ONLINE LEARNING APP FOR LIDO LEARNING USING REACT-NATIVE

Project Report submitted in partial fulfillment of the requirement for the degree of

Bachelor of Technology

In

Computer Science and Engineering

By

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Under the supervision of

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To

Department of Computer Science & Engineering and Information Technology

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Certificate

Candidate's Declaration

I hereby declare that the work presented in this report entitled "**ONLINE LEARNING APP FOR LIDO LEARNING USING REACT-NATIVE**" in partial fulfillment of the requirements for the award of the degree of Bachelor of Technology in Computer Science and Engineering submitted in the Department of Computer Science & Engineering and Information Technology, Jaypee University of Information Technology Waknaghat is an authentic record of my own work carried out over a period from February 2020 to May 2020 under the supervision of   **Mr. Jivitesh Bansal** (Vice President- Engineering in Lido Learning).

The matter embodied in the report has not been submitted for the award of any other degree or diploma.

Rohit Garg,161203

This is to certify that the above statement made by the candidate is true to the best of my knowledge.

Mr. Jivitesh Bansal   Dr. Vivek Kumar Sehgal

(Vice President - Engineering)   Associate Professor (CSE&IT)

Lido Learning   Jaypee University Of Information Technology

Dated: 24-07-2020

Acknowledgement

I take this opportunity to express my profound gratitude and deep regards to my guide **Mr. Nishu Goyal**(CTO at LIDO LEARNING), **Mr. Jivitesh Bansal**(VP-Engineering), **Mr. Hemant Goyal**(Project Lead) for their exemplary guidance, monitoring and constant encouragement throughout the course of this project. The blessing, help and guidance given by them from time to time shall carry me a long way in the journey of life on which I am about to embark.

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At the end I would like to express my sincere thanks to all my friends and others who helped me directly or indirectly during this project work.

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List of Abbreviations

Abbreviation	Definition
SDLC	Software Development Life Cycle
DBMS	Database Management System
RDBMS	Relational Database Management System
AWS	Amazon Web Services
MVC	Model View and Controller
DFD	Data Flow Diagram
CRUD	Create,Read,Update and Delete
GraphQL	Graphical Query Language
OTP	One Time Password
NCR	National Capital Region
JS	JavaScript
CSS	Cascading Style Sheets
HTML	HyperText Markup Language
NPM	Node Package Manager
ACID	Atomicity,Consistency,Integrity,Durability
API	Application Programming Interface

Abstract

The project aims at developing an android app for an organization named **LIDO LEARNING** that provides students of class 5-9 with content of science and maths and also they will get to know about the organization.

The technology that we have chosen to complete the project goals is React-Native and JavaScript using MVC Architecture for frontend and TypeScript aided by GraphQL for database connections and communications. GraphQL or Graph Query Language is used extensively for several CRUD operations like fetching records, creating new users, adding videos for students etc.

The App provides users with content related to their syllabus for class 5-9 consisting of Science and Maths for free of cost. Also If they like the content they can book a free live class for themselves to gain insight into online   experience.

Chapter 1
INTRODUCTION

1.1 Brief of Organization

LIDO Learning is an ed-tech company changing offline classroom education through a unique and impressive online classroom for every child in India. Lido Learning (Quality Tutorials Pvt. Ltd.) was launched in April 2019 by Sahil Sheth, offering to students of Class 5-9 in Math and Sciences from both CBSE and ICSE boards with live class and personal coaching tutions.

They create virtual classrooms for the students online. Students feel as if the are in real classroom. The main motive of the company is to fix the education system in India, making school going children love the subjects rather than hating them .With about 1400+ satisfied customers , company is expanding day by day with more and more people trusting them. Sahil Sheth, the Founder of Lido Learning has been in the EdTech industry for the last 8 years.

The idea for Lido Learning was born – to disrupt the live class tutoring market by enabling students to connect with tutors from the comfort of their home, via a tablet app. Headquartered in Mumbai, The current team has about 800 people, with offices in Mumbai, Bengalore, Delhi , Chandigarh and Jaipur and Indore.

Organization Type : Startup
No. of employees : Around 800
Founder : Mr. Sahil Sheth
Chief Technical Officer : Mr. Nishu Goyal

1.2 Introduction To Project

I am working on the Lido Learning App of the Lido platform. Students can access live classes, quizzes, interactive videos through this platform.

Building the platform for smaller number of users is not a big deal. Real challenge begins when users start increasing. Currently working on scaling the platform and integrating the third party service 'Agora' with the platform to ensure seamless streaming of live classes on daily basis.

Login is based on OTP. User have to enter his/her mobile number to login. As and when the user enters his mobile number, a six digit OTP is sent to his mobile via text message.

Lido Learning App has further got many interfaces/components:

1. Home
2. Classroom
3. Library
4. Quizzes
5. Live Class Booking
6. Edit Profile
7. Give Feedback
8. Share the app

1.3 Objectives

The goal of this Lido Learning App is as follows:

- To Provide Students with content of Science and Maths.
- To gain insights about user interactions.
- To offer them free demo live class.
- To advertise what LIDO has for them.

1.4 Methodology

1.4.1 Front-End

JAVASCRIPT

JavaScript (often abbreviated to JS) is a lightweight, translated, object-oriented programming language for programming, and is widely known as the writing language of Web pages, but is also used in many other non-browser environments. It is a theoretical approach that is theoretically based, multi-dimensional and has a supportive nature of objects, priorities, and performance.

JavaScript works with the event occurs. JavaScript is easy to read and powerful for writing language, it is widely used to control web page performance.

CSS

Cascading Style Sheets, called CSS, is a language used for the process of making web pages visible.

CSS stands for students and practical professionals to become a great Software Engineer especially when working on the Web and App Development Domain. I will list some of the key benefits of learning CSS:

- Create Awesome Website - CSS manages the look and feel of being a part of a web page. You can control the color of the text, font style, spaces between paragraphs, how columns are used and how, what images or colors are used, the layout of the layout, the variations displayed on different devices and screen size and various other effects.

- Become a Web Designer - If you want to start a career as a professional web designer, HTML and CSS design must be skilled.

- Learn other languages - Once you understand the basics of HTML and CSS then related technologies like Java, cript, php, or angular are easily understood.

REACT-NATIVE

It is made by facebook for developing traditional iOS & Android style apps under the same language, JavaScript. Initially, Facebook developed only React Native to support iOS. However with its recent support for the Android app, the library is now able to offer mobile UI on both platforms.

1.4.2 Back-End

Node.js

JavaScript running time environment that uses JavaScript code without a browser. - side-script scripts to, Node.js represents the "JavaScript everywhere" paradigm, development around a single programming language, rather than different server- and client-side scripting languages.Node.js is an open source, platform, which combines web application eb browser. As a result generate powerful web page content before the page is sent to the user's wult

Although .js is expanded as a JavaScript code name file name, "Node.js" does not specify a specific file in this context and is simply a product name. Node.js has event-driven architecture that is Node.js allows developers to use JavaScript to write command line tools and side-by-side scriptting capable of performing asynchronous I / O.

PostgreSQL

PostgreSQL, also known as Postgres, is a free and open source database management system (RDBMS) that emphasizes expansion and compliance with technical standards. It is designed to manage a range of tasks, systems that many users interact with.

PostgreSQL includes transactions on Atomicity, Consistency, Isolate, Durability (ACID) properties, automated views, customizations, constraints, foreign keys, and stored procedures. PostgreSQL is being developed by PostgreSQL Global Development Group, a multidisciplinary team with specific stakeholders.

PostgreSQL is designed to work on platforms like UNIX. However, PostgreSQL was also built to be handy for migrating to various platforms such as Mac OS X, Solaris, and Windows.

1.5 What is Required?

REQUIRED HARDWARE:

- Computer with Good Processor(ex. Pentium 4)
- Minimum RAM 512 MB
- Good Internet Connection
- Android Mobile for testing

REQUIRED SOFTWARE:

- Operating System - Wimdows/MAC/Linux
- Redis Server
- NPM (Node Package Manager)
- NodeJS
- React-Native
- web browser(like Chrome , Firefox , etc)

Chapter 2

LITERATURE REVIEW

2.1 Model

The **Waterfall Model** is the first SDLC model used for software development. The waterfall Module introduces the software development process in a linear sequence. This means that any phase in the development process starts only when the previous phase is complete.
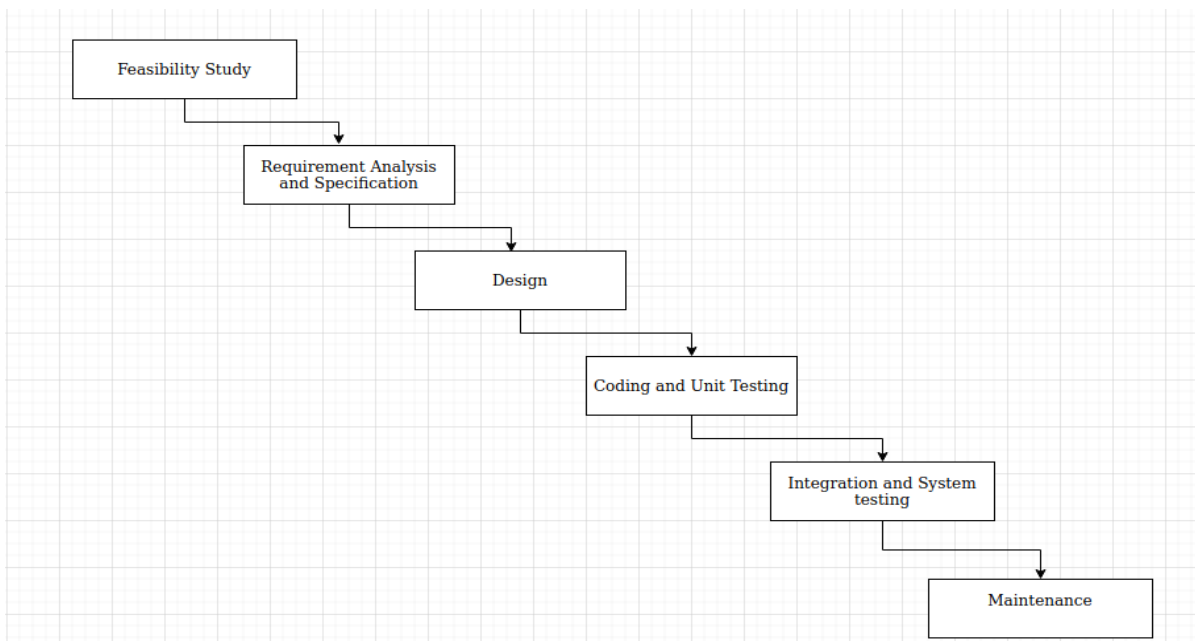

Fig. 2.1 Waterfall Model

Requirement Analysis and Definition: All system development requirements are covered in this section. Requirements are collected from the end user in consultation, these requirements are analyzed for validity and the possibility of system requirements to be developed and studied.

System and Software Structure: The need specification from the first stage is read in this section and prepared by the program. System Design helps in defining requirements and helps in explaining the overall architecture of the system. The program structure specification acts as the input to the next stage of the model.

Launching & Unit Testing: In receiving program design documentation, the work is divided into modules / units and the original code is started. The program is initially developed into smaller programs called units, which are covered in the next section. Each unit is built and tested for its performance; this is called Unit Testing. Unit tests are especially valid

Functionality and Adjustment: This section of "The Waterfall Model" is almost never ending phase (Too long). Generally, problems with an upgraded program (which are not detected during the life cycle) arise after its active use, so system-related issues are resolved after the program is installed. Not all problems come directly to the picture but they arise from time to time and need to be resolved; hence the process is called Maintenance.

Benefits

An advantage of water interchange development is that it allows for departmental operations and management. The schedule can be set by the deadline for each development phase and the product can proceed through a car-like development process on the carwash, and of course, it can be delivered on time. Improvements from idea, design, implementation, testing, installation, troubleshooting, and maintains performance and maintenance. Each stage of development progresses in sequence, with no additional steps or steps combined.

Too bad

The disadvantages of water diversion improvements are that they do not allow for much enlightenment or reclamation. Other methods for modeling the flow of water include application (JAD), adaptability and robustness, design and optimization, and wind model.

2.2 What is different?

2.2.1 Existing System

One of the back feature present in private teaching is its cost. Hiring a quality tutor with pre-existing knowledge and experience can be expensive, and many families may not be able to afford it. Families on a tight budget may choose less expensive educational options. However, that increases the risk of private instruction, turning into a waste of money. In fact, more experienced teachers and certificates charge more and can provide higher quality services. In the meantime, teachers who charge less do it for a reason. They may not have the knowledge . Therefore, it may be helpful to do a test or some knowledge checker before trusting tutor to teaching for a long time. Unfortunately, many believe that getting someone with a degree in a particular subject can lead to good teaching results. However, it is not a solution. Teaching is a skill, not everyone has it. Hiring a teacher with no teaching skills can lead to frustrating lessons and diminish your child's motivation to learn. We cannot trust with teachers about how they are teaching our children.

2.2.2 Proposed System

One of the advantages of online learning is that the student pastor's not a problem. A few basic requirements such as a computer and an Internet connection and you can read anywhere. This saves a lot of time for students and energy they can spend doing something else. As online education applies to each item, there is no time limit. Students can chat with the same topics often with their teachers. This is not the same as a classroom where students have to match the pace of the whole class. They could take their time and strengthen the weak areas of their strength. Today's generation of technology. Video chats, messages, and threats are not uncommon through new software programs. Therefore, they can easily adapt to the online learning environment. In addition, the tools used in online education having live information for reading by manifolds. For example, shared screens and white chat boards or collaboration file sharing tools. Teachers are working on the Internet often located at 24/7 to help the students. This is one of the advantages of advanced online educational college students as they plan their learning accordingly. In some cases students may need help immediately during their studies. With online, you can find last-minute help study whether exercise or assignment to work on it. The great advantage of teaching online education that students get the opportunity to learn and teachers who love their field. There are thousands of tutors available online with amazing information and practical experience that give students the best opportunity to test their knowledge of certain things on a topic. Another prominent reason for studying the Internet cheaper. Teachers are working on the Internet today provides a non but high standard of learning, making it economic to read online than your lessons offline. It also reduces unnecessary student travel costs.

CHAPTER 3

SYSTEM DEVELOPMENT

This chapter focuses on the process around how models are used, metrics used to compare different models, the platform used, the programming languages in which they were written. Other open source libraries / frameworks have also been documented here.

3.1 SYSTEM DESIGN

The most creative and challenging phase of the SDLC is System Design. The term Design tells the storage system and the process by which it is created. It refers to the technical description that will be used when performing a task the election process. Includes program development and program evaluation. Here is the important question "How can this problem be solved?"

3.1.1 PLANNED RESEARCH

Structured analysis allow the analyst to create a new type of system specification that the user can easily understand and a set of algorithms and encoding tools that.

3.1.2 DATA FLOW

DFD also known as a "bubble chart" or "data flow graph" with a view to diversifying system requirements and pointing to the major changes that will be to programs in program design. DFD shows flow of data through the code. It views the program as a function that converts the input to the desired output. The DFD intends to use an in-app transformation in the input data to eventually extract the output data. Data flow diagram is a process representation or process data flow (usually a systm of information). Exact performance based on data can be represented by a dot.

DATA FLOW DIAGRAM ELABORATING OVERALL PROCESS OF PROJECT

Zero Level Data Flow Diagram
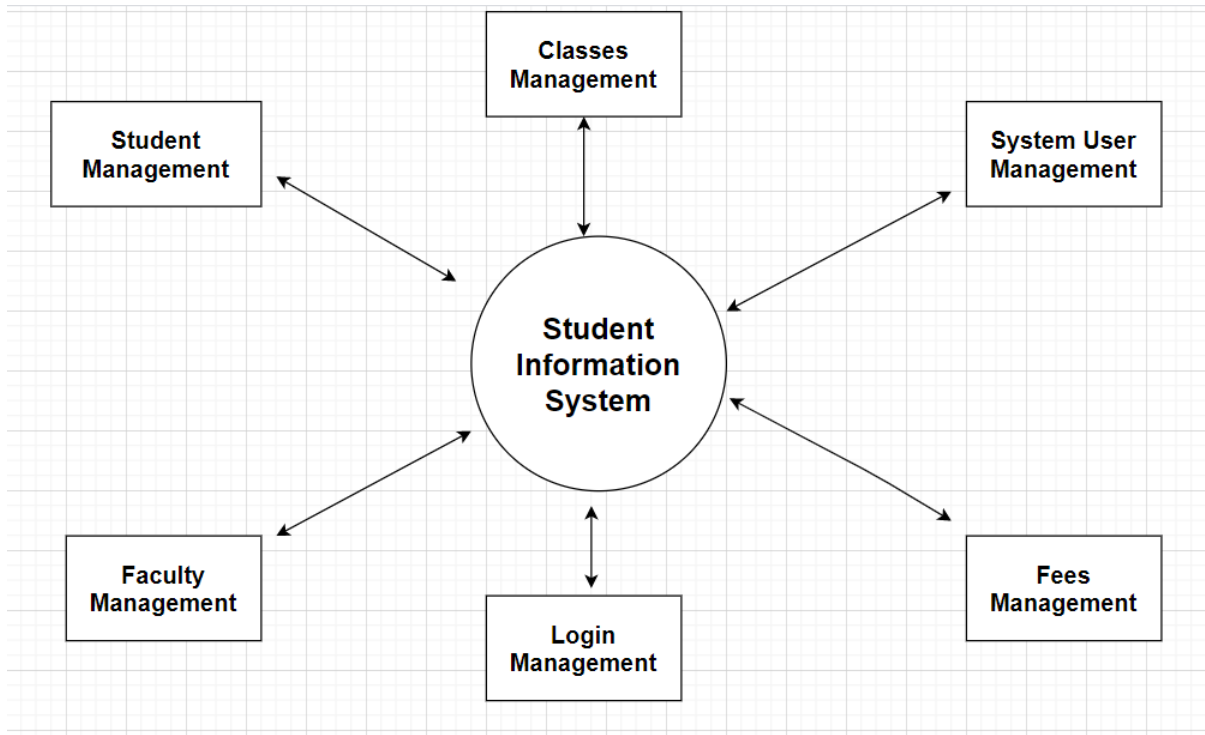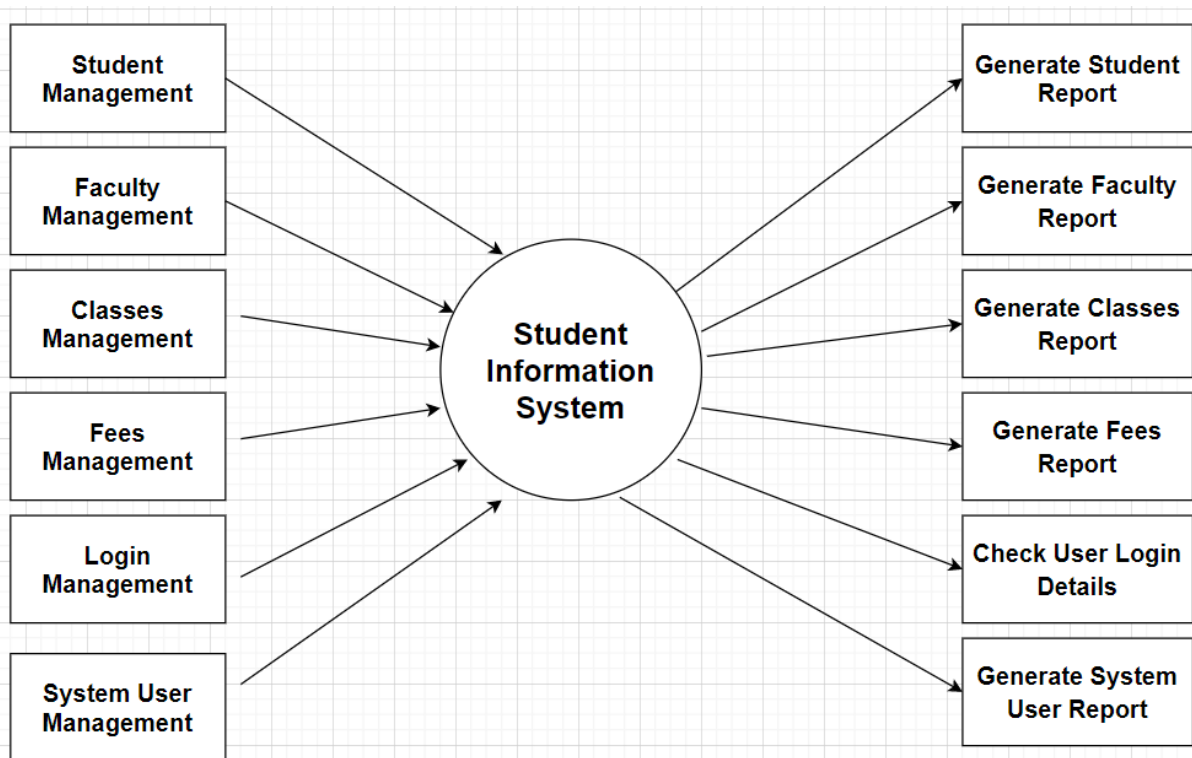

Fig. 3.1 Level 0

Level First Data Flow Diagram
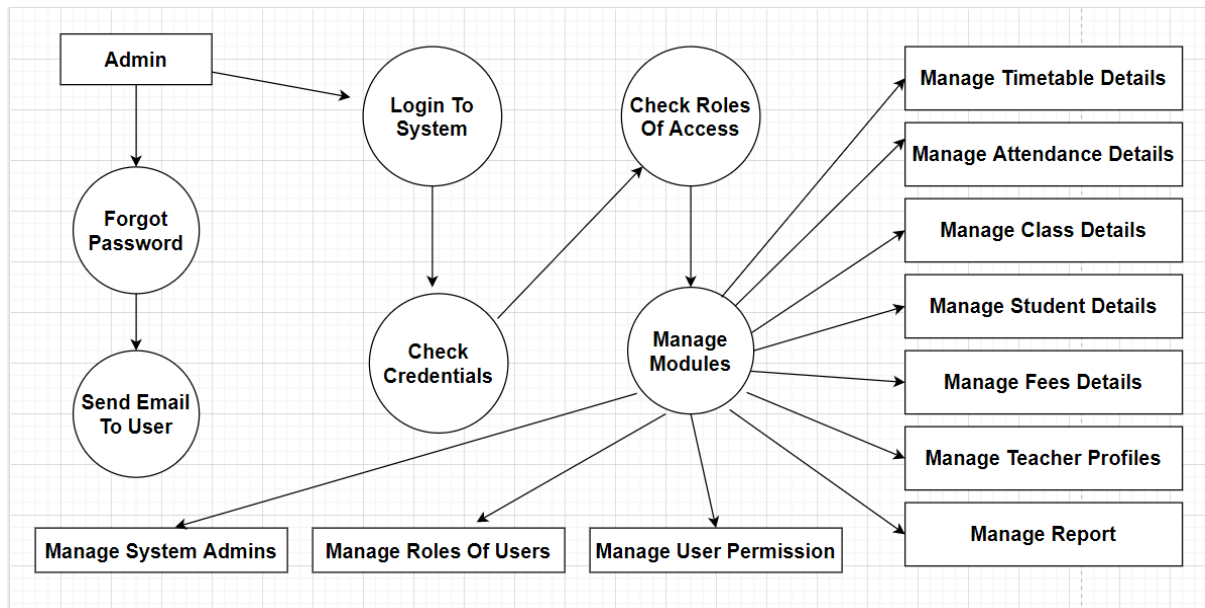

Fig 3.2 Level 1st

LEVEL SECOND Data flow Diagram

Fig 3.3 Level 2nd
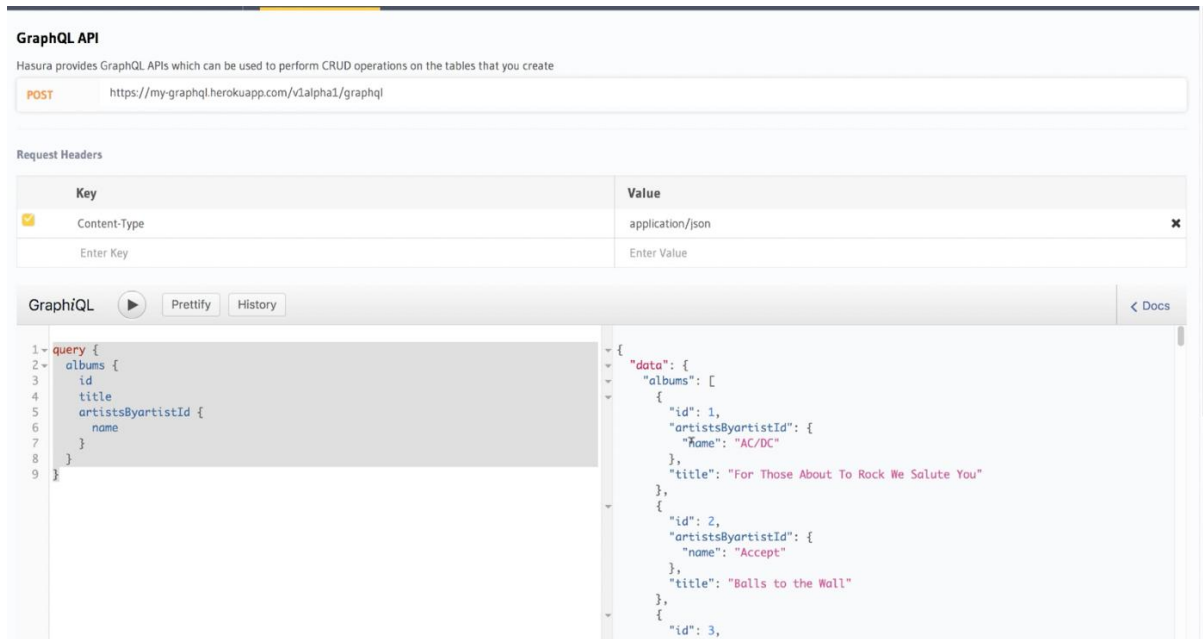
3.2 Database

3.2.1 Roles

Table 3.1 User Roles Table

Name	Type	Type of data	Required	Example
Id	Number	Numeric	True	1
Name	String	Alphabets	True	Freemium

3.2.2 Users

Table 3.2 Student Details Table

Name	Type	Type of data	Required	Example
User Name	String	Alphabets	True	Rohit
Email	String	Email	True	abc@example.com
School	String	A-Z,0-9	True	Dav school
Board	Number	Numeric	True	1
Grade	Number	Numeric	True	5
School City	String	A-Z	True	Delhi
Phone number	Number	Numeric	True	99999999999
Alternate Phone	Integer(10)	Alphanumeric	False	99999999999
Pin	Varchar(6)	Numeric	False	151505

3.2.3 Hasura

Hasura provides Apis related to graphql with add on to postgress databases.

Fig 3.4 GraphQL Hasura

Fig 3.5 Relational Management

Fig 3.6 Create Table in Hasura

3.3 Code Development

The language used for development of app is React-Native.

It is basically a javascript library then provides components for app development.

It is developed by Facebook for their own application services.

CSS used is the same as used for web development along with HTML.

The only difference here is that CSS follows camelCase pattern in javascript instead of hyphen pattern i.e.

background-color in react-native is written as backgroundColor.

We followed a functional component based approach throughout our project.

Redux store is used to store data at client side like user's watch history, user search results, bookmarked videos etc.

GraphQL is used for connecting with databases.

Mutation is used for CRUD (Create,Read,Update and Delete) operation on database using GraphQL.

3.3.1 Here are some screenshots from the App we are working on:

Play Store:
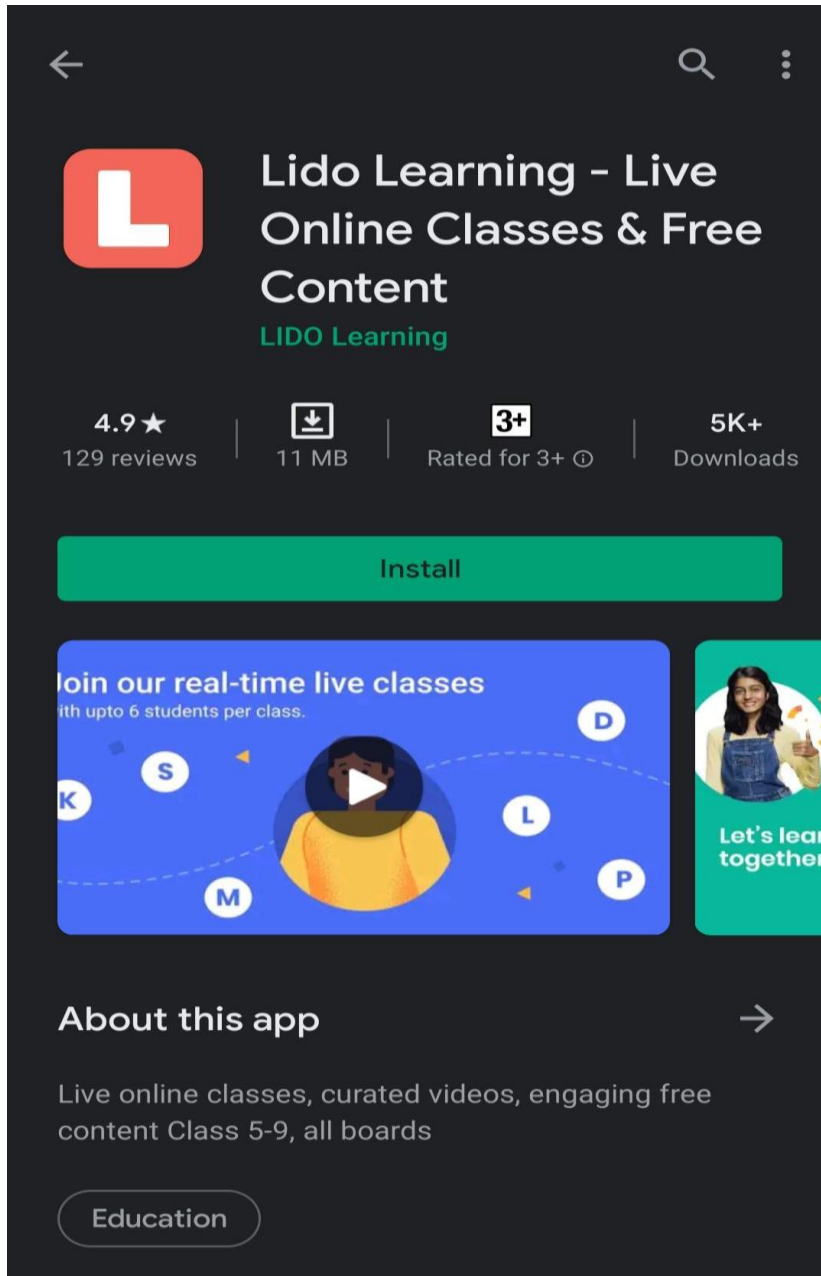
Fig 3.7 Image of App from Play Store

Onboarding of User:

User gets to see some slides related to app.

User have to register themself using valid mobile number which is verified through six-digit OTP with auto read functionality.

Then user have to fill their basic information like name, class, board and school

Hey there!
Enter mobile number

+91 | 9812345678

Fig 3.8 Mobile Number Screen

Verify your number
Enter OTP   ⏱ 00:28

We have sent a 6 digit OTP to 2222222229 ✏

Fig. 3.9 OTP Screen
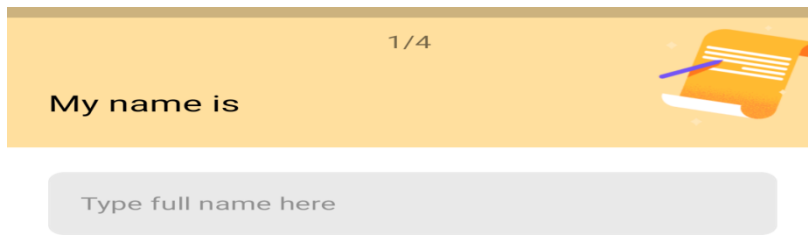
Fig 3.10 Name Screen

Fig. 3.11 Class Screen

My school board is

CBSE

Central Board of Secondary Education

ICSE

Indian Certificate of Secondary Education
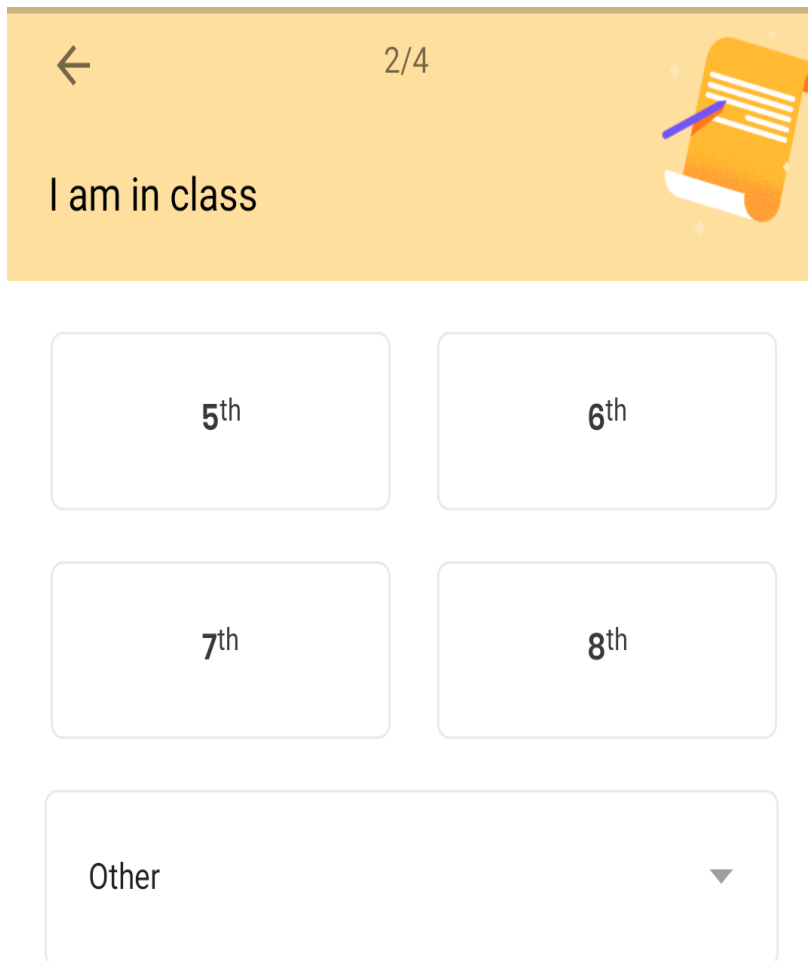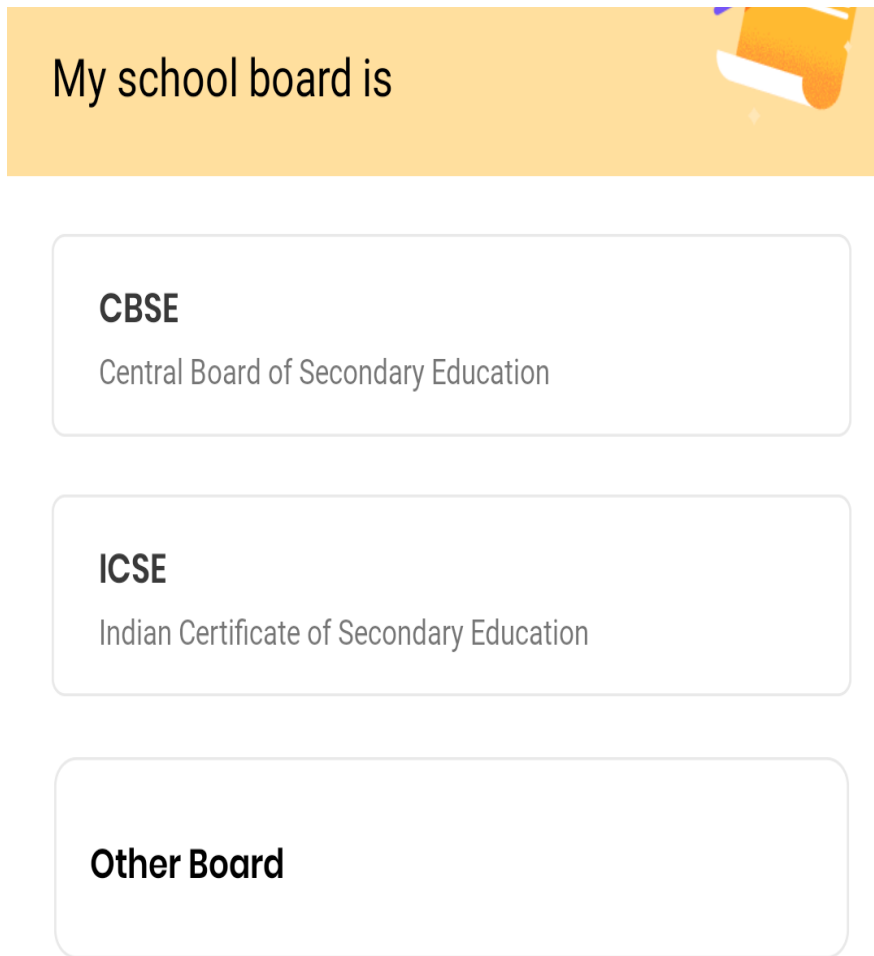
Other Board

Fig. 3.12 Board Screen for board selection

←   4/4

I study at

Search school name here   Q
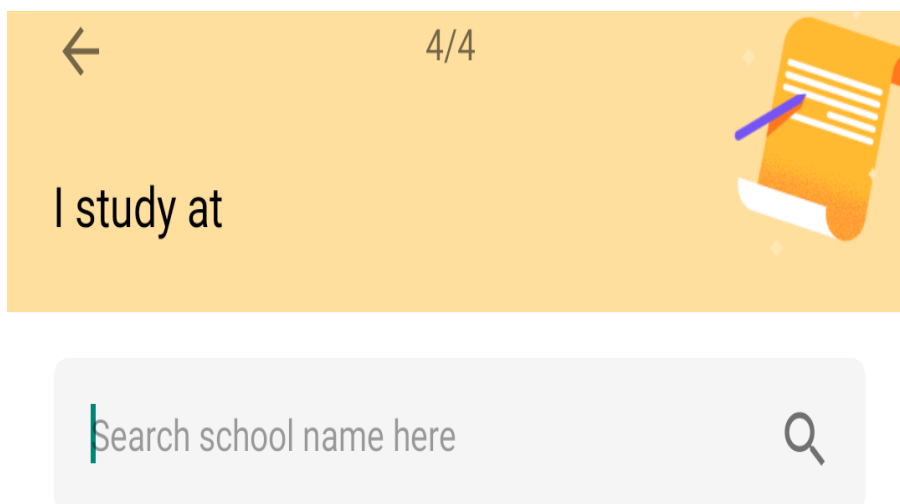
Fig 3.13 School Screen for providing school

Loading Screen:

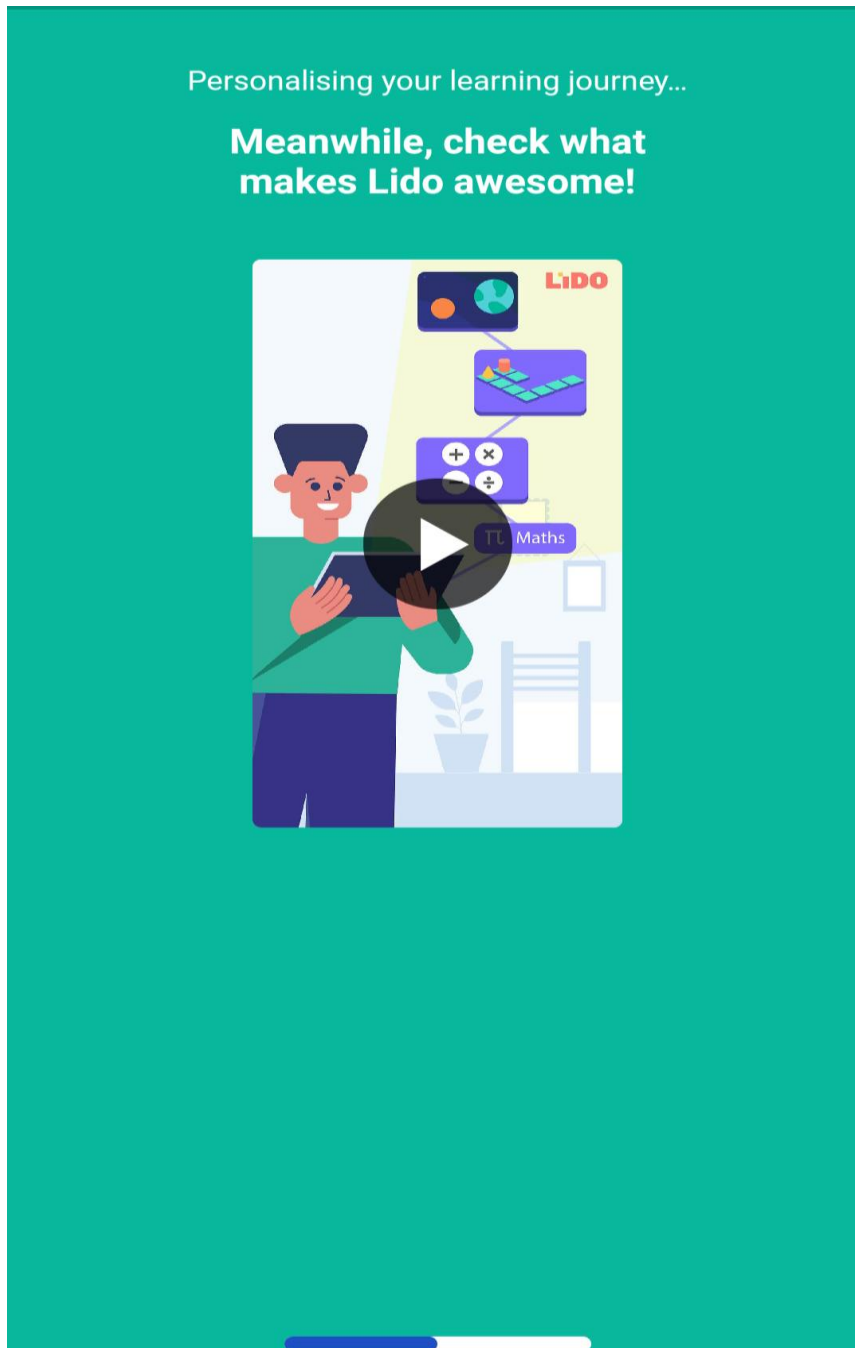This is the screen where api call for getting content corresponding to selected grade and board is loaded. Also there is one video to know about LIDO.

Fig 3.14 Loading Screen while API calls are made

Home Screen:

This is the home screen of the App where subject tabs and watched history is shown if there is any.
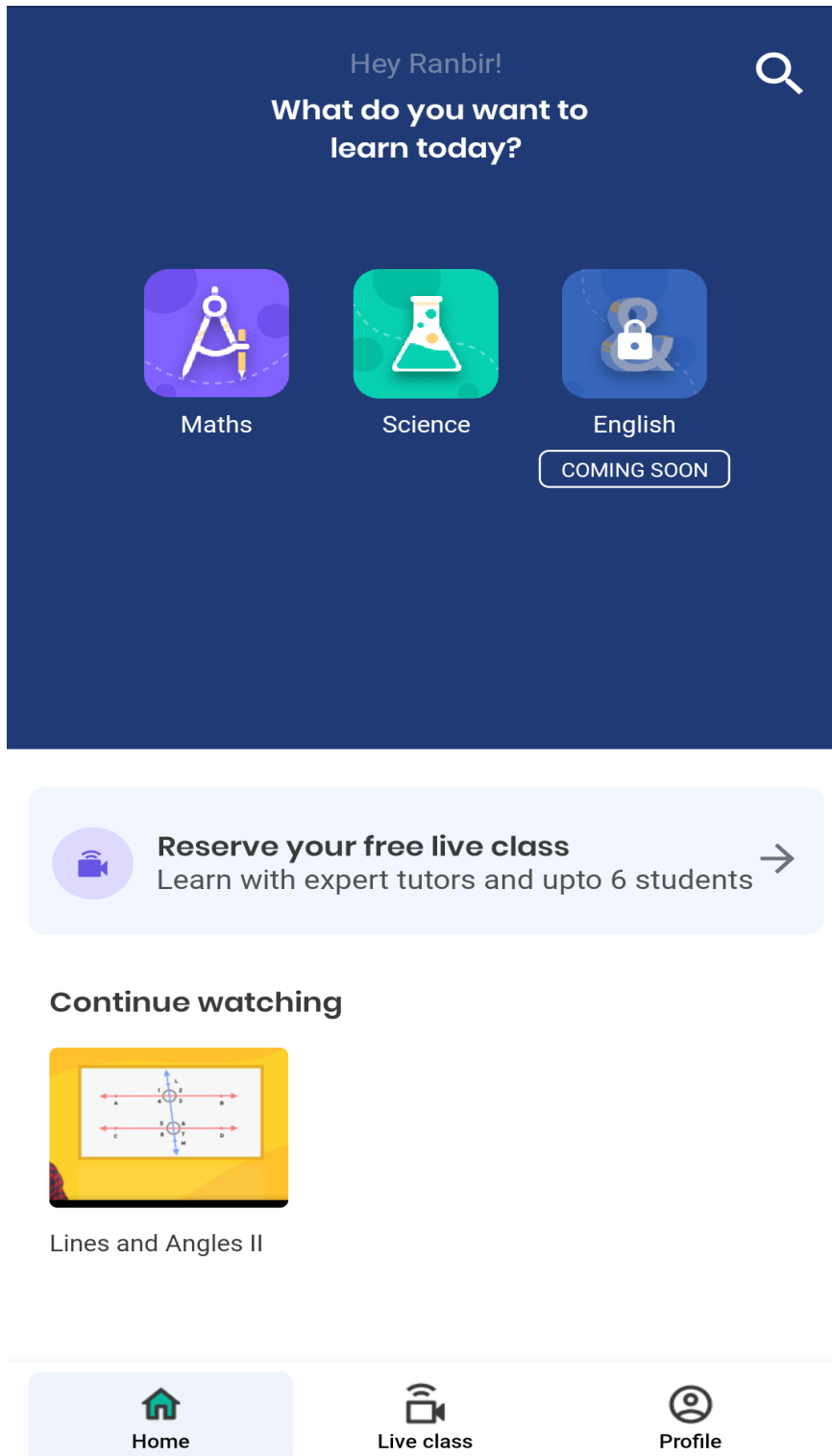
Fig 3.15 Home Screen

Live Class Screen: Here user can reserve demo live class to get onboard with the structure.

Fig 3.16 Live Class Screen for booking demo live class

Profile Screen:

On this page user can edit their details and also can check content for other class and board by updating grade and board.

Also through drawer menu user can share app with other users and also can give rating in playstore.

Fig 3.17 Student Profile Section

Library Screen:

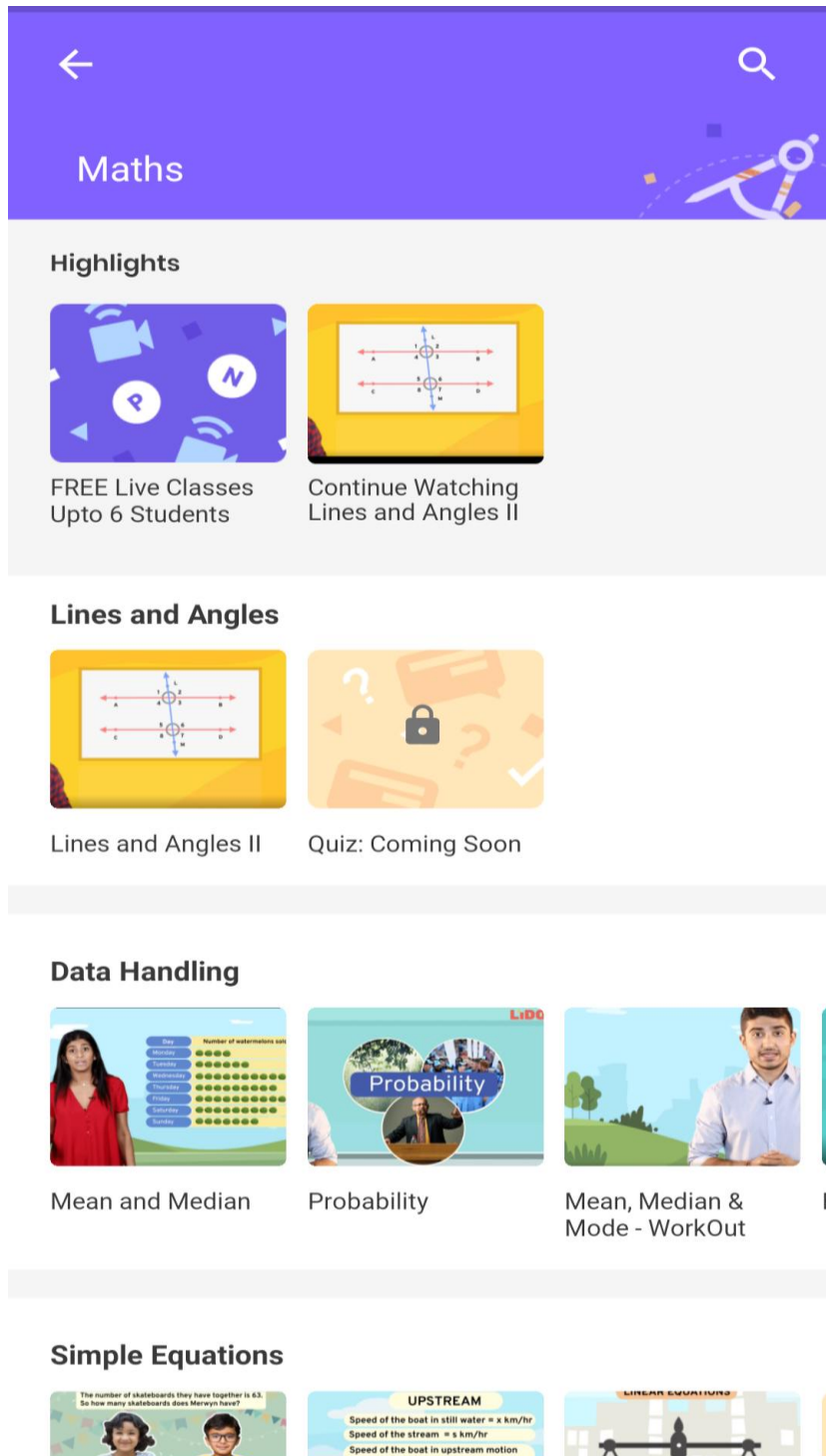This is the screen where users are navigated to when they choose a subject from the main screen.

Fig 3.18 Library Page showing Class 6 Maths Content

Video Player:

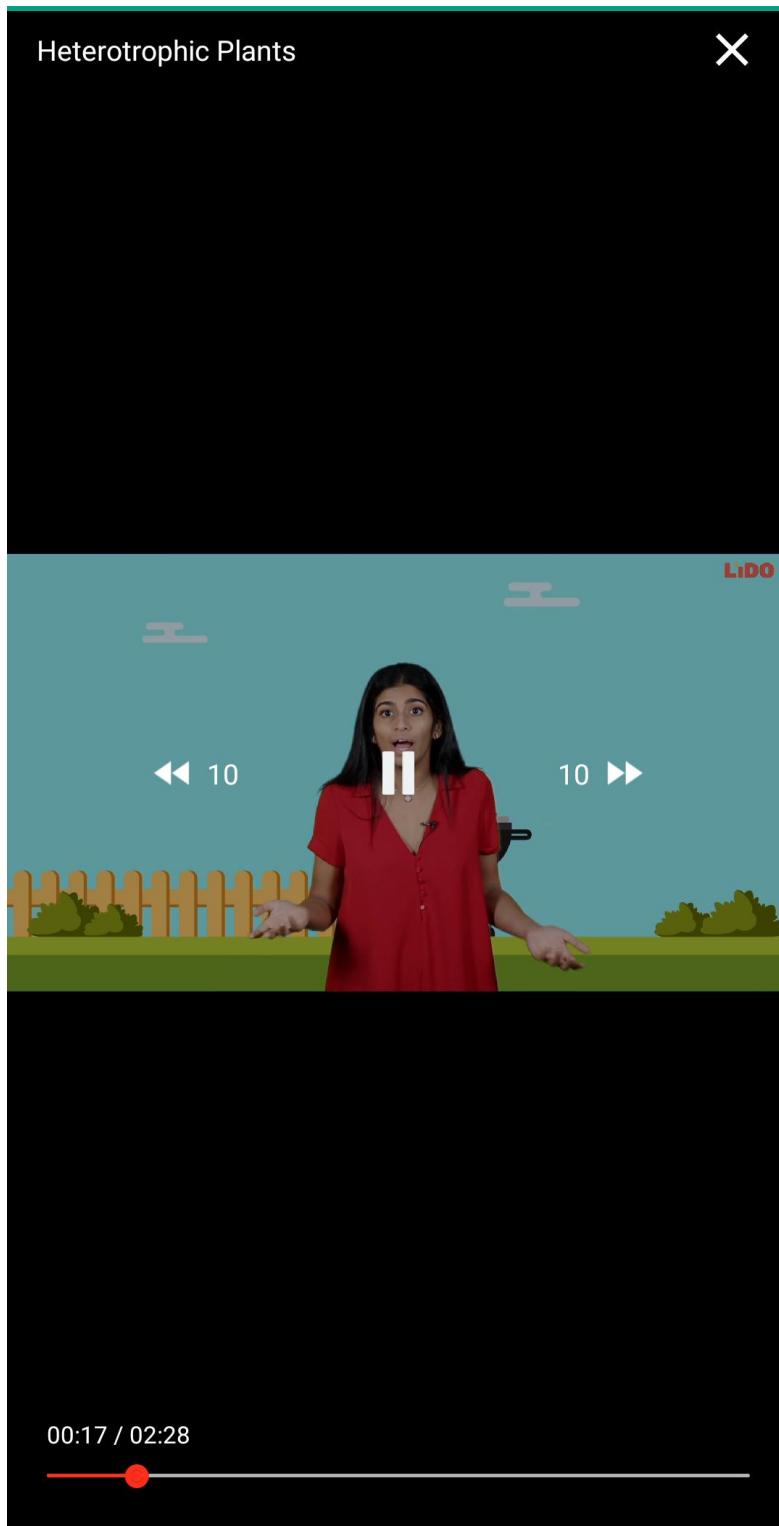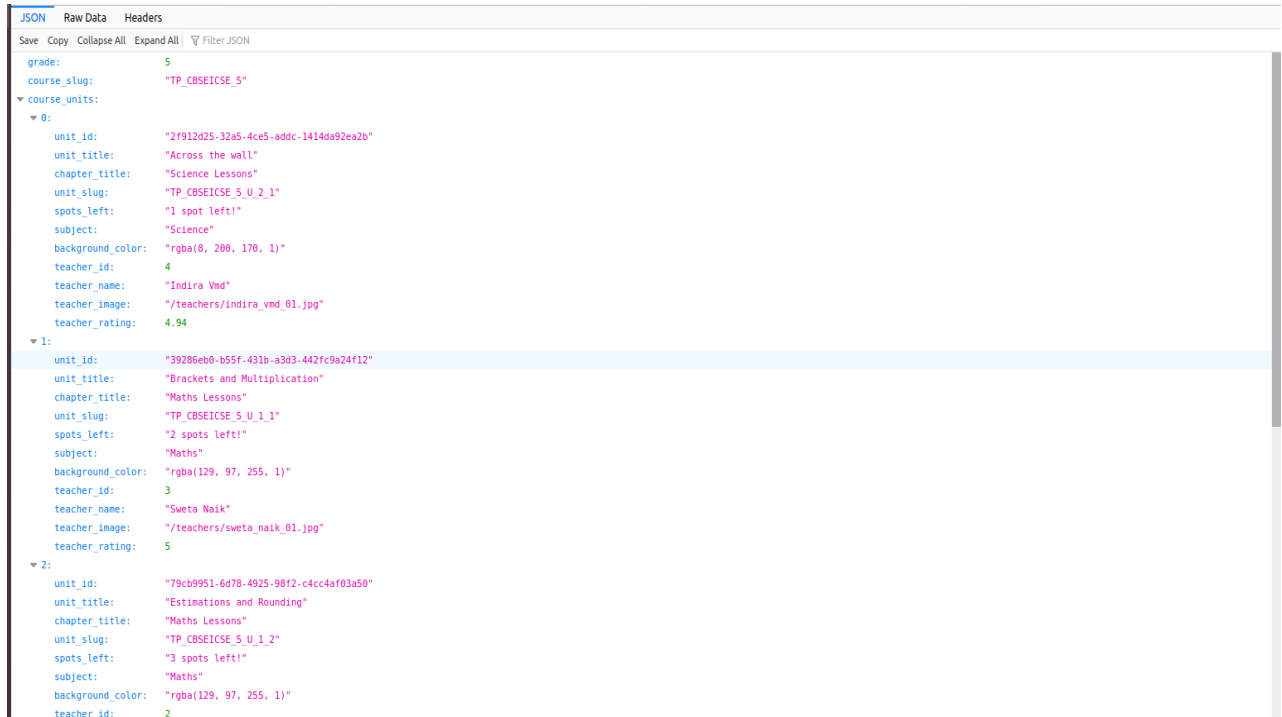Here we used npm library(react-native-video-player) to play video.

Fig 3.19 Video Player in App

3.3.2 Back End

On back end we used typescript to development of API's.

The real-time content like class details, videos etc. are uploaded to Amazon S3 and there API calls are made to get data in json format.

Fig 3.20 Json data received through API

3.4 TESTING

Testing is the necessary quality control during software development. It is a process for the purpose of obtaining a mistake. No part of the code is complete ready without it being is fully tested. In this section it is confirmed teh code and improved to met the requirements prescribed or no. However, all validations are also tested in the test section.

Types:

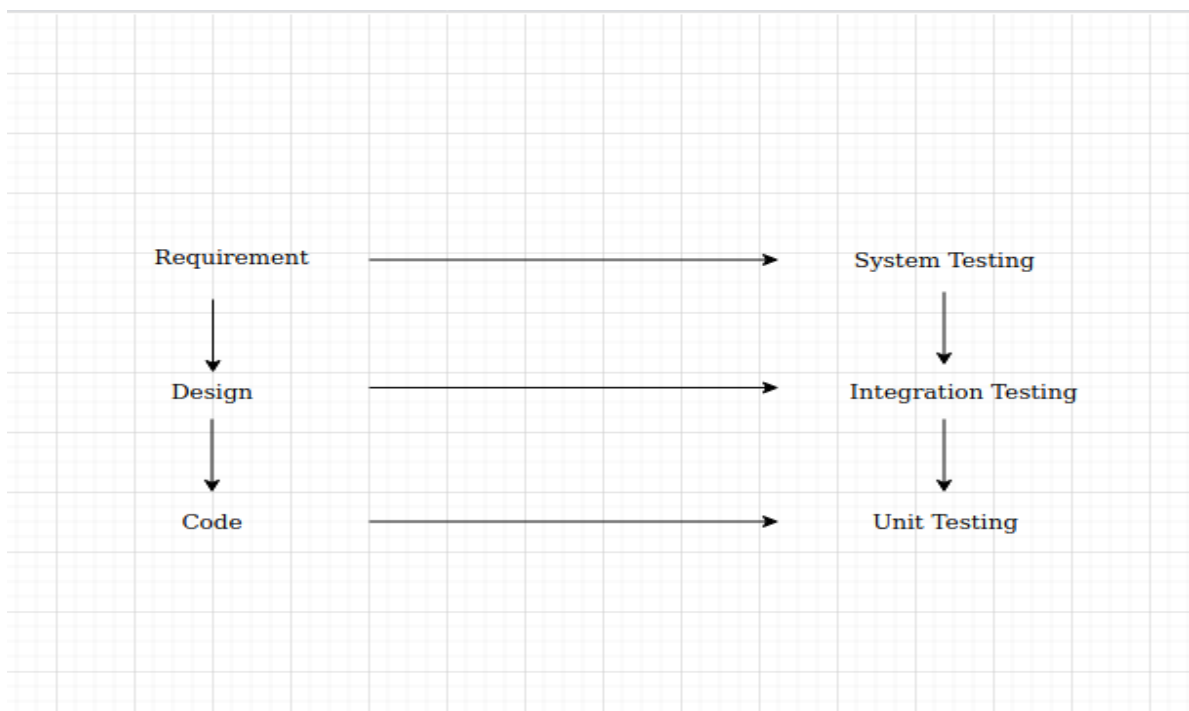- ❖ Unit test.
- ❖ Integration test.
- ❖ System test.

Fig 3.21 Testing Flow of Application

Unit Testing

Unit testing is the first method of testing in our project. In this experiment, we examined different modules as opposed to the specifications

Unit testing is essential to the validation of the code generated during the encoding and therefore the purpose is to have an inside understanding of the modules.

Integration Testing

In this case, many tested modules were integrated into the sub-system. if the modules can be integrated properly, with emphasis being on the functionality of the test module.

System Testing

The entire program is checked. An index document is required and the purpose is to see if the software met its specifications. This is actually a verification process.

VERIFICATE & VALIDATE

"Are we building the product right?"

"Are we building the right product?"

Verification and validation checks of our project

- **No field cannot be empty:** With this check, no field is to be entered blank or empty. If the user will do this then the message will be displayed that this field is compulsory.

- **User enters valid mobile number:** According to this feature the user has to register with a genuine mobile number otherwise the user can't login.

3.5 IMPLEMENTATION

The most important part is the successful implementation of the new system plan. Implementation simply means converting a new system architecture into an application.

The process of implementing the newly designed information systems, includes the discovery, testing, documentation, input and conversion functions. It also includes training of end users in the implementation and implementation of a new information system. Therefore, implementation is an important initiatives. Even a well-designed program can fail if not implemented properly.

Success Reasons

- User Feedback
- Top management Involvement
- Clean state of specification
- Real Expectations
- Proper Plan and implementation

Failure Reasons

- Less users
- continuously changing requirements & specifications
- Lack of funding
- Technical weak team

3.6 MAINTENANCE

When a website is launched, then it is the adjustment phase. All programs need to be maintained. Corrections are necessary because there are often any remaining errors in the system that should be removed when they are found.

3.6.1TYPES OF MAINTENANCE

Two types of Maintenance:

Corrective Maintenance

Almost all software produced has some flaws or errors in it. Many of these are just beyond the system after work, sometimes for a long time. These errors once detected must be removed, which results in software to get modified.

Adaptive Maintenance

Even without errors, the software often changes. Software will sometimes have to be developed and upgraded to include many features and provide many services.

Chapter 4

Performance Analysis

4.1 Firebase Analytics

Google Analytics is a tool that helps in getting insights into user interactions and app uses and what exactly the user is interested in.

Google Analytics is part of Firebase, a free and infinite analytics tool. Analytics integrate all Firebase things and provide you with up to 400 fields that you can define using the Firebase SDK. Analytics reports help you better which allows you to understand, make great changes about app promotions and how your users behave ,performance optimization.

4.1.1 How does this Happen?

Google Analytics helps in understand what people do with software provided by you. events and user and lets you define custom events to measure the most important things in your business. Data is available on the dashboard through the Firebase form. The SDK automatically captures information about your a large number of.

Analtics and meet other features Firebase. It automatically includes events related to notification messages sent through a notification provider and provides report on the effect of each market.

4.1.2 Integrations with other services

Crashlytics

Analytics incorporates individual crash events to get an idea of the crash rate of different versions or regions, and respond with notification messages aimed at that audience.

FCM

Analytics automatically includes events related to supports report on the effect of each market.

Remote Config of Firebase

It helps in change the functionality and name of various fields of your app for different audiences without having to distribute various versions of your application.

Google Tag Manager Integration (GTM)

Manager lets you manage events usage remotely from a web site after your software is launched.
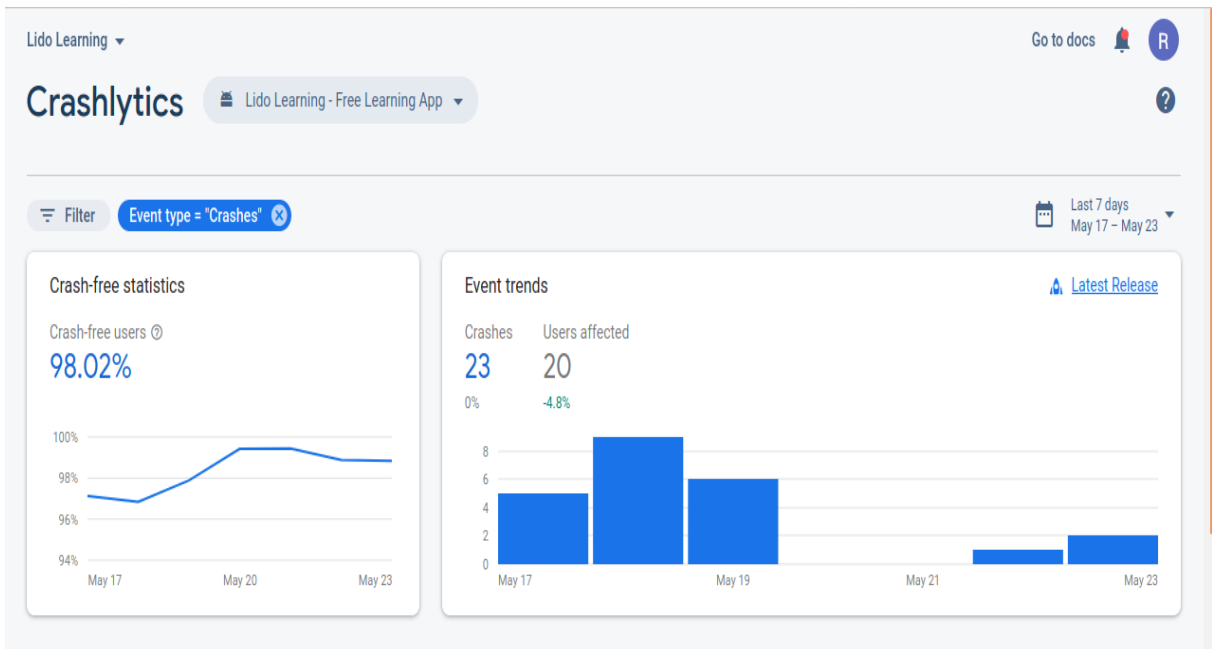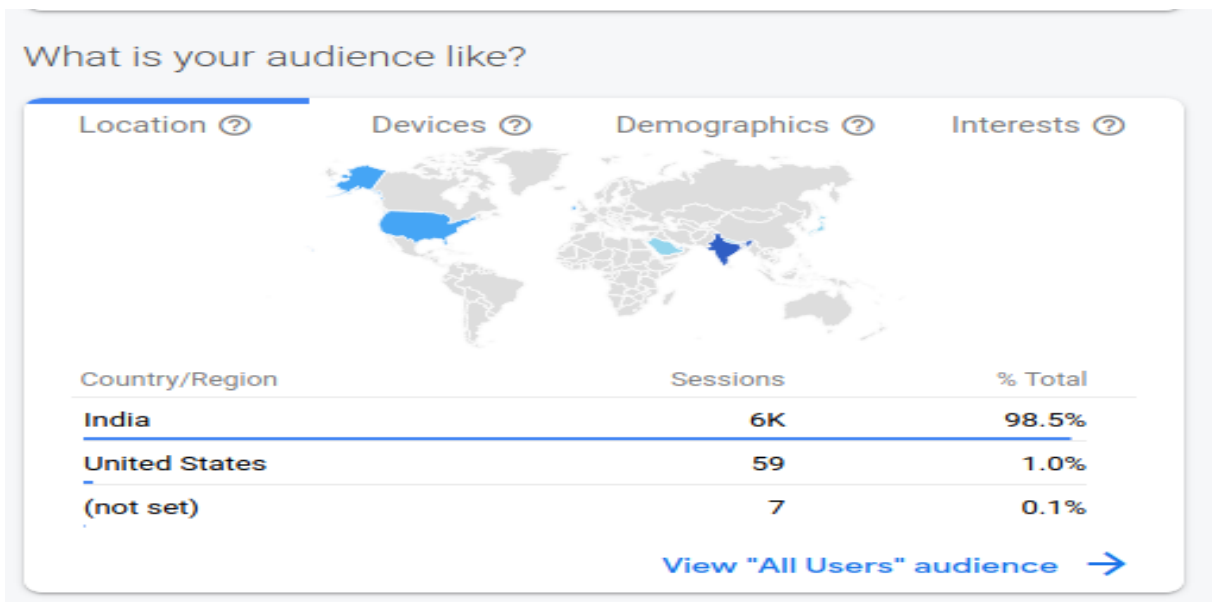
Fig 4.1 Analysis of Crash

Fig 4.2 User login track

Fig 4.3 Source of download

4.2 Test Plan

Test system describesstrategic management plan, test objectives, software and hardware required for the assessment that includes all the resources required for testing. It helps to evaluate or verify the ability the application has created. It worked rule us all.

4.2.1 Functional Test Of App

Table 4.1 Test Cases Table

Sr.No.	Definition	Expected Result	Output actual	Improvement
1.	Registration	Mobile Number	Validation was not there	Validation added(only 10 length and number only)
2	User Name	Alphabets only	Validation not implemented	Validation added(Only alphabets)
3	Loading Screen	No back to registration screen	Goes back to school screen	navigation history cleared
4	Main Screen(User closes App)	Upon again opening,directly main screen	Registration Screen	Logged In check implemented
5	Profile Screen	No empty field save	Name can be saved empty	Check On validation

CHAPTER 5

CONCLUSION

5.1 Conclusion of Project

This was my project as a working professional in the IT Department.

It was a great experience to learn how applications are developed in organizations.

How various phases during development are implemented like documenting, designing, developing and then testing and then maintaining.

How various user activities are logged to get insight about user interests.

How data is cached and also API calls for get and post data from and to server.

5.2 What is Future Scope of Project

This project still has lot to add on. Thus in future the application will be made better by adding some of the things like:

1. Payment portal Integration

2. Premium Users Integration

3. Agora Integration for live class

4. Introducing Student Performance Measurers

5. Introducing Practice Quizzes

6. Introducing games and various other activities

7. Optimizing app size

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4. https://www.javascript.com/

5. https://play.google.com/store/apps/details?id=com.lido.learning&hl=en