Coursework 3: The Process

Yaswanth Pulavarthi(sc19yp),
Alain Fernando (ed18asf),
Nicholas Dharmadi(sc19nmd),
Alec Millward(sc19am)

PACT Analysis

People:
Outdoor enthusiasts, eg: skiers, climbers, hiking, mountain biking, etc. Primarily 18 - 35 using mobile/desktop devices. Also used by older users on larger devices such as laptops/tablets.

Activities:
One page application, buttons located on the same screen. Majority of the screen used by video. Play/Pause Video. Skip through a video. Search through multiple videos.

Contexts:
Difficulty of use in some outdoor situations, eg: when wearing equipment, cold hands, high brightness. Can't rely on internet connection.

Technologies:
Desktop Program, mobile app, Intermittent/no internet connection requires video to be stored locally.

Personas:

John, a 26 year old skier who captures video on a GoPro. He wants to use the application outdoors to review skiing footage on his mobile device. Frustrated by difficulty using other apps when in skiing equipment, one handed and cold. Wants a simple UI that lets him select clips to watch, and to be able scroll through and review long bits of footage.

Mary, a 73 year old who takes videos when she is out on walks. She takes short videos that she would like to show her Grandchildren on her computer. Mary has many videos she would like to watch, so needs to be able to find them easily. She also likes to look back at the videos from a walk on a particular day.

Scenarios:

John is skiing by himself in a blizzard. He wants to review some footage he took the previous day of a run down a slope so that he can improve on it. Due to the weather he must use one hand to steady himself and the other to use his phone. He scrolls through the videos to find the clip he wants. The clip is almost an hour long so he needs to scroll through to find the beginning of his run down the slope. Once he has found it he wants to pause to see what made him fall over before.

Mary's family are visiting for a birthday and she would like to show them some videos she took the year before on the same day. She searches for videos taken on the same day the year before. She then scrolls through the videos to find the ones she would like to watch. She pauses at a particular moment to show the view.

Cycle 1

Requirements to be implemented during Cycle 1: Play/Pause, Thumbnail Scroll Bar, Default Thumbnail, Fix Thumbnails Changing, Mute Button

Prototype:

The goal of this cycle was to implement key features to allow the program to become usable for its intended purpose. For example, implementing the Play and Pause buttons gives the user some degree of control over the video being played back to them - without this feature then much of the functionality proposed in the scenarios would be impossible. Furthermore, changes can be made to the program that improve the user experience, such as preventing the video thumbnails from shuffling randomly or allowing videos to be shown even if they have no thumbnail.

Low fidelity prototyping, specifically a sketch on paper was used during this stage of the cycle.

The motivation for the design of this prototype was to create a simple UI that is similar to many other popular video playing websites/apps so that minimal effort from the user is required. As discussed previously, due to the expected use of the app outdoors the simplicity of the UI is important in ensuring that the user can still use the app even in difficult conditions. To reflect this need the buttons are large, with as few UI elements on the screen as possible.

Low-fidelity prototyping generally saves time in designing a prototype while also giving enough information for us to understand what is needed to be placed in the prototype. As this is just the first stage of the development, we are expected to make a lot of changes throughout the development, thus a sketch like this is appropriate.
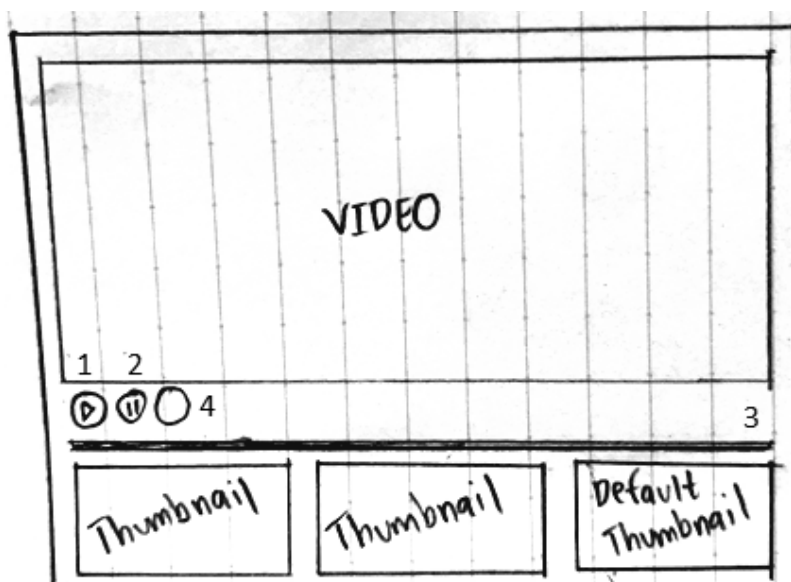
1. Play
2. Pause
3. Thumbnail scroll bar
4. Mute Button

Evaluation:

The evaluation technique used for this cycle was a cognitive walkthrough. The walkthrough is as follows:

Task: Find a specific video and pause at a certain point
Users: Young adult outdoor enthusiasts
Context: Mobile use, single-handed use, in a rush
Steps:
1. Scroll through video thumbnails to find the correct one
2. Select that video to play
3. Pause at the desired point

The reason for this choice is that a cognitive walkthrough evaluates the user experience quickly, without having to involve end users explicitly. Since the goal of cycle 1 is usability this suits the cycle well.

The steps above describe a realistic use case, and demonstrate the cycle 1 has produced a usable program. However, since cycle 1 does not have features to allow the video to be navigated such as skip and scroll, for long videos (such as those described in John's scenario), the usability decreases drastically. For example, if the user wants to pause halfway through an hour long video, it would take them half an hour to do so. This clearly shows a flaw in the design of this cycle - only short videos are realistically usable. As many videos taken by Outdoor Enthusiasts may be long, additional features to address this will be required. Another improvement would be to combine the play and pause buttons to reduce the number of buttons on screen, reducing the work required from the user.

Video:https://www.youtube.com/watch?v=RUZP5fgdpKA&feature=youtu.be

Will the users know which is the **correct action**? Will the user notice how to **perform** the correct action? Will the user **associate and interpret** the response from the action correctly?

Step	Correct Action?	Perform?	Associate & Interpret
1	As long as there is a thumbnail, it is easy to determine which video to click on. Scroll bar is also clear. However, multiple default thumbnails will all look the same, so it will be difficult to select the correct video, unless filenames are implemented later.	Scroll bar is clear and its use is familiar to the user.	List of videos changes, can see the bar moving.
2	Clicking on a video thumbnail is a familiar and straightforward action.	Outline of video becomes blue on hover, signifying it is clickable	Video begins to play.
3	Pause button is clear and has a familiar icon.	Button is highlighted blue on hover, signifying it is clickable	Video pauses

Code:

Video:https://www.youtube.com/watch?v=RUZP5fgdpKA&feature=youtu.be(same as evaluation video)

Link to end of cycle 1:
https://gitlab.com/sc19yp/ui_cwk3/-/commit/d9f565058bf431b73e453f647210c4f41531e495

The main change made to the prototype in implementation was moving the play, pause and mute buttons to the center of the screen. This was because it helps usability as the center of the screen is more easily accessible on mobile devices.

Cycle 2

Requirements to be implemented during Cycle 3: Volume control, skip by 5 seconds, bar for video scroll, make play pause 1 button, duration under video.

Prototype:

Goal of this Cycle

The goal of this cycle was to build upon the limited functionality we introduced in Cycle 1 in order to make it more usable to our target demographic, and adding important extra functionality such as video skipping and more in-depth volume control, as well as less essential functionality such as being able to view the duration and current time of the video. In our user scenarios, skipping would be a significant feature, as especially for those with lengthier videos; being able to skip to a specific point rather than letting the video play out would be essential. Other usability concerns will also be taken into account during the design.
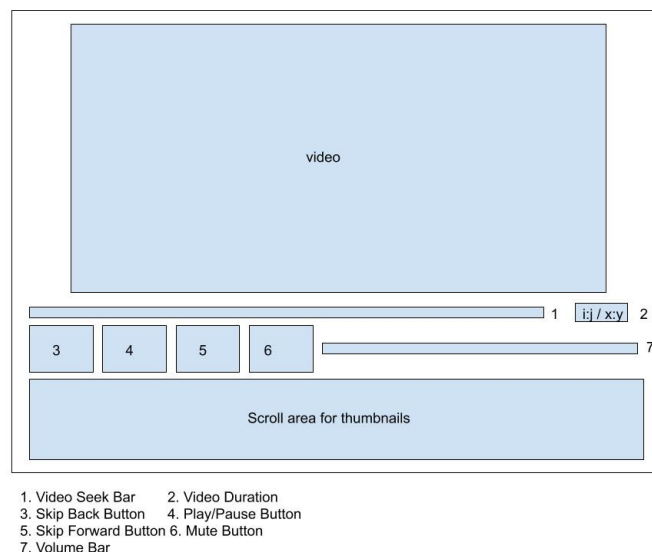
Once again, the method of prototyping used was a low-fidelity wireframe of all of the UI elements that would be available to the user. This time, Google Drawings is used as there are more complex elements to be added in the design, thus designing it digitally is appropriate.

Motivation of Design

The motivation for this design was to add on additional features to our initial interface while adhering to our core goals: making the UI intuitive and accessible. The buttons remain the same size, in order to still be usable, while the new video seek bar will be placed right underneath the video player, alongside a new time/duration element; in order to make it clear to the user what the bar is used for without any explicit instruction. Similarly, the volume bar would be placed alongside the mute button. The skip buttons remain, despite having the seek bar, such that users who are less able to easily move a slider can still press a large button. This allows us to add functionality, without losing out the benefits from our previous approach.

Reason for Chosen Technique

Using a wireframe was useful in that our UI design could quickly be changed if any of the team saw any faults with it. One fault in particular was the exclusion of skip buttons after implementing the seek bar, which led to an amendment in the wireframe. This amendment was much simpler to do using a low-fidelity prototype than it would have been otherwise.

1. Video Seek Bar   2. Video Duration
3. Skip Back Button   4. Play/Pause Button
5. Skip Forward Button 6. Mute Button
7. Volume Bar

Evaluation:

Reason for Chosen Technique

       The evaluation technique used for this cycle is **heuristic evaluation**. This method is used at the early stage of the cycle because we want to know what is lacking in the current prototype and what could we do to improve these in the further stages of development. Since we have included the main features needed for the prototype, doing this evaluation would give us an idea on what needs to be added to the prototype to make it improve its usability.

0 – I don't agree that his is a usability problem at all
1 – Cosmetic problem only; no need to be fixed unless extra time is available
2 – Minor usability problem; low priority
3 – Major usability problem; important to fix ; high priority
4 – Usability catastrophe; must be fixed

Checklist	Severity	Issues	Comments
Visibility of system status	2 / 4	No file names under videos	File names need to be added to give context to each video
Match between system and the real world	2 / 4	Still missing some features	Prototype already have the main functionality of a media player, but more functions could be added
User control and freedom	0 / 4	-	Users have full controls to the video player
Consistency and standards	0 / 4	-	Buttons and thumbnails are placed and sized consistently
Error prevention	0 / 4	-	Buttons and videos' outline changes color when hovered, signifying it is clickable
Recognition rather than recall	0 / 4	-	Since buttons and videos' outline changes color when hovered, it gives suggestion to users that they are clickable
Flexibility and efficiency of use	0 / 4	-	Controls are straightforward and not ambiguous
Aesthetic and minimalist design	0 / 4	-	Design is already made simple and minimalist

Outcome of Evaluation

From the checklist, we have concluded that there are minor improvements to be made, which is good because we have mainly satisfied the requirements and only need small touches to develop the prototype. As shown from the checklist, we need to work on the visibility of system status and implement more features to match between systems and the real world which are going to be implemented in cycle 3 and cycle 4.

Code:

Link to video: https://youtu.be/aMINN-XioqM

Link to end of cycle 2:
https://gitlab.com/sc19yp/ui_cwk3/-/commit/e76920cb215fc6bc9831edc9b5013a87b15c773c

As there were only a few minor issues with our prototype, there were no immediate changes in the way that we implemented it, compared to the prototype itself. The issues in the prototype were considered too minor to tackle immediately, and so will be tackled in later cycles, once we get more of the core functionality finished.

Cycle 3

Requirements to be implemented during Cycle 3: Video search by name, Fullscreen video.

Prototype:

Goal of this Cycle

Since the main features and functionality have been implemented in the previous cycles, this cycle will be focusing more on enhancing our prototype, allowing users to do some extra features. At this stage, we want to improve our prototype based on the evaluation from the previous cycle, we are aware that we have not provided enough information on visibility in the system, thus, we are implementing filenames to be shown under each of the videos. Moreover, users can search these videos by their filenames.

For this cycle, we have decided to use high-fidelity prototyping and have made use of Photoshop to design the layout.

Motivation of Design

Motivation of this design is to sketch the overall layout, showing its functionalities and make it as close as possible to the output.

Reason for Chosen Technique

High-fidelity prototyping is used at this stage because we are reaching its final stage and we think that it is appropriate to show the realistic view of the expected prototype, including its functionalities and details. By doing this method of prototyping, we could also use it to get feedbacks from people and

1. Video seek bar
2. Video duration
3. Fullscreen button
4. Search bar
5. Media controls:
   Skip Previous, Move Back, Play/Pause, Move Forward, Skip Next, Mute button respectively
6. Volume bar
7. Scroll area for thumbnails
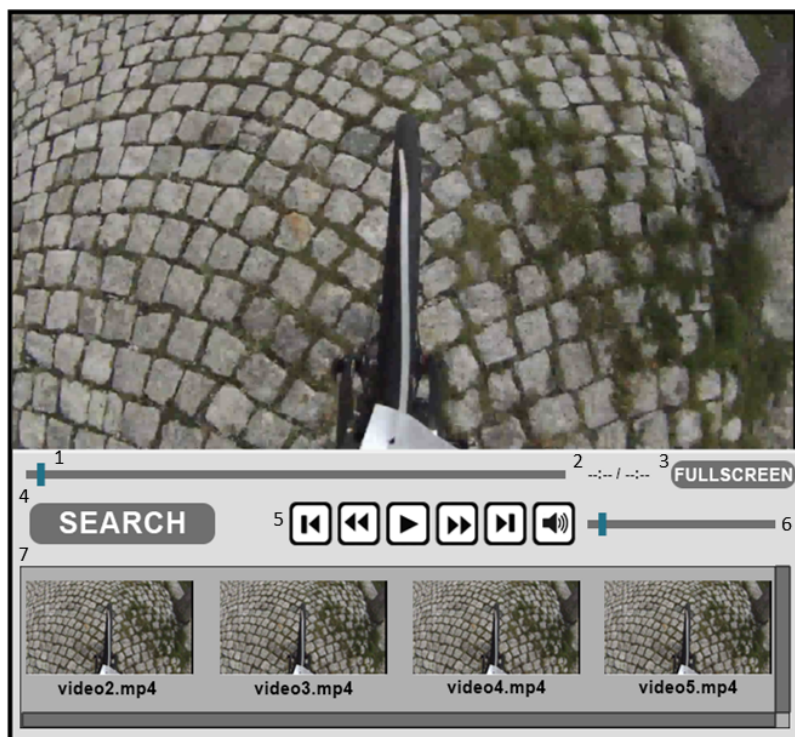
Evaluation

For this cycle, we have done some questionnaires to get feedback from people about the current design of the prototype.
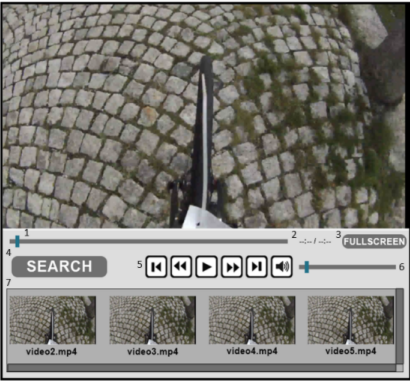
Reason for Chosen Technique

As mentioned, we have designed a high fidelity prototype which allows us to get an overview of how our prototype is actually going to look like. Since this design has its functionalities included, we could ask and get people's opinion on the design. These people could be the potential users and their opinions on our current design would help us to improve in the final cycle. We have made a short and straightforward Google Forms and share the forms to students to observe their response.


Outcome of Evaluation

We have received about 11 responses and have evaluated what changes are necessary for the next stage of development. In general, respondents think that our prototype is familiar, informative, and easy to use. We have achieved our main objectives at this point but there is room for improvement, and that is to enhance its functionalities in the next cycle.

Questionnaires Results
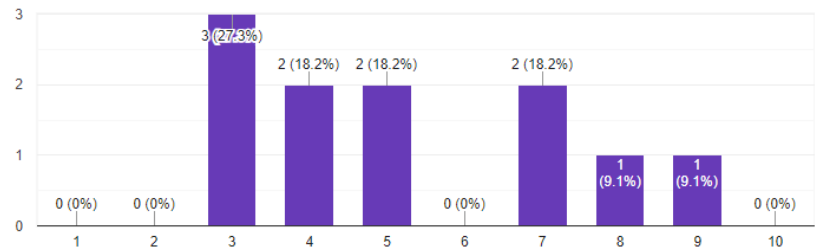
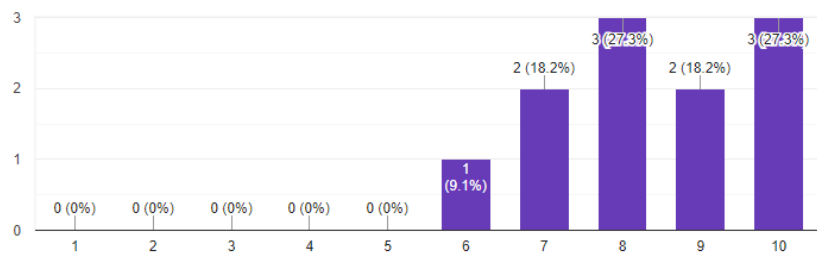## From the design, how would you rate its ease of use?

11 responses

- 1: 0 (0%)
- 2: 0 (0%)
- 3: 0 (0%)
- 4: 0 (0%)
- 5: 0 (0%)
- 6: 3 (27.3%)
- 7: 1 (9.1%)
- 8: 6 (54.5%)
- 9: 1 (9.1%)
- 10: 0 (0%)
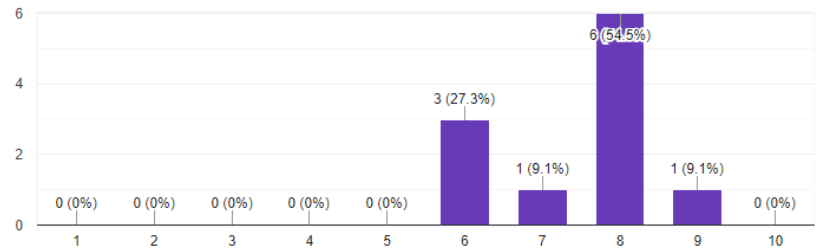
How attractive does the prototype look to you?

11 responses

- 1: 0 (0%)
- 2: 0 (0%)
- 3: 3 (27.3%)
- 4: 2 (18.2%)
- 5: 2 (18.2%)
- 6: 0 (0%)
- 7: 2 (18.2%)
- 8: 1 (9.1%)
- 9: 1 (9.1%)
- 10: 0 (0%)

How informative is the prototype to you?

11 responses

- 1: 0 (0%)
- 2: 0 (0%)
- 3: 0 (0%)
- 4: 0 (0%)
- 5: 0 (0%)
- 6: 1 (9.1%)
- 7: 2 (18.2%)
- 8: 3 (27.3%)
- 9: 2 (18.2%)
- 10: 3 (27.3%)

Would you personally use the prototype?

11 responses

- Yes: 81.8%
- No: 18.2%
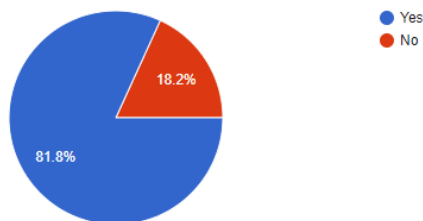
How clear are the buttons to you?
11 responses

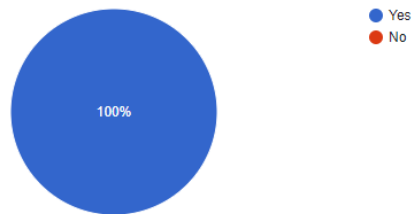| | | | | | | 3 (27.3%) | 5 (45.5%) | 3 (27.3%) | |
| 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | | | | 0 (0%) |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
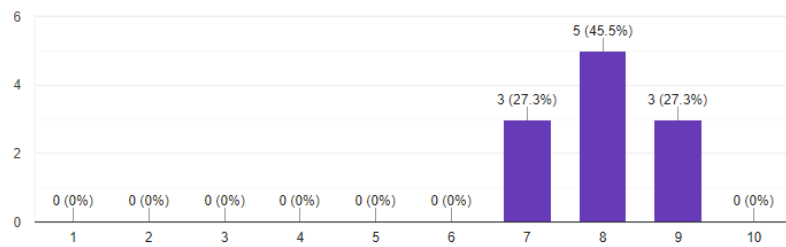
Does the design look familiar to you?
11 responses

- Yes
- No

100%

What other functionalities should be added to improve the prototype? (any improvements are accepted)
11 responses

sort

dunno

Playrate

Maybe subtitles and meta data box

Video filter

Not to loopover evertime

Different themes

Need a shuffle button

Change video speed

Code:

Link to video: **https://youtu.be/8q7LCm7I3E0**

Link to end of Cycle 3:
https://gitlab.com/sc19yp/ui_cwk3/-/commit/021a802e9e794b0e131e44207c0050a185107915

      Feedback on our prototype was overwhelmingly positive, with the majority of participants stating that they would use the prototype. The only real negative responses that were given were towards the new designs appearance, to which we implemented a minimalistic, light design following in the footsteps of the previous cycles.

Cycle 4

Requirements to be implemented during Cycle 4: Playrate, Sort by (Date and Alphabetical order)

Prototype

Goal of this Cycle

In this final stage of development, we have made several advancements that contribute to the overall functionality and to satisfy users' requirements. From the evaluation that we have done in the previous cycle, we have concluded some of the main aspects that are most important and needed to be implemented in this cycle which are playrate and sort. Other improvements mentioned by the respondents contribute more to the cosmetics and appearance which is rather not necessary. For the most part, we have developed a prototype that satisfies our main objectives and requirements according to our analysis at the first stage.

High-fidelity prototyping is once again used to design our prototype, however we used a different tool called Framer.

Motivation of Design

The design for our final cycle has been implemented based on the feedback we received as well as other evaluations involved in the previous cycles. As mentioned, we have added the playrate and sort elements in the design in a manner that it is clearly visible and accessible for the users. Our motivation is to also keep the design simple and familiar to the users, while also giving more functionalities in the prototype.

Reason for Chosen Technique

High-fidelity prototyping is chosen as we want to get the overall idea of how the prototype is going to look like. At the end of a development cycle, it is crucial to have each of the elements listed and placed in a proper manner so that there is no mis-understanding during the development. Unlike the previous cycles, there are no major changes made during this cycle as it is believed that the layout of the UI elements has been done properly in the previous cycle and at this stage we are improving its features and functionalities. By using this technique, the entire features and functionalities of the prototype is clearly presented, such as the hovers (blue outline around videos which are hovered), and also the dropdowns (sort by and playrate)
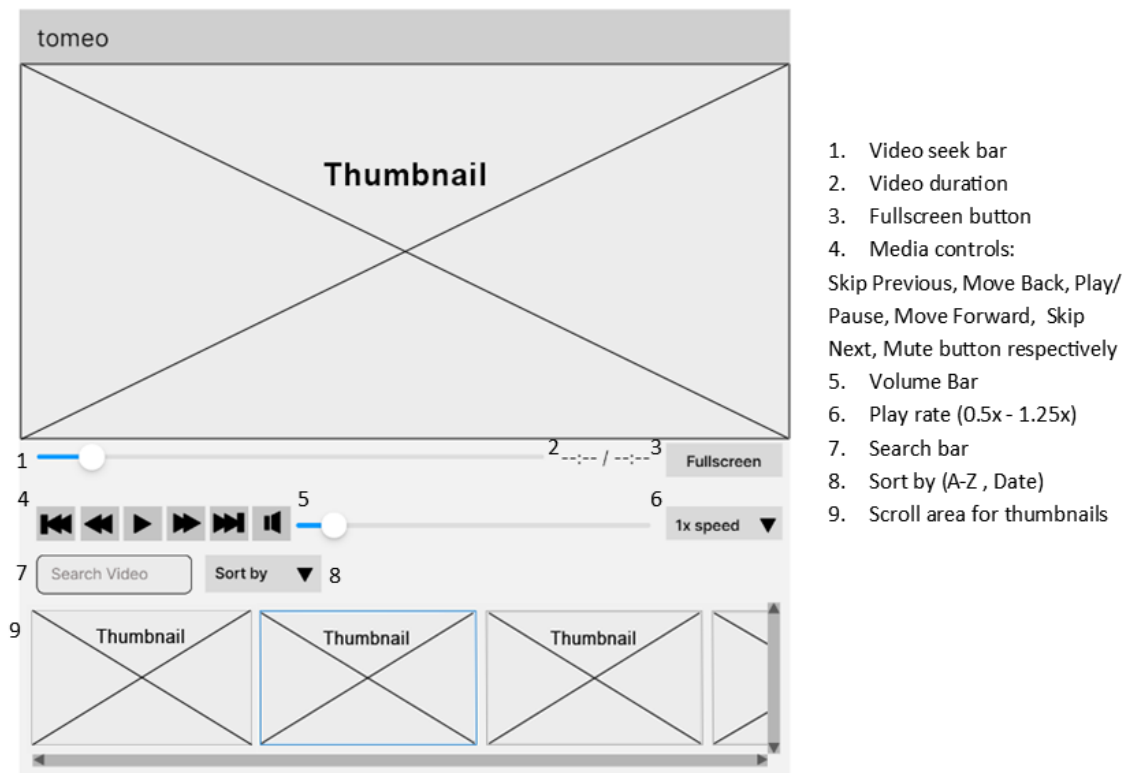
Evaluation:

Cognitive walkthrough was used in order to evaluate this prototype:

Reason for Chosen Technique

      We have chosen this method of evaluation because we want to make sure that users are able to perform a series of tasks while also asking a set of questions from the perspective of the user. As it is our final cycle, we want to corroborate that we have implemented the functions needed for our targeted users. Since we did the same technique at the first stage of the cycle, we could observe how advanced our prototype has become from its initial design.

Task: Find the latest recorded video, fast forward to a specific time stamp, play it in different play rates
Users: Outdoor enthusiast.
Context: User is comfortably reviewing the videos and would like to get detailed footage at slower rates.
Steps:
1. Click on the sort by drop down
2. Select sort by date
3. Select the first video, assuming the latest one comes first
4. Fast forward to desired time stamp in the video, and click on playrate drop down
5. Select 0.5x speed

Will the users know which is the **correct action**? Will the user notice how to **perform** the correct action? Will the user **associate and interpret** the response from the action correctly?

Step	Correct Action?	Perform?	Associate & Interpret
1	User is familiar with the placement of sort element which is next to Search Bar and an arrow pointing downwards beside to label, identifying it as a dropdown element	Outline of the element becomes blue on hover, signifying it is clickable.	List of dropdown options appears upon click
2	Label for date is clearly shown	Label's background changes colour on hover, signifying it is clickable	Video is sorted by date.
3	Not entirely obvious that the first video is the latest one, there are no date labels under each video.	Outline of video becomes blue on hover, signifying it is clickable	Desired video is displayed
4	Users are familiar with the media controls and also the play rate element which is placed on the same row as other controls.	Outline of the element becomes blue on hover, signifying it is clickable.	List of playrate options appears upon click
5	Label for 0.5x speed is clearly shown	Label's background changes colour on hover, signifying it is clickable	Video continues to play in 0.5x speed

Outcome of Evaluation

The outcome of our cognitive walkthrough was mainly positive, as the prototype allows users to perform the overall tasks needed. We also have successfully enhanced our prototype and satisfies the requirements from the previous cycles' evaluations. The fields colored in green mean that we have achieved these without any issues, the yellowish-orange color indicates that we did not achieve it but it has low severity, and lastly the fields in red indicate that it is a medium-high severity. The reason for it to be high severity as it may be ambiguous or give a different context to the users.

Code

Link to video: https://youtun.be/dz0UZMoIg-I

Link to end of Cycle 4:
https://gitlab.com/sc19yp/ui_cwk3/-/commit/1476bfbf3481fe1d05cc5a7bb4c8e5e4e3da7af1

Our implementation has been impressive and we have implemented nearly everything needed for the prototype. However, there is a technical issue where we didn't get the sort elements to function in the current implementation due to the lack of time. Despite that, all the elements required are placed according to our prototype and we have succeeded in implementing a prototype that is useful for outdoor enthusiasts.

Ethics Statement

We have followed university regulations for ethical research on humans. All participants and non-participants were provided with the University's **Research Participant Privacy Notice** along with the following information sheet:

Participant Information Sheet

Tomeo User Feedback Project

We are taking survey feedback in order to improve our prototype for a modern-day video player, tailored to those who enjoy the outdoors.

You are being invited to take part in a short survey in order to help us improve our project. Please read the following information in order to decide whether you wish to participate.

What is the purpose of the project?

Our task is to create a video player functional on both mobile and desktop. This video player will be tailored to an audience who spends lots of time outdoors, and thus you have been invited. Your feedback will be used to help us improve our prototype and come closer to a final product.

Why have I been chosen?

You have been as you have been pinpointed as a possible future user of the program.

You do not have to take part. If you do decide to take part, you will be allowed to keep this information sheet, and then be asked to sign a consent form. After signing this form, you may still withdraw from participating without notice.

What do I have to do?

Taking part consists only of answering a small online survey. This survey will only take a few minutes. Most of the survey is multiple choice, with one question asking for any personal suggestions for additional features.

There are no immediate benefits to participating, however the information provided will be used to create a better final product that may benefit you in the future.

How will you use my data?

Your data will solely be used over the course of this project and will not be stored for future use. It will only be seen by the students working on the project as well as other members of the School of Computing once submitted. Data will not be published in any way. All data you supply will be completely anonymised. Participant contact info will be kept entirely confidential.

Contact for further information

If you require any further information, contact the lead researcher, Alain Fernando at: ed18asf@leeds.ac.uk
Our module leader, Tom Kelly can also be contacted at: t.w.a.kelly@leeds.ac.uk

Thank you for reading through all our information. As aforementioned, you may keep this document and the consent form you will sign if participating.

The following consent form was given to those who decided to participate upon reading the information form:

School of Computing

UNIVERSITY OF LEEDS

Consent to take part in the Tomeo User Feedback Project	Add your initials next to the statement if you agree
I confirm that I have read and understand the information sheet explaining the above research project and I have had the opportunity to ask questions about the project.	
I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason and without there being any negative consequences. In addition, should I not wish to answer any particular question or questions, I am free to decline. Data already provided can be removed on my request.	
I understand that members of the research team may have access to my anonymised responses. I understand that my name will not be linked with the research materials, and I will not be identified or identifiable in the report or reports that result from the research. I understand that my contact details will be kept strictly confidential.	
I understand that relevant sections of the data collected during the study, may be looked at by individuals from the University of Leeds or from regulatory authorities where it is relevant to my taking part in this research.	
I agree to take part in the above research project and will inform the lead researcher should my contact details change.	

Name of participant	
Participant's signature	
Date	
Name of lead researcher	
Signature	
Date*	

*To be signed and dated in the presence of the participant.
Once this has been signed by all parties the participant should receive a copy of the signed and dated participant consent form, the letter/ pre-written script/ information sheet and any other written information provided to the participants. A copy of the signed and dated consent form should be kept with the project's main documents which must be kept in a secure location.

Due to the inability to meet in person, these forms were instead signed digitally, and participants were allowed to keep copies of all sheets provided. All filled in forms were kept securely and privately with the lead researcher.