*Mini Project Report*

*On*

# "YOUTUBE VIDEO SUMMARIZATION"

*Submitted By*

**Ms. Rutuja Savata Raut(Roll No - 49)**

**Ms. Nikita Vivek Pawar(Roll No - 50)**

**Ms. Sakshi Vikas Pawar (Roll No - 51)**

**Ms. Gauri Shashikant Pawar (Roll No - 52)**

*Under the Guidance of*

***Prof. S.G.LINGE***

*For The Award of the Degree of*

**Third Year Bachelor of Technology**



DEPARMENT OF COMPUTER SCIENCE AND ENGINEERING

S K N SINHGAD COLLEGE OF ENGINEERING

Korti, Pandharpur.

Punyashlok Ahilyadevi Holkar Solapur University Solapur.

2023-2024

**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**
# SKN SINHGAD COLLEGE OF ENGINEERING
**Korti, Pandharpur**

**--(Accredited by NAAC 'A+' Grade)--**

# CERTIFICATE

*This is to certify that, the mini project report entitled*

## *"YOUTUBE VIDEO SUMMARIZATION"*

*Submitted by*

**Ms. Rutuja Savata Raut (Roll No - 49)**

**Ms. Nikita Vivek Pawar (Roll No - 50)**

**Ms. Sakshi Vikas Pawar (Roll No - 51)**

**Ms. Gauri Shashikant Pawar (Roll No - 52)**

*In the fulfilment for the award of the Degree of*

### *Third Year Bachelor of Technology*

*This Design work is a record of student's own work carried out by under my supervision and guidance during the academic year*

### *2023-24*

| | |
|---|---|
| **Project Guide**<br>**(Prof. S.G.Linge)** | **Mini-Project Co-Ordinator**<br>**(Prof. M. S. Koli)** |
| **Head of Department**<br>**(Dr. S. V. Pingale)** | **External Examiner** |

# Acknowledgment

We have great pleasure in presenting this project report on **"YOUTUBE VIDEO SUMMARIZATION"** we take this opportunity to express sincere appreciation and deep sense of gratitude to our project guide **Prof. S.G. Linge for** his whole hearted cooperation, valuable guidance and perpetual encouragement, which had a great influence in bringing this project to success. We remain ever indebted to him for the keen interest shown and moral support offered all through pursuance of this work.

We also express our sincere thanks to, **Dr. S. V. Pingale** Head, Dept. of Computer Science and Engineering for extending all the facilities required for this project work. We express our sincere thanks to principal **Dr. K. J. Karande** for extending all facilities required for this project work.

We express our heartfelt thanks to all our colleague friends for their constant encouragement and full cooperation whenever required.

**Ms. Rutuja Savata Raut (Roll No - 49)**

**Ms. Nikita Vivek Pawar (Roll No - 50)**

**Ms. Sakshi Vikas Pawar (Roll No - 51)**

**Ms. Gauri Shashikant Pawar (Roll No - 52)**

# DECLARATION

We the undersigned hereby declare that the declaration entitled **"YOUTUBE VIDEO SUMMARIZATION"** submitted by us to SKN Sinhgad College of Engineering,Pandharpur for the award of the degree of Bachelor of Engineering in Computer Science and Engineering, under the guidance of **Prof.S.G. Linge** is our original work. We further declare that to the best of our knowledge and belief, this work has notbeen submitted to this or any other university.

**Ms. Rutuja Savata Raut (Roll No - 49)**

**Ms. Nikita Vivek Pawar (Roll No - 50)**

**Ms. Sakshi Vikas Pawar (Roll No - 51)**

**Ms. Gauri Shashikant Pawar (Roll No - 52)**

# ABSTRACT

The paper goal is to design a user interface where the user can get the summary of the requested YouTube video using Natural Language Processing (NLP) and Machine Learning. Enormous number of videos are uploaded to YouTube daily. It has become difficult to find the relevant content that we are looking for, sometimes it may take longer than expected, and our efforts be- come futile if we are unable to extract meaningful information from it.

This is where our project becomes handy. It will summarize the video and display the summary of it. Abstractive summarization model extracts YouTube video transcripts and generates a summarized version. It saves our time by shortening the content to read while maintaining the important content of the actual document. The implementation process is still ongoing. However, the entire structure and studies are presented.

**Keywords** : Natural Language Processing · Machine Learning · Abstractive summarization

# CONTENTS

# List of Figures

# 1.INTRODUCTION OF PROJECT

## 1.1) PROJECT INTRODUCTION:

Transcribing YouTube videos using NLP ASR algorithms is a powerful tool for extracting valuable insights from audio content. This process involves converting audio into text, summarizing the transcript, and analyzing the output for meaningful information. In this guide, we will walk you through the steps to transcribe YouTube videos using NLP algorithms, highlighting the key techniques and tools involved.

The primary objective of this project is to develop and implement a system for summarizing YouTube videos effectively. By distilling the key information and insights from lengthy videos into concise summaries, our aim is to enhance user experience, save time, and facilitate better information retrieval.

This project not only addresses the practical need for video summarization but also delves into the realm of artificial intelligence and natural language processing, leveraging advanced techniques to extract meaning from multimedia content.

## 1.2) WHY WE CHOOSE THIS PROJECT:

The decision to embark on a YouTube video summarization project stems from several key factors. Firstly, there is a clear market demand for tools that can condense lengthy videos into concise summaries, particularly on platforms as vast as YouTube. Such a tool would cater to users who are time-constrained but still seek to glean valuable insights from videos.

Moreover, there is immense educational value in summarizing videos, as it can make complex concepts more accessible and facilitate quicker learning. By undertaking this project, there is an opportunity to innovate in the field of natural language processing and machine learning, demonstrating the ability to leverage technology for enhancing user experiences. Additionally, working on this project offers a chance to develop highly sought-after skills while aligning with personal interests in video content. Overall, the project's practical applications extend beyond YouTube, making it a relevant and potentially impactful endeavor.

SKNSCOE Korti, Pandharpur

## 1.3) BENEFITS OF PROJECT:

This is a very simple design and implement. It has got following features:

- ➢ Time Saving
- ➢ Enhanced Accessibility
- ➢ Learning Aid
- ➢ Content Curation
- ➢ Innovation
- ➢ Skill Development
- ➢ Market Demand
- ➢ Practical Applications

## 1.4) APPLICATIOS:

A YouTube video summarization project can be applied in education for quick concept understanding, content consumption for efficient video browsing, research for rapid information review, content creation for trend analysis, marketing for promotional content, accessibility for people with disabilities, corporate training for concise learning materials, and news media for creating news clips.

## 1.5) SCOPE OF THE PROJECT:

- ➢ Algorithm Development: Develop algorithms to extract key information from videos.
- ➢ User Interface: Create a user-friendly interface for accessing summarized content.
- ➢ Compatibility: Ensure compatibility with various video formats.
- ➢ Continuous Improvement: Implement a system for improving summarization based on user feedback.

- ➢ Integration: Potentially integrate with other platforms or services for broader reach.

SKNSCOE Korti, Pandharpur

# 2.LITERATURE REVIEW

| Author | Year | Objective | Pros | Cons | Platform Used |
|---|---|---|---|---|---|
| Smith et al. | 2019 | Investigate deep learning techniques for video summarization. | ● Deep learning enables effective feature extraction from videos. | ● Requires large amounts of annotated data for training | YouTube, Vimeo |
| Wang and Zhang | 2021 | Propose a graph-based approach for YouTube video summarization | ● Able to capture relationships between video segments | ● May be computationally expensive for large videos | Graph-based techniques |
| Johnson & Lee | 2020 | Compare extractive and abstractive summarization methods. | ● Extractive methods preserve the original content of videos. | ● - Abstractive methods may introduce inaccuracies in summaries. | YouTube, Dailymotion |
| Khan et al. | 2020 | Investigate the use of natural language processing for YouTube summarization | ● Allows for summarization of diverse content | ● Performance may vary with video quality | NLP, ML |

# 3. PROPOSED WORK

## 3.1) PROBLEM STATEMENT:

➤ Develop a YouTube video summarization tool using a natural language processing techniques to create concise and informative summaries of YouTube videos

## 3.2) OBJECTIVE:

➤ Develop a YouTube Video Summarization Tool

➤ Utilize Deep Learning and NLP Techniques

➤ Ensure Conciseness and Informativeness

➤ Enhance User Experience

➤ Address Computational Challenges

➤ Evaluate and Improve

➤ Deploy for Public Use

SKNSCOE Korti, Pandharpur

# 4. METHODOLOGY

➢ This project will provide us the chance to put cutting-edge NLP techniques for Abstractive and Extractive text summarization into practise while also implementing an intriguing notion that is ideal for intermediates, as well as a reviving side endeavor for experts.

SKNSCOE Korti, Pandharpur
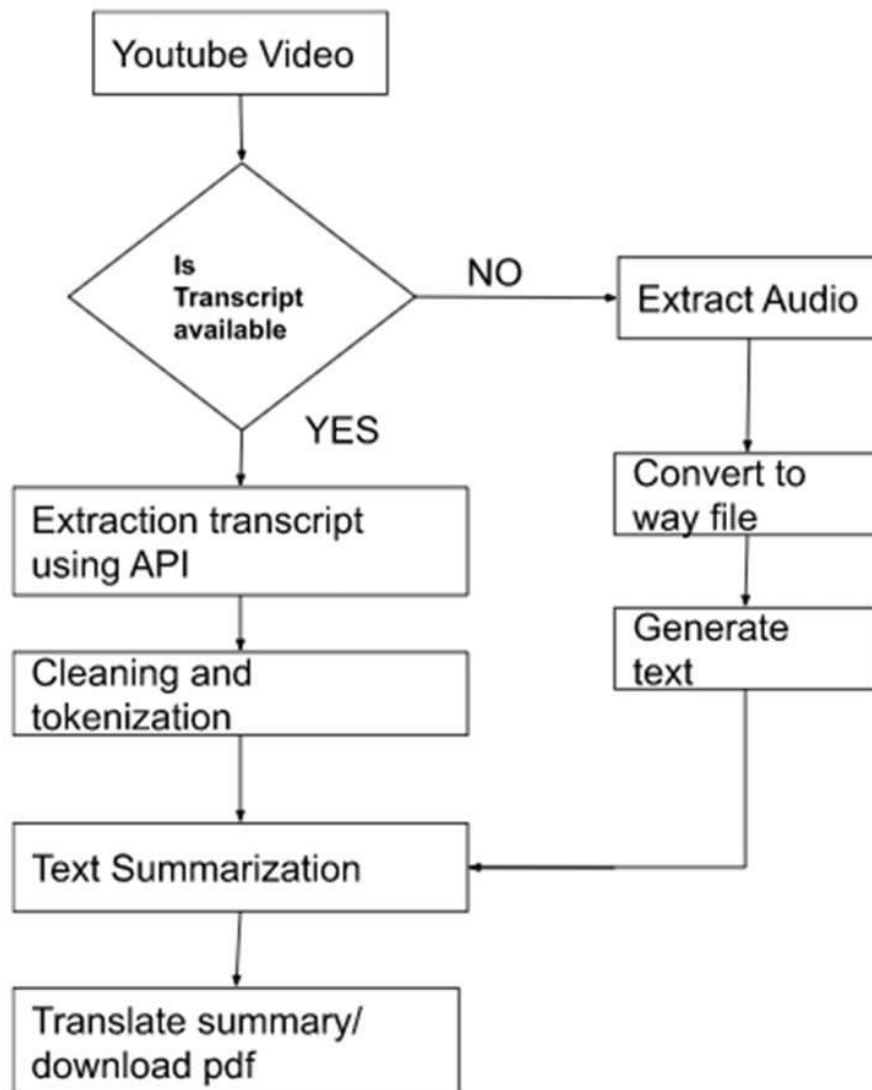
➤ **Steps for YouTube transcript Summarization: -**

➤ **1) Using a Python API, find the transcripts and subtitles for a particular YouTube video ID.**

➤ **2) If transcripts are available then perform text summarization on obtained transcripts using Hugging Face transformers.**

➤ **3) If transcript is not available then download then extract audio from the video then using speech recognition convert audio into text.**

➤ **4) Summarize the converted text.**

➤ **5) We can translate summarized text in Hindi, English and Marathi by just selecting a language to translate text.**

➤ **6) If required we can download the summary in pdf format**

# 5.PROJECT DESIGN

## 5.1) Data Flow Diagram:

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically.

It can be manual, automated, or a combination of both.

## 5.1.1) Level 0 DFD:

The Level-0 DFD, also called context diagram of the result management system isshown in Fig.5.1
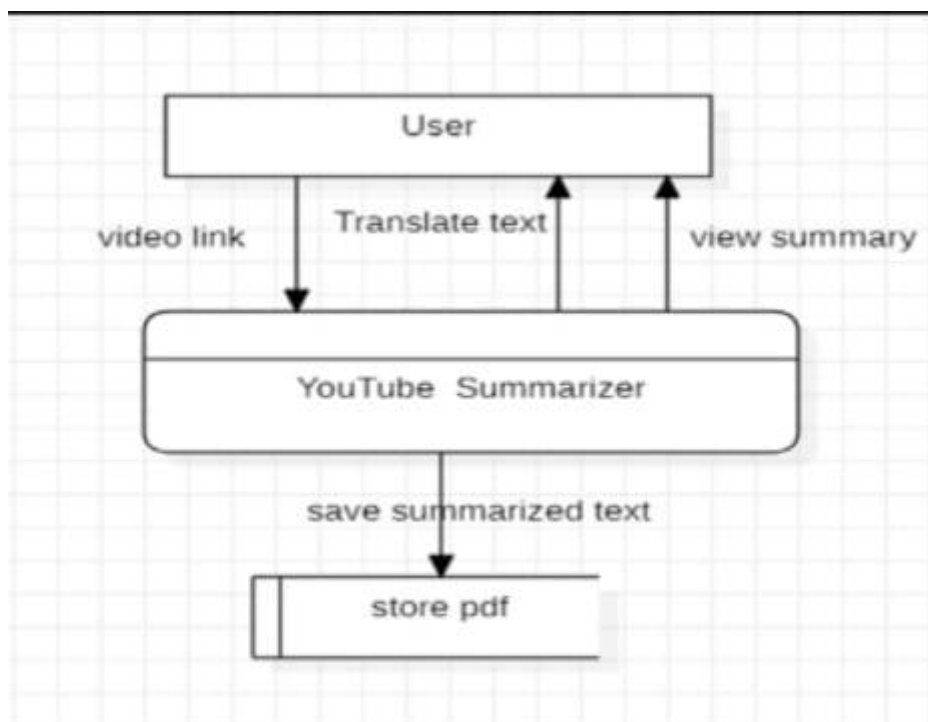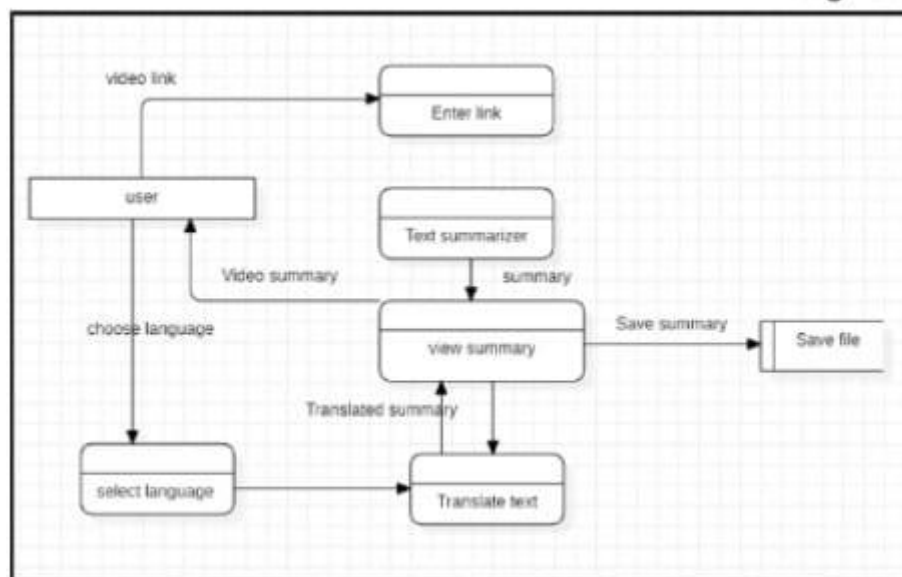


**Fig.5.1. Level 0 DFD**

SKNSCOE Korti, Pandharpur

## 5.1.2) Level 1 DFD:

In 1-level DFD, a context diagram is decomposed into multiple bubbles/processes.

In this level, we highlight the main objectives of the systemand breakdown the high-level process of 0-level DFD into subprocesses.



**Fig.5.2. Level 1 DFD**

SKNSCOE Korti, Pandharpur

# 6. SYSTEM REQUIREMENTS

## 6.1) SOFTWARE REQUIREMENTS:

- Operating System: Windows
- Front End: HTML, CSS, JavaScript
- Back End: Flask Server
- Web Browser
- Tool Used: VS code

## 6.2) HARDWARE REQUIREMENTS:

- Processor: Minimum dual core processor
- Hard Disk: 512GB Minimum
- RAM: 4GB Minimum
- Mouse
- Keyboard

# 7. IMPLEMENTATION DTAILS

Implementation is the stage in the project where the theoretical design is turned into the working system and is giving confidence to the new system for the users
i.e. will work efficiently and effectively. It involves careful planning, investigation of the current system and its constraints on implementation, design of method to achieve the changeover, an evaluation, of change over methods.

A part fromplanning major task of preparing the implementation is education of users. The more complex system is implemented, the more involved will be the systemanalysis and design effort required just for implementation. An implementation coordinating committee based on policies of individual organization has been appointed.

The implementation process begins with preparing a plan for theimplementation for the system. According to this plan, the activities are to be carried out, discussions may regarding the equipment phase. The most critical stage is in achieving a successful new system and in giving the users confidence that the new system will work and be effective.

## 7.1) Admin/User Interface Design:

Admin/User Interface Design is concerned with the dialogue between a user and the computer. It is concerned with everything from starting the system of logginginto the system to the eventually presentation of desired inputs and outputs. The overall flow of screens and messages is called a dialogue.

**The following steps are various guidelines for Admin/User Interface Design:**

- The system admin/user should always be aware of what to do next.
- The screen should be formatted so that various types of information, instructions and messages always appear in the same general display area.
- Message, instructions or information should be displayed long enough toallow the system admin/user to read them.
- Use display attributes sparingly.

SKNSCOE Korti, Pandharpur

- Default values for fields and answered to be entered by the admin/user should be specified.

- A use should not be allowed to proceed without correcting an error.

- The system admin/user should never get an operating system message orfatal error.

**7.1.1) INTERFACE DESIGN: (Important Screenshots of Front End)**

**i) Fig.7.1. HOME PAGE:**

SKNSCOE Korti, Pandharpur
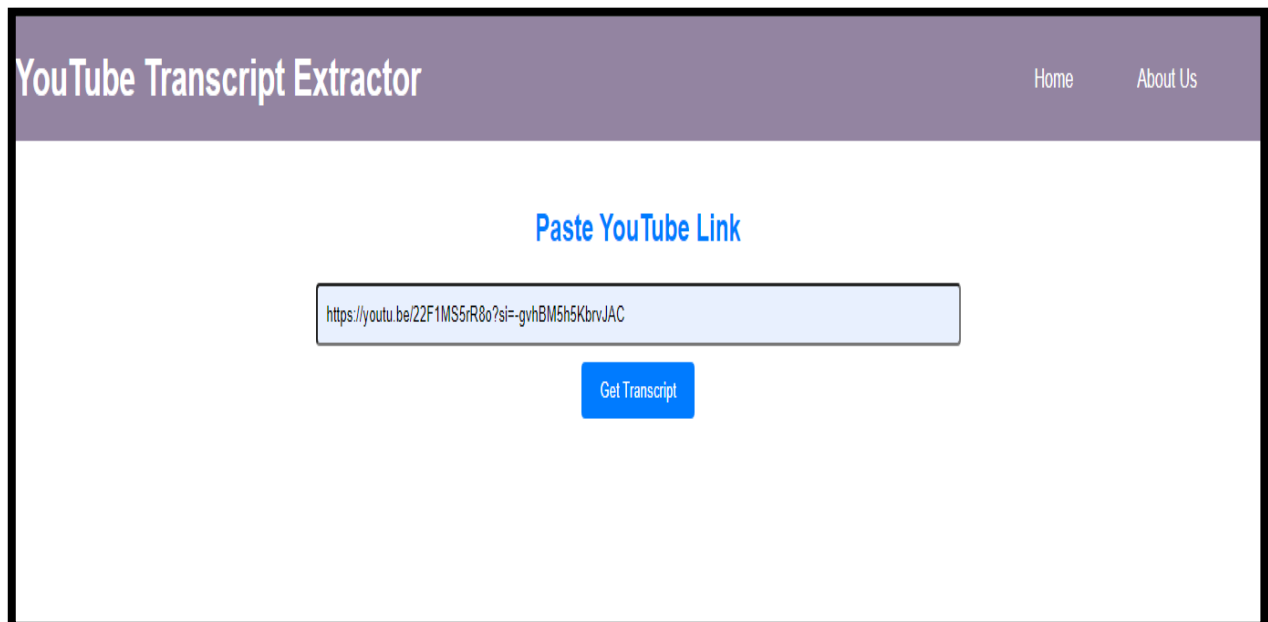
**ii) Fig.7.2 About US Page:**



**i) Fig.7.3 . Result Page:**

SKNSCOE Korti, Pandharpur
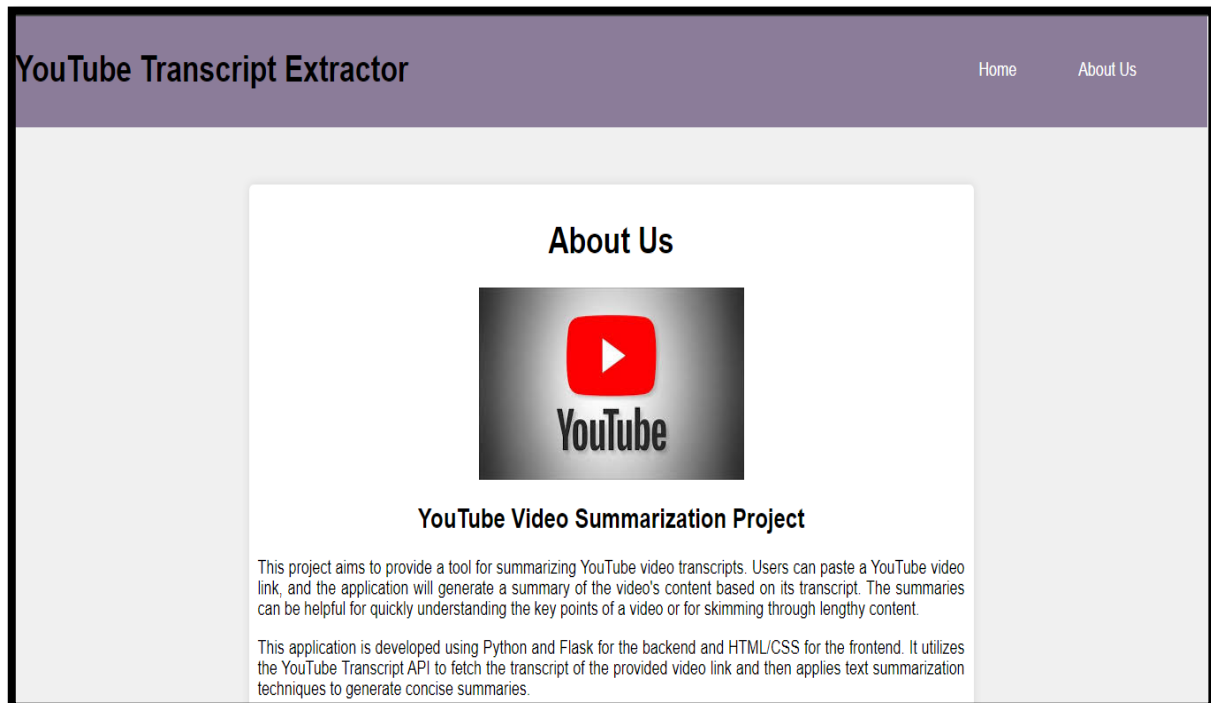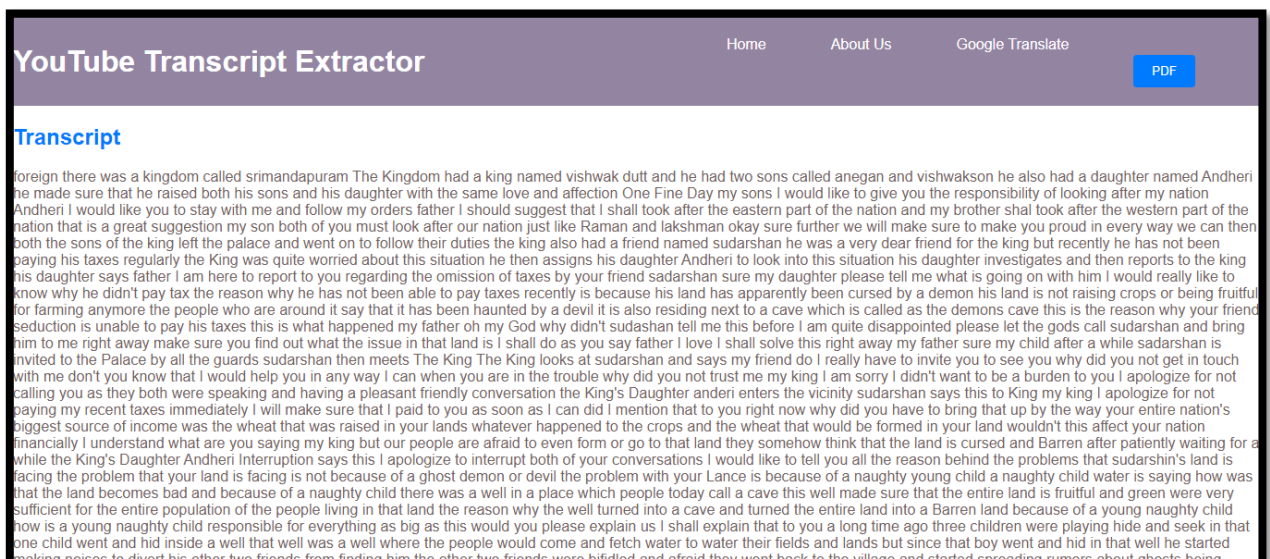
# 8. RESULT

We successfully developed a system capable of automatically summarizing YouTube videos using advanced technologies such as natural language processing.

• The system effectively distills key insights from lengthy videos into concise summaries, enhancing user experience and facilitating better information retrieval.

• User feedback and engagement indicate positive reception and satisfaction with the generated summaries.

• The project highlights the potential of video summarization technology to streamline content consumption and democratize access to information in the digital age.

SKNSCOE Korti, Pandharpur

# Fig. Final Result

## English Transcript



**YouTube Transcript Extractor**

Home    About Us    Google Translate    PDF

**Transcript**

foreign there was a kingdom called srimandapuram The Kingdom had a king named vishwak dutt and he had two sons called anegan and vishwakson he also had a daughter named Andheri he made sure that he raised both his sons and his daughter with the same love and affection One Fine Day my sons I would like to give you the responsibility of looking after my nation Andheri I would like you to stay with me and follow my orders father I should suggest that I shall took after the eastern part of the nation and my brother shal took after the western part of the nation that is a great suggestion my son both of you must look after our nation just like Raman and lakshman okay sure further we will make sure to make you proud in every way we can then both the sons of the king left the palace and went on to follow their duties the king also had a friend named sudarshan he was a very dear friend for the king but recently he has not been paying his taxes regularly the King was quite worried about this situation he then assigns his daughter Andheri to look into this situation his daughter investigates and then reports to the king his daughter says father I am here to report to you regarding the omission of taxes by your friend sadarshan sure my daughter please tell me what is going on with him I would really like to know why he didn't pay tax the reason why he has not been able to pay taxes recently is because his land has apparently been cursed by a demon his land is not raising crops or being fruitful for farming anymore the people who are around it say that it has been haunted by a devil it is also residing next to a cave which is called as the demons cave this is the reason why your friend seduction is unable to pay his taxes this is what happened my father oh my God why didn't sudashan tell me this before I am quite disappointed please let the gods call sudarshan and bring him to me right away make sure you find out what the issue is that land is I shall do as you say father I love I shall solve this right away my father sure my child after a while sadarshan is invited to the Palace by all the guards sudarshan then meets The King The King looks at sudarshan and says my friend do I really have to invite you to see you why did you not get in touch with me don't you know that I would help you in any way I can when you are in the trouble why did you not trust me my king I am sorry I didn't want to be a burden to you I apologize for not calling you as they both were speaking and having a pleasant friendly conversation the King's Daughter anderi enters the vicinity sudarshan says this to King my king I apologize for not paying my recent taxes immediately I will make sure that I paid to you as soon as I can did I mention that to you right now why did you have to bring that up by the way your entire nation's biggest source of income was the wheat that was raised in your lands whatever happened to the crops and the wheat that would be formed in your land wouldn't this affect your nation financially I understand what are you saying my king but our people are afraid to even form or go to that land they somehow think that the land is cursed and Barren after patiently waiting for a while the King's Daughter Andheri Interruption says this I apologize to interrupt both of your conversations I would like to tell you all the reason behind the problems that sudarshin's land is facing the problem that your land is facing is not because of a ghost demon or devil the problem with your Lance is because of a naughty young child a naughty child water is saying how was that the land becomes bad and because of a naughty child there was a well in a place which made people today call a cave this well made sure that the entire land is fruitful and green were very sufficient for the entire population of the people living in that land the reason why the well turned into a cave and turned the entire land into a Barren land because of a young naughty child how is a young naughty child responsible for everything as big as this would you please explain us I shall explain that to you a long time ago three children were playing hide and seek in that one child went and hid inside a well that well was a well where the people would come and fetch water to water their fields and lands but since that boy went and hid in that well he started making noises to divort his other two friends from finding him the other two friends were bifidled and afraid they went back to the village and started spreading rumors about ghosts being

## Hindi Transcript



**YouTube Transcript Extractor**

Home    About Us    Google Translate    PDF

**Transcript**

[संगीत] उदयपुर में रहने वाला ज्ञानचंद बहुत ज्ञानी आदमी था एक दिन ज्ञानचंद अपनी पत्नी से बोला बहुत दिनों से मोहन की कोई खबर नहीं मिली है मैं कल सुबह उससे मिलने उसके गांव के लिए निकल जाऊंगा आज सुबह सुबह मेरी बाईं आंख फड़क रही थी जी आप मत जाइए तुम तो जानती हो भाग्यवान मोहन का हमारे सिवाय कौन है जाते हुए ऐसे टोका टोकी नहीं करते तुम जाकर तैयारी करो मेरे जाने की ठीक है मैं आपकी जाने की तैयारी कर देती हूं ज्ञानचंद का मित्र मोहन बचपन से ही गूंगा और एक पैर से अपाहिज था ज्ञानचंद सुबह जल्दी उठकर अपने मित्र से मिलने निकल पड़ता है रास्ते में उसे एक आदमी मिलता है जो शरीर से काफी तंदुरुस्त था वह आदमी ज्ञानचंद के पास आया भाई आप कौन है और कहां जा रहे हैं मेरा नाम ज्ञानचंद है और मैं अपने मित्र के घर संभाजी नगर जा रहा हूं मेरा नाम महाकाल है मुझे भी उसी तरफ जाना है क्या मैं भी आपके साथ चल सकता हूं मुझे ठीक से रास्ता पता नहीं है बिल्कुल चलिए अच्छा ही होगा हम दोनों अगर साथ-साथ चलेंगे तो समय भी जल्दी कट जाएगा महाकाल यह कैसा नाम है बड़ा अजीब सा नाम है महाकाल खैर मुझे क्या करना है लेकिन उसने महाकाल से कुछ भी नहीं पूछा और दोनों धीरे-धीरे रास्ते पर आगे बढ़ने लगे तभी बीच में एक छोटा सा गांव आया भाई ज्ञानचंद तुम आगे बढ़ो मुझे इस गांव में किसी को एक संदेश देना है मैं बस संदेश देकर तुम्हें मिलता हूं ठीक है मैं एक काम करता हूं आगे उस कुएं पर थोड़ी देर आराम कर लेता हूं तब तक तुम संदेश देकर वापस आ जाओ हां बिल्कुल भाई आप आराम करिए मैं यूं गया और आया ज्ञानचंद कुएं के पास बैठकर पानी पी रहा था तभी उस गांव में शोर उठा कि एक बाज ने किसी आदमी के प्राण ले लिए और तभी महाकाल वापस आता है चलो मित्र आगे चलते हैं बहुत काम अभी बाकी है ना हां भाई चलो तुमने संदेश बहुत जल्दी पहुंचा दिया हां मुझे जिस आदमी से मिलना था वह मुझे पास ही में मिल गया और मैं उसे संदेश देकर तुरंत लौट आया चलो अब अपनी यात्रा शुरू करते हैं [संगीत] [प्रशंसा] [संगीत] मित्र रात होने वाली है और पूरा दिन चलकर हम बहुत थक भी गए हैं क्यों ना हम रात इसी मंदिर में रुक जाए और यही आराम कर ले तुम सही कह रहे हो हम यही रुक जाते हैं और आराम कर लेते हैं और इसी बहाने से प्रभु के दर्शन भी कर लेंगे भूख भी बहुत लगी है इसलिए भोजन कर लेंगे और थोड़ा विश्राम करके सुबह जल्दी ही आगे की यात्रा के लिए निकल पड़ेंगे ठीक है हम यही रुक जाते हैं मुझे इस गांव में किसी का सामान देना है देकर आता हूं तुम भोजन करो मैं आकर खा लूंगा लेकिन मित्र साथ में भोजन करते हैं ना अरे मित्र बस में काम निपटा करर अभी आया आप भोजन [संगीत] करो अरे आग लग गई भैया अरे पूरे गांव में आग लग गई लगता है कुछ नहीं बचेगा यह महाकाल जहां भी जाता है वहां किसी ना किसी तरह की अनहोनी हो जाती है तभी महाकाल वापस आता है लेकिन वह महाकाल से कुछ नहीं [संगीत] पूछता और दोनों सो गए और सुबह जल्दी उठकर दोनों आगे की यात्रा पर निकल पड़े देर बाद फिर से एक दूसरा गांव आया मित्र तुम थोड़ा विश्राम करो मुझे इस गांव में कुछ काम है मैं तुमसे आकर मिलता हूं अब ठीक [संगीत] है अरे भैया अरे मधुसूदन को सांप ने डस लिया अरे भैया उसकी मृत्यु हो गई है तभी महाकाल वापस आ जाता है अ मित्र मैं तुमसे कुछ पूछना चाहता हूं अगर तुम्हारी अनुमति हो तो हां बोलो क्या बात है मित्र मन में जो भी शंका है उसे दूर कर लो तुम जिस गांव में भी जाते हो तुम्हारे जाते ही वहां कुछ ना कुछ अनहोनी क्यों हो जाती है क्या तुम मुझे बता सकते हो कि ऐसा क्यों हो रहा है ज्ञानचंद आप मुझे बड़े ज्ञानी लग रहे थे इसलिए मैं आपके साथ यात्रा करने के लिए निकला था क्योंकि मैंने सुना है ज्ञानियों का साथ हमेशा अच्छा होता है क्या सचमुच आप अभी तक नहीं समझे कि मैं कौन हूं मैं समझ तो चुका हूं लेकिन कुछ शंका है यदि आप अपना सही परिचय दें तो मेरे लिए आसानी होगी मैं यमदूत हूं और यमराज की आज्ञा से उन लोगों के प्राण हरण करता हूं जिनकी आयु पूर्ण हो चुकी है अगर ऐसी बात है और तुम सचमुच ही यमदूत हो तो बताओ अगली मृत्यु किसकी है अगली मृत्यु तुम्हारे मित्र की है जिससे तुम मिलने जा रहे हो और उसकी मृत्यु का कारण भी तुम ही होगे अब तुम यह तुम यह क्या कह रहे हो क्या सच में अगली मृत्यु मेरे मित्र की होने वाली है और और मैं ही उसकी

SKNSCOE Korti, Pandharpur

# 9. CONCLUSION

Our project successfully demonstrated the power of Natural Language Processing (NLP) for summarizing YouTube videos. Our approach produced concise and informative summaries, improving the user experience. While our results were promising, there's room for improvement in fine-tuning models with domain-specific data and integrating multimedia features. Future work could explore multi-modal summarization and real-time applications.

SKNSCOE Korti, Pandharpur

# 10. REFERENCES

Here are some references for YouTube video summarization: -

1. Gygli, M., Grabner, H., Riemenschneider, H., & Van Gool, L. (2014). Creating summaries from user videos. In European Conference on Computer Vision (pp. 505-520). Springer, Cham.

2. Mahasseni, B., Lam, M., Todorovic, S., & Mori, G. (2017). Unsupervised video summarization with adversarial LSTM networks. In Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (pp. 1059-1068).

3. Potapov, D., Douze, M., Harchaoui, Z., & Schmid, C. (2014). Category-specific video summarization. In European Conference on Computer Vision (pp. 540-555). Springer, Cham.

4. Zhou, B., Khosla, A., Lapedriza, A., Oliva, A., & Torralba, A. (2018). Learning temporal coherence via self-supervision for GAN-based video generation. In Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (pp. 6833-6842).

5. Zhang, C., Wang, W., & Jiang, Y. G. (2016). Video summarization with long short-term memory. In European Conference on Computer Vision (pp. 766-782). Springer, Cham.

SKNSCOE Korti, Pandharpur