

Notespane - A community based learning system

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Abstract - In the era of globalization, knowledge becomes necessary. To help curious learners across different backgrounds we have come up with an e-learning platform. NotesPane is a community-based web application developed to ease learning all over the world. It's a platform where users can upload, download, view or edit notes. Notes are in the PDF, Videos, Links, Google form format. This website has more features like Notes Feed, Notebook, Mock tests, courses, Calculator, Help guide, Planner and scheduler and background music.

Today it is very easy to share and disseminate knowledge due to evolution in technology. In this paper, we have included the study of e-learning based learning management systems (LMS). We'll develop this system using React for frontend, Java for backend and SQL for handling databases.

Key Words: E-learning, Web application, LMS, React, Java, SQL.

1. INTRODUCTION

As modernization took over the world, the field of education and studying wasn't left behind. Thus, platforms such as Coursera, Udemy, ByJUS, WhiteHat paved the way for effective e-learning. However, these platforms burden the joy of learning with their expensive nature. Enthusiastic learners face the expenses of these online courses as a barrier to their growth. Also, the educators who are enthusiastic about spreading knowledge find it hard to meet, build and grow a community of like-minded learners and educators. Thus, with the intention of providing a platform for the community of learners, we bring NotesPane - a community of lifelong learners.

NotesPane is a community-based web application developed to ease learning all over the world. It's a platform where users can upload or download notes. The notes can be in the following format: 1. PDF 2. Text Files 3. PPT 4. Blogs 5. Links 6. Videos. These notes can be published globally or shared with specific users on the platform. The user can view others notes, review them, or store and edit them as a personal copy. This enables users to study on a more private level rather than just scanning through others notes.

The aim of this platform is to build a community of learners to facilitate a vast range of quality study materials to help users learn without boundaries. This website has features like Notes Feed, Notebook, Mock

tests, courses, Calculator, Help guide, Planner and scheduler and background music.

2. LITERATURE SURVEY

In this section, we've summarized the study of existing research papers on Learning Management Systems. We are going to develop one such Learning platform with many more additional functionalities providing users with a single place to cater to all their needs.

Azura Azharuddin[1] The authors in this research paper have studied the effectiveness of E-learning on university students. It gives different insights into how the system works. It also highlights the usage of the internet for academic activities, factors influencing the usage of the internet, the impact of LMS on academic performance, issues of LMS. Overall, it shows the importance of LMS and its positive impact on learners' growth.

Chirag Patel[2] This research paper studies different e-learning based LMSs. It shows the importance of a cloud-based system. It would help the educational institutes or Universities to share knowledge among students, teachers, and researchers. It proposes the system with features like plagiarism detector and keyword matching, web-based virtual workshop management, and single sign-on.

Long Pham[3] The author of this research paper defines the relationships among e-learning service quality attributes, e-learning student satisfaction, and loyalty in the context of Vietnam. The paper indicates that e-learning service quality depends on three factors, namely, e-learning system quality, e-learning instructor, and course materials quality. It concludes that e-learning service quality is positively related to student satisfaction. It has a direct impact on e-learning student loyalty.

Naveen Kumar[4] The author of this research paper investigates the interaction between concentration and background music. It concludes that the higher the learners' working memory capacity, the better they can learn with background music. It also mentions that music has a positive impact on the learning ability of disabled students or students with poor spelling skills.

Hossein Khodabakhsh Zadeh[5] This research paper focuses on whether the Mock IELTS exam could have any effect on IELTS candidates' overall score on the exam. This determines if such preparatory tests are useful for students preparing for competitive exams. This knowledge motivates both students and instructors to make use of such tests.

Moylan[6] The author of this paper puts the combined process of planning and scheduling of multidisciplinary programs. It also gives a systematic approach for transforming the Project Plan into the Schedule and the Schedule into the actual work. When planning mainly deals with the selection of appropriate policies and procedures, scheduling converts the project action plans into an operating timetable. This in turn increases the quality and productivity of work.

3. PROBLEM STATEMENT

To develop a Learning Management System which will allow learners to upload, download, and share notes (PDF, text files, PPT, blogs, videos, links). The application will also provide features like notes feed, mock tests, planner and scheduler, help guide, calculator, motivational music, etc.

3.1. Problem and Necessity of a solution

1) Economic Burden on a learner

With the fast spread of the internet all over the world, education resources are available at the distance of a click. However, turning the deed of sharing knowledge to a business for earning profits. This makes it hard for learners to achieve quality education for free. There are many websites which provide quality learning materials at the price of an arm and a leg. Unfortunately, students who are genuinely interested in learning and growing lose hope.

2) Wastage of time in search of scattered resources across the internet

Knowledge is widespread. It is vastly available in the form of books, research papers, blogs, videos, online courses, etc. However, the problem is they're several sources, several instructors, making it hard to verify the trustworthiness and validity of any study material. Thus, it is not feasible to search for a topic all over the internet and verify its genuineness. If it is possible to provide all the resources under one site,

3) Lack of proper productive learning strategies and implementation tools.

Research shows that a change in learning style based on proven learning strategies such as POMODORO technique boosts understanding, grasping and learning. However most of the students aren't aware of it or find it learning. Therefore, there arises a need to provide an

integrated environment, where all the productivity tools, learning resources and peer community fall under one software.

4) Need of a learning community to motivate learners and promote cooperative learning

When peers with similar thoughts and interests interact together, it promotes learning by motivating learners by sharing, collaborating and communicating. Thus, there is a need of a platform where learners can interact with each other and share resources to boost their learning.

3.1.2. Proposed System:

Notespane is a web application where users can share learning materials in various formats. They can either share this to all the users on the system or restrict it to themselves. When shared i.e.- made public learners can get opinions from other learners, get ratings, and advice. This activity of posting learning material acts as an input to the recommendation algorithm which later suggests the user with similar content. This helps the user build a community with like-minded people.

Learners can also download or save learning resources on the cloud for further use. They can also make changes to any copy of the learning material without tampering the original content . They can ask doubts, research similar topics or attempt tests without having to switch to any other website at all.

With productivity tools embedded into the system, learners can manage their time better and boost their productivity. Motivational music helps improve concentration and grasping power thereby boosting morale.

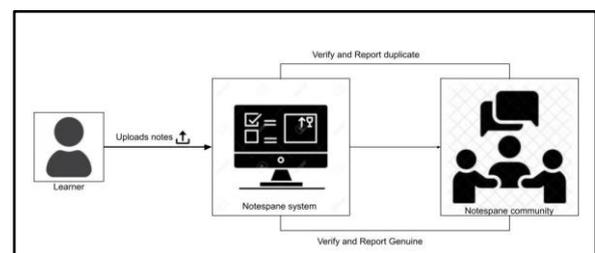


Fig.: Community Based Verification Model

Features, Functionalities, and Methodologies

1) Notes Feed

The user gets the latest updates of the various study materials posted by other users followed by the user. Machine learning helps provide a dedicated recommendation system for the notes, based on users' past activities. These notes can be saved to view later. The user can provide active feedback rating the notes. This feedback helps the algorithm to learn, adapt and provide

future recommendations. The user can share the notes with other users through a single click. This makes communication between peers easier, thus building a community of learners. This algorithm helps the user view similar notes on a regular basis. This facilitates a broader and deeper excavation of favored topics without much searching of notes. It also keeps the user updated about the latest topics of research and the new advancements in the various fields of study.

2) Notebook

A user can create their own notes and study material in the notebook feature. They can create or edit documents, add images, voice notes, add videos, etc. These notes can later be published on the platform globally. The user can also share their personal notes with selected people. They can also highlight, write upon, draw or make changes to existing notes published by other users only after they've saved this. This will create a local copy of the note and will not update the genuine copy in any way. This helps create a personalized study environment, which simulates the usual pen and paper way of taking notes.

3) Mock Tests

The author can upload mock tests and question banks. The process of uploading mock tests will be the same as uploading study material. Students can access all tests under this Mock Test Section.

- Anytime-Anywhere Online Test

Appear in the online tests Anytime-Anywhere According to your Comfort Level.

- Test Prepared by Expert

Improve with Pinpointed Expert Recommendations.

- Separate Question Bank

Thousands of Questions with Answers in the Question Bank, See on Mobile or Computer.

- FREE Sample Test Papers

FREE Tests Papers as per Exams Pattern and syllabus.

- Low-Cost High Quality

Most of the Exams Cost Rs.0 Per Paper Only.

4) Courses

The author/Teacher can upload the whole Course as well. He can upload the course for free, to gain more followers. Or he can launch a paid course, we will provide a payment gateway in that case. Take courses from the world's best instructors and universities. Courses include recorded auto-graded and peer-reviewed assignments,

video lectures, and community discussion forums. When you complete a course, you'll be eligible to receive a shareable electronic Course Certificate for a small fee.

- Affordable

Explore hundreds of free courses or get started with a free trial.

- Flexible

Get on-demand lectures for desktop and mobile—on your schedule.

- Job-relevant

Master essential career skills based on comprehensive skills data. Build personal and professional skills with applied learning.

5) Calculator

Just like any usual calculator, this feature helps the usual perform basic and advanced calculator. It includes basic, scientific, financial, and programming models. These calculations can be saved in separate documents if the user wants to.

6) Help Guide

Students may sometimes feel overwhelmed by the multitude of resources available online. It might take one a tremendous amount of time to sift through and locate required materials to use, which is a taxing task for the already overburdened student.

To make better use of their time and resources we have curated some of the best free websites that provide a treasure trove of educational content most of which is created and shared by teachers and educators and is globally approved.

From ready-made lesson plans and study guides to practice exercises and EdTech tools, these websites provide the resources needed to enhance your learning and grow professionally.

7) Planner and Scheduler

Schedule Planner is an enrollment planning tool that allows students to find conflict-free schedules based on the courses they need to take and their obligations outside of school, such as work.

The process of planning primarily deals with selecting the appropriate policies and procedures in order to achieve the objectives of the project. Scheduling converts the project action plans for scope, time cost, and quality into an operating timetable.

The Planner/Scheduler helps in applying good strong and diversified knowledge of Project Control Management principles and practices relevant to manufacturing projects in meeting technical costs and schedule objectives.

8) Motivational Music

Scientific studies prove that music can improve your motivation. Music can cause the brain to release dopamine, a chemical that works to regulate motivation and goal-oriented behavior. It can help your brain absorb and interpret new information more easily. Research also supports music as a possible method of improving focus.

Music ignites all areas of child development and skills for school readiness, including intellectual, social-emotional, motor, language, and overall literacy. It helps the body and the mind work together. Exposing children to music during early development helps them learn the sounds and meanings of words.

4. Algorithm: Plagiarism Detection for uploading of notes.

Whenever a learner uploads any learning material, it should be checked if the same material is already available in the notespane database. This is to avoid data redundancy, copyright infringement and wastage of resources. There should be a method to determine the authenticity of a document, Thus, there arises a need for plagiarism detection. The algorithm below illustrates the working of plagiarism detection.

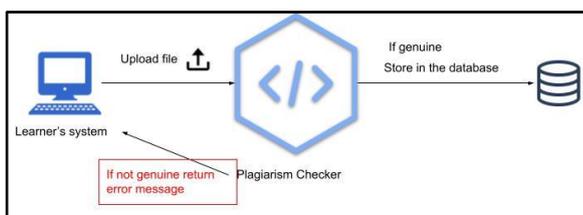


Fig.: Upload notes through plagiarism detection

Modules of the Plagiarism Detection System:

- 1) **Input:** The document which is to be checked for plagiarism.
- 2) **Document Classifier:** This module determines the domain of the input document. Domains represent different subject wise categories like Chemistry, Mathematics, Biology, etcJob-relevant.
- 3) **Slicer:** This component divides the document into different parts such as Header, Title, Authors Info, Footer, Footnote, Abstract, Paper body, Reference, Acknowledgement etc.
- 4) **Candidate Resolver:** This component simply excludes the unnecessary components such as

author information and references and combines the important slices of document together to be processed by the plagiarism checker.

- 5) **Plagiarism Checker:** It is made up of two components:
- 6) **Syntax/String Based Plagiarism Checker:** This component performs Syntax or string based matching.
- 7) **Semantic Based Plagiarism Checker:** It normally deals with the meaning of the content in the candidate document and other resources available from internal databases as well as external databases. To perform a complete semantic matching between the target contents, a lexical database holding the meaning of different words as well as their different senses (i.e. noun, verb, adverb etc.).
- 8) **Data Zone:** This section of the model represents the required resources to perform a successful plagiarism checking. Two types of databases are shown in the figure. One is the Internal Database. It is the local database maintained by the system itself holding the previous submissions as well as their corresponding report, referring to the Output data bases. External database mainly holds the references to the external resources along with their permission to access them remotely by the system.
- 9) **Degree of matching:** After performing all the matching criteria it is time to aggregate them properly and find out the percentage of the matched content into the candidate document. This step is named as Degree of Matching. After finding out the matching degree it will transfer the result to the next component of the model, called Decision Maker.
- 10) **Decision Maker:** The main job of this component is to identify whether the candidate document is plagiarized or not. For this it depends on two inputs. First one is the matching degree provided by the previous component Degree of Matching. And the second one is the predefined threshold value fixed by the system administrator. If the matching degree crosses the threshold value then the Decision Maker will flag it as plagiarised otherwise not.
- 11) **Output Categories:** This component gives the actual reports on plagiarism. The proposed model will store this generated reports with user's permission into two categories named as Non-Plagiarised and Plagiarised.

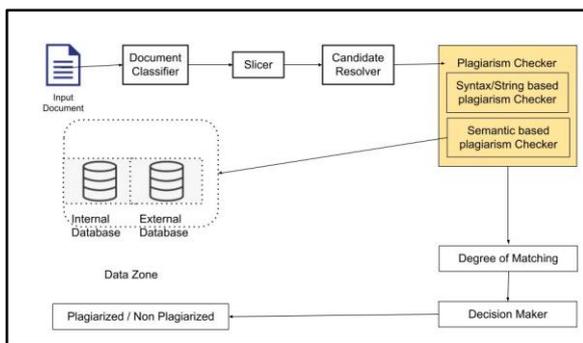


Fig.: Plagiarism Detection Model

Algorithm:

Input: Document to be checked and required permission to the other document storage for comparison.

Output: Degree of plagiarism, Flagged candidate document as plagiarized or non plagiarized

1. Read the input document for plagiarism detection as D
2. Detect the domain of the topic of the document as $dom(D)$.
3. Set the threshold for plagiarism as T .
4. Slice down the D in following section:
 - a. Header section from D as h .
 - b. Footer contents of from D as f
 - c. Author's information from D as $auth_info$.
 - d. Abstract information as abs .
 - e. Keywords as k .
 - f. Main content or body of the document as B .
 - g. Acknowledgements if any as ack .
 - h. References as R_f
5. Prepare the candidate document for checking by excluding the unnecessary components as $C_d = abs + k + B$. [$h, f, auth_info, ack, R_f$ is excluded for test].
6. Perform similarity matching between candidate document and other documents from $dom(D)$
 - a. First perform the Syntax based matching to identify the exact copy of the content.
 - b. Perform the Semantic matching to identify the copy of ideas/ thoughts or alteration of copied words/ phrases or sentences.

7. Deduce degree of matching $Deg(D)$ based on the outcome of Step 6.
8. Considering F flag the document D as plagiarized or non-plagiarized.
9. Prepare the final report based on the decision taken at Step 8
10. End

5. CONCLUSION

In this paper, we've proposed a Learning Management System(LMS)- NotesPane- a platform, which can help learners from everywhere around the globe with quality study material for free. We've studied the existing Learning management systems to understand the effectiveness of E-learning as well as difficulties and vulnerabilities faced by these systems. Based on this research, we are going to build a system that will provide quick and easy access to study material which not only provides quality to the E-learning process but also enhances effectiveness and learning outcomes. The system will minimize the distance between educators and learners across the globe.

REFERENCES

- 1) Nor Azura Azharuddin and Lee Hwei Ling, Member, IACSIT, "Learning Management System (LMS) among University Students: Does It Work?", International Journal of e-Education, e-Business, e-Management and e-Learning, Vol. 3, No. 3, June 2013
- 2)Chirag Patel, Mahesh Gadhavi, Dr. Atul Patel, "e-learning based learning management Systems (LMS)", International Journal of Scientific & Engineering Research, Volume 4, Issue 6, June-2013 ISSN 222
- 3) Long Pham, Yam B. Limbu, Trung K. Bui, Hien T. Nguyen & Huong T. Pham, "Does e-learning service quality influence e-learning student satisfaction and loyalty? Evidence from Vietnam", International Journal of Educational Technology in Higher Education, Article number: 7 (2019)
- 4)Naveen Kumar, Mohamad Arif Wajidi, Yong Tai Chian, Vishroothi S, Swamy Ravindra S, and Ashwini Aithal P., "The Effect of Listening to Music on Concentration and Academic Performance of the Student: Cross-Sectional Study on Medical Undergraduate Students.", Research Journal of Pharmaceutical, Biological and Chemical Sciences, ISSN: 0975-8585
- 5)Hossein Khodabakhsh Zadeh, Reza Zardkanloo, Iman Alipoor, "The Effect of Mock Tests on Iranian EFL learners' Test Scores", International Journal of Education & Literacy Studies, Volume 5, Issue 3, July-2017 ISSN 2202-9478

6) Moylan, W. A. (2002). Planning and scheduling: the yin and yang of managing a project. Paper presented at Project Management Institute Annual Seminars & Symposium, San Antonio, TX. Newtown Square, PA: Project Management Institute.

6) M.P. Cuéllar, M. Delgado, M.C. Pegalajar, Improving learning management through semantic web and social networks in e-learning environments, Expert Systems with Applications, Volume 38, Issue 4, April 2011, Pages 4181-4189, ISSN 0957-4174, 10.1016/j.eswa.2010.09.080.

7) Cybulski, J.L.; Linden, T.; , "Learning systems design with UML and patterns," IEEE Transactions on Education, , vol.43, no.4, pp. 372- 376, Nov 2000, doi: 10.1109/13.883344

8) Xin Liand Shi-Kuo Chang, "A Personalized E-Learning System Based on User Profile Constructed Using Information Fusion," in 7th International Conference on Communication (ICC), Beijing, China, 2007.

9) Hernandez-Leo, D.; Bote-Lorenzo, M.L.; Asensio-Perez, J.I.; GomezSanchez, E.; Villasclaras-Fernandez, E.D.; Jorriñ-Abellan, I.M.; Dimitriadis, Y.A.; , "Free- and Open-Source Software for a Course on Network Management: Authoring and Enactment of Scripts Based on Collaborative Learning Strategies," IEEE Transactions on Education, , vol.50, no.4, pp.292-301, Nov. 2007, doi: 10.1109/TE.2007.904589



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