

User Needs + Defining Success

Overview/Review of Data pipeline:

It is predominantly an LLM inference pipeline with the goal of helping YouTube users with productivity by summarizing videos and comment sections. An open-source model will be hosted on GCP. Auxiliary services on GCP will support servicing of user requests and LLM inference output. Severe errors will come from connection points or API failures. Users may also determine that low quality summaries are also errors.

1. Evidence of User Needs

Overall, a variety of browser extensions already exist that summarize YouTube videos or comment sections. Their downloads and positive reviews indicate that the user's need of these summarizations exist and are able to be met.

Research Summary:

1: KOME Browser extension

<https://chromewebstore.google.com/detail/kome-ai-summary-and-bookm/hidkfmopckdjpogoencckkbngdfggf>

This extension provides a sleek interface that can summarize multiple types of web content: news, articles, PDF files, and YouTube videos. It is unique in that it allows the user to store/bookmark summaries. It also allows the user to generate emails, tweets and blog posts based on the generated summaries. It does not allow for any summarization of comment sections. It is a paid app that requires an account. It has moderate reviews.

2: Glasp Browser extension

<https://chromewebstore.google.com/detail/youtube-summary-with-chat/nmmicjeknamkfoonkhhcjmomieiodli>

Compared to KOME, it has a simpler and more limited interface. It only has functionality to summarize YouTube videos. It is free; however, the user must pass an OpenAI or Claude API key to the interface. This is not easy for some users: generating an API key can be somewhat technical. It has good ratings.

3: Eightify Browser Extension

<https://chromewebstore.google.com/detail/eightify-ai-youtube-summa/cdcpabkolgalpgeingbdcebojebfelgb>

This is the most popular YouTube video summarizer tool with 200,000 reported users. It can summarize videos up to 10 hours. It provides summaries with timestamps in an interface so that a user can navigate and watch portions of a video that they are interested in. It also promotes basic comment section summaries. The extension seeks to generate transcripts for videos without them; however, user reviews indicate mixed success in these cases. It is a paid service with mostly positive reviews.

4: YouTube Comment Analyzer Browser Extension

<https://chromewebstore.google.com/detail/youtube-comment-analyzer/fhdadknjimpbibbeknkeelkfbckhlmen>

The tool focuses entirely on the comment section with 4 distinct features. Its goal is to assist content creators extract constructive feedback. The first generates general summaries, the second provides a simple graphic for sentiment of the comments, the third attempts to extract questions made, and the fourth attempts to directly extract ideas or statements made relating to constructive feedback. The tool is free. It requires users to input their OpenAI API key.

5: SummifyYT Browser Extension

<https://chromewebstore.google.com/detail/summifyyt-summarize-youtu/mcjgidambippeaajehcfimmephgholco>

It is also a tool only for comment summarization; however, unlike 'YouTube Comment Analyzer' it does not provide any other features like sentiment analysis. It only provides a general summary of the comment section.

6: Official 'Ask' AI button on YouTube

<https://support.google.com/youtube/answer/14110396?hl=en#zippy=%2Chow-does-the-conversational-ai-tool-on-youtube-work%2Ccan-i-chat-with-youtube-support-through-this-tool>

YouTube now natively supports AI integration with YouTube. A chat window appears upon clicking the button. The user is then able to ask questions about the video. However, the tool does not have the ability to summarize the comment section.

7: Notebook LM

<https://notebooklm.google/>

An official Google service, it is a general study and productivity tool. Its main interface is a chat window where multiple sources can be uploaded: YouTube links included. The user can then chat about a particular topic, generate a quiz, or generate a podcast instead of reading the response. This tool is more appropriate for long term learning since it requires more effort to input the source material. Instead, a browser extension operating directly with YouTube serves a user requiring short and efficient information.

Making a case for and against our AI feature:

Against:

- Tools that offer basic summarization already exist
- It would be difficult to compete only offering same base functionality
- YouTube/Google may continue to expand their official features which may make our feature obsolete
- As a browser extension, YouTube often changes their UI which requires significant maintenance.
- Our team does not have expertise in web development or UI, so our product may not be efficient or may not appear as aesthetically pleasing as other products.

For:

- By hosting our own opensource LLM, we may be able to offer a cheaper service than current competitors.
- Few services combine YouTube video and comment section summarization. This may give us a competitive edge.
- Our complete unique idea would be to extract and display helpful and novel ideas that were introduced from the comment section. This may also give us a competitive edge.
- Traditional NLP techniques are not feasible. No other service attempts it.

Summary statement:

We think AI can help solve the user's need for productivity while watching videos and reading comment sections. This is because there is precedence. Also, there is room for improvement such as using open-source models and combining features from multiple services together.

2. Augmentation vs. Automation

By definition, the product is an augmentation tool. There is no possibility for automation since it is a productivity enhancement tool. The human user cannot be eliminated from the service loop. It is not possible to automatically upload information for a human user. They need to read and interact with the tool.

3. Designing the Reward Function

The definitions of each relating to our product are below.

True Positive: Generated summary reflects summary of overall content, is not overly verbose or concise. System meets user needs

False Positive: Generated summary produces coherent text, but summary quality is low, information is hallucinated/incorrect, or summary is extremely brief or verbose. The system appears to meet user needs, but does not.

True Negative: Internal failure where the system fails to deliver any summary. System fails to meet user needs.

False Negative: YouTube transcript is not available for video, therefore summary is not possible to be generated. This is no fault of our system; however, this does not meet user need.

Summary statement:

Our AI model (system) will be optimized for precision since false negatives cannot be mitigated. However, the main focus will be to reduce our defined true negatives.

4. Define success criteria

Version 1:

If our service is able to provide all defined main features, we consider this a basic success. These include: coherent and permissible summaries of both Videos and comment sections, and the ability to filter or highlight comments that provide novel and interesting insight.

Version 2:

If our service is able to handle at least 100 concurrent requests for summaries without failure, this will be considered a basic success.

Version 3:

If our latency between user request and final summary output is less than 5 seconds (for all concurrent users), then we consider our product a success.

Final Version:

If our product delivers all specified basic features, handle at least 100 concurrent requests while maintaining 5 second latency, this will be considered success.