

## Smart Book Recommendation System For Library Books: LibX

Yash Trivedi, Kartik Kansaria, Prof. Deepali Vora

*Information Technology Vidyalankar Institute of Technology , VIT Mumbai,India*

*Information Technology Vidyalankar Institute of Technology , VIT Mumbai,India*

*Information Technology*

*Vidyalankar Institute of Technology , VIT Mumbai,India*

*Corresponding Author: Yash Trivedi*

**Abstract**— General recommendation systems are used to suggest appropriate items to the users. The book recommendation systems analyze the content of the book or reviews of readers to suggest apt choice for the user. Book recommendation systems are used to suggest a novice user with the right choice and also simplify the complex decision making process by extracting information from the knowledge base. These systems implement automation which reduce existing workload on the current organization and at the same time create a knowledge base which very useful for information extraction. LibX - An Automated Bibliotheca is basically a book recommendation system which will be used by students and staff to access the library facility such as books and papers and exam notes. It will provide the best of reference books through recommendation and feedback by others. Recommender systems help in automating and making decisions based on the collective knowledge and lay the foundation of solving decision based approaches in the future on various streams from information technology to robotics.

**Keywords**—Recommendation Systems,Library Recommender system, Machine Learning.

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### I. INTRODUCTION

Recommender Systems Recommender systems or recommendation systems are a subclass of information filtering system that seek to predict the 'rating' or 'preference' that user would give to an item . Recommender systems have become extremely common in recent years, and are applied in a variety of applications. Recommender systems assist and augment this natural social process to help people sift through available books. Usually, a recommender system providing fast and accurate recommendations will attract the interest of students and bring benefits to companies and organization. Usually Recommender systems produce a list of recommendations in one of three ways: Collaborative filtering (CF), Content-based filtering, and Hybrid recommender systems.[1] Recommender systems improve access to relevant products and information by making personalized suggestions based on previous examples of a user's likes and dislikes. Most existing recommender systems use social iterating methods that base recommendations on other users' preferences. By contrast, content based methods use information about an item itself to make suggestions. This approach has the advantage of being able to recommend previously unrated items to users with unique interests and to provide explanations for its recommendations. [2] The purpose of LibX -An Automated Bibliotheca is to utilize the resources provided in the library to it's most optimum and at the same time to create a centralized repository which helps everyone to access papers and recommends the best reference books based on the reviews by everyone a part from that it aims to spread awareness of a variety of resources provided by the library. At the same time our teachers can also load crucial exam notes and research papers required by the students. Recommendation system is one of the stronger tools to increase profit and retaining buyer. The book recommendation system must recommend books that are of buyers interest [3]. Recommendations are being regarded as a new key measure of determining whether or not products, services and business are successful. From prior research, we know that 92 percent of all consumers report that a word-of-mouth recommendation is the leading reason they buy a product or service [4].Section 2 provides more information about different approaches to hybrid recommendation systems followed by a discussion of the proposed system in Section 3.The remaining sections deal with algorithm comparison, usage and their respective advantages/disadvantages are highlighted.

## II. SYSTEM ARCHITECTURE

Each component block is explained in detail below –

### A. Database I-

Register, Login and Passwords: This database is used to store login and passwords in a hashed form and will be used to compare and evaluate login of various users and provide them with access according to their user level.

### B. Database II-

This database is used to store all other processing content and items required to keep the recommender system and site running in coordination with DB I.

### C. Books–

Provides access to all types of books and notes uploaded by admin.

### D. Papers –

Provides access to all types of research papers uploaded by admin and staff.

### E. Review, Ratings and Feedback–

This component are responsible to indicate weights in the recommender system and provide information to Machine Learning component accordingly.

1. Stop word removallist (removing words which are not important which are normal conjunction and grammar).
2. Calculate degree of association (calculates the associativity between 2 keywords takes a decision whether it is one keyword or not)
3. Keyword pruning (removes all keyword which have lesser score and do not qualify the threshold).
4. Keyword Extraction.

### F. Admin –

Admin module can be accessed by entering its id and password, admin can insert new book, upload IEEE AND VIT paper.

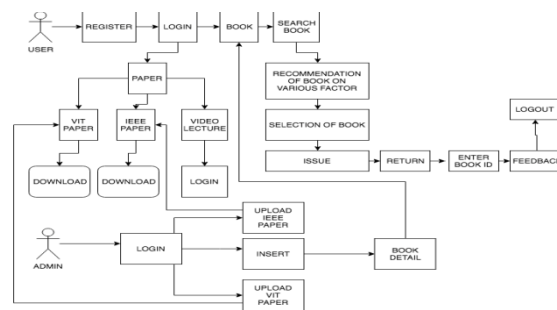


Fig 1:Block diagram

## III. IMPLEMENTATION AND RESULT

TABLE I. User Feedback Calculation Matrix

Bookid	Keyword present	Keyword present (in title)	User feedback rating	Total
1001	AI,intelligent	AI, intelligent, artificial	5	9
1002	Java,programming	java, Advanced java ,	3	8
1003	Spm,agile	Software project management, project ,management,	4	10
1004	Coding,programming	Steve McConnell, Rapid ,code	5	9
1005	Algorithm,protocol	algorithm , cryptography , protocols	2	7

For every user query the total score for each book is calculated and the result is stored in an array with 'BookId', 'Name of Book', 'Score'. Then the array is sorted and results are displayed to the user with book having highest score at the top.

Here are some of the few screenshots of book recommendations–



Fig 2: Book Issue Page

BookId	Book name	Weight
1016	Refactoring: Improving the Design of Existing Code	4.5
1013	Applied Cryptography: Protocols, Algorithms, and So	4.5
1018	The Art of Computer Programming, Vol. 1: Fundam	3.5
1013	Just in Software	3.5
1018	Writing Effective Test Cases	3

Fig 3: Recommendation Page

This is book issue page user will search the book name on the search bar. After searching for the book the recommendation of book will take place with more higher weight, depending on the user, he will select the book.

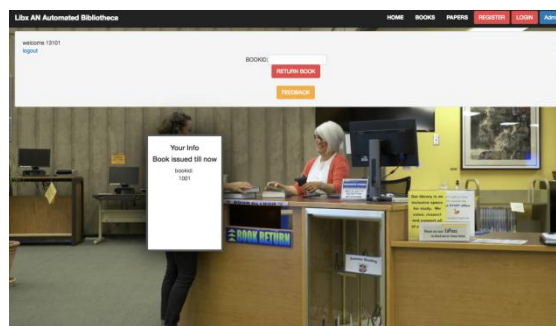


Fig 4: Book Return

On returning the book, user will write his book id from the list of book id he has issued.

Fig4: Feedback Page

Once the book is returned, user will be redirected to feedback form where he has to fill the necessary details.

#### IV. USER RESPONSE

This section talks about the input statistics which we received after the completion of our project when hosting it in our college project competition called Tantravihar 2018 and lists the feedback received from people and the relevant recommendations with it.

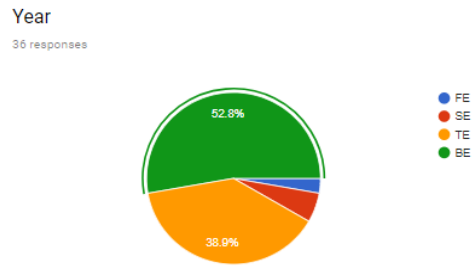


Fig 5: User response (based on year).

How would you rate the user interface and functionality

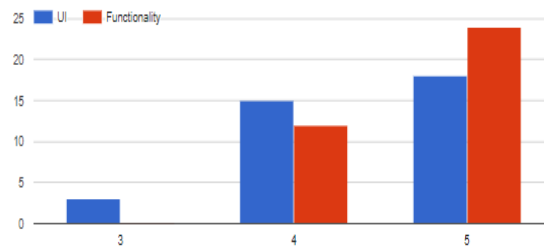


Fig 5.1: User response (based on Functionality)

Rate project according 0-5 (5 being highest)

36 responses

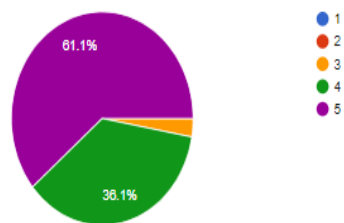
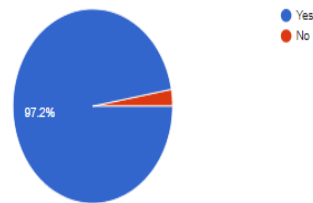


Fig 5.2: User response (based on rating project).

Do you think the project is useful for being used in the library

36 responses



**Fig 5.3: User response (based on project usefulness)**

97.2percent of them rated the project as useful for the library.  
61.1 percent of the respondents rated the project 5/5.

## V. CONCLUSION

Recommender systems are already a huge part of our lives and are tightly integrated into a variety of systems around us. This project not only helped us to enlighten different recommendation techniques by understanding them but also helped to contribute valuable information and data gathered. There are a number of challenges like the cold start problem to face in recommendation systems but the field of recommendation will only get more invaluable to us and help to increase the efficiency of data analysis. Managing trust is of essence and a big data point currently debated in the industry as the data should not be able to personally identify the user and keep his privately identifying information secure. At the same time it should be able to provide enough aggregate data to companies such that they can take the best possible decisions to tailor their products accordingly. The project also helped to create a digital interface and can be used further as a system in our own library which might be helpful to other students in the future as it creates a quality control standard only refining and providing the books which are the best among that subject area.

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