

Analysing recommended content provided by YouTube and users preferences

A Case Study at Dalarna University in Sweden

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Abstract

The application YouTube released in 2005 is today known as the most prominent platform on the world wide web for sharing, creating, and discovering video content(s). By utilizing technology trends such as Machine learning, YouTube can take advantage of algorithms such as deep neural networks to entice the users with a massive amount of personalized recommended content(s)t to watch based on the user's data.

The algorithm in the YouTube recommendation system collects the users' personalized data such as location, watch history and search history to recommend video content. The YouTube recommendation system gives personalized recommended content(s) to a YouTube user with the collected data. The user may deem the recommended content as ethically wrong. Therefore, bring up meaningful discussions such as a YouTube consumer's sentiment towards those contents they deem unethical.

This research study examines what ethical challenges exist in the YouTube recommendation system and how those challenges affect the YouTube consumers trust in the recommendation system.

- The research questions that were examined in this study are: What kind of ethical challenges does the YouTube recommendation system have?
- What kind of impact do those ethical challenges have on the user's trust in the YouTube recommendation system?

The respondents consisted of students at Dalarna University. This research was conducted with semi-structured interviews and a questionnaire that consisted of 11 questionnaires.

By examining the results from the literature reviews, interviews, and questionnaire, the gathered results show that challenges such as inappropriate, misinformed content and privacy exist with the YouTube recommendation system. Numerous of our respondents felt like they did not trust the YouTube recommendation system with their personalized data, primarily because of receiving video content that is not relevant, which has made some of the respondent question what YouTube does with the influx of the individual data.

Based on the result it can be concluded that there are many concerns related to ethical issues in the YouTube recommendation system. In essence, the respondents highlighted the significance of privacy when using a platform such as YouTube. The respondents desired more transparency with their data.

Acknowledgements

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Omar Ahmed & Philip Kelli

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1. Introduction

This section introduces the study with subheadings such as background, problem formulation and purpose of this research. Delimitations of the research have been explained in this section.

1.1. Background

In the modern age, digital services such as Netflix, Amazon, and YouTube are widely used to watch content(s). Similarly, the mentioned digital services utilize algorithms that make suggestions based on what a user watches and data such as search history, location, age, we interact with the recommendation system regularly Milano et al. (2020). YouTube is the biggest social media platform for discovering, creating, and viewing free online videos. The video services on YouTube can be used on tablets, mobile phones, PCs, and laptops. According to YouTube's product chief Neal Mohan claims that the YouTube recommendation engine is responsible for more than 70% of users' time watching videos on the platform (Solsman, 2018). Thus, making YouTube's recommendation system a crucial aspect for YouTube to keep the consumer engaged on their platform. Furthermore, Jeong et al. (2019) claims that the recommendation system of YouTube has provided more than a billion content of videos to its users.

The YouTube recommendation system gathers much data from the individual user on YouTube. The lack of transparency with the user data can cause concern to the users. Receiving content(s) that are inappropriate can consist of videos that promote sexual and religious harassment and fights that may harm the viewers. Such content(s) could open a dialogue about whether the recommended content by YouTube may pose ethical concerns. The ethical problem(s) in the recommendation system is multifaced and is hard to pinpoint. In a research article by Paraschakis (2016) regarding recommender systems, data collection is mentioned as one such ethical challenge. Data collection can cause concerns because of a lack of transparency and informed consent, and the user should have more control over the data collection process.

In another research article, Milano et al. (2020) expand on the distinction between what is deemed unethical within the recommendation system. The author sets two parameters to explain what is ethically at stake, and such parameters are behaviour and impact. Behaviour in the article means manipulative and biased recommendations given to a user. Impact refers to the consequences of a recommendation. Furthermore, the value of consequences is measured in terms of utility, which means how a recommendation can impact (negatively) the utility of its stakeholders or any violation of the user's rights. Lastly, Milano et al. (2020) give a clear example of one such utility, inaccurate information; in this instance, it refers to a recommendation that does not agree with the user's value or exposes them to privacy violations.

The YouTube recommendation system is an engine made up of a branch of Artificial intelligence (Ai) that branch is mostly known as Machine learning (ML). ML algorithms can be used to provide customized videos to specific users by forecasting their interest based on the information about formerly viewed items Jeong et al. (2019). The objective of the YouTube recommendation system is to decrease the overload of information and as well as to ease the retrieval of services and information that are relevant from an immense proportion of data based on the user's input, consequently providing personalized services based on the data. Personalized recommendation contents to the users are only possible once the users' inputs are collected. The user's inputs include watch history, clicked ads, age, location, and search history. To provide YouTube content consumers with the best possible experience, YouTube today utilizes different technologic trends in cooperation with their system.

AI has many different categories, depending on its scope of functioning and level of independence. Sorbán (2021) described that AI is frequently known as intelligent agents in such a way that they can execute any intellectual job or task a human can perform. This touches on conscious machines that can perform with almost full human intellectual capacity. Sorbán (2021) stated that AI will surpass human intelligence, therefore human beings will not be able to control and understand the technological development of AI.

YouTube utilizes AI to promote recommendations and videos. For this purpose, the deep neural network is used in the YouTube recommendation system. A deep neural network is a ML algorithm focusing on imitating the information processed in the brain. The primary duty of the ML algorithm is to absorb the user's input to provide recommendations. Covington et al. (2016) described that a deep neural network uses "the user's embeddings u as a function of the user's history and context that are useful for discriminating among videos with a SoftMax classifier". However, in this thesis, this research will briefly focus on what kind of ethical challenges the YouTube recommendation system has and how immense impacts those ethical challenges have on the user's trust in the YouTube recommendation system.

1.2. Problem area and formulation of the problem

The YouTube recommendation system entices users with what they assume are relevant suggested content based on a user's personalized data, for example, watch history and search history. One of the most frequent themes about recommendation systems in recent literature research studies is ethical issues and what risks these ethical issues poses (Milano, 2020). Milano (2020) expands on 7 ethical challenges of the recommender systems:

- **Privacy:** Refers to the possibility of unfair or malicious use of personal data to target individual users.
- **Inappropriate content:** Content which the user may deem to be distressing, irrelevant or in other way unacceptable.
- **Autonomy and personal identify:** Refers to how the recommendation system nudge user's autonomy, by providing recommended content by attempting to "addict" them to some types of contents.
- **Social effects:** Refers to transformative impact on society.
- **Opacity:** Explanation of how personalized recommendation are generated for individual uses by giving them access to the algorithm to give users a way to understand how the system works.
- **Fairness:** Fairness refers to how to mitigate potential bias in the algorithm that is run by the recommendation system.
- **Inaccurate recommendations:** recommendations that does not agree with the user's values or expose them to privacy violations.

These parameters offer map and analysis of the main ethical challenges posed by recommender system.

Moreover, there has not been extensive research about YouTube consumers' preferences regarding their thoughts on ethical challenges within the YouTube recommendation system. Therefore, there might be a need for case-study-based research with YouTube consumers. Hence, this research will focus more on the YouTube consumers in Dalarna University in Borlänge sentiment towards this research formulated questions. In focus.

There may be a need for an expanded understanding of how YouTube consumers as mentioned above experience the content they receive from YouTube's Recommendation System. Moreover, a YouTube consumer's concerns and trust in the Recommendation System might unravel unknown or complicated subject(s) that need addressing for the future development of the recommendation systems.

1.3. Objective and purposes

This research aims to examine how content consumers on YouTube experience the Recommendation system in the context of ethical issues and their trust in the YouTube recommendation system.

- The problems examined in this thesis are: What kind of ethical challenges does the YouTube recommendation system have?
- What kind of impact do those ethical challenges have on the user's trust in the YouTube recommendation system?

1.4. Delimitations

The research focuses only on the YouTube recommendation System. Since YouTube has not released the technical details of the algorithm their recommendation system is built on, this research will not focus too heavily on the technical aspect of the recommendation system thus, will exclude ethical challenges such as "Opacity, "Fairness", "Autonomy" that requires more knowledge and in-depth understanding of the algorithm. Moreover, this will not cause a problem for the research since Google has released an article providing an overview of the algorithm YouTube uses for its recommendation system. Only students in Dalarna university in Sweden whom consume YouTube content are considered for research'. Thus, this research will not focus on the "Social effects" of the recommendation system.

2. Literature Review

The literature section presents previous research and central and recurring concept in this research.

2.1. Recommender system and their ethical challenges

One of the several types of research related to this study described the systematic analysis of the ethical challenges caused by recommender systems. Milano et al. (2020) points out concerns in seven areas. Those seven areas include ethical challenges such as inappropriate content, privacy, opacity, fairness, social effects, autonomy, and personal identity. Milano et al. (2020) mentioned that the problems with the recommendation system are not humanly proper "For example, adding a filter to exclude content gives away the information that the users may find this content distressing, irrelevant, or in other ways unacceptable". Milano et al. (2020) described that user privacy is the most considerable challenge with recommendation systems. As a result of this research, Milano et al. (2020) also stated that most of the main challenges associated with violations of privacy are the likelihood of wrong or unfair uses of data that are personal to then later target users that are individual, However, it transpired that those concerns of privacy might be best suitable as an exposure risk.

2.2. How YouTube leads privacy-seeking users away from reliable information

The policies of the YouTube recommendation system are justly blurred. In this article, the nature of the YouTube recommendation system was investigated by Spinelli et al. (2020). It was confirmed that the YouTube recommendation system in general leads away from authentic or reliable sources of information, with a likelihood to, then push the users of YouTube to video channels uncovering unscientific and extreme viewpoints. Spinelli et al. (2020) also described that there are some fundamental tensions between the extreme recommendation and the privacy of the users. The study showed generally that those who receive much more unreliable

and extreme recommendations from YouTube were the users who seek privacy by keeping personal information/data hidden. This disadvantage of privacy of the users in the YouTube recommendation system has not been generally acknowledged.

2.3. Challenges to privacy protection on YouTube

The main issue of the misuse of personal data on the internet has been widely talked about in Serbia (Stepanović, 2018). Questions about privacy violations through videos on the YouTube platform have not been addressed. The YouTube platform allows almost any user to upload videos without going through a few censorship processes or official editing; this authorizes many cases of abuse and violation of a person's privacy by publishing video content. Stepanović, (2018) describe that the majority of YouTube users in countries of southeastern Europe, together with Serbia, are minors and children. YouTube authorizes instant sharing, yet also reuploading and multiplying the same contents by the different users; this makes video content almost indestructible. Because of this, minors and children are very unprotected and vulnerable. Stepanović (2018) described that the Serbian laws are not protecting the privacy on YouTube. The goal of the study conducted by Stepanović (2018) was to explore new challenges to the protection of privacy by analyzing its policies, content uploaded by users, and Serbian law. Hence to raise the consciousness of this problem and the significance of teaching children about digital privacy.

2.4. Deep Neural Networks for YouTube recommendations

YouTube is the world's largest platform for creating, sharing, and discovering video content. One of the essential, integral functionalities of YouTube is its recommendation system which is responsible for helping a billion users discover personalized content (Covington et al., 2016). YouTube's recommendation system is powered by a Deep neural network (deep learning algorithm). Deep learning is part of ML methods based on artificial neural networks. It consists of sophisticated mathematical modelling to process data in complex ways and thus can be used to build a recommendation system. The YouTube recommendation system's structure comprises two neural networks: one called "candidate generation" and another one for "ranking." The candidate generation takes events from the user's YouTube personalized data such as activity history as input from the user. It retrieves a small subset of hundreds of videos that, according to Covington et al. (2016), are intended to be highly relevant to the user with high precision.

Once candidate generation has taken place, the next step is to use the impression data to specialize and calibrate candidate data prediction for the user interface; this process is called ranking. When a user watches a given video, the ranking algorithm takes in a set of features for each video and scores each item from the candidate generation methods, thus resulting in recommended content for a user (Covington et al., 2016).

2.5. Explanation of terms

This section will describe the essential terms used in this study. Therefore, to give the reader a clear understanding of important concepts or terms that will be mentioned often in this research.

Artificial intelligence (AI): AI refers to systems that show intelligent performance by taking actions and analysing their behaviour, with some degree of autonomy to accomplish goals. AI systems can be completely software-based, acting in the virtual world (such as face and speech recognition, voice assistants, search engines, and image analysis software systems). AI can also be immersed into devices that hardware (such as the internet of things applications, advanced robots, autonomous cars, and drones) (Sorbán, 2021).

Machine Learning (ML): Machine Learning is a branch of artificial intelligence that focuses on using data and algorithms to build complex systems based on the idea that systems can learn from data, identify patterns, and make decisions with minimal human intervention (Sorbán, 2021).

Recommendation system: A recommendation system is a system built and run by ML algorithm to entice user with relevant suggestion based on a user's data such as watch history, search history (Cristos, 2021).

Deep neural network: A deep learning algorithm is used in the YouTube recommendation system. A *deep neural network* is an ML algorithm focusing on imitating the information processed in the brain. The primary duty of the ML algorithm is to absorb the user's input to provide recommendations (Covington et al., 2016).

Inappropriate content: Contents that do not comply with YouTube's Community Guidelines include footage of corpses, inciting others to commit violent acts, animal abuse, and violent physical and sexual assaults (YouTube, 2022).

Personalized recommendation: YouTube uses your data to improve your experience by giving you more relevant recommendations and search results. Such data can be your watch history, ads clicked, location, and search history (YouTube Help, 2022).

Misinformation: Contents that do not comply with YouTube's Community Guidelines, such examples are content that claims that harmful substances or treatments can have health benefits. Content that has been technically manipulated or doctored in a way that misleads users (beyond clips taken out of context) and may pose a severe risk of harm. Furthermore, content that may pose a severe risk of harm by falsely claiming that old footage from a past event is from a current event (YouTube, 2022).

Ethical Challenges: Refers to moral principles that govern how technologies should be used. In this instance, it implies how YouTube accounts for a user's digital rights, privacy, data protection, and online behaviors (Milano et al., 2020). Furthermore, ethical challenges can consist of content(s) that are inappropriate, inaccurate, and invasion of an individual user's privacy.

3. Method

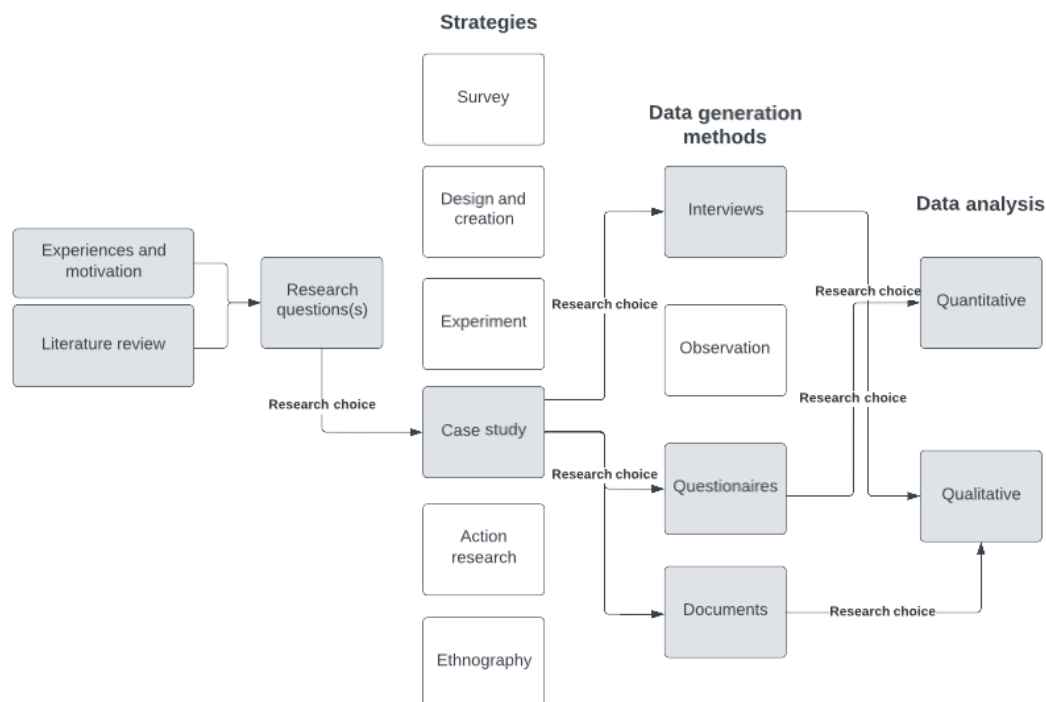
The method section will clarify the method(s) chosen for the thesis. Throughout this section, a systematic description of how the research was carried out is explained, coupled with data generation method(s) and how the data will be analysed.

3.1. Choice of research strategy

Oates (2005) mentions six different research strategies to systematically conduct research: Survey, Design and creation, Experiment, Case study, Action research, and Ethnography. Case study is the most optimal strategy for this research. Figure 1 displays the research process and a foundation of how systematically and strategically this research will be conducted—moreover, the different methods used. Interviews are very efficacious when conducting qualitative research. The interviews helped the researchers describe, understand, and investigate the interviewee's experiences and behaviors. In that way, the interviews helped the researchers fully fulfill the goal of the subject. Interviews are highly ideal since the research focuses on gathering opinions and experiences regarding a particular matter, making interviews one of the best data generation methods for this research.

A questionnaire was necessary to provide a comprehensive capability, establishing precise sample data to gather selected results and then making significant decisions and drawing conclusions. Very much like interviews, questionnaires are effective for measuring opinions and making analyses with statistical graphics such as pie-chart.

Figur 1. Model of the research process and studies election of methods (Oates, 2005).



This research focuses on students at Dalarna University in Sweden. The researchers of the thesis are attendees at Dalarna University. The University is in Borlänge. Students in Dalarna University was the research primary focus. Since the research is conducted in a case study manner for the convenience and to spare time and resources students was the optimal target group for this research, A case study is the most optimal strategy for this research. A case study aims to generalize

several units. One can capture a wide range of perspectives instead of the single view of an individual from a survey response or interview.

A case study as a research strategy systematically includes a variety of data generation methods such as questionnaires, interviews, and documents. Using the different variance of generation methods, Oates (2005) states that one can obtain rich and detailed insight into a matter researched.

Furthermore, a case study is ideal since a relatively targeted small population from a group or organization is researched. Choosing a survey as a research strategy could also be optional because a survey strategy uses data generation methods such as interviews, questionnaires, and documents. However, a survey study is more concerned with gathering from an entire population or a vast sample size to comprehend the opinion on a particular matter, thus focusing more on numerical data. Furthermore, a case study is ideal in this research since a relatively targeted small population from a group or organization is researched to generate rich, in-depth data rather than numerical data.

By gathering data from this research sample, it is possible to assess thoughts, opinions, and feelings toward the research questions. To mitigate the cons of using a questionnaire, for example, answers that can be challenging to analyse or interpret unanswered questions, we will complement this research with interviews as a data generation method. By interviewing respondents, we will be able to deal with the problems mentioned earlier; interviewing will also help collect more in-depth and allow for a narrower discussion than a questionnaire.

Documents will provide supplementary research data such as previous studies or books relating to ethical issues with the recommendation system. Documents will also be used as a supplementary data generation method. Making a document analysis will be beneficial; it will provide background information and broad coverage of data, thus helping contextualize one's research within its subject or field; this will not be possible by using the data mentioned above generation methods.

3.2. Data Collection

The collection of the scientific literature was carried out with a digital library. Google Scholar see Table 1; with the library's help, you can collect and search for journals and scientific publications. The kinds of literature were selected based on the subject area, which is the YouTube recommendations system and the ethical challenges with YouTube. The first keyword in Table 2 received 313 000 results; subsequently, many of them were reviewed and relevant to our study. We did not manage to review all the results, so instead. The chosen works of literature were picked based on the relevancy of this research. The main goal was to obtain scientific literature regarding the YouTube recommendation system and ethical issues about the recommendation system to gather rich and relevant information as fundamental groundings for this research.

Table 1. Digital libraries

Digital libraries	Date
Google Scholar	2022-04-10

Table 2. Keywords and search engine

Keywords for literature collection	Search engine	Number of results	Number selected
"YouTube recommendation system algorithm" + "Recommendation systems" + "Personalized data"	Google Scholar	313 000	6
"YouTube recommendation system" + "inappropriate content" + "privacy" + "misinformed content"	Google Scholar	173 000	4

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3.3. Interviews

Respondents for this research consisted of students at Dalarna University. These students individually were chosen based on criteria such as if the student consumes YouTube content and if they wanted to partake in this research only if they were students in Dalarna University. The student was directly asked in person if they were willing to be interviewed. Many students were eager to partake in this research and had a lot to say, thus those kinds of students were picked for the interviews

3.3.1. Planning interviews

Oates (2005) described three different types of interview structure. Structured interviews use identical, predetermined, and standardized questions for every interviewee. In this approach, you note the responses of your interviewees and read out the questions, frequently using pre-coded answers. In this research, pre-coded answers were not used; instead, interviewees talked freely about those open questions that were asked. Therefore, the structured interview approach was excluded. When performing unstructured interviews, Oates (2005) stated that the researchers have a lesser amount of control by starting with introducing a subject and allowing the interviewees to develop their ideas on this subject; you are not interfering and not interrupting. This approach was excluded primarily because there needs to be a control in the interviews and ensure that the interviewees talked about the presented subject.

The researcher's supervisor manufactured the questions that were asked to the interviewees. The research's intention with the question was to include the ethical issues introduced in the literature reviews, such as "privacy," "misinformed and inappropriate content that would be suitable for the case study.

The semi-structured approach was used in the interviews; see Table 3 for the planning of the interviews. In this approach, there was some themes list that needed to be covered and questions to be asked to the individuals. However, using a semi-structured interview allowed for a more robust way to ask questions and change the conversation flow. Oates (2005) described that it is vital to ask some additional questions to the interviewees in this approach. In that way, the interviewees feel comfortable and secure about the questions. The respondents for this research interviewees consisted of students in Dalarna who consumed YouTube content(s). Oates (2005) stated that semi-structured is one of the approaches that allows interviewees to "speak their minds" and is used where the primary purpose is "discovery" rather than "checking".

Table 3. Respondents

Respondents	Role	Date	Interview time
Respondent 1	Student	7/4-22	28 min
Respondent 2	Student	7/4-22	25 min
Respondent 3	Student	7/4-22	44 min
Respondent 4	Student	20/4-22	17 min

3.4. Questionnaire

A questionnaire consists of a pre-defined set of questions in a pre-determined order. The respondents are to answer pre-defined questions. The answers will then be analysed and interpreted. Using a questionnaire is to find patterns and generalize about the action or view based on the result of the answers (Oates, 2005).

3.4.1. Planning Questionnaire

For the questionnaire, we used Google Forms. The targeted group pupils in Dalarna University; therefore, our questionnaire was sent via "Gmail" with complementary information to students at Dalarna University that consume YouTube content(s). The questionnaire was self-administered, meaning we were not present during the respondent time answering the questions. According to Oates (2005), a self-administered questionnaire is ideal, because the respondents are less likely to try to please the researchers by giving answers they perceive to be "correct," "desired."

Furthermore, the questions were constructed by following the guidelines of Oates (2005). For example, trying to have less than 20 words for each question, and all the questions were constructed to be relevant to the overall questionnaire and its purpose. Furthermore, the questions were constructed under the guidance of our supervisor. They included the ethical issues mentioned in the literature review, such as "privacy," inappropriate," and "misinformed" content that would be relevant for the case study.

The questionnaire consists of 11 questions, whereas two are about factual data (age, gender). The remaining nine questions were opinion data (for example, what the respondent thinks about content recommended to them). In our nine opinion questions, 5 were open-end answers, meaning the respondent can express what they think. Open-end answers are essential because they allow for a wide range of possible answers instead of forcing the respondents to choose from pre-defined answers. The questionnaire was pilot tested by six respondents to see whether they found

difficulties answering specific questions or how long it took people to complete it (Oates, 2005). In this study, 58 students participated in the questionnaire, whereas 57 consented to be a part of this research. The research aimed to get at least 30 respondents to achieve the recommendation by Oates (2005) to reach an optimal level of confidence and accuracy range in the instance the research would require statistical analysis. Furthermore, Oates (2005) claims that a questionnaire would require 30 respondents to make any reliable conclusion. Thus the aim was to get at least 30 students to partake in the questionnaire.

3.5. Data Analysis

The generated data consists of audio-recorded interviews and visual aid for the questionnaires consisting of figures such as bar charts and pie charts. The open-ended answers from the questionnaires will be analysed using tables to demonstrate the data.

Oates (2005) stated that it is essential to capture the discussions when interviewing. To rely on memory alone can be difficult and is not recommended. In this research, audiotape recording for our interviews was utilised with everything that was said during the interviews. The recording of the interviews was transcribed, and relevant discussion was put on a transcript. The researchers went through every transcript together.

The research interviews were audiotaped and recorded in the zoom, thus granting more focus on listening to the respondent rather than trying to take notes and relying on memories alone can be difficult and is not recommended by Oates (2005). Furthermore, the interviews were transcribed to search and analyse the obtained data.

Our questionnaire consists of ordinal data (for example, the responses: Disagree Agree) and nominal data, which describes categories and has no actual numeric value (such as gender). A recommendation by Oates will be followed (2005); in other words, tables, and charts to present the data visually, to explore and see value and patterns in the data. The bar displayed frequencies, for example, the number of times misinformed content is recommended to a YouTube consumer. The

pie chart also for showing proportions for ease of reading. When analysing the collected data, it must be considered that in this research, the respondents were not asked if they shared their YouTube account with a friend or family member; thus, this could affect their experience of getting recommended content on YouTube.

3.6. Ethics

To assure the protection of every respondent's data, this research complies with the Data Protection Regulation (GDPR); in both our questionnaire and interview, clear instructions, and information on the purpose of the study were outlined (GDPR, 2022). To ensure that the research follows ethical considerations, this research method selection is based on regulations such as GDPR to protect personal data. During the questionnaire, respondents were informed the how their data would be analysed, what it would be used for, and how long their data would be stored. Furthermore, a check box was included for the respondents to check if they consent to be a part of the research and all the respondents were anonymous. For example, the respondents could choose for themselves whether they wanted to remain anonymous or not during the interview process. The respondents could also any time voluntary leave during the interview.

4. Results

The result section will present the outcome from the data collection that contains the ethical challenges with the YouTube recommendation system and the user's trust in the system, the results of the interviews and the questionnaires will be presented. The intentions of performing interviews and questionnaires were to get information about how the different ethical challenges affected the users trust in the YouTube recommendation system.

4.1. Participant information

Our factual questions, such as gender and age, provide a piece of demographic profile information that allows for a better understanding of certain characteristics of an audience. The gender variation consisted of 64,9% which were male (n =37), 29,8% were female (n=17), 3,5% identified as other (n=2) and 1.8% did not want to specify their gender (n=1).

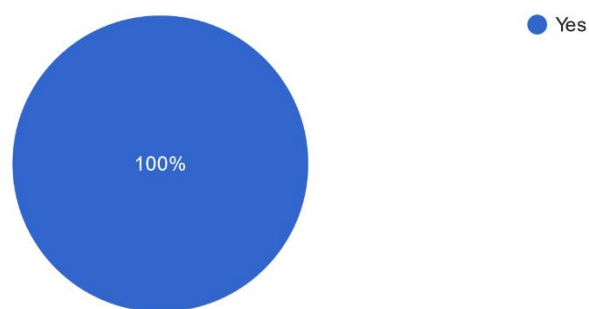
Most of the respondents 47,4% is of the age between 18-25 (n=27), 31,6% as of the age 25-32 (n=18), 10,5% was 32-39 (n=6), 10,5% was 39 and above (n=6).

As for how much our respondent(s) consume YouTube content based weekly, 40,4 % spend 0-5 hours on YouTube (n=23), and 17,5% spend 5-10 hours (n=10). 10,5% spend 15-20 (n=6). 3,5 % 25-30 (n=2), lastly 5,3% watch YouTube 30+ hours (n=3). The interview result section clarifies what consumers experience during the hours spent consuming YouTube content. The result mentioned above can be seen in Figures 2--5.

4.2. Results of the questionnaires

I consent to be a part of the research

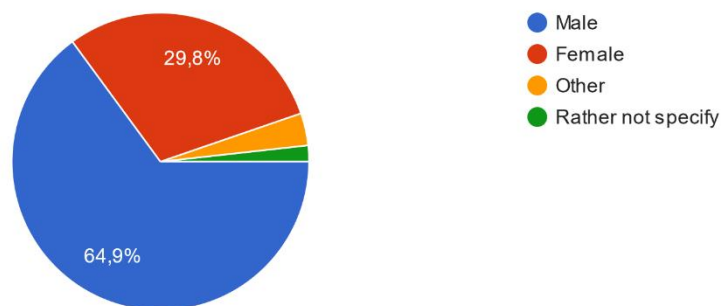
57 svar



Figur 2. Pie chart showing number of respondents consenting to be a part of this research.

1. What is your gender?

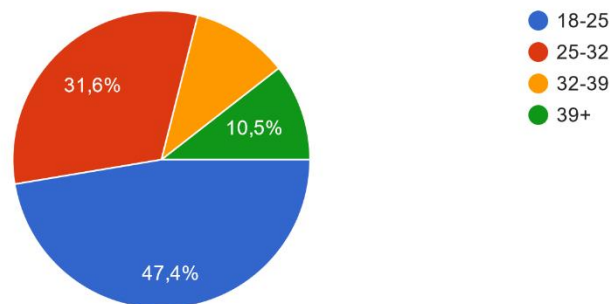
57 svar



Figur 3. This pie chart shows the respondents genders

2. What is your age?

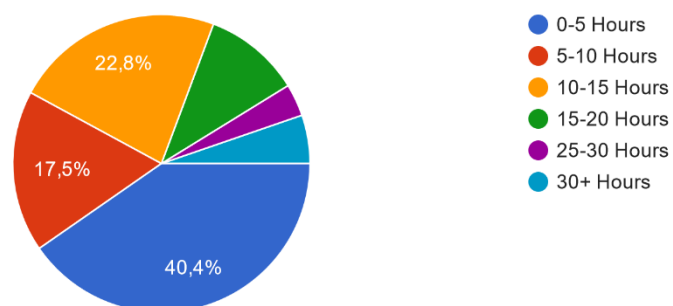
57 svar



Figur 4. This pie chart displays the age of the respondents.

3. Approximately how many hours do you believe you consume YouTube content based weekly?
(Hint: you can find this in YouTube setting)

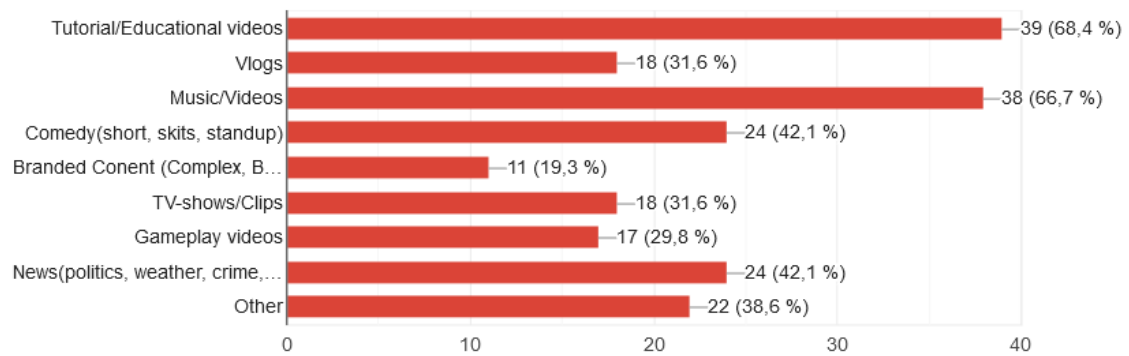
57 svar



Figur 5. This pie chart displays how many hours our respondents consume on YouTube content(s) weekly.

4. What type of content do you watch on YouTube?

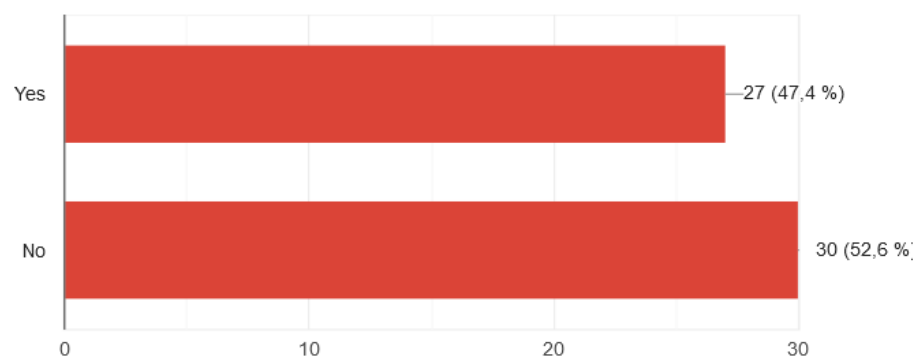
57 svar



Figur 6. Multiple choice questions. This bar chart displays what type of content(s) the respondents watch on YouTube.

5. Have you come across inappropriate content on YouTube based on the recommended content provided to you ? (For reference look at the keyword section in description)

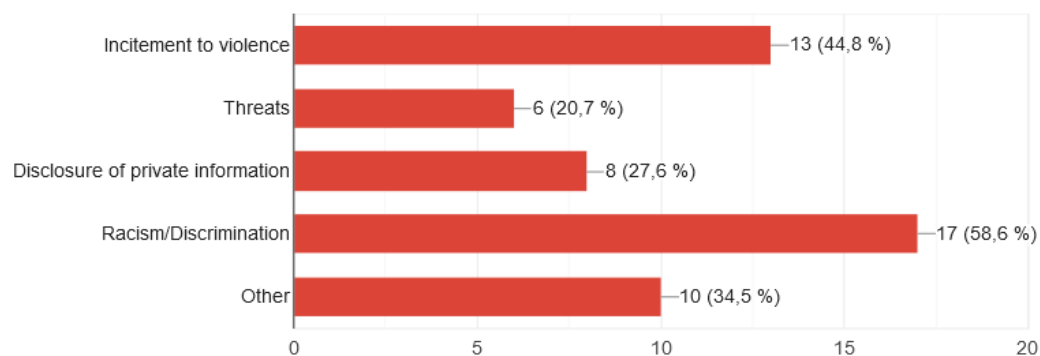
57 svar



Figur 7. This bar chart displays how many times our respondents have come across inappropriate content(s).

6. Based on the question above if you ticked yes, what kind of inappropriate content has been recommended to you? Tick the ones that matches your experience.

29 svar



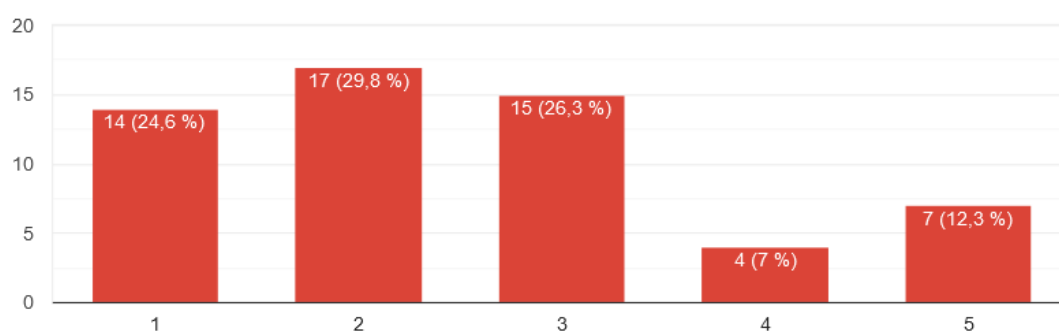
Figur 8. Multiple Choice Questions. This bar chart displays the inappropriate contents(s) recommended to the respondents.

Table for open answer for figure 8 if the respondent ticked "other" box.

If you clicked on other, what other inappropriate content have you experienced?	Respondents
False information regarding covid-19 vaccine	Anonymous
Fake news and propaganda	Anonymous
Political censorship of conservatives	Anonymous
My daughter has experienced content, which is designed to scare, in the middle of child aged content	Anonymous
Misinformation - obviously rubbish flat earth / qanon / clickbait stuff	Anonymous
Videos that are just barely clothed models that focus on sexual areas	Anonymous
Sexually provocative content	Anonymous

7. In what frequency has YouTube recommended misinformed content to you? (For reference look at the keyword section in description)

57 svar



Figur 9. This bar chart displays in what frequency YouTube has recommended misinformed content(s) to our respondents.

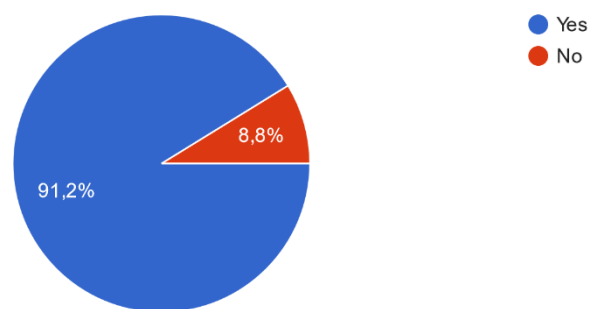
Table for open-answer table for figure 9

If often, what type of misinformed content has been recommended to you?	Respondents
Dumb gaming ads that intentionally infuriates one to get people to download it	Anonymous
Mostly violence	Anonymous
false conspiracy, fake news	Anonymous
Clickbait content is everywhere. clickbait is intended to seduce the user into clicking a link just for views and is most often not even remotely representative of the content of the video in question.	Anonymous
Health advice without any scientific ground. Both physical and psychological health advices. Motivational "gurus" that makes scientific claims without any evidence to back it up.	Anonymous

Scam ads	Anonymous
Trying to Censor things you don't agree with	Anonymous

8. Are you aware that the recommendation system analyzes your data based on your watch history, ads clicked, location, search history, etc.?"

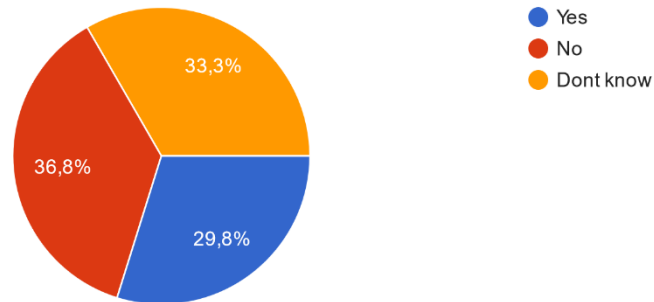
57 svar



Figur 10. This pie chart displays how many percent of the respondents are aware of what the recommendation system analyses.

9. Based on your experience has YouTube's recommendation system impacted your decision-making in watching videos by encouraging you to watch certain content?

57 svar



Figur 11. This pie chart displays how the YouTube recommendation system has impacted our respondent's decision making in watching videos.

Table for open-answer table for figure 11

If you clicked on yes, what type of content(s) has been forcefully recommended to you?	Respondents
Political content	Anonymous
vlogs and ads about how to make quick money	Anonymous
Shorts and foreign 'political punditry'	Anonymous
Content that doesn't interest me at all. For example: "morning routine of a high school girl". I don't care about that since vlogs do not interest me. Personally, I think it's creepy and weird to examine another person's routines.	Anonymous
Automatic loading after I watch a video.	Anonymous

Short video content and advert	Anonymous
the same channels and videos that I've watched already	Anonymous

10. Do you trust YouTube with your personalized data in order to give you recommended content?

57 svar

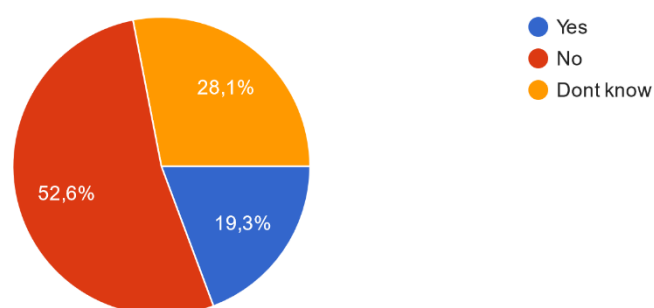


Figure 12. The pie chart displays how many percent of our respondent's trust YouTube with their personalized data in order to recommend content(s)

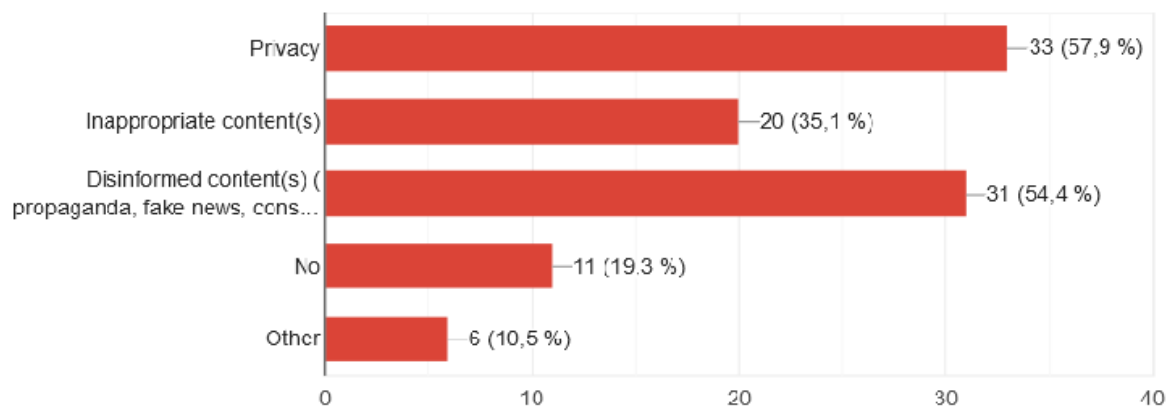
Table for open-answer table for figure 12

If you clicked on no, what concerns do you have?	Respondents
I have concerns that YouTube might use or sell my data for advertisement	Anonymous
That they share my personal data or that my YouTube page is going to be to adjusted to me and not show anything else	Anonymous
YouTube is a commercial entity. What is in my interests and what is in YouTube's interests are entirely different and likely at odds. It is for example in YouTube's interest to push material to become viral perhaps regardless of what it may contain or the effects it may have.	Anonymous

I know that YouTube is "Google" and they are not fully transparent about your data	Anonymous
The amount of silly commercials that I have no interest in keeps popping up.	Anonymous
I don't trust anyone with my personal information, i just rely on the fact that my personal information is not very relevant to them. You kind of have no choice in the matter. If you want to consume online media you will most often have to submit to their will in some way.	Anonymous
I think if I allow YouTube to use this data, the data will appear on my profile. Alternatively, I tell YouTube not to track watched content, but is it tracking and using it anyway?	Anonymous

11. Are you dissatisfied with how YouTube has addressed the following ethical challenges? Tick the ones that you are not satisfied with. (For reference look at the keyword section in description)

57 svar



Figur 13. Multiple choice questions. Bar chart displays the dissatisfaction of our respondents with the different ethical challenges with the YouTube recommendation system.

Table for open-answer table for figure 13

If you ticked on other, what other ethical challenges would you like YouTube to address?	Respondents
stop pushing the same ads that i have skipped more than 10 times	Anonymous
I wish they'd actually use my data more, because it often seems like they are ignoring it. Surely YouTube must know I'm not a yank by now, but they keep recommending me videos by racist yankees with misinformation about their politics. Sometimes they recommend me things that are not available in my region. I've tried using 'not interested'/'don't recommend channel', but the same videos will be recommended the next time I open the app.	Anonymous
To do show more about the whole world, not only western news!	Anonymous
YouTube likes to remove content that doesn't correlate with their own policy. But their policy doesn't seem to include validating if the information being shared is valid or not. They don't seem to highlight and show that the lives that some of these social media famous people are living actually has a downside and is not perfect at it may seem. Ethically, this is wrong since selling and painting lies to the youth can never be good.	Anonymous
Not helping content creators with things like copyright abuse	Anonymous
Does it promote content you might like or music that has been endorsed/plugged by paying organization? I'd like clarification on how it recommends things.	Anonymous
Copyright	Anonymous

4.3. Results of the interviews

4.3.1. Respondents' primary usage of YouTube

All four of the respondents proclaimed that they use YouTube to view content. The kinds of content and why they watch on YouTube differ for each respondent. Respondent 2, much like Respondents 3 and 4, claims to use YouTube only to view content. Respondent 2 tends to watch entertainment content such as stand-ups, music videos, and international reporting recommended to (them) or subscribed to channels like "Vice." Respondent 4 watched educated related videos such as programming in information security. (they) also claims to watch sketch videos and sport-related content.

Respondent 3 claims to watch many content ranges, from educated content about jurisdiction and laws to psychological and sociological education. However, Respondent 1 claims to post-school projects on YouTube sometimes but would not call (himself) a content creator. Furthermore, Respondent 1 explains that (they) mostly watch sport-related content and comedic sketches and sometimes documentaries,

4.3.2. Number of hours respondents spend on consuming YouTube content(s)

Students	Number of hours spend by respondents on watching YouTube content weekly
Respondent 1	10 Hours
Respondent 2	14 Hours
Respondent 3	5 Hours
Respondent 4	4 hours

4.3.3. Relevancy of the recommended content(s) to the respondents

Students	Answer
Respondent 1	The Respondent watch many videos based on the recommended content provided to the responder. Furthermore, Respondent 1 states that the content recommended is most relevant because the recommended content is related to the content the respondent has previously watched.
Respondent 2	Respondent two thinks that the content recommended is very relevant. Watch videos based on recommended content during visiting hours on YouTube always interested. They always show something that the respondent is interested in, so they never recommend something completely different from what the respondent usually watches.
Respondent 3	Most videos recommended to respondent three are not relevant to what the respondent is interested in. It says that in 10 videos, two might be relevant but cannot say precisely what section the wronged recommendation content falls into. The respondent feels forced to watch content that does not interest the responder leading to the respondent shutting down YouTube. Relevant content respondent likes to see are education and comedic videos. Based on visiting hours on YouTube, 50/50 are relevant and relevant. Irrelevant to what respondent watches.

Respondent 4	<p>Respondent states to watch programming and gaming content. Moreover, the respondent claims that unrelated content is recommended. Examples of irrelevant contents the respondent talks about are charity videos, and explicit content recommended which is not based on the respondent's watch history. Furthermore, the explicit content recommended to the respondent are often content with millions of views, making the respondent feel targeted since the respondent picks video based on likes.</p>
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4.3.4. What is your understanding of YouTube Recommendation system?

Students	Answers
Respondent 1	Respondent understanding of YouTube's recommendation system is that it is a system that helps to provide you video content to watch most likely based on your watch history.
Respondent 2	Respondent did not have a deep understanding of the YouTube recommendation system. Although the respondent explained that they think that the recommendation system works, when you watch a particular type of video on YouTube, the same kind of category the content falls into will be recommended to an individual.
Respondent 3	Respondent understanding of the YouTube recommendation system is that it bases the provided recommended content on the individual's behaviour on YouTube. What we search, watch, and comment on. Furthermore, it states that the recommendation system is intelligent and tries to understand and provide videos relevant to our behaviour.
Respondent 4	Respondent understanding of the YouTube recommendation system is that the system recommends your video based on your watch history. Furthermore, it provides examples like if they spend time on different YouTube videos, they will get recommended content that matches what they previously watched.

4.3.5. Respondents' awareness of the YouTube recommendation system

Students	Answers
Respondent 1	Respondent states that they recently became aware of the YouTube recommendation system. That is to say that the recommendation system provides relevant suggestions based on a user's "Personalized data." When asked how come they were not aware of it, respondents answered that they were not aware of it prior because they were unaware of many computers and data.
Respondent 2	Respondent was unaware that the YouTube recommendation system uses personalized data to provide relevant suggestions. The respondent was not aware because they claimed not to be so computer and technological say.
Respondent 3	Respondent was not aware of the level of data being stored. In this case, data like ads watched, watch history, and search history.
Respondent 4	Respondent stated that they knew that YouTube collects data such as the user's age and location. The respondent also described knowledge of YouTube being owned by Google. Respondents have a suspicion that YouTube or the YouTube platform also tracks your inputs on Google in general. So, what you search on Google might even affect your recommendation on YouTube. That is what they suspect. They have not seen a direct link to that, but they suspect that your overall inputs on the internet might, if Google is involved in it, they might use that to even recommend in the US.

4.3.6. Respondents' opinion of YouTube using their personalized data

Students	Answers
Respondent 1	Respondent does not wholly trust YouTube with its data. The respondent does not trust YouTube with their data because of data leakage. Furthermore, the respondent thinks that there are laws and rules that YouTube has to comply with to protect an individual's data.
Respondent 2	Respondent thinks there has to be a trade-off with getting recommended content. Such a trade-off is to give YouTube parts of your personalized data. Overall, the respondent completely trusts YouTube with their data.
Respondent 3	Respondent has trusted the recommendation system but is dissatisfied because they think that YouTube has not figured out how to recommend exciting videos. Further explains that the respondent has received misinformed content.
Respondent 4	Respondent described that they do not trust the YouTube recommendation system with their personalized data. Most of the time when YouTube does not give them data that match the history of his input. The respondent also stated that the videos YouTube recommends would match their inputs. They would trust more in the YouTube recommendation system more.

4.3.7. Respondents' thoughts about ethical issues with the YouTube recommendation system

Students	Answers
Respondent 1	Respondent stated that privacy is a huge challenge primarily because of how society is right now. It is easy to access someone's data and then sell it to other corporations. The respondent described some concerns with misinformed content because if you watch one political video, you know, primarily is primarily fake news. They try to make it more comedy, so if you watch one video, then they will recommend you. They used to watch a lot of inappropriate content that consisted of conspiracy videos, and they started to believe those conspiracies.
Respondent 2	Respondent does not feel like the recommendation system has extreme challenges. However, respondent thinks that propaganda content may be a problem that can be hard to solve because content(s) like trump rallies might be okay for one person but not okay for another. Furthermore, the respondent expressed that propaganda content such as aforementioned falls into the category of inappropriate content.
Respondent 3	Respondent described that the recommendation of misinformed content is a huge issue. In the sense that if I am watching just one very fact-based video, then they should be encouraging to me watch more stuff like that, you know, the recommendation system, it should be encouraging me to learn more to become cleverer to be more educational, you know, because I mean, look at history. So far, it has been said that the government and the more prominent companies always want their consumers to do not to be so. So, what

	<p>you say so conscious about what's going on in the government and the organization we meet as a student, I know those kinds of things because I've learned and read about history. So, I know that history says that this government, this organization, does not want the people to know exactly what is going on because it is easier to manipulate them on products and stuff like that. So, when YouTube does not give me the content that should be informing me, making me richer in knowledge and making me more educational, when it does not recommend me stuff like that, I start to lose trust in it. The respondent also described that the users could post whatever they want on YouTube basically, and there are, of course, guidelines that must be followed. However, I am just surprised that the guidelines do not check if the content is misinforming. It checks if the content can be vulgar. For example, if someone curses too much, they might take that away.</p> <p>Nevertheless, if it is misinforming, they do not care about that. That makes no sense to me because I think this poses an ethical problem. The respondent explained that out of 10 videos I watch, maybe two are relevant. Meaning two of them I might be interested in. It is perhaps relevant to the subject I am watching.</p>
Respondent 4	<p>Respondent described that those irrelevant videos recommended to him could be very annoying and exhausting. The respondent also described that they often get half-naked videos that have many views recommended. He realizes that</p>

	<p>those videos with millions of views that get recommended to the respondent are a way of targeting him. So, they avoid those videos that get many views and consist of half-naked girls in the thumbnail. The respondent also noticed that YouTube recommends videos that are corporate propaganda related on different occasions. The YouTube recommendation system has often forced the respondent to watch those types of content. In his opinion, that is not appropriate to just target users in that way.</p>
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4.3.8. Respondents thought whether YouTube addresses some of the ethical challenges

Students	Answers
Respondent 1	Respondent described that YouTube needs to address inappropriate and misinformed content more. There is much content out there on YouTube that has a significant effect on kids that watch those types of content.
Respondent 2	Respondent was more and less dissatisfied with YouTube's assessment of the ethical challenges. The respondent felt like that because they stated that there is no way to democratize knowledge since content uploaded mirrors our society.
Respondent 3	Respondent states that you should have more control over what you do, like, what you are recommended, for example, this thing about I consent. I do not consent to give you an ultimatum, you know, like on other pages, they have this, like accept cookies, or do not accept cookies. And when you do not accept cookies, somehow, some pages do not allow you to view their page. It is like forcing me to say something, you know? And the same thing is about YouTube. I think it should not be like, yes or no, accept consent, or no, it should be more like, hey, listen, everyone, we have a system here that can give you recommendations based on what you want. Do you want us to use your history? Your search history? This would be more dynamic. So, you can choose precisely what YouTube can extract from you. Do you know? So, it does not be like yes or no. I think it should be more control for the user.
Respondent 4	Respondent states that they is dissatisfied and in fact that YouTube is a big company, YouTube

	need to let the users know about those issues that are experienced by them. YouTube need to provide more knowledge about the usage of it.
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4.3.9. Further knowledge of YouTube and the recommendation system

Students	Answers
Respondent 2	<p>Respondent states that YouTube mirrors society, and by that, people always try it push a particular agenda. People are going to behave in a certain way. YouTube has democratized knowledge, and it is accessible to everyone. Furthermore, the respondent believes that it is not plausible to beat the main idea of YouTube, democratizing knowledge in a very user-friendly way. Moreover, the respondent believes that YouTube is an excellent public service for teaching people. Adding to that, the respondent voiced their opinion that, in some cases, YouTube can be an excellent public service, meaning that in countries that lack the depths of knowledge, YouTube can provide a solution to that problem. The respondent states that some inappropriate content can be better than the school curriculum since most schools teach more systematically. At the same time, YouTube is freer linguistic and can sometimes teach something familiar in the real world that the school curriculum would not voice.</p>
Respondent 3	<p>Respondent added that YouTube must narrow down more on what they are marketing and selling. They have not categorized their organization, i.e., what YouTube is. Furthermore, the respondent described a consequence of YouTube being too accessible, leading people to post whatever they want. Moreover, the respondent gives examples like "explicit content." which can appear as a thumbnail or people expressing vulgarly. Moreover, the respondent expressed that if YouTube is a democratizing platform, every opinion should be allowed. Respondent also</p>

	added that YouTube is somewhat selective with what they allow to be uploaded. If they are for a democratizing platform, individuals who upload content should not be censored or punished for their thoughts.
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5. Discussion

In this section, an analysis is made of the collected data from our data generated methods in relation to the past research.

5.1. Comparing the results with literature studies

Previous studies coupled with the research results confirm that the YouTube recommendation system does have ethical issues. In reference to the previous studies, the YouTube recommendation system faces identical ethical issues, which will be discussed.

The respondents in this research stated a lot about the irrelevant videos being recommended to them on YouTube. Furthermore, many of these irrelevant contents contain fake news, dangerous or troubling behaviour, and sexual content, which is against the YouTube policy.

Spinelli et al. (2020) described privacy as a concern in the YouTube recommendation system. On the contrary, the YouTube recommendation systems policies are just obscure. Moreover, in our questionnaire, a couple of respondents stated that they wish to have more control over their data and, more importantly, what they are being recommended. Notably, the outcome of our results does show many similarities to previous studies, such as privacy, misinformed content(s), and inappropriate content(s).

In the article "*Recommender system and their ethical challenges*," Milano et al. (2020) the authors bring up ethical issues about the recommendation system. One of the many mentioned issues is privacy. Privacy was mentioned in the research article as a primary challenge since the personalized data from a user power a recommendation system; therefore, this could lead to problems such as data leaks. From this research collected data, many similarities

between some of the respondent's concerns about privacy and the mentioned privacy problem in the article by Milano et al. (2020). One similarity was that some respondents felt like YouTube collects uncoerced data. Another concern was the risk of leaked data to external agents.

Spinelli et al. (2020) stated that the YouTube recommendation system in general leads away from authentic or reliable sources of information, with a likelihood to, then push the users of YouTube to video channels uncovering unscientific and extreme viewpoints. The video channels' content relates particularly to the inappropriate and misinformed content that gets recommended to the users. Similarly, what Milano et al. (2020) mentions, inappropriate content is also a concern of recommendation system, however Milano et.al. (2020) provides a little bit more context of this issue stating that there is no filter to exclude content that can be deemed as unacceptable or distressing for a consumer that relies on recommendation system. Numerous of our respondents felt that the inappropriate content that got recommended to them consisted of racism, discrimination, and incitement to violence. Some respondents also felt that content recommended to them was misinforming in the sense that those videos included fake news and propaganda.

5.2. Ethical concerns based on result

Based on this research results from our questionnaire and interviews, ethical manners such as privacy, misinformed content, and inappropriate content mainly was mentioned—furthermore, other concerns were mentioned. Based on the 57 respondents in our questionnaire, 57,9% were dissatisfied with how YouTube has addressed ethical challenges such as privacy. The second majority, 54,4%, is dissatisfied with how YouTube has addressed disinforming content such as fake news and conspiracy theories; 35,1% felt inappropriate content(s) is something YouTube needs to address. 19,3% felt satisfied with how YouTube has addressed the above-mentioned ethical challenges, while 10,5% of the respondents had other concerns than listen on the multiple-choice questions. More importantly, a majority of the respondents, 91,2%, answered that they are aware that the recommendation system is designed to recommend things to a user based on many different factors such as search history, watch history, ads, and age.

When asked the same question during interviews, 75% of the respondents only had a basic overview of how a recommendation system works. YouTube collects data such as watch history and searches history to provide recommended content. The respondents also mentioned that they recently became aware of this because of their education. Only one respondent had a more in-depth knowledge that the recommendation system is powered by an algorithm that keeps track of an individual's "personalized data" to provide recommended content. Furthermore, when asked if the respondents trust YouTube with their personalized data to be provided tailored content, 52,6% answered no in our questionnaire. In the open-form answers in the questionnaire, the respondents could further detail why they felt they could not trust YouTube with their data. To that questions, 27 answers (59%) had concerns about their privacy with their data, while the remaining 41% of the open answers consisted of other worries mentioned in the privacy section. The sections "Privacy" will discuss the ethical challenges the YouTube recommendation system has about what our respondent has answered and how it has affected their trust in the YouTube recommendation system.

5.2.1. Privacy

As mentioned earlier, 91.2% of our respondents in the questionnaires knew that YouTube recommendation analyses data based on their watch history, ads clicked, location, and search history. However, 52,6% of our respondents stated that they did not trust YouTube with their personalized data to give recommended content consequently of the concern that the respondents had was that YouTube might sell or use their data for advertisement. The respondent also felt that YouTube is not transparent with their data and that Google owns YouTube.

Respondent 1 in our interviews stated that they do not wholly trust YouTube with their data. Primarily because of data leakage. Furthermore, "Respondent 4" described that they do not trust the YouTube recommendation system with their personalized data. YouTube does not recommend content that matches their inputs. However, if the recommended content matched their inputs, they would entirely trust the YouTube recommendation system with their personalized data. "Respondent 1" described that privacy is a challenge primarily because of how society is right now. It is easy to access someone's data and then sell it to other corporations. "Respondent 2" felt that there must be a trade-off with getting recommended content. Such a trade-off is to give YouTube parts of your personalized data.

5.2.2. Misinformed content(s)

Respondents in the questionnaires felt that the YouTube recommendation system often recommended misinformed content. For example, “Respondent 4” in the interview claims that they have been recommended health-related videos that have no scientific ground, which has negatively affected “Respondent 4” trust in the YouTube recommendation system. Furthermore, in our questionnaire, the respondents claimed to have been recommended misinformed content(s) such as fake news, clickbait content, ads, and violence. The respondents even mentioned that YouTube tries to censor things the users disagree with. The respondents have even been recommended content consisting of health advice without any scientific ground that included physical and psychological health advice. One of our respondents stated that motivational gurus make scientific claims without evidence to back them up.

The respondents from the interview shared their thoughts about the ethical challenges in the YouTube recommendation system. “Respondent 1” described that they have experienced some concerns with receiving misinformed content because of watching one political consisting of fake news. YouTube tried to make it more of a comedy, so if the users would watch one video, they would likely recommend a similar one to users. “Respondent 2” did not recognize any extreme challenges with the YouTube recommendation system, but the respondent felt that propaganda content might be a problem that can be hard to solve. While “Respondent 3” described that the recommendation of misinformed content is a huge issue. If they watch one very fact-based video, YouTube should encourage the users to watch similar videos with their recommendation system. However, that is not the case. If the videos are misinforming, YouTube does not care about that. Additionally, “Respondent 3” stated that it does not make sense and believes this poses an ethical problem.

5.2.3. Inappropriate content(s)

Amongst the 57 respondents, a majority of 52,6% answered that they have not come across inappropriate content on YouTube based on the recommended content. Nevertheless, 47,4 % of the respondents answered that they have come across inappropriate content based on recommendation feed. When further asked what kind of inappropriate content has been recommended to understand better what the respondents have experienced, racism/discrimination seems to be the biggest conundrum and incitement to violence followed as the next most significant problem with 44.8%. YouTube addresses the issue of violence and racist content. The YouTube Guideline states that they remove content promoting violence or hatred against individuals or groups based on an attribute list YouTube has compiled. Two of the attributes listed are ethnicity, race, and victims of a significant incident.

34.5% of the respondents ticked the other option in our questionnaire, meaning they have experienced other inappropriate content than what was listed. Other inappropriate recommended content was false news and false information about Covid-19. In the YouTube guidelines, Covid-19 fake news is regarded as a breach of the YouTube content policy; this could be a video claiming a guaranteed cure for Covid-19 (YouTube Help, 2022).

In our interview, two respondents claimed that they had experienced inappropriate content. Both answered that they had been recommended sexual content on YouTube. Sometimes, recommended content on their YouTube feed will have nudity as a thumbnail, which they feel is highly unethical because of their religion. Moreover, explicitly sexual, provocative content was mentioned, with one respondent stating that their daughter has experienced content designed to scare children.

5.2.4. The challenges of YouTube recommendation system

As a result of our respondents from our interviews and questionnaire, the respondents described that YouTube recommends many videos that are not appropriate. Videos consist of incitement to violence, threats, and disclosure of private information. Due to that, Covington et al. (2016) described recommending videos on YouTube as very challenging from multiple viewpoints:

Freshness: YouTube has an immensely dynamic entity with numerous hours of videos uploaded every second. However, the YouTube recommendation system needs to be reactive enough to imitate the latest actions taken by the user and the recent content uploaded by the user.

Noise: Moreover, the user's actions on YouTube are tough to predict due to the variety and sparsity of unobservable external factors. The YouTube recommendation system infrequently obtains user satisfaction and models noisy suggested feedback signals.

Recommending YouTube videos is highly challenging. The recommendation system architecture in YouTube comprises two crucial integral aspects of the recommendation system: "candidate generation" and "ranking." The general idea of the candidate generation is that the network should optimize for precision. Thus, it will forge items that may be widely popular but irrelevant to the user. This is prominent during our data collection, where plenty of respondents have answered that they have been recommended content that they deem to be highly irrelevant to them. In contrast, the ranking network takes in a set of features for a video and scores them based on the candidate generation network. The general idea here is that it is okay for some content to be irrelevant if the most relevant items are included.

5.3. Conclusion

This study revealed a broad area of concern pertaining to ethical issues in YouTube's recommendation system. Respondents emphasized the importance of individual privacy when using a platform such as YouTube. The respondents stated that they would want more transparency with their data since many respondents feel like YouTube's recommendation is pushing them with material that does not align with their interests. Ethical challenges such as receiving inappropriate and misinformed content and privacy when using the YouTube application were prominent in the result. The users that were recommended irrelevant video content and described that such content(s) could be fake news or inaccurate information regarding the covid-19 vaccine. However, a majority of 51.7% of respondents answered that they had not encountered inappropriate content, which entails that the majority experience inappropriate content not being a problem with the YouTube recommendation system.

Regarding the user's trust in the YouTube recommendation system, the majority of 52.6% answered that they did not trust YouTube with their personalized data. In a follow up open-answer table, some of the respondents evaluated that the reason they did not trust YouTube with their data was that perhaps YouTube might adjust their YouTube page to consist of marketed content based on what content the respondent consume. Furthermore, the respondent expressed that YouTube might not be fully transparent with the user data.

YouTube mirrors our society, and there will always be content creators trying to push a particular agenda; regulating an individual's way of expressing themselves would beat the idea of democratizing knowledge, going against the main principle of YouTube. Moreover, YouTube does follow its policy, but its policy does not seem to include validation of whether the content is valid, resulting in numerous contents containing false information, according to the respondents in this research. Evidently, in line with our literature review about recommendation systems, our respondents voice similar concerns about what ethical issues they face.

5.4. Suggestions for future research

The mentioned ethical issues provided by our respondents could require YouTube to modify the way their recommendation system functions. The ranking network, an essential factor of the YouTube recommendation system, focuses highly on recalling that it is acceptable for some recommendations not to be very relevant if the recommendation system does not miss the most relevant content.

The fundamental idea behind dividing the recommendation system into two networks is to provide the ranking network with videos more efficiently than the candidate generation model. The generation model only has access to features such as the number of watches a video has. In contrast, the ranking network takes in elements including a thumbnail image and the interest of their peers to then contribute to a more precise scoring. The main objective of the ranking network is to maximize the expected watch time for any given recommendation, according to Covington et al. (2016). The ranking network accomplishes this task by assigning scores to each video; the highest-scoring videos are presented to the user. The ranking network could explain why some YouTube consumers might experience highly relevant content(s) and the contrast content that can range from slightly to highly irrelevant due to the content(s) having a lower score.

The YouTube algorithm network focuses very much on high precision, that is to say; each content should be highly relevant even if it requires forgoing some items which may be widely popular but irrelevant. A consequence of "high precision" has resulted in YouTube consumers experiencing issues like receiving content that may be irrelevant or inappropriate for a YouTube consumer. Hence, YouTube must figure out a way to configure those issues.

Perhaps future research could be conducted to build a new recommendation system algorithm that tries to find a way to combat the consequences as mentioned earlier of "high recall" and "high precision". Future research could include the same research methods coupled with

observation to capture a snapshot of what kind of content the YouTube recommendation system recommends to the users.

In building a recommendation system, it is important to have consumer pressure, better oversight, and common-sense laws, Lomas (2021) described therefore to propound a combination of laws that decree transparency into the system of AI. The platform users should be empowered with robust controls (Meaning to have the ability to select out of their personalized recommendations). This can be an essential factor when building a recommendation system. The AI of YouTube has failed to optimize this requirement.

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Appendix A

7.1. Interviews

7.1.1 Respondent 1

Hello, I'm Omar, and we are Phillip Kelly. And we're going to present a brief description about what we are going to do in our thesis. And yeah, we are currently studying for a bachelor's degree in informatics in Högskolan Dalarna. For our bachelor thesis, we are researching what kind of ethical problems YouTube recommendation system poses, and its effect on the user's trust in YouTube's recommendation system. Our recommendation system is built on the simple principle of helping people find the video based on what they usually like to watch. So, a problem a brief about our problem description. What we do think a problem that can occur with such a kind of recommendation system is that it can be posed ethical issues like privacy concerns, getting him inappropriate content that does not comply with the YouTube guidelines such as showing video of corporates for example. So before we start with this question with us, Anonymous is the person who is we are going to interview today. So Anonymous, before we start, is it okay for you? If we record this conversation and transcript? (Respondent: Yes, it is okay for me.) Okay. So what is said during this conversation will be used in our bachelor thesis to rule how YouTube users like yourself experience, the user recommendation system, and you trust for it. We will solely use this information for our bachelor's thesis, you have you have the right to remain anonymous there is this interview and writing process during our work. Do you want to remain anonymous, or it doesn't matter? (Respondent: It doesn't matter for me.) Okay, that's good. So, as you know, this recording will be stored until the ending of June 20 2022. And other things than that, do you have any further questions? Or you can introduce yourself? Like, what do you do? Who are you if you don't feel like answering a question you have the right to not answer, if you also feel like you don't want to do the interview anymore you have the right to leave.

Respondent:

So, i will start with introducing myself. My name is Anonymous. I'm currently studying informatics in högskolan Dalarna. And I'm, I'm in second year in this system science program.

Speaker:

Okay,. So yeah, and as you know, me and Philip, we are last year students. So yeah. And this is it. And now, , we're going to start by answering the first question. So the first question, could you tell us what your primary usage of YouTube is? Is it for example, to create content or to view content? What do you do when you are in on YouTube?

Respondent:

I will say for a mostly I view content, but sometimes in school, we have a project.

That's maybe when I post something, okay. But mostly it is about watching, Speaker:

So, you don't you don't like create content, you're just watching the content for mostly Okay. Okay. So, what type of content do you view? Like, what kind of content do you watch a lot on YouTube?

Respondent:

I will say I watch mostly sport related content, and comedy, skits, and sometimes documentary, stuff Speaker:

Okay. So, approximately, how many hours? Do you believe you consume YouTube? Based? Weekly?

Respondent:

Weekly? Yeah. And weekly, I will say about 10 hours.

Speaker:

Okay. So, 10 hours. You consume YouTube content based weekly? Okay. So not based on your visited hours from YouTube? How much would you say that the content you watch is based on the recommendation system provided to you.

Respondent:

And I will say a lot because I watch it full and mostly because of the recommendations, other videos, okay. That's why I stay on YouTube for a long time.

Speaker:

Okay, so you get a lot of likes, recommended content that you watch, on YouTube, and so forth and so on. Okay. So, based on the content you have consumed during your visit hours on YouTube, how do you perceive the recommendation content to be relevant to you? Is it like, how do you see like the content you get recommended or relevant to you?

Respondent:

I will say mostly is relevant because it is something I have watched before. It's something that relates to the video that I already watched.

Speaker:

Okay. I so it's actually based on your current watch history. So what is what is your understanding of YouTube recommendation system? Like, when you when you heard the word like YouTube recommendation system? What do you think of?

Respondent:

I will say I will think of it is a system that provides or helps you to watch other videos that are most likely okay to the eye and your history.

Speaker:

Okay, so are you aware that the YouTube recommendation system gives you like, relevant suggestions based on your data? Like the videos, you watch the ads, you click your search history age and your location, and IP address and so on? Are you aware of that?

Respondent:

I would say I became recently aware of it before maybe two, three years ago, I wasn't aware of it.

Speaker:

Why is that? Why were you not aware?

Respondent:

Because I wasn't really aware of a computer invoking incense. I would say

Speaker:

So do you trust YouTube to use your data for their YouTube recommendation system then to later to provide you with contents?

Respondent:

My data? I wouldn't say I will trust them. But I think they also have some laws and rules that it applies by,

Speaker:

can I ask you like, why do you why do you not trust them? Why is that?

Respondent:

Because there's a lot of things in the internet, a lot of ways you can access someone's data. So, I would say mostly because of it.

Speaker:

Okay, so you don't you don't trust like YouTube with all your data. Now, you don't want to like all your data to be to be like exposed to you to know. Okay, okay. Okay. YouTube, YouTube recommendation system, with your data to provide you recommend contents. Okay, we go to the next question. I would like to hear your thoughts on whatever you think challenges like privacy and this from this misinformed content, inappropriate contents occurred with the YouTube recommendation system like have you experienced those, those like ethically ethical challenges with the recommendation system of the algorithm?

Respondent:

I will say mostly right now. It is because of how we view our society because if you watch our political video, then mostly you will get thrown into videos, or if you watch conspiracy theories, videos, then mostly they will recommend those type of videos. I would say that's the that is the most ethical questions that resonates with me.

Speaker:

Okay. But have you like experienced some ethical issues like sometimes in like, you saw this was like, inappropriate of YouTube to do like, I don't want to watch this video or I don't wanna, I don't wanna, I don't want to see this. For example, have you experienced those type of things? Like, for example, misinformed content can be political misinformation, fake news, and stuff like that? is it something you have experienced in YouTube?

Respondent:

Yes. And I will say a lot. If you watch one political video, then you know, mostly, as of right now, mostly is fake news. They try to make it more comedy is so if you watch one video, then they will recommend you.

Speaker:

Do you see that like, as an ethical challenge, like something YouTube should need to address or something? if so what kind of ethical challenge?

Respondent:

And I would say yes, because of the younger audience. That is where the ethical questions come in, I think, okay, because they don't really see the recommendation system.

Speaker:

So you think like, so do you think like is a lot of like for selected content? Like they want you to watch this video, for example, then this video can, for example, change your mind or something like that.

Change your ideology or something like that?

Respondent:

that exists? And I would say yes, I'm not really sure because I would mostly say because of the age limit, An audience

Speaker:

Based on this, these challenges you just need, how has those challenges like affected your experience on the YouTube recommendation system?

Respondent:

I don't really know how to answer that question.

Speaker:

like, for example, has it lead to that you trust them even less like this recommendation system is like, doesn't show me what I want to see, for example, it just want to like, show me other things. For example, like when we talked about the fake news is like the misinformed content. And also it can be inappropriate content, because it can be like things you don't want to watch. So. So I mean, like, how you experienced? Like, how has it affected your experience with YouTube recommendation system?

Respondent:

I would say that I don't consume YouTube content as much as I did before when I was younger. Because now I know, sometimes when I watch a video, then I can see almost directly that they recommend, other videos that i don't really want to watch. so I will say that I have less consumption,

Speaker:

Because now you are more knowledgeable. Yes. Okay. But when when you were like younger, like this, did it affect you? Like, when you have inappropriate content?

Respondent:

I would say yes, because I watched a lot on documentary and conspiracy theories as a younger. So yes, I would say indeed, it did. effect.

Speaker:

And approximately how often does those kinds of contents get recommended to you during your visited hours? Like those contents? You don't want to watch? Like you don't want to see that? The has those ethical challenges, as you mentioned? Approximately, like how many, how often does those kinds of content get recommended to you during your visits.

Respondent:

I wouldn't say that. Because I know that if I watch one video, then they will recommend more like, likely videos of that content. So I am very careful of the videos I watch

Speaker:

Okay. So, based on what you answered in the previous question, yeah, so you told us like, how have those ethical challenges, like, affected your, like trust on the YouTube recommendation system? So by trust me, like, for example, you know, like, you know, that you give like, your personal data to YouTube, based on that they give you

recommendations instead of recommendation content, right. So, so do you trust like them with your data? For example? Do you trust them? Like, with your data, to give you like a recommendation system?

Respondent:

I would say no, because I'm very careful of the videos I watch. I don't want them to recommend me videos that I don't really want to watch. So I would say that I am. I don't trust them that much. Because I have the knowledge to know that. I don't always watch videos randomly. So I am more careful.

Speaker:

But you like I said, like inappropriate content, privacy content, and so on. Is those the challenges you name? Like? What challenges do you think of when you think of ethical challenges? Do you believe like, it's privacy?

Respondent:

I will say mostly because of our society as it is right now. I will say privacy because how easy it is to access data, and how easy it is to sell data to other corporate is obviously privacy.

Speaker:

Okay. So are you dissatisfied with how YouTube has addressed the following ethical challenges like privacy misinformation, based on the YouTube guidelines? You know, like, when you go to YouTube guidelines, you can see like, the different things like

YouTube have, for example, things they want to fix, they want to be better at, for example, they have those information there. So based on those, like ethical challenges you mentioned, do you think like, YouTube has addressed those issues like very well mannered way or do they need to address it even more?

Respondent:

I will say they will need to address it even more because there is a lot of content out there. In YouTube, that have a large effect on kids who I would say they need to address it better.

Speaker:

Okay. So, before we end this interview , is there something else you would like to share with us? Before we end this interview? Something you have in mind? Are some more like ethical issues you would like to discuss?

Respondent:

No, I'm good. Okay.

Speaker 2:

I have question. Because you said that YouTube can show you fake news. What kinds of fake news do they show you?

Respondent:

And I will say mostly when it comes to relative political content, if you watch example, there are other there are many American contents with Fox News or CNN, and other stuff. If you watch one full length video, then they are different content that are recommended to you that are not really news.

Speaker 2:

Thanks. One last question, when you said you were younger, a lot of conspiracy theory was recommended to you. Did you stated that you did not like the recommended content that was recommended to you when you were younger? Or did you not mind it?

Respondent:

I didn't mind them because I didn't really focus on it. Because I was really into conspiracy theories. So I thought it was something normal that they recommended. Even more, more videos were almost the same content,

Speaker:

But what do you think like now you're a grown man, right? You're younger, but when you think of right now, like those contents' conspiracy theories, you got recommended to you is it like suitable for a child to see that? Or can it is it good for a child? You know what I mean?

Respondent:

I will say no, because that can have a huge impact on you. Because maybe you will think that conspiracy theories are for real. You will look at some people different views, I would say

Speaker:

So now like, if you would to watch like those videos, now, you will see see this, those type of videos like misinformed content and inappropriate content, and also could you watch those type of videos now?

Respondent:

Yes i would see them as misinformed content and inappropriate content. Now I would not watch them because I know the difference between conspiracy theories and The Real News. So I will say no.

Speaker:

Is it anything else you will you would like to ask

Speaker 2:

or Yeah, I know this, this is hard to answer. But do you know approximately, let's say when you watch YouTube, like how often will those kinds of conspiracy theories of fake news pop up?

Respondent:

I will say not that much, because I am aware of how the recommendation system works. If you watch one video, then it's most likely that they will recommend you other videos that are the same so I'm very aware of not to click any videos. so I don't really want to watch.

Speaker:

Okay, so would you say that like, based on what you just said that you are careful with what you click on when you are on Youtube?

Speaker:

Yeah, I don't have any other things or question to add. So if you feel it if you don't have something to add.

Respondent:

No, I don't have anything to add.

Speaker:

Thanks for your time.

7.1.2 Respondent 2

Speaker:

Okay, so hello, I'm Omar, and with me is Philip Kelli. And we're going to present a brief description about what we are going to do in our thesis. And yeah, we are currently studying for a bachelor's degree in informatics in high school and Alanna. For our bachelor thesis, we are researching what kind of ethical problems YouTube recommendation system poses, and its effect on the user's trust in YouTube's recommendation system. Recommendation system is built on the simple principle of helping people find the video based on what they usually like to watch. So, a problem a brief about our problem description. What we do think a problem that can occur with such a kind of recommendation system is that it can be posed ethical issues like privacy concerns, getting him inappropriate content that does not comply with the YouTube guidelines such as showing video of corporates for example. So, before we start with this question with us, our mouth Samad is the person who we are are going to interview today. So Respondent, before we start, is it okay for you If we record this conversation and transcript everything that is said?

Respondent:

Yes, it is okay for me.

So, what is said during this conversation will be used in our bachelor thesis to rule how YouTube users like yourself experience, the user recommendation system,

and you trust for it. We will solely use this information for our bachelor's thesis in our result, you have you have the right to remain anonymous during the interview and writing process of our work if you don't feel like answering a question you have the right to not answer, if you also feel like you don't want to do the interview anymore you have the right to leave.

Speaker:

Do you want to remain anonymous, or it doesn't matter?

Respondent:

It doesn't matter for me.

So, as you know, Respondent, this recording will be stored until the ending of June 20/22., do you have any further questions? Or you can introduce yourself? Like, what do you do? Who are you?

Respondent:

Sure, my name is Anonymous and I'm a student in Högskolan Dalarna reading my second year in the Socionom program.

Speaker:

Could you tell us what your primary usage of YouTube is for example do you use YouTube to create content or only to watch or both?

Respondent:

My usage is primarily to watch entertainment content, entertainment news and technology.

Entertainment, news.

Speaker:

Okay, understood. Approximately how many hours do you believe you consume YouTube content based weekly you can check that information in YouTube setting if you want?

Respondent:

Weekly weekly or daily during a week?

Speaker:

Both works fine

Respondent:

Daily i watch around 2 hours but based on those 2 hours i might leave YouTube on for 1 hour as background noise, i would say that i spend around 1:30minutes looking at the screen.

Speaker:

And between the mentioned hours. Is it? Like the content you mentioned earlier? That you watch technology, news and entertainment?

Respondent:

I would say mainly entertainment. And then after entertainment, I will say technology and then the news. Last, okay. Not really prioritized. I might spend around 30 minutes watching new related content and go back and forth watching entertainment and tech content for 1 hour.

Speaker:

Okay, so when you're watching for example entertainment content do you already know what you want to watch, or do you go by what YouTube recommends to you?

Respondent:

Hmmm i have to think about that, i mainly watch entertainment content that YouTube recommends to me, i usually scroll around and watch recommended contents.

Speaker:

Okay. So based on the content, we are consumed during revisited hours on YouTube, how do you perceive the recommendation content to be relevant to you?

Respondent:

I think it's very relevant. I think they always show something that I have an interest in so they never recommend something that is completely different from what I usually watch. Or I think maybe sometimes it's short. But I think mostly it's very relevant.

Speaker:

In your case, so you get, say, mostly get videos that you're interested in?

Respondent:

Yes, for sure. For sure.

Speaker:

Okay, so on to another question could you tell me your understanding of YouTube's recommendation system?

Respondent:

Not I don't have a very deep understanding. But I think that the more you look at a certain type of video, the more recommendations you will get, that are associated with that kind of video. But I'm not very

Speaker:

Yea, a basic overview explanation would be that YouTube feeds the recommendation system that is powered by a machine learning algorithm with your data like your watch history, search history, sometimes even your location and your age. Based on that, that i just explained how you feel about YouTube using your data previously mentioned like your watch history, search history and location to provide your recommended content.

Respondent:

I do. I think I think that there is a trade-off, of course, between privacy but I think they teach me a lot of things that I'm willing to I'm willing to you know, give up some of my privacy because of the benefits.

Speaker:

Okay. So overall, you do trust YouTube, which data to provide the two-recommendation system

Respondent:

completely it is.

Speaker:

Okay, I'd like to hear your thoughts on whether you think challenges like privacy, forcefully fed content and this information this informed contents or inappropriate content? Oh, sorry, I like to hear your thoughts or where do you think challenges like privacy, like this information, this inform content and the appropriate content in the recommendation system? Do you believe that a problem they can have? Is it something you have experienced yourself related to what you watch?

Respondent:

regards to privacy or

Speaker:

privacy or maybe you watched like news, and you see like misinformed content or propaganda stuff like that, or maybe can be inappropriate content, like this short video of caring dog's throat or nudity? Nudity?

Respondent:

Oh, wouldn't say it's on the extreme side. Never. Okay. It's never like graphic videos, but sometimes they might show you don't agree with. Okay, that you don't agree with. Sometimes you can feel like they're doing propaganda. Because you

don't agree with that ideology. But I think it's, it's, it's based on case-by-case basis. So, I think what, I think it's okay, another person might think is not okay.

Speaker:

Does those like it's a propaganda? Is it content that gets recommended to you?

Respondent:

Yeah, sometimes they might recommend like, a Trump rally. But I don't agree with what Trump says. But maybe I think some of these videos are funny. And I might watch some small clips. But I wouldn't want to be recommended by entire Trump speech to listen, that is maybe one hour, because I don't agree with his ideology, but maybe, you know, small clips, and he's doing funny things. I would like that.

Speaker:

So approximately, how often does that happen that you get those kinds of political content recommended to you? Very

Respondent:

rarely, very, very rarely. It's not often, but maybe, if you do some types of searches one day, and then they will base that content on the surface. But the immediately they will go away. If you don't keep them. I don't think they'll keep popping off the same videos.

Speaker:

Okay. Nice. Do you do like right now, do you think or feel or can come up with any channels that you think the YouTube recommendation system has? Or is it something that has been like a concerning thing for you regarding the recommendation system that now that

Respondent:

I think they shouldn't really show the same videos in the recommendation. So sometimes you might see the same video on recommendation for several weeks, several days, maybe you have no interests of watching this video, but it keeps showing up again. And again. I think instead of showing the same video, you can use that spot for something else that, you know, perhaps might be more interesting than trying to do the same thing.

Speaker:

Okay. I read an article that talked about some ethical concerns we need to and the person brought up something like you said, YouTube might like nudge a user to watch a video, nudge them to, I wouldn't say not not forced, kind of nudging you to watch a video to a certain direction. We'll just say that that fits your explanation or is it different

Respondent:

somehow it fits but it's never the same type of video. So it's always a different type of video a different type of category. Maybe it's entertainment or news or, or technology. But I think the scenario where the show a video that has already been shown again and again, it's not necessarily the Same type of video, but it's like, yeah, so it's like the same video that shows up again, but it's like different types of videos in different categories. So it's not only one type of category, which they always repeat. Okay.

Speaker:

Okay. Um, based on what you just said, does it affect your trust on the recommendation system?

Respondent:

No, I think that, you know, YouTube is pretty is pretty has like a monopoly on video sharing streams, especially video sharing schemes that are very user friendly. So I don't think that affects because they're really the only players on the market that have like this market share, you know, because there might be Vimeo and other video sharing apps, but, you know, they're nowhere near that level at

Speaker:

all. Okay. Are you Yes? I don't know if you know too much about this, but are you satisfied or dissatisfied with how YouTube has addressed the following ethical challenges like privacy, Miss misinformed content, which can be like propaganda or like fake medical advices? Or, or inappropriate content?

Respondent:

Okay, I would say that I would say that YouTube is just like, It mirrors society, and I think society, it has people who always tried to push a certain agenda. They're always trying to make you behave in a certain way. But in the end of the day, I think YouTube has really the kind of way they have democratized you know, knowledge, because now you have knowledge in a very accessible form, which I think even though there's propaganda on YouTube, that that that idea behind YouTube, the original idea, I think, it's still unbeatable, you cannot beat the idea of democratizing knowledge in a very user friendly way. YouTube does mirror our society

Speaker:

Oh, interesting.

Respondents:

Yes pulling knowledge can be confusing.

Speaker:

Yes indeed it can be really confusing thanks for your time we don't really have any more questions to ask. Is this something you'd like to share before we end the interview?

Respondents:

I will just say that I believe you deserve in very good public service. That I think in some cases, even better than your government facilities in a way of teaching people because they I think in some countries, you know, this system is very poorly formed does not have the depth. The depth of knowledge that you can access from pieces can even be better than it can be more and more appropriate, and some school says some school curriculums. Love rules.

7.1.3. Respondent 3

Speaker:

Okay, so hi, I'm Omar, and we me are Phillip Kelly. And today we are going to interview Anonymous. And so a little bit about our background. So we are currently studying for a bachelor degree in informatics in högskolan Dalarna. For our bachelor thesis, we are researching what kind of ethical problems YouTube recommendation system poses, and its effect on the users trust YouTube recommendation system. The YouTube recommendation system is built on the simple principle of helping people find the videos based on what they usually like to watch. So in our problem description, but we do think a problem that can occur with such kind of recommendation systems is that the can pose ethical issues like privacy concerns, getting inappropriate content that does not comply with the YouTube guidelines, such as, for example showing video of corpses. So, before we start this, before we start with the question, simple, is it okay for you? If you record this conversation and transcript it

Respondent:

is absolutely okay. Rather not. You don't have to include my name.

Speaker:

So what is said during this interview will be used in the bachelor thesis to rule how YouTube users like yourself, experience the YouTube recommendation system, and you trust for it. And we will solely use this information for our bachelor thesis you have the right to remain anonymous during during the interview and the writing process.

Respondent:

actually it doesn't matter. So we wanted to ask you like, is it? Do you want to remain anonymous?. Doesn't matter for you.. So this recording will be stored onto the ending of June 22. And before we start, yeah, a brief introduction about using who are

Respondent:

I am a student here in Dalarna University. I'm born and raised in Uppsala, which is in Sweden. And yeah, I decided to to expand my education here in Borlänge. So right now currently, I'm in my last year in my bachelor's degree, doing my Bachelor's, so to speak, so. Yeah. Okay. Yeah, I'm a student in system science. So

it's, this, this is quite relevant for me, because I'm also analyzing and studying Information Systems.

Speaker:

Okay, good to hear. So, to start with the first question, , could you tell us what is your primary usage of YouTube is like, is it to create content or to new content? It is to do content view content. Okay.

Can I ask you like what type of content do you view when you talk about like YouTube?

Respondent:

Yes, absolutely. If, okay, I can answer that simply. But if I if I got to choose, I would rather view like content. That's educational. That's that. Yeah. Educational, mostly, I would like to view but. But I can say that the content that I've used sometimes it, it happens that almost forcefully that I have to view what YouTube is recommending to me, almost like, like when you're when you have just a limited number of channels on your television is just the same, even though YouTube is almost infinite. Somehow, I keep getting limited in what I can do. So basically, I, I watch a lot of things that is already recommended to me. To answer that question, I have to say that if I want to view something, if I want to use something that I like, then I have to search for it. So what I like is mostly educational videos educational,

Speaker:

What kind of educational videos do you watch?

Respondent:

I watch everything from from I watch everything from you could say education in, in jurisdiction, and laws, for example, to learn about laws, common laws in places like America, I mean, even here in Sweden, and Europe, I try to learn education in that type of for example, sometimes even behavioural education, how to behave in certain situations. So that's like psychological education with sociological education I like to see for example, like and also cultural education about people's cultures and stuff like that. And also, scientific education. And with scientific I mean, the natural sciences, like, you know, physics, mathematics, chemistry, biology. And also I like to Yeah. And if by education I might, if I, if I may add, I will also say philosophy, a lot of philosophy like I actually, I would say philosophy is one of the most types of interesting contents. One of the most type of educational content check. does really

Speaker: good to know.

Speaker:

just one question about when you watch, let's say educational content about you said, like justification, you know, lawsuits, Sweden, or America, have you like, what have you come across a video that is completely wrong when it comes to, for example, laws in Sweden that you?

Respondent:

Absolutely, but I can add that I have the majority of the videos that are recommended to me, or actually, as I have experienced it, as I can remember it right now, they are not relevant to what I am interested in, but a minority gets recommended to me. So sometimes I can find it out of let's say, 10 videos, I might find two videos that are relevant to me, and the rest is not relevant. It's something else. That's what shows up to me in my experience. Now, I haven't analyzed exactly under which like, under which section they fall under, but on the front page, what is represented to me, the majority of the thing that is recommended to me are actually not that interesting to me. . At least it's something else. It's maybe,

Speaker: Yeah

Respondent:

I think yeah. If that answer the question, okay.

Speaker:

So approximately, like, how many hours do you believe you consume YouTube based? Weekly,

Respondent:

weekly? I would say around five hours a week for five, six hours, maybe tops.

Speaker:

So based on those five hours, on YouTube, how much would you say like, the content you watch is based on the recommendation system provided to you?

Respondent:

I mean, it's not that the recommendation doesn't do system doesn't work totally. But the thing is, like I said, it does recommend videos to me that are that are relevant to me. But somehow, those videos that that are recommended to me, are not exactly what I'm looking for. The it becomes, too. Yeah, it doesn't interest me. Like, it's not exactly what I'm looking for. So what happens is that I go search for what I'm looking for instead, all the time, I'm trying to find so. So basically, I actually not so much like I have to search for when I want to when you feel

Speaker:

like do you feel like those content that are not relevant to you, you get the gets recommended to you all the time. Do you believe like YouTube? Do you think like YouTube, trying to force you to watch them? Do you feel that?

Respondent:

Yes, yes. Yes, I do. And the thing is, I must add that yes, of course, we have to be like, honest here, of course. So I have watched like, sometimes I get recommended, like short clips, like short clips. That's a new thing. I guess nowadays, a short clips. And I do watch them. I do watch them. But it's almost like it's become automatic. Like, I just press and watch, like, you know, like, just for a short period of time, but it's not what I like, I wouldn't say I'm not, I'm not indulge in

the content in a way that I'm like, totally focused on the content. And I can watch for a long time, you know, it's not like that, like, I watch maybe one or two videos like that. And then I get bored fast, because it's not what interesting. So somehow, yes, they have, I feel like they're forced me to watch this. And you know, of course, they have been, the content creators have become very efficient in attracting the viewer. So you, you might click like, it's automatically. But what happens to me personally, is that after one, two videos, like these short videos, or maybe something that didn't really interest me, I actually shut them down. Because I realized, hey, this was not what was interesting to me. So somehow, yes, I feel like, forcefully, forcefully recommend these videos to you.

Speaker:

So, so based on the content you have consumed during your visit hours on YouTube plus, how do you like perceive the recommended content to be relevant to you? As you stated earlier, you said like most of the time, the recommended videos, yes, you get like, on relevant videos that are not relevant to you, for example.

Respondent:

Yeah, I mean, I did mention educational the first one, but I have to, because the question was my primary usage. But I can say that I also like to watch comedic content, which is also one of this. The second thing most that I watched YouTube for is committee for comedic purposes, because the question was primary, so. So what was the question? Again, it was based on hours,

Speaker:

based on the content you have consumed during your visit hours on YouTube.
How do you perceive

the recommendation content to be relevant? On those like, hours? And those
contents you watch?

Respondent:

Actually, from from here, I can say it's it's Yeah, I mean, actually, I think it's like, 50, 50. Yeah, it's like 50% not relevant. 50%? Like, maybe even more not relevant. Actually, maybe 60% 40, something like that, you know? The thing is, like, it's a bit, it's hard to answer this question, because the 60%, that's not relevant to me, actually know, the 40%. That's not that's relevant to me, out of those 40%. Somehow, when I watch them, I see that they're not interested. Interesting to me, You know what I mean? So they're irrelevant to what I watch. But when I watched them, I see that I'm not interested in this, you know, so it's a difference between interest and relevancy. You know, like, they might, they might be relevant to my subject that I'm interested in. But when I watched them, I see that I'm not interested in, you know, okay, so to like to add on the latter, I was answered and has asked one of the questions like 100, how many of the content is relevant to my, to what I watch? Like I said, like, out of 10 videos might be two videos, that's like, relevant. Actually, it's out of 10 videos, two of them, I might be interested in, you know, so that's the thing, like, it might be relevant to the subject I'm watching. But that doesn't necessarily mean that I'm interested, you know, so, yeah, so I feel like the recommendation system might work in, in what's relevant to me, but it doesn't work. And what's interesting to me, you know, what's interesting, doesn't know how to do that.

Speaker:

Okay. Good thing that you mentioned, the recommendation system? Yes. Because the next question is going to be a little about that. So when you hear like, YouTube recommendation system, yeah.

What do you think of like, what is like, your understanding? For example?

Respondent:

My understanding is that based on our behavior on YouTube, basically what we search on what we watch, and, yeah, what we like and such, even what we comment, you know, our behavior, so to speak, the recommendation system is basically an intelligent system that, that, that analyzes our behavior on the platform, and tries at least, or that's what I have understood that what they want to do is try at least give us videos that are that are relevant to our behavior.

Speaker:

So when you talk about like behavior, you mean, like, based on the videos, you watch the ads, you click the search history, the as your location for example?

Respondent:

Yeah, I mean, the age and location. I mean, that's, that's the thing. I because I know that YouTube is owned by Google. Right? So um, I have a suspicion that YouTube or the YouTube platform also tracks your behavior on Google in general. So what you search on Google might even affect your recommendation on YouTube. That's what I suspect, you know, I haven't seen a direct link to that, Brian, suspect that your overall behavior on the internet might, as long as

Google is involved in it, they might actually use that to even recommend in the US, you know, can I feel? Yeah, so I sense it's like that.

Speaker:

Can I ask you like, why do you suspect that? Based on your experience?

Respondent:

It's, I think, yeah, maybe it's based on my experience, and I haven't, like, thought about it too much. But I feel I have I have, yeah, I have like a suspicion of that, because it's like, if they already is they already have the YouTube has already made this attempt to give you recommendations. Why wouldn't they go all the way? You know, if they already are trying to optimize your experience, so to speak, why shouldn't they optimize your experience to the full extent, you know, I mean, have already, like you say there's a lot of ethical problems with it. They don't care about that. I don't think they care about that. It seems like they're not caring too much about that, because they're already like using your data to give you recommended use and such. So why wouldn't they go all the way? You know, that's my, that's my, that's my philosophy around this is like when you have already shown that you're you're capable of, you're capable of doing some things to, to to achieve a certain goal, in this case, to optimize the experience for the user. Why shouldn't you use all of the platforms that you can do to extract data from the user? So for example, if I can use Facebook, and see your behavior on Facebook and see what you like, on Facebook, if I am allowed to do that, as a company, why shouldn't I do that? I can optimize the experience even further, you know, so that's why that's my suspicion. That's my personal like, philosophy around things. Like if you if you're capable of doing that on one platform, why shouldn't you be able to do that on all of the platforms?

Speaker:

Yeah. Like, based on what you said? Would you feel like it raises like privacy concern for you? If it's like you said, if Google uses your data from Google?

Respondent:

Yeah, absolutely. Actually, to be honest, like just the fact that they already that they already have done it on one platform, it already has a long time ago, it had already concerned me privacy wise, you know, so yes, absolutely. I think. I think like, it's, I somehow, I didn't ask for this, you know, I didn't ask for them to recommend me things based on what I, what I watch. I didn't ask for it. They just implemented without asking me personally, I don't know. They might have done it somehow, sometime in the process. But I don't remember them asking me. Maybe they have like, Yeah, I mean, I guess Yeah, you're right, you consent to some things, you know, but you do that, because you cannot use the system. Otherwise, you cannot use YouTube, otherwise, maybe you can, but I don't feel like I have because all the time, when you step in into YouTube, or Google, there's some like form that comes up and say accept and consent, or disagree, and you feel like every time you disagree, the experience will not be as good, you know, you're not going to be able to use you to somehow you feel like that, you know? So yeah, maybe they'll ask me actually, or maybe they've asked me like this in a way of with the formula and stuff like that. So I guess I can say that, but but at the same time, I feel like, yeah, I feel like it's to is to like yes or no, you know, accept or No.

Speaker:

do you think like they should give out like more information to address those, like, those issues?

For example, on their guidelines?

Respondent:

I think, you know, I think you know, what, I think I think you should have more control over what what do you want, like, what what you are recommended, for example, like this, this thing about I consent, and I don't consent is to, is to is giving you an ultimatum, you know, like, I don't know about YouTube, I can say now on a straight arm, so to speak, I can say now, but like, on other pages, they have this, like accept cookies, or don't accept cookies. And when you don't accept cookies, somehow, some of the pages, they don't allow you to view their page. It's like, it's you're giving me you're forcing me to say something, you know? And the same thing is about YouTube. I think it shouldn't be like, yes or no accept consent, or no, it should be more like, Hey, listen, everyone. So everyone, like you said, give more information. Listen, and we have a system here that can give you recommended based on what you want. Do you want us to use your history? Your search history? No, no. And you have it would be like more dynamic. So you can choose exactly what YouTube can extract from you. You know? So it doesn't be like yes or no. So, yeah, I think it should be more control for the user. And he shouldn't be it shouldn't be. It shouldn't be, what can I say? It shouldn't be like, something that's more available to the user. I don't know, maybe, maybe they are in the settings, but I haven't looked

Speaker:

Would you want YouTube to give you more of an informed content by using your data?

Respondent:

Actually, now that I think about it, you know, I hadn't thought about it, but now that I think about it, I think they have might informed me a lot, you know, but people get lazy and I am one of those. They might have informed me actually, they might have informed me of everything. But you know, not everyone is like, willing to read through the whole documents and everything, you know, so I think yeah, they might have informed me, but they haven't informed me in a way that's appealing to me. You know, so, you know, they might, they might, they shouldn't get better gotten better in informing the people in a way that's more appealing to them, they're very good at showing things that appealing, for example, they're very good at appeal ads, they're very good at make, like, you know, like, I don't know, like, hygiene articles be very appealing to men, for example, but they don't they don't seem to be very good at to appeal the information, you know, important information. So I think yes, they could get better at informing the people in a not in a way as in, they're not informing the people already, because I think they are actually now that I think about it. But in a way that's more appealing to the person in a way that's more human to the person, it's not human to, like, give 100 site page document to a normal YouTube user is not, that's not appealing, it has to be appealing to the to the average user to the casual user.

Speaker:

If we did that, would you let's say now, if you go on YouTube, and they give you a more you forecast, and they say like hey Anonymous, we are going to do this with your data , would that provide like more trust? when we are talking about privacy?

Respondent:

Absolutely, if they told me what they were going to do with my data, exactly. And they were very transparent about it, and not in a way that I have to read like a whole law book for to like to know what's going to happen with my data, like, just a way that's very straightforward. And tell me Listen, if they were more honest with what they're going to do with my data. And I felt that honesty, you know, and we are humans, we have to, we have to feel certain types of things to trust, we cannot just go on based on like, what is told to us, we have to, we have to sense that there is a mutual trust, you know, so, so I would trust them more, if they show me more what's going to happen with my data in a more appealing way, you know, in a way that's human, a human, you know, like, human way, because the other thing is, like more like, I don't know, it's too formal, you know, for the average user is, he's not going to read through all of that. And somehow, he's feeling like you're forcing him because every time he wants to use the app, if he doesn't consent, it's going to pop up all the time. Hey, hey, consent, consent, consent, at last, you will just consent if you feel like okay, I have no other choice. So appealing and appealing. Well, yes. So, then I would trust them.

Speaker:

Good answer. So, based on what you said, to as if as if it right now, like do you trust you to trust you to build your data to use it for the recommendation system, to then later provide you with the contents?

Respondent:

More or less? Yes, they are providing me with related content, but they haven't seemed to figure out yet, how I like to recommend videos that that are really interesting to me, like really, really like what I'm interested, what I'm interested in what what, you know, not just what's relevant to my subject, like somehow I feel like they are recommending things to me that might be relevant, but the things that are recommended or not necessarily like even true information, it could be misinformed content, for example, is not interesting, too.

Speaker:

When you say like misinformed content, yeah. What do you mean, like by that exactly for example?

Respondent:

like I told you earlier, I'm very interested in, for example, psychological education, or even health education. Okay, so when I watch a video, that's quite, I can see that the man or the person speaking is quite educated in his area. He has is a legitimate person that's giving me education and whatnot, then I can, I can trust it, you know, he has sources and everything in the video, he's telling me something about, I don't know something about like cancer or something like that. And I listening to that, now, because I watched a health education video. It doesn't mean I want every health education video to shown to me, you know, because that happens. That's exactly what YouTube's recommendation system does. And it works. It works. But when I watched those other videos that I might be interested in at least from the thumbnail or from the title, but when I watched him, I see what No, this was, that's misinformed content. It's more they don't have any sources. And they start to speak about nonsense some stuff that's not saying that doesn't have scientific ground, is totally misinformed. And is in

for like, misinforming for the for the viewer, you know, and then I start to lose trust for the YouTube recommendation system because I was just now I was watching something that was really educational, which I value a lot and I want more of that. That's what I want you to recommend nothing things that are based on no scientific ground, no scientific sources, nothing. That's nothing. That's the real fact that they've proven to be a fact through through experiments and stuff like that, you know, so. So I think, yeah, I think I know I don't trust the YouTube recommendation system to give me things. That is interesting to me. But I do trust it to give me things that might be relevant to what I watch. But not what's interesting. Most of the time, it doesn't.

Speaker:

We'll just say like, when you say Misinformed information, content, do you want YouTube to like, give you more of like, fact based scientific videos rather than that?

Respondent:

Yeah, absolutely. If I'm watching just one video, that is very fact based, then they should be encouraging to me watch more stuff like that, you know, the recommendation system, it should be encouraging me to learn more to become more clever to be more educational, you know, because I mean, look at history, history has so far has told us that, that, that the government, the bigger companies, they always want their consumers do not be so. So what you say so conscious about what's going on in the government and the organization we meet as a student, I

know those kinds of things, because I've learned I've, I've, I've read about history. So I know that the history says that this government, this organization, they don't want the people to know exactly what's going on, because it's easier to manipulate them on products and stuff like that. So when YouTube doesn't give me the content that should be informing me making me richer in knowledge and making me more educational, when it doesn't recommend me stuff like that, then I start to lose trust on it.

Because then I start to see them in from another light, I start to see them from a light of one of those companies that I have read and read about in history, or one of those governments that I've read about in history, you know, so they're doing, I mean, they're trying to recommend stuff to me that's relevant. But no, since I've started to use YouTube, since the recommendation system has been implemented, I've never thought misinformed content is been relevant. Why is that relevant to me, it has never been revealed to me. It's never going to be relevant to me. But still, it recommends me stuff like that. So. So that's what I mean, with misinformed content. I mean, that it seems that YouTube doesn't have a way to validate if what they are having in their content. Like, what, what, what YouTube has in their content, if the information is true or not? They don't care about that.

Speaker:

Okay, so you just meant mentioned and talked about misinformed content? Yes. So I would like to like hear you talk about whatever you think, like challenges, like privacy for different content, inappropriate content, according to the YouTube recommendation system? Like what are you thought about those, like, ethical challenges? Have you like experienced those?

Respondent:

Yes, absolutely. Absolutely. I've seen people that, for example, there. You know, like, the thing is, YouTube is for private users to private creators, they can post whatever they want, basically, and there's of course guidelines that has to be followed. But I'm just surprised on the guidelines doesn't really doesn't really check if the content is misinforming, or not. It checks if the content can be vulgar. For example, if someone is cursing too much, they might, they might take that away. But if it's misinforming, they don't care about that. So that makes no sense to me, you know, because I think that this poses a very ethical problem, actually. Because let's say you're, you're young person, your 16 year old girl, and you're watching these, I don't know these, like vloggers in YouTube that are living their best life. And they're not really showing the whole the whole truth about their life they might be doing some autosys acts for for to get those money they might be they might be you know, doing some things that will hurt them psychologically to get these money, but they don't show that on the YouTube. They don't that's that's misinforming to me. You tell people that you're making millions of money by doing vlogs which you might be doing, but on the process. Tell us what's what's also what's also the downside of that, you know, you don't tell us the downside. You just show us what's so beautiful and what's good. And that's my biggest informing to young people and, and especially this generation that are that has grown up with this digital, digital landscape. They have grown up with this, they've grown up with this. So they become like, they might sit see this and think it's natural. And hey, I should also become a vlogger. I should also become a social media influencer or whatever, you know, and it might misinformed them to, to some of the sites that might be very dark and negative about living a life like that, you know? So. Yeah, so I think like the ethical problem that's posing is that by misinforming the people about stuff, for example, how people are living, that's one of the examples but also even health advice. For example, you can if you give wrong health advice to people, of course, there is a

risk to the user for the user to listen to that. But if you're young, and you're listening to some of these things, who knows health advice, psychological advice, behavior, otherwise, you might start doing things that you shouldn't be doing, you know, because you're, you're getting misled in front. Of course, that's an ethical problem. And who checks these last thing I will add to this, like, for example, there are motivational gurus on YouTube that make the claim that they know the answer to life and how everyone should behave. And everyone should be if you're a young person, and you're watching that, and you have, let's say, you have not a role model in your life, you might you might start doing things that that really not beneficial to you. You don't know that, you know, so. So that's an ethical problem for me, someone has to check that, that you that the content of YouTube is actually leading the youth, for example, to the right way.

7.1.4. Respondent 4

Okay, so hello, I am Omar and with me are Philip. And today we are going to interview the career and a little background about our work. So we are currently studying for a bachelor degree in informatics in högskolan Dalarna. So for our bachelor thesis, we are researching what kind of ethical problems YouTube recommendation system poses, and its effects on the users trust in the YouTube recommendation system. Our recommendation system is built on the simple principle of helping people find the video based on what the user usually like to watch. So in our problem description, what we think is of a problem that that can occur with the such kind of recommendation system is that it can pose ethical issues like privacy concerns, getting inappropriate content, that does not comply with the YouTube guidelines, such as, for example, showing videos of that corpus or corpses corpses. Exactly. So, so before we start this, before we start with the questions, is it okay for you? The career to is it okay for you? If we

record this conversation and transcript? Is it okay for you? Yes. Okay. Okay. So what it said during this conversation will be used in our bachelor thesis to rule how you to use this, like yourself, experienced the YouTube recommendation system, and you trust for him. So we will solely use this information for our bachelor's thesis. You have the right to remain anonymous there is during this interview and writing process during our work. Do you want to remain remain anonymous? Or does it matter? Doesn't matter? Okay, so this record, this recording will be stored until the ending of June 20 2022. So, before we start, can you please introduce yourself? Who are you and what? What do you do? In English, and if you don't feel like answering a question you have the right to not answer, if you also feel like you don't want to do the interview anymore you have the right to leave.

Respondent:

My name is anonymous, I'm currently studying IT security in högskolan Dalarna. And I'm in my third year, and hopefully this summer I will graduate. Take my graduation degree in computer science.

Speaker:

Okay. Okay. Very interesting. So as a career, could you tell me what your primary usage of YouTube is? Is it to create content? Or is it to view content?

Respondent:

For most of time, I when I watch one on YouTube, or watch stuff from YouTube, I usually watch like education related videos on and I sometimes enroll YouTube educational videos, such as programming night is information security stuff.

Speaker:

So other than that, from the educational videos do you watch like other types of videos content?

Respondent:

Sometimes I watch like sketch short videos, like funny sketch videos on on for most of the time, I also watched like game related videos on sports related it can be a basket or football for most of time is mostly football on highlight videos from Premier League and Okay, yeah, okay.

Speaker:

So approx approximately how many hours do you believe you can soon YouTube content based weekly?

Respondent:

That's a good question. Weekly. I will say that I spend like two to four hours weekly on YouTube. Five hours I think

Speaker:

okay, so based on your those five hours you said on YouTube, how much of them would you say that content you watch is based on the recommended private provided to you? Like the recommended videos provided?

Respondent:

it's based on which video I mostly watch you know, if I watch live video, that's, that's, that's about educational videos. And I usually get a recommendation from from that educational videos like I if I watch like coding videos, I I often get like coding related videos,

Speaker:

okay. So those contents recommended content to you are there are those contents relevant to you?

Always relevant to you?

Respondent:

Not always, sometimes I get video content that that's about that does not related the thing I'm currently doing, you know, the thing I, if I'm watching videos, Coding videos, I often get videos from, like, charity videos on and stuff like that.

Speaker:

So why why do you think like, do you think those videos are? Like? You said like they are not relevant? Yeah, right. Yeah. Why do you think that? Do you are

there although, like some ethical issues with those videos you get recommended to you

Speaker:

if it's ethical issues? What do you mean?

Speaker:

Like I mean, like, all those contents for example, with information misinformed content for you, or are those orders content inappropriate content for you? Or something like that?

Respondent:

Yeah, it's, it can be sometimes annoying, you know, to get videos that that's that you're not related to, you know, from sometimes, you know, what, when, when I'm on YouTube or watching something from YouTube, I often get like, naked videos like that with the videos that usually have more views. So, I, I often looked at the video and see the views. So based on the views, I understand that like, they, they target me, based on the video, the video views, Okay, watch how many what views that video has?

Speaker:

Okay, so you have felt that on many different occasions like situations? Okay. Okay. when I say for example, YouTube recommendation system, what do you think of? What are your understanding of YouTube recommendation system, my

Respondent:

understanding of YouTube's recommendation system, I mean, it's like, YouTube recommend you videos that are related to your history. So if you spend time on different YouTube videos, and yeah, you only get the related videos that you that your history matches,

Speaker:

okay? So when you said like history, you mean like, based on your data, like, for example, the videos, you watch the ads, you click the search history, and so on. And also Google, YouTube also collect the data, the data, like the age of you, and the location will be also. So were you aware of those things that you to collect in order to give you

Respondent:

I honestly, I didn't aware that I'm aware that my data is stored, I aware that my data is was stored. I didn't you know, aware that that level of data for me, you know, that in store, from two YouTube servers or? Yeah,

Speaker:

so another thing I was wondering like do you trust? YouTube with your data, to use it for their YouTube recommendation system to provide you recommended content?

Respondent:

Basically, I don't trust you to data collection for so if wanting if they just give me that videos that match with my history, fine, they can collect my data. And based on my history, they can give me data that match my history, but without that, I don't like trust YouTube.

Speaker:

Okay, so So you say so, you say like, the reason you don't trust YouTube recommendation system, too, is like, they don't give you content, the that are relevant to you that aren't relevant to use inappropriate content. But another thing Have you experienced like misinformation as like or misinappropriate content, like content that that gives you like false information or false knowledge, for example, or something like that? Have you experienced those?

Respondent:

Yeah, notice, I've noticed different occasions. YouTube, you know, recommend me some videos that are corporate propaganda related. So yeah, And thus, I might have my opinion, I think that's not appropriate, you know, to, to just target people on send some irrelevant videos.

Speaker:

But when you said like propaganda content, what do you mean exactly by that? Based on based on your experience?

Respondent:

For example, if I watch like, some political videos, yeah, after a few minutes, YouTube sometimes can give you like, videos that are more we're going to relate to, you know, sometimes if you want, if it's if it's same on election, if it's election videos you're interested in, you know, some election information. And yeah, they have they if they are, you know, taking information on the right way.

They supposed to give you just that information related to that history you're searching for.

Speaker:

Okay. So what are your thoughts about whatever you think of challenges, like for example, privacy, first, forcefully content, and this content, inappropriate content occur with the use of recommendation system? What are your thoughts about this? Have you like, as you said, like, you have experienced, like, inappropriate content and misinformed content, but like privacy or like that YouTube force you to watch a certain content, then you watch it, you know, so have you thought about those ethical challenges?

Respondent:

They have forced me to watch a certain type of content.

Respondent:

And you should, I don't know, I don't know that as much as much. I did an hour editing that, but for most of the time, the videos I watch, I just, you know, like, is

interesting video. So I didn't go that deep about the background of what information has come from or how they out, they recommended to me and stuff like that. So I'm not I'm just uneducated about that level of YouTube recommendation.

Speaker:

Okay. Okay. So you mentioned like, those ethical challenges you experienced, like, for example, inappropriate content, and misinappropriate content, for example, that you get recommended content that are not relevant to you. So how has had as those challenges affect your trust on the YouTube recommendation system? You trusted as much like for example, you to gather your data like, right, based on your search history, to give you a recommendation system, when YouTube are not giving you relevant recommendation system based on your data. How does that be? Does that affect the trust to the recommendation system?

Respondent:

It affected me My connection with my account, and it is annoying, okay. It's mostly annoying that people get you know, or, or they just get information from our to just information about irrelevant information, which is mostly annoying.

Speaker:

Okay. So another question, like, you talked about those ethical challenges, like, Are you like dissatisfied with how YouTube to address the following ethical challenges, like privacy misinformation based, like, for example, based on the

YouTube guidelines, like, Would you like, like, for example, YouTube to address those ethical challenges that you had experienced even more to let the users know? Yeah, you think that?

Respondent:

Yeah, they have to because they are a big company. Yeah. And you have to, you know, let the people know, what they were looking for what type of information they provided , to the public, you know?

If it's, they have to inform us, they have to, you know, give more information to the users.

Speaker:

Okay. Okay, Philip, do you have any questions you want? You'd like to ask? No. Okay. All right. Uh, is there like something else you would like to share with us before we end this interview?

Respondent:

I think it's interesting that you guys, you know, brought up this issue and, you know, talk about it and write about it is interesting.

Speaker:

Okay. By that being said, thank you for your time to and this is the end of the interview.

Speaker:

Thank you for your time.

7.2. Questionnaire

I consent to be a part of the research

☐ Yes

1. What is your gender? *

☐ Male

☐ Female

☐ Other

☐ Rather not specify

2. What is your age? *

☐ 18-25

☐ 25-32

☐ 32-39

☐ 39+

3. Approximately how many hours do you believe you consume YouTube content based weekly? (Hint: you can find this in YouTube setting) *

☐ 0-5 Hours

☐ 5-10 Hours

☐ 10-15 Hours

☐ 15-20 Hours

☐ 25-30 Hours

☐ 30+ Hours

4. What type of content do you watch on YouTube? *

- ☐ Tutorial/Educational videos
- ☐ Vlogs
- ☐ Music/Videos
- ☐ Comedy(short, skits, standup)
- ☐ Branded Content (Complex, BuzzFeed, TMZ, Vice)
- ☐ TV-shows/Clips
- ☐ Gameplay videos
- ☐ News(politics, weather, crime, business, entertainment etc)
- ☐ Other

5. Have you come across inappropriate content on YouTube based on the recommended content provided to you ? (For reference look at the keyword section in description) *

- ☐ Yes
- ☐ No

...

6. Based on the question above if you ticked yes, what kind of inappropriate content has been recommended to you? Tick the ones that matches your experience.

- ☐ Incitement to violence
- ☐ Threats
- ☐ Disclosure of private information
- ☐ Racism/Discrimination
- ☐ Other

If you clicked on other, what other inappropriate content have you experienced ?

Kort svarstext

7. In what frequency has YouTube recommended misinformed content to you? (For reference look at the keyword section in description) *

	1	2	3	4	5	
Not often	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Often

"If often, what type of misinformed content has been recommended to you?"

Lång svarstext

8. Are you aware that the recommendation system analyzes your data based on your watch history, ads clicked, location, search history, etc.?" *

☐ Yes

☐ No

9. Based on your experience has YouTube's recommendation system impacted your decision-making in watching videos by encouraging you to watch certain content? *

☐ Yes

☐ No

☐ Dont know

...

If you clicked on yes, what type of content(s) has been forcefully recommended to you?

Lång svarstext

10. Do you trust YouTube with your personalized data in order to give you recommended content? *

☐ Yes

☐ No

☐ Dont know

If you clicked on no, what concerns do you have?

Lång svarstext

11. Are you dissatisfied with how YouTube has addressed the following ethical challenges? Tick * the ones that you are not satisfied with. (For reference look at the keyword section in description)

☐ Privacy

☐ Inappropriate content(s)

☐ Disinformed content(s) (propaganda, fake news, conspiracy's etc)

☐ No

☐ Other

If you ticked on other, what other ethical challenges would you like YouTube to address?

Lång svarstext