

Group Project Log

Group Name:	Group - 4
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Group Members:	Nikunj Goenka, Bala Sundeep Krishna Dasari, Prashant Sanjay Sarvi, Harry Ben Alex Pavuluri
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Deliverable:	StudE Project Report
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Group Member Name	Work Done (%)
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Prashant Sanjay Sarvi	25%
Harry Ben Alex Pavuluri	25%
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TECHNICAL REPORT

GROUP - 4

StudE (A Student Companion)

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ABSTRACT

The importance of online education spiked in 2020 due to the covid-19 outbreak. Most of the applications focus on higher education. The team produced a solution in the form of a virtual study platform named StudE. The application developed aims to bridge this gap by providing a learning tool for primary schools. The report showcases the competitive advantage, unique features, task flow, and other essential components of the application, which will result in maintaining the focus of the student even during the disturbance in the class schedule.

Keywords

pandemic, educational institutions, students, SAAS, primary school, examinations, responsive web application, MERN stack, e-learning, education.

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1. INTRODUCTION

From the last couple of years, the concept of traditional classroom learning has changed entirely. The rise of the internet and the advancement in modern technologies have gone hand in hand and paved a way for providing a new learning experience that is better, efficient, and timesaving as compared to conventional teaching practices [1]. People all over the world are entering a new era- the breakthrough in online learning. The importance of online education went unnoticed until the breakout of the pandemic which entirely shook the world with fear, disturbing the usual study routine of the students and responsible for the downfall of the economy globally. StudE, the online education platform for school students, strives hard to deliver quality education whenever and wherever necessary and continuously delivers knowledge to the students online without interrupting their study routine.

Keeping in mind the importance of online education, our team worked hard and built an online platform for the students. So, the students can resume learning by providing teaching materials online by the teachers to the students and recovering the progress lost due to the pandemic. The team members Bala Sundeep, Nikunj Goenka, Harry Ben, and Prashant Sarvi developed the features like providing a separate profile to track their progress and events, allowing the students to access the course content and flexibility to store their information in notes, a dictionary tool which is available throughout the website so that a student can simultaneously view the meaning of the word while studying without getting distracted, a teachers comment section for each student, a discussion forums section to create or participate in a discussion, parents view to see teachers comments about their child. Thus, satisfying our goal is to provide quality education online and convenience to the students for their smooth learning experience, making them a better person each day.

1.1 Developed Features:

1.1.1. Profile management: This feature allows both students and teachers to log in via credentials provided by the institution and gain access to their specific dashboard. There is a bulk import API that can be accessed by the admin to create user accounts for a particular educational institution.

1.1.2. Course Content: This feature allows the students to access the content of the specific enrolled course with advanced filters for quick navigation to the needed content. Also, this feature allows the teachers to add, modify, and delete the content of their assigned courses.

1.1.3. Dictionary: This feature allows the students to get the meaning of any word that they feel hard to understand at any particular instance while using our application. This feature uses an external API to retrieve the data of the selected words.

1.1.4. Teachers Comments: This feature allows the students to get the information about their daily tasks given by the teachers. Whereas this feature allows the teachers to provide feedback about every student for each single. Also, this feature allows the parents to monitor the feedback given by the teacher every day.

1.1.5. Discussions: This feature allows the students to discuss any doubts that they have regarding the courses where anyone who enrolled in that course can respond to the discussions in the comment sections along with the teacher. Also, this allows the teachers to share any information that they missed out in the lectures and assess students' active participation in the course.

1.1.6. Notes: This feature allows the students to save any textual information that they wish to revise later when they come back. It is specific to each course and can be used as paperless running notes. Also, it allows users to save the content with a title for a quick reference.

1.2 Live Project URL

The application can be accessed using the following link:

<https://stude-group4.herokuapp.com/>

The link for GitHub repository is:

<https://github.com/bala-sundee-d/StudE.git>

2. BACKGROUND

Today's world is more likely to take the privilege of online platforms for any kind of problem that needs to be solved, and quality education is one of the most concerning issues among those. So, our "StudE" application will try to solve that problem by continuously delivering knowledge to the students online without interrupting their study routine whenever and wherever necessary. The application offers some unique features like a parental view, an inline dictionary, notes, and teachers' comments.

2.1 Competitive Landscape

The Stud-E is an online educational platform for Primary school students. Due to the global pandemic of 2020, most schools and universities have shifted towards online classes. Unlike universities and colleges, schools do not have the budget or the resources to develop their learning applications. Stud-E is a website that is entirely based on providing primary school a platform which will help them deliver study content to the students. There are other applications like Brightspace that provide similar services, but all these applications are focused on high school and graduate-level students. There are a few unique selling propositions of our web applications which gives us an upper hand in the market.

2.1.1 Layout and Design: Since our application is focused on primary school, we have tried to develop an application that is easy for kids to use. Most of our task flows are small and require minimum learning for students.

2.1.2 Parents View: Unlike High school students, primary school students still need parents' guidance. Our application provides features that are specifically made so that parents can monitor their kid's performance and activities in school.

2.1.3 Teacher Communication: Parent-Teacher communication is very important for primary school students. Parents need to be aware of upcoming events, activities of their kids. This feature will enable teachers to notify parents of any such event.

2.1.4 Dictionary: Kids are easily distracted and have a small attention span. They will get distracted every time they search for the meaning of a new word on the internet. To prevent this, we have provided an in-app dictionary, this icon will always be on the screen so that students can access it whenever they face a difficult word.

2.2 Problem and Approach

The purpose of the StudE is to provide students with an online learning platform personalized for them with a one-to-one learning experience which helps us understand every child's learning ability and needs to fulfill their dreams. The StudE strives hard to completely transform how knowledge can be imparted to students, benefiting students by learning in an easy, effective, and simpler way [2]. Unlike classroom teaching, the student can refer to the course content anytime and anywhere just with the availability of the internet. The StudE is extremely helpful during the revision of the chapters during the examination, especially if the student did not attend the classes during regular hours. The StudE platform can help the students to acquire knowledge with ease and according to their own pace. It also helps the student to improve the ability to prepare the topic on their own.

The StudE aims to deliver knowledge in a well-organized way and continue to keep the concentration of the students on the studies without getting affected by external parameters like the ongoing pandemic (COVID-19). StudE provides a separate portal for each student to keep track of all the major events in the school and provide reports on their performance in each subject. StudE also believes in socializing among peers which can help to improvise interactions between teachers and students. So, it provides students with a discussion forum where students can share their thoughts, ideas, and news regarding the subjects in the curriculum which helps the students to update their knowledge on the courses on a day-to-day basis. Providing all the essential modules and facilitate the help of tools under one roof provides convenience to the students and enables them to progress well and improve their learning skills. StudE also provides ease to the parents by updating their children's behavioral remarks by automatically delivering all the information to parents regularly in a separate parent's portal.

3. APPLICATION DETAILS

The application StudE primarily focuses on improving the online educational experience for everyone and provides a one-stop application for all their needs. As a platform, the application will be continuously improving and expanding with new features and enhancements, but the target users for the application will remain the same.

3.1 Target User Insights

The application StudE is developed for primary schools. There are two levels of Target users for this application the application StudE primarily focuses on improving the online educational experience for everyone and provides a one-stop application for all their needs. As a platform, the application will be continuously improving and expanding with new features and enhancements, but the target users for the application will remain the same.

1. Schools
2. Secondary Users – (School's Faculties, School's Students, School's Parents)

Schools will be able to lease StudE as Software as a Service (SaaS), hence learning institutions will be the primary audience. For every school, the people associated with them will be able to use StudE. So, Teachers, Students, and Parents will be the secondary users of the application.

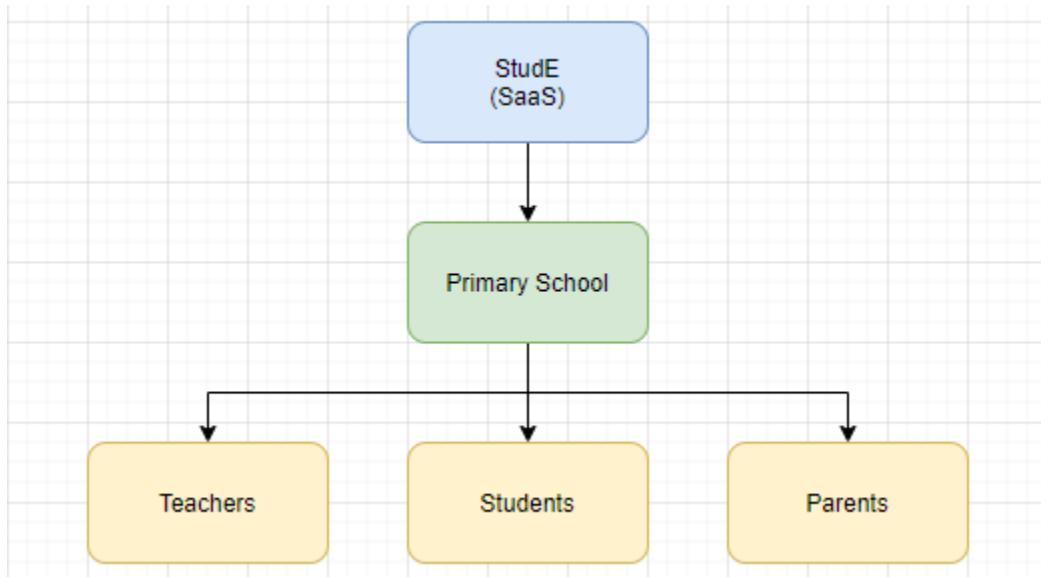


Figure 1: Target Users. Created with Draw.io [3]

Most applications will be used by schools and universities to provide distance education or for providing online learning along with classroom teachings. The application target audience of age 5-14 years, who live in modern society and having facilities to avail of the latest technology. By providing unique features which can help the students to improvise each day will drive more customers to choose our service. As the users are

school students, the visual appeal of the application has various color combinations that keep the interests of the student to stay on the website, deeply involve them in the learning.

The application aims to bridge the conversation and information gap created due to the online mode of learning.

3.2 User-Centered Design Approach

The User Interface also considers the fact that primary school students using the application will have many miss-clicks and accidental scrolls. The overall application has no scroll and covers the entire browser screen hence, making it impossible to scroll by mistake.

3.2.1 Information Architecture

The website is designed toward small task flows so that primary school children can navigate easily through the content on the website.

The parents' view is placed in the main navigation bar so that the busy parents don't have to go through the entire website. They can simply navigate to the "parents' view" tab and view teachers' comments. In the future, this tab will contain more features like overall grades and performance (proposed in the proposal document).

For Students, the flow is kept simple. As soon as they select a course, they will be able to see all the content related to that course. In the future, this content will be furthered enhanced based on chapters (proposed in the proposal document).

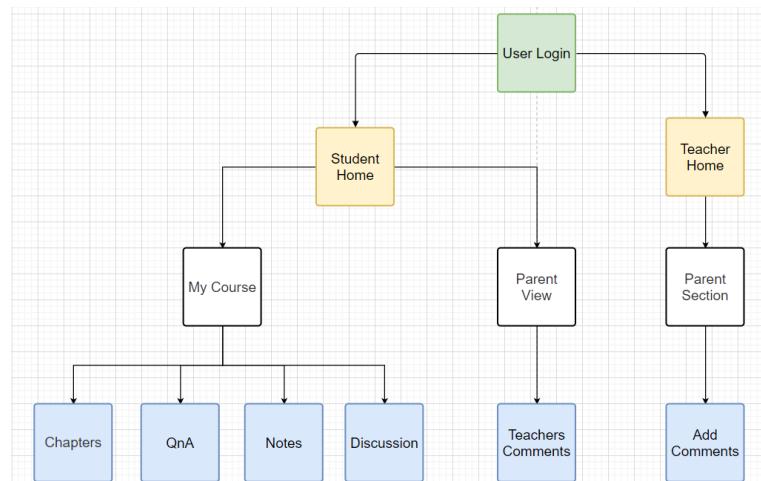


Figure 2: Sitemaps. Created with Draw.io [3]

3.2.2 Design and Layout

All the website designs are focused on simplicity. The application considers the fact that the website will be used by primary school students. The website design should be simple and motivate the students to interact with the application. This has been achieved by adding bright colored user interface, simple user interface, small task flows.

3.2.2.1 Home Page

Since the entire application is based around students, the application has a course page as the default homepage. As soon as the students log on to the website, they will see the course cards with big images and attractive colors.

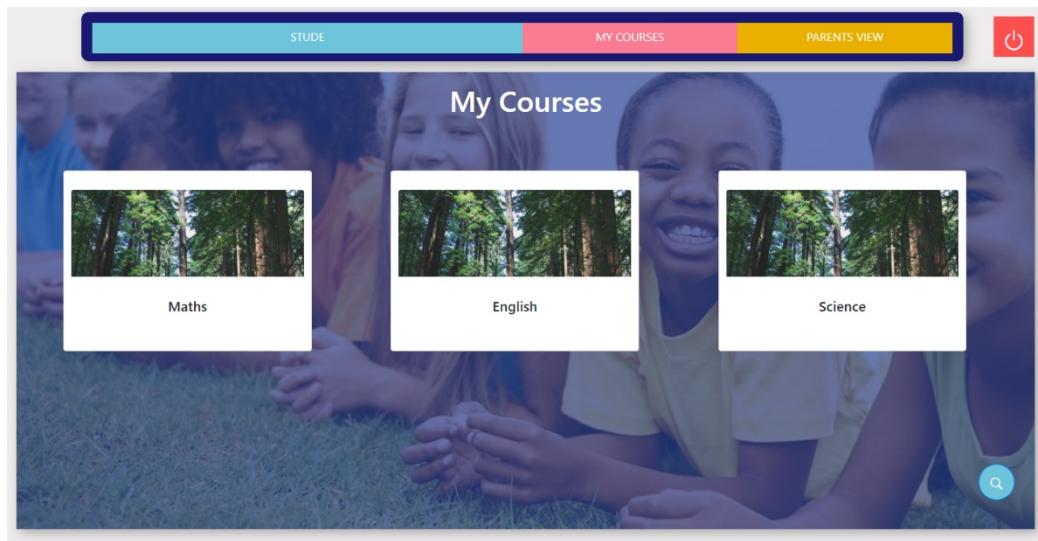


Figure 3: Home Page

3.2.2.2 Course Page

When a student selects any one course from the course list on the home page, they are redirected to the course page. This page consists of navigation tabs that have links related to the course like study material, discussion forum, etc.

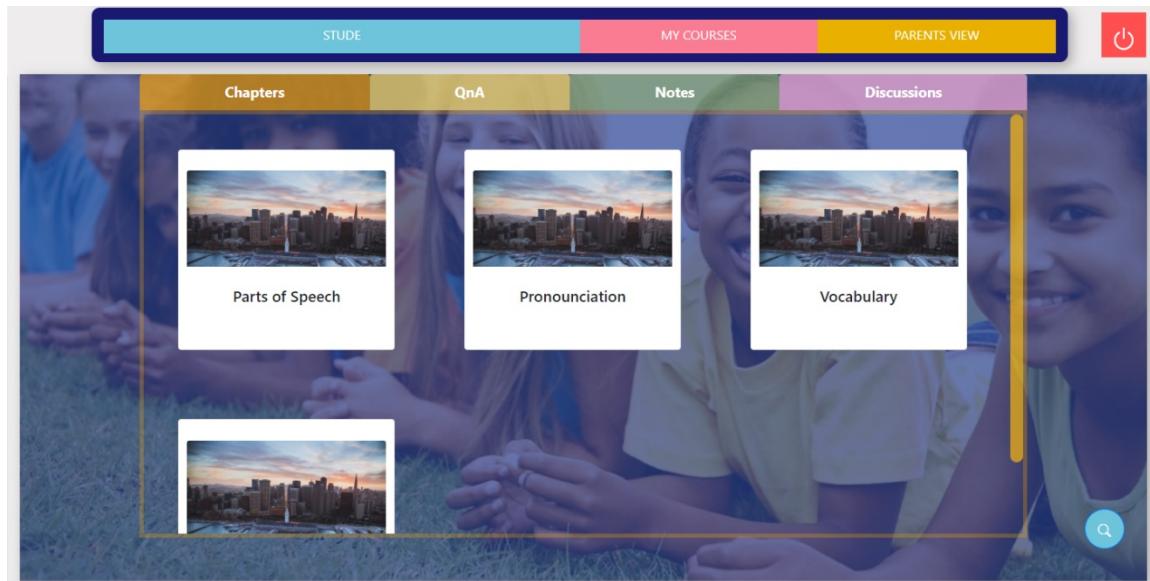


Figure 4: Course Page

3.2.2.2.1 QnA Tab:

QnA feature is posted on the web page for the student to get a detailed explanation of a topic in the form of text. This feature is very useful to the students who have missed the classes and during examination for revision purposes. Most of the questions in the examinations are asked from this section. The unique thing about this feature is that it's available anywhere anytime which is responsive and user-friendly such that they can access it easily from PCs, tablets, and smartphones to improve the learning experience of the students.

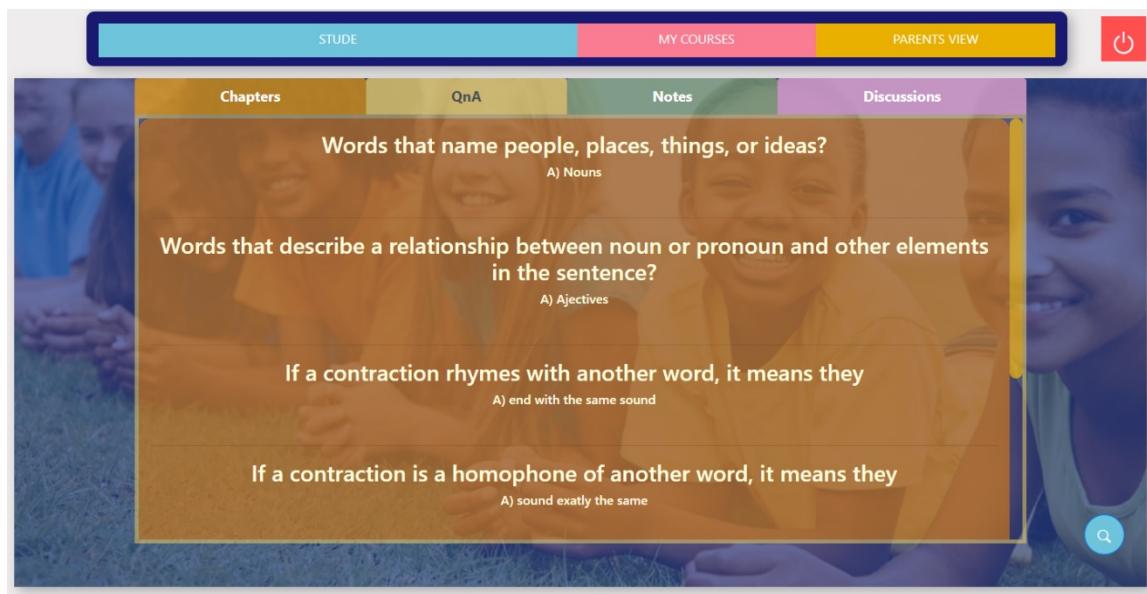


Figure 5: Question & Answers

3.2.2.3 Notes Tab

After selecting any of the subjects, a student can create a new note or view all the existing notes from the notes tab.

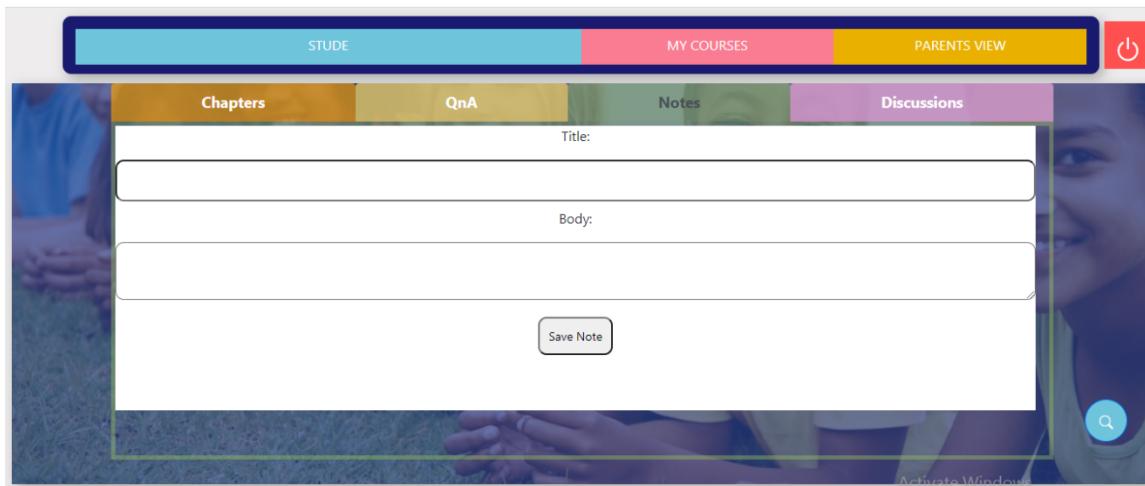


Figure 6: New Notes Option

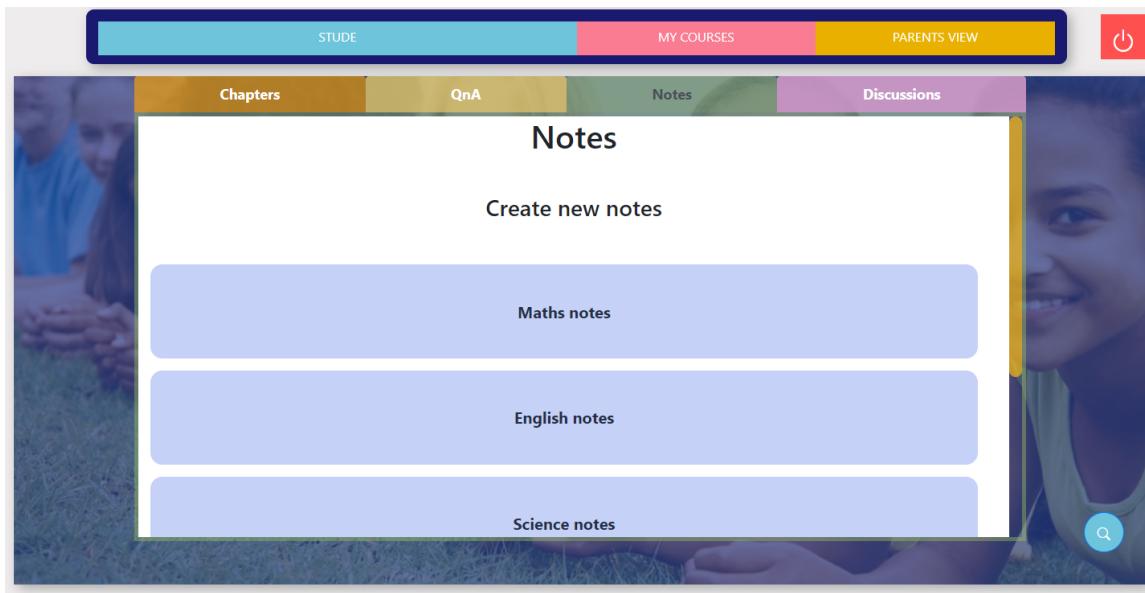


Figure 7: Existing Notes

3.2.2.4 Discussions Tab

After clicking on a particular subject, the users can view and participate in all the ongoing discussions by commenting or they can create a new discussion forum.

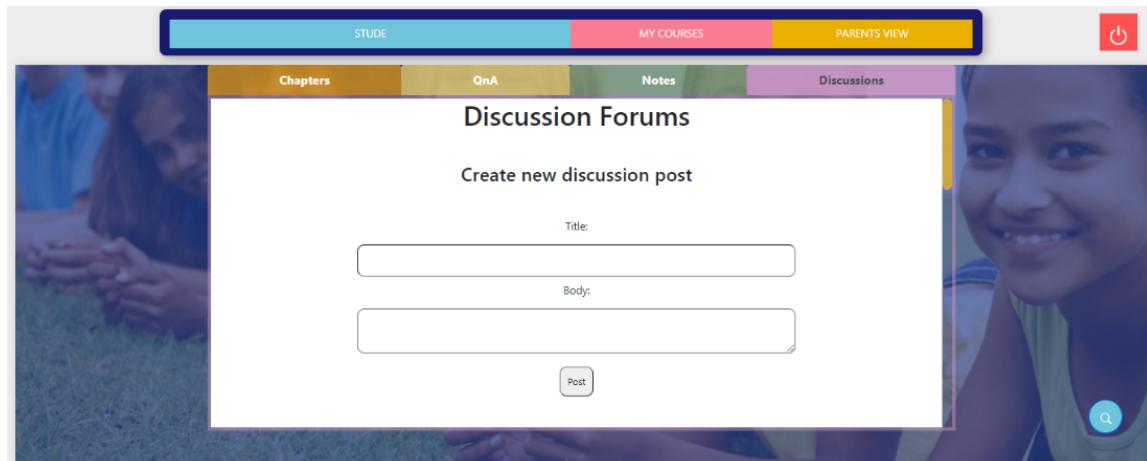


Figure 8: New Discussion Post

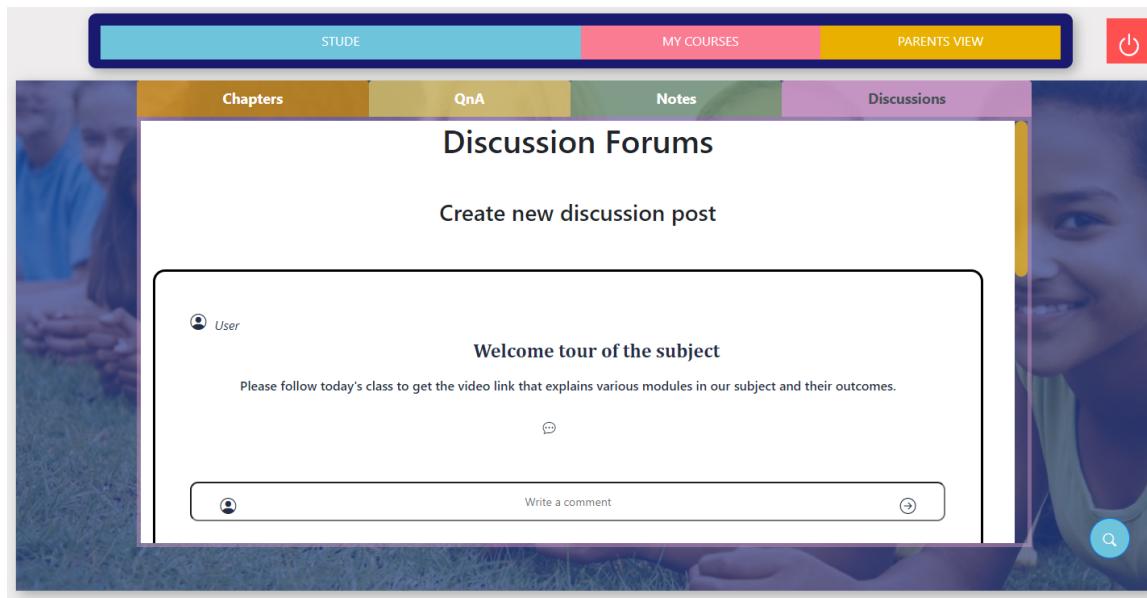


Figure 9: Discussions

3.2.2.5 Teachers Comments

Most of the working parents need to go through the website quickly and having comments shown as soon as they click the ‘parent view’ button will save time for them. For this fact parent’s tab showcasing the teacher, comments are easily available on top of the application.

In the future the “parents View” will also have more features like Overall performance, to help parents understand their children’s activities in school better.

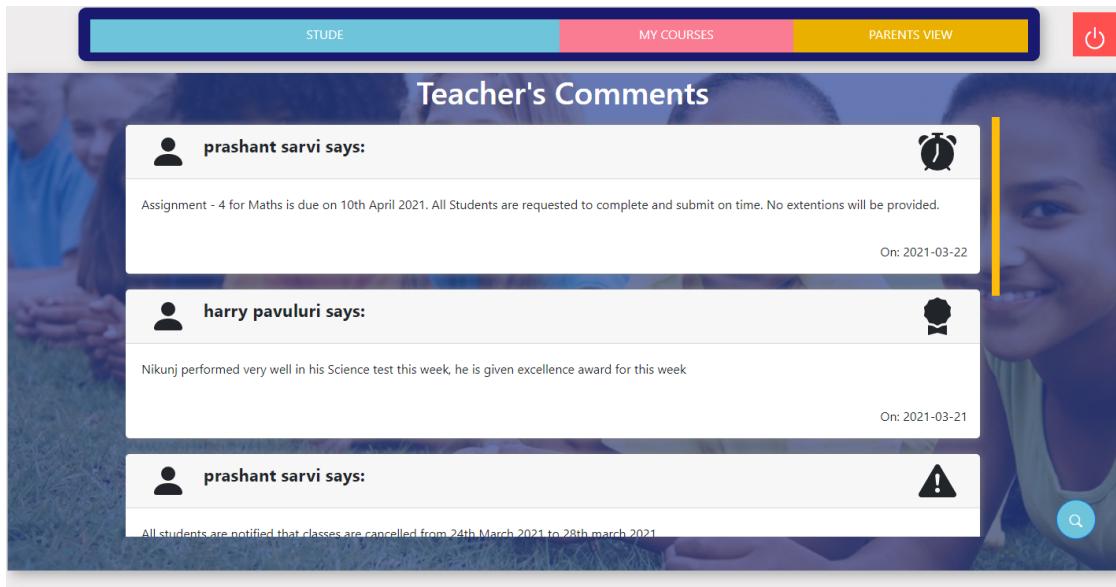


Figure 10: View Teacher's Comments

Techers will be able to add comments for students in their course.

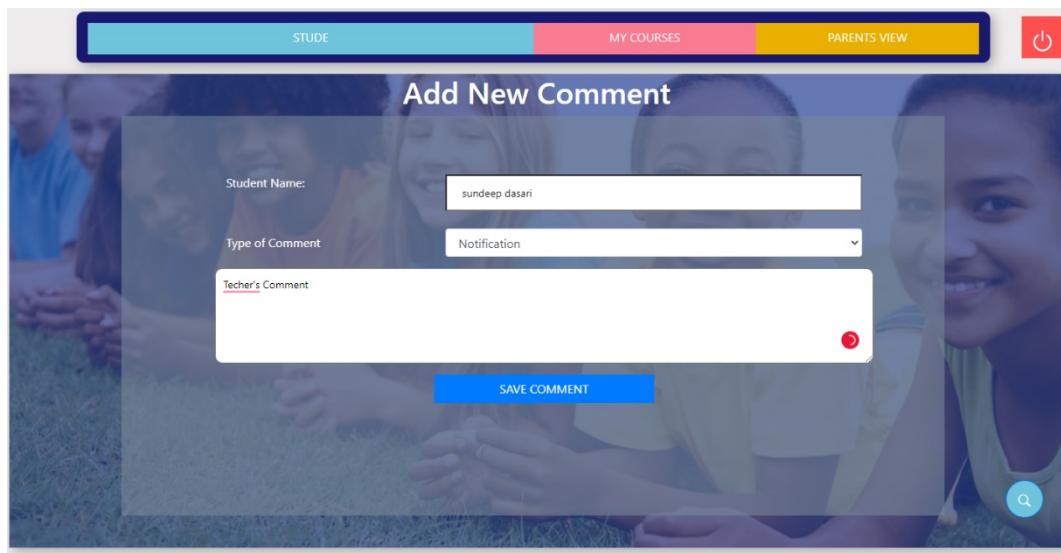


Figure 11: Add Teacher Comment

3.2.2.6 Login Page

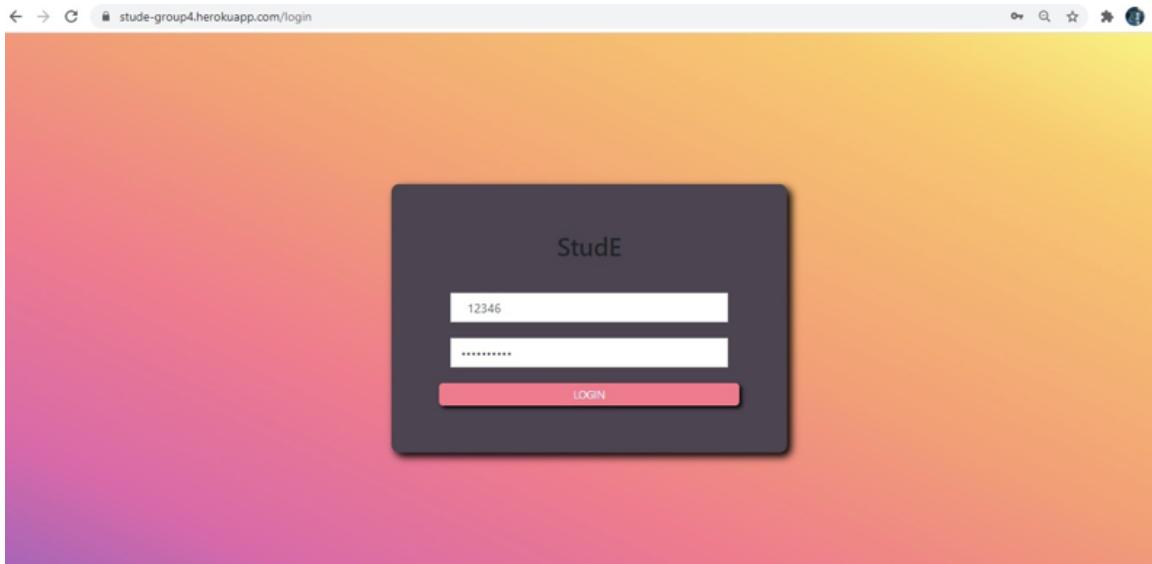


Figure 12: User Login Form

3.2.2.7 Dictionary Page

This feature allows the students to get the meaning of any word that they feel hard to understand at any instance while using our application. This feature uses an external API to retrieve the data of the selected words.

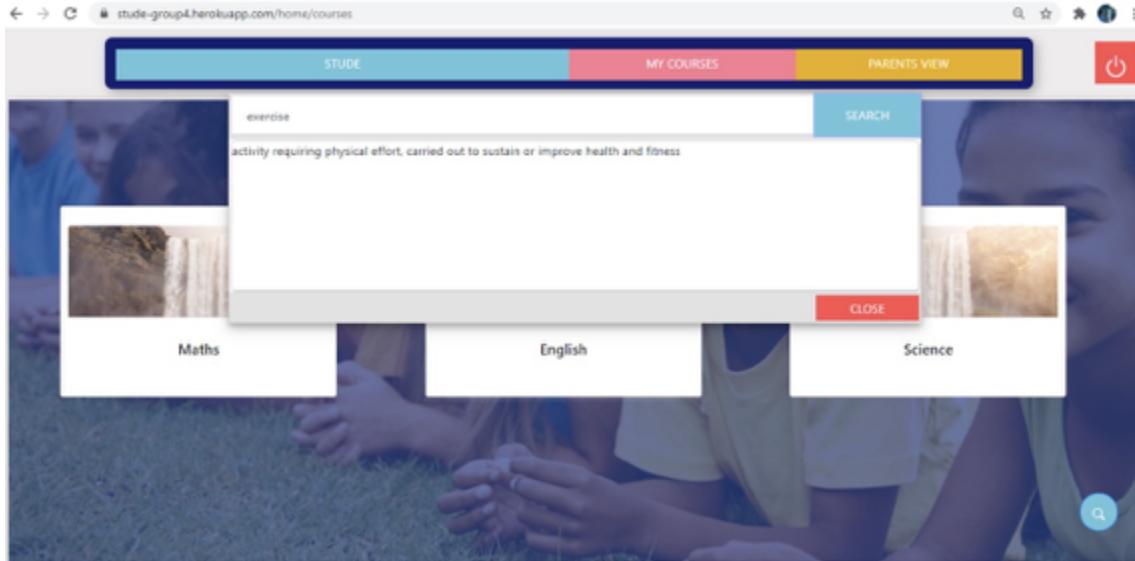


Figure 13: Dictionary Look up Page

4. APPLICATION WORKFLOW

Since the application is made for primary school students, most of the task flows are quite simple and easy to perform. MongoDB is set up for the data storage of the application. There are collections for all the components of the application.

4.1 Interaction Design

For each feature click stream and backend process is given bellow:

4.1.1 Teacher comment:

Users: Teaches (Add Comments) and Parents (View Comments)

- **Click Steam for Parents:** Parents have to log in using the student ID and Password, then click on the “Parents View” Tab present in the top navigation bar.
- **Click Steam for Teachers:**
Teachers have to log in using the Teacher ID and Password, then click on the “Parents View” Tab present in the top navigation bar. They will be able to see the Add comment form. Fill this form and save comments will add a comment for the selected student.

- **Backend Flow:**

To get the teachers comments, the application first needs to get the get teacher id for all the subject user is enrolled in and then we get the Comments using the teacher Id.

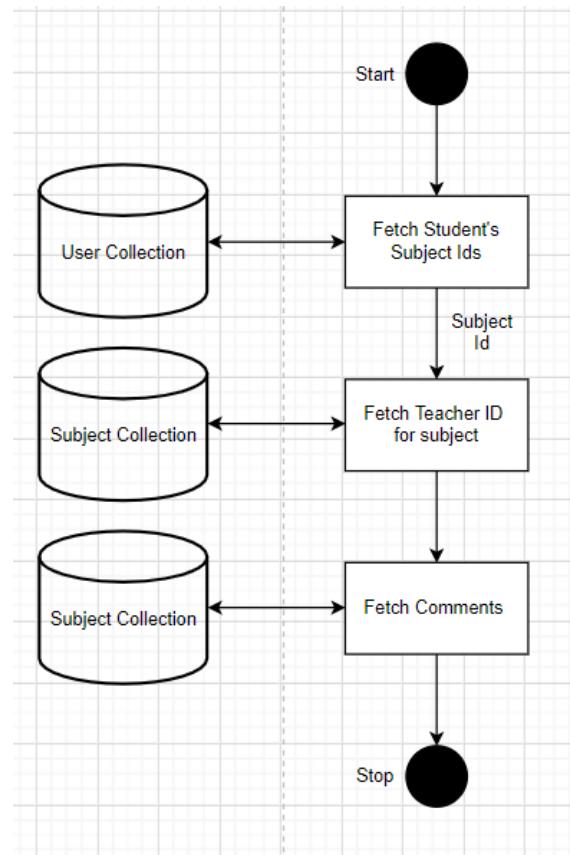


Figure 14: Teacher's Comments Backend flow. Created with Draw.io [3]

4.1.2 QNA:

- **Click Steam:**
 1. Login using the student ID and Password
 2. Select subject by clicking on subject cards.
 3. Click on “QnA” tab present in navigation Tabs.
- **Backend Flow:**

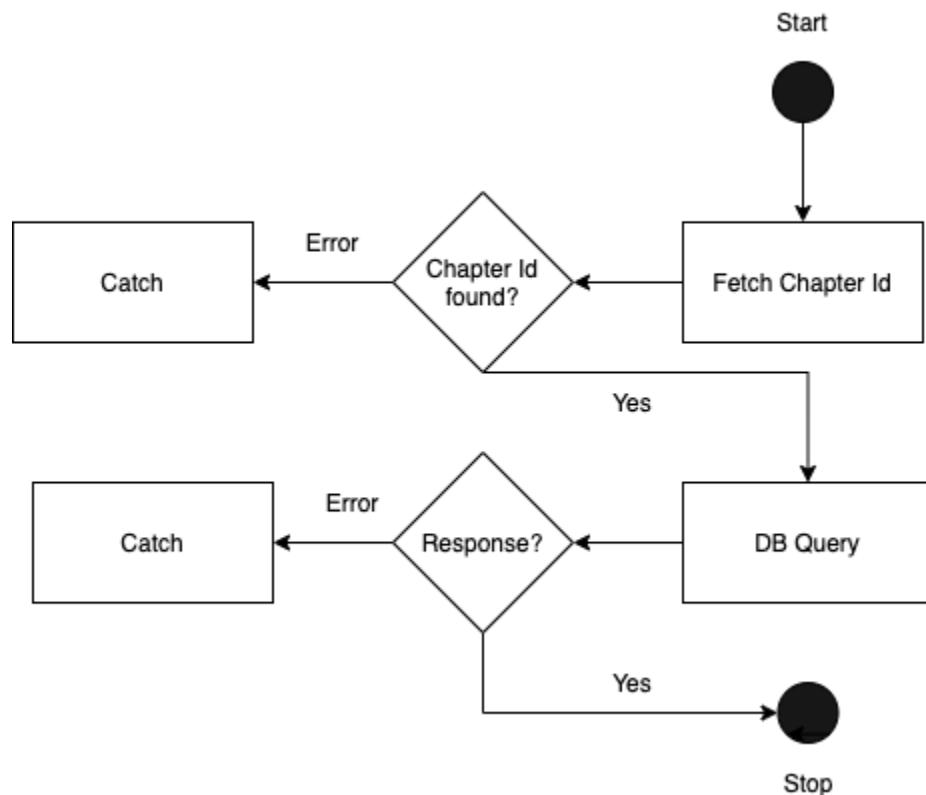


Figure 15:QnA Backend flow. Created with Draw.io [3]

4.1.3 Notes:

- **Click Steam:**
 1. Login using the student ID and Password
 2. Select subject by clicking on subject cards.
 3. Click on “Notes” tab present in navigation Tabs.
- **Backend Flow:**

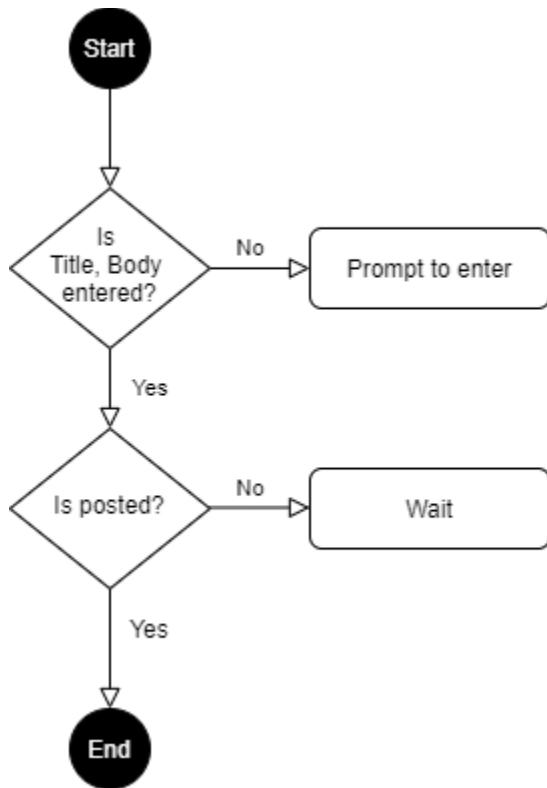


Figure 16 : Create New Notes Backend flow. Created with Draw.io [3]

4.1.4 Discussion:

- **Click Steam:**
 1. Login using the student ID and Password
 2. Select subject by clicking on subject cards.
 3. Click on “Discussion” tab present in navigation Tabs.
- **Backend Flow:**

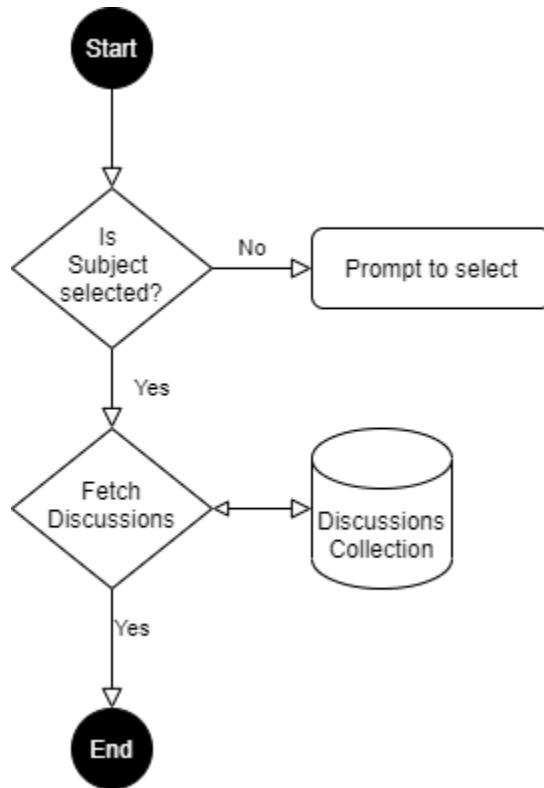


Figure 17: Fetch Discussions Backend flow. Created with Draw.io [3]

4.1.5 Profile Management:

- **Click Steam:**
 1. Provide array of JSON objects containing user details.
 2. Invoke <https://stude-group4.herokuapp.com/users/importUsers> POST API with the above body.
- **Backend Flow:**

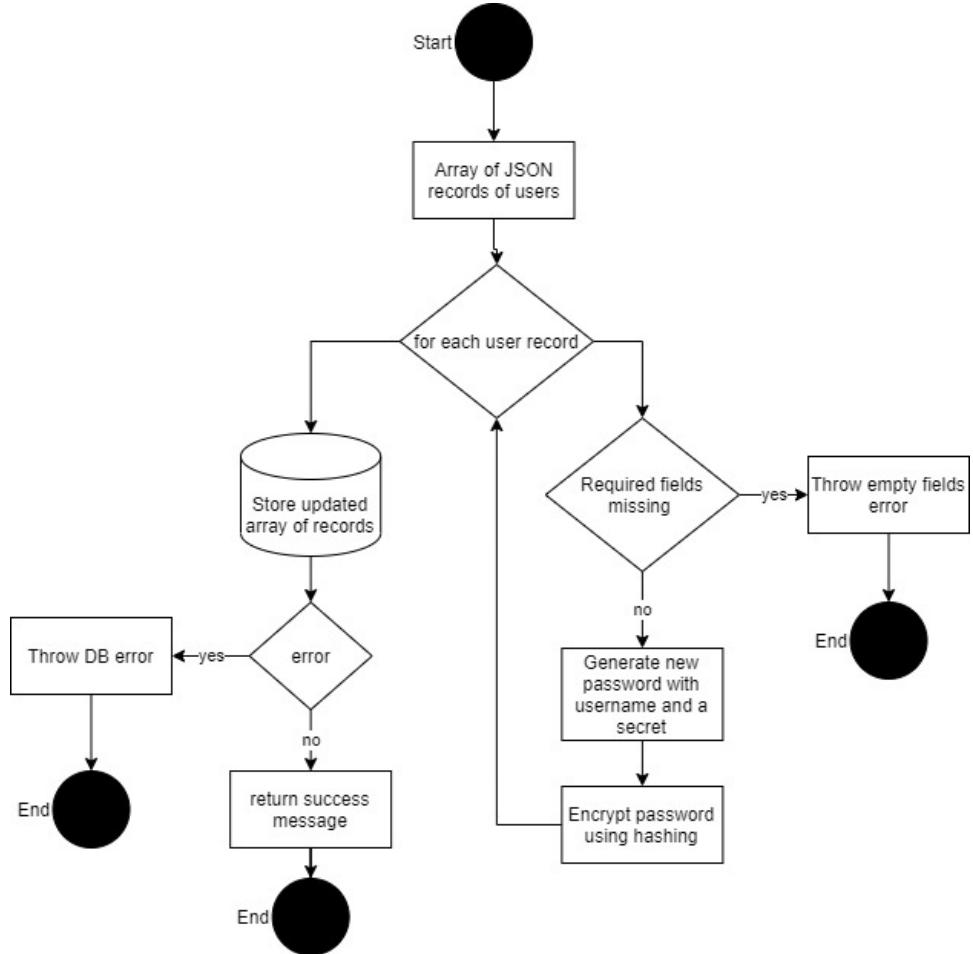


Figure 18: Users' Bulk Import workflow diagram. Created with Draw.io [3]

- **Click Steam:**
 1. Provide userId and Password.
 2. Click on login button.

- **Backend Flow:**

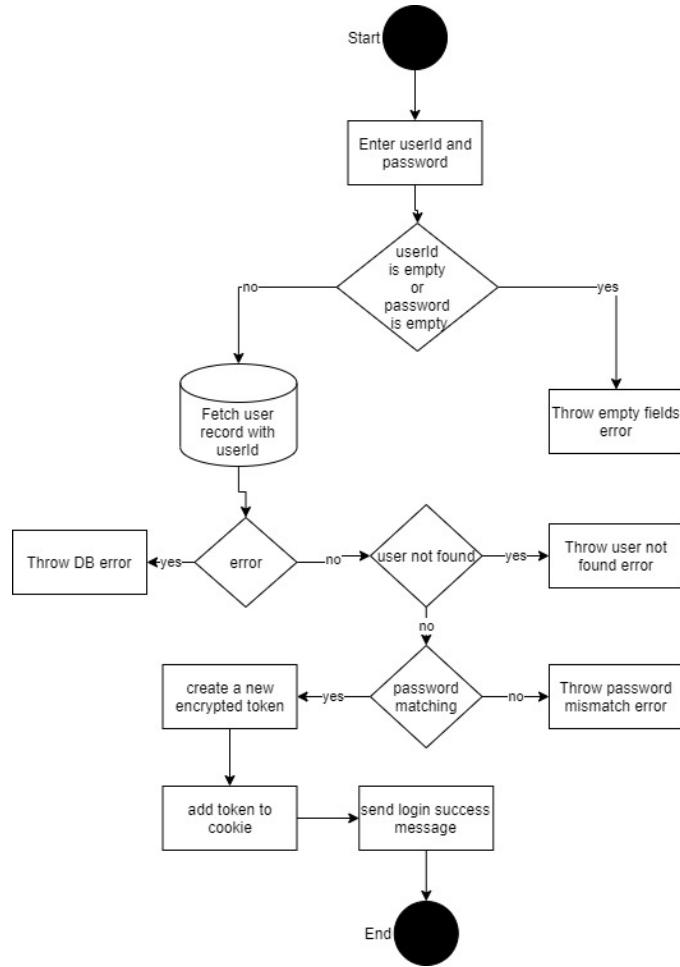


Figure 19: Login workflow diagram. Created with Draw.io [3]

- **Click Steam:**
 1. Click on dictionary icon.
 2. Enter a word to search the meaning for.
 3. Click on the search button.
 4. View the meaning and click on close button.

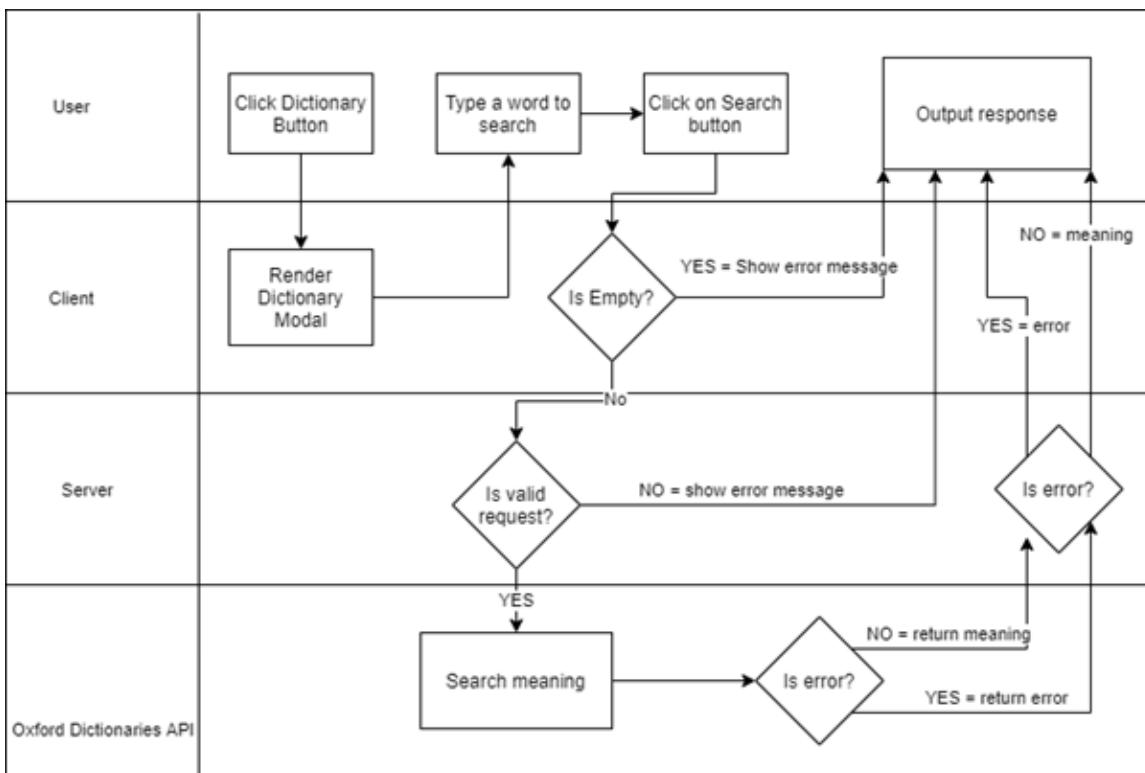


Figure 20: Task flow diagram to search the meaning of a word. Created with Draw.io [3]

4.2 Process and Service Workflow

Intended Scenario 1:

Harry is preparing for the upcoming mid-term examination of English subjects. He came across the word “Empathy” while reading the question and answers of the Chapter1. He is unaware of the word’s meaning and wants to look up the meaning in the dictionary. Figure 21 explains the task flow of this scenario.

Use case 1:

1. Harry clicks on the ‘Dictionary’ button floating on the right side of his screen. **[User Action]**
2. The system opens a modal window of the dictionary. **[System Action]**
3. Harry sees the dictionary modal window. **[User Action]**
4. Harry types the word “Empathy”. **[User Action]**
5. Harry clicks on the ‘search’ button. **[User Action]**
6. System searches for the word through online API. **[System Action]**

7. Systems shows an error saying that “Oops! Unable to fetch the meaning.” [System Action]
- 7.1. Harry searches the word again. [User Action]
- 7.2. System shows the meaning of the word. [System Action]
8. Harry clicks the close button of the dictionary modal. [User Action]
9. Systems hide the dictionary modal. [System Action]

Task Flow 1:

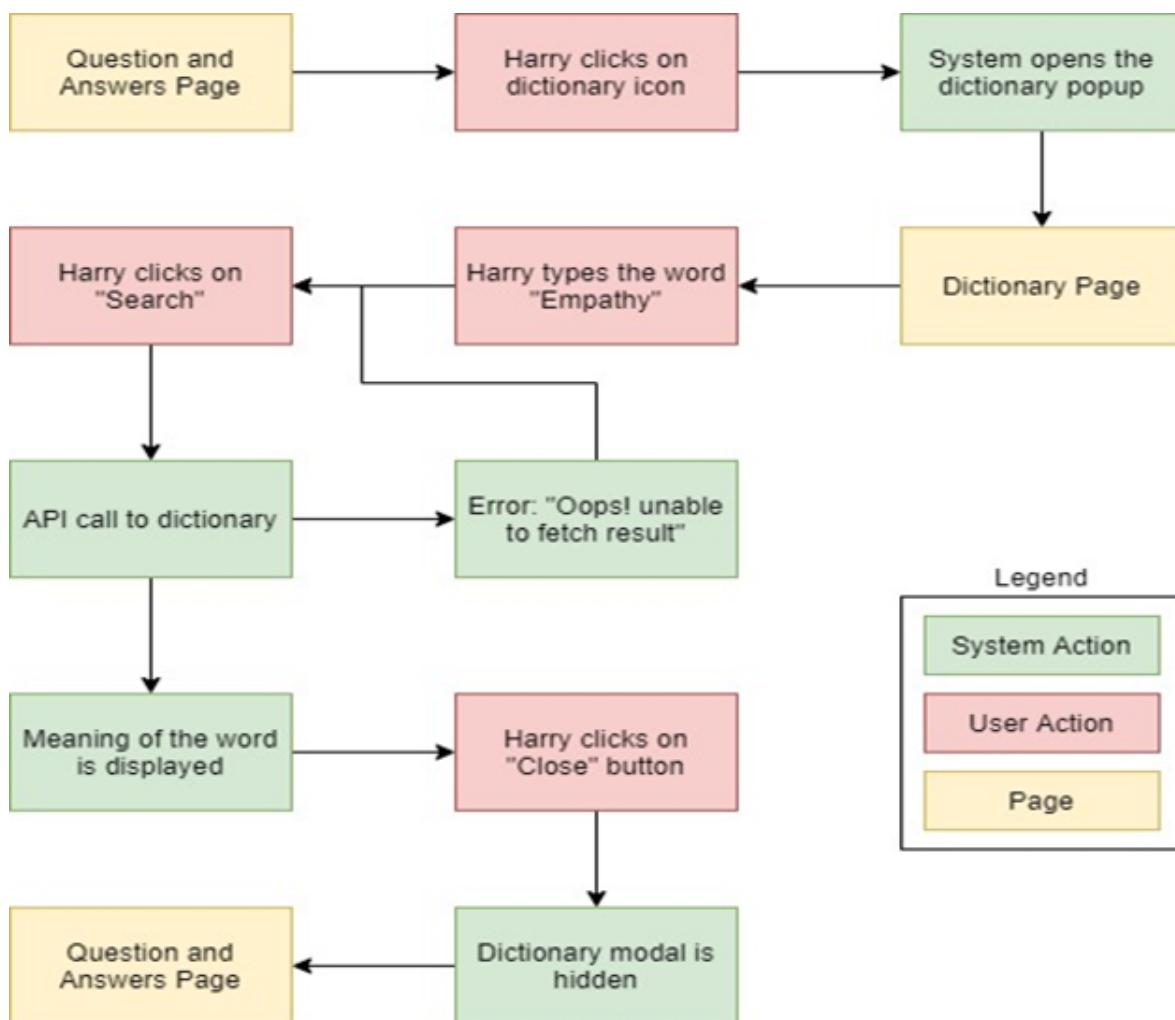


Figure 21: Task flow diagram for use case 1. Created with Draw.io [3]

Intended Scenario 2:

Your science teacher instructed every student to participate in the discussion forum about any topic from the subject. So, either you have to create a new discussion, or you can comment on any one of the already existed discussions, so you have decided to go ahead and create a new discussion. Figure 22 explains the task flow of this scenario.

Use Case 2: Creating a new discussion

1. Peter visits the application homepage **[user action]**
2. Peter clicks on the ‘Discussion Forums’ option **[user action]**
3. System displays forums page **[system action]**
4. Peter clicks on the ‘Create new discussion’ link **[user action]**
5. System displays new discussion form, and requests user to enter title and content of discussion **[system action]**
6. Peter enters title and content of discussion **[user action]**
 - 6.1. Peter enters only the title but not the content of the discussion **[user action]**
 - 6.1.1. System displays an error message and prompts the user to enter valid content **[system action]**
 - 6.1.2. Peter enters valid content **[user action]**
 - 6.2. Peter enters only content but not the title of discussion **[user action]**
 - 6.2.1. The system displays an error message and prompts the user to enter a valid title **[system action]**
 - 6.2.2. Peter enters valid title **[user action]**
 - 6.3. Peter did not enter both title and content of the discussion **[user action]**
 - 6.3.1. System displays an error message and prompts the user to enter valid title and valid content **[system action]**
 - 6.3.2. Peter enters valid title and valid content **[user action]**
7. Peter clicks on the ‘Post’ button **[user action]**
8. System displays a confirmation message of successful post **[system action]**

Task Flow 2:

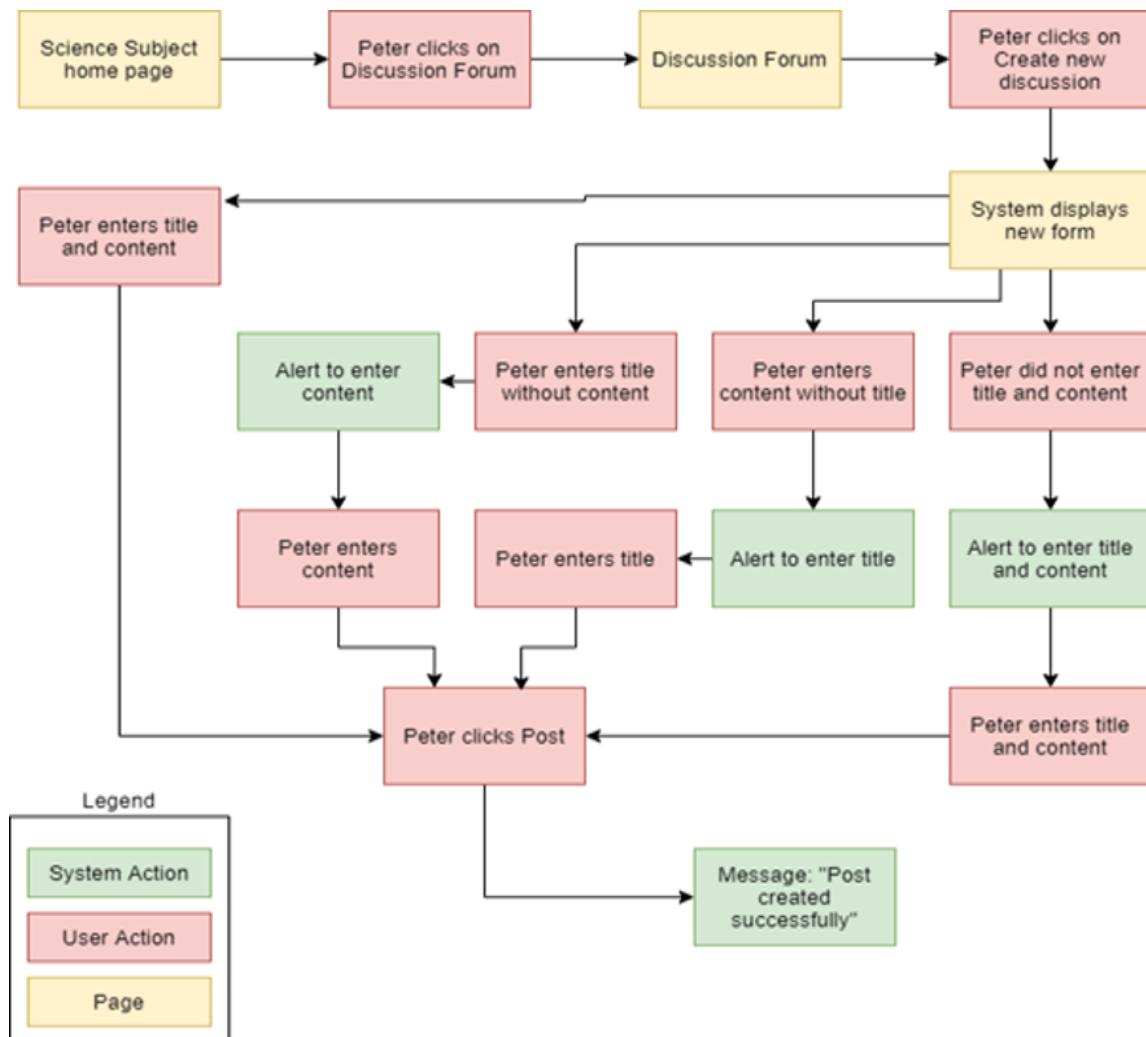


Figure 22: Task flow diagram for use case 2. Created with Draw.io [3]

Intended Scenario 3:

You have announced to your students that everyone must participate in the discussion forums and instructed them either to create a new discussion or to comment on any one of the already existed discussions. So, all your students have actively participated and now you have to view them and comment on what you feel about it. Figure 23 explains the task flow of this scenario.

Use Case 3: Commenting to a forum

1. Rob visits the application homepage **[user action]**
2. Rob clicks on the ‘Discussion Forums’ option **[user action]**
3. System displays forums page with all the existed forms **[system action]**
4. Rob views all forums **[user action]**
5. Rob selects one of the forums **[user action]**
6. Rob clicks on the ‘write a comment’ option of the selected forum **[user action]**
7. System waits for the user to enter comment **[system action]**
8. Rob enters comment **[user action]**
 - 8.1. Rob did not enter comment **[user action]**
 - 8.1.1. The system displays an error message and prompts the user to enter a valid comment **[system action]**
 - 8.1.2. Rob enters valid comment **[user action]**
 9. Rob clicks on the ‘Comment’ icon **[user action]**
 10. System displays a confirmation message of successful comment **[system action]**

Task Flow 3:

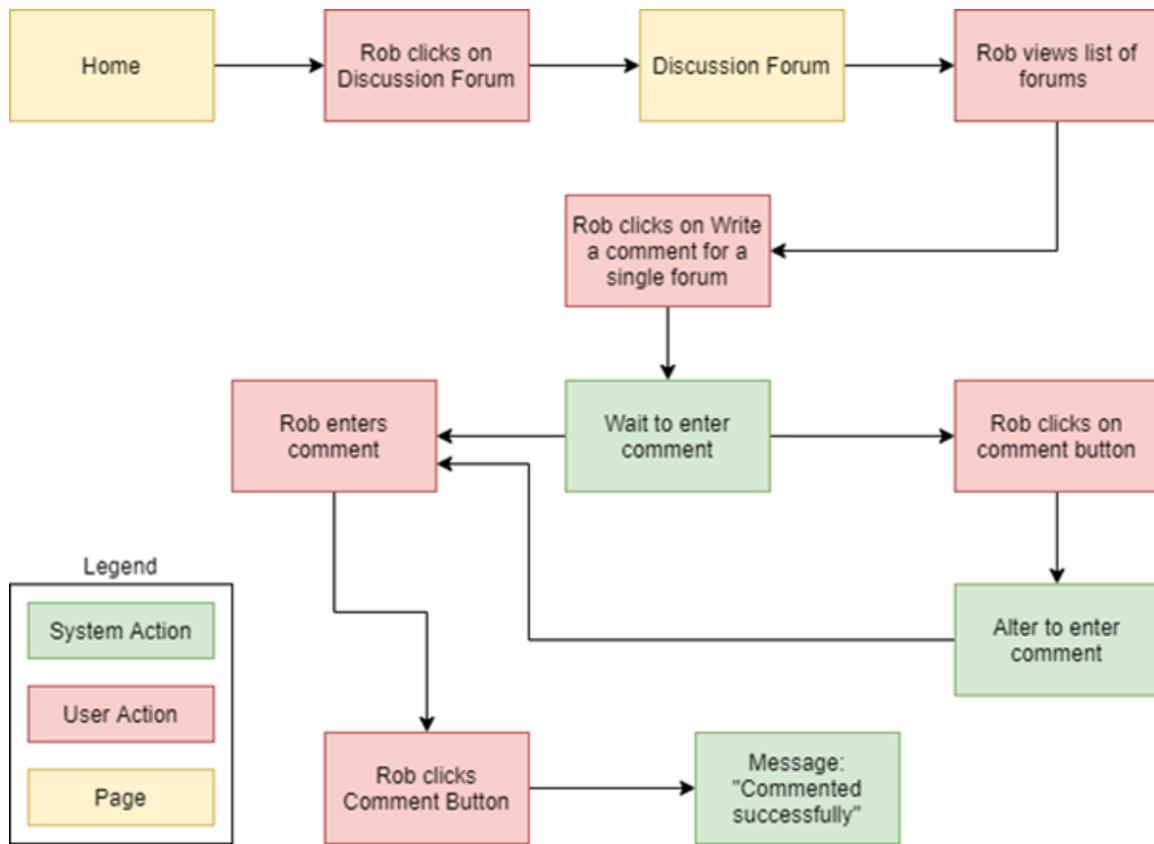


Figure 23: Task flow diagram for use case 3. Created with Draw.io [3]

Intended Scenario 4:

Anna has just attended the Science lecture and made notes regarding the same. Now, as the topic is fresh in the student's mind, Anna wants to refer to the course content which consists of questions & answers and wants to get in-depth knowledge about the topic. Figure 24 explains the task flow of this scenario.

Use Case 4:

1. Anna visits the landing page of the web application [user action]
2. Anna has two options to select:
 - 2.1. If Anna is an existing user, the student enters the username and password details for authentication [user action]
 - 2.1.1. Anna clicks on the 'Sign in' button [user action]
 - 2.2. If it's a new user, the Anna registers by entering the basic details [user action]

- 2.2.1. Anna then clicks on the ‘Sign up’ button [user action]
3. System validates the user credentials [system action].
4. System displays an acknowledgment message to the user for successful Sign in/Sign up [system action]
5. System redirects to the student home page which consists of dashboard [system action]
6. Anna selects one of the courses from the list of enrolled subjects available on the dashboard [user action]
7. The system redirects to a page that contains the list of chapters of that Subject [system action]
8. Anna selects one of the chapters from the list available on the dashboard [user action]
9. The system redirects to the Content page which consists of all the questions and answers regarding the preferred course [system action]
10. Anna then refers to the course information on the web page [user action]

Task Flow 4:

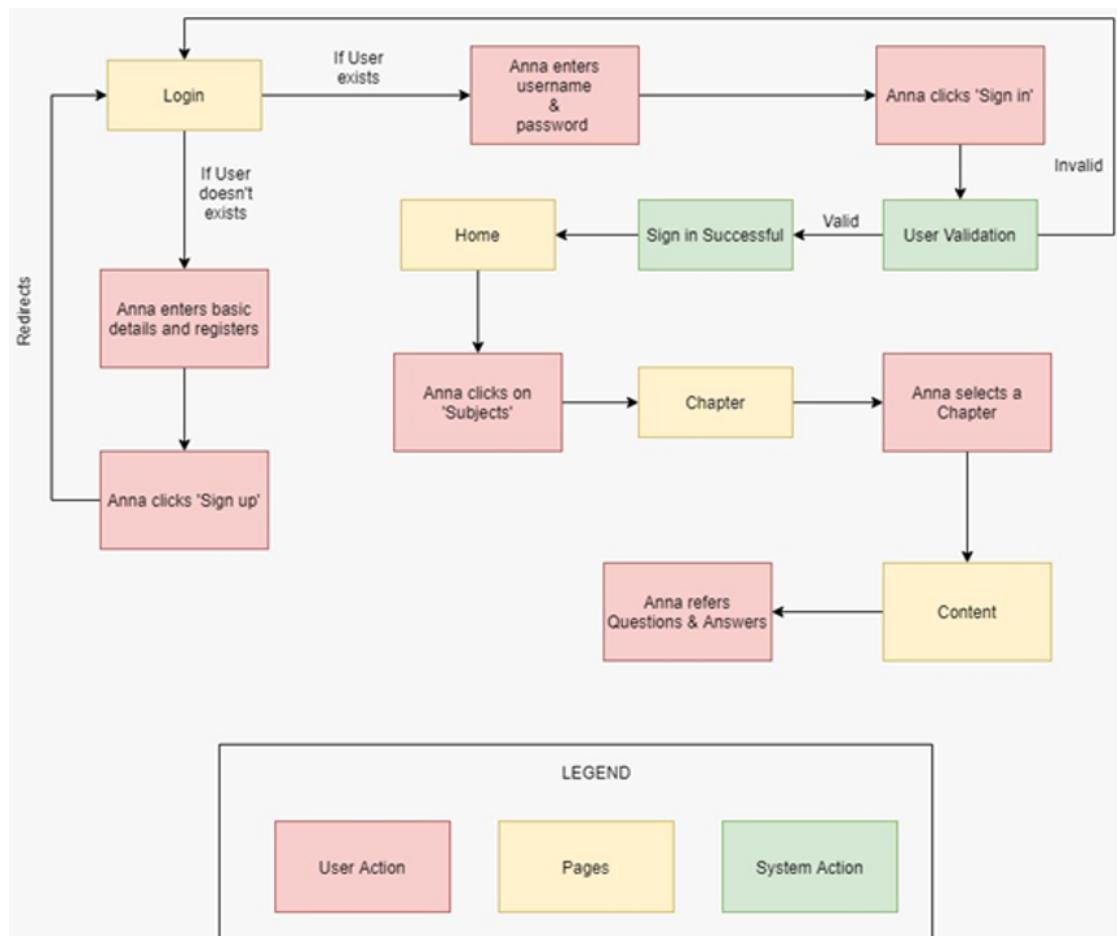


Figure 24: Task flow diagram for use case 4. Created with Draw.io [3]

Intended Scenario 5:

The lecturer Robin is worried about Alexis Roger and wants to notify her parents about the poor performance in the quizzes, recommend their parents to follow her up with her studies, and recommend her to take up the extra classes in the course scheduled at the end of the week. Figure 25 explains the task flow of this scenario.

User Case 5:

1. Robin visits the landing page of the web application
2. Robin has two options to select:
 - 2.1. If Robin is an existing user, the student enters the username and password details for authentication **[user action]**
 - 2.1.1. The Robin clicks on the ‘Sign in’ button **[user action]**
 - 2.2. If it’s a new user, the Robin registers by entering the basic details **[user action]**
 - 2.2.1. Robin then clicks on the ‘Sign up’ button **[user action]**
 3. System validates the user credentials **[system action]**
 4. System displays an acknowledgment message to the user for successful Sign in/Sign up **[system action]**
 5. System redirects to the Lecturer home page which consists of dashboard **[system action]**
 6. Then, Robin searches for the student Alexis Roger **[user action]**
 - 6.1. If the student is not available in the list, the system displays a message by saying “Student doesn’t exist” **[system action]**
 7. If the student exists, the system redirects to Alexis’s profile page which consists of a dashboard having various options **[system action]**
 8. Robin selects the Diary option from the dashboard **[user action]**
 9. System redirects to Alexis’s Diary page **[system action]**
 10. Robin enters the remarks which he wants to convey to Alexis’s parents **[user action]**

Task Flow 5:

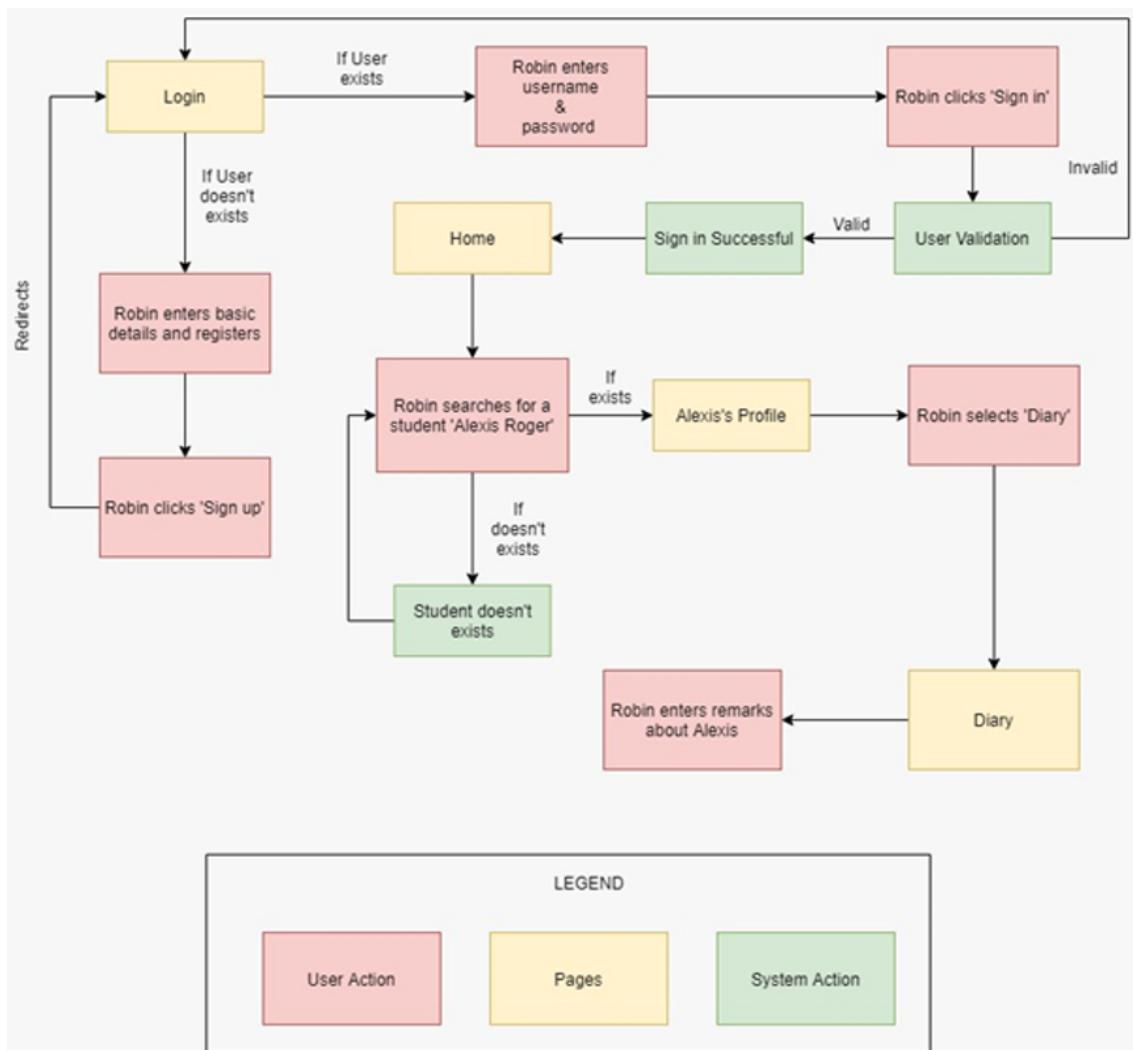


Figure 25: Task flow diagram for use case 5. Created with Draw.io [3]

Intended Scenario 6:

Robin is a student and wants to log in to the application to perform certain tasks. His main intention is to check whether his credentials are working or not. Figure 26 explains the task flow of this scenario.

User Case 6:

1. Robin visits the landing page of the web application
2. Robin enters user-id **[user action]**
3. Robin enters password **[user action]**
4. Robin clicks on submit **[user action]**
5. System validates the credentials
 - 5.1. Incorrect user id/ password
 - 5.2. Robin re-enters his credentials **[user action]**
 - 5.3. Robin clicks on submit **[user action]**
6. System redirects to dashboard page **[system action]**

Task Flow 6:

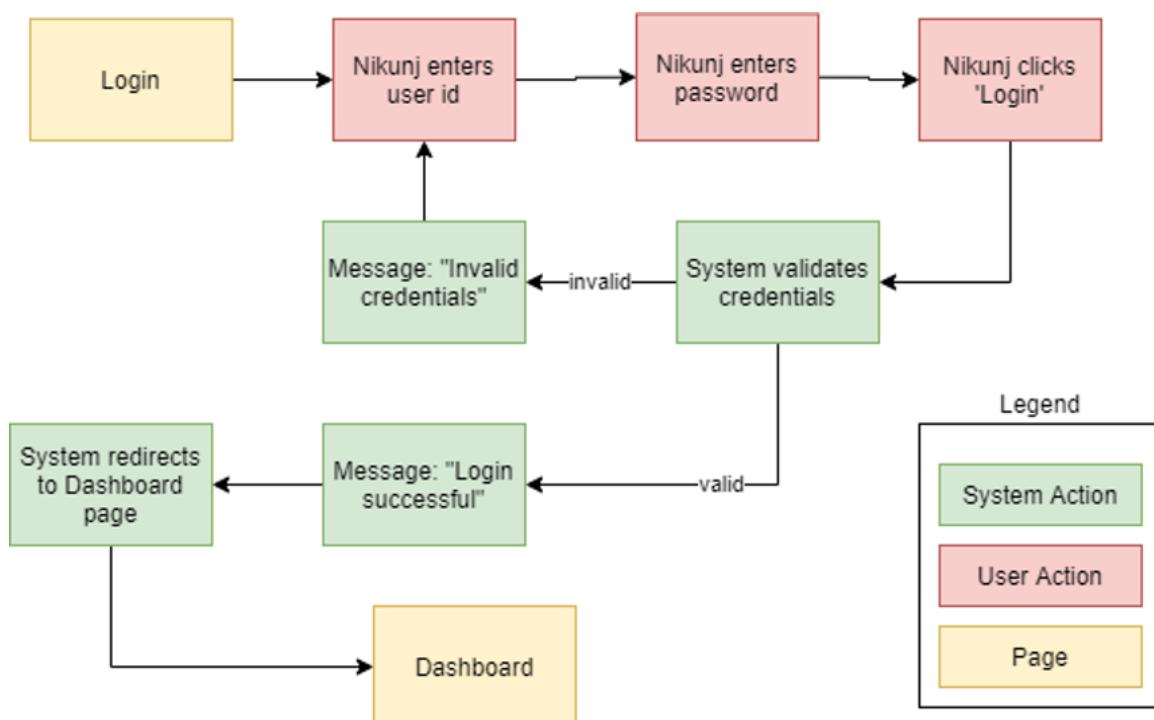


Figure 26: Task flow diagram for use case 6. Created with Draw.io [3]

5. ASSET INVENTORY

Following is the list of proposed frontend technologies used in developing our website:

5.1 Front-end technologies

- 5.1.1 **React Bootstrap:** React Bootstrap framework [4] is the basic foundation and provides responsiveness to our application. This supports Grid layout and all the components required for designing the building blocks of our website.
- 5.1.2 **React:** This JavaScript library [5] simplifies the development of our UI with its efficiency in updating and rendering any data changes to our application by maintaining the state of the components.
- 5.1.3 **Bootstrap:** This framework is internally used by React Bootstrap. Yet, this is used to support other features like Bootstrap Icons [6].
- 5.1.4 **React Router:** React alone does not support routing. We need to additionally use this library to be able to navigate between different routes across the website [7].
- 5.1.5 **CSS:** This style sheet language [8] is used for customizing the look and feel of our website where required.

5.2 Back-end technologies

Following is the list of backend technologies used for developing our website:

- 5.2.1 **Node.js:** As our business does not involve complex operations that require more processing power, Node.js [9] is used to take the advantage of non-blocking I/O, which is efficient for data handling and transmission.
- 5.2.2 **Express:** This framework [10] for Node.js is used to expose server-side APIs and interacting with the database.
- 5.2.3 **MongoDB:** This NoSQL, document database [11] helps in maintaining and transmitting data more simply.

5.3 Version control

- 5.3.1 **GitHub:** This hosting platform [12] makes our source code management and versioning more reliable.

5.4 Deployment

- 5.4.1 **Heroku:** This cloud platform [13] is used for hosting our production-ready website and make it available for usage.

6. CONCLUSION

The team has identified the problems that students experience in conventional classroom education and designed a simple solution in the form of a web application which is a virtual study platform specially curated for the needs of the students. The team has made the website keeping in mind the psychology of the students in lower grades. The user interface is made up of various vibrant colours which can captivate the interests of the student and make them spend more time on the website which in turn benefits them to study more and progress each day without getting distracted from their regular curriculum due to external factors as seen in case of classroom teaching during a pandemic. We have developed unique features in the applications by which students can have a seamless experience while studying from our application and which can help parents to track the progress of their children and get updates of their daily activities in the school.

Firstly, the team has built the home which contains a simple design of the dashboard that can easily be operated by the students. The students get instant access to the various courses on the home page. The young children are attracted to warm, calming vibrant colors, along with tints and pastels, the user interface of the StudE website is catered to children's needs. Secondly, the course page which consists of a list of all the courses which are designed in the form of cards which can attract to click on the course and motivate them to study. The page also contains navigation tabs that can help students to use the features in an easy way unlike the cliché websites with a complicated user interface which is difficult to understand by the students. The team has developed the navigation tabs in such a manner that students can select the Chapters, QnA, Notes, and Discussions with just a click. Thirdly, the QnA page consists of questions and answers displayed systematically one after the other based on the chapter selected by the students and the notes feature enables the student to save all the important notes while reading the chapters. The discussion section allows the students to interact with each other share their idea and helps them to update their knowledge on regular basis. The teacher's comment tab is very important for the parents to refer to the remarks given for their children which could help the parents follow up on their child's performance in a better way.

Therefore, all the work done by the team members resulted in developing a smart alternative for the students for education and provides more transparency to the parents regarding their child's activity. We have met our main aim to provide an alternate platform for quality education whenever & wherever necessary and continuously delivers knowledge to the students online without interrupting their study routine and providing convenience to the students for their smooth learning experience and helping them grow each day.

7. RECOMMENDATIONS

Our application has two main user personas namely the student persona and the teacher persona. We implemented all the features in the student persona perspective and few features from the teacher perspective are yet to be implemented. Future work of our StudE application includes completion of the teacher persona and enabling notifications feature as they would enhance the usability of our application.

As StudE focuses on primary school students, it is a good thought to add a parent persona that helps in monitoring the students' performance and the teachers' performance. As StudE is a simple, secure, and robust application to be integrated with other systems, this application can be extended to use for high school students and universities by considering the upgrading of UX based on the level of education.

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