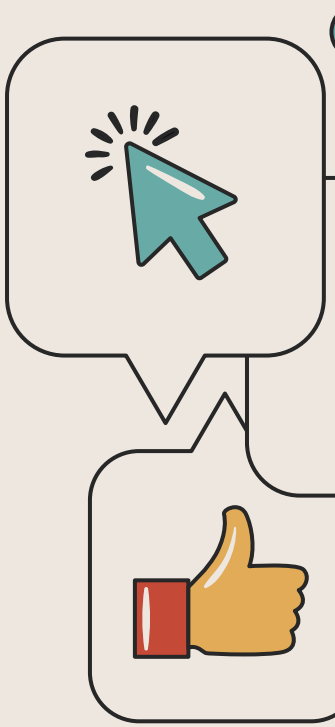

Human Computer Interaction

TERM LONG ASSIGNMENT

OVERVIEW and PROBLEM IDEATION & DATA GATHERING PRESENTATION

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Course: Human Computer Interaction (UN1) Monday 8 AM Tutorial with Ms. Nadine Maitland

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01| Introduction.

The proliferation of social media platforms has fundamentally transformed human communication, business operations, and content creation practices. This presentation will examine the multifaceted impacts of these technological tools, exploring their benefits and drawbacks in remote social interactions, business reach through marketing, content creation, and education. Ideas and improvements to existing YouTube features will be proposed, and one will be chosen for design and implementation; the data-gathering process for this assignment will also be outlined.

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02| Question 1.

Overview: Analyse the benefits and drawbacks of these technological tools and how they facilitate social interactions among remote users and marketing, extending businesses reach and content creation the drawback of their uses?

Problem Ideation & Data Gathering: Think of problems that people face while trying to socialize, do business or just interact remotely with one another using one of these mediums.

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03| Benefits of Social Media Platforms.

Enhanced Remote Social Connections:
Social network sites benefit their users when they are used to make meaningful social connections (Clark et al., 2018). The primary advantage of these platforms lies in their ability to maintain and strengthen relationships across geographical boundaries. Research indicates that social media platforms provide valuable opportunities for individuals to stay connected with family friends and professional networks regardless of physical distance.

Business Marketing and Extended Reach:
The use of the internet and social media have changed consumer behaviour and the ways in which companies conduct their business. According to Appel et al. (2020), digital and social media marketing allows companies to achieve their marketing objectives at relatively low cost. These platforms also provide unprecedented opportunities for direct customer engagement, real-time feedback collections and brand community building.

Content Creation and Creative Expression:
Social media platforms have created new economic opportunities through content creation, influencer marketing, and creative entrepreneurship. A study has shown that brands tend to make between 48 and 72 posts per week across platforms (Hootsuite, 2025), demonstrating the substantial content demand these platforms have generated, creating employment opportunities for content creators, social media managers, and digital marketers.

Easier Educational Information Access:
Over the years, the wealth of educational content online has grown exponentially. A study conducted by Liu, 2010, shows the top reasons students choose to use social media in education include direct communication and speed of feedback. Youtube, being one of the most popular among formal and informal students, allows users continuous, free, quick access to content relevant to their studies.

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04| Drawbacks of Social Media Platforms.

Negative impact on Social Skills and Relationships:
Recent research has shown that increased social media use tend to decline social skills among those who experience high social anxiety symptoms (Nesi et al. 2024). This finding suggests that while social media can facilitate connections excessive use may impair the development essential to face-to-face communications skills, particularly among vulnerable populations may ultimately lead to feelings of loneliness and isolation among youths (Thorisdottir et al., 2021).

Business and Marketing Challenges:
A major challenge social media marketing faces is how to create meaningful content that ignites a spark with audiences (Drossos et al., 2024). The oversaturation of content on these platforms makes it increasingly difficult for businesses to achieve meaningful engagement with their target audiences.

CyberBullying and Digital Harassment:
Cyberbullying through social media platforms represents a significant threat to mental health, particularly among adolescents and young adults. Adolescents who are targeted via cyberbullying report increased depressive effect, anxiety, loneliness, suicidal behavior, and somatic symptoms (Nixon, 2014).

The “Echo Chamber” Effect:
Social Media users are the ones actively curating their online spaces, though many are unaware of how even a second spent on a post may change their feed for the next few weeks. According to Cinelli et al., 2021, such autonomy often limits users’ exposure to diverse perspectives as they are mostly digitally surrounded by like-minded users who reinforce their opinions. This is called an Echo Chamber which consists of 2 main components: homophily — surrounding oneself with individuals who share the same world views — and information bias.

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05| Question 2.

Problem Ideation & Data Gathering: What role can secure interactive computing play to solve the problems identified?

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06| The Role of Secure Interactive Computing.

Secure interactive computing can address many identified problems through several approaches:

Enhanced Privacy Protection and Data Security: Privacy-preserving technologies represents a fundamental component of secure interactive computing. Privacy remains one of the most recurrent concerns that people have about social media (Sloan & Warner, 2022). Advanced cryptographic techniques, including zero-knowledge proofs and homomorphic encryption, can enable social media platforms to process user data for personalization and security purposes while maintaining user privacy (Raza et al., 2022)..

Authentic Identity Verification and Anti-Fraud Mechanisms: Secure computing systems can implement robust identity verification protocols that reduce the prevalence of fake accounts and inauthentic behavior while preserving user anonymity when desired. Blockchain technology offers desirable features of decentralization, autonomy, integrity, immutability, verification, fault-tolerance, and anonymity (Raza et al., 2022), which can be leveraged to create trusted identity systems without compromising user privacy.

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06| The Role of Secure Interactive Computing.

Mental Health Protection and Well-being Safeguards: Interactive computing systems can monitor usage patterns and provide interventions when detecting signs of problematic social media use or mental health concerns. These systems can implement features such as usage time limits, content filtering based on mental health triggers, and proactive support resource recommendations, helping users maintain healthier relationships with social platforms.

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07| Problem Ideation & Data Gathering Submission Items.

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08| Summary of Proposed Ideas.

Ideas by Benjamin Robinson

1. **Intelligent ai video navigation and content discovery system for youtube**. Youtube's current video navigation system forces users to rely on imprecise scrubbing, manual chapter jumping and repetitive back and forward seeking to find specific content within videos manually using the scrubber (red dot) functionality in the progress bar to change their place in the video. The proposed ai solution to this problem would involve allowing users to search a video or do intelligent query to timestamp mapping using natural language to search specific parts in the video using specific concepts, quotes or topics using natural language queries for example like "show me the part in the video that explains neural networks and transformers " and the ai would analyse the video and jump instantly to the relevant timestamps.

2. **AI Constructive Discourse Enhancement System.** YouTube's comment sections are plagued by toxicity, misinformation, and unconstructive discourse that destroys the potential for meaningful social interaction and learning. This proposed system would analyze YouTube comments in real-time using AI to provide preemptive guidance, suggesting improvements to comment drafts before posting (such as rephrasing hostile language more constructively) and intelligently organizing discussions into coherent conversation threads. The system would act as a proactive communication coach that helps users engage more thoughtfully by offering culturally-aware suggestions for respectful disagreement, constructive response templates, and gradual interventions that guide conversations toward productive discourse rather than simply removing toxic content after it appears.

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08| Summary of Proposed Ideas.

Ideas by Errol Hunter

1. **Smart Video Guide -** This feature helps viewers get the most out of YouTube without wasting time. The AI would create short previews and summaries for videos, giving users a quick idea of what the content is about. For longer tutorials or lectures, it could answer questions directly, so viewers don't have to watch the whole video again. This makes learning faster, easier, and more convenient, while improving the overall viewing experience.

2. **Safer and Healthier Youtube -** This feature focuses on making YouTube a safer and more balanced platform. The AI would filter out harmful, hateful, or spam comments to make interactions more positive. It would also suggest content that combines entertainment, educational videos, and wellness topics, rather than only pushing trending material. For viewers who spend too much time watching, the AI could suggest breaks or shorter highlights. Creators would also benefit from automatic captions, chapter markers, and insights on what keeps audiences engaged, while businesses would see smarter ad placements in a safer environment.

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08| Summary of Proposed Ideas.

Ideas by Iyana Taylor

1. **AI User Playlist Search -** For context: Pinterest has a “Search your Pins” feature where the results will be drawn from the pins you’ve saved to or created on your account rather than the entirety of the Pinterest database. A similar Youtube feature may be implemented where the user explains to an AI search engine exactly what they want to watch/ are searching for and it draws results from the videos they have saved to their playlists ONLY. The user should be able to specify which playlists to search and the number of results they want. This applies Shneiderman’s, “Reduce short-term memory load” rule, and, Nielsen & Molich’s “Recognition rather than recall” rule and takes advantage of Youtube’s already existing playlist creation function. It also takes advantage of one current AI implementation on the platform where an AI-generated video summary is provided in the description box (if the video publisher so chooses).

2. **Smart Contextual History Search -** This is an AI-powered natural language search across one’s Youtube watch history. The problem is that users struggle to relocate videos when they don’t know the title or exact keywords. A solution to that is an AI search bar may be implemented (improving on the current history search feature) where users can type “Find the video where MrBeast gives away an island” or “Show me the tutorial where the guy fixed a phone screen with toothpaste”. The AI will use semantic search to locate the right video even if the keywords don’t exactly match. This applies Nielson & Molich’s rule “Recognition rather than recall” — users describe what they remember, not exact titles. The benefits of this implementation are that it saves time, reduces frustration, and improves accessibility for less tech-savvy users.

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09| Our Chosen Idea.

Smart Contextual History Search - This is an AI-powered natural language search across one's Youtube watch history. The problem is that users struggle to relocate videos when they don't know the title or exact keywords. A solution to that is an AI search bar may be implemented (improving on the current history search feature) where users can type "Find the video where MrBeast gives away an island" or "Show me the tutorial where the guy fixed a phone screen with toothpaste". The AI will use semantic search to locate the right video even if the keywords don't exactly match. This applies Nielson & Molich's rule "Recognition rather than recall" — users describe what they remember, not exact titles. The benefits of this implementation are that it saves time, reduces frustration, and improves accessibility for less tech-savvy users.

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10| Project Concept.

Problem Description: A common frustration YouTube users experience is the difficulty of locating a previously watched video if they are unable to recall the exact title, keywords or creator. The platform's current history function organizes content in chronological order and allows keyword-based search, but the limit here is that users must use exact or closely matching terms. As a result, significant time is wasted scrolling through their watch history, or they are unable to recover the video at all.

Why it is interesting and not trivial to solve: This problem is interesting and worth solving because it directly impacts user satisfaction, accessibility, and efficiency. There are billions of videos on the platform, and for those who use it frequently and watch across diverse topics, their history can become overwhelming. It is not trivial to solve, as it requires an intelligent system that is capable of interpreting natural language queries, remembering context, and semantically linking user descriptions to the correct video. Unlike the standard keyword search, contextual search must be able to handle vague, incomplete, or conversational queries such as "the video where MrBeast gave away an island" or "a phone repair tutorial that used toothpaste."

Issues and Positives of existing solution & Our implementation: YouTube's current history search is a useful feature worth retaining as it is simple, fast, and effective, but only when users recall specific words from the title. But as said before, this reliance on exact keyword matching is a major limitation. Our proposed solution builds on this strength by adding an AI-powered semantic search layer that enhances usability without discarding the familiar interface. Our Smart Contextual History Search implementation has the potential to reduce user frustration, save time, and improve accessibility for a wide range of users, especially for those who are less familiar with technology.

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11| Outline for the Data-gathering.

Overview

To understand user behaviour patterns, frustration and needs related to Youtube history search, we will employ a mixed-methods approach using three complementary data gathering techniques to ensure comprehensive data triangulation. This approach will provide both quantitative metrics and qualitative insights into user experiences with current Youtube history functionality and their requirements for improved semantic search capabilities.

Data-gathering methods

Method 1: Semi- Structured interviews: Semi-structured interviews will provide deep insights into users' mental models of video memory, their current search strategies, and specific frustrations they experience. This method allows for open-ended questions to explore unexpected themes while maintaining consistency through closed questions for demographic and usage data. This flexibility allows for follow up questions and the exploration of unexpected themes while maintaining consistency across participants.

Who will gather: Members of the team will conduct the interviews- one member as the primary interviewer while the remaining two as note-takers/observers to ensure comprehensive data capture and reduce interview bias.

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11| Outline for the Data-gathering.

Method one continued…

How data will be gathered:

30-45 minutes interviews conducted through video call(zoom/google meet) or in person face-to-face.

Screen-sharing and recording sessions with consent from participants where they demonstrate their current search behaviours

Real time note taking using structure interview guides

Method 2: Online Survey: The survey will collect qualitative and quantitative data from a larger sample to validate patterns identified in interviews. **Closed questions** with Likert scales and multiple-choice options will provide statistical evidence, while strategic **open questions** will capture specific examples and suggestions that may not fit predetermined categories.

Who will gather: All team members will design and distribute the survey, with all team members contributing to analysis.

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11| Outline for the Data-gathering.

Method two continued…

How data will be gathered: Google Forms survey distributed through university networks and social media platforms. The instrument will use primarily **closed questions** for quantitative analysis, supplemented by key **open questions** for qualitative insights and specific examples.

Method 3: Secondary Data Analysis/Document Review: Analysis of existing research studies, YouTube user behavior reports, UX research publications, and platform usage statistics will provide broader context and validate our findings against established patterns. This method offers comprehensive background data without the time and resource constraints of additional primary data collection.

Who will gather: All team members will contribute to literature search, as well as coordinating the systematic review process.

How data will be gathered: Systematic review of academic papers, industry reports, YouTube's published user research, UX case studies, and platform analytics reports from sources like Pew Research, YouTube Creator Academy, and HCI conference proceedings.

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Participants Demographics

Target Participants (N = 50 total across all methods)

Primary Demographics:

- Age Range: 18-55 years (digital natives and digital adopters familiar with YouTube)
- Geographic Location: Primarily Kingston, Jamaica, with some participants from other regions to capture broader perspectives.
- YouTube Usage: Regular users (minimum 1 hour weekly, with a substantial and diverse watch history).

Secondary Demographics:

- Gender Representation: Balanced male, female, and non-binary participants.
- Education Level: Secondary, tertiary (college/university), and postgraduate participants to capture different levels of digital literacy.
- Occupation/Role:
    - Students (high school/tertiary)
    - Working professionals (e.g., marketing, education, business)
    - Content creators (small to mid-level creators who rely on YouTube for their work)
    - General casual users

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Behavioural Demographics:

- Device Preference: Smartphone users, desktop/laptop users, and smart TV/console users.
- Primary Use Case:
    - Entertainment (music, vlogs, lifestyle)
    - Education (tutorials, lectures, skill learning)
    - Business/ Professional (marketing, personal branding, research)
- Tech Familiarity:
    - High familiarity (comfortable with shortcuts, playlists, advanced features)
    - Moderate familiarity (basic browsing, occasional playlists)
    - Low familiarity (struggle with search/navigation, but use YouTube regularly).

Diversity Factors:

- Frequency of YouTube Use: Daily, several times a week, occasional users.
- Cultural Context: Participants who consume both local Jamaican content and international content.
- Language: English as primary, but with exposure to dialects/other languages in videos (relevant for semantic search challenges).

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12| Data-gathering Instruments to be Used.

Instrument 1: Semi-Structured Interviews

This will include:

- 5 questions organized into 5 sections(opening, current search behaviour, memory patterns, task scenarios, ideal solutions.)
- Includes hands -on tasks where participants demonstrate their current search process.
- Probing questions to explore memory patterns and frustrations.

Instrument 2: Online survey Questionnaire

This will consist of:

15 Structured questions across three sections:

- Section A: Demographics and Usage(5 questions)
- Section B: History Search experience (8 questions)
- Section C : Preferences and Accessibility(3 questions)

These will be multiple choice questions, Likert scales and open-ended responses.

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12| Data-gathering Instruments to be Used.

Instrument 3: Systematic Review protocol/Matrix

This will include:

- Standardized data extraction forms to capture key information from each source(sample size, key findings, methodology and limitations).
- Literature review matrix/spreadsheet to organize and compare findings across sources.

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THANKS!

Do you have any questions for us?

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