MOBILE APPLICATION FOR CONNECTING STUDENTS AND TEACHERS

BY

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This Report Presented in Partial Fulfillment of the Requirements for the Degree of Bachelor of Science in Computer Science and Engineering

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DAFFODIL INTERNATIONAL UNIVERSITY

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APPROVAL

This Project titled **"MOBILE APPLICATION FOR CONNECTING STUDENTS AND TEACHERS"**, submitted by Ahasun Ur Rahaman, ID No: 181-15-11194 to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfilment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on *26 January, 2023*.

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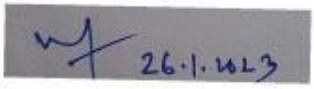

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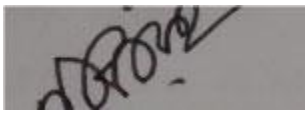

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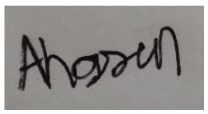

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Finally, I must acknowledge with due respect the constant support and patients of my parents.

ABSTRACT

The Bangladeshi government invested heavily on making digital Bangladesh. That include virtual learning. Unfortunately, studies have shown our student are not performing well. Mobile app can help us fill in that void. My project is based on android web application. Everyone can use this application and easily communicate with each-others as well as publish video to understand educational topic better. I made this mainly because we use different applications to communicate each-others but those application waste our time with different other topic as distraction. So, students as well as teachers can use my application to save time and understand their educational topic better. I use Java and SQL program to build this app with Android studio. I made the entire application with it. I also use Adobe Illustrator for graphical purposes. I also use firebase for data storage. The application still has many limitations. Like the storage space is low. I created this project for student like us. I created an android application for students as well as teachers.

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CHAPTER 1
INTRODUCTION

1.1 Introduction

Education is a process which facilitates the acquisition of abilities, enlarges understanding, and promotes learning. It is traditionally transmitted from one generation to the next. In the past, individuals used to learn through books, newspapers, etc. Now, new technologies are being devised, with novelties existing in all industries and branches. The educational field is no exception, and new approaches for education have been invented to make learning fun and straightforward. Educational app development has become a new phenomenon in the educational sector that is drawing everyone's attention. An educational application, as the name implies, is an app which emphasizes teaching and instructing people with the aid of technology. Various devices like smartphones, computers, iPad etc. are used for this application.

1.2 Motivation

Education is beneficial in terms of expanding our knowledge, honing our skills and understanding. An education app should be of a high standard as it is a vital part of the ever-evolving arena of education that offers significant value to learners. The educational app market is highly competitive, with plenty of educational apps available to users. So, I am creating an app that will stand out in this saturated market and give the best result to all. Also, daily usage of educational app is on the rise. As I can see it is always rising so I should make an app that connects all the student and teacher of the world.

1.3 Objective

Utilizing mobile technology is one of the most effective ways to immediately augment teaching, learning and school life for all involved no matter where they live. This application encourages enjoyable activity as it educates students by transforming teachings

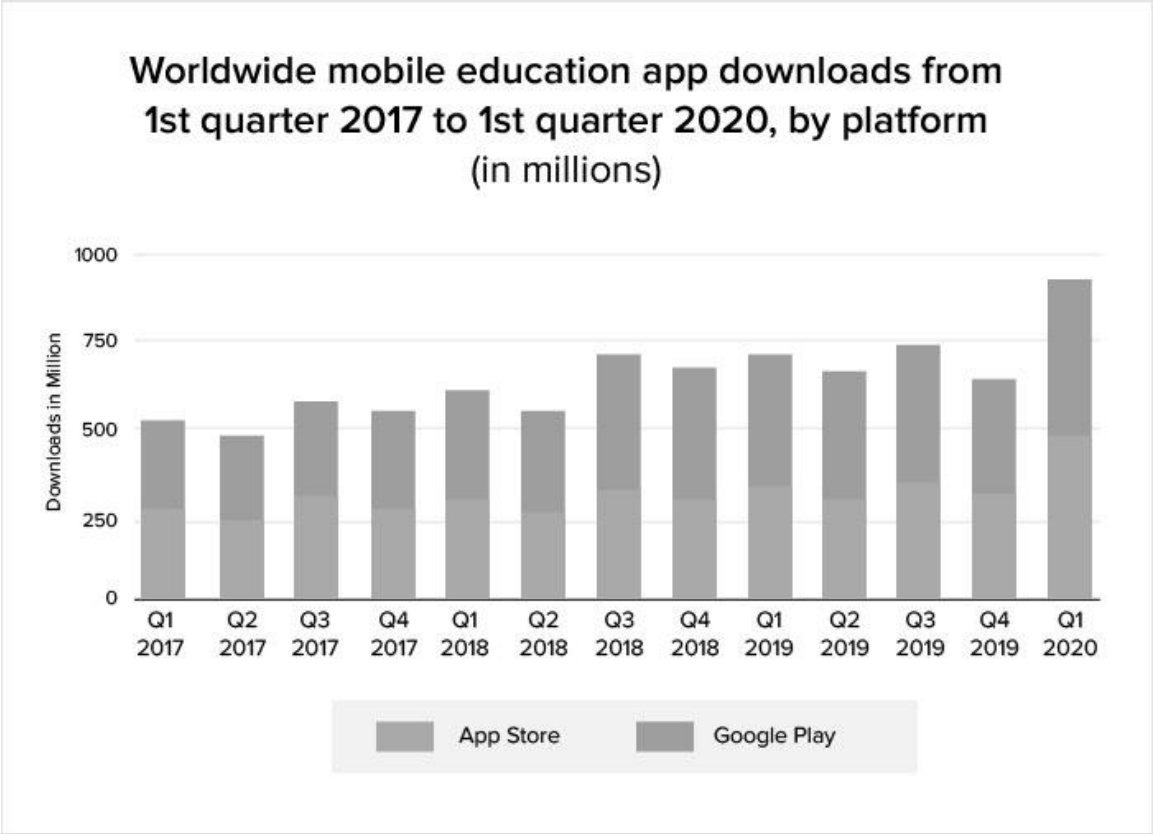


Fig 1.1: Education1al app usage

into a group chat, which heightens students' enthusiasm and prevents them from becoming bored. The application's objective is to reach all kinds of students and teachers. As the apps market is saturated it is very hard to concentrate in a single app. So many students use many different types of app, in the mean time they cannot group work properly. As they use many all students are separated. So, the app's main objective is to make a gathering spot for all students and teacher alike in one place. Which is this app.

1.3 Expected Outcomes

Students of today are well-prepared to gain a comprehensive grasp of their respective disciplines. To enhance productivity, educational applications are designed to be interactive and beneficial to draw in students to study further. Mobile applications grant

Fig 1.2: Objective of the application

us access to an abundance of informative and factual information. This digital technology has completely revamped the educational infrastructure to a different level. My App provides contemporary education right to a mobile device, offering students and instructors immediate access to their own curricula, materials, and communities regardless of their location. The expected outcome is that student now can learn their daily topic faster and together. In the meantime, their own teacher can keep an eye on the students and help them anytime they want without and delay and cost. It is just one click away.

1.4 Project Management and Finance

As I have previously described the app is absolutely free. But the app needs virtual memory to store its data. For the starter I am using Firebase to minimize the cost. But in the future, I would like to pay a fee for additional virtual memory. For managing the project, I can make more subjects on the app. I can easily handle it with some Java knowhow. Also, I want to add some plugin's for keeping the data safe and check real-time database.

1.5 Report Layout

The report layout should contain all the useful information. I have placed all the information sequentially. My classmates and professor helped me sort out the best ones which I have put in the report.

CHAPTER 2
BACKGROUND

2.1 Preliminaries

The modern world is full of electronic devices and electronic resources. In this project, I need things that can be used for creating this program. For preliminary action is to know Java and XML language. Without these to the project will fall apart. It is also required to know about Firebase applications. It is needed to store virtual data. I need to know how to use Adobe Photoshop, Adobe Illustrator and most important of all I need to know how to use Android Studio. The Android Software Development Kit consists of a wide range of tools for engineering, such as debuggers, libraries, simulators of smartphones, documents, example codes, and guidance. It is currently compatible with Linux systems running on x86 architecture, Mac OS 10.4.8 or more recent, and Windows XP or Vista. It is the most vital for the whole project. The requirements also need the Java Development Kit.

2.2 Related works

The integration of iPads or TABs into the educational system is gaining traction in the United States, England, Europe, and the Middle East. Nevertheless, this implementation is facing a great challenge in Asia and Africa. My app has the potential to be the answer to fostering this development in those regions. But there is a lot works need to be done before the main project begin. I need to have an idea of my app's user demographic. What they like, and what they don't like. I need to research that and make and assessment. With that assessment I can analyze and make the correct decision. Like what I need to implement on my app and what is going to the app design. I can make a quick survey of the students and teachers to come up with a quick solution. With it I can design the app layout as people describe so it can appeal all student and teachers alike. Also the layout needs to have eye catching design so it can attract people.

2.3 Comparative Analysis

The mobile smartphone is an incredibly advantageous device for both teachers and students due to its portability and capability to act as a powerful learning tool. Multiple applications with myriad functions can be obtained and installed on any such device. Currently, there are a great number of mobile applications available on the internet which can aid students in their academic studies, particularly in the subject of mathematics. Mathematics can be a tiresome subject for many and a challenging one at that, so if a student can take an interest in the topic, it can encourage them to complete the course with enthusiasm. My application can expedite the solving of complex, graphical, and trial-and-error equations by pressing buttons and inputting the data into a mobile device. Compare to other apps on the market mine is dedicated for the students and students only. So, students can easily choose my app over other apps on the market.

2.4 Scope of the Problems

With instructors across the globe deciding to spread information online, the production of educational apps is becoming more and more popular. Though, it is not a straightforward job as there are various distinctive issues that need to be conquered. Businesses that produce quality educational apps should be able to overcome these difficulties to guarantee that the app is completely successful. There is bound to be problems when making something from scratch. But I can minimize everything with well thought out plan. I can break down every problem with small steps. So, solving it will be easy and my customers can use it effectively.

2.5 Challenges

Initially, it is essential to comprehend the demands of the target audience when coding an app. The program should be structured in accordance with their requirements and preferences. At the outset, the essential work begins. I must be consistently looking for ways to eliminate glitches, establish new functions depending on consumer needs, and keep the application modernized with platform modifications. Adequate resources should be

allocated to this endeavor to achieve better outcomes. Educational software contains a massive amount of data. This app must have the capacity to secure sensitive information. Thus, my primary preoccupation will be the security of data. As hacking and data theft become more prevalent, the security of information is a major worry for educational software companies. In the end, the level of rivalry for applications is escalating day by day. Therefore, planning can be of great help. No program can be successful without a solid marketing strategy. Making the software user-friendly, search-friendly, and entertaining is a continuous learning challenge.

CHAPTER 3
REQUIREMENT SPECIFICATION

3.1 Business Process Modeling

For marketing and business process modelling I need to make a solid plan. Business process modeling gives me a simple way to understand and optimize my workflow by creating data-driven visual representations of key business processes. Without a fundamental planning of these workflow the app can only be un-useful. So, for the business process I can start with my own university first and involve all the student their which in itself can be a huge bump in user interaction.

3.2 Requirement Collection and Analysis

The expense of creating educational mobile applications is composed of various components, including the amount of features needed. A mobile educational app generally has two groups of people: instructors and students. Teachers sign in to the system by means of email or phone numbers, create their profile and commence using the program. The profile should incorporate personal information like name, username, and email.

3.3 Use Case Modeling and Description

Establishing the software design process is a highly critical aspect. When creating software for mobile gadgets, it becomes more intricate. Constructing applications for mobile devices brings forth difficulties that are not typical in traditional app building. To begin with, the first struggle is the vast amount of mobile phones with multiple platforms in circulation. Consequently, some platform regulations should be kept in mind when creating the software. There are several languages that serve some platforms, but not all. Prior to coding, it is necessary to collect information about the requirements and build a prototype. After that, once the requirements have been met, the actual work can commence.

3.4 Logical Data Model

Data modeling is the practice of establishing a data model to retain in a database. It refers to logical data components, associations, and regulations among different data objects. Data design tools assist in constructing database structures from diagrams, allowing me to craft the data structure that best suits my requirements. Thus, it is critical to construct a coherent Data model prior to the commencement of the entire process.

3.5 Design Requirement

It doesn't matter if my end user is a student, a teacher, entire university or an employee who needs to be trained, each of them will choose mobile apps with a simple and clear UX/UI.

Here are some things to I follow:

- I need a good knowledge about Google and Amazon's guidelines to be accepted in their stores
- Making the design intuitive according to the 2-tap rule (if what the user wants requires more than two taps, make some changes to the application)
- My design must be responsive to all the devices
- Logical design elements follow the 5-point rule (counting every different font, color, size on the screen. If the number of elements is greater than 5, redesign it is the best choice.)

CHAPTER 4
DESIGN SPECIFICATION

4.1 Front-End Design

The front end, also known as the "client side", is the part of a mobile app that the client directly interacts with. It includes all elements of visual design such as layout, colors, text fonts, images and videos, as well as content, interactive elements (buttons, drop-down menus) and navigation. The purpose of frontend development is to create an eye-pleasing and easy-to-understand interface that will help users achieve their goals in the application. In addition to paying close attention to detail, front-end engineers should keep two fundamental metrics in mind: performance and responsiveness. Performance will show how fast your app loads and what resources it needs to function properly (the less the better). Responsive means displaying elements correctly on all screen types and sizes. Frontend requires close collaboration with UI/UX to provide the best possible experience. For Android, the main language used by most developers is Kotlin. Google switched to Kotlin in 2017 and has preferred the language ever since. Kotlin has a concise syntax and a sufficient set of libraries. But for this project I am using an older language which is JAVA. It is widely used language. Frontend development for Android can be quite difficult due to all the different types of devices based on this operating system, but talented developers can create a beautiful solution that will work almost flawlessly everywhere. I can also create a cross-platform app that will work with one code base and all platforms.

There is a specific set of technologies that frontend developers commonly used to build the client side of an application. It includes programming languages such as HTML, CSS, JavaScript and XML language. These are the essential to design the User interface. After the front-end design I need to emulate it to find out if it looks exactly like I want. If it is not, I need to design it properly until I get good results.

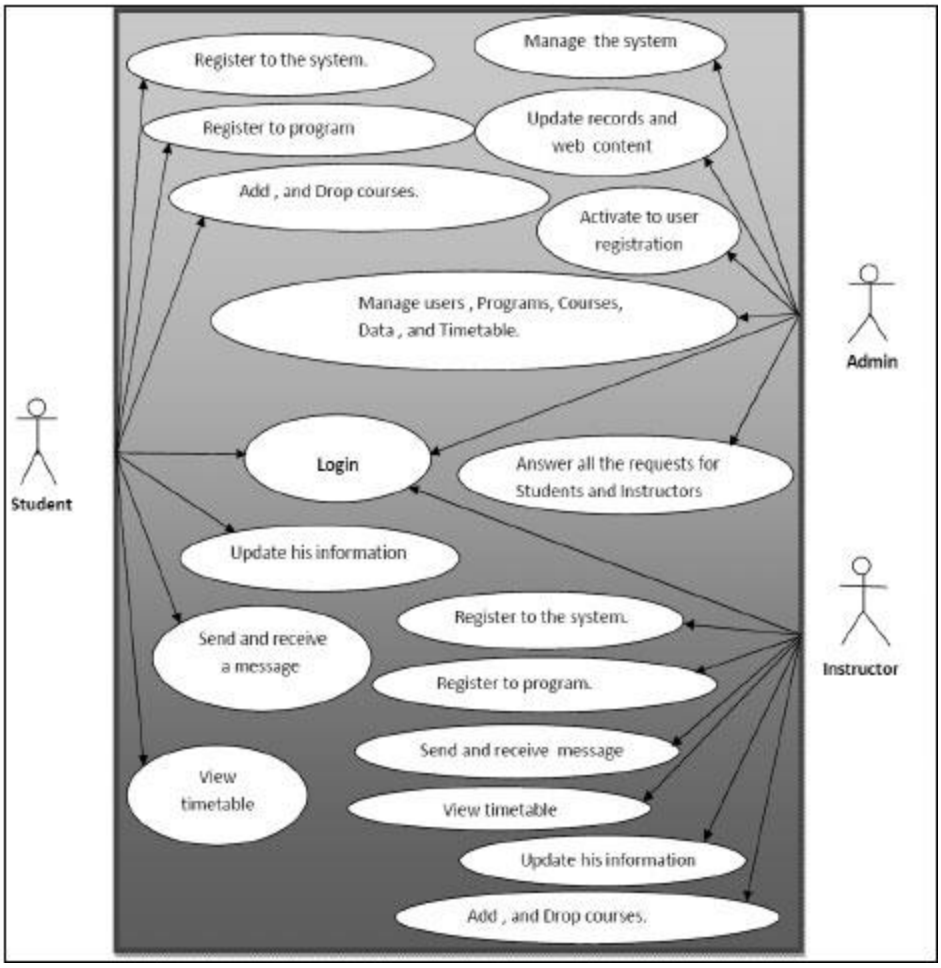


Fig 4.1: User interaction design

4.2 Back-end Design

The backend or "server-side" is the part of the mobile application that is hidden from users. It is responsible for the collection and storage of data as well as for retrieving relevant data upon request. Backend development also handles business logic and manages behind-the-scenes operations such as monetary transactions or data security.

For example, when you go to the application, create a profile, the information you enter will be stored in the backend database. Also, when you edit your profile, it updates without you seeing any details about the process.

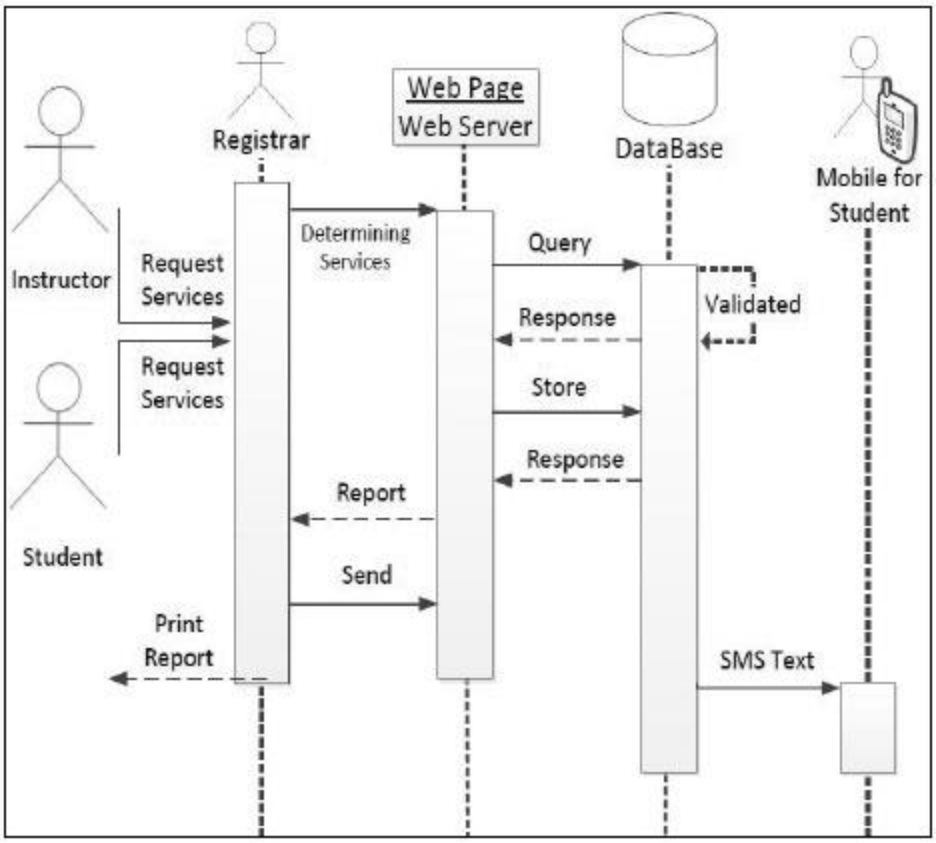


Fig 4.2: Back-end data save and update figure

4.3 Interaction Design and User Experience

A high-quality user interface that meets the requirements of the target audience would increase the conversion of online educational resources by 200%. Looking at this data, I cannot doubt that 'design' in the development of educational applications is a crucial aspect. Statistics show that about half of users say that they do not return to a site because of its aesthetic qualities. The same source states that 88% of users would not return to an app/site with poor UX design. According to the source, thoughtful UX design increases the conversion rate by 400%.

The design provides many tools for microlearning and personalization of instruction, which are major trends in e-learning. By developing apps with a customizable intuitive interface,

choosing colors/shapes according to the age and characteristics of the user, using infographics, progress bars, motivational stickers and breaking the content into small parts, you will ensure that your app meets the requirements of the modern learner.

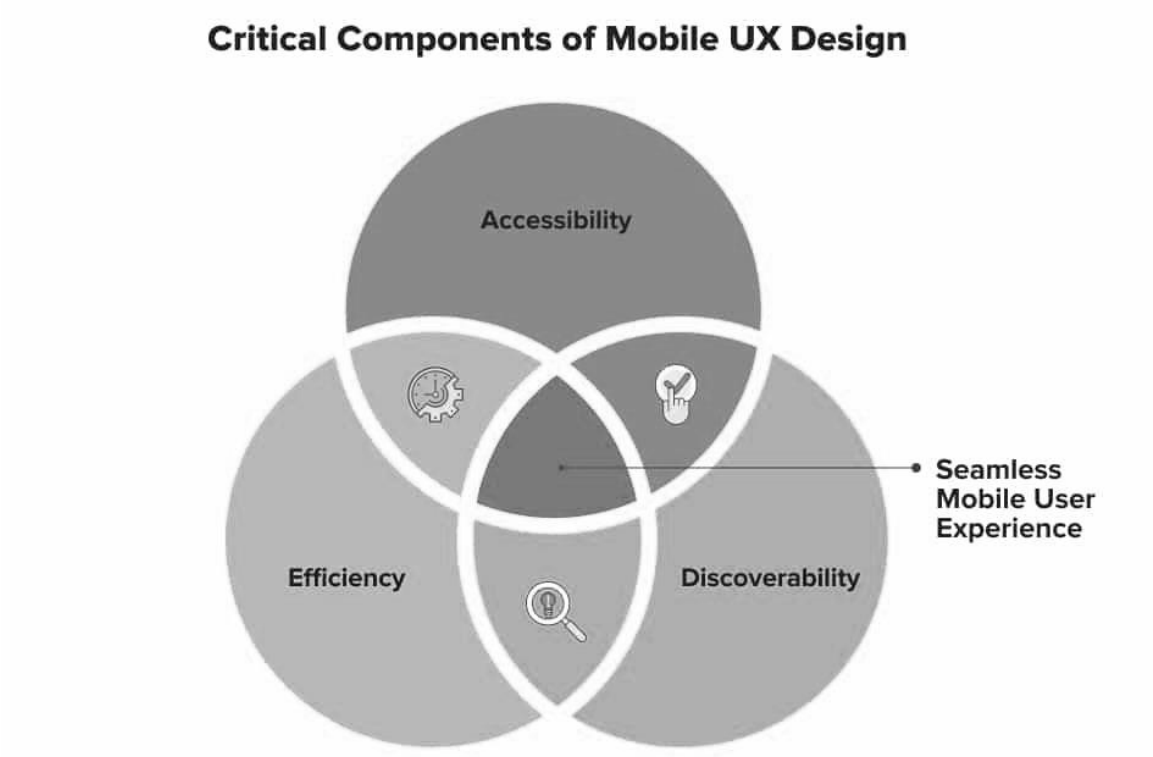


Fig 4.3: User interaction components

UX is the consequence of the display, functioning, system performance, interactive behavior and support capabilities of interactive systems, both hardware and software.

Each component has its own purpose in its context. User interface design and aesthetics contribute to the best aesthetic interaction for user adoption of the application. Because user dissatisfaction can cause distress and uneasiness. An exciting and attractive interface design inspired more students to learn. The importance of the functional element was highlighted as the expectations of the customers in terms of the interface. It is important to anticipate the utilization of a product or system through user discernment and responses towards an enjoyable and entertaining experience. Functional elements are able to contrast

and compare user convenience, product characteristics and design to draw in a target group of users to retain their commitment.

4.4 Implementation Requirements

In order to build an Android application, execution is essential. I have to integrate all the front-end and back-end codes and make them work together for the app to function. There is a great deal of implementations in my app, for instance, I use Picasso to display pictures in the application. Furthermore, I have employed various implementations for video streaming as well as various other activities. Without these implementations, the development would have been very difficult, if not impossible.

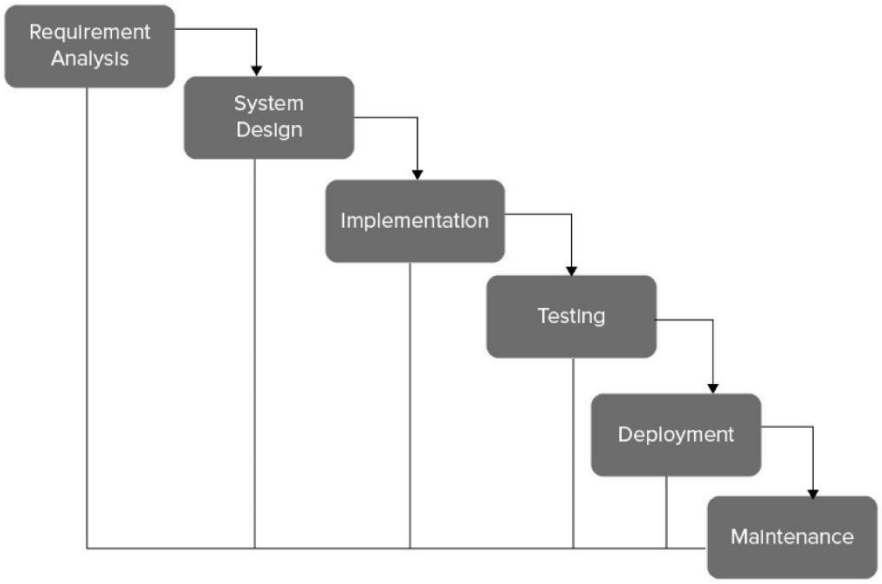


Fig 4.4: Implementation Requirements

CHAPTER 5
IMPLEMENTATION AND TESTING

5.1 Database Implementation

After the user interface is done, I need to start working on database design. It is where our data will store virtually. The database is designed to contain the following tables:

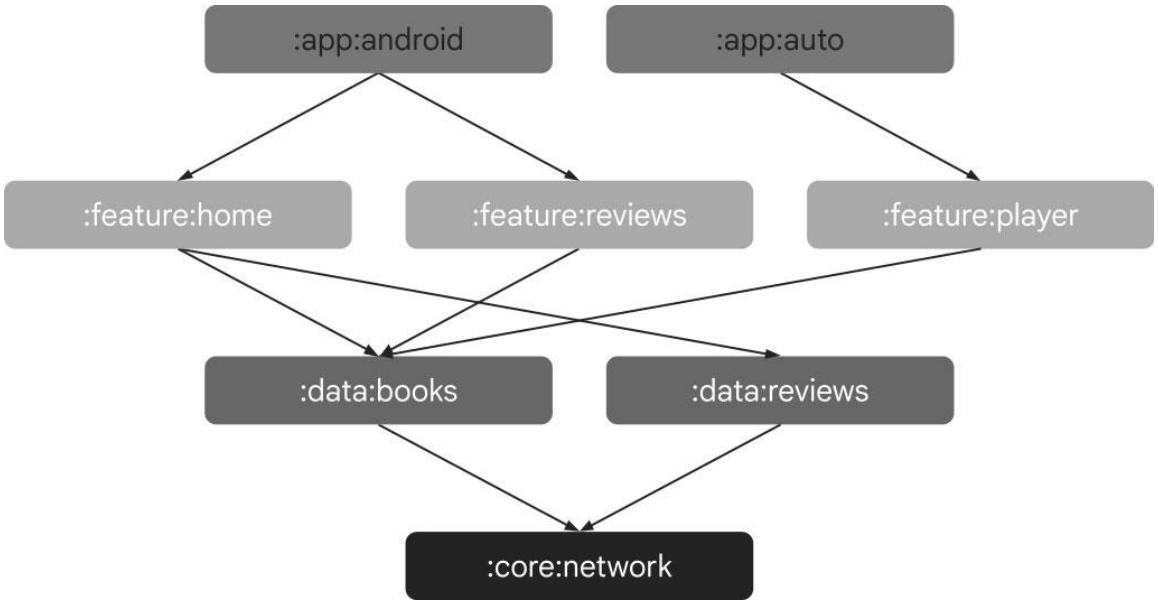


Fig 5.1: Database implementation.

In here student or teacher will make their profile and the data will be saved on the online database.

5.2 Implementation of Front-end Design

Building the perfect is not always impossible you just need to know how to do it. When I reach a conclusion with my design then, I should start designing my app.

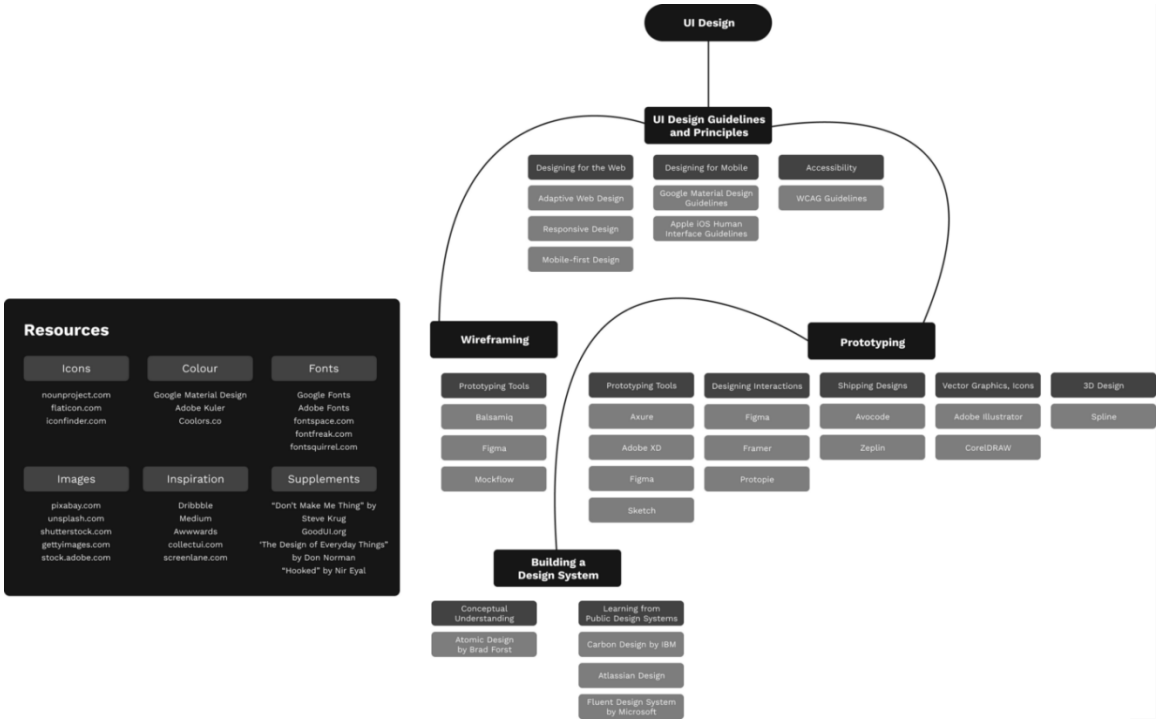


Fig 5.2: Front-end design and implementation

When I start the implementation, I need to start testing synchronously. Without testing I will never know if my app has any bug or not. Which will lead to bad user experience. After trial and error my layout design could reach a conclusion. After all this the finale product is done, but I can never stop testing it. And implementing new plan for the app.

5.3 Testing Implementation

Examining mobile applications is not only done to assess the user experience and how the app responds to commands, but also to evaluate its ability to transmit and receive data. The overarching goal of this type of testing is to guarantee high quality, which meet user expectations,

The most basic test scenarios in functional testing can be considered:

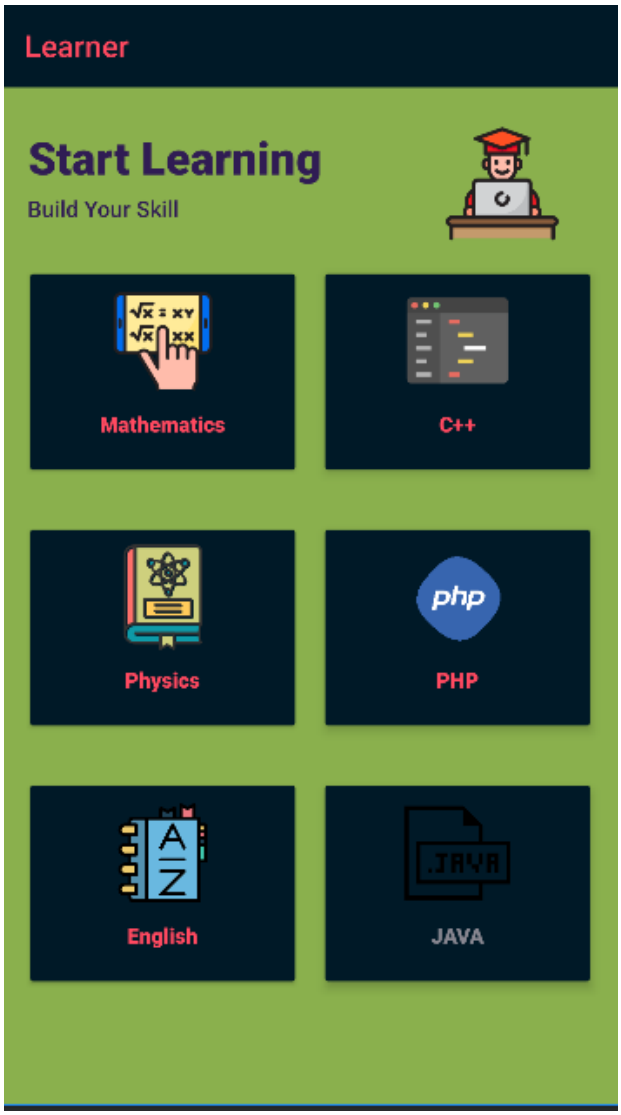


Fig 5.3: User interface

- To verify that all required fields are working as required.
- To verify that required fields are displayed differently on the screen than optional fields.

- To verify that the application is working as required whenever the application is started/stopped.

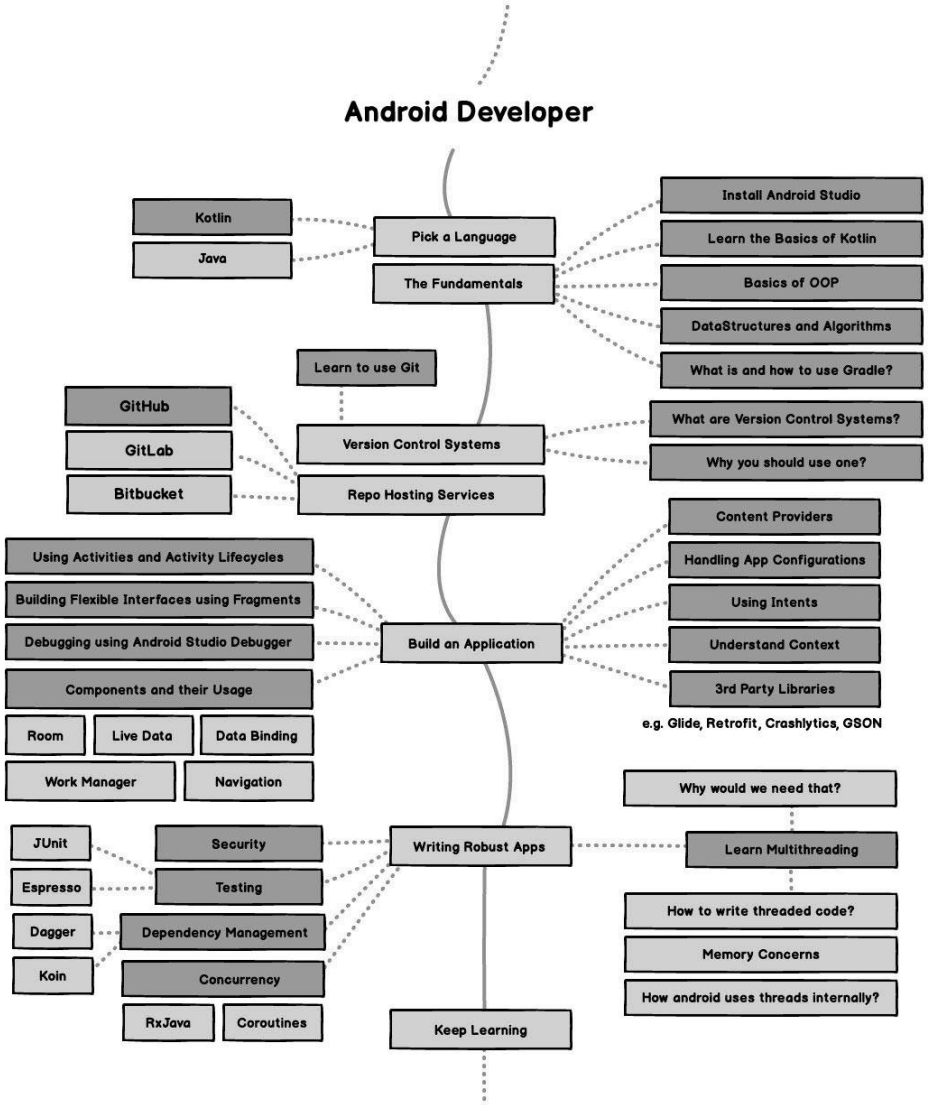


Fig 5.4: Testing and Testing Implementation

- To verify that the phone is capable of storing, processing and receiving SMS whenever the application is running. In order to verify the same, I need to use the second phone to send an SMS to the device under test where the app under test is currently running.

- To verify that the device is capable of performing the required multitasking requests whenever required.
- To verify that the application enables the necessary social networking capabilities such as sharing, posting and navigation, etc.

5.4 Test results

When I finish test results, now I have to start implementing the solution and check on the reports again and again. It is better to make the app public to certain category of people and let other people interact with the app so I can figure out bug much faster as well as solve it faster. When I find any bug, I should write it down in a chart so that I can remember and fix everything one at a time. After one bug is dealt with, I can start working on the next. With this I can easily solve all the bug and finish the build. Also, I need to check on the bug and error on server side, because there could be bugs too. Like if it saves user data security or not. Varity of other things, with all these solved my app is done. Now I need to market it.

Fig 5.5: Testing mobile app

CHAPTER 6

IMPACT ON SOCIETY, ENVIRONMENT AND SUSTAINABILITY

6.1 Impact on Society

M-learning, which is also referred to as mobile learning, is a branch of e-learning that is rapidly expanding. In a nutshell, it involves the utilization of smartphones, computers, tablets and other mobile devices in combination with wireless and cellular networks to facilitate the learning process. As it grows all educational app's influence will grow with it. It is best to say that the next generation of students will mostly learn through online application. With it my app's influence will grow sequentially. In order to do that I need to continuously update my app. Through it our future generation learn new topics and grow the society.

6.2 Impact on Environment

Creating a programmed course necessitates engineering of hardware and software, data design, evaluation of student understanding, choosing and installing content, and giving students direct feedback in the absence of people. I can deduce that there is no effect on the environment from this. If we factor in humans into the equation, then there is an effect, but it is not very obvious. Thus, the impact on the environment is negligible.

6.3 Ethical Aspects

The web was not designed with minors in consideration; however, they are presently helping to form its future. By offering young people the means to explore the online world with knowledge and faith, I can assist them in determining and comprehending potential danger. Imparting this concept to kids at an early age will not only affect their choices now, but will shape the decisions they will make in the future as entrepreneurs and problem

solvers.

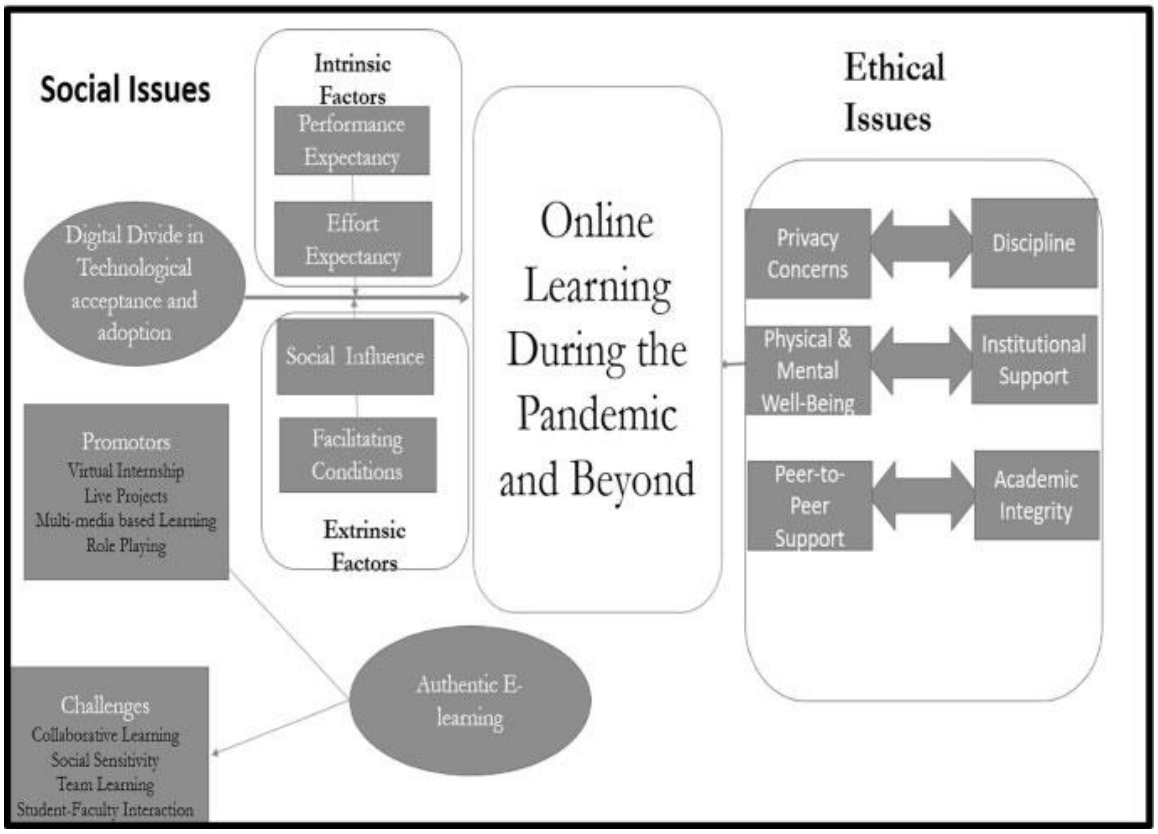
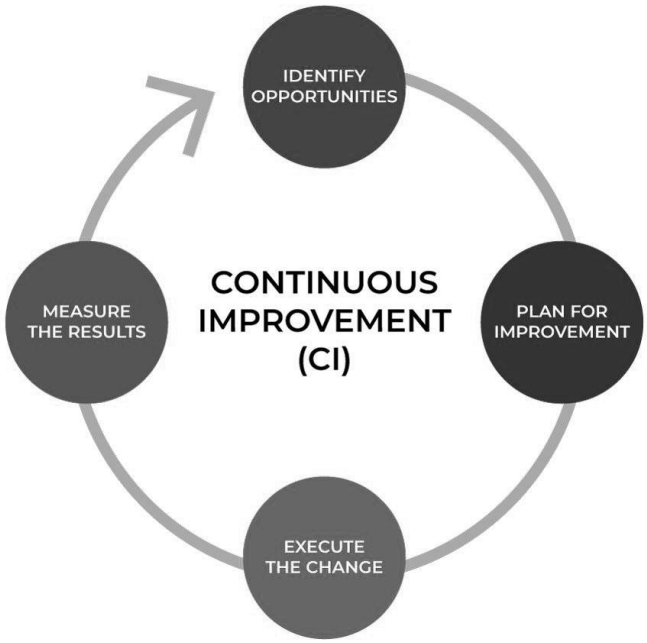


Fig 6.1: Ethical Aspects

By giving children the abilities and drive to build a more equitable, more inclusive, and less risky tech sector, I am creating a more promising tech future for all of us. Consequently, this application is for minors who are also students, so morally I must make sure they don't hurt themselves with this program.

6.4 Sustainability Plan

In this day and age if I want to sustain my app more than few months than I have to constantly improve my app without resting. As the market is huge for educational app, so the competition is tough. In order to survive I need to know what my customer want and improve it immediately. Otherwise, the app will lose favorability.



Fir 6.3: Sustainability of the app

CHAPTER 7
CONCLUSION

7.1 Conclusion

Recent research in the educational field has highlighted mobile applications as a significant trend. The outcomes of the literature review illustrate that utilizing a mobile app can be a great substitute for enhancing student understanding and success, especially in science, technology, engineering, and mathematics education. Mobile learning apps that are tailored to each student's learning preferences will stimulate and motivate learners to excel in science and math. Therefore, my application should be able to enhance the learning experience of future generations and help them pursue a brighter future.

7.2 Scope for Further Developments

There is a lot I can improve in my app. I can make a live class view for everyone to share their thoughts and ideas. I can also make a web base application so students can access it from their computers and laptops without any issue. With this there are even more improvement I will add in the future. I am also planning to introduce paid courses, so teachers have a motivation to upload good educational content also student can broaden their knowledge with various topics.

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Final Test

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