

INSY691 Final Project

Chatbot Design

Group 3

Richy Jin, Rachel Lu, Kathy Chen



YouTube

About YouTube^[1]

A global video-sharing platform that connects more than **2.52** billion of users worldwide, ranking **2nd** of the world's most 'active' social media platform, following Facebook. (April, 2023)

YouTube's Current Systems



Recommendation^{[2][3]}

Learning, comparing, suggesting
Key signals

- Clicks & watch-time
- Channel subscriptions
- Likes & dislikes, etc.

Two scenarios

- Homepage
- Up-next



Search^[4]

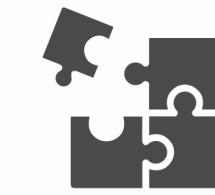
Vast content-based
Three main elements

- Relevance
- Engagement
- Quality

Additional elements

- Search & watch history

Challenges



Passive

Users accept recommendations without more freedom

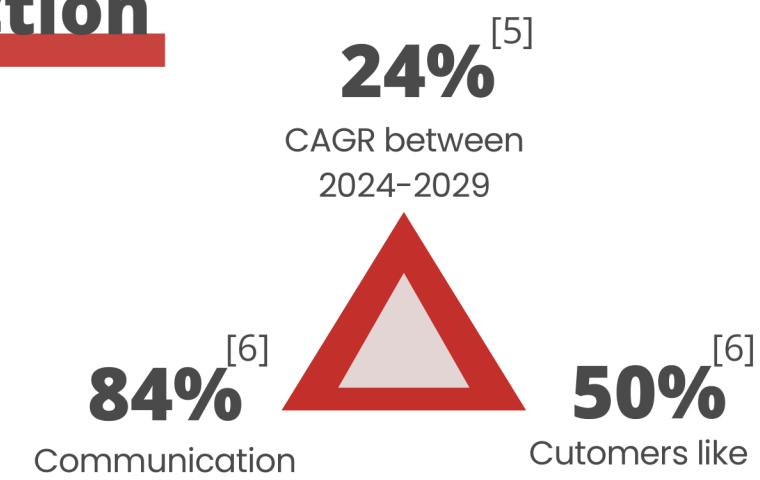


Homogeneous

Highly rely on historical information and user habits

Chatbot follows two trends to add on interaction and content horizons

Increasing Interaction



Diversified Demands

Future Target Group
Gen Z^[7]

Undefined ID

Expressing individual truth

Communaholic

Connecting through different truths

Dialoguer

Understanding different truths

Interactive

Given chatbot's increasing importance for communication between customers and businesses, our chatbot aims to leverage the format of conversation to create an interactive scenario.

Explorative

Based on Gen Z's main focus on self-identity and recognition for differences, our chatbot aims to provide more content horizons with new explorative possibilities.

New scenarios we considered

Prompt for search options

- **Rationale:** Integrating the top 1000 YouTuber dataset, list search options by categories, top YouTubers, or trends in the countries
- **Impact:** Encourage users to actively explore new content, cultivating new personal preference

Introduce content before click-in

- **Rationale:** Accessing Openai, briefly introduce users' interested YouTubers and recommended videos before viewing them
- **Impact:** Helps users make more informed decisions, improving customer satisfaction and trust

Conversative interactions

- **Rationale:** Using cosine similarity text analysis, not only let users choose keywords but also allow them to type textual messages
- **Impact:** Boost user satisfaction and conversion rates through interactive, tailored recommendations

Libraries & APIs

Libraries used

- **Data Manipulation and Analysis**

import numpy: Fast array operations; crucial for numerical computations on data analytics

import pandas: Data manipulation and analysis; indispensable for handling and analyzing data in tabular form.

- **Web request and API interaction**

import requests: Send HTTP requests; essential for interacting with YouTube API to fetch or post data

import openai: Interface with OpenAI's models; useful for generating responses or analyzing text from YouTube

- **Text Processing and Machine Learning**

from Scikit-learn:

import TfidfVectorizer, CountVectorizer: Convert text to numerical data; key for feature extraction from YouTube

import cosine_similarity: Measure text similarity; aids in finding related comments or content

import StandardScaler: Standardize features; important for preprocessing data for machine learning models

import json: Parse and generate JSON data; vital for working with API responses

- **Display and Debugging**

from IPython.display import display: Display data in proper formats; enhances the debugging and presentation

- **Youtube V2 Youtube Search**: Find a specific number of videos for a specific keyword

- **Youtube V2 Video Details**: Get all publicly available details about a YouTube video with a specific video ID

- **Youtube V2 Trending Videos**: Returns the list of trending videos given a country

APIs used

- **Object-detection-all-scopes**: Allow users to search for relevant content by uploading photos

- **Youtube V2 Video Subtitles**: Offer a more accurate by summarizing video subtitles instead of descriptions

Code Extension

Two Benefits for YouTube

01

Boosting Interactivity

- Every conversation turns into an opportunity to suggest more videos and keep viewers engaged
- More engagement means more screen time, and that means more spaces for ads
- A loyal viewer base that drives higher revenue

02

Expanding Content Horizons

- More views across the board
- A fairer and more vibrant platform for creators
- A diverse content mix that attracts a wider audience
- Draw in more advertisers and help YouTube to secure its spot as the top content platform

Additional Variables



Diversity Score

A variable that assesses the diversity of content recommended to a user over time

- Serve users a vibrant variety of videos
- Keep the YouTube experience fresh and exciting



New Creator Spotlight

A variable focuses on identifying and promoting new creators who may be struggling to get visibility due to the dominance of established channels

- Explore emerging talent

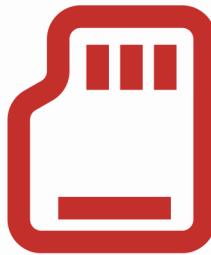


Cultural Relevance

A variable considers local events, holidays, or trends that are not captured by global popularity metrics but are highly relevant to specific user segments

- Make YouTube a personal space that feels like home

Future Improvements for the Chatbot



Contextual Understanding Enhancements

Employ advanced NLP (Natural language processing) capabilities to grasp the context of user queries better

- Understanding the nuances of language, slang, or trending terms
- Make interactions with the chatbot more natural and effective



Data-Driven Insights for Creators

Provide analytics and insights to content creators based on data collected from chatbot interactions

- What type of content users are searching for
- Common questions asked about their channel
- Content gaps in the market

THANK YOU!



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APPENDIX

- [1] <https://datareportal.com/essential-youtube-stats?rq=YouTube>
- [2] https://www.youtube.com/intl/ALL_ca/howyoutubeworks/product-features/recommendations/
- [3] <https://blog.youtube/inside-youtube/on-youtubes-recommendation-system/>
- [4] https://www.youtube.com/intl/ALL_ca/howyoutubeworks/product-features/search/
- [5] <https://www.mordorintelligence.com/industry-reports/global-chatbot-market>
- [6] <https://www.dashly.io/blog/chatbot-statistics/>
- [7] <https://www.mckinsey.com/industries/consumer-packaged-goods/our-insights>true-gen-generation-z-and-its-implications-for-companies>