Abstract

Personalization is an essential element of any content access. Currently, there are only a few platforms that offer personalized digital content services. The platform offers personalized recommendations over Podcasts and Standup Comedy based on user genre preferences. The metadata available in the video descriptions is utilized to enhance search results and proficiency in the topic area. This will provide a personalized environment in which to explore the various genres available. The recommendation will be made using content-driven algorithms. The initial recommendations are based on popularity and then personalized recommendations are made based on acquired data. The final website includes a friendly platform that offers personalized recommendations. Monitoring of user satisfaction and engagement will be monitored and provided with additional content.

Keywords: Digital content recommender system, Content-based filtering, Metadata, keyword embedding, Keyword concatenation, Personalized recommendations, User preferences.
1 Introduction

Digital content is being a very famous way of consuming knowledge, inquire and learn many new technologies and future updates for people in this era of developing technology. Personalizing content which is being consumed by many people would be a great way of helping users with ease in content access and a great way of increase in learning interest or trying to acquire some knowledge based on the topics they want. Even the main platform has become more cluttered with other recommendations which leads users with distraction over the content they are looking for.

This project focuses on a platform that offers content recommendations for booming digital contents such as Podcasts, Stand-up Comedy. This platform allows users with finding a creator whom they have seen somewhere but unable to get their details.

The project importance’s the data from video descriptions to provide search results and experience better recommendations. This allows users to explore and experience various genres. The recommendation system algorithm will initially recommend the content based on the popularity, then the rest content.

Colleges and universities can collaborate with us in order to promote their content through this platform and let their students get to know about the developments that are taking place in the other space of their world, which would give a clear-cut idea about needs of future developments in all fields such as technology, construction, etc.

The ultimate goal is to provide an engaging and dynamic platform or website that not only enhances the experience of personalized recommendation of content but also for navigating and accessing options in a user-friendly way.

2 Literature Survey

2.1 Content Based Filtering

Content based algorithm is a machine learning algorithm which is one of the techniques used to build a recommendation system, it basically takes users preferences[1] as an input for recommending them with content. It can even be expanded to recommend content to users based on their watch history too. It mainly advantages the users who interests in watching a particular genre of content rather than exploring multiple new content. Analyses the attributes of the items and match them with users’ preferences. CBF allows the content to have a well-defined semantic, which enables the user to better interaction with the supplied information based on their preferences.

2.2 Keywords

Loh has researched and explored about the use of keywords and classes to create user profiles for content-based recommendations. Keywords are automatically extracted from the text [2]. Researchers have developed a system that learns user profiles implicitly by using keywords and their automatically generated relationships [3], these allow relationships enhance the accuracy of similarity calculations. Their system estimates the likelihood of a user being interested a particular item based on the characteristics of the item.[4] tags given as input are improved for precision of recommendations. Tags helped to create more detailed and accurate user profiles.

2.3 Similarity

Content based recommendation involves recommending items that are similar to those a user has previously liked.[5] The core task of content-based recommender system is to calculate the similarity between items. One of the most popular methods for modelling items id the Vector Space Model. This model extracts [6] keywords from an item and assigns weights to them.[18] The prediction of unknown ratings occurs during the active user visit stage. For new users, the user-based predictor is estimated to the ratings. However, for existing users, the item-based predictor is utilized, this significantly enhances the recommendations quality, regardless the users’ status which can be new or existing.

2.4 Cold start

Content based recommendation algorithms have an advantage when it comes to providing recommendations to a new users’, over the other approaches like collaborative filtering. Collaborative filtering struggles in recommending content to user as there is very limited or no interaction history.[7] Even though a user is new into the system, content-based algorithms can make recommendations based on users’ preferences. This is because content-based algorithms analyze the content of the items and make recommendations based on their similarity to items that user has previously liked.[10]
2.5 Information Filtering

Information filtering techniques are essential for removing irrelevant information and content from a user’s perspective. Content-based filtering techniques analyze the features of items to make recommendations based on a user’s interests. Folksonomy is a user-generated taxonomy that categorizes user interests with tags.

Researchers have developed a method for learning user profiles from both static content and UGC [9]. This method uses semantic analysis of the content and knowledge bases to overcome the limitations of keyword-based approaches. The advantage of this system is that it can analyze both static and UGC, and it addresses the limitations of keyword-based approaches. Main goal of classification learners is to learn a function that predicts which class a document belongs to. In information retrieval system the first step is to identify keywords for representing the documents. It avoids indexing useless words, a text retrieval system often associates stop list with a set of documents. The irrelevant words are called stop list. The information retrieval system needs to identify groups of words where in a group are small syntactic variants of one another and collect only the common word stem. A group of different words may share the same word stem.

2.6 Recommendations

This can be divided into two distinct parts: rating prediction and item selection, we focus specially on the rating prediction aspect. The system first determines whether a user is a new user or not. Subsequently, the user-based prediction is performed to calculate the unknown ratings for these new users.

3 System Architecture

![System architecture diagram](image)

Figure 1: System architecture diagram
4 Related Work

Figure 2: Graphical representation of increase in consumption of personalized content.

4.1 Rating Similarity

\[ M(k, d, v) = \begin{cases} v & \text{if } k \in d \\ 0 & \text{otherwise} \end{cases} \]

Where: \( M(k, d, v) \) represents the function that performs a key match and conditional assignment. \( k \) represents the key to search for. \( d \) represents the dictionary. \( v \) represents the default value to assign if the key doesn’t exist.

4.1.1 Key Existence Check

\[ \text{KeyExists(key, dictionary)} = \begin{cases} \text{True} & \text{if } key \in \text{dictionary} \\ \text{False} & \text{otherwise} \end{cases} \]

\[ \text{GenreValue(key, dictionary)} = \text{dictionary}[key] \text{ if KeyExists(key, dictionary)} \text{ else None} \]

Key Exists (KeyExists(‘name’, newdict) = True)
Key Doesn’t Exist (KeyExists(‘name’, newdict) = False)

The above equations used for finding out the similarity between the genres selected by the user as their preferences for content recommendation and the genre of a particular video that it comes under. This makes the work easier in assigning videos for a particular user into their recommendation section.
4.2 Information Filtering

Figure 3: gathering video id’s in a random order

<table>
<thead>
<tr>
<th>Video ID</th>
<th>Description</th>
<th>Uploaded Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>31</td>
<td>the Vocna transformation is 😱 shorts #strange...</td>
<td>2022-06-19T14:00:00Z</td>
</tr>
<tr>
<td>17</td>
<td>Tripping Over Nothing Prank 😁 comedy #funny...</td>
<td>2023-06-18T15:56:44Z</td>
</tr>
<tr>
<td>23</td>
<td>Ghost Story</td>
<td>Standup Comedy</td>
</tr>
<tr>
<td>1</td>
<td>Kaala Jaade</td>
<td>Standup Comedy</td>
</tr>
<tr>
<td>35</td>
<td>Rani Mukerji speaking in Bangla is too cute😊💕...</td>
<td>2021-05-27T22:29:38Z</td>
</tr>
<tr>
<td>41</td>
<td>It’s a cama 😱 shorts</td>
<td>2023-04-19T11:00:24Z</td>
</tr>
<tr>
<td>46</td>
<td>When A Tantric Meets An Aghori Baba...</td>
<td>2023-03-23T09:00:08Z</td>
</tr>
<tr>
<td>28</td>
<td>Aghori Baba Shorts</td>
<td>Power of Aghori Shsorts #...</td>
</tr>
<tr>
<td>20</td>
<td>Sabse Darwana Experience 🤡 - @SushantDDvJrR...</td>
<td>2022-10-20T15:14:26Z</td>
</tr>
<tr>
<td>32</td>
<td>REAL BEAUTY OF SANATAN DHARMA 🌏️ 🌏️</td>
<td>2023-05-06T13:45:44Z</td>
</tr>
<tr>
<td>44</td>
<td>Arrogant Boy Has a Secret Allowing Him To Treat...</td>
<td>2022-11-30T17:00:24Z</td>
</tr>
<tr>
<td>16</td>
<td>Backwards prank at the hospital #shorts...</td>
<td>2022-10-03T10:00:50Z</td>
</tr>
<tr>
<td>9</td>
<td>Black Magic in Varanasi #88Shorts</td>
<td>2012-12-23T16:09:39Z</td>
</tr>
<tr>
<td>34</td>
<td>Why Girls are Touching Samay Raina 😥</td>
<td>2023-03-14T05:40:41Z</td>
</tr>
<tr>
<td>21</td>
<td>Why You See Nimithu Kirchi On Indian Roads - Bl...</td>
<td>2023-01-01T15:30:05Z</td>
</tr>
<tr>
<td>29</td>
<td>The Black Phone - Official Trailer...</td>
<td>2021-10-12T15:00:12Z</td>
</tr>
<tr>
<td>27</td>
<td>Ghosts and Periods</td>
<td>Stand Up Comedy by Urooj...</td>
</tr>
<tr>
<td>17</td>
<td>South Indian vs Hindi</td>
<td>Indian Stand Up Comedy...</td>
</tr>
<tr>
<td>2</td>
<td>This Real Story Of Black Magic Will Shock You...</td>
<td>2023-11-08T10:47:58Z</td>
</tr>
<tr>
<td>40</td>
<td>Aghori Baba &amp; Shiva Bhakti, Yoga Gurud Saraswati 🌺...</td>
<td>2021-04-09T13:33:01Z</td>
</tr>
<tr>
<td>37</td>
<td>Janki Kapoor &amp; Rihana’s FUN dance on Zara...</td>
<td>2024-02-20T16:16:46Z</td>
</tr>
<tr>
<td>42</td>
<td>Mythology &amp; Religion 📚</td>
<td>2019-09-23T12:06:59Z</td>
</tr>
<tr>
<td>0</td>
<td>RealTalk Ep.24 Ft. Gijajayalani on Ghosts, Black...</td>
<td>2022-12-18T06:40:45Z</td>
</tr>
<tr>
<td>6</td>
<td>Kaali Mata ki Kahaani - Black Magic &amp; Aghori...</td>
<td>2022-05-26T15:54:07Z</td>
</tr>
<tr>
<td>40</td>
<td>SaiDharmenderla a Counter</td>
<td>Shorts...</td>
</tr>
<tr>
<td>5</td>
<td>Black Magic Removal,Exorcism and Types of Spirit...</td>
<td>2012-01T06:39:00Z</td>
</tr>
<tr>
<td>30</td>
<td>A fake Guru cannot know God. He can only cheat...</td>
<td>2020-01-15T11:42:28Z</td>
</tr>
<tr>
<td>10</td>
<td>Aghori culture, Kaal Bhairav, Black Magic, Bal...</td>
<td>2022-03-26T13:33:00Z</td>
</tr>
<tr>
<td>43</td>
<td>Bruce Almighty : Bruce controls Evan HD CLIP</td>
<td>2021-01-09T03:00:12Z</td>
</tr>
</tbody>
</table>

Figure 4: Collecting video descriptions and date of publish
Figure 5: Listing out video images for thumbnails with like and dislike count.
4.3 Keywords gathering

Figure 6: Storing usernames from database into a dictionary.

Figure 7: Storing username and their preferences.

5 Experiments

```
def search_youtube_videos(query, api_key):
    base_url =
    params = {
        "part": "snippet",
        "maxResults": 5,
        "q": query,
        "type": "video",
        "key": api_key
    }
    response = requests.get(base_url, params=params)
    return response.json()

videos_dict = {}
genre_preferences = ["happy", "sad", "comedy"]
```

Figure 8: Limiting count of results for each genre to 5.
6 Discovery and Discussions

The project is capable of making recommendations to users based on the preferences that a user has selected while registering themselves into the website. A user can view or explore other genres too through the search bar or through the keywords in the Main page. University Special is independent to users (based on the university tie-ups, the cards will change). We even try to push some other genre of content so that it could be knowledgeable to users regarding the existence of such type of content. Users can easily identify a content creator through profile cards, easily watch all of their content without any limitations.
via search bar and access their public profiles sites. A user is allowed to change their preferences after every month. The recommendations that are made to user will change after the update of dataset. The Content Based algorithm keeps on updating the dataset with newer and recent content posted by different content creators in YouTube and even for university students if their respective university updates any videos in YouTube. Content updating will be done in overall dataset and individually for users too.

7 Conclusion and Future work

7.1 Conclusion

The digital content recommendation system will allow users to access their required content by using ML based algorithms and techniques. This platform observes users’ personalisation’s and interests towards the topics they are searching for and the type of content they are accessing to learn and experience. User experience will be enhanced through responsive navigation between webpages. The application represents a combination of technology and interest in learning new things that would help in development of user’s knowledge. Content which are license free will be recommend continuously and licensed content will be shown to users after we seek permissions from content creators.

7.2 Future Work

Extension of content types- The platform could include more types of content such as teaching users how to play an instrument and how to create content, etc. Advanced Algorithms- tentative algorithms will not be used. Some new algorithms will be used so that the platform could incorporate more advanced recommendation algorithms, which would potentially improve the accuracy of the recommendations. Partnership with creators- The platform could form partnerships with content creators to offer exclusive content, further enhancing its appeal to users. Global Expansion- If the platform is currently available in limited regions, there could be plans for expanding its services globally, reaching out to a broader audience. Chatbot- takes users feedback for improvements and also provides additional and instant recommendations in a limited number.

References


