INFORMATICS INSTITUTE OF TECHNOLOGY
In Collaboration with
UNIVERSITY OF WESTMINSTER

Study Hive

A Project Proposal by
Mr. Rashmina Fernando

Supervised by
Supervisor's Mr. Banu Athuraliya

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Declaration

We, the members of SDGP: CS 47, declare that the software requirements and features outlined in this proposal are based on our current understanding and research conducted as part of the Software Development Group Project. This proposal is intended solely for academic purposes and reflects our efforts to design a conceptual application. The specifications and features described herein are subject to change based on further research and feedback from our academic advisors.

(SDGP Group: CS 47)

1. PROBLEM

1.1 Introduction to problem

Many students at universities face significant challenges in accessing quality study resources, organizing coursework deadlines, and engaging in collaborative learning. These issues can negatively impact their academic performance and overall learning experience.

Existing platforms like “Kuppiya” at IIT, which operates through WhatsApp groups, help students understand lectures better but are inefficient and lack organization. “Kuppiya” relies on manual processes for sharing study materials and coordinating study sessions, which can be time-consuming and prone to errors. Additionally, the disorganized nature of WhatsApp groups makes it difficult for students to find the resources they need when they need them.

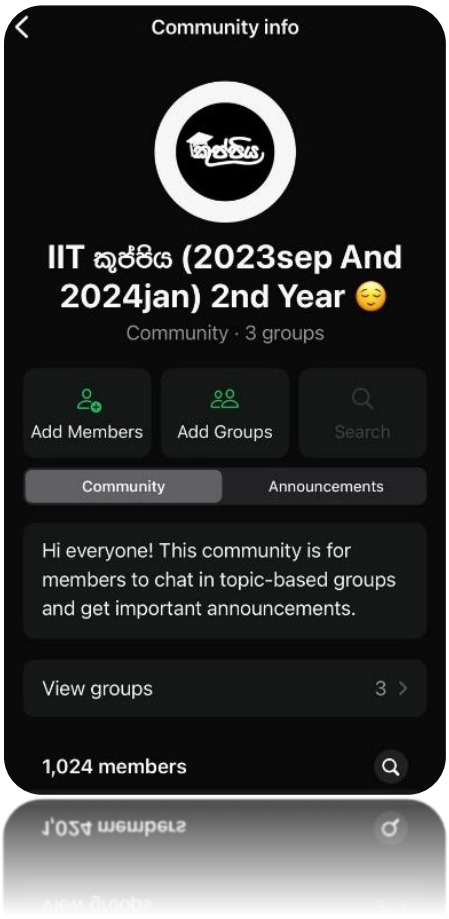

Figure 1- Example of an existing platform called “Kuppiya.”

By using Study Hive, students can easily access study materials uploaded by their peers, study together, and receive resource recommendations, enhancing the overall learning experience. Study Hive offers a more structured and efficient approach to managing study resources and deadlines, facilitating better collaboration among students. This app aims to address the limitations of existing platforms by providing features specifically designed for academic collaboration, such as keyword search, automated note summaries, and integration with Learning Management Systems (LMS).

In summary, the introduction of Study Hive will significantly improve the way students access and organize study materials, manage their coursework deadlines, and collaborate with their peers, enhancing their academic performance and reducing study-related stress.

1.1.1 Problem Background and Stats

Research indicates that collaborative study tools and shared academic resources can increase student productivity by 30% compared to solo studying. However, existing platforms often lack streamlined features like dedicated academic chat groups, personalized resource recommendations, and deadline tracking. For example, a survey conducted at IIT revealed that 65% of students felt overwhelmed by the lack of organized study materials, and 70% missed deadlines due to poor time management.

A study titled “Impact of Collaborative Learning on Student’s Academic Performance in Teacher’s Education Program” supports these findings by demonstrating that collaborative learning significantly enhances academic performance. The research highlights that student interaction with peers, teachers, and the use of social media positively impacts collaborative learning, leading to improved academic outcomes [1]. This underscores the importance of implementing effective collaborative tools in educational platforms to enhance student productivity and academic success.

1.1.2 Examples in the Problem

For instance, a student preparing for exams might struggle to locate reliable study notes, which are crucial for effective revision. This difficulty often arises because study materials are scattered across various sources, making it time-consuming to gather comprehensive and accurate notes. Additionally, students may be unaware of upcoming assignment deadlines due to the lack of a centralized system for tracking coursework. This can lead to last-minute preparation, which is often stressful and less effective, potentially resulting in lower academic performance and increased burnout.

Moreover, the existing “Kuppiya” system at IIT, which operates through WhatsApp groups, exacerbates these issues. Since “Kuppiya” relies on manual processes for sharing study materials and coordinating study sessions, students frequently miss timely updates. The manual nature of this system means that essential information can easily be overlooked or delayed, reducing the efficiency of resource sharing. Furthermore, the disorganized structure of WhatsApp groups makes it challenging for students to find the specific resources they need when they need them, leading to further frustration and inefficiency.

In contrast, a more structured and automated system like Study Hive could significantly alleviate these problems. By centralizing study materials and providing automated notifications for deadlines and updates, Study Hive would ensure that students have easy access to the resources they need and are always aware of important dates. This would not only enhance the efficiency of their study sessions but also reduce the stress associated with last-minute preparations and missed deadlines.

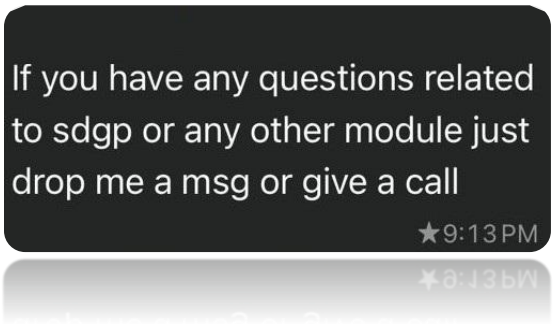

Figure 2- Example of the manual process in “Kuppiya”

1.1.3 Attempted Solutions and Competitor Analysis

Existing solutions like Studocu and Google Classroom provide some useful functionalities but lack essential academic-oriented features tailored specifically to university students. While these platforms offer basic tools for sharing and accessing study materials, they do not integrate seamlessly with Learning Management Systems (LMS), which is crucial for synchronizing course content and academic information. Additionally, they lack advanced keyword search capabilities that allow students to quickly find specific topics or information within a large repository of study materials. Furthermore, these platforms do not offer automated short note generation, a feature that can save students considerable time by providing concise summaries of lengthy documents.

Feature	*Studocu*	Google Classroom	*StudyHive*
Note Sharing	✓	✓	✓
Keyword Search	✗	✗	✓
Group Chat	✓	✓	✓
Deadline Calendar	✗	✓	✓
Automated Short-Notes	✗	✗	✓
LMS Integration	✗	✗	✓
Chatbot	✗	✗	✓

Table 1 – Comparison of the features of Studocu, Google Classroom & Study Hive apps.

2. PROPOSED SOLUTION

Study Hive is a web-based application designed to enhance the academic experience for university students by addressing key challenges they face in their studies. The primary goal of Study Hive is to centralize study resources, facilitate peer collaboration, and provide tools for effective time management.

By centralizing study resources, Study Hive ensures that all academic materials, such as notes, lecture slides, and past papers, are stored in one accessible location. This eliminates the need for students to search through multiple platforms or rely on fragmented sources, making it easier to find and use the necessary materials for their studies.

Facilitating peer collaboration is another critical aspect of Study Hive. The application creates a structured environment where students can interact, share knowledge, and support each other. This collaborative approach not only enhances understanding of the subject matter but also fosters a sense of community among students, which is essential for a supportive learning environment.

Effective time management is crucial for academic success, and Study Hive provides tools to help students stay organized and manage their schedules efficiently. By tracking important dates and deadlines, Study Hive helps students plan their study time effectively, reducing the stress associated with last-minute preparations and missed deadlines.

In summary, Study Hive aims to improve the overall academic experience by making study resources more accessible, promoting collaborative learning, and helping students manage their time more effectively. This comprehensive approach addresses the core issues faced by university students, enhancing their academic performance, and reducing study-related stress.

3. TARGET AUDIENCE

This application is specifically designed for university students across various institutions. The target audience includes students from both government and private universities, ensuring a wide range of users with diverse academic needs and backgrounds. These students often face challenges such as accessing quality study materials, managing coursework deadlines, and engaging in effective peer collaboration. By addressing these issues, the application aims to enhance their academic experience, improve productivity, and reduce stress. The focus is on providing tools and resources that are tailored to the unique demands of university-level education, making it easier for students to succeed in their studies.

While the following list includes some of the targeted universities, it is **not exhaustive**,

- University of Colombo (Government)
- University of Peradeniya (Government)
- University of Moratuwa (Government)
- University of Sri Jayewardenepura (Government)
- Sri Lanka Institute of Information Technology (SLIIT) (Private)
- National School of Business Management (NSBM) (Private)
- Open University of Sri Lanka (Government)

By focusing on a diverse range of institutions, both government and private, the application aims to support a broad spectrum of students, enhancing their academic experience through centralized resources, collaborative tools, and effective time management solutions.

4. RESOURCE REQUIREMENTS

4.1 Hardware requirements

Computers: Standard laptops or desktops. These should be capable of running development tools and the application smoothly.

4.2 Software requirements

- ✓ **Server:** Node.js or a similar backend framework to manage server-side operations efficiently.
- ✓ **Database:** MongoDB, MySQL, or a similar database management system to store and manage data securely and efficiently.
- ✓ **Frontend:** React.js, Angular, or Vue.js for building a responsive and user-friendly interface.
- ✓ **Notification System:** Integration with Push Notifications API and email services to keep users informed about important updates and deadlines.

4.3 Technology stack

- ➢ Programming Languages: JavaScript and Python for versatile and robust application development.
- ➢ Frameworks: Backend: Express.js to create a scalable and maintainable server-side architecture.
- ➢ Frontend: React.js to develop a dynamic and interactive user interface.
- ➢ APIs: Integration with IIT's Learning Management System (LMS) to synchronize academic resources and information seamlessly.

5. FEATURES OF THE SOLUTION

Note Sharing:

Users can upload, organize, and share notes by subject. These notes are searchable via keywords, allowing students to quickly find relevant materials. This feature ensures that all study materials are easily accessible and well-organized, reducing the time spent searching for information.

Keyword Search:

Students can easily locate notes or resources pertinent to specific topics or courses, enhancing study efficiency. The advanced search functionality helps students find exactly what they need without sifting through irrelevant content.

Group Chat:

An integrated group chat feature enables study groups to collaborate effectively, facilitating real-time communication and study sessions. This promotes a collaborative learning environment where students can discuss topics, share insights, and support each other.

Q&A Board:

A peer-led space where students can ask and answer questions, promoting a collaborative learning environment and peer support. This feature encourages active participation and knowledge sharing among students.

Gamification:

A points-based reward system encourages active participation. Students can earn points for their contributions, which can be redeemed for rewards, motivating continuous engagement. This makes the learning process more interactive and enjoyable.

Offline Access:

Allows students to download notes for times when they do not have internet access, ensuring uninterrupted study sessions. This feature is particularly useful for students who may have limited internet connectivity.

LMS Integration:

Seamless syncing with the university's LMS enables easy import and export of resources, ensuring that students have access to the latest academic materials. This integration helps in maintaining up-to-date information and resources.

Notification System:

Notifies users when searched materials are unavailable, suggesting alternatives or enabling resource requests. This ensures that students are always informed and can plan their studies effectively.

Calendar for Deadlines:

Tracks important dates and coursework deadlines, helping students stay organized and manage their time efficiently. This feature helps in reducing the stress associated with last-minute preparations.

Automated Short Notes:

When notes are uploaded, the system generates summaries automatically, capturing essential content and saving student's time. This feature helps in quickly reviewing key points and concepts.

5.1 Additional Features

The application includes several additional features designed to enhance the user experience and support academic success. User Profiles allow students to display their contributions and achievements within the app, fostering a sense of accomplishment and community. The Study Planner is an organized schedule tracker with reminder settings for academic goals, helping students manage their time effectively and stay on top of their coursework. Resource Recommendations provide personalized material suggestions based on user search history, ensuring that students have access to relevant and useful study materials.
Additionally, Interactive Quizzes enable students to create or attempt quizzes to reinforce their knowledge, making learning more engaging and effective.

- **User Profiles:** Display student contributions and achievements.
- **Study Planner:** Organized schedule tracker with reminders.
- **Resource Recommendations:** Personalized material suggestions.
- **Interactive Quizzes:** Create or attempt quizzes to reinforce knowledge.

5.2 Key Features of Chatbot Integration

The chatbot integration in Study Hive offers several key features that enhance its utility and effectiveness. Contextual Understanding is a crucial aspect, as the chatbot is trained on the specific curriculum and uploaded study materials, allowing it to provide accurate and relevant responses to student queries. The Instant Q&A feature ensures that students receive quick answers to questions related to notes, topics, or specific subjects, facilitating efficient learning. Material Recommendations are provided when exact answers are not found, ensuring that students have access to comprehensive resources. The chatbot also integrates with the note-sharing feature, helping students locate notes relevant to their queries, thus streamlining the search process.

The chatbot is available 24/7, ensuring that support is always accessible whenever students need it. Its User-Friendly Interface is designed to be easy to interact with, offering quick help on academic queries. A Feedback Loop allows students to provide feedback, which helps improve the chatbot's accuracy and functionality over time. Finally, Privacy and Security are prioritized, ensuring that all interactions are secure, and data protection is maintained, thereby building user trust and confidence in the system.

REFERENCES

[1] Nazeef, N.M., Khan, A. and Ali, J. (2024). Impact of Collaborative Learning on Student`s Academic Performance in Teacher's Education Program. *Deleted Journal*, 13 (1), 1054–1068. Available from https://doi.org/10.62345/jads.2024.13.1.87.