A HYBRID E-LEARNING RECOMMENDATION APPROACH BASED ON LEARNER'S INFLUENCE PROPAGATION

K. Venkatesh [1], K. Sravani[2],

[1]**Assistant professor(HOD) , MCA DEPT,** Dantuluri Narayana Raju College**, Bhimavaram, Andharapradesh**
Email:- kornalavenkatesh@gmail.com
[2]**PG Student of MCA, Dantuluri** Narayana Raju College**, Bhimavaram, Andharapradesh**
Email:- koppinenisravani9@gmail.com

ABSTRACT

In e-learning recommender systems, interpersonal information between learners is very scarce, which makes it difficult to apply collaborative filtering (CF) techniques. In this study, we propose a hybrid filtering (HF) recommendation approach (SI □ IFL) combining learner influence model (LIM), self-organization based (SOB) recommendation strategy and sequential pattern mining (SPM) together for recommending learning objects (LOs) to learners. The method works as follows:

(i) LIM is applied to acquire the interpersonal information by computing the influence that a learner exerts on others. LIM consists of learner similarity, knowledge credibility, and learner aggregation. LIM is independent of ratings. Furthermore, to address the uncertainty and fuzzy natures of learners, intuitionistic fuzzy logic (IFL) is applied to optimize the LIM.

(ii) A SOB recommendation strategy is applied to recommend the optimal learner cliques for active learners by simulating the influence propagation among learners. Influence propagation means that a learner can move toward active learners, and such behaviors can stimulate the moving behaviors of his neighbors. This SOB recommendation approach achieves a stable structure based on distributed and bottom-up behaviors of individuals.

(iii) SPM is applied to decide the final learning objects (LOs) and navigational paths based on the recommended learner cliques. The experimental results demonstrate that SI □ IFL can provide personalized and diversified recommendations, and it shows promising efficiency and adaptability in e-learning scenarios

1 INTRODUCTION

Currently, owing to the plentiful learning materials and the convenient access, e-learning platforms have been widely used by learners to accomplish their study, such as ELM-ART, AHA, etc. The popularity of MOOCs, such as Coursers and edX, further increase learners' interests on e learning. Correspondingly, how to recommend personalized and effective learning resources and learning path to e learners has become an important problem, because more and more learners expect to be recommended with personalized learning content, especially LOs. LOs refer to items with smallest

granularity, such as examples or multiple-choice question.

E-learning recommender system (RS) offers flexibility for learners to decrease the time for searching learning content, increase the learner's interest, and provide the recommendations relevant to the learner's goals or interests. Content-based filtering (CBF), collaborative filtering (CF) and hybrid filtering (HF) are common methods to filter the learning content. CBF recommender systems customize items for users according to what they have learned. Learners' knowledge level, learning ability, cognitive model and learning experience are common recommendation criteria. Furthermore, the similarities between items are critical to recommend what learners might like. However, although some research implemented CBF recommendations by combining multi-dimensional preferences of learners and multi-attributes of items, information overload is normally encountered due to the over specification for certain preferences and the high reliance on learner-item similarity**.**

Literature Survey

E-Learning Recommendation Systems:

Explore various types of recommendation systems used in E-learning platforms, such as collaborative filtering, content-based filtering, and hybrid approaches.

Understand the advantages and limitations of each approach in the context of E-learning.

Hybrid Recommendation Approaches:

Investigate recent developments in hybrid recommendation systems that combine multiple recommendation techniques to improve accuracy and coverage.

Look into how these approaches have been applied in domains similar to E-learning.

3 IMPLEMENTATION STUDY

Existing System:

Zaiane applied CF techniques to some e-learning platforms which have experienced and well-established learning communities. The rating information can be obtained from the interactive evaluation records. Zapata attempted to add voting functionality to obtain the score of learners and items. Aleksandra presented an approach for the implementation of collaborative tagging techniques into online tutoring system. However, not all the learning platforms like to provide interaction entrances or communities, and it is not realistic for learners to rate or tag the large amount of resources during their continuous learning process.

Disadvantages:

- In the existing work, the system never finds hybrid recommendation for heterogeneous Education system.

- The system approaches for the implementation of collaborative tagging techniques into online tutoring system and which not all the learning platforms like to provide interaction entrances or communities, and it is not realistic for learners to rate or tag the large amount of resources during their continuous learning process.

Proposed System & alogirtham

The system approaches for the implementation of collaborative tagging techniques into online tutoring system and which not all the learning platforms like to provide interaction entrances or communities, and it is not realistic for learners to rate or tag the large amount of resources during their continuous learning process.

Build a learner model-LIM. LIM includes learner similarity, knowledge credibility and learner aggregation. LIM can be deduced form learning styles and learning profiles directly, so LIM is effective in addressing the extreme data sparsity normally encountered when applying CF techniques.

4.1 Advantages:

1. The system is more effective due to adaptive and intelligent educational systems.
2. The system is more effective due to provide personalized and diversified recommendations, and it shows promising efficiency and adaptability in e-learning scenarios

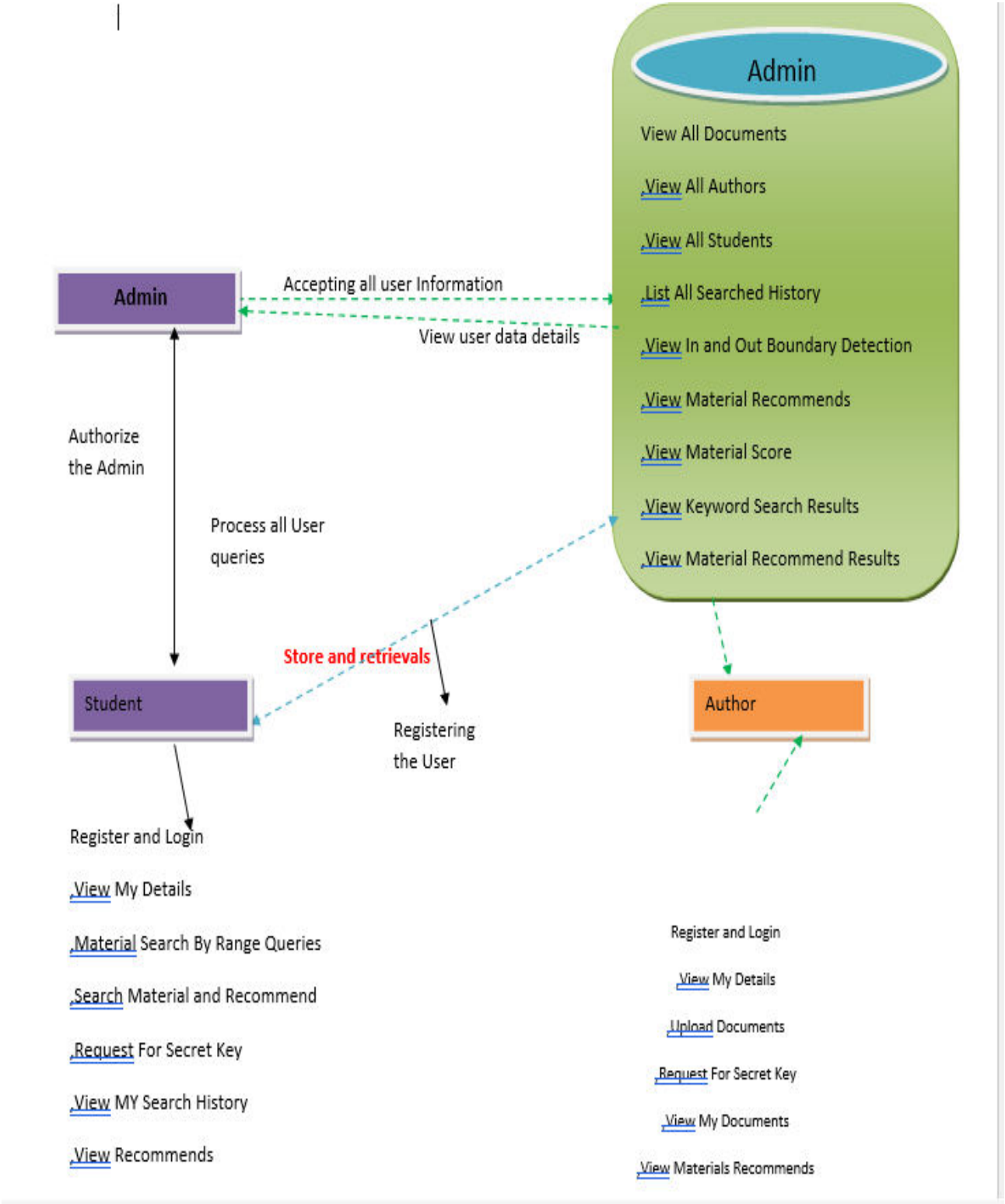


Fig1: System Architecture

IMPLEMENTATION

Modules:

Admin:

In this module, admin has to login and also performs the following operations such as View All Documents, View All Authors, View All Students, List All Searched History, View In and Out Boundary Detection, View Material Recommends, View Material Score ,View Keyword Search Results ,View Material Recommend Results.

Author:

In this module the author has to register and login and also performs the following operations such as View My Details, Upload Documents, Request For Secret Key, View My Documents, View Materials Recommends.

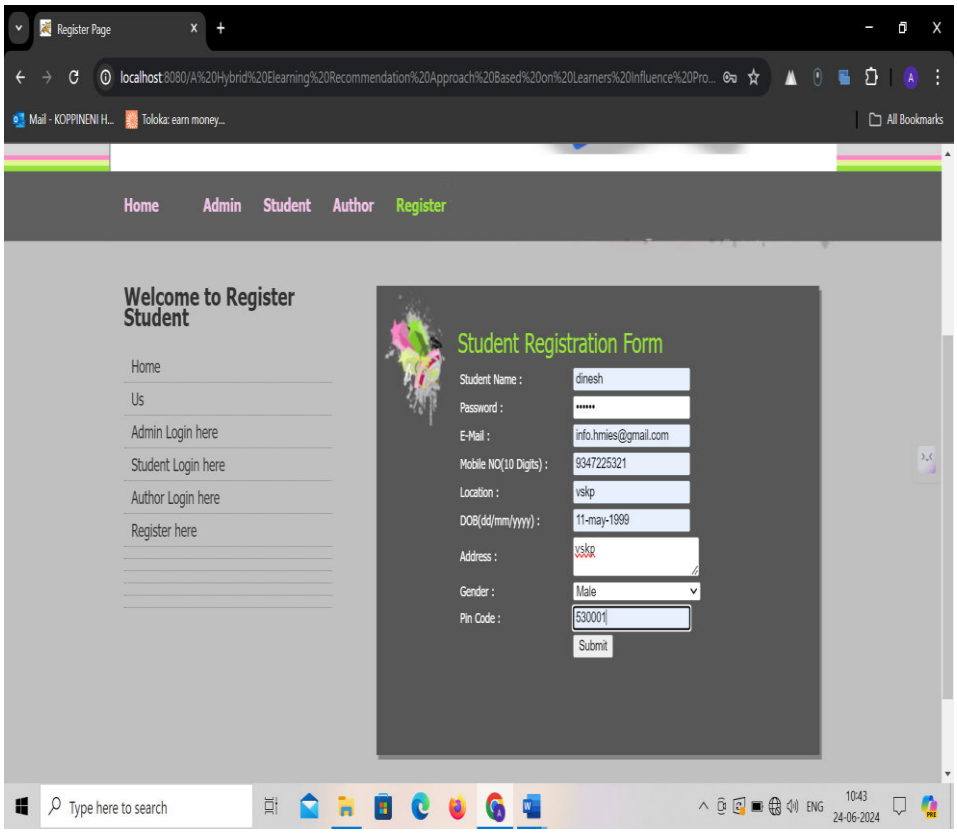
Student:

In this module, the student has to register to admin and log in and performs the following operations such as View My Details, Material Search By Range Queries, Search Material and Recommend, Request For Secret Key, View MY Search History, View Recommends.

5 RESULTS AND DISCUSSION

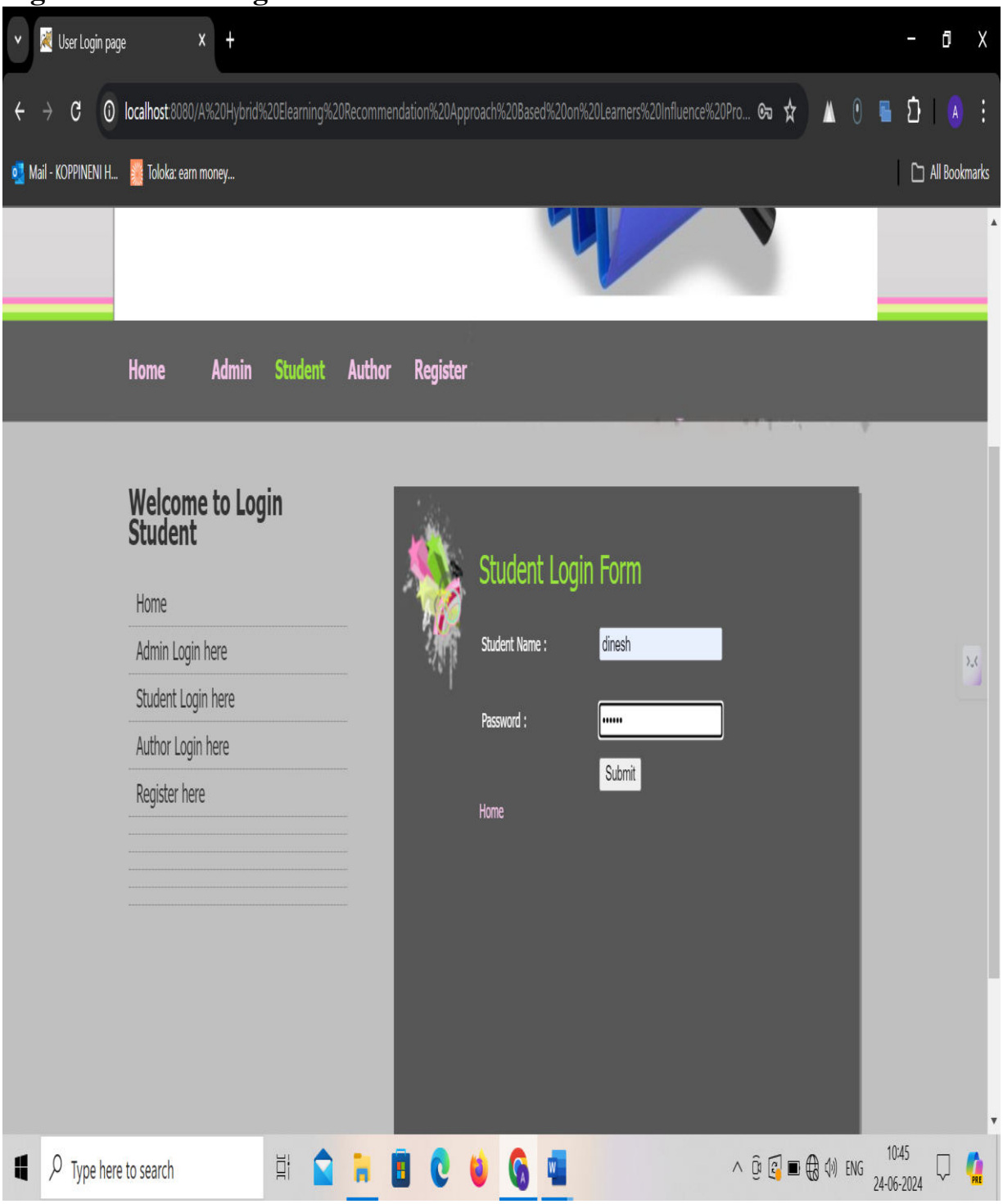
Screenshots:

Fig 5.1: Student Registration Form:



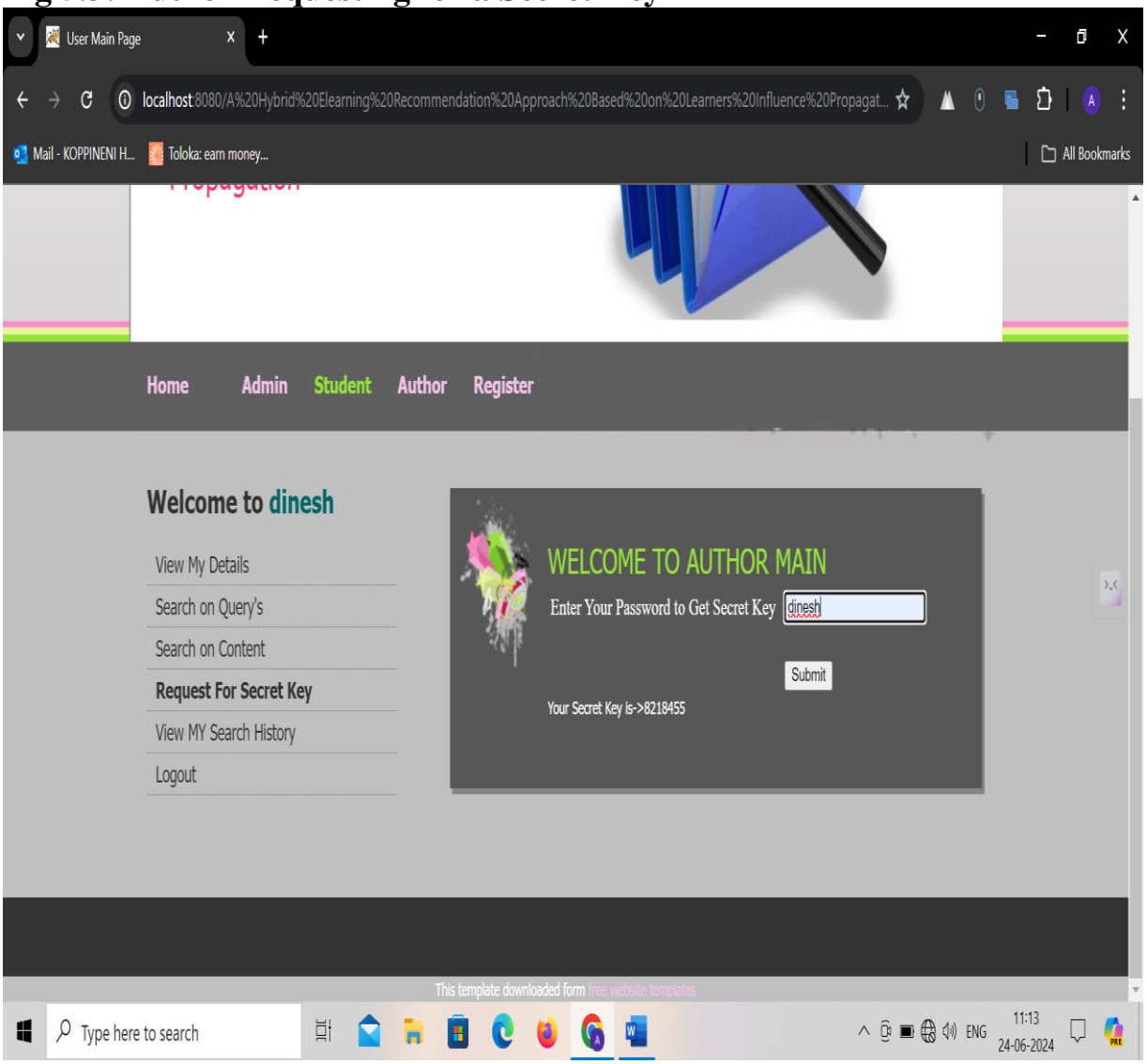
In the above screenshot a new student was registered.

Fig 5.2: **Student Login Form:**



In the above screenshot the student was login after registration.

Fig 5.3: Author Requesting for a Secret Key



In the above screenshot the author was requesting a secret key by entering their password.

Fig 5.4: Document Details:

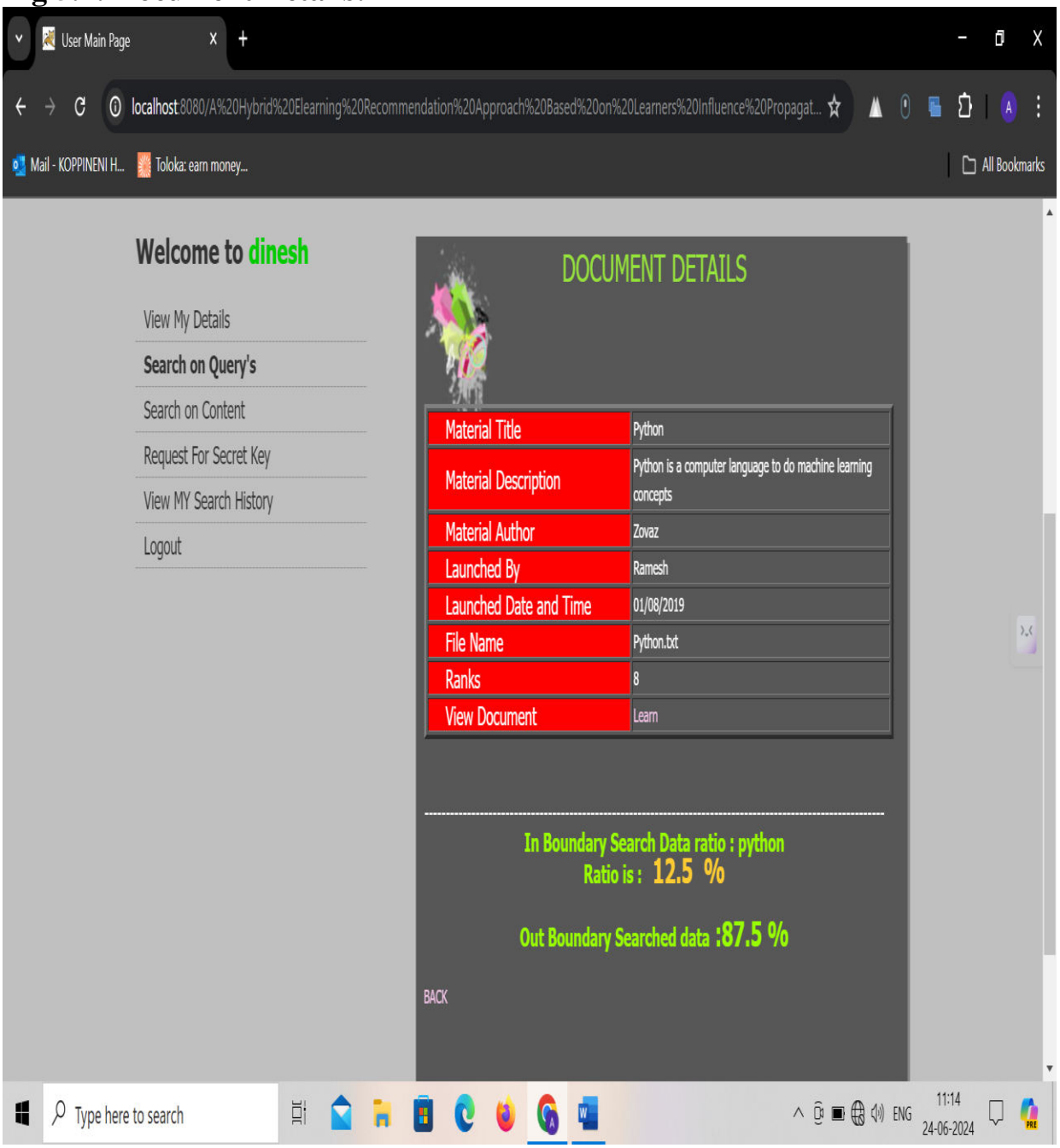
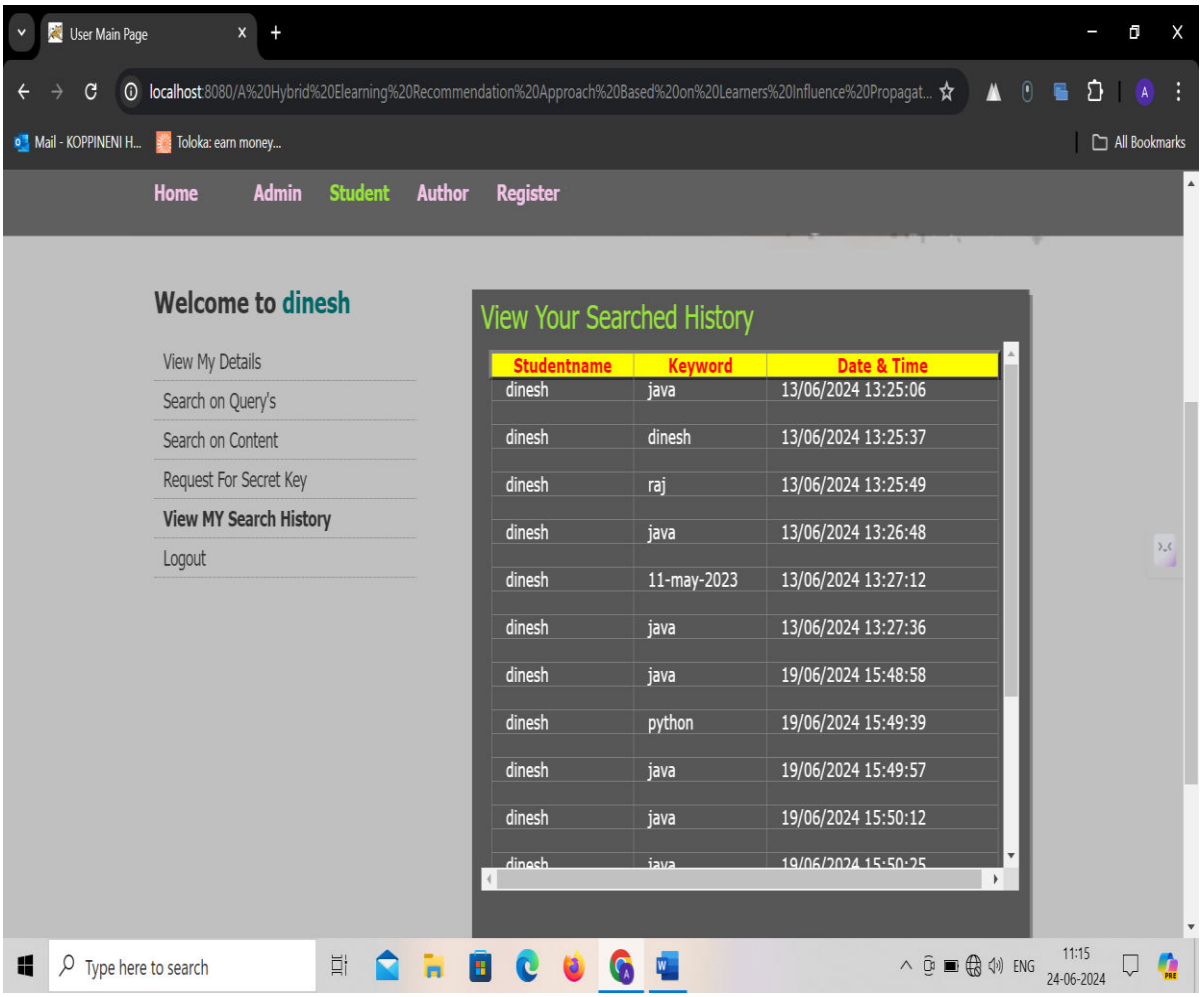
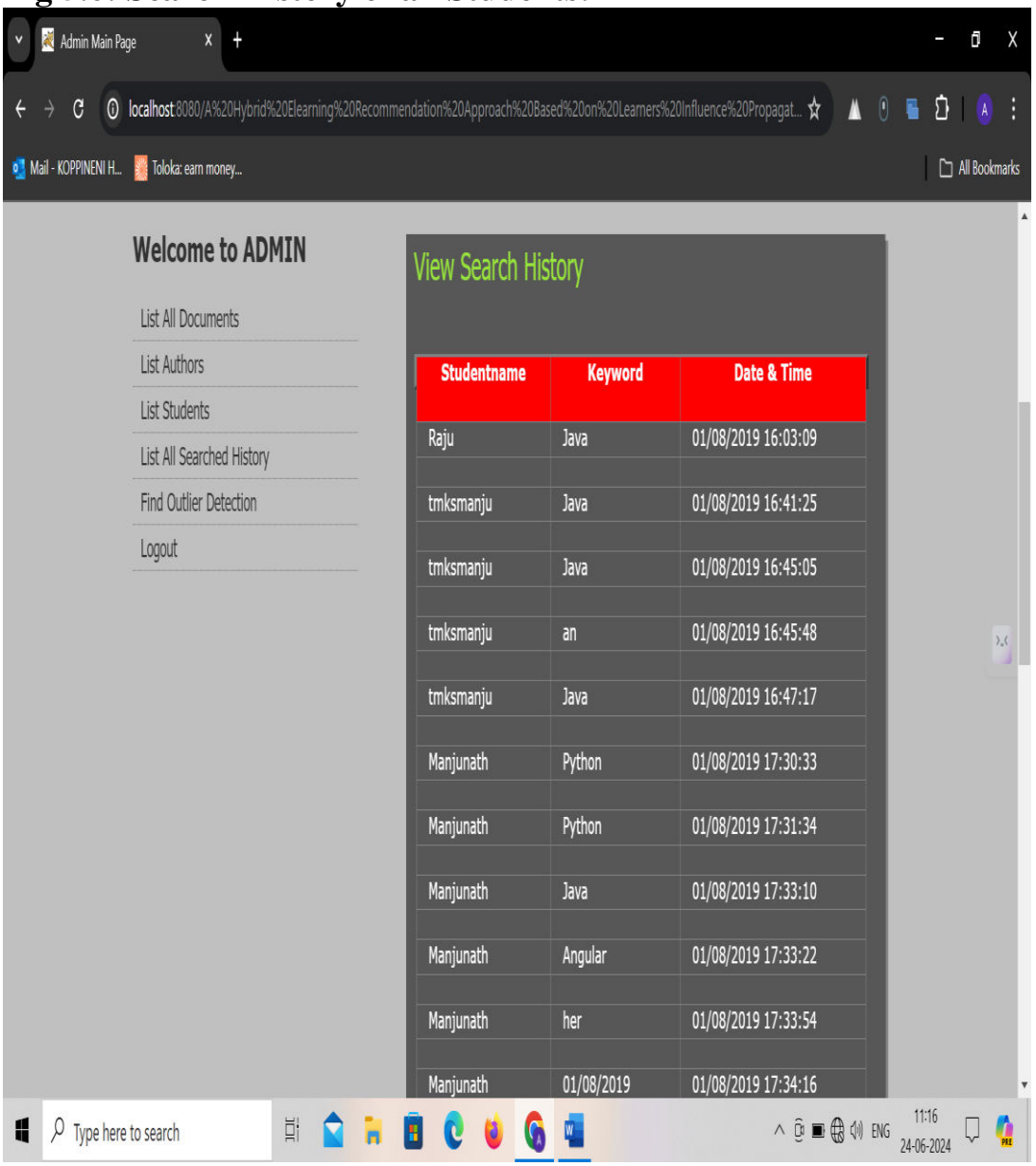


Fig 5.5: Student Search History



In the above screenshot the student was viewing his history.

Fig 5.6: Search History of all Students:



In the above screenshot the admin was viewing all the search history search by the students.

Fig 5.7: Document Score:

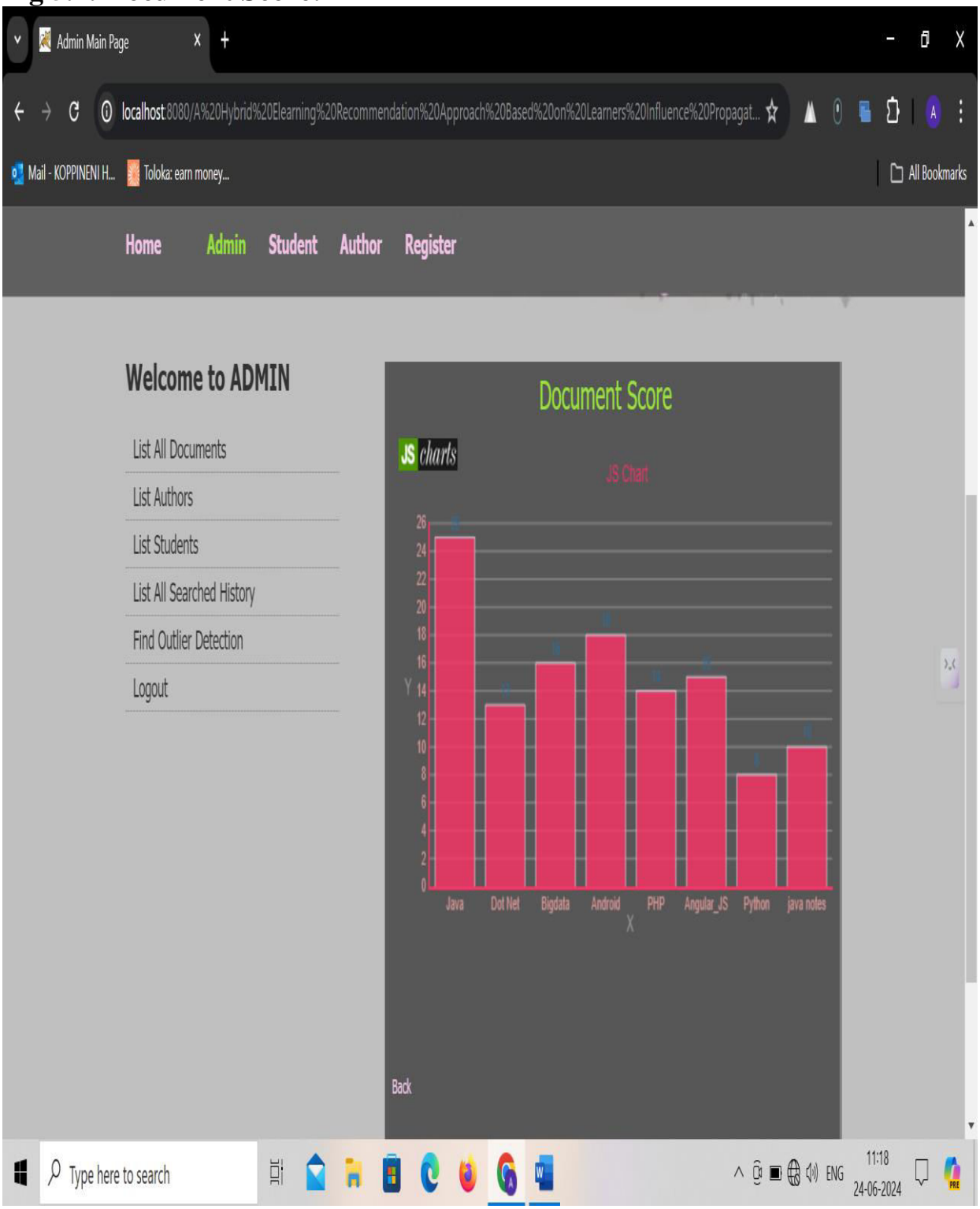


Fig 5.8: Material Recommendation:

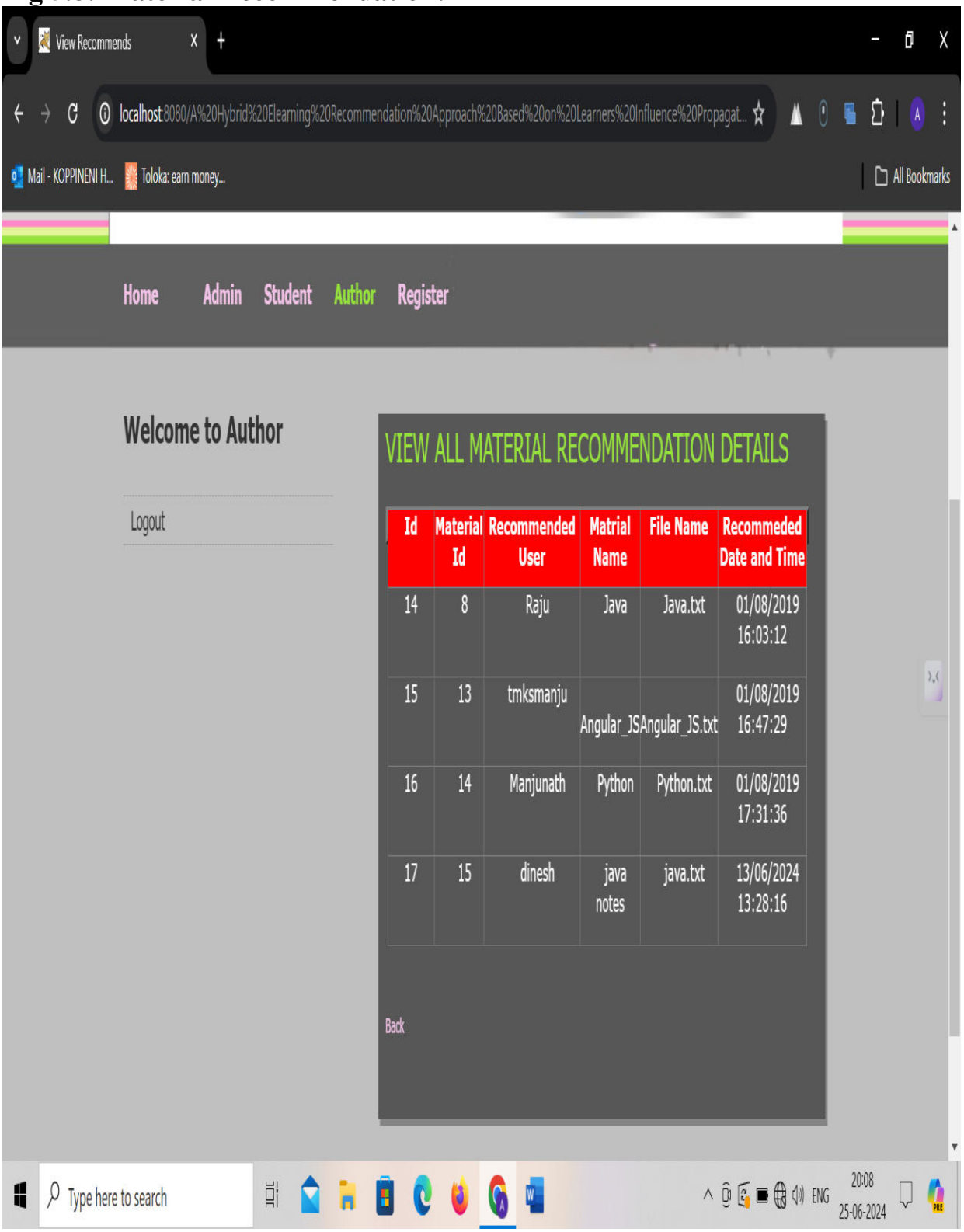


Fig 5.9: Author document details:

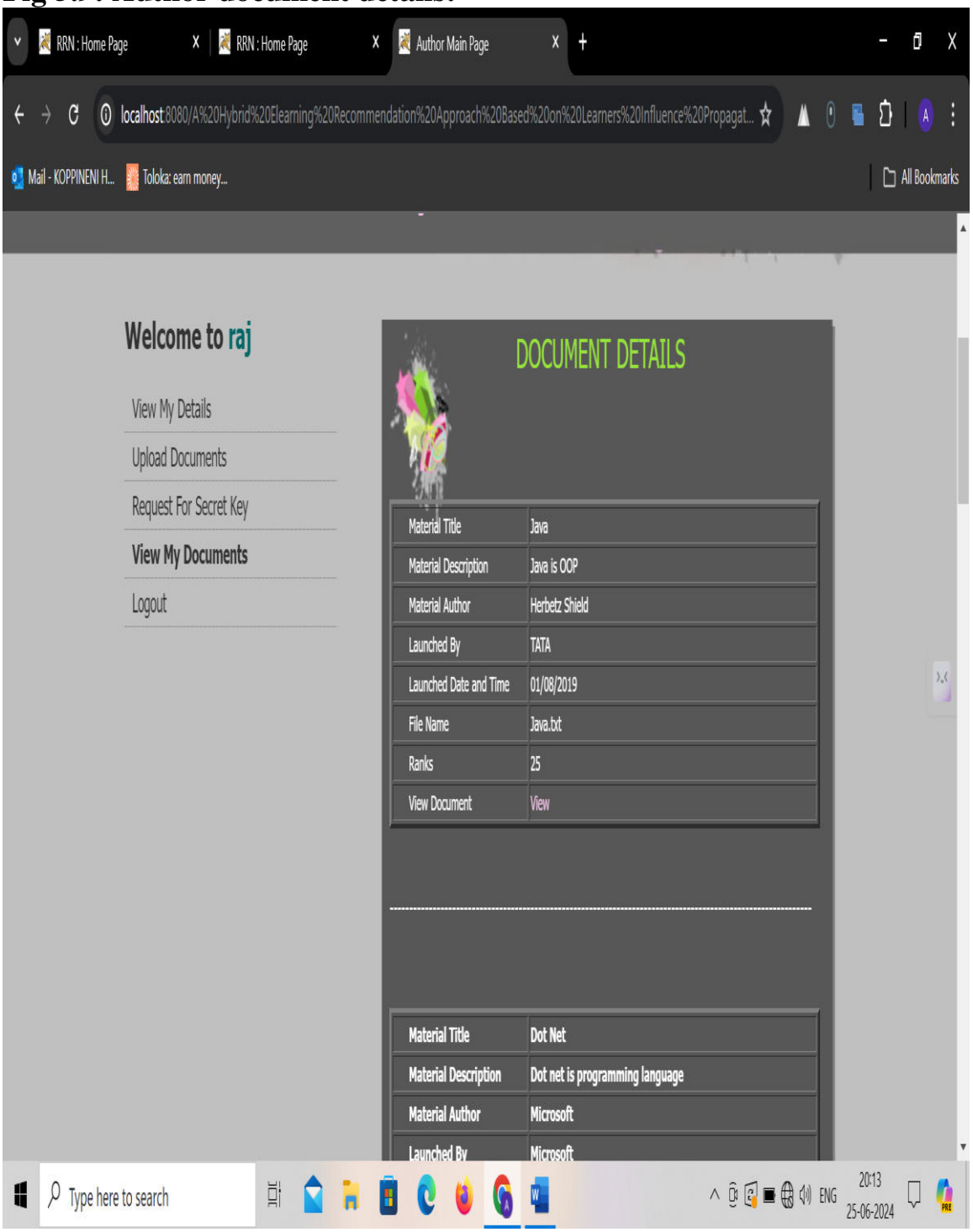


Fig 6.10: Author uploading a new document:

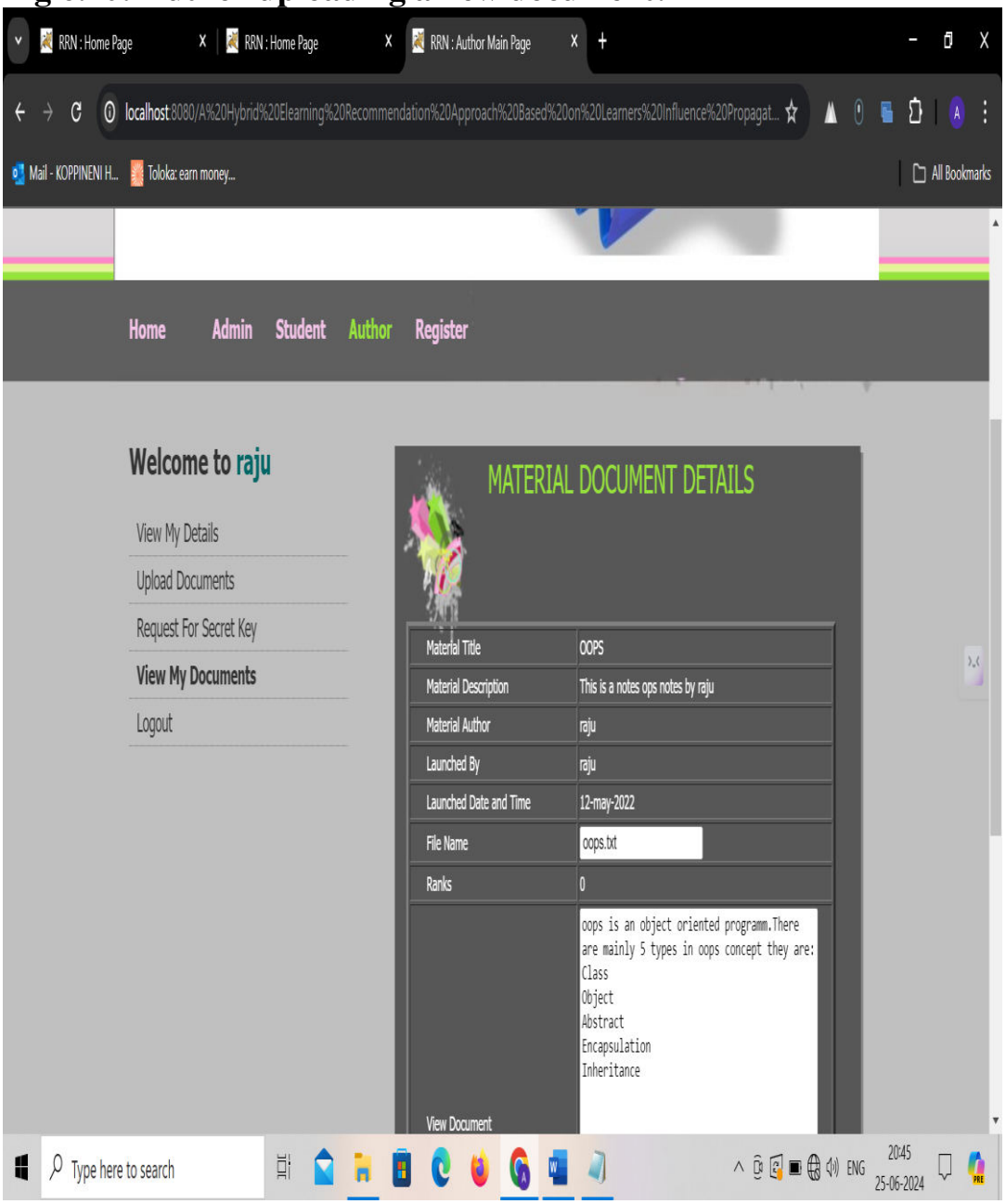
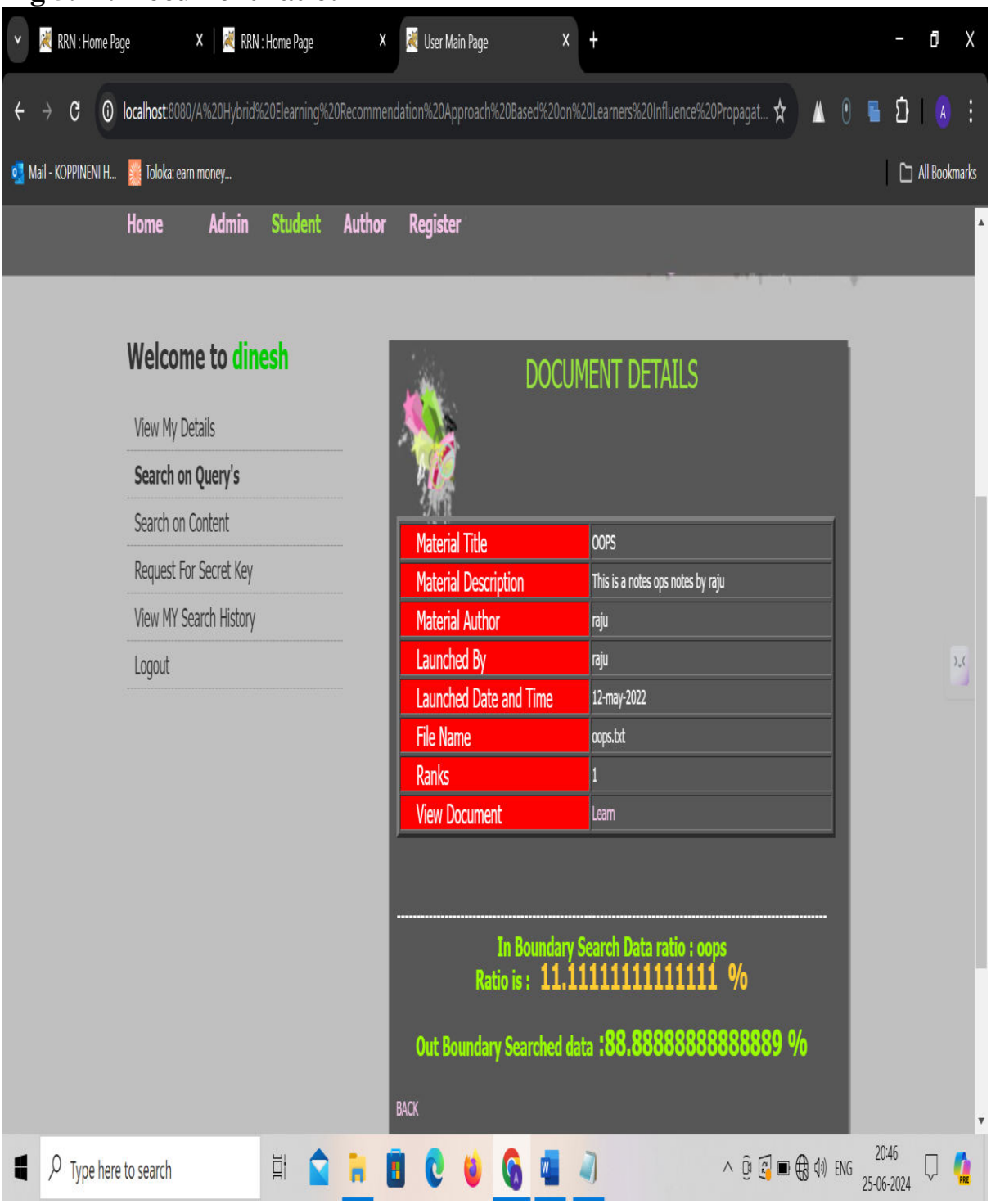


Fig 5.11: Document ratio:



CONCLUSION

Different from e-commerce fields, e-learning faces excessive information scarcity, which hinders the application No. 61370137), the National 973 Project of China (No. 2012CB720702), Ministry of Education China Mobile Research Foundation Project (2016/2-7), Beijing emergency project (No, Z171100004417031), and the Fundamental Research Funds for Beijing University of Civil Engineering and Architecture (No. X18070).

7. REFRENCES

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