

SUMMARIZED AUDIO BOOK RECOMMENDATION SYSTEM WITH OPEN SOURCE DATA

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ABSTRACT

In a day to day life there has been tremendous development in digital library. The infrastructure of reading books has changed colossally. The book industry is undergoing digital transformation. The recommender systems are software Systems that filter relevant information out of large amount of available information as per user's preference and interest. In addition to recommendation, the content of the book will be portrayed in the form of sound especially for the people who actually can't sit and read the book. In a day to day life, the libraries and knowledge centers have to go hand in hand with upcoming e-tech demands of user. In the light of background, the application makes a profile of a user so that user can add books of his / her own choice. The user will have a privilege to share their book shelf with their friends.

KEYWORDS: *Audio, Digital Library, PDF, Book Summary*

INTRODUCTION

In the era where technologies are developing at a rapid rate, the people attempt to find the information via smart device. Many users' access different book online which makes him/her very convenient to read the book. This application allows user services with a user can create his/her book shelf which contains books of his/her own choice. For making this bookshelf, the user needs to create an account. This account will contain users' books, which will hold two (2) separate parts, out of which one is visible to user only and other is visible to users' peer. The user can also share his books to colleague via social media. The users of social media accounts will be interlinked with this application. The user may rate the book and also give feedback of the book. This application also provides a concept of audio-book. This concept is introduced mainly for the people who have no time to sit and read the book. They can easily access the book via audio systems.

LITERATURE SURVEY

In 2012, C. A. Gomez I N. Hunt Competitive Business Model in Audio Book Industry A case of chain distribution)

In this paper, Shanda platform was used and advantage of the platform is its original work and good base. The disadvantage in this paper is single product and the single channel distribution.

In 2018, Mohit Gupta, Sridevi Jetty Library was in everyone's pocket. In this paper, the library OPAC was used; it saves the time of user. This delivers the notification of new arrival and provides services within their system. The disadvantage of this paper is it provides services within their organization.

In 2017 Goran Antolic, Ljiljana Brkic Recommender System was based on the analysis of publicly available data. The advantage of this paper is recommendation system, which uses publicly available services to get the data which is useful to build the user profile. And the disadvantage is that user is not satisfied with grade of recommendation.

In 2017.E. Mohamed sarwat, Raha Moraffah, Mohamed F. Mokbel, James L. Avery Database System Support for personalized recommendation Application was developed. In this paper, the system collects the statistics about the demand of each user and leverages these statistics to take the materialization decision. And the disadvantage is that no sharing of books is allowed.

In April 2017, Y. Sahana Karanth, Jenishiyacastelino, Nireeksha developed an Advanced library Management system using Android device. In this paper, it provides easy interfaces, and it can be used in all the existing versions of android devices. The main disadvantage is about managing the library manually by a librarian.

In 2017 Jayanti Rathnavel, Kavita Kelkar developed Personalized Book Recommendation System. In this paper, it tries to eliminate the problem like cold start and scalability.

Proposed Work

This section describes the proposed system, explaining how modules and components integrate and communicate to bring about the working application of the proposed system. The systems cause to grow and elaborate necessary condition of contemporizes collaborative filtering recommendation system. This algorithm includes computational structures and latest model training algorithms. The system contains major functional building blocks that are requisite to perceive the intended meaning of an online book recommendation system.

The User: The user represents the individual or client that utilizes the interface of the android application at any time and location globally. User activities include the creation at any location globally of his/her profile. This profile is composed with users' information and enables to view the books that he/she curiously are interested in.

Book List: A book list in the proposed system refers to a collection of recommended or non-recommended books presented to the user through the app interface. **User's Preferences:** The user's preference is used to describe the user's preferences the preferred choice of suggested books. Different users have different choice of books. A collection of these user choices contribute to the effective recommendation of books summary is auditable for other users

Users rating: The user rating describes the act of the user providing ratings for the books in the book shop.

Implicitly and Explicitly Rated Books: This represents a collection of book ratings which are obtained by explicitly providing users with an interface/option to rate books online. Rated books data is also obtained by implicitly observing and taking note of how a user interacts with the online bookshop. **Rating stored in Firebase:** A collection of different rated books and user list is saved into a real-time. NoSQL database called Firebase are used to perform recommendation of items. **Directory Created for the file:** For each entry in the Firebase database, links are created to ensure access to data from the Recommender android application.

Collaborative Filtering (CF) Recommender: This involves the generation of books recommendation list for users using the inputs in the database. The engine of the CF Recommender performs the reorganization books that are similar among the other books that are rated by the users. This is done by using an adjusted cosine similarity model. This is given as:

Directory Created for the file: For each entry in the Firebase database, links are created to ensure access to data from the Recommender android application.

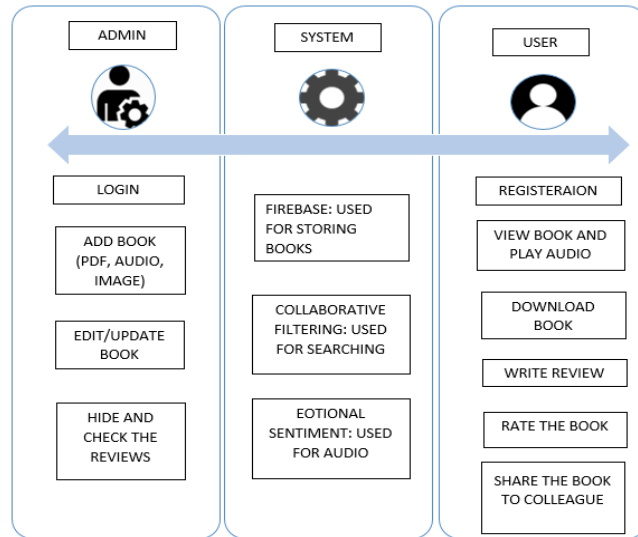


Figure 1: Architecture Diagram.

ALGORITHM

Collaborative Filtering

Collaborative Filtering is used for recommendation that are purely based on the action of people with identical interested. It is based on the book that the user is interested in.

Item based collaborative filtering is used as it works better with large sets of data. The algorithm is as follows:

List all the items with the given ratings to them by different users.

Calculate similarity between the items using Pearson correlation coefficient:

Where,

$$r(X, Y) = \frac{\sum(X - \bar{X})(Y - \bar{Y})}{\sqrt{\sum(X - \bar{X})^2 \sum(Y - \bar{Y})^2}}$$

X : Rating of person X for item k

\bar{X} : Mean Value of person X ratings

Y : Rating of person Y for item k

\bar{Y} : Mean Value of person Y ratings

Similarly, it is possible to compute the similarity between all the N numbers of pairs of ratings for particular item. Sort the similarity between the items such that the items are in descending order. Produce weighted table for scores that rank the items by multiplying the ratings by different users similarity score. Find the average of the weighted scores by dividing the weighted score by sum of the similarity ratings. List out N items for user by sorting the average weighted scores.

METHODOLOGY

GTTS (Google Text to Speech):

This is a screen reader algorithm, which is used to convert text into audio format. That is the book summary which is in text format is able to hear user in audio.

- In GTTS (Google Text to Speech) the input is in form of text.
- The language model is a file that contains the sequence of words. This model is used for dictation application.
- Google text to speech converts the text into audio format.
- The output is in the audio format.

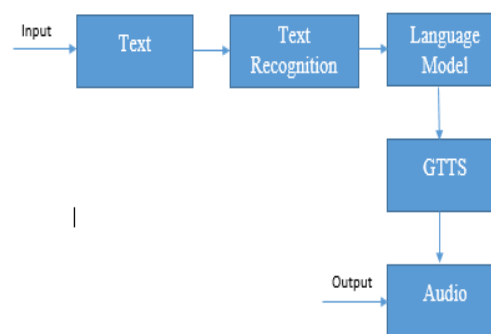


Figure 2: GTTS Block Diagram.

Process of GTTS:

- Libraries are imported from gttts.
- Add a text.
- Select Language.
- Load mp3 file in Library of your choice.

Content Based Recommender:

In this type of algorithm, items are first represented by their attributes. A user profile is then built by taking Users rating on this attribute. The rating can be Taken from implicit action of the user such as reading item, Clicking or explicitly by asking the user to rate the item.

With regard to taking the similar book recommendation, we use similar matrix, which is interrelated to each and every word related in the book title. The content based recommender matrix looks same as figure. The diagonal are symmetrical because of their similarities between book 1 and book 2 and will be same as book 2 and book 1. This may include author of his entire books and all other books from different authors which Share similar title.

	Book 1	Book 2	Book 3	.....	Book n
Book 1	1	0.285	0.482	.....	0.526
Book 2	0.285	1	0.376	.....	0.574
Book 3	0.482	0.376	1	.....	0.492
.....
Book n	0.586	0.574	0.492	.....	1

Figure 3: Similarity Matrix.

RESULTS AND DISCUSSIONS

- In our System, we can search Book using Rating and audio of book summary. The result is given below.
- In this paper we can search books according to user interest and books rating. In this paper, initially it audio is played on book summary and then book can be downloaded.
- So in this system, not each and every book can be downloaded initially and then it can be read. You can easily listen to their book summary which can be heard like human voice and then download pdf file.
- These audio-based books can be best action to achieve and overcome the difficulties that are faced by human such as difficulty in reading of some words..
- This may allow the person to express their development of skills such as it improving their knowledge, listening power and may get to know many interesting things.

Result in graphical Format:

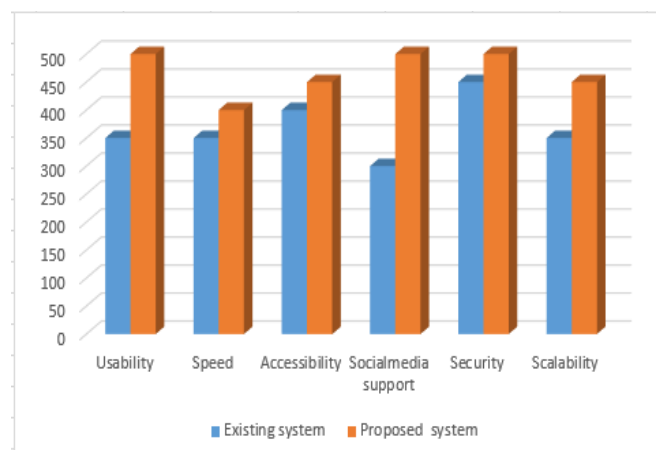


Figure 4.

DISCUSSIONS

In our System, we can add some more features like search books using available book images, and providing book suggestion through audio book summary to users.

CONCLUSIONS

This paper was able to present a comprehensive review on researches previously targeted on improving recommender systems. It also introduced a real-time database, an efficient quick sort algorithm and adjusted cosine similarity algorithm to improve the recommender systems. From the results and visualizations, we can deduce that the accuracy of rating followed a normal distribution which suggests consistency and efficiency. Hence, future works should target on securing recommender system data against attacks and also improving on the algorithms used.

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