

Usability of Video-Based Website Designs

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Abstract

Usability of different aspects of websites is a practice commonly explored in various studies throughout the past several years. The feedback gained by these projects allowed companies to build sites that would best fit their users' needs and preferences. Most of the study of the particular aspects of sites has been done over websites with a content consisting mostly of various texts and has led to the pattern in which content is along the top and sides of a page. As there has been little research over how best to design the layout of a website whose content relies mostly on videos, it was difficult to determine what 'rules' designers should follow for these sites. In this study, we hypothesized that there was a pattern for video-based websites similar to that of other websites and decided to test several sites for the usability of their layouts. Results revealed certain patterns followed by the users when interacting with the tested sites and led to the beginning stages of the preferable overall design of a video-based website.

Introduction

Usability is the practice of determining how usable a product is for an audience. Though this process is commonly used in testing physical products, the age of websites and the internet ushered in a new type of usability. Now used to test different aspects of websites such as their page layouts, information and satisfaction to an audience, usability practices became a widely adopted step essential in the process of creating an online product.

Most of the current studies and tests of usability available were conducted over websites that mainly contained information for a user in the form of text. Several different principles of design for these types of websites were developed as more testing was done over their various parts. This has led to a distinct pattern in text-based website layouts.

Despite the common success in testing a product that usability has brought through the years, it has not been utilized efficiently to review all different types of websites. What has not been covered sufficiently in the past several years is research over the layout of a more video-based website. There is little research to be found concerning the most-used and common pattern for website layouts that contain mostly video content. There were no set or accepted rules for how these websites needed to be designed in order to best fit the user's needs. This research project concerned itself mostly with

discovering what could be the beginning of a more standard ‘basic’ set-up video-based website designs.

Literature Review

There has been much research done over the different aspects of usability and what exactly it entails. For many researchers, usability is defined as “a structured process of getting information on the extent to which a product can be used by the intended users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use” (Ward and Hiller 156). The process itself has had many uses over the time of its existence. It is not only used for websites but for “products” as well (Ward and Hiller 156). Over the years, it has shifted into becoming a “much more diverse” practice that “has changed from being an add-on to the development process to becoming an integrated part of it” (Madsen 61). There is even a difference in how it is conducted, as “different domains may require different sets of evaluating criteria/tools” (Zhang et. Al. 78).

Despite the technical definition of usability, there is another aspect of a product or website that the researchers must take into consideration. Due to recent studies, it is suggested that “aesthetics may play an important role in product and systems design” (Sonderegger and Sauer 1). In more common terms, this is known as design. Design is a base for usability; the two must coexist or a website will fail. Design essentially “relates to how the product communicates” with a user (Rubin and Chisnell 11). However, despite this fact, “design research is a more recent phenomenon” in the realm (Roth 18). According to Jason Beard’s *The Principles of Beautiful Web Design*, “Some people become caught up in the aesthetics and graphics, and forget about the user, while some usability gurus get lost in their user testing and forget about visual appeal” (5). For a website to be successful, it is “essential to maximize both” (Beard 5). Overall, “website searching is a goal-oriented activity,” and the different elements must cooperate for the website to function correctly (Zhang et. Al. 78).

This need for design and usability has created patterns for website designers to use. There has been much research over the patterns most companies follow. In these patterns, most of the content that users will see is on the left side for this is where their eyes will look because we are taught to read left to right. This is called the F-shaped pattern. The eyes of a user are important to a usability test because “measurements of eye movement can serve in transferring very useful information from man to machine” (Barbuceanu and Antonya 23). This study and portion of usability testing is typically called eye tracking. This is essentially the practice of tracking eye movements to see the “dynamic trace of where attention is being directed” on a page (Spivey et. Al. 282). Though eye tracking studies were mostly “conducted in psychology-related fields” relating to advertisement, the extent of use has been growing over the past several decades (Lai et. Al. 2). Eye tracking is a very useful practice to companies “concerned with where to place advertisements on their web pages” (Rubin and Chisnell 112).

Without seeing where a user's eyes move to on a page, usability experts can not find patterns or the best way to utilize a web page. This is very troubling to some companies who strive to do their best to find the pattern that best works for them. Without a pattern that is tested and proven to work, some companies would be unable to have a functioning website. For most websites, the testing is a necessary and private occurrence. In fact, some "companies regard their usability testing as proprietary information and often strenuously resist publication of usability testing data" (Meister and Enderwick 208). This testing, though private most of the time, is "one of the most important success factors in system quality" (Alshamari and Mayhew 402).

However, despite the broad research that has proven usability useful to companies, there is not a satisfactory amount of research dedicated to different kinds of companies. For sites that contain mostly word content, the patterns are easily seen and can be followed to provide a useful and pleasing website. For other sites such as those that carry mostly visual content, there is not any research. Most of the research that has to do with video-heavy websites has been over ads, such as where advertisements appear and whether "in-stream advertisements can improve the viewing experience for users without sacrificing advertising value for advertisers or content owners" or not (Pashkevich et al. 451). This was due to the fact that companies were spending "billions of dollars annually to add a wide range of sophisticated features...to improve users' experience with their websites (Nadkarni and Gupta 501).

However, the current research has left questions about the preferred design of other types of websites. As there has been little to no research done on the subject, there is no defined pattern for the websites that contain a large number of videos that are mostly uploaded by various users rather than one that incorporated videos in just ads. There is, as far as is known, no significant placement of the video being viewed for these websites as there are for some such as Yahoo or Fox News. This is critical information to find, as currently "video sharing websites are a driving force behind this rise of the Web as an alternative platform for viewing video content" (Cha 1). Though they make up a significant number of websites, the amount of research dedicated to their design research is very small. This leads to companies designing websites that may or may not be the most effective for their purpose, which is to display videos to the users. As YouTube "is the most popular online video community in the United States and in the world," it would be a good site to test for usability in order to find patterns for these video-sharing websites to use (Pashkevich et al. 451). The study will be taken further by using various other video-based websites such as Hulu and Vimeo. This study is intended to answer the following questions: How effective are the current website designs, and whether or not there is a pattern that video-based websites should follow when designing their user interface.

Methods

This research will test 10 Angelo State University students from the ENG 3351 and ENG 3352 courses. Most of these students are traditional, having come straight from high school into college. They have varying experiences with different video-based websites and computer technologies. They will be required to rate themselves from beginner to expert on their experience level. These students will be recruited through a course announcement by Dr. Kevin Garrison who will provide the moderator with an extra credit sheet for the students to sign in exchange for their participation.

The lab used for the research is located in the basement level of the Academic Building in room 004B. There are two different stations set up for various users of the Usability Lab. There are dual computer monitors in one corner of the room where the participant being tested is sitting. Attached to these computers is the Mirametrix S2 Eye Tracker as well as the software needed to run the eye tracker. The S2 Eye Tracker uses infrared cameras and requires a calibration of 9 points on the screen to line up with the user's vision. An error rating of under 80 is good while under 40 is excellent. This aids in providing eye tracking studies with reliable data. On the other side of the lab is where the moderator conducting the research and test sits to monitor the participant. The moderator also has a set of dual monitors which record video clips of linear fixations. Some of the other equipment provided for the study is a handheld audio recorder to keep record of what the participants say during the post-test interview. The moderator will take notes as well, but will use these audio files to get direct quotes and have exact records of what each student thought during the test. There will be a pre-test questionnaire, as well. All video clips, audio clips, and answers to the questionnaires will be kept in an Excel spreadsheet for easy comparison on my laptop. All of this data will be used to help answer the research question concerning design, therefore making it all valuable to the project.

The procedures for the project will be the same for each student who is tested for this research project.

Recruitment: The students will be recruited from Dr. Garrison's Technical Writing and Business Communication courses and offered extra credit for their participation. Once students are contacted through email, the moderator will schedule meeting times to conduct tests one on one.

Forms: Once they have entered the room, the moderator will give them a brief tour to make them comfortable and ask them to fill out the IRB form and a Consent Form and an Audio/Video Release Agreement (http://www.angelo.edu/dept/english_modern_languages/usability.php). This is to ensure that they know what will happen during the test and what the moderator will do with the data collected.

Survey, Testing, Interview: Students will be given a pre-test questionnaire with several questions. This is to ask for their name and major as well as their experience with the various websites tested and technologies used on the computer. Then, they will be given a list of different video-based websites (such as Hulu, YouTube, Vimeo, etc.) and

asked to rate their experience level with them on a scale from 1-5. This scale is called the Likert Scale and will give me a better idea of what level each student is on before they are tested. After the survey is conducted, the test will begin and they will be instructed to complete certain tasks tied to each different website. For YouTube, they will be asked to find videos about how to make a paper airplane and to be able to answer questions about the videos. If they have an account, the moderator will ask them to log in before searching for the video. If they do not, the moderator will ask them to create an account. For the next task, the moderator will ask them to navigate to Hulu and find a video of John Oliver talking about the FIFA World cup and to be able to answer questions about it afterwards. Just as with YouTube, the students will be asked to either log into their account on the site or to create one. For the last task, the moderator will ask the student to go on Vimeo and find a video where Grumpy Cat is ‘signing’ books. For the account question, the moderator will ask them to either log in or create an account. They will watched trying to complete the goals without being given any hints. Once they are done with the websites, the moderator will conduct an interview with each student. The students will be asked questions about how easy or difficult they found their tasks, what they think of the current website design, and what they like or dislike about each website. This entire process will take 10 to 15 minutes for each student. To protect the identity and information of each participant, the students will be labeled participants 1-10. No names or any other information concerning their identity will be released. The sheets from the survey that ask questions such as their major, name, and experience will be kept locked in a filing cabinet in the Usability Lab to which only the moderator and Dr. Garrison have access during the duration of this research. The audio and visual data I collect will be stored on a flash drive before being placed on my computer for permanent storage. The files (both audio and visual) will then be deleted from the flash drive. This information is then stored only on my laptop’s hard drive, and the laptop itself is protected with a username and password only the moderator know. The audio records from the interviews will be kept on a recorder which will be kept under lock and key.

The data gathered from these tests will give answers as to the main research questions. These are questions having to do with the current level of efficiency of the various website designs being used, and whether or not they are liked by the public users. The main data used for the research will be the video clips taken from the eye tracker, as the moderator wants to see how the various students interacted with the design of the websites. This will help determine what the ‘best’ design would be or what pattern should be used to satisfy the largest percentage of users. However, to get accurate data, the moderator will have to use deception: in order to get the best representation of how the students will view the websites, the moderator will tell them in the beginning that they will be asked questions about the video’s content once they have finished watching them; however, the moderator will rather ask questions concerning design, which is the main objective in the study.

Results

For this research project, 10 participants were tested with 6 being male and 4 female. These participants were the volunteers recruited from an upper division Technical Writing class. Their ages ranged from 20 to 29, with a mean of 22.6 and a standard deviation of 3.02. Their calibrations, which indicate how well an eye tracking device could follow them, varied (See Figure 1). For a calibration, a rating of below 80 is good, while below 40 is excellent.

Participant:	Age:	Calibration:
1	20	35
2	29	35
3	21	30.2
4	20	49.8
5	27	41.6
6	22	23.7
7	21	21.3
8	21	30
9	22	31.3
10	23	34.9
Mean:	22.6	33.28

Table 1. Eyetracking calibrations. This table provides the ages of each individual participant, their eyetracking calibration, and the means of both categories of information.

The test revealed 5 major results based on video-based websites' layout designs. The first observation dealt with account creation on each of the three websites tested. The students tested had no trouble on Hulu and Vimeo though they had difficulties logging on to YouTube due to the connection the site has with Gmail accounts. If they already had an account, they found it easy to log in. The only issues besides YouTube that arose from this part of the test was finding the log in screen on Hulu.

The next result dealt with the search bar on the sites. Participants found that YouTube and Vimeo followed a similar pattern when playing results, making it simple to find the one specified in the search. With Hulu however, the sporadic results made it difficult for a participant to use.

The third result dealt with ads while watching the video itself. 9 of the 10 participants either skipped or completely ignored the ads, whether embedded in the video, the search, or the search results.

The fourth result dealt with the design of all three websites. The participants found YouTube simplistic and familiar, Vimeo unfamiliar but more simplistic than YouTube, and Hulu overwhelming and difficult to work with.

The last observations were details with video usability on all three websites. Participants watching the Hulu video would have trouble trying to find the time bar on the video when asked how long they had watched the segment. Some other details were that 4 participants full-screened at least one of the videos they were asked to watch, while the rest watched it in the format originally presented. None of the participants used closed captioning to watch the videos.

Discussion

The points discussed in the results section of this paper were good indicators for what exactly the design of a video-based website should include. Currently in practice are some factors that proved useful for a website while others were lacking in terms of individual usability.

Creating an Account

Many different areas were covered by this research project, with the first arising when the participants created accounts on the three different sites that were tested. According to the data retrieved by the eye tracker, most of the students had no trouble either signing in or signing up for an account on Vimeo. The link was on the front page when the site was opened up, making it easy to find. However, Hulu's was difficult to navigate, and a few were dismayed by the time it took to locate the button they needed. The website that gave participants the most trouble was YouTube. As the website is owned by Google, Gmail accounts are required to sign into YouTube. The two being intertwined added extra time onto each participant's session, causing them to become frustrated. Overall, however, the participants had little trouble whether they were the owners of an account or not.

Search Engine

The next point of interest that was discovered through testing was the issue of the search engine on each site. As one of the participants stated in their post-test interview, "YouTube has just one column of suggestions", which made it easy to navigate and find the video they were supposed to watch. They liked the fact that the website provided a limited amount of results they could see at one time. This carried through with Vimeo, as this website's search was so specific that only a few results came up when searching for their video. However, Hulu caused difficulty as the search engine is made up of four columns and a participant could scroll through a list several pages long. This caused the suggestions to be rather sporadic and, as participant 2 said in their interview, "overwhelming". So complicated was the process on that particular website that often the participants would entirely miss the video about John Oliver discussing the FIFA World Cup despite looking either near or directly at it (See Figure 1). Despite

people having familiarity with Hulu as many previously had accounts created, they felt “betrayed” by the site as it gave them difficulty in the search engine. Overall, the participants preferred YouTube and Vimeo’s styles of search engines over Hulu’s.

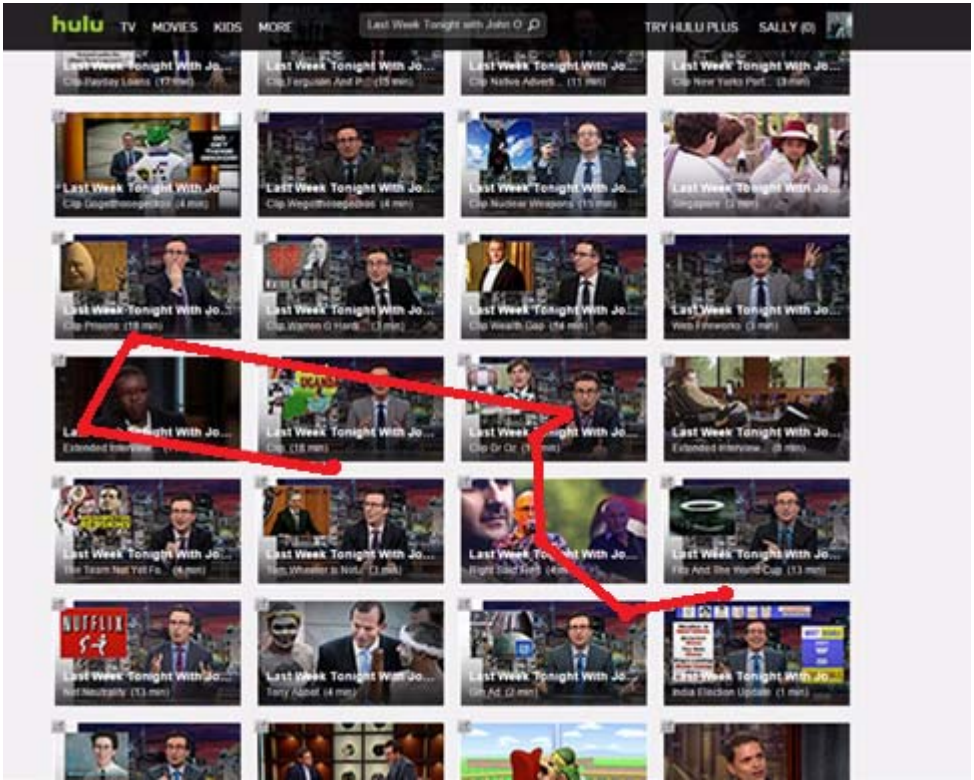


Figure 1. Hulu Search. This figure displays the difficulties the participant had when searching for the video of John Oliver discussing the FIFA World Cup.

Advertisements

The next point discovered during the testing phase of the research dealt with ads. As part of the research was to find how ads interacted with the site and, in turn, participants interacted with them, this part was crucial to all the testing phases of the sessions. What was discovered through interviews and tests was that most of the ads, whether the audience does it consciously or not, are entirely ignored. The eye tracker revealed that often participants would skip right over the ads even if they were listed in the search suggestions (See Figure 2). The only time a student would pay attention the ads was when they had to skip it at the beginning of the video. This often frustrated the participant, and in the interviews, participant 2 said that the ads only “cluttered” the page and distracted from the actual video. This was on YouTube, a website which participants felt had too many ads. None of the commented on the ads for either Vimeo

or Hulu, though both websites had them scattered throughout the website. They only had complaints for YouTube, the only website that actually embedded ads in its videos. Overall, participants would rather the ads disappear entirely from their viewing experience, as they only see them as a hassle.

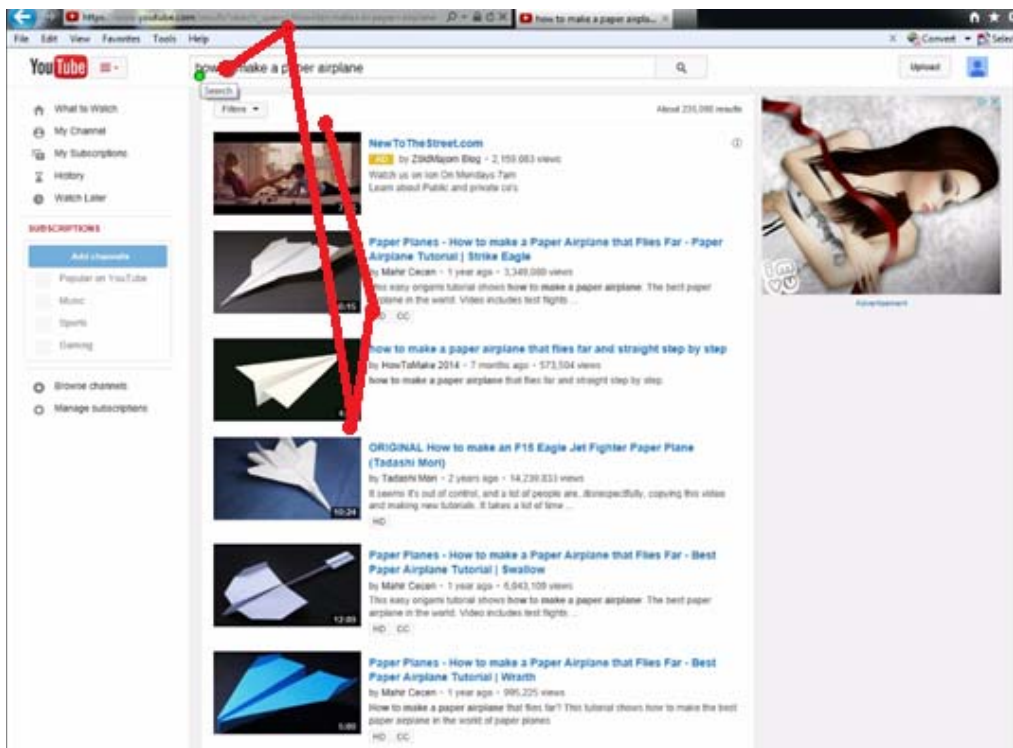


Figure 2. Advertisement Distraction. This figure displays the lack of interaction that the participant had with the advertisements on the webpage.

Layout Design

The designs for the three websites vary in their search bars, layout, and general video player. The participants spoke about factors that they liked or disliked about each website's layout. Hulu was more difficult for them to navigate, as there was so much content spread randomly around the webpage that they didn't seem to know where to look. They were troubled by the amount of suggestions that faced them as well as the blocky layout that the website possessed. Hulu was, as one participant said in his interview, "overwhelming" and good if looking for a specific video. It is not one that should be used to browse random clips, as one said "[Hulu] would bring up every video that had any part of the phrase [they] were searching for." The participants all spoke in their interviews about how they "preferred YouTube" due to its "familiarity."

It was generally easy for a participant to follow. However, one spoke about how he “disliked how often YouTube changes its layout” and that he would prefer for it to stay one certain way. One factor of YouTube that the participants seemed split over was the video suggestion bar to the right of the video they were watching at that moment. Some liked the suggestions, though others found them “distracting” and just “caused clutter.” They were unable to focus on the video due to being distracted by the suggestions (See Figure 3). Vimeo, the last video website tested, was the unfamiliar one. None that were tested had ever used Vimeo to look up videos, though they did like its “simplicistic design” and “how easy it was to navigate”. They did not speak about how different factors distracted them, or even scroll down to look at anything but the video itself despite the fact the content was rather busy and almost too much information for a mind to process at once. Their eyes generally stayed trained on the video rather than wandering around, as they had little content to look at otherwise (See Figure 4). Overall, the students found that though they would be familiar with a website, there were always those that they would rank over them in terms of usability.



Figure 3. Suggestion Distraction. This figure displays the action of the participant being distracted from the video by the suggestions on the right side of the webpage.



Figure 4. Video Player. This figure displays how the participant focused only on the video on the website Vimeo.

Video Player

The video player itself was the last thing tested. Overall the results showed little variation for how people watched the videos individually, but as a group there were certain patterns. For example, around half of the participants full-screened the videos they were watching on YouTube to avoid being “distracted by the suggestions” on the page or anything else. Some stated that they did it out of “habit” while others seemed to find it necessary to watch the video. Another pattern they followed was the trouble with discovering how much time had passed while watching the video on Hulu. After being asked if they had watched at least two minutes of the clip, some participants had no idea how to tell if they were that far in or not. It took them some time to find the bar it was located on. The last point to note that they all followed was their lack of closed captioning(CC). Though some adjusted the volume in different videos in order to hear better, they did not use any visual elements to help their experience. Overall, the patterns generally showed as a group impact rather than an individual one.

What this research gathered about the ideal layout of a video-based website and how people watch the videos was that the overall design should aim for being simplistic rather than complicated. Audiences would prefer less changes to their environment as they get used to how something is placed on a page. However, as this research showed,

familiarity does not always mean a website will be easy to use. Despite knowing the site Hulu, participants still had the most problems with it over the other two, and they preferred Vimeo though the majority had never heard about it until their testing day. Therefore, it has shown that the simplicity of a website's layout can be of more value than familiarity of one in terms of usability.

Conclusion

The results of this research found that there are several problems with the layout designs of the tested websites. Some contain too much clutter and are distracting while others are confusing to navigate and leave their users frustrated. However, there are a wide variety of this kind of website and this project only covered a small portion. A further limitation of this research is that the websites tested all serve a different audience as their functions vary. YouTube and Vimeo contained mostly clips while Hulu's content included full-length episodes of different TV shows. The range of participants was limited to Angelo State college students and therefore may not serve as an ideal representation of the world population as a whole. Despite the limitations, the conclusion that 'less is more' is still made when it comes to what the college-age population tested would prefer on their website layout designs.

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