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Comparing the Usability of Amazon Prime Video and Netflix applications using HCI Principles

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The authors declare that they are the sole authors of this thesis and that they have not used any sources other than those listed in the bibliography and identified as references. They further declare that they have not submitted this thesis at any other institution to obtain a degree.

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ABSTRACT

Subscription Streaming services are very popular in the past few years and due to the covid many movies are released in the streaming applications like Amazon Prime Video, Netflix, HBO, etc., The Subscription Streaming Services are playing a crucial role in the entertainment aspect. The subscription services also provide Series, Tv-Shows, and Online Games. Due to having a huge amount of content, many people like to buy subscriptions from most service providers.

We are also one of the users of these applications and we found many issues while using these applications, most of the users are using Amazon Prime Video and Netflix. And we got an idea of why we don't have to do a comparison of these applications and then we decided on the topic "Comparing the Usability of Amazon Prime Video and Netflix Using HCI Principles".

Background: In this productive world every day some new technologies are evolving and these leads to making human life very easy and comfortable. One of the trending services right now in the market is "Subscription Streaming Services", not only adults most children also use these applications on a large scale. A reliable study is required to compare these applications based on their usability factors. This study is focused on "Comparing the Usability of Amazon Prime Video and Netflix Using HCI Principles".

Objectives: The main objective of this thesis is to find the Usability of Amazon Prime Video and Netflix streaming applications with the help of a survey evaluation, Comparing the Usability of Amazon Prime Video and Netflix is done with the help of HCI Principles and gives the result of which application provides the best user experience.

Methods: Survey evaluation is the method used to find the usability of Amazon Prime Video and Netflix, the survey is done with the help of google forms and the survey questionnaires are related to the HCI principles, we totally considered 29 users for the survey, and all the responses are considered for the conclusion. Based on their responses we concluded the result of "which application is providing the best user experience".

Results: The results are taken from the survey responses we conducted. A comparison of Amazon Prime Video and Netflix is done with the help of survey evaluation and found the application which provides the best user experience.

Conclusion: The findings of this thesis show that Netflix provides the best user experience compared to Amazon Prime Video according to the survey we conducted.

Keywords: Amazon Prime Video, HBO, HCI Principles, Netflix, Subscription Streaming, Survey evaluation.

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List of Acronyms:

Acronym	Unfolding
HCI	Human-Computer Interaction
UI	User Interface
UX	User Experience

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1 INTRODUCTION

Usability is a measure of how well a specific user in a specific context can use a product/design to achieve a defined goal effectively, efficiently, and satisfactorily [1]. Designers usually measure a design's usability throughout the development process from the wireframe to the final deliverable to ensure maximum usability [1].

The definition which has been used is derived from several views of what usability is. Three of the views relate to how usability should be measured:

- The product-oriented view, that usability can be measured in terms of the ergonomic attributes of the product [2].
- The user-oriented view, that usability can be measured in terms of the mental effort and attitude of the user [2].
- The user performance view, that usability can be measured by examining how the user interacts with the product, with particular emphasis on either ease-of-use: how easy the product is to use, or
-acceptability: whether the product will be used in the real world.

These views are complemented by the contextually oriented view, that usability of a product is a function of the user or class of users being studied [3].

Nowadays, the internet makes every aspect of entertainment like watching movies, series, comedy shows, etc., easier to watch and we don't need to download all the things or buy a CD drive. We just need to pay money for the streaming platforms like Netflix, amazon prime, and others, we can stream all our favourite content through these applications. Amazon Prime Video and Netflix are the rivals in the present trend and most people are using these applications. And we are also the users of these applications, and we found many issues while using these applications like

1. The Amazon Prime Video applications search engine is not good enough because it shows unrelated data compare to Netflix [4].
2. Netflix requires a very less amount of bandwidth to stream a video, but Amazon requires a lot of bandwidth [4].
3. The video quality on Amazon is not good while we are streaming but if we download the video the video quality will be fine [4].

Because of these issues, makes us more enthusiastic to take up this project as our bachelor's thesis. And we start researching this topic to know if anyone had already done this or not. And we found that only very little research is available on the internet on this topic and the research which is already done is also related to the cost and content only. A few types of research are done based on usability, but they are done completely without using any usability principles [5] [6]. And we decided to do the research on the usability of these applications in depth.

1.1 Aims and Objectives

This work aims to determine which application between Amazon Prime Video and Netflix, best follows usability heuristics and provides the best user experience by applying survey evaluation.

Objectives are as follows:

- Studying and using both applications Amazon prime video and Netflix and then finding the importance of both.

- Exploring all the features of these applications.
- Creating user tasks on Amazon Prime Video and Netflix like creating the user accounts, watching a video, downloading any content from the applications etc.,.
- Making a survey questionnaire that is related to Nielsen's heuristics.
- Finding the various categorized people for the survey, i.e., basic, moderate, and professional users of both apps.
- Doing a survey and gathering all the responses from the users.
- The survey responses from users will be analysed and determine which application adheres to Nielsen's Usability heuristics.

1.2 Research Question

Following is the research question:

- Which streaming application between Amazon prime video and Netflix, serves the best usability experience by using HCI principles with the help of survey evaluation from the user perspective?

Motivation: It is important to know what the user feels while using these applications, so we like to find the best application between these with the help of HCI principles from the user perspective by using the survey evaluation [7].

1.3 Background

Subscription Streaming Service:

An over-the-top media service is a streaming media service offered directly to viewers via the Internet. OTT bypasses cable, broadcast, and satellite television platforms, the companies that traditionally act as a controller or distributors of such content. Most of these services are owned by a major film studio. Some streaming services started as an add-on to Blu-ray offerings, which are supplements to the programs watched [8].

Streaming is an alternative to file downloading, a process in which the end-user obtains the entire file(s) for the content before watching or listening to it [8].

A client end-user can use the media player, computer, mobile phone, and smart TV to start playing digital video content before the entire file has been transmitted. Users will need an Internet connection to stream or download video content. Users lacking compatible hardware or software systems may be unable to stream or download certain content [8].

Amazon Prime Video:

Amazon Prime Video, or simply Prime Video, is an American subscription platform.

Video-on-demand over-the-top streaming and rental service of [Amazon](#) offered as a standalone service or as part of Amazon's [Prime subscription](#) [9]. The service primarily distributes films and television series produced by Amazon Studios and MGM Holdings or licensed to Amazon, as Amazon Originals, with the service also hosting content from other providers, content add-ons, live sporting events, and video rental and purchasing services [9].

Operating worldwide, the service may require a full Prime subscription to be accessed. In countries such as the United States, United Kingdom, and Germany, the service can be accessed without a full Prime subscription, whereas in Australia, Canada, France, India, Turkey, and Italy, it can only be accessed through a dedicated website [9]. Prime Video additionally offers a content add-on service in

the form of channels, called Amazon Channels, or Prime Video Channels, which allow users to subscribe to additional video subscription services from other content providers within Prime Video [9].

Launched on September 7, 2006, as Amazon Unbox in the United States, the service grew with an expanding library and added the Prime Video membership upon the development of the Prime subscription [9]. It was then renamed Amazon **Instant Video on Demand**. After acquiring the UK-based streaming and DVD-by-mail service Love Film in 2011, Prime Video was added to the Prime subscription in the United Kingdom, Germany and Austria in 2014, available on a monthly subscription of £/€7.99 per month, continuing the plan of Love Film Instant [9]. The service was previously available in Norway, Denmark, and Sweden in 2012, but was discontinued in 2013. On April 18, 2016, Amazon split Prime Video from Amazon Prime in the US for \$8.99 per month [9].

On December 14, 2016, Prime Video launched worldwide (except for Mainland China, Cuba, Iran, North Korea, Russia, and Syria) expanding its reach beyond the United States, United Kingdom, Germany, Austria, and Japan [9]. Among the new territories, the service was included with Prime in Belgium, Brazil, Canada, France, India, Ireland, Italy, Poland, and Spain, while for all other countries, it was made available for a monthly promotional price of \$/€2.99 per month for the first six months and \$/€5.99 per month thereafter [9].

Netflix:

Netflix, Inc. is an American subscription streaming service and production company. Launched on August 29, 1997, it offers a film and television series library through distribution deals as well as its productions, known as [Netflix Originals](#) [10].

As of March 31, 2022, Netflix had over 221.6 million subscribers worldwide, including 74.6 million in the United States and Canada, 74.0 million in Europe, the Middle East, and Africa, 39.9 million in Latin America, and 32.7 million in Asia-Pacific [10]. It is available worldwide aside from Mainland China, Syria, North Korea, Russia, and Crimea. Netflix has played a prominent role in independent film distribution and is a member of the Motion Picture Association (MPA) [10].

Netflix can be accessed via the internet browser on computers, or via application software installed on smart TVs, set-top boxes connected to televisions, tablet computers, smartphones, digital media players, Blu-ray Disc players, video game consoles, VR and virtual reality headsets on the list of Netflix-compatible devices [10]. It is available in 4K resolution. In the United States, the company provides DVD and Blu-ray rentals delivered individually via the United States Postal Service from regional warehouses [10].

Netflix was founded on the date by Reed Hastings and Marc Randolph in Scotts Valley, California. Netflix initially both sold and rented DVDs by mail, but the sales were eliminated within a year to focus on the DVD rental business. In 2007, Netflix introduced streaming media and video on demand [10]. The company expanded to Canada in 2010, followed by Latin America and the Caribbean. Netflix entered the content-production industry in 2013, debuting its first series *House of Cards*. In January 2016, it expanded to an additional 130 countries and then operated in 190 countries [10].

The company is ranked 115th on the *Fortune 500* and 219th on the Forbes Global 2000. It is the second-largest entertainment/media company by market capitalization as of February 2022. In 2021 [10], Netflix was ranked as the eighth-most trusted brand globally by Morning Consult. During the 2010s, Netflix was the top-performing stock in the S&P 500 stock market index, with a total return of 3,693% [10].

Netflix is headquartered in Los Gatos, California, in Santa Clara County, with the two CEOs, Hastings and Ted Sarandos, split between Los Gatos and Los Angeles, respectively. It also operates international offices in Asia, Europe, and Latin America including [10]

in Canada, France, Brazil, Netherlands, India, Italy, Japan, South Korea and the United Kingdom. The company has production hubs in Los Angeles, Albuquerque, London, Madrid, Vancouver r, and Toronto. Compared to other distributors, Netflix pays more for TV shows upfront but keeps more "upside" (i.e. future revenue opportunities from possible syndication, merchandising, etc.) on big hits [10].

Human-Computer Interaction (HCI):

Human-Computer Interaction (HCI) is a study of how people interact with computers and to what extent computers are developed for successful interaction with human beings [11].

Principles can be applied to any user interface, independently of the supported activity, the user, and the form of solution [11]. Because of various tasks and new techniques, designer constants are involved in unfamiliar design problems. Principles can provide a source of help by referencing general principles based on cognitive theory [12].

Following are the HCI principles that we will use to compare Amazon Prime Video and Netflix streaming applications [13].

1. Visibility of system status:

The system should always keep users informed about what is going on, through appropriate feedback within a reasonable time [13].

2. Match between system and the real world:

The system should speak the users' language, with words, phrases, and concepts familiar to the user, rather than system-oriented terms. Follow real-world conventions, making information appear in a natural and logical order [13].

3. User control and freedom:

Users often choose system functions by mistake and will need a marked «emergency exit to leave the unwanted state without having to go through an extended dialogue. Support undo and redo [13].

4. Consistency and standards:

Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions [13].

5. Error prevention:

Even better than good error messages is a careful design that prevents a problem from occurring in the first place [13].

6. Recognition rather than recall:

Make objects, actions, and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate [13].

7. Flexibility and efficiency of use:

Accelerators – unseen by the novice user – may often speed up the interaction for the expert user such that the system can cater to both inexperienced and experienced users. Allow users to tailor frequent actions [13].

8. Aesthetic and minimalist design:

Dialogues should not contain information that is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility [13].

9. Help users recognize, diagnose, and recover from errors:

Error messages should be expressed in plain language (no codes), precisely indicate the problem, and constructively suggest a solution [13].

10. Help and documentation:

Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation. Any such information should be easy to search, focused on the user's task, list concrete steps to be carried out, and not be too large [13].

Application users are subjective views in survey evaluation. Here, the users are meant to be the application's basic, moderate, and professional users. A set of questions will be created regarding both applications and the questions are created based on the usability factors. And the user's responses are used only for research purposes, and we will also maintain privacy. Based on the user's responses, we will conclude which among these applications provides a better user interface.

This research will benefit the users to choose the streaming application which provides better usability. And this research is helpful to the designers of the application to improve the application interface from the user view.

1.4 Scope

The scope of this thesis is limited to the applications of Amazon Prime Video and Netflix, these are the top Subscription streaming service providers in the world. Human-Computer Interaction (HCI) principles are used to do survey evaluation on Amazon Prime Video and Netflix. the results of this thesis are evaluated based on the HCI principles and survey evaluation.

1.5 Outline

All the contents in the report are described chapter-wise, in the first chapter the basic overview of the problem is explained. In the second chapter related work regarding the usability of subscription streaming services is explained. In the third chapter how the survey evaluation is conducted is explained. In chapter four how the results are taken from the survey, and evaluation is explained. In chapter five based on the results discussion is done and in chapter six analysis of the results is done and finalized the conclusion.

2 RELATED WORK

Yong Gu Ji, Jun Ho Park, Cheol Lee & Myung Hwan Yun have done a usability checklist for the Usability Evaluation of Mobile Phone User interface using the HCI principles and based on the principles. They have done the research in the year 2006, and they have taken results based on the principles and the method they used [14].

Rolf Molich, Meghan R. EDE, Klaus Kaasgaard, and Barbara Karyu kind researched the consistency of Usability testing on Microsoft Hotmail using Neilson's principles in the year 2004. In this research they worked on all the usability factors of the Hotmail and then the factors which they have observed in the Hotmail are compared with the Neilson's principles and they found out most of the usability problems with the Hotmail [15].

C.Ardito, M.F. Costabile, M.De Marsico, R. Lanzilotti, S.Levialdi, T. Roselli, and V. Rossano have done research on the evaluation of educational software based on their Usability using HCI principles and they have been used survey evaluation for this. This research is done in the year 2005 [16].

Panagiotis Zaharias and Angeliki Poylymenakou researched developing a usability evaluation method for e-learning applications using HCI principles, before this research there is no researcher had done research on e-learning application to do the usability evaluation. This is the first research in the world on e-learning application on usability they have done this research in the year 2009 and they have found many issues with that platform [17].

Samuel Ssemugabi and Ruth De Villiers researched A comparative study of two usability evaluation methods using a web-based e-learning application in the year 2007. And, the evaluation includes HCI principles, and they have used survey evaluation for this research. The results are concluded based on the severity ratings from the users [18].

Chao-Ming Wang and Ching-Hua Huang researched usability checks on user interfaces which are done based on Nielsen's principles in the year 2015. They have done this research using four principles mainly [19].

Wayne D. Gray and Marilyn C. Salzman researched the topic called "A review of experiments that compare usability evaluation methods" in the year 1998. In this research, they have studied many evaluation methods and they finalized some of the methods which are good enough to research the usability experiments in the finalized results they conclude that Nielsen's principles are the important principles to evaluate usability experiments [20].

Henry Been-Learn Duh and Gerald C. B. Tan have done research on "Usability evaluation for mobile devices: A comparison of laboratory and field tests" in the year 2006. In this research they have concluded that there are some limitations to the effectiveness of conventional usability tests, mainly for mobile devices [21].

Bassfar Zaid, Rozinah Jamaluddin, and Bajaba Wafaa done a comparative study of usability methods for mobile applications in the year 2004. And, they have considered many methods for this study as follows planning usability questions, selecting a representative sample and recruiting participants, and preparing test methods for the evaluation and they have considered 5 HCI principles [22]

Sugandha Gupta did research called "A comparative study of Usability Evaluation Methods" in the year 2015. In this research the author had done the research to address the available evaluation methods in the Usability subject and the author addresses all the concepts of these methods and how to

use these methods for the study, especially the author mainly focusses on the HCI principles and survey evaluation to do this research [23].

3 METHOD

This section gives the idea about how the Subscription streaming services are evaluated with the help of a survey evaluation. The survey evaluation method is used to find out the which application provides the best user experience between Amazon Prime Video and Netflix. the survey is conducted for more than 20 people and the survey questions are shared using WhatsApp and Gmail.

The users are provided with a link that will navigate to the google forms and it consists of the questions which we framed; the questions are framed in such a way that all the questions are related to the HCI Principles. The users will complete the survey and all the responses are noted then based on the responses we will conclude the result. The entire survey and the evaluation is done on the laptops with the following specifications:

- Windows 11 Home 64bit
- 8 GB RAM
- Intel Core i5 eighth generation

3.1 Survey Evaluation

The survey evaluation is the scientific method we used for comparing both applications to know what the users feel regarding the usability experience of these applications by using this method. We can find which application the user likes to use between these.

The survey evaluation is done, such as questionnaires are used which aim to identify usability problems by using google forms. The google forms consist of a few basic multiple-choice questions. We choose at least twenty participants for the survey. We will probably send the google forms to the participants through WhatsApp or Gmail. The questions which we create will be referenced to one of the HCI principles.

Some of the questions which we use for the survey are listed below:

Survey question 1:

During user account creation in Netflix and Amazon Prime Video which application interface is looking like other applications like Facebook, Twitter, or any other?

Refers to the “Match between system and the real world” principle.

Survey question 2:

During the account creation which application is more helpful and suggestive to avoid mistakes?

Refers to the “Error Prevention” principle.

Survey question 3:

Which application gives you better navigation like going to the next or previous page or exit?

Refers to the “User control and freedom” principle.

Survey question 4:

While using these applications do you feel any difficulty with the symbols in the applications?

Refers to the “Consistency and Standards” principle.

Survey question 5:

After using the application for a while, which application is giving the better recommendations to watch.

Refers to the “Recognition rather than recall” principle.

Survey question 6:

When you used these applications for the first time, which application do you feel more comfortable with?

Refers to the “Flexibility and efficiency of use”.

Survey question 7:

After signing into the application which application gives you the exact relevant data?

Refers to the “Aesthetics and Minimalistic design” principle.

Survey question 8:

What is the result when you are searching for content which is not available in the application?

Refers to the “Help users recognize, diagnose, and recover from errors”.

Survey question 9:

Which application provides you the better help and documentation to achieve your action?

Refers to the “Help and Documentation”.

Survey question 10:

Which application notifies you after completion of a movie, or series for download?

Refers to the “Visibility of system status” principle.

For all the above-listed questions the following will be the options: A. Netflix

B. Amazon Prime Video

C. Both

D. None

All the responses are labelled with the help of metrics in a table with the help of scaling from 0 to 10 according to the principle.

3.2 Relating HCI Principles to the Survey Questions

Principle	Survey Question
Visibility of the system status	Question 10
Match between system and the real world	Question 1
User control and freedom	Question 3
Consistency and standards	Question 4
Error prevention	Question 2
Recognition rather than recall	Question 5
Flexibility and efficiency of use	Question 6
Aesthetics and minimalist design	Question 7
Help users recognize, diagnose, and recover from errors	Question 8
Help and documentation	Question 9

Table 1 Relating Principles to the Survey Questions

Based on the responses from the users we will update a table in the form of scaling in the range of 0-10 [13]. And we conclude the result based on these statistics.

4 RESULTS AND ANALYSIS

In this chapter, the results are shown based on the responses received from each user in the survey evaluation.

We received 29 responses which mean 29 people have participated in the survey which is conducted. And the exact responses are taken from the users and the results are shown here in the form of screenshots: the questions are made a way of options choosing type because the users may feel uncomfortable doing the survey.

We represented 10 questions in the survey, and we showed the results of each question one by one.

Question 1 Along with the responses:

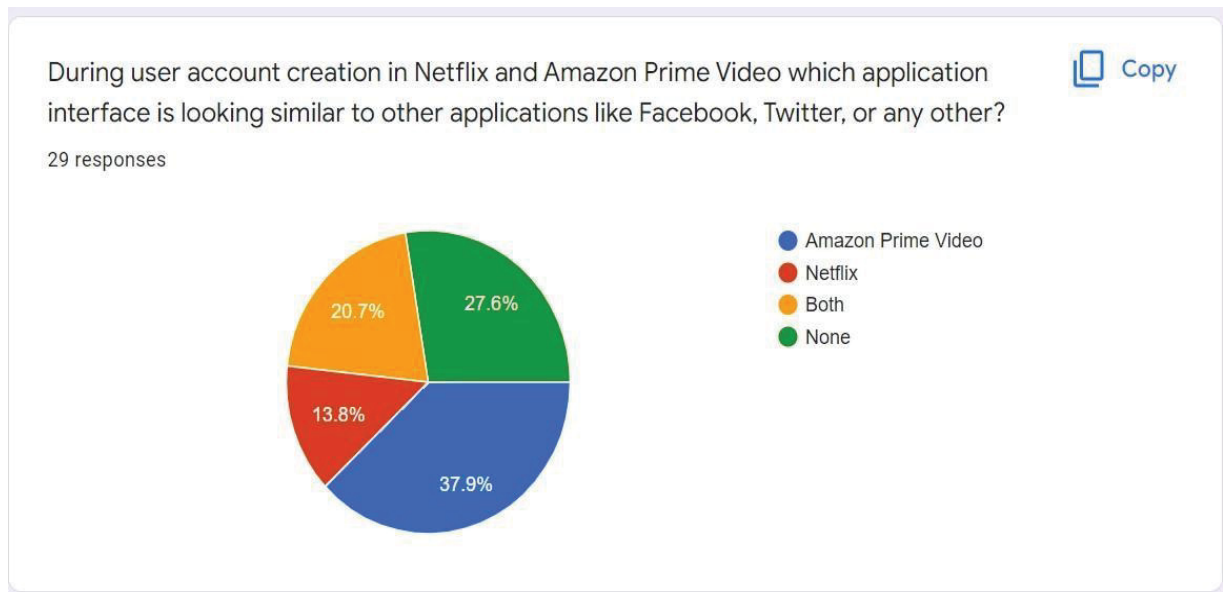


Figure 1 Survey question 1 response

Here we can see the responses are represented in the pie-chart, here we are asking the users which application interface is copied from any other application so, more the sort. Here we can see that 37.9% of the people are supporting Amazon Prime Video, 13.8% of the people are supporting Netflix and for this question, 20.7% of the people are supporting both applications, now let's see the result of this question by considering the individual result of each application and considering the "Both" options.

$$\text{Amazon Prime Video} = 37.9\% + 20.7\% = 58.6\%$$

It means 58.6% of the people are saying that the application interface is like other applications. we are taking the percentage into the points to represent so the related points to it is 5.86 and it's a negative question so we must do minus from 10.

$$\text{The actual score of Amazon Prime Video is} = 5.86$$

Now let's see the Netflix score for this question, 13.8% of the people are supporting this question individually and 20.7% of people are supporting Netflix indirectly now let's find the score of Netflix.

$$\text{Netflix} = 13.8\% + 20.7\% = 34.5\%$$

It means 34.5% of the people are saying that the application is like other applications. We are taking the percentage into the points to represent so the related points for it are 3.45

The actual score of Netflix is = 3.45

So, by this result for question 1 based on the responses from the survey Amazon Prime Video won.

Question 2 Along with the responses:

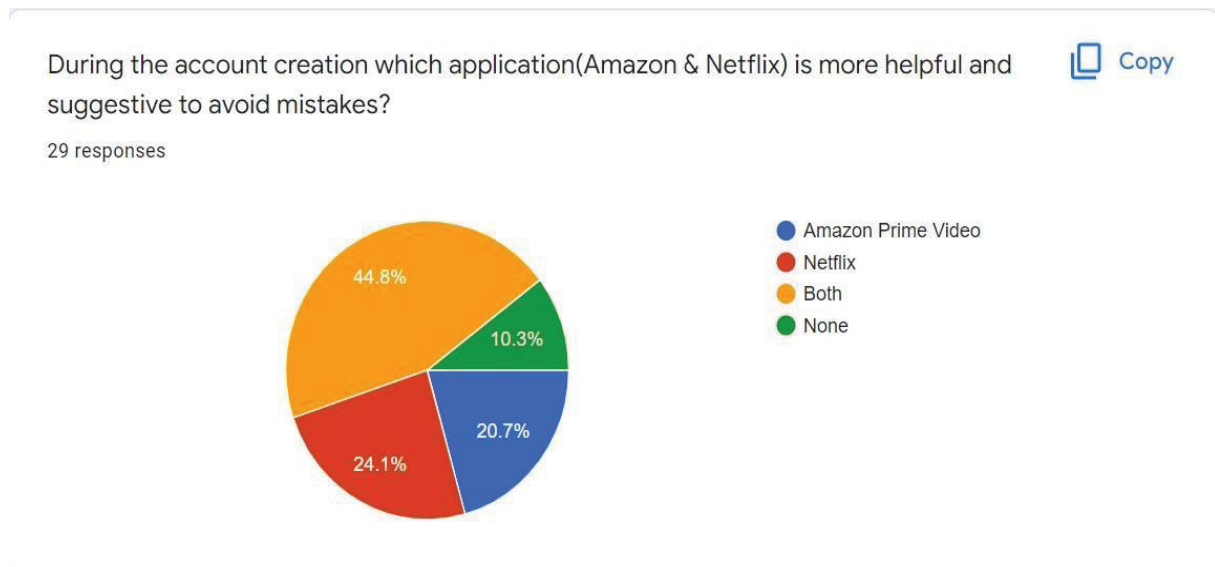


Figure 2 Survey Question 2 responses

Here we can see the responses to the question and let's examine the responses for it, for Amazon Prime Video 20.7% of the people are supporting. For Netflix, 24.1% of people are supporting Netflix and 44.8% of most people are supporting both applications.

Now, let's see the Amazon Prime Video score. 20.7% of the support Amazon individually and 44.8% of the people are supporting indirectly.

$$\text{Amazon Prime Video score} = 20.7\% + 44.8\% = 65.5\%$$

It means 65.5% of people are saying that Amazon Prime Video is more helpful to avoid mistakes, and its related score on a scale of 0-10 is 6.55

$$\text{Amazon Prime Video} = 6.55$$

Now, let's see the Netflix score, 24.1% of the people are supporting individually and 44.8% are supporting indirectly.

$$\text{Netflix score} = 24.1\% + 44.8\% = 68.9\%$$

It means 68.9% of the people are saying that Netflix is more helpful to avoid mistakes and its related score on a scale of 0-10 is 6.89

So, by this result, we can say that Netflix won in this case.

Question 3 Along with the responses:

Which application(Amazon Prime & Netflix) gives you better navigations like going to next or previous page or exit?



29 responses

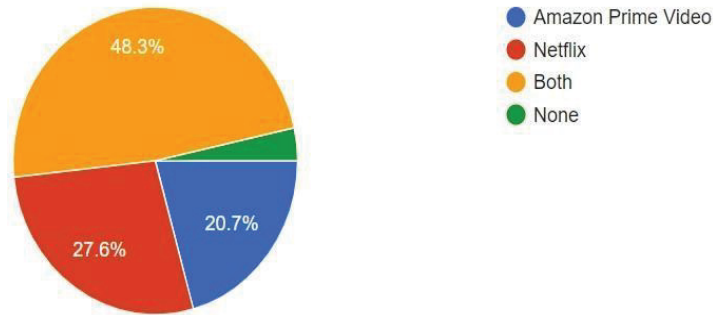


Figure 3 Survey Question 3 responses

Here we can see the responses to the question and let's examine the responses for it, for Amazon Prime Video 20.7% of the people are supporting. For Netflix, 27.6% of people are supporting Netflix and 48.3% of the majority of people are supporting both applications.

Now, let's see the Amazon Prime Video score. 20.7% of the support Amazon individually and 48.3% of the people are supporting indirectly.

$$\text{Amazon Prime Video score} = 20.7\% + 48.3\% = 69\%$$

It means 69% of people are saying that Amazon Prime Video gives better navigations like going to the next or previous page or exit, and its related score on the scale of 0-10 is 6.9

$$\text{Amazon Prime Video} = 6.9$$

Now, let's see the Netflix score, 27.6% of the people are supporting individually and 48.3% are supporting indirectly.

$$\text{Netflix score} = 27.6\% + 48.3\% = 75.9\%$$

It means 75.9% of the people are saying that Netflix gives better navigations like going to the next or previous page or exit and its related score on the scale of 0-10 is 7.59

$$\text{Netflix} = 7.59$$

So, by this result, we can say that Netflix won in this case.

Question 4 Along with the responses:

While using these applications(Amazon Prime & Netflix) do you feel any difficulty with the symbols in the applications?



29 responses

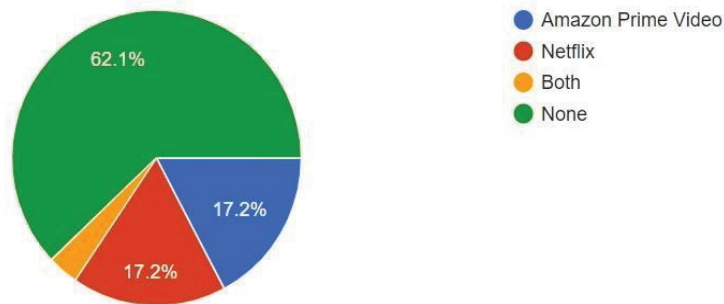


Figure 4 Survey Question 4 responses

This question is negative, what it means is here we are asking the users that “which application do you have any difficulty with the symbols in the applications” so, more support leads to a negative score. Here we can see that 17.2% of the people are supporting Amazon Prime Video means 17.2% of the people are saying that Amazon is making the users feel difficulty with the symbols, and 17.2% of the people are supporting Netflix it means 17.2% of the people are saying that Netflix is making the users feel difficulty with the symbols and for this question, 62.1% of the people are supporting both applications that they don't feel any difficulty while using both applications. So, we must do minus from the total percentage.

$$\text{Amazon Prime Video} = 100\% - 17.2\% = 82.8\%$$

It means 82.8% of the people are saying that Amazon is not making the users feel any difficulty and its related score is 8.28.

$$\text{The actual score of Amazon Prime Video is} = 8.28$$

Now let's see the Netflix score for this question, 17.2% of the people are saying that it is making users feel difficult to use it for this question now let's find the score of Netflix.

$$\text{Netflix} = 100\% - 17.2\% = 82.8\%$$

It means 82.8% of the people are saying that Netflix is not making the users feel any difficulty and its related score is 8.28.

$$\text{The actual score of Netflix is} = 8.28$$

So, by this result for the question based on the responses from the survey both Applications got equal scores.

Question 5 Along with the responses:

After using the application(Amazon Prime & Netflix) for a while, which application is giving the better recommendations to watch ?



29 responses

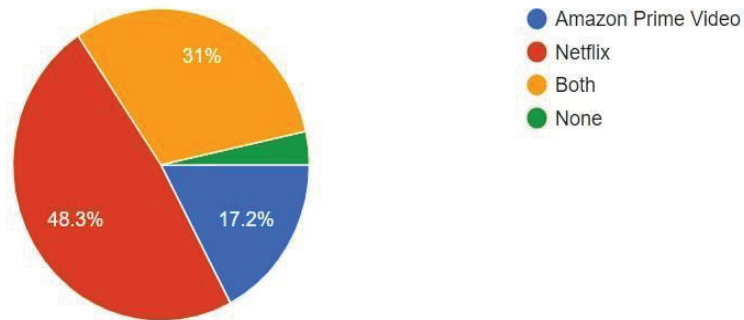


Figure 5 Survey Question 5 responses

Here we can see the responses to the question and let's examine the responses for it, for Amazon Prime Video 17.2% of the people are supporting. For Netflix, 48.3% of people are supporting Netflix and 31% of people are supporting both applications.

Now, let's see the Amazon Prime Video score. 17.2% of the support Amazon individually and 31% of the people are supporting indirectly.

$$\text{Amazon Prime Video score} = 17.2\% + 31\% = 48.2\%$$

It means 48.2% of people are saying that Amazon Prime Video gives better recommendations to watch, and its related score on a scale of 0-10 is 4.82

$$\text{Amazon Prime Video} = 4.82$$

Now, let's see the Netflix score, 48.3% of the people are supporting individually and 31% are supporting indirectly.

$$\text{Netflix score} = 48.3\% + 31\% = 79.3\%$$

It means 79.3% of the people are saying that Netflix gives better recommendations to watch, and its related score on the scale of 0-10 is 7.93

$$\text{Netflix} = 7.93$$

So, by this result, we can say that Netflix won in this case.

Question 6 Along with the Responses:

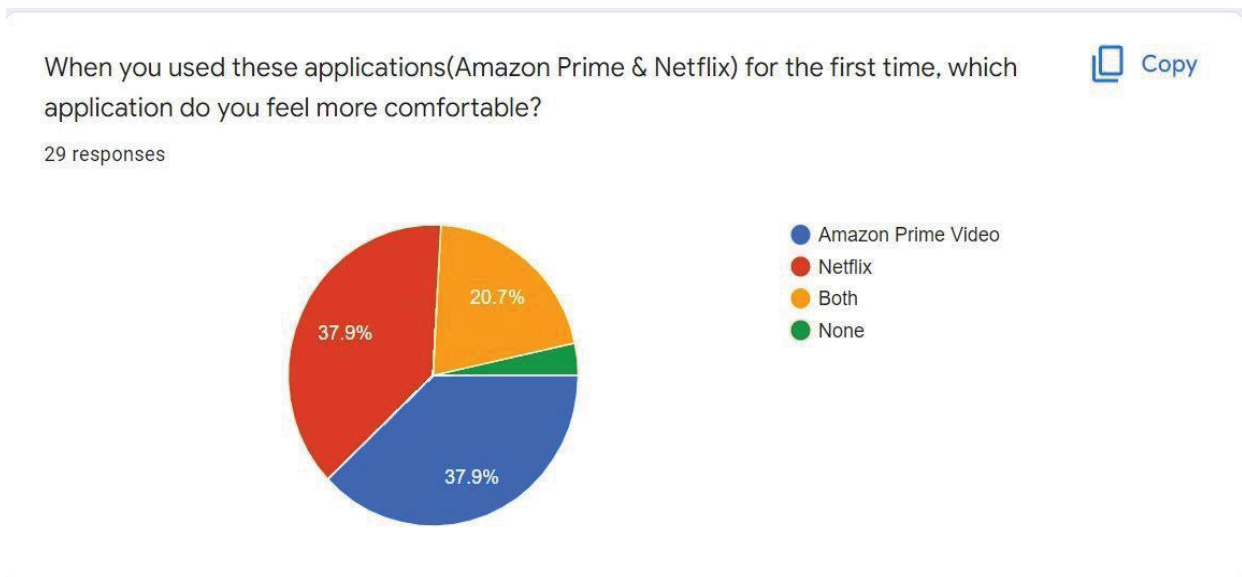


Figure 6 Survey Question 6 responses

Here we can see the responses to the question and let's examine the responses for it, for Amazon Prime Video 37.9% of the people are supporting. For Netflix, 37.9% of people are supporting Netflix and 20.7% of people are supporting both applications.

Now, let's see that Amazon Prime Video scores 37.9% of the supporting Amazon individually and 20.7% of the people supporting indirectly.

$$\text{Amazon Prime Video score} = 37.9\% + 20.7\% = 58.6\%$$

It means 58.6% of people are saying that Amazon Prime Video makes users more comfortable to use, and its related score on a scale of 0-10 is 5.86

$$\text{Amazon Prime Video} = 5.86$$

Now, let's see the Netflix score 37.9% of the people are supporting individually and 20.7% are supporting indirectly.

$$\text{Netflix score} = 37.9\% + 20.7\% = 58.6\%$$

It means 58.6% of the people are saying that Netflix makes the user more comfortable to use, and its related score on a scale of 0-10 is 5.86

$$\text{Netflix} = 5.86$$

So, by this result, we can say that both are equal in this case.

Question 7 Along with the responses:

After signing into the application(Amazon Prime & Netflix) which application gives you the exact relevant data?



29 responses

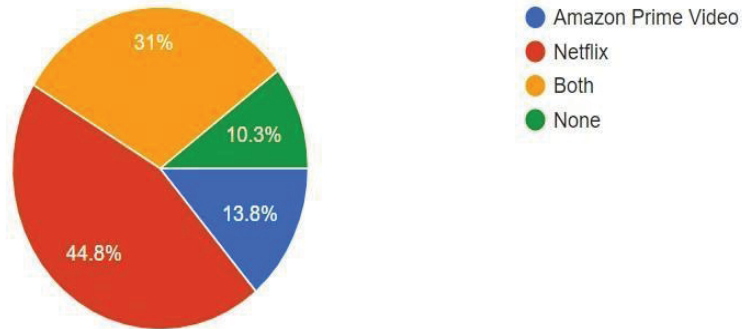


Figure 7 Survey Question 7 responses

Here we can see the responses to the question and let's examine the responses for it, for Amazon Prime Video 13.8% of the people are supporting. For Netflix, 44.8% of people are supporting Netflix and 31% of people are supporting both applications and 10.3% don't like both applications for this scenario.

Now, let's see that Amazon Prime Video scores 13.8% of the supporting Amazon individually and 31% of the people supporting indirectly.

$$\text{Amazon Prime Video score} = 13.8\% + 31\% = 44.8\%$$

It means 44.8% of people are saying that Amazon Prime Video gives the exact relevant data, and its related score on the scale of 0-10 is 4.48

$$\text{Amazon Prime Video} = 4.48$$

Now, let's see the Netflix score 44.8% of the people are supporting individually and 31% are supporting indirectly.

$$\text{Netflix score} = 44.8\% + 31\% = 75.8\%$$

It means 75.8% of the people are saying that Netflix gives the exact relevant data, and its related score on the scale of 0-10 is 7.58

$$\text{Netflix} = 7.58$$

So, by this result, we can say that Netflix won this scenario.

Question 8 Along with the Responses:

What is the result when you are searching for a content, which is not available in the application?



29 responses

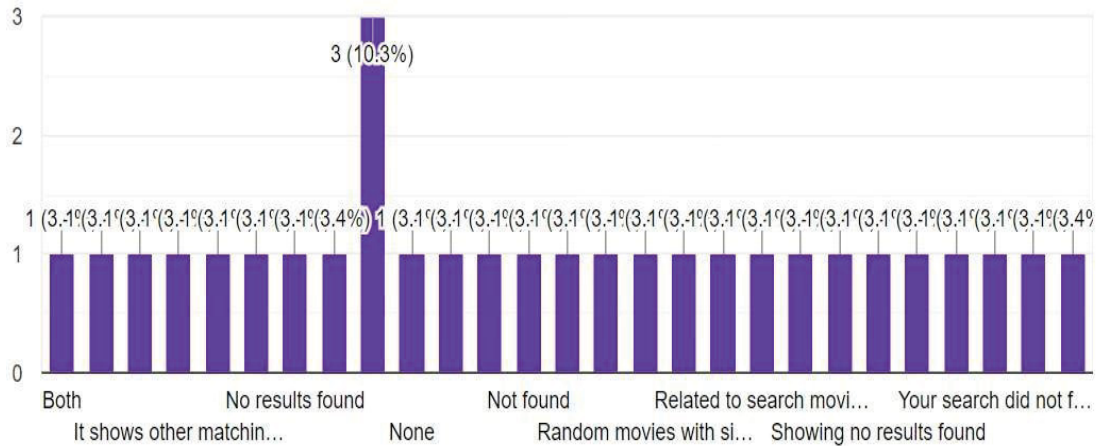


Figure 8 Survey Question 8 responses

Here we can see the responses to the question and let's examine the responses for it this is an answer based question which means we don't provide any options for the users we just asked them to write their answers for this question and most of them wrote the following answers:

- No Results found
- Not found
- Related content to the search
- Your search did not find
- Random movies with a similar type of content Related movies to the search

After examining all these responses, we found that both applications are giving a valid reason So, based on the responses the users indirectly declare that both applications are correct in this scenario. Therefore, the scores for both applications should be the same so, let's assume the scores will be 8.

Question 9 Along with the Responses:

Which application provides you the better help and documentation to achieve your action?



29 responses

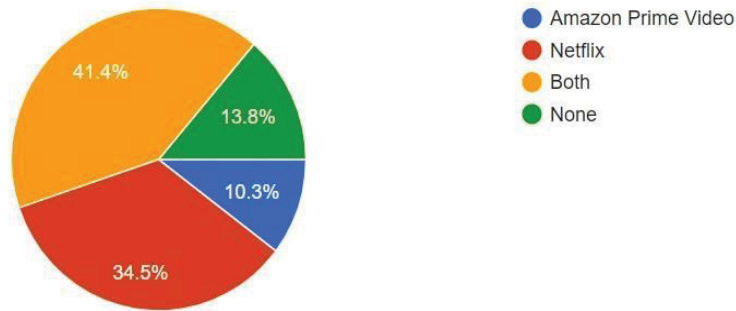


Figure 9 Survey Question 9 responses

Here we can see the responses to the question and let's examine the responses for it, for Amazon Prime Video 10.3% of the people are supporting. For Netflix, 34.5% of people are supporting Netflix and 41.4% of people are supporting both applications and 13.8% don't like both applications for this scenario.

Now, let's see that Amazon Prime Video scores 10.3% of the supporting Amazon individually and 41.4% of the people supporting indirectly.

$$\text{Amazon Prime Video score} = 10.3\% + 41.4\% = 51.4\%$$

It means 51.4% of people are saying that Amazon Prime Video provides the better help and documentation to achieve the action, and its related score on a scale of 0-10 is 5.14

$$\text{Amazon Prime Video} = 5.14$$

Now, let's see the Netflix score 34.8% of the people are supporting individually and 41.4% are supporting indirectly.

$$\text{Netflix score} = 41.4\% + 34.8\% = 76.2\%$$

It means 76.2% of the people are saying that Netflix provides the better help and documentation to achieve the action, and its related score on a scale of 0-10 is 7.62

$$\text{Netflix} = 7.62$$

So, by this result, we can say that Netflix won this scenario.

Question 10 Along with the Responses:

Which application notifies(Notification) you after completion of a movie, series for download?



29 responses

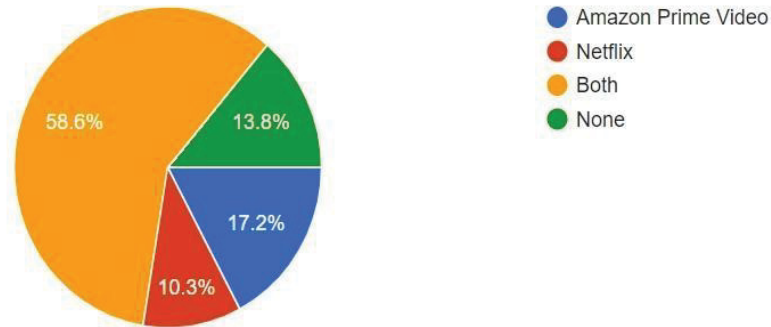


Figure 10 Survey Question 10 responses

Here we can see the responses to the question and let's examine the responses for it, for Amazon Prime Video 17.2% of the people are supporting. For Netflix, 10.3% of people are supporting Netflix and 58.6% of people are supporting both applications and 13.8% don't like both applications for this scenario.

Now, let's see that Amazon Prime Video scores 17.2% of the people supporting Amazon individually and 58.6% of the people are supporting indirectly.

$$\text{Amazon Prime Video score} = 17.2\% + 58.6\% = 75.8\%$$

It means 75.8% of people are saying that Amazon Prime Video notifies after completion of a download, and its related score on the scale of 0-10 is 7.58

$$\text{Amazon Prime Video} = 7.58$$

Now, let's see the Netflix score 10.3% of the people are supporting individually and 58.6% are supporting indirectly.

$$\text{Netflix score} = 58.6\% + 10.3\% = 68.9\%$$

It means 68.9% of the people are saying that Netflix notifies after completion of a download, and its related score on the scale of 0-10 is 6.89

$$\text{Netflix} = 6.89$$

So, by this result, we can say that Amazon Prime Video won this scenario.

Based on all the responses to the survey the table is drawn which consists of the principles and scores of both applications, based on that the thesis approach figured out which application is giving the best user experience to the users.

Principle	Amazon Prime Video	Netflix
Visibility of the system status	7.58	6.89
Match between system and the real world	4.14	6.55
User control and freedom	6.9	7.59
Consistency and standards	8.28	8.28
Error prevention	6.55	6.89
Recognition rather than recall	4.82	7.93
Flexibility and efficiency of use	5.86	5.86
Aesthetics and minimalist design	4.48	7.58
Help users recognize, diagnose, and recover from errors	8	8
Help and documentation	5.14	7.62

Table 2 Scores of both applications according to the HCI Principles

Based on the survey responses the table is updated with its scores now let's compare both applications according to the principles:

Based on the Principle "Visibility of the system status" Amazon Prime Video scores 7.58 and Netflix scores 6.89 so, in this case, Amazon Prime Video won this scenario.

Based on the Principle "Match between system and the real world" Amazon Prime Video scores 4.14 and Netflix scores 6.55 so, in this case, Netflix won this scenario.

Based on the Principle "User control and freedom" Amazon Prime Video score 6.9 and Netflix scored 7.59 so, in this case, Netflix won this scenario.

Based on the Principle of "Consistency and standards" Amazon Prime Video scores 8.28 and Netflix scores 8.28 so, in this case, both are equal.

Based on the Principle of “Error prevention” Amazon Prime Video scored 6.55 and Netflix scored 6.89 so, in this case, Netflix won this scenario.

Based on the Principle “Recognition rather than recall” Amazon Prime Video score 4.82 and Netflix scored 7.93 so, in this case, Netflix won this scenario.

Based on the Principle “Flexibility and efficiency of use” Amazon Prime Video scores 5.86 and Netflix score 5.86 so, in this case, both are equal.

Based on the Principle “Aesthetics and minimalist design” Amazon Prime Video score 4.48 and Netflix scored 7.58 so, in this case, Netflix won this scenario.

Based on the Principle “Help users recognize, diagnose, and recover from errors” Amazon Prime Video scores 8 and Netflix scores 8 so, in this case, both are equal.

Based on the Principle “Help and documentation” Amazon Prime Video score 5.14 and Netflix scored 7.62 so, in this case, Netflix won this scenario.

Among 10 principles, Netflix had won 6 scenarios so, we declare that Netflix gives the best user experience to the users.

5 DISCUSSION

In this section, the research question we mentioned above will be explained with the help of a survey we conducted.

Research Question:

Which streaming application between Amazon prime video and Netflix, serves the best usability experience by using the HCI principles and with the help of survey evaluation from the user perspective?

The usability of Amazon Prime Video and Netflix are compared based on the Human-Computer Interaction (HCI) principles with the help of conducting a survey evaluation and determining which application serves the best user experience to the users.

To find out which application serves the best user experience we created a questionnaire in such a way that all the questions are related to the HCI principles directly or indirectly and the questions are also easier to understand the users which make users don't feel difficult to do the survey. And we considered 29 users' responses to the survey. The survey is done with the help of Google forms and the Google forms are shared with the users with the help of WhatsApp. Now, let us examine all the responses according to the principles one by one.

Survey Question 1 is based on the principle "**Match between system and the real world**". This principle states that the system should speak the user's language, with words, phrases, and concepts familiar to the user, rather than system-oriented terms [13]. Here for this question, 37.9% of the user voted for Amazon Prime Video directly and 20.7% of the users voted for Amazon Prime Video indirectly so, totally Amazon Prime Video got $20.7\% + 37.9\% = 58.6\%$. approximately 59% of the users selected Amazon Prime Video. Now let's analyze Netflix's votes it got 13.8% of the votes directly and 20.7% of the users voted indirectly so, totally Netflix got $20.7\% + 13.8\% = 34.5\%$. so, here based on the user's response Amazon Prime Video interface is looking similar so, users can easily understand the interface clearly because there has already seen a similar type of interface. So, here Amazon Prime Video won this scenario based on the "Match between system and the real world" principle.

Survey question 2 is based on the principle "**Error Prevention**". This principle states that even better than good error messages is a careful design that prevents a problem from occurring in the first place [13]. Here for this question, 20.7% of the users are supporting Amazon Prime Video directly and 44.8% of the users support it indirectly so, a total of $20.7\% + 44.8\% = 65.5\%$ of the users are supporting Amazon Prime Video and saying that it is helpful suggestive to avoid mistakes. Let's see the analyses on Netflix, 24.1% of the users voted for Netflix directly and 44.8% of the users voted indirectly so, a total of $24.1\% + 44.8\% = 68.9\%$ of the users are saying that Netflix is more helpful to avoid mistakes. So, here Netflix has won this scenario against Amazon Prime Video.

Survey question 3 is based on the principle "**User control and standards**". This principle states that users often choose system functions by mistake and need a marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue. Support undo and redo [13]. Here for this question, 20.7% of the users voted for Amazon Prime Video directly and 48.3% of the users voted for it indirectly so, a total of $20.7\% + 48.3\% = 69\%$. So, 69% of the users are saying that Amazon Prime Video gives better navigations like going to next or previous or exit. Analysis of Netflix, 27.6% of the users voted for Netflix directly and 48.3% of the users voted indirectly so, a total $27.6\% + 48.3\% = 75.9\%$ of the users are saying that Netflix gives better navigation like going to the next or previous page. By the user's responses, we can say that Netflix won this scenario.

Survey question 4 is based on the principle "**Consistency and Standards**". This principle states that Users should not have to wonder whether different words, situations, or actions mean the same thing [13]. Here for this question, 17.2% of the users voted for Amazon Prime Video directly and 62.1% of the users voted for it indirectly so, a total of $17.2\% + 62.1\% = 79.3\%$. So, 79.3% of the users are saying

that Amazon Prime Video makes users feel difficulty with the symbols in the application. Analysis of Netflix, 17.2% of the users voted for Netflix directly and 62.1% of the users voted indirectly so, a total of $17.2\% + 62.1\% = 79.3\%$ of the users are saying that Netflix makes users feel difficulty with the symbols in the applications. By the users' responses, both Amazon Prime Video and Netflix both got equal scores so, in this case, both are the same.

Survey question 5 is based on the principle of “**Recognition rather than recall**”. This principle states that Make objects, actions, and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable [13]. whenever appropriate. Here for this question, 17.2% of the users voted for Amazon Prime Video directly and 31% of the users voted for it indirectly so, a total of $17.2\% + 31\% = 48.2\%$. So, 48.2% of the users are saying that Amazon Prime Video gives better recommendations to watch[13]h. Analysis of Netflix, 48.3% of the users voted for Netflix directly and 31% of the users voted indirectly so, a total of $31\% + 48.3\% = 79.3\%$ of the users are saying that Netflix gives better recommendations to watch. By the users' responses, we can say that Netflix won this scenario.

Survey question 6 is based on the principle “**Flexibility and efficiency of use**”. This principle states that Accelerators – unseen by the novice user – may often speed up the interaction for the expert user such that the system can cater to both inexperienced and experienced users. Allow users to tailor frequent actions [13]. Here for this question, 37.9% of the users voted for Amazon Prime Video directly and 20.7% of the users voted for it indirectly so, a total of $37.9\% + 20.7\% = 58.6\%$. So, 58.6% of the users are saying that Amazon Prime Video makes users feel more comfortable using the application. Analysis of Netflix, 37.9% of the users voted for Netflix directly and 20.7% of the users voted indirectly so, a total of $37.9\% + 20.7\% = 58.6\%$ of the users are saying that Netflix makes users more comfortable using it. By the users' responses, we can say that both applications performed well in this scenario.

Survey question 7 is based on the principle “**Aesthetics and Minimalistic design**”. This principle states that Dialogues should not contain information that is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility. Here for this question, 13.8% of the users voted for Amazon Prime Video directly and 31% of the users voted for it indirectly so, a total of $13.8\% + 31\% = 44.8\%$. So, 44.8% of the users are saying that Amazon Prime Video gives exact relevant data to the users. Analysis of Netflix, 44.8% of the users voted for Netflix directly and 31% of the users voted indirectly so, a total of $44.8\% + 31\% = 75.8\%$ of the users are saying that Netflix gives the exact relevant data to the users. By the users' responses, we can say that Netflix won this scenario.

Survey question 8 is based on the principle “**Help users recognize, diagnose, and recover from errors**”. This principle states that error messages should be expressed in plain language (no codes), precisely indicate the problem, and constructively suggest a solution [13]. Here this question is answer-based, not option-based, so users have their answers in their own words. After examining all the responses from the users, we found that both applications are giving a valid reason So, based on the responses the users indirectly declare that both applications are correct in this scenario. Therefore, the scores for both applications should be the same as the users' responses we can say that both applications performed well in this scenario.

Survey question 9 is based on the principle “**Help and Documentation**”. This principle states that Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation. Any such information should be easy to search, focused on the user's task, list concrete steps to be carried out, and not be too large [13]. Here for this question, 10.3% of the users voted for Amazon Prime Video directly and 41.4% of the users voted for it indirectly.

So, totally $10.3\% + 41.4\% = 51.7\%$. So, 51.7% of the users are saying that Amazon Prime Video gives better help and documentation to the users. Analysis of Netflix, 34.5% of the users voted for Netflix directly and 41.4% of the users voted indirectly so, a total of $41.4\% + 34.5\% = 75.9\%$ of the users are saying that Netflix gives better help and documentation to the users. By the users' responses, we can say that Netflix won this scenario.

Survey question 10 is based on the principle "**Visibility of system status**". This principle states that the system should always keep users informed about what is going on, through appropriate feedback within a reasonable time [13]. Here for this question, 17.2% of the users voted for Amazon Prime Video directly and 58.6% of the users voted for it indirectly so, a total of $17.2\% + 58.6\% = 75.8\%$. So, 75.8% of the users are saying that Amazon Prime Video notifies well after the completion of a download to the users. Analysis on Netflix, 10.3% of the users voted for Netflix directly and 58.6% of the users voted indirectly so, a total of $58.6\% + 10.3\% = 68.9\%$ of the users are saying that Netflix notifies well after the completion of a download to the users. By the users' responses, we can say that Amazon Prime Video won this scenario

By our discussion on the survey among 10 principles-related questions, Netflix won 6 of the questions and Amazon Prime Video won only 2, and the remaining are tied so, we declare that Netflix gives a better user experience to the users than Amazon Prime Video.

6 CONCLUSION AND FUTURE WORK

6.1 Conclusion

Human-Computer Interaction Principles are used for the usability evaluation of Amazon Prime Video and Netflix. A survey evaluation is conducted by selecting more than 20 users for the survey and based on the survey and the HCI principles we conclude that Netflix is providing a better user experience to the users compared to Amazon Prime Video.

Netflix application is providing a better user experience than Amazon in the following HCI principles:

- User control and Freedom
- Error Prevention
- Recognition rather than recall
- Aesthetic and minimalistic design
- Help and Documentation

In these five principles, Netflix performed well compared to Amazon Prime Video. So, we conclude that Netflix provides a better user experience compared to Amazon Prime Video, but it doesn't mean that Amazon is not good at following the HCI principles it just means that Netflix is better than Amazon Prime Video according to the survey.

Amazon Prime Video got performed well in the following Principles:

- Match Between system and the real world
- Visibility of the system status

And in the following principles both applications performed equally

- Consistency and Standards
- Help users recognize, diagnose, and recover from errors
- Flexibility and efficiency of use.

6.2 Future works

We will extend our work by using different evaluation techniques for this. And we will try to do it more accurately and like to prepare more questionnaires also, we like to involve a greater number of users than now.

Future improvements are as follows:

- Evaluation can be done using different evaluation methods.
- Survey will be done by considering a greater number of users than now.
- More questionnaires will be introduced.
- The survey will be conducted using various types of users not only the students.

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