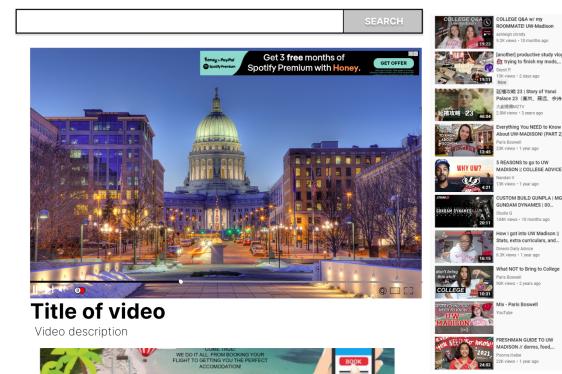
We did several improvements and modifications for our final prototype based on the data we collected from the usability testing, depending on the feedback of participants from the usability testing process. We noticed that the function of the bullet requires lots of improvements. Participants require emojis to help them to send their feelings quickly, so we add three default emojis for users to send. It will also send three at the same time, which will look nicer and won't cause the problem of chaos on the screen. Besides, based on participants' feedback about the problem of bullet chat's color. We also allow users to choose the five default colors (which are blue, red, yellow, green, and white) they like before they send the chat to the screen. It provides users more options to share how they feel by color.

At the same time, the bullet chat still covers the content of the video to some extent. As a result, we follow participants' suggestions and set a fusion that will only show some particular section of the bullet, for example, only show bullet chat on the top or on the bottom. It can prevent bullet chat from covering some important video content and protect users' watching experience at the same time.

Moreover, in order to make sure users can understand all functions we provided in our final prototype, we redesigned the UI of all buttons. We try to make sure every button is straightforward and easy to understand for all users.

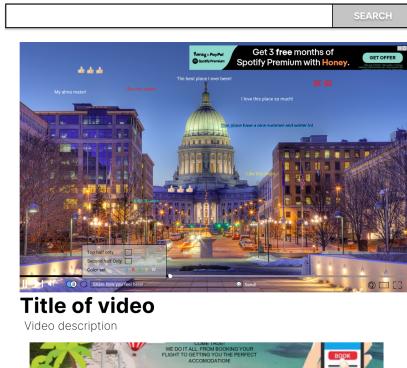


The main interface

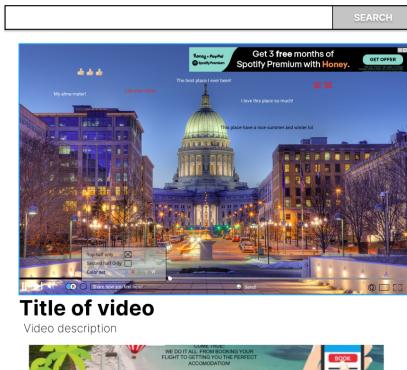


Turn on/off the bullet chat

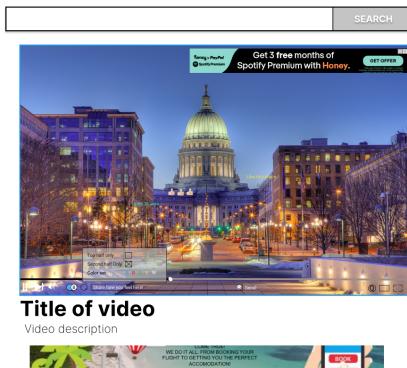
PROJECT I:WEB-BASED SERVICES FINAL SOLUTION



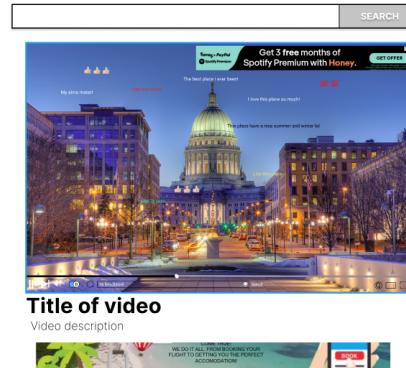
Set the bullet chat



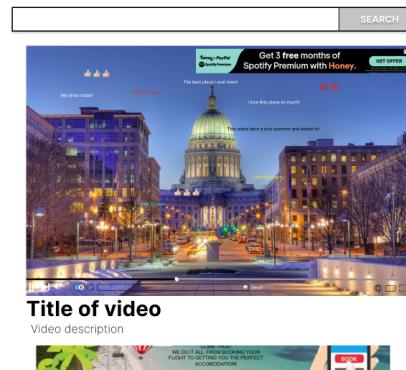
Only show top-half of bullet chat



Only show the second half of bullet chat



Send a bullet chat with default color

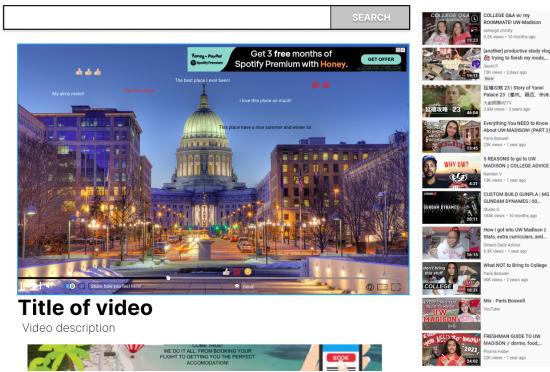


Send a bullet chat in blue

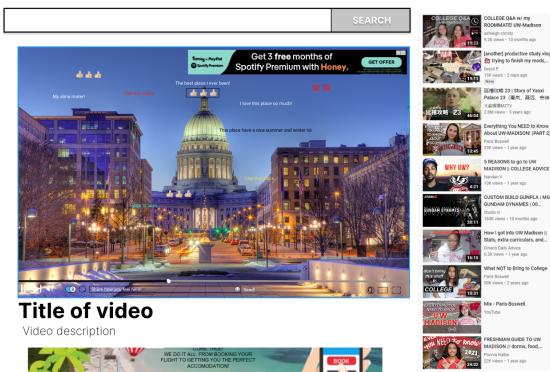
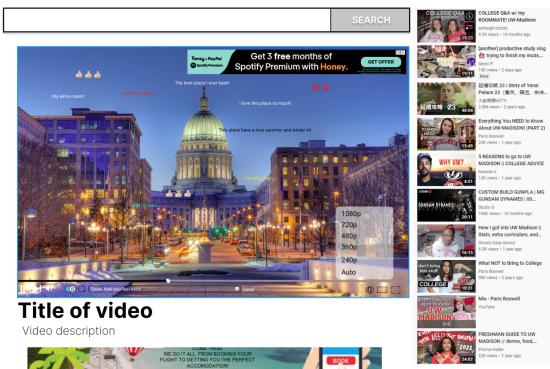


PROJECT I: WEB-BASED SERVICES

FINAL SOLUTION

**Title of video**

Video description

Set three default emojis for users*Send emojis to bullet chat**Set the quality of video*