

"Productivity is never an accident. It's always the result of a commitment to excellence, intelligent planning, and focused effort." - Paul J. Meyer

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

In the Name of Allāh, the Most Gracious, the Most Merciful

# Lingua Pro+

Final Year Project

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A project submitted in partial fulfillment of the degree of

**Bachelors of Information Technology**



**SUPERIOR UNIVERSITY**

Department of Information Technology

Faculty of Computer Science & Information Technology

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### Plagiarism Free Certificate

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## Project Report

### Language Learning Application

#### Change Record

Author(s)	Version	Date	Notes	Supervisor's Signature
Muhammad Rabi, Daniyal Khan, Usman Latif, Abdikareem	1.0	01/02/2023	Template	
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## APPROVAL

This is to certify that [FYP-BITM-S23-01] have worked on and completed their Software Project at Software & Research Projects Section, Department of Information Technology, Superior University of Lahore in partial fulfillment of the requirement for the degree of Bachelor in Information Technology under my guidance and supervision

In our opinion, it is satisfactory and up to the mark and therefore fulfills the requirements of Bachelors of Information Technology.

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## **Dedication**

I dedicate this project to ALLAH Almighty my creator, my strong pillar, my source of inspiration, wisdom, knowledge and understanding. He has been the source of my strength throughout this program and on His wings only have I soared. I also dedicate this work to my PARENTS, who always encouraged me all the way and whose encouragement has made sure that I give it all it takes to finish that which I have started. To my TEACHERS who have done all possible things to complete my project. Thank you. My love for you all can never be quantified. ALLAH bless you.

## Acknowledgments

Many people have provided their contributions towards successful completion of this Study and we would like to express our gratitude to them without forgetting the Almighty God for directing my life .

We would like to express special thanks of gratitude to our supervisor **Ms. Sanya Abdullah** who gave us the opportunity to do this project. We are also thankful to our parents and friends who helped us. We are not making this project just for sake of marks but to also increase our knowledge

## Executive Summary

LinguaPro+ is a multi-platform immersive language learning system is an innovative and interactive platform for people to enhance their language skills. This comprehensive language learning solution offers web, mobile, and VR-based language learning experiences. English Language is one of the dominant language and proficiency is a crucial factor in gaining access to higher education opportunities both in Pakistan and abroad in professional and personal context. The main focus of the proposed system is to develop the four crucial English language skills of reading, writing, speaking, and listening in a thorough and captivating way. The system provides an immersive language learning experience to cater to individuals who face difficulty in public speaking and fear making mistakes.

The system employs advanced technology to deliver an interactive and user-friendly interface. It incorporates various features such as customized learning plans, interactive quizzes, role-playing or problem-solving activities and provides real-time feedback on proficiency status through assessments and evaluations. It focuses on developing the ability to communicate in English through activities that simulate real-life situations through VR environments such as classroom environment, socializing scenarios, café etc. The system is designed to adapt to the learning style of each user, providing a customized learning experience that is tailored to their unique needs. Students can create personalized accounts to track their progress, and the system provides individualized recommendations based on their learning style.

This system holds immense potential, particularly in countries like Pakistan where access to quality language learning resources is limited but 67.3% of primary schools, 88.6% of middle schools, and 92.1% of high schools offered English as a subject. It can benefit both local and foreign students by providing an effective and interactive way to acquire language skills. With its immersive approach, it can help individuals build their confidence in speaking English and overcome their fear of making mistakes. The platform's innovative features make it a valuable tool for individuals, educational institutions, and businesses looking to improve their language skills.

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# **Chapter: 1**

## **Introduction**

## Chapter 1:

### 1. Introduction

The power of English language cannot be denied as it has emerged as a globally accepted language with a massive reach. It holds the status of an official language in 59 countries and has more than 1.5 billion speakers worldwide. One cannot ignore the fact that mastering English is now mandatory for individuals belonging to any age or profession. In the past, when people were learning English they used specific traditional methods. They mainly focused on books, grammar rules, and remembering words. Learning involved doing lots of exercises, writing assignments by hand, and repeating parts of stories. Classes were usually centered around the teacher who taught directly and followed strict grammar rules. Speaking skills were developed by talking with others and tests were mostly written exams. Reading literature was essential to understand language nuances and cultural aspects. While these traditional methods were good for learning but slow learning process.

Language learning is an active process that begins at birth and continues throughout life. In today's era, there are innovative solutions and applications that make learning English accessible and engaging. Here are some latest generation approaches to learn languages one of them is Duolingo language learning application uses a game like approach allowing users to learn at their own pace with lessons focused on vocabulary, grammar, and pronunciation. Rosetta Stone adopts an immersive learning style emphasizing visuals and context to teach language naturally across reading, writing, speaking, and listening exercises. Babbel concentrates on practical language skills, tailoring lessons to real-life conversations for increased relevance. Busuu integrates language learning with a social community providing interactive exercises and opportunities for language exchange. HelloTalk connects users with native speakers worldwide facilitating real time communication through chat, voice messages, and video calls. Memrise employs mnemonic techniques and spaced repetition for effective vocabulary building in an enjoyable way. BBC Learning English offers multimedia content such as videos, audio clips, and articles across diverse topics for contextual and

enjoyable learning. These applications collectively harness technology to offer personalized and interactive experiences catering to various learning preferences and styles.

Language learning platforms advance in providing accessible and engaging experiences it is essential to recognize some distinctions and areas for improvement among them. One significant divergence lies in their instructional methods. Duolingo employs a gamified structure appealing to users who enjoy a playful learning experience which lack the learning structure. Rosetta Stone which utilizes a contextual and visual approach for a more natural understanding of language might lack immersive depth found. Babbel's focus on practical conversation skills may not encompass the social connectivity aspect present in Busuu where users engage with native speakers for real-time language practice. HelloTalk excels in connecting learners with native speakers its structured lessons might not be as comprehensive as those offered by Memrise, a platform specializing in vocabulary building through mnemonic techniques. While BBC Learning English provides rich multimedia content it may not match the user generated diversity found in platforms like Memrise. Identifying and addressing these distinctions can further refine the effectiveness and inclusivity of language learning platforms providing users with a well rounded and tailored educational experience.

Introducing Linguapro+ an innovative language learning application designed to address the identified gaps in existing platforms and elevate the language learning experience to new heights. Built on a multi-platform framework Linguapro+ combines the strengths of various methodologies to offer users a comprehensive and engaging language learning journey. Linguapro+ is multiplatform language learning application and web-based framework revolutionizing the language experience. Strategic focus on four modules Reading, listening, writing, and speaking the application utilizes a combination of innovative techniques. Gamification, a key feature of Linguapro+ injects an element of fun into the learning process transforming it into an interactive and enjoyable journey. By incorporating real time language practice the application ensures that users can immediately apply what they learn hands on communication skills for real world scenarios. Structured lessons further enhance the learning experience providing a systematic and comprehensive approach. The app includes special methods helpful for people getting ready for IELTS exams. It gives smart tips and tricks to do really well in language tests. One of the standout features of Linguapro+ is its immersive

learning component. Through the utilization of VR headset users can go into pretend worlds that look and feel real, just like everyday situations in language learning. This way of learning make feel surer about yourself. It creates a pretend world that seems real helping you improve your language skills and deal with different situations linguapro+ helping you learn English. It is not just a regular learning tool it is a whole system that uses tech, smart ways, and fun experiences to change how you learn a new language. If user want to get better at reading, listening, writing, or speaking, Linguapro+ is here for user from the start till the end of user language adventure. Learning English brings lots of opportunities and makes user grow with the help of mobile and web apps getting good at English is easier than ever. Discover a world of possibilities that makes more interesting and bring new adventures.

### **1.1 Background:**

In the past, English language learning primarily took place in physical classrooms face-to-face interaction between teachers and students. Students followed a structured curriculum often focusing on grammar rules, vocabulary lists, and textbook exercises. The teacher played a central role in imparting knowledge evaluating students' progress. Learners had limited access to learning resources. They relied heavily on textbooks, dictionaries, and audio materials like cassette tapes. Libraries and language labs were common places for self-study and practice. Resources were often limited in quantity and variety. Traditional methods of English language learning placed a strong emphasis on reading and writing skills. Grammar rules and sentence structure were given significant attention. Speaking and listening skills received comparatively less focus. The traditional learning style was often teacher centered the instructor acting as the primary source of knowledge and authority. Teachers led classroom activities provided explanations and corrected student's errors. Authentic language use exposure to native speakers and real-life communication was relatively limited. Learners had fewer opportunities to practice English in authentic contexts or engage in meaningful conversations with fluent speakers. 2D and static websites provide a valuable platform for English language learners to engage with various language learning materials. Websites typically offer a combination of text, images, and audio recordings to deliver lessons

and exercises learners can access a wide range of resources such as grammar explanations, vocabulary lists, reading passages, listening exercises, and interactive quizzes.

Applications are not properly giving the user friendly features according to the user interest which is the drawback of using these kind of platform which does not meet the user expectations.

## **1.2 Scope:**

LinguaPro+ is a language learning application focused on enhancing users' proficiency in reading, listening, writing, and speaking skills. Our application offers a wide range of interactive activities and customized resources to different language levels of learning styles. Users will have access to engaging reading materials, audio-based content, writing exercises, and interactive speaking activities. The application incorporates advanced features such as real-time feedback, personalized learning plans, and progress tracking. Our goal is to provide an immersive and user-friendly platform that empowers learners to develop their language skills effectively and confidently. LinguaPro+ aims to be the go-to language learning solution for individuals, educational institutions, and businesses seeking to improve their language proficiency in an engaging and comprehensive manner. LinguaPro+ all about making user language journey exciting and straightforward. It is not just another learning tool like having a friendly guide that uses clever method technology and enjoyable experiences to transform the way to learn a new language. User aiming to improve reading, listening, writing, or speaking skills our platform is a companion from the very beginning to the end of language adventure. Learning English opens up a world of opportunities helping you grow personally and professionally. With the support of mobile and web apps along with engaging experiences becoming proficient in English is more accessible than ever.

The app aspires to be the go-to choose for individuals, schools, and businesses seeking an enjoyable and comprehensive way to enhance their language skills. LinguaPro+ is closely affiliated with Superior University actively participating in the university's Go Global program. This initiative involves sending students abroad that necessitates proficiency in the English language. Recognizing the importance of IELTS testing for students engaging in the Go Global program LinguaPro+ plays a important role in assisting these students. The application not

only facilitates English language learning also focuses on preparing students to excel in the IELTS examination. By offering a comprehensive approach to language development LinguaPro+ serves as a valuable tool for Superior University students ensuring they are well-equipped linguistically to navigate their educational experiences abroad through the Go Global program.

### **1.3 Goals & Objective:**

#### **Goals:**

- Provide a seamless and engaging language learning experience for users.
- Foster proficiency in reading, writing, speaking, and listening skills.
- Cater to diverse learning needs and styles.
- Offer personalized learning paths tailored to individual learners.
- Enhance learners' confidence in using the target language in real-life situations.
- Promote cultural understanding and global communication.
- Continuously improve and update the application based on user feedback and emerging language learning trends.

#### **Objectives:**

- ❖ Develop a user-friendly and intuitive interface for easy navigation and engagement.
- ❖ Create comprehensive language courses and lessons covering various proficiency levels and language skills.
- ❖ Design interactive exercises and activities to reinforce learning and encourage active participation.
- ❖ Incorporate multimedia content (e.g., audio, video, visuals) to enhance the learning experience.
- ❖ Implement a speech recognition feature to provide accurate pronunciation assessment and feedback.
- ❖ Utilize adaptive learning algorithms to adjust content difficulty and pacing according to learners' progress.
- ❖ Provide regular assessments and progress tracking tools to monitor learners' development.

- ❖ Include real-life simulations and role-playing activities to help learners practice language skills in practical contexts.
- ❖ Facilitate peer interaction and collaboration through community features and language exchange opportunities.
- ❖ Incorporate gamification elements to enhance learner motivation and engagement.
- ❖ Continuously update and expand the application's content library to keep up with evolving language needs.
- ❖ Gather user feedback through surveys and analytics to identify areas for improvement and new feature requests.
- ❖ Conduct research and stay updated on emerging language learning trends and methodologies.
- ❖ Establish partnerships with educational institutions and language learning organizations to extend the reach of LinguaPro+.
- ❖ Market and promote LinguaPro+ through targeted strategies to reach a wide audience of language learners.

## **1.4 Motivation & Challenges:**

Creating LinguaPro+ poses a significant challenge for us in today's digital landscape. Our affiliation with Superior University serves as a strong motivator pushing us to provide valuable language learning services to this esteemed institution. We encounter noteworthy challenges that require dedicated attention. Developing LinguaPro+ demands an extra dose of effort from our team. We have to navigate through the complexities of using essential resources such as advanced systems and high-cost software, adding a layer of difficulty to our task. High performance system adds another dimension of challenge that necessitates careful consideration. Our commitment to overcoming these challenges stems from our dedication to delivering an exceptional language learning experience. We acknowledge that building LinguaPro+ requires persistent effort and determination. We remain resolute in our goal to not only meet but exceed the expectations set by Superior University. Working collaboratively and leveraging our collective skills we are confident that we can turn these challenges into opportunities making LinguaPro+ a revolutionary and impactful addition to the digital language learning landscape.

## Challenges in Developing Learning through VR:

- High costs associated with creating a high-quality English Learning VR.
- Requires technical expertise in programming, 3D modeling, and game design.
- Obtaining and employing technical expertise can be a complex process.
- Limited accessibility for learners without VR equipment, like VR headsets.
- The creation of engaging, relevant, and effective content for English learning can be challenging.
- Ensuring the effectiveness of the content in facilitating language learning adds an extra layer of complexity.

## 1.5 Statement of Problem:

Traditional language learning applications often lack a comprehensive approach failing to effectively integrate reading, listening, writing, and speaking modules. These platforms may lack engagement and interactivity on making the learning process less enjoyable. Another issue is the limited real world application of language skills learned hindering users from immediately practicing what they've acquired. Conventional language learning tools may lack innovation not harnessing the potential of emerging technologies like virtual reality (VR) to create immersive language learning experiences. The absence of gamification elements in many platforms contributes to a lack of fun and motivation in the language learning journey. The paragraph suggests that existing tools may not adequately address the specific needs of individuals preparing for language proficiency exams such as IELTS. In response to these identified problems Linguapro+ is positioned as an innovative solution that combines various methodologies introduces gamification for engagement, integrates real-time language practice, and leverages VR for immersive learning. The platform aims to revolutionize the language learning experience by offering a comprehensive, enjoyable, and effective solution that addresses the shortcomings of existing tools.

## 1.6 Literature Review:

Learning English is a crucial aspect of education and communication in today's globalized world. The learning English aims to examine the various methods, strategies, and approaches

used in teaching and learning English as a second or foreign language. The review covers a wide range of topics such as the importance of English as a global language, the role of motivation and attitude in language learning, the impact of technology on language acquisition, and the effectiveness of different teaching methodologies.

Studies have shown that students who have a positive attitude towards learning English tend to have better outcomes. Additionally, the use of interactive and immersive techniques, such as games, videos, and virtual reality, has been found to be effective in enhancing language learning

**Table 1: Literature Review**

Application Name / introduction	Year	Country	Features	Download	Platforms	Immersive experience	Language	Reviews
<b>Duolingo :</b> Duolingo is the fun, free app for learning 40+ languages through quick, bite-sized lessons. Practice speaking, reading, listening, and writing to build your vocabulary	2011	America	Academic/Education Activity Dashboard Asynchronous Learning Blended Learning Course Management Gamification Mobile Learning Multi-Language Tests/Assessments	Free / Paid	Website and Mobile application	No	0+	1. It doesn't remedy the fact that we might not be pronouncing the words correctly, but the ability to make and speak our own sentences

and grammar skills.								<p>is a great step toward really learning to use the language.</p> <p>2. It is only for beginners and not meant for Advanced learners</p> <p><b>4.5/5</b></p>
<p><b>Hello English:</b> Hello English is a free language-learning app. It's essentially a tutor, online course and video game mixed into one application</p>	20 14	India	<p>Language Lessons</p> <p>Level Placement Test</p> <p>Personalized Learning</p> <p>Listening and Speaking Practice</p> <p>Vocabulary Building</p> <p>Grammar Exercises</p>	Paid/ Free	Only Mobile applicatio n	No	1 (En glis h)	<p>1. Its truly good app. Its help to teach how to make a conversati on, vocabulary and words meaning and speaking practice</p> <p><b>4/5</b></p>

<b>Mondly VR:</b> is the first language learning experience with chat-bot and speech recognition in the world.	20 17	Rom ania	Virtual Reality Language Learning Conversational Lessons Realistic Environments Speech Recognition Avatar (chat- bot)	Paid / free	Website / mobile applicatio n	Yes	En glis h	Beautifully designed. Only language company to focus on VR and AR Huge language selection Very affordable Also caters to children <b>4.5/5</b>
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## 1.7 Gap Analysis:

Linguapro+ providing an exceptional language learning experience to enhance its effectiveness are conducting a comprehensive gap analysis. One key focus is ensuring accessibility to make Linguapro+ user-friendly across various devices. Acknowledging that the inclusion of advanced technologies might pose challenges for some users our goal is to simplify the technical aspects to ensuring that Linguapro+ remains easy to navigate for individuals with varying levels of technological familiarity.

Linguapro+ emphasizes its support for those preparing for IELTS exams the analysis aims to validate and optimize the effectiveness of these specialized methods. Particularly the immersive VR learning component to confirm its educational value seeking a harmonious blend of engagement. The integration of technology driven features with traditional learning methods is another area under examination with the aim of achieving a seamless and effective balance.

Linguapro+ promises an exciting language learning journey to make it even better. Identify areas that might need improvement or attention.

**Accessibility:**

**Current State:** Linguapro+ claims to be multiplatform need to ensure that it works smoothly on different devices without any problem.

**Desired State:** Ensure that users can easily access Linguapro+ on various devices, making it user-friendly for everyone.

**Technical Simplicity:**

**Current State:** With advanced methods and VR technology Linguapro+ might be a bit complicated for some users.

**Desired State:** Simplify the technical aspects to ensure that even those less familiar with technology can comfortably use Linguapro+.

**Effectiveness for IELTS Preparation:**

**Current State:** Linguapro+ mentions special methods for IELTS exams need to ensure their effectiveness.

**Desired State:** Validate and enhance the methods to make sure users preparing for IELTS exams find Linguapro+ genuinely helpful.

**Educational Efficacy of VR Learning:**

**Current State:** The claim of an immersive VR experience needs to be evaluated for its real impact on learning.

**Desired State:** Verify that the VR component is not just fun but genuinely aids in language learning, balancing engagement and educational value.

**Integration of Tech and Traditional Methods:**

**Current State:** Linguapro+ aims to be a whole system using tech, smart ways, and fun experiences need to ensure a seamless integration of these elements.

**Desired State:** Fine tune the balance between technology driven and traditional learning methods making it a harmonious and effective learning experience.

**User Engagement:**

**Current State:** Linguapro+ talks about a world of possibilities and adventures need to confirm that it keeps users engaged throughout their language learning journey.

**Desired State:** Enhance features to keep users excited and motivated ensuring a consistently engaging experience.

**1.8 Proposed Solution:**

To address the identified areas for improvement to propose a series of enhancements to make Linguapro+ an even more user friendly and effective language learning application.

**Enhanced Accessibility:**

**Proposal:** Implement refinements to ensure Linguapro+ works seamlessly on various devices making it accessible to users with different gadgets.

**Simplified Technology:**

**Proposal:** Introduce user-friendly features and clearer instructions to simplify the technical aspects of Linguapro+ catering to users with varying levels of technological familiarity.

**Optimized IELTS Support:**

**Proposal:** Conduct a thorough review of the IELTS support methods and implement improvements based on user feedback to ensure Linguapro+ is a valuable resource for exam preparation.

**Educational Value of VR Learning:**

**Proposal:** Validate and enhance the VR learning component by incorporating interactive and educational elements ensuring it contributes substantively to language acquisition.

**Seamless Integration of Tech and Tradition:**

**Proposal:** Fine-tune the integration of technology driven features and traditional learning methods to create a cohesive and effective language learning experience.

## **Sustained User Engagement:**

**Proposal:** Introduce engaging features, interactive challenges, and personalized learning milestones to keep users motivated and excited throughout their language learning journey.

These proposed solutions aim to refine Linguapro+ into a more accessible, user-friendly, and engaging language learning platform. Ensuring that it not only meets but exceeds user expectations continuous improvement for user-centric enhancements. Linguapro+ will provide a transformative and enjoyable language learning experience for all users.

### **1.10 Project Plan:**

As we are going through a proper way to build out system so here is our project plan which is further explained in Gantt Chart.

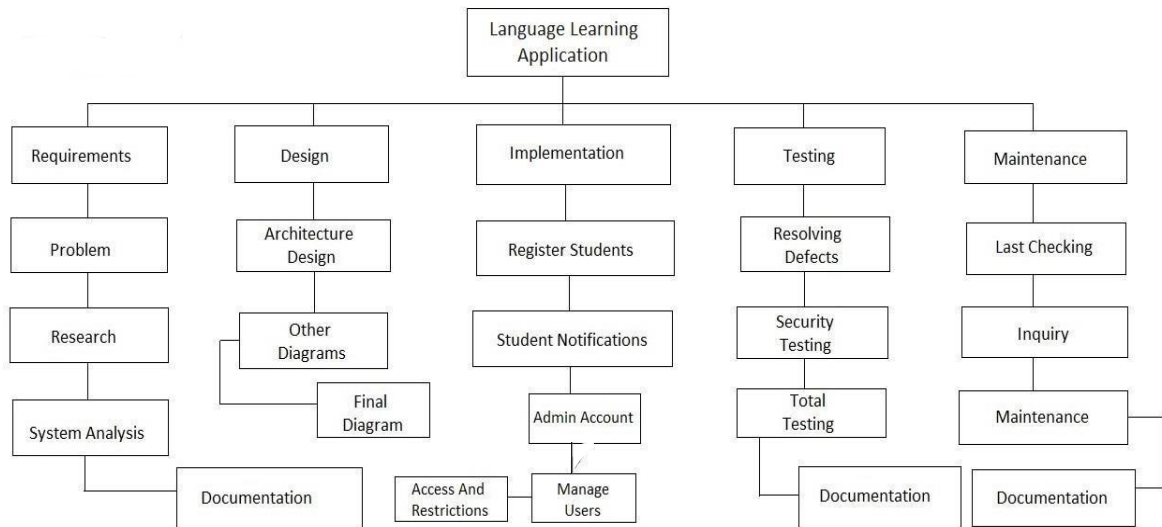
- Requirement
- Design
- Implementation
- Testing
- Maintenance

Estimated days for work are 270 days (**from 1<sup>st</sup> march till 25<sup>th</sup> November**), which can be a little bit less or more. We will collect requirements by using different techniques which are interviews one by one, surveys and questionnaires, which help us to meet the requirements according to the public demand.

**Table 2: Project Planning**

No#	Task name	Duration	Start	End
1	Planning	30 days	1 Mar,2023	30 Mar, 2023
2	Designing	30 days	1 Apr, 2023	31 May, 2023
3	Implementation	90 Days	1 June,2023	30 Aug, 2023
4	Testing	15 Days	1 Sep,2023	15 Sep,2023
5	Delivery	55 Days	16 Sep,2023	25 Nov,2023

**1.10.1 Work Breakdown Structure (WBS):**



**Figure 1: Work Breakdown Structure**

### 1.10.2 Gantt Chart:

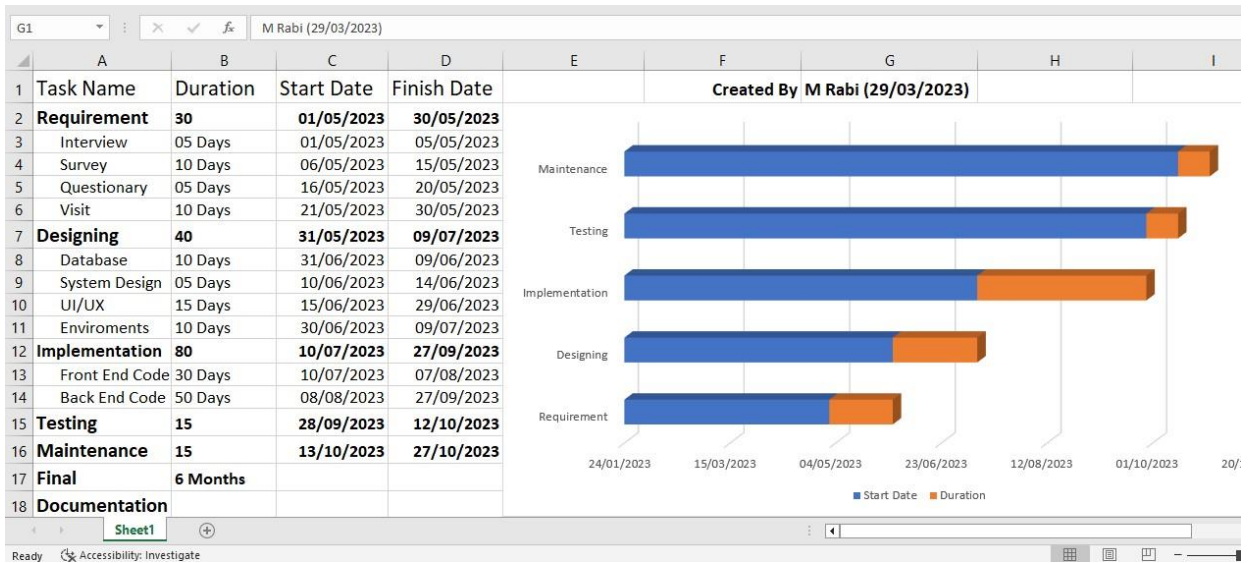


Figure 2: Gantt Chart

### 1.10.3 Pie Chart:

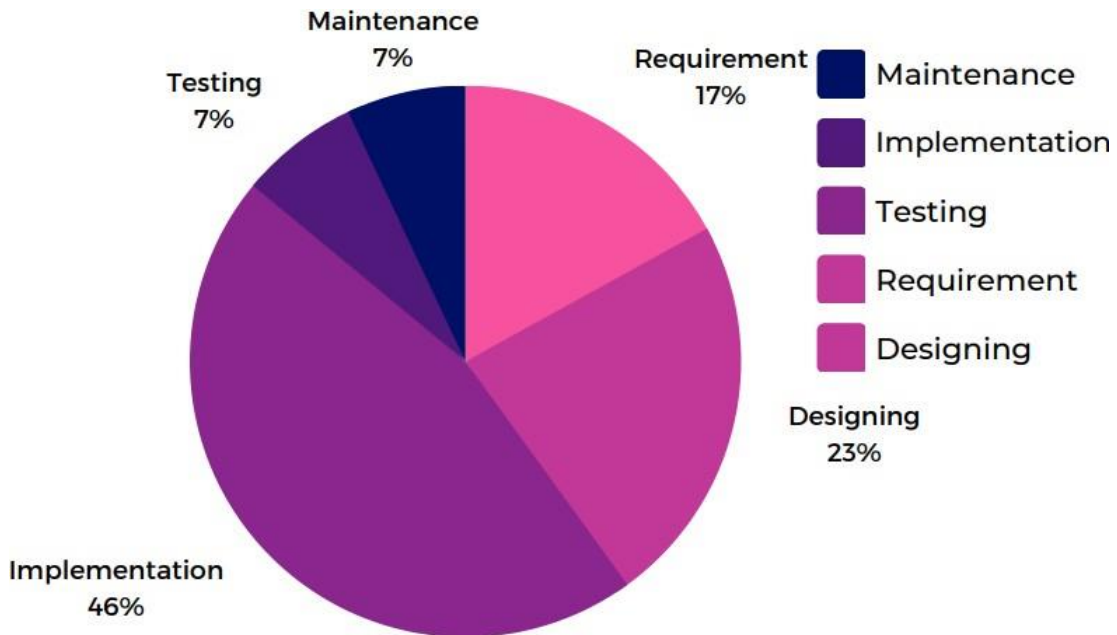


Figure 3: Pie Chart

## 1.10.4 Roles & Responsibility Matrix

### Phase1 (Starting)

**Table 3: Roles & Responsibility Matrix (Starting Phase)**

<b>Task</b>	<b>Assigning</b>	<b>Starting date</b>	<b>Ending Date</b>	<b>Duration</b>
Meeting	Daniyal Khan M. Rabi Khan Usman Latif	15-02- 2023	28-02- 2023	13
Research on Project	Daniyal Khan M. Rabi Khan Usman Latif	1-03- 2023	15-03- 2023	15
Requirements	Daniyal Khan M. Rabi Khan Usman Latif	15-03- 2023	30-03- 2023	15
SRS 1	Daniyal Khan M. Rabi Khan Usman Latif	1-04- 2023	15-04- 2023	15

## **Phase 2(Planning)**

**Table 4: Planning Phase**

<b>Task</b>	<b>Assigning</b>	<b>Starting date</b>	<b>Ending Date</b>	<b>Duration</b>
Project proposal	Daniyal khan M Rabi khan Usman Khan Abdikareem	15-04- 2023	20-04- 2023	5
SRS 2	Daniyal khan M Rabi khan Usman Khan, Abdikareem	20-04- 2023	30-04- 2023	10

## **Phase 3(Execution)**

**Table 5: Execution Phase**

<b>Task</b>	<b>Assigning</b>	<b>Starting date</b>	<b>Ending Date</b>	<b>Duration</b>
DataSet	Daniyal Khan M. Rabi Khan Usman Latif, Abdikareem	1-05- 2023	20-05- 2023	20
Servay	Daniyal Khan M. Rabi Khan Usman Latif Abdikareem	20-05- 2023	26-05- 2023	6

Learning material upload	Daniyal Khan M. Rabi Khan Usman Latif Abdikareem	27-05-2023	20-06-2023	23
Coding	Daniyal Khan M. Rabi Khan Usman Latif Abdikareem	20-06-2022	25-09-2023	70
SRS 3	Daniyal Khan M. Rabi Khan Usman Latif Abdikareem	25-09-2023	30-09-2023	5

#### Phase 4 (testing and concluding)

**Table 6: Testing & Concluding Phase**

Task	Assigning	Starting date	Ending Date	Duration
linking	Daniyal Khan M. Rabi Khan Usman Latif Abdikareem	1-10-2023	2-10-2023	2
testing	Daniyal Khan M. Rabi Khan Usman Latif Abdikareem	3-10-2023	10-10-2023	7
Closing of project	Daniyal Khan M. Rabi Khan Usman Latif Abdikareem	11-10-2023	15-10-2023	4

SRS 4	Daniyal Khan M. Rabi Khan Usman Latif Abdikareem	16-10-2023	18-10-2023	2
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**Chapter: 2**

**Software Requirement**

**Specification**

## Chapter 2: Software Requirement Gathering

### 2.1 Introduction:

In today's interconnected world, the ability to communicate effectively in different languages is more important than ever. Language learning applications and websites have gained significant popularity as they provide a convenient and accessible way to acquire new language skills. Developing a successful language learning application or website requires careful planning and a thorough understanding of user requirements. In this document, we will delve into the process of gathering software requirements specifically for a language learning application and website.

We provide our users with an interactive and immersive learning experience. It will cater to individuals of varying proficiency levels and offer a range of features, including vocabulary building, grammar exercises, pronunciation practice, interactive lessons, and cultural insights. The goal is to create a comprehensive platform that motivates users to learn and progress in their language learning journey.

In this chapter underlying infrastructure and technical aspects of the language learning application and website. This includes determining the required hosting environment, database management system, programming languages, frameworks, and other software components. Scalability, security, data privacy, and integration with third-party services (e.g., payment gateways, language APIs, or analytics tools) are critical considerations to ensure a robust and reliable system and Same vice versa for the mobile Application development.

The main benefits for the User is:

- Convenience and accessibility.
- Interactive and engaging learning experience.
- Personalized learning paths.
- Progress tracking and feedback.
- Gamification and motivation.
- Social interaction and community engagement.
- Cultural insights and contextual learning.
- Continuous learning and updates.

### 2.1.1 Purpose:

The Main Purpose to build a language learning platform is to provide individuals with a comprehensive and effective means to acquire and improve their language skills. It serves as a digital environment where users can access learning materials, engage in interactive activities, receive feedback, and track their progress. The platform aims to facilitate language learning by offering a range of features and resources tailored to the needs of learners, ultimately helping them develop proficiency in the target language. And our target language is English language to improve and remove the communication gap of our students by using our digital website and Application.

The purpose of our language learning platform is to provide a digital platform where users can access language learning materials, resources, and tools to enhance their language proficiency. Include:

**Access to Learning Materials:** We provide our users to access a wide range of learning materials, including lessons, exercises, vocabulary lists, grammar explanations, audio/video content, and interactive activities. The goal is to deliver comprehensive and well-structured materials that cover various aspects of language learning.

**Learning Resources and Tools:** We offers learning resources and tools to support users in their language learning journey. These may include dictionaries, translation tools, pronunciation guides, grammar references, language exercises, flashcards, and language proficiency assessments. The aim is to provide users with resources that facilitate their learning and reinforce their understanding of the language.

**Interactive Learning Experience:** Our aim is to create an interactive and engaging learning experience for our users. It may incorporate interactive exercises, quizzes, games, and multimedia elements to make the learning process more enjoyable and effective. The goal is to actively involve users in practicing language skills, reinforcing language concepts, and providing immediate feedback on their progress.

**Community and Social Interaction:** Our goal is to provide opportunities for users to connect with fellow learners, native speakers, or language instructors, facilitating language practice, cultural exchange, and support by using social circle that we made as online or physical both.

**Progress Tracking and Motivation:** We may incorporate features that allow users to track their progress, set goals, and receive feedback on their performance. This could include

progress tracking dashboards, achievement badges, certificates, or gamification elements. The aim is to motivate users, provide a sense of accomplishment, and encourage continuous learning and improvement.

At the end user is able to communicate fluently English language with Faculty, Admin and with each other.

### **2.1.3 Document Conventions**

This document is made with standard rules of documentation for System Requirement

Specification document to create the language learning platform which gives the digital environment to our users.

### **2.1.4 Scope**

The scope of this project is encompassing a wide range of digital tools and resources designed to facilitate language acquisition and proficiency in learners of all levels. Our platform provides learners with a convenient and accessible means of studying and practicing language (English) through various features and functionalities. Typically offer interactive lessons, vocabulary drills, grammar exercises, and audiovisual materials to enhance listening and speaking skills. We have also provided the incorporate features such as speech recognition technology, virtual classrooms, and language exchange communities to foster real-time communication and cultural immersion. Additionally, our platform provides personalized learning paths, progress tracking, and feedback mechanisms to cater to individual needs and optimize the learning experience. With the advancement of technology, after success we also evolved to be versatile, adaptable, and adaptable to different learning styles, making language acquisition more efficient, engaging, and enjoyable for learners worldwide.

## **2.2 Overall Description**

There are many platforms which gives the comprehensive digital environment designed to assist individuals in acquiring and developing language skills and We offer a wide range of features and resources that cater to learners of all levels, from beginners to advanced speakers. Users can access interactive lessons, vocabulary exercises, grammar drills, and audiovisual materials tailored to their specific language goals. Through engaging and immersive activities, language learning platforms foster listening, speaking, reading, and writing proficiency. And secondly, we incorporate advanced technologies such as speech recognition, allowing learners to practice pronunciation and receive immediate feedback.

Virtual classrooms and fostering real-time communication and cultural immersion. Personalized learning paths, progress tracking, and adaptive algorithms ensure that learners receive tailored content and guidance to meet their individual needs. Language learning platforms empower users to overcome language barriers, gain confidence in their abilities, and unlock opportunities for personal, educational, and professional growth. With their convenience and flexibility. Revolutionized the way people learn languages, making language acquisition accessible, enjoyable, and effective for our users.

We are providing both digital environments mobile application and the website interface to engage our user with its comfort. According to the back-end administration side we are providing different level of access to our Admin and For student interface having three different level of access to interact with the platform either application or website.

## 2.2.1 Platform Website

### Access by Administration:

Typically has various access levels and responsibilities to handle and manage the platform effectively. These access privileges may include:

- **User management:** Creating, managing, and overseeing user accounts, registrations, and profiles.
- **Content management:** Creating, editing, and removing lessons, exercises, and learning materials.
- **Analytic and reporting:** Monitoring user activity, course progress, and engagement through analytic tools.
- **Communication and support:** Interacting with users, responding to inquiries, and providing support through communication channels.
- **System configuration and updates:** Configuring and maintaining website settings, applying software updates, and implementing security measures.
- **Financial management:** Handling payment processing, subscription management, and revenue tracking for paid courses or premium features.

### Access by Students:

- User account creation and login.
- Enroll the for test to identify level. (beginner, intermediate, professional).
- Course enrollment and access to specific courses.

- Progress tracking within lessons and courses.
- Access to interactive learning materials (vocabulary exercises, grammar drills, listening activities, etc.).
- Communication tools for interacting with instructors and fellow learners (discussion forums, chat systems, virtual classrooms).
- Feedback on assignments, quizzes, and speaking exercises.
- Progress reports summarizing achievements and performance.
- Access to supplementary resources (language guides, dictionaries, audio recordings, video tutorials, flashcard, Game learning).
- Personalized learning paths based on proficiency levels or individual goals.

### 2.2.3 Platform Mobile application

#### Access by Admin:

- **User management:** Creating, managing, and overseeing user accounts, registrations, and profiles within the mobile application.
- **Content management:** Creating, editing, and removing lessons, exercises, and learning materials specific to the mobile application.
- **Analytic and reporting:** Monitoring user activity, engagement, and performance within the mobile app through analytic and reporting tools.
- **Communication and support:** Interacting with users, responding to inquiries, and providing support through in-app messaging or push notifications.
- **System configuration and updates:** Configuring and maintaining settings related to functionality, security, and performance of the mobile application.
- **Financial management:** Handling payment processing, subscription management, and revenue tracking for in-app purchases or premium features.

#### Access by students:

- User account creation and login within the mobile application.
- Apply test check level of student (beginner , intermediate , professional).
- Access to specific language courses and lessons offered in the mobile app.
- Progress tracking within lessons and courses, allowing students to keep track of their completed and pending tasks.
- Access to interactive learning materials such as vocabulary exercises, grammar drills, and

listening activities through the mobile app.

- Communication tools within the app to interact with instructors or fellow learners, such as in-app messaging or discussion forums.
- Feedback and performance evaluation on assignments, quizzes, and speaking exercises provided within the mobile app.
- Progress reports summarizing achievements and performance available in the mobile application.
- Access to supplementary resources like language guides, dictionaries, audio recordings, or video tutorials offered within the mobile app.
- Personalized learning paths based on proficiency levels or individual goals, tailored to each student's needs and accessible through the mobile application.

## 2.3 User Classes and Characteristics

### Admin

Admin controls and manage the overall performance of system and maintain Database who has full rights on administrator.

### Student

Login Throw id Upload class tasks, assignments, attempt quizzes, see time table and attempt surveys.

#### 2.3.1. Operating Environment

The software will operate with the following software components and applications: The software being developed will be running under Windows and embedded operating system. The Hardware require to access is a computer or mobile with an internet.

**Operating Environment:** Android, Linux, IOS, Windows.

**Database:** Latest SQL Server and SQLite

**Platform:** Visual Studio Code , Android Studio , Unity 3D .

#### 2.3.2 Design and Implementation Constraints

The project intends to follow SCRUM (AGILE METHODOLOGY) for its development. Agility helps in time boxed iterative development, suggests adaptive planning and promote incremental delivery. To deal with changing requirements and yield frequent and small

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software increments which can be adjusted, documented and built on the project intends to use SCRUM as the process model.

- ☑ User's details save into the database.
- ☑ SMS Application will work 24/7.
- ☑ Users may access from any android or windows that has Internet connection.
- ☑ Users must have their login account to do any kind of task.

### 2.3.3 User Documentation

Students and faculty must know details of our products and know how to use it. They should use android system for login this system

- how to use this App
- features of this app
- tips and tricks of this system
- how to resolve common problems with this system.

## 2.4 External Interface Requirements

### User Interfaces

The project entitled Language learning platform is an online platform on desktop using website and static platform for the mobile application that will cater the transactions and records of a students and Admin center. The **opening scene** of the application will have options like login sign-up, sidebar and splash screen with different features.

**Navigation Menu:** A navigation menu provides easy access to different sections of the website, such as home, courses, lessons, resources, and user profile. It allows users to quickly navigate to their desired sections.

**Course Catalog:** The course catalog provides an overview of the available English courses. It may include descriptions, levels, and ratings to help users choose the most suitable course for their needs.

**Lesson Structure:** Lessons are structured in a clear and organized manner, often following a sequential order. Users can progress through lessons one by one, and each lesson may contain different sections, such as vocabulary, grammar, listening, and reading exercises.

**Learning Materials:** The user interface presents learning materials in a visually appealing and accessible format. This may include interactive elements, audio recordings, visual aids, and text-based content to accommodate different learning styles.

**Multimedia Integration:** English learning websites often incorporate multimedia elements, such as videos, audio clips, and images, to enhance the learning experience. These elements can be integrated seamlessly within lessons or made available in separate resource sections.

**Interactive Exercises:** The user interface includes interactive exercises that allow users to practice their English skills. These exercises may involve multiple-choice questions, fill-in-the-blanks, matching activities, or speaking and writing prompts.

**Progress Tracking:** Users can easily track their progress within the website. This may include a visual representation of completed lessons or modules, badges or rewards earned, and overall course completion percentage.

**User Profile and Settings:** The user interface includes a user profile section where learners can view and update their personal information, track their learning history, and manage preferences such as language settings, notification preferences, and privacy settings.

**Communication and Support:** English learning websites often provide communication tools, such as chat systems or discussion forums, to facilitate interaction with instructors or fellow learners. These tools may be integrated within the user interface, allowing users to seek support or engage in language-related discussions.

**Mobile Responsiveness:** With the increasing use of mobile devices, English learning websites often incorporate a responsive design that adapts to different screen sizes and ensures a seamless user experience across desktops, laptops, tablets, and smartphones.

### **Mobile application:**

- Splash screen with logo
- Home screen providing easy access to various sections and features.
- Test screen to verify the student learning level (beginner, intermediate , professional)
- Course catalog showcasing available English courses.
- Structured lessons with sections for vocabulary, grammar, listening, and reading exercises.

- 
- Mobile-friendly learning materials with interactive elements and multimedia integration.
- Progress tracking to monitor completed lessons and overall course progress.
- User profile section to view and update personal information and track learning history.
- Communication tools for interaction with instructors or fellow learners.
- Gamification elements such as badges or rewards for achievements.
- Chatbot using Artificial intelligence
- Immersive experience environment menu to select the environment to interact with the Avatar. Using unity software
- Push notifications to provide updates, reminders, or learning prompts.
- Search functionality to quickly find specific lessons or topic.
- Settings options to customize language preferences, notifications, and other app-specific features.
- Mobile responsiveness, ensuring a seamless user experience across different screen sizes and orientations.

### **Building tool:**

The following form designs and user interfaces were designed and developed in Visual Studio Code (Html, CSS, JavaScript, bootstrap, React js )

**Unity:** Unity is a game development platform that also offers powerful tools for creating 3D environments. It provides a visual editor and scripting capabilities for designing and building interactive 3D scenes. (For Environment creation work on VR technology)

Mobile application:

Android studio: Java, XML and SQLite.

### **2.4.2. Hardware Interfaces:**

#### **Computer/Server:**

Processor: Intel Core i7, i5 or equivalent

RAM: 8-16 GB or higher

Storage: SSD with sufficient storage capacity

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Operating System: Windows 10 or macOS.

### **Graphics Card:**

NVIDIA GeForce GTX 1060 or higher

AMD Radeon RX 480 or higher

### **Internet Connection:**

Stable high-speed internet connection with sufficient bandwidth for streaming VR content

### **Virtual Reality Headsets:**

Oculus Rift or Oculus Rift S

HTC Vive or HTC Vive Pro

Windows Mixed Reality headsets (e.g., HP Reverb G2, Samsung Odyssey+)

### **Motion controllers and Display**

Compatible with the VR headset being used.

Compatible VR headset with integrated display or external monitors/projectors for non-VR content.

### **Mobile app:**

Operating System: Android or iOS (compatible with the mobile application)

Device Model: High-end smartphones or tablets with VR support

RAM: 4 GB or higher

Storage: Sufficient storage capacity for the mobile application and VR content

## **2.4.3 Communications Interfaces**

This application will not communicate with other users using the same application. The communication between the different parts of the system is important since they depend on each other. However, in what way the communication is achieved is not important for the system and is therefore handled by the underlying operating systems for the app portal.

## 2.4.4 System Features

### User side:

1. User registration and profile management
2. Course catalog and enrollment
3. Structured lessons and content delivery
4. Progress tracking and reporting
5. Practice exercises and assessments
6. Learning resources and materials
7. Communication and collaboration tools
  
8. Mobile responsiveness
9. Support and help resources
10. Personalized learning paths

## 2.5 Functional and Non-Functional Requirements

### 2.5.1 Functional Requirements

Table 7: Functional Requirements

Sno	Requirements	Purpose
1.	<b>User Login and Registration</b>	Users should be able to create accounts, log in, and manage their profiles. This allows for personalized learning experiences, progress tracking etc. Users should be able to create accounts, log in, and manage their profiles. This allows for personalized learning experiences, progress tracking etc.
2.	<b>User Survey</b>	Gather user's basic information like name, DOB, Country Name, Qualification, Institute Name and level of expertise in language that wanted to learn.
3.	<b>Rate Skills</b>	User can rate his skills himself in Listening, Writing, Speaking and Reading. On the basis of these ratings we will evaluate the user.
4.	<b>Gather User Interests</b>	Get user interest so that the user can get the learning material according to his taste.
5.	<b>Evaluate User</b>	Before lesson delivery the user have to attempt a general knowledge quiz which will be divided into four sections (listening, speaking, writing and reading skills). In this way the user will get the learning material on the basis of marks achieved in each section.
6.	<b>Lesson Delivery</b>	The application will deliver lessons in a structured and organized manner. Lessons may include exercises, multimedia content (audio, video, gamification), and most important is the interactive VR environments where the user can learn in different <b>VR Environments</b> and get <b>Immersive Experience.</b>

7.	<b>Learning Modules</b>	The application will provide various learning modules such as interactive exercises, multimedia content (audio, video, gamification). Each module has three difficulty levels which will be unlocked as per user quiz performance.
8.	<b>Content Selection</b>	The application should provide a variety of language courses or learning paths for users to choose from. These courses may be categorized by proficiency level, language skill (e.g. listening, speaking, reading, writing).
9.	<b>Progress Tracking</b>	The application should keep track of a user's progress, such as completed lessons, exercises, and achievements. This allows learners to see their improvement over time and motivates them to continue learning.
10.	<b>Assessment &amp; Feedback</b>	The application should include regular assessments to evaluate a user's language proficiency. These assessments can be in the form of quizzes, tests, or speaking exercises. Detailed feedback should be provided to help learners identify areas for improvement.
11.	<b>Get Certificate</b>	After the user complete all the learning modules, the certificate of appreciation will be generated.

## 2.5.2 Non-functional Requirements

**Table 8: Non-Functional Requirements**

<b>Sno</b>	<b>Requirements</b>	<b>Purpose</b>
1.	<b>Performance</b>	The application should be responsive and provide fast loading times for lessons, exercises, and other content. It should handle concurrent user activity efficiently and maintain stable performance even during peak usage periods.
2.	<b>Availability &amp; Reliability</b>	The application should be available and accessible to users consistently. It should have minimal downtime, and any scheduled maintenance or updates should be communicated to users in advance. Backup and recovery mechanisms should be in place to ensure data integrity and quick recovery in case of system failures.
3.	<b>Scalable Resources</b>	The application should be designed to handle an increasing number of users, courses, and content without significant degradation in performance. It should have the ability to scale up its infrastructure and resources as the user base grows.
4.	<b>Security Checks</b>	The application should prioritize the security of user data, personal information, and payment details. It should implement robust authentication and authorization mechanisms to protect user accounts.
5.	<b>User Interface and Usability</b>	The application should have an intuitive and user-friendly interface that is easy to navigate. It should provide clear instructions and guidance to users, making it simple to access courses, track progress, and interact with learning materials. Consistency in design and layout across the platform enhances user familiarity and ease of use.
6.	<b>System Integration</b>	The application should be capable of integrating with external systems and tools, such as learning management systems (LMS), content management systems (CMS), or

		third-party language learning resources. This allows for seamless data exchange, content synchronization, and enhanced functionality.
<b>7.</b>	<b>Compliance</b>	The application should comply with relevant accessibility standards to ensure that users with disabilities can access and use the platform effectively. It should also adhere to legal requirements, such as copyright laws and intellectual property rights.
<b>8.</b>	<b>Domain Requirement</b>	To use this application you need an android/IOS based smart phone. You can also run it on PC and Laptop systems. For <b>Immersive Experience</b> , you need a stand alone VR head set such as meta quest 2 or HTC Vive Pro.

# **Chapter: 3**

## **Use Case Analysis**

## Chapter 3:

### System Analysis

In this chapter, we create use case model and create a description for every case to analyse the Lingua Pro+.

#### 3.1 Use Case Model

User:

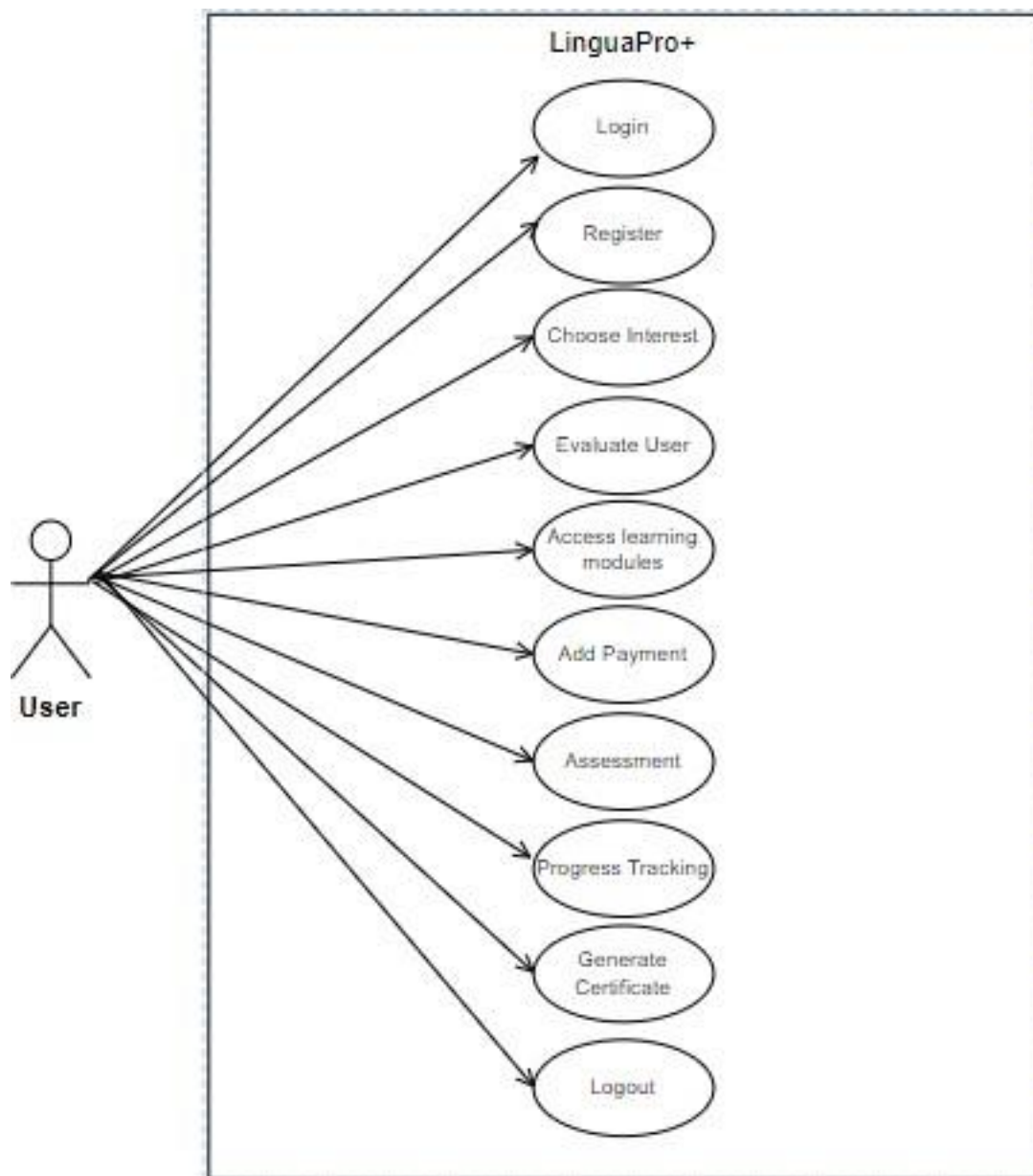
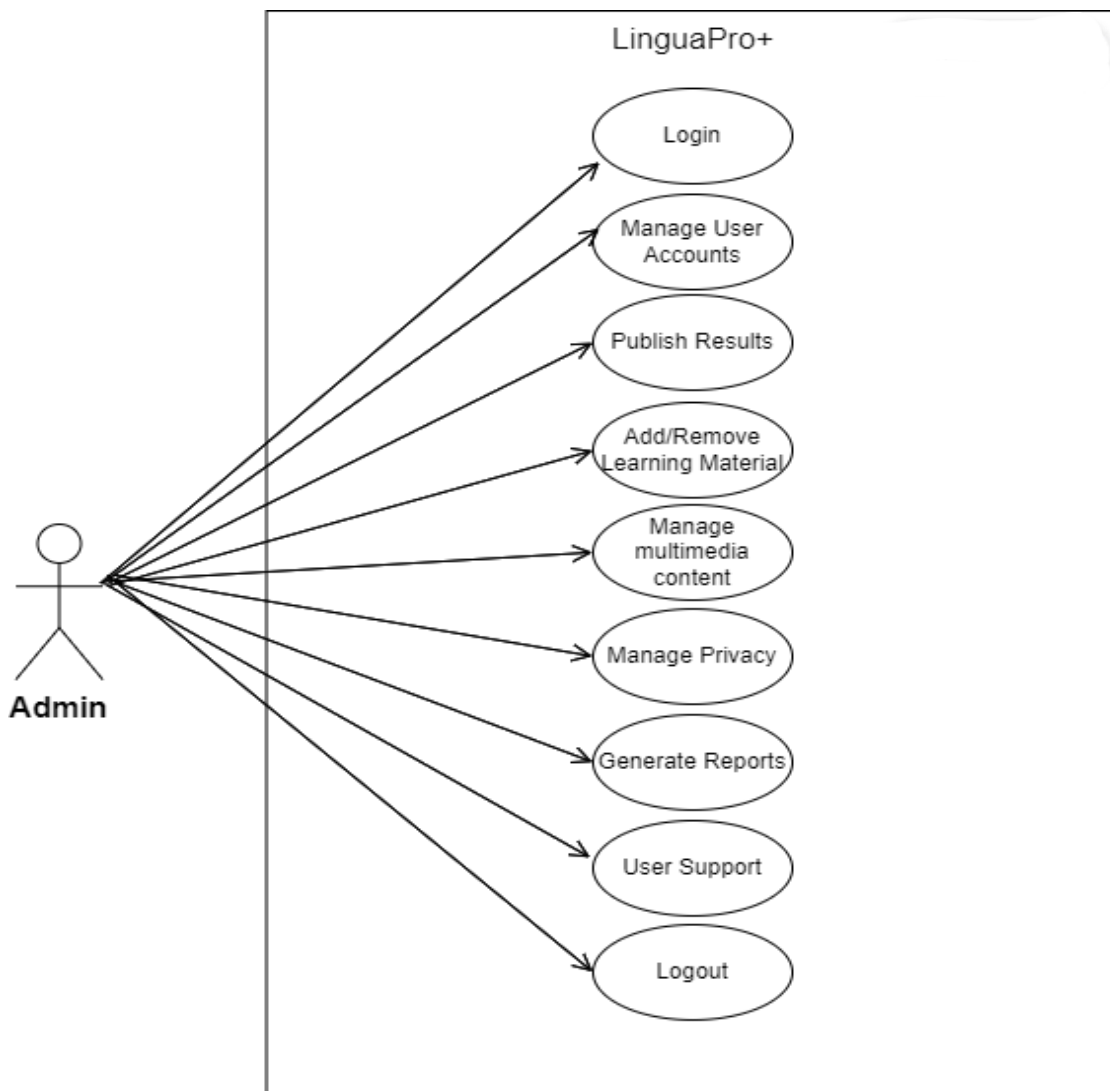


Figure 4: Use Case For User

**Admin:**



**Figure 5: Use Case For Admin**

### 3.1.1 Fully Dressed Use Case

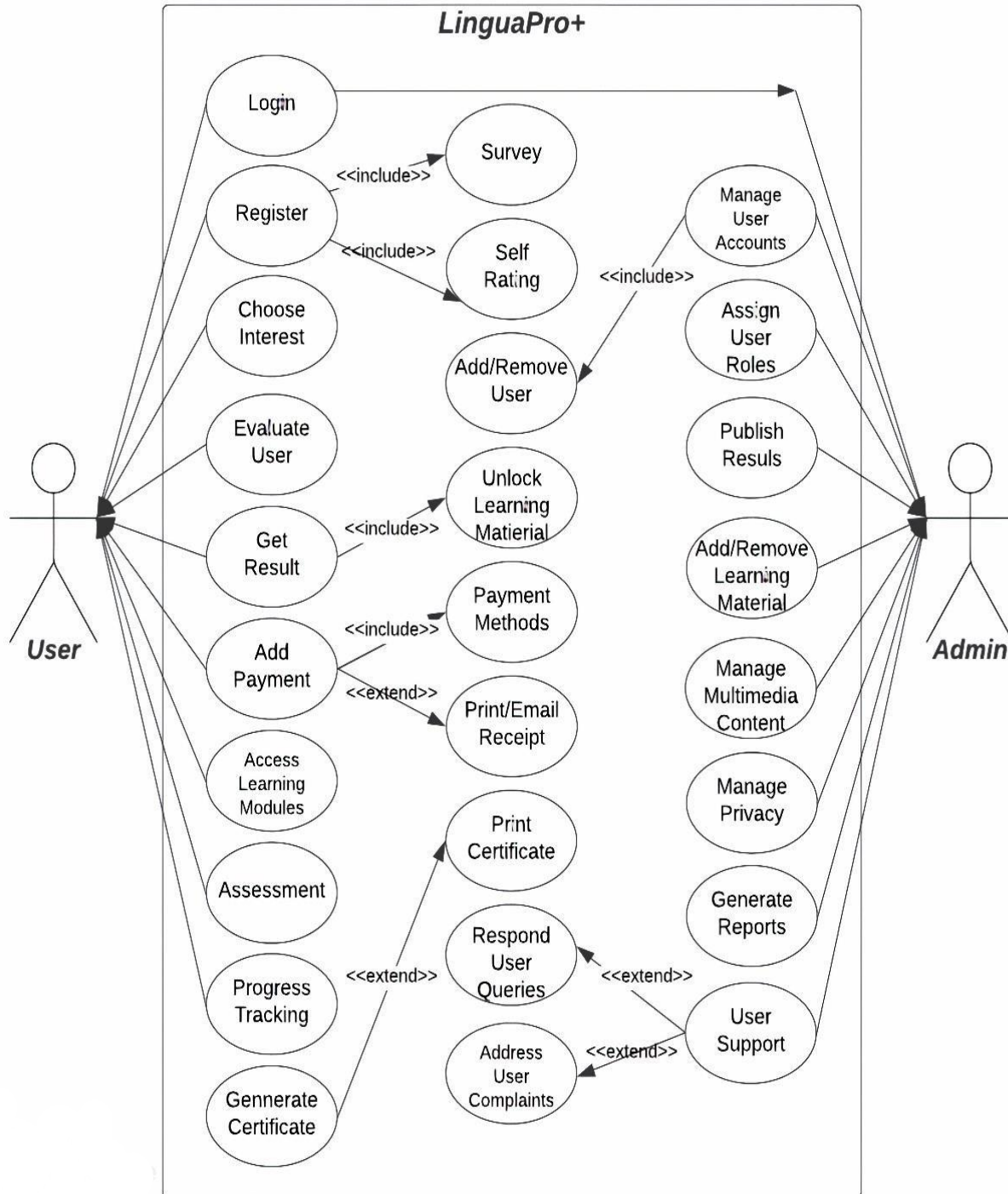


Figure 6: Fully Dressed Use Case

### 3.1.1 Use Cases Description:

**Table 9: Use Case Description**

<b>Use Case</b>	Registration
<b>Actor</b>	User
<b>Trigger</b>	The User to access the features.
<b>Pre-Condition</b>	User device is switched on with internet connection.
<b>Success End Condition</b>	The User Successfully Registered with Valid Information.
<b>Failure End Condition</b>	The User can't be Registered with Valid Information.
<b>Scenario</b>	<ul style="list-style-type: none"> <li>• The user opens the registration page.</li> <li>• Enter Name, Email Address, Phone, Choose Category, Password, Confirm Password to register this System.</li> <li>• After entering this information user press Register to registration this System.</li> </ul>
<b>Alternative Path</b>	<p>Automatically Browsing the Login page:</p> <p>Browsing the system LinguaPro+ System will reach the user in loginpage though they are not logged in yet.</p>

**Table 3.1**

<b>Use Case</b>	Login
<b>Actor</b>	User, Admin.
<b>Trigger</b>	The User, Admin to access the LinguaPro+.
<b>Success End Condition</b>	The User and Admin Successfully Logged in with Valid Information.
<b>Failure End Condition</b>	The User, or Admin can't be Logged in with Valid Information.
<b>Pre-Condition</b>	User must be registered with valid Information and the admin must be authenticated.
<b>Scenario</b>	<ul style="list-style-type: none"> <li>• The user opens the Login page.</li> <li>• Enter Email Address, Password and click Login.</li> <li>• Then user Logged in user home page.</li> </ul>
<b>Alternative Path</b>	<p>Automatically Browsing the Login page:</p> <p>Browsing the system AI Dermatologist System will reach the User/ServiceProvider/Admin in login page though they are not logged in yet.</p>

**Table 3.2**

<b>Use Case</b>	Survey Form
<b>Actor</b>	User
<b>Trigger</b>	The User access the survey form.
<b>Pre-Condition</b>	User device is switched on with internet connection and the app must be register with valid information.
<b>Success End Condition</b>	The User Successfully Registered with Valid Information.
<b>Failure End Condition</b>	The User failed to fill the survey form.
<b>Scenario</b>	<ul style="list-style-type: none"> <li>• The user opens the survey form.</li> <li>• The user enter his personal details like DOB, CountryName, Qualification, Institute Name.</li> <li>• The user will submit the survey form.</li> </ul>

**Table 3.3**

<b>Use Case</b>	Self Rating
<b>Actor</b>	User
<b>Trigger</b>	The User will access the self rating form .
<b>Pre-Condition</b>	User device is switched on with internet connection and the app must be register with valid information and submitted the survey form.
<b>Success End Condition</b>	The User rate himself and his rating will be recorded.
<b>Failure End Condition</b>	The User unable to record the rating due to database or internet connection lost.
<b>Scenario</b>	<ul style="list-style-type: none"> <li>• The user opens the self rating form.</li> <li>• The user rate himself in various ways (Listening, Writing, Reading and Speaking).</li> <li>• The user will submit the self rating form.</li> </ul>

**Table 3.4**

<b>Use Case</b>	Choose Interests
<b>Actor</b>	User
<b>Trigger</b>	The User will access the choose interest form.
<b>Pre-Condition</b>	User device is switched on with internet connection and the app must be register with valid information and submitted the self rating record .
<b>Success End Condition</b>	The user will choose the interests and he will access the quiz according to the selected interests.
<b>Failure End Condition</b>	The User failed to choose the interests due to database and internet connection lost.
<b>Scenario</b>	<ul style="list-style-type: none"> <li>• The user opens the choose interest form.</li> <li>• The user select the desired interests and he can only select 3 interests at a time.</li> <li>• The user will submit the form.</li> </ul>

Table 3.5

<b>Use Case</b>	Evaluate User
<b>Actor</b>	User
<b>Trigger</b>	The User will be redirected to evaluation page .
<b>Pre-Condition</b>	User device is switched on with internet connection and the app must be register with valid information and he must fill the .
<b>Success End Condition</b>	The User Successfully Registered with Valid Information.
<b>Failure End Condition</b>	The User failed to fill the survey form.
<b>Scenario</b>	<ul style="list-style-type: none"> <li>• The user opens the survey form.</li> <li>• The user enter his personal details like DOB, Country Name, Qualification, Institute Name.</li> <li>• The user will submit the survey form.</li> </ul>

Table 3.6

<b>Use Case</b>	Get result
<b>Actor</b>	User
<b>Trigger</b>	Result screen will appear along with the user level.
<b>Success End Condition</b>	The User Successfully see the result of an particular module.
<b>Failure End Condition</b>	The user failed to see progress if he/she lost the internet connection and device not capable to run the application and portal
<b>Pre-Condition</b>	<ul style="list-style-type: none"> <li>● Connected with internet</li> <li>● Capable device. Android version and chrome.</li> <li>● Set the language.</li> </ul>
<b>Scenario</b>	<p>After successfully apply the test :</p> <ul style="list-style-type: none"> <li>● Select the result button.</li> <li>● Open the result page.</li> <li>● If result meet the requirement then user applicable to access the learning levels.</li> </ul>

Table 3.7

<b>Use Case</b>	Unlock learning module
<b>Actor</b>	User
<b>Trigger</b>	Three learning levels will appear on screen ( beginner, intermediate , Pro)
<b>Success End Condition</b>	The User Successfully applicable for the learning level.
<b>Failure End Condition</b>	The user failed to see progress if he/she lost the internet connection and device not capable to run the application and portal
<b>Pre-Condition</b>	<ul style="list-style-type: none"> <li>● Connected with internet</li> <li>● Capable device. Android version and chrome.</li> <li>● Must attempt the test.</li> </ul>
<b>Scenario</b>	<ul style="list-style-type: none"> <li>● Select course</li> <li>● Select learning level.</li> <li>● Start learning as per the student level.</li> </ul>

Table 3.8

<b>Use Case</b>	Add payment
<b>Actor</b>	User
<b>Trigger</b>	Move to payment method screen.
<b>Success End Condition</b>	The User Successfully move to payment method.
<b>Failure End Condition</b>	The user fail to process the payment.
<b>Pre-Condition</b>	User must be registered in database.
<b>Scenario</b>	Select paid course  Select the payment method

<b>Use Case</b>	Payment method
<b>Actor</b>	User
<b>Trigger</b>	Different payment method open ( Easypaisa , Visa , master ,paypak, jazzcash etc.)
<b>Success End Condition</b>	The User Successfully pay the charges.
<b>Failure End Condition</b>	The user fail to proceed the payment.
<b>Pre-Condition</b>	User must be registered in database.
<b>Scenario</b>	<ul style="list-style-type: none"> <li>● Select paid course</li> <li>● Select the add payment</li> <li>● Select payment method</li> <li>● Select send button.</li> <li>● Received receipt.</li> </ul>

**Table 3.12**

<b>Use Case</b>	Progress tracking
<b>Actor</b>	User
<b>Trigger</b>	Display achievement of a particular completed course outline including practice material
<b>Success End Condition</b>	The User Successfully see the progress of learning.
<b>Failure End Condition</b>	The user failed to see progress if he/she lost the internet connection and device not capable to run the application and portal
<b>Pre-Condition</b>	<ul style="list-style-type: none"> <li>● Connected with internet</li> <li>● Capable device. Android version and chrome.</li> </ul>
<b>Scenario</b>	<ul style="list-style-type: none"> <li>● Select course</li> <li>● Select progress status button</li> <li>● Progress bar will appear on screen.</li> </ul>

<b>Use Case</b>	<b>Assessment</b>
<b>Actor</b>	User
<b>Trigger</b>	Display the Quiz, feedback , result.
<b>Success End Condition</b>	The User Successfully see the progress of learning.
<b>Failure End Condition</b>	The user failed to see result due to lost internet connection.
<b>Pre-Condition</b>	<ul style="list-style-type: none"> <li>● Connected with internet.</li> <li>● Must started the course</li> <li>● Must attempt the Quiz</li> <li>● Must apply the test</li> <li>● User must be registered in database.</li> </ul>
<b>Scenario</b>	<ul style="list-style-type: none"> <li>● Select course</li> <li>● Select the assessment button</li> <li>● Result , quiz score , feedback comment box will appear</li> </ul>

<b>Use Case</b>	Generate certificate
<b>Actor</b>	User
<b>Trigger</b>	Certificate appear on display screen with progress and download options (pdf).
<b>Success End Condition</b>	The User Successfully see the certificate of learning.
<b>Failure End Condition</b>	The user failed to see progress if he/she lost the internet connection and device not capable to run the application and portal
<b>Pre-Condition</b>	<ul style="list-style-type: none"> <li>● Connected with internet</li> <li>● Capable device. Android version and chrome.</li> <li>● Must be greater then 75 percent marks.</li> <li>● Attempt all quizzes</li> <li>● Attempt all practice work.</li> <li>● Attempt the progress which meets the requirements</li> </ul>
<b>Scenario</b>	<ul style="list-style-type: none"> <li>● Select course</li> <li>● Select the certificate button.</li> <li>● Open the certificate.</li> <li>● Download in pdf if user need.</li> </ul>

# **Chapter: 4**

## **System Design**

## **Chapter 4:**

### **4.1 Introduction**

An online platform designed to facilitate the learning and improvement of English language skills for users worldwide. The website provides a variety of interactive features, educational resources, and community engagement to enhance the user's language proficiency.

This system design documentation outlines the key components, architecture, and functionalities of the English Learning Website. It serves as a comprehensive guide for developers, designers, and stakeholders involved in the project.

## 4.2 Use Case

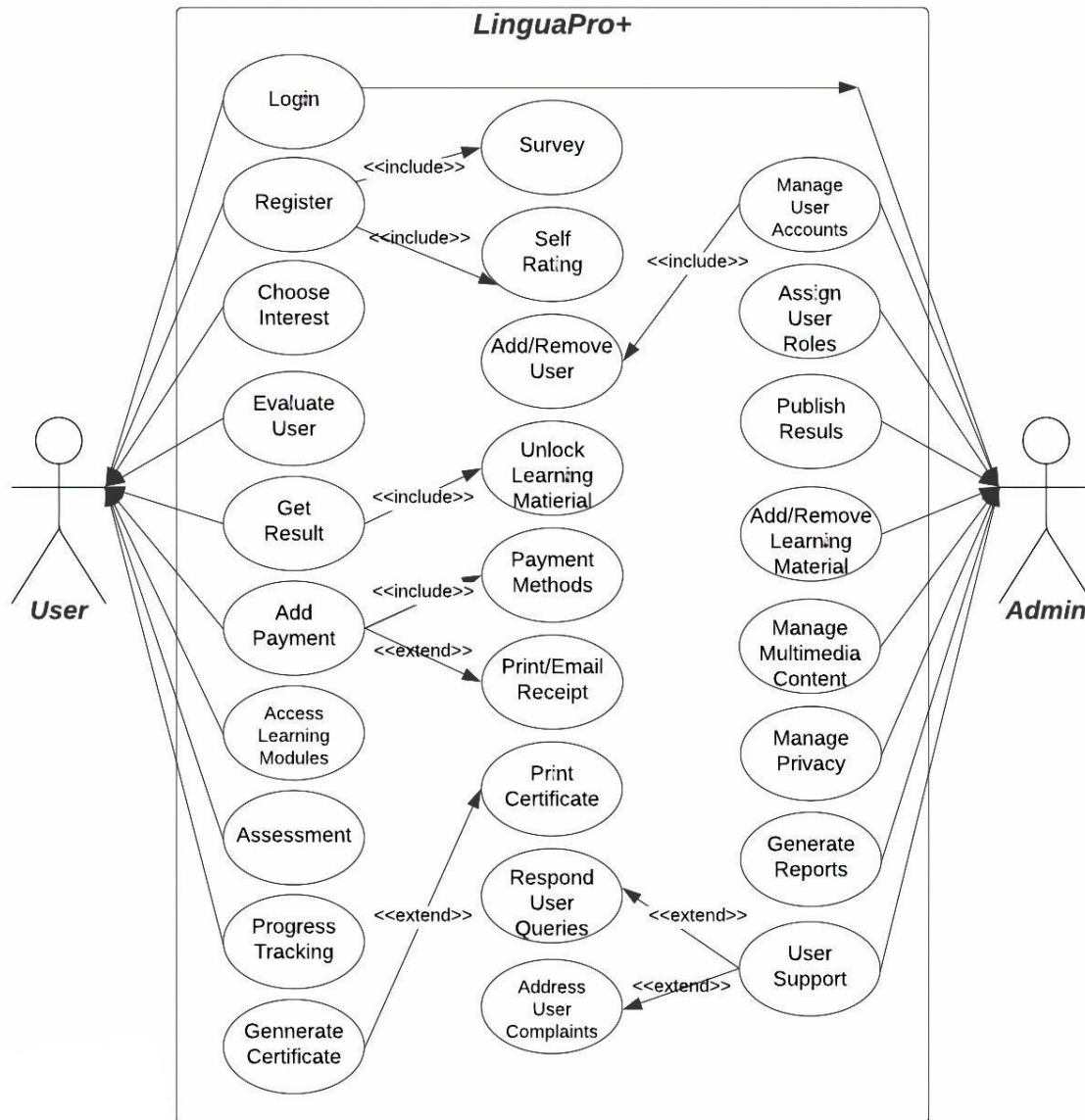


Figure 7: Fully Dressed Use Case

### 4.3 Class Diagram:

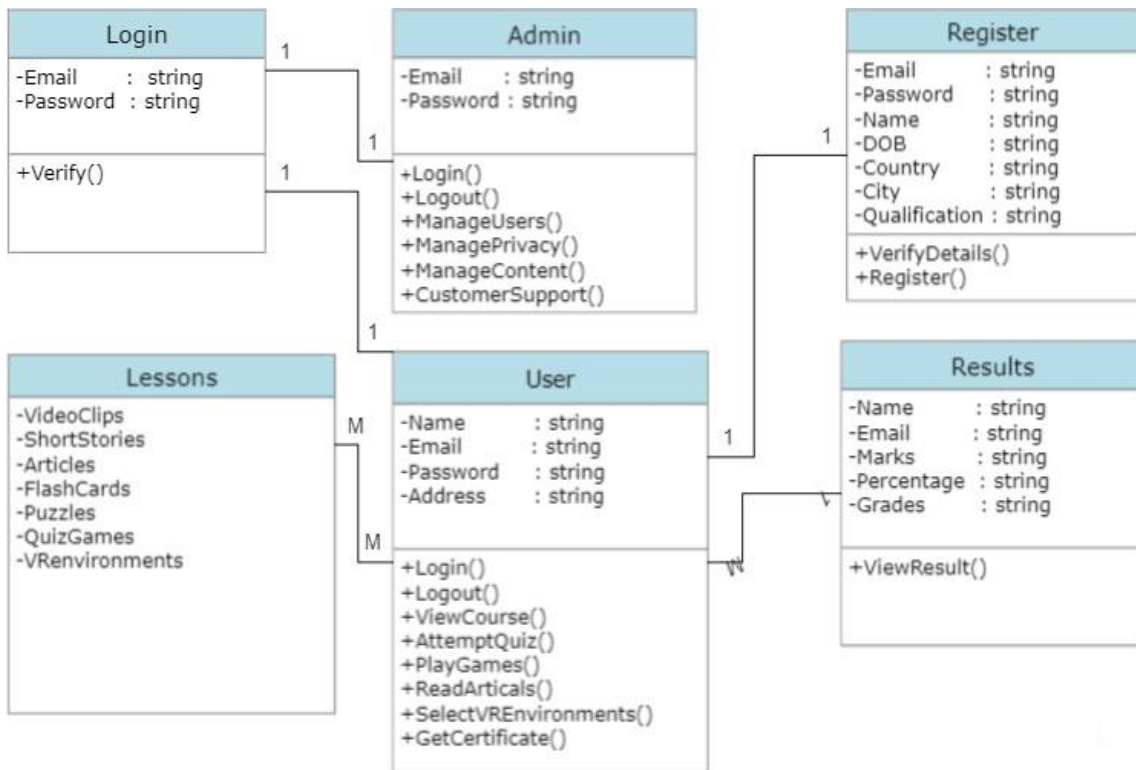


Figure 8: Class Diagram

## 4.4 State Diagram

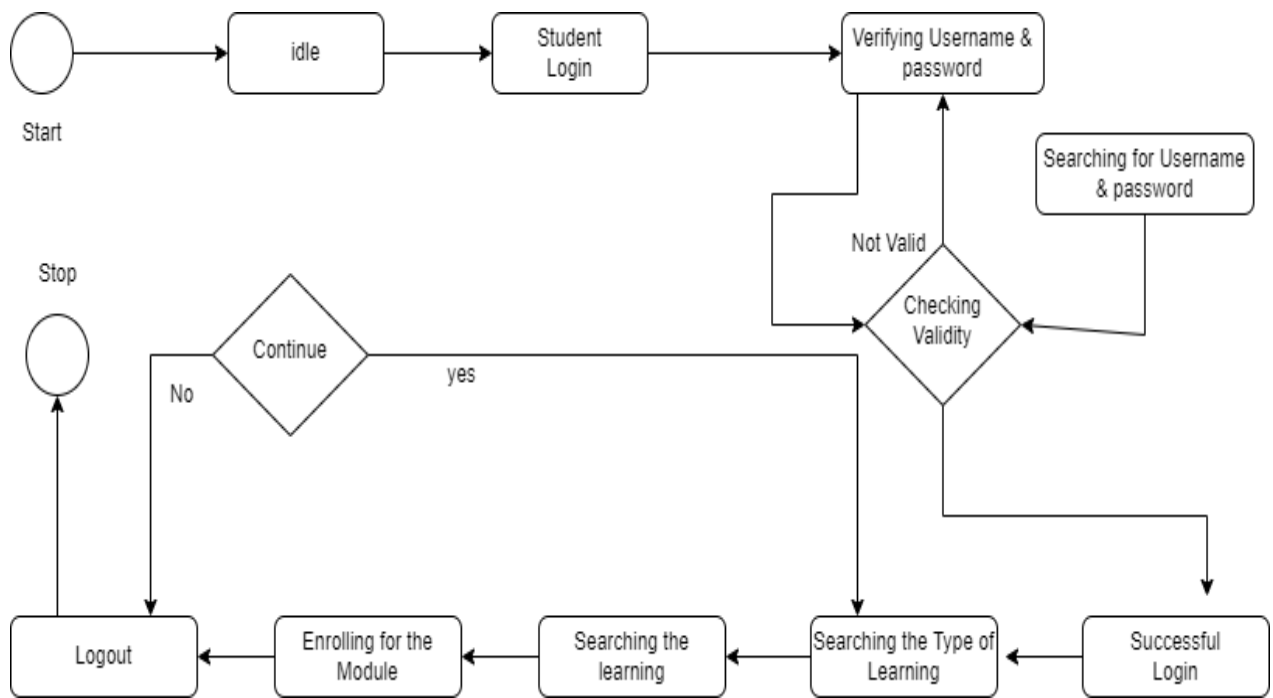
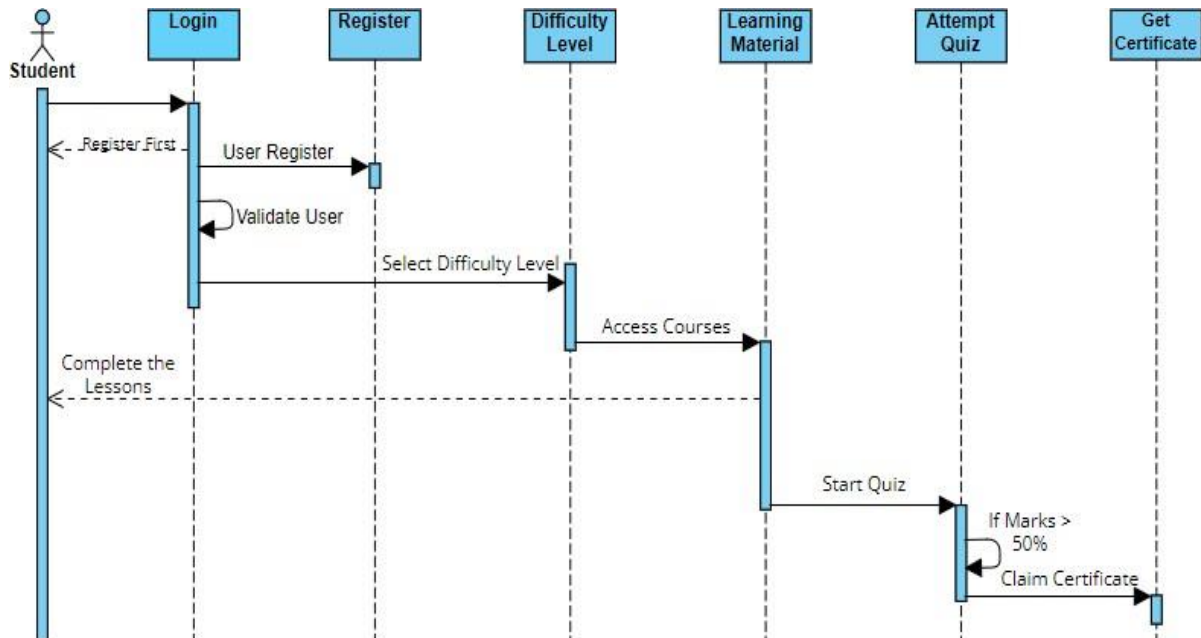


Figure 9: State Diagram

## 4.5 Sequence Diagram

### Sequence Diagram For Student:



## Sequence Diagram For Admin:

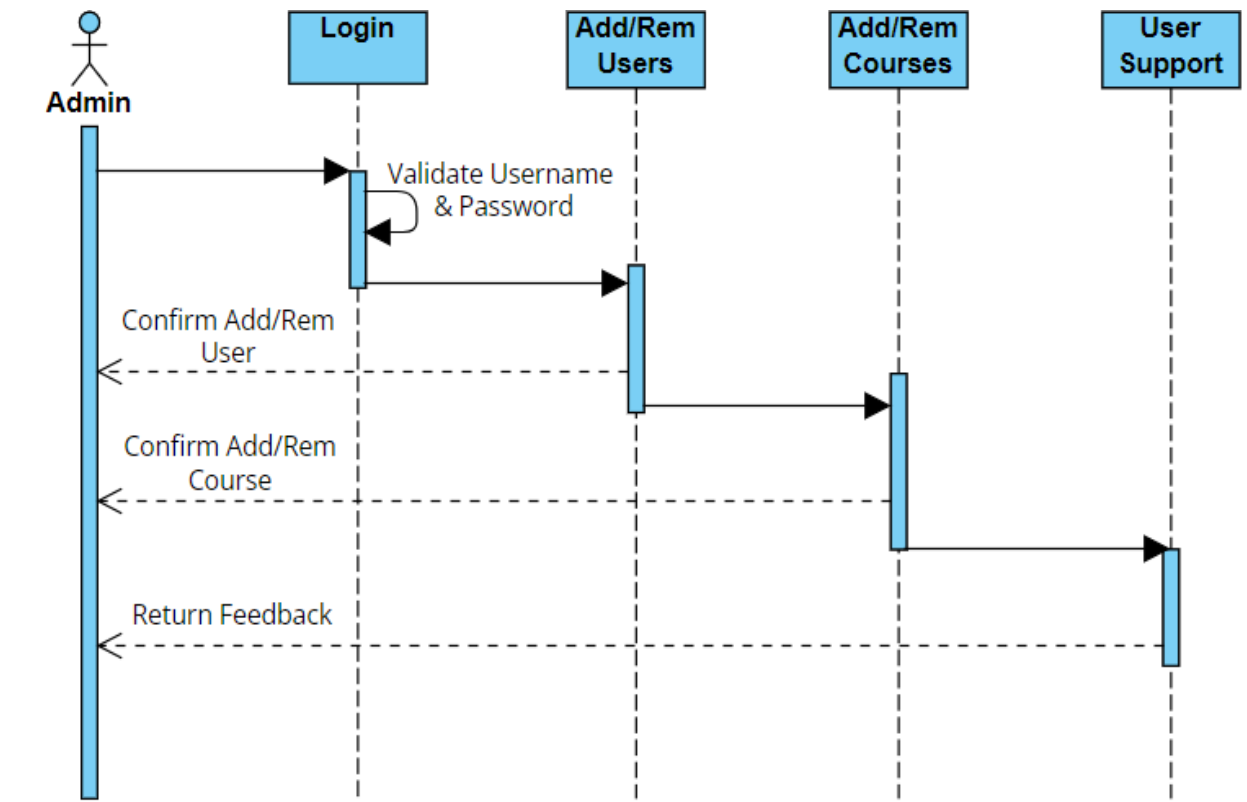


Figure 10: Sequence Diagram

## 4.6 Collaboration Diagram

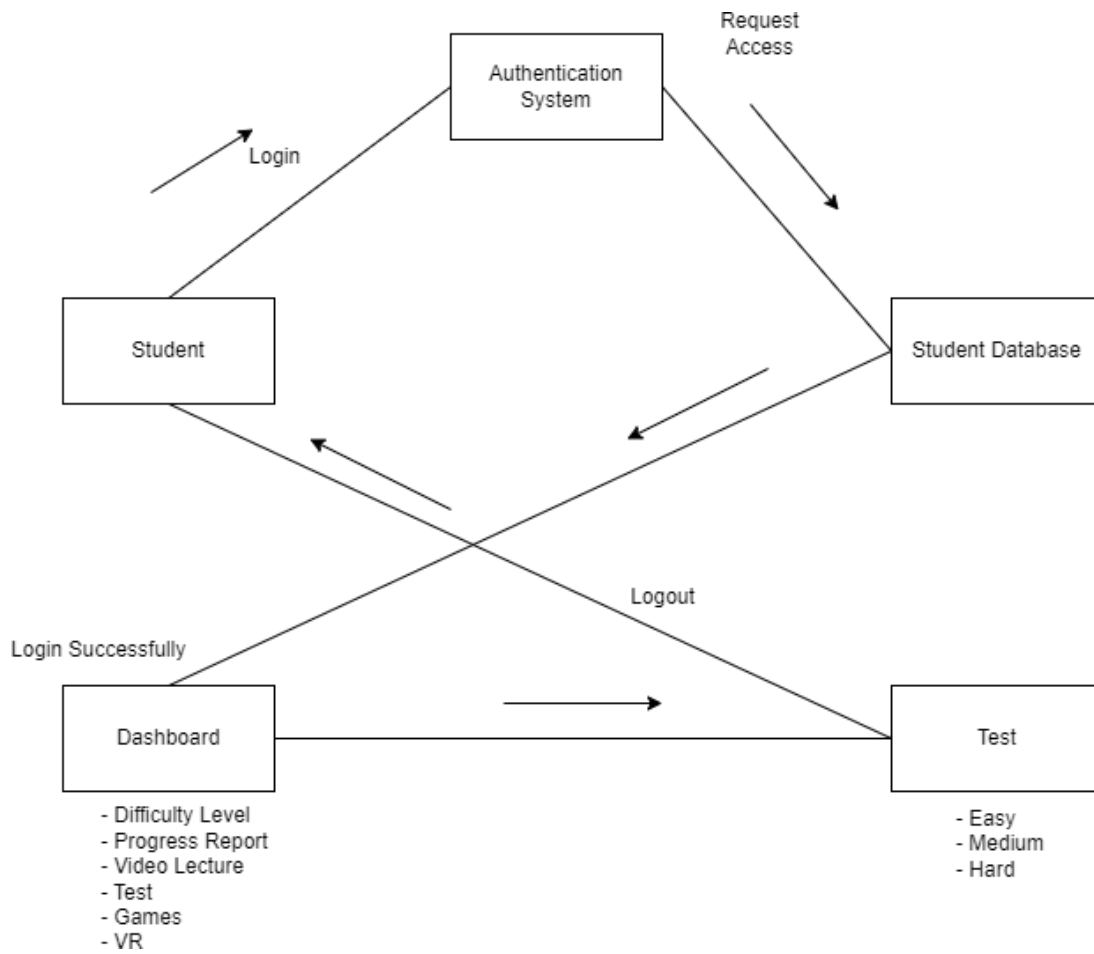


Figure 11: Collaboration Diagram

## 4.7 Entity Relationship (ERD) Diagram

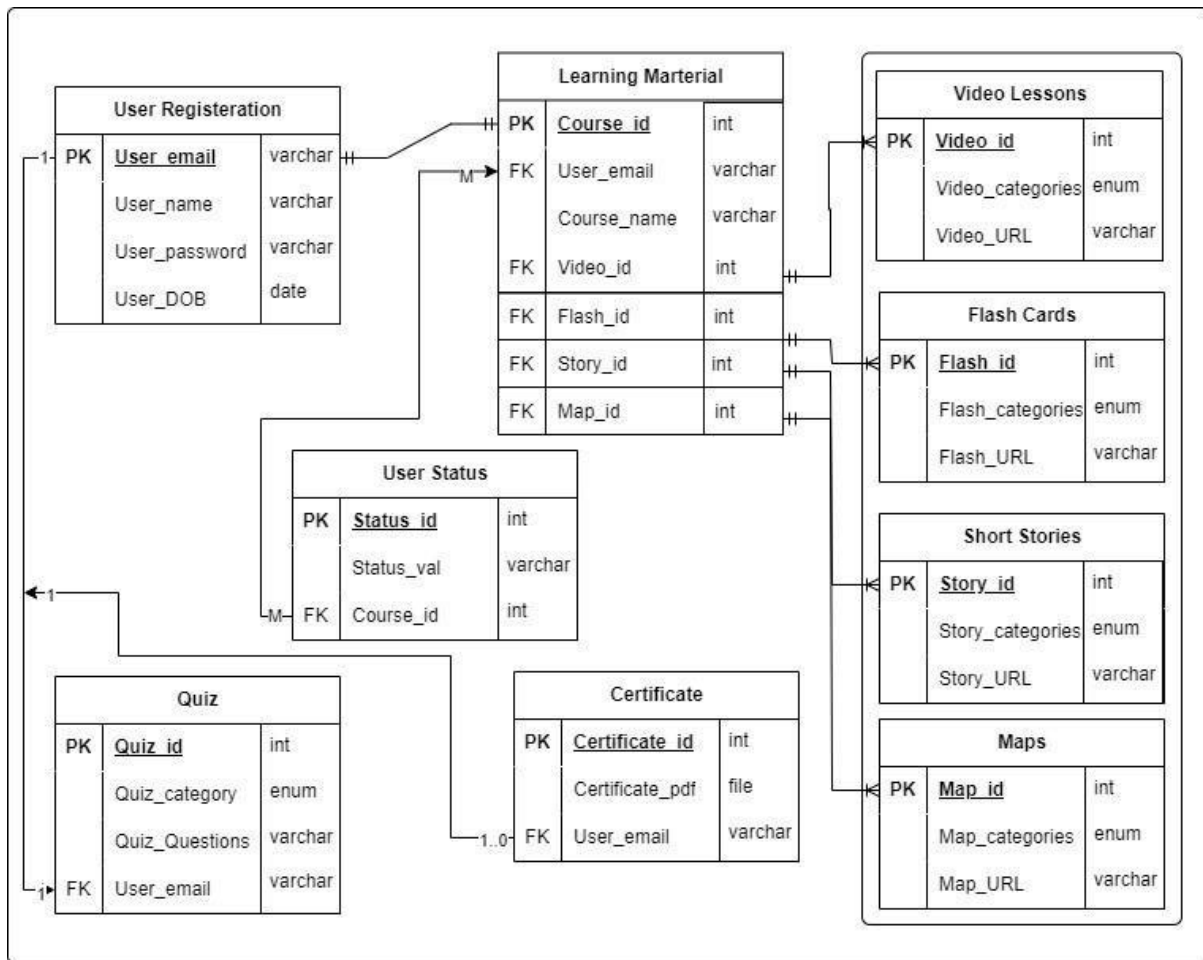
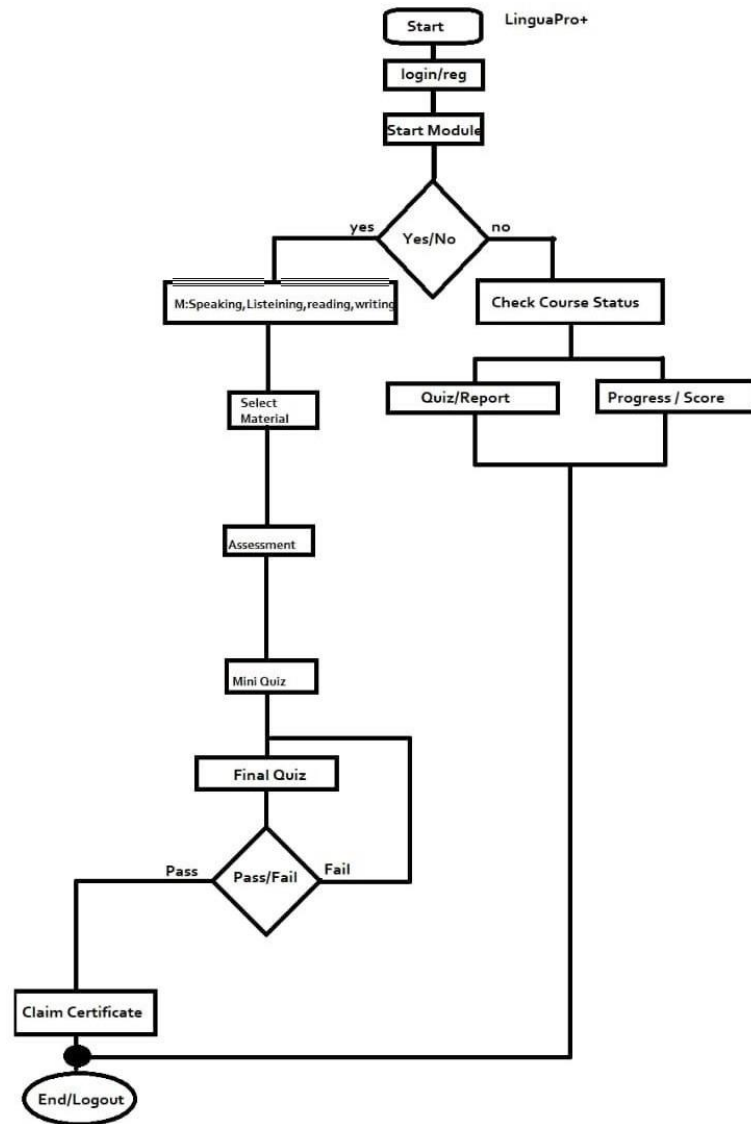


Figure 12: Entity Relationship Diagram

## 4.8 Activity Diagram:



## 4.8 Architecture Design

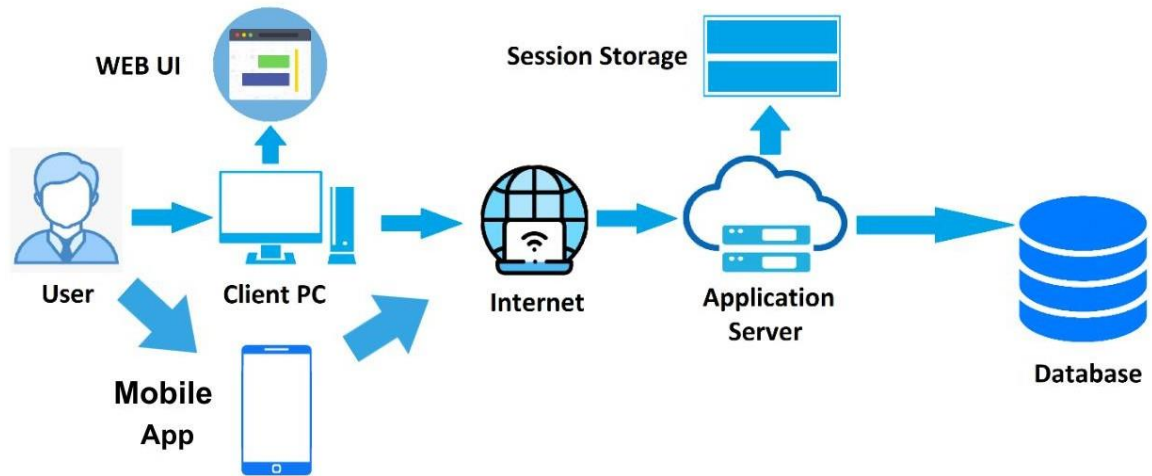


Figure 13: Architecture Design

# **Chapter: 5**

## **Implementation**

## Chapter 5: Implementation

### 5.1 Introduction:

The implementation phase of website development is a crucial stage where the design and plans for a website are transformed into a fully functioning and interactive web presence. It involves converting visual designs into code, integrating functionality, and building the necessary back end infrastructure. This phase plays a crucial role in bringing the website to life and transforming the vision into a tangible online presence. It requires a combination of technical expertise, attention to detail, and adherence to industry standards to ensure a successful and functional website.

There are several activities involved in implementing a project.

- Important Flow Control/Pseudo Codes
- Components, Libraries, Web Services and stubs
- Deployment Environment
- Tools and Techniques
- Best Practices / Coding Standards
- Version Control

### 5.2 Important Flow Control/Pseudo Codes:

Here is the important flow control:

#### 1. Initialize the website:

- ✓ Set up the required files and directories.
- ✓ Set up the web server and configure it to handle HTTP requests.

#### 2. Define the website structure:

- ✓ Identify the main pages and their URLs.
- ✓ Define the navigation structure and create links between pages.

### **3. Implement the HTML structure:**

- ✓ Create HTML files for each page.
- ✓ Add necessary HTML tags like <html>, <head>, <body>, etc.
- ✓ Structure the content using HTML elements such as headings, paragraphs, lists, etc.
- ✓ Insert placeholders for dynamic content or data retrieval.

### **4. Apply CSS styles:**

- ✓ Create a CSS file for defining styles.
- ✓ Link the CSS file to the HTML files.
- ✓ Define styles for various HTML elements, classes, and IDs.
- ✓ Customize the appearance of the website using CSS properties.

### **5. Writing code in React:**

- ✓ React follows a component-based architecture, which promotes re-usability. With React, you can break down the user interface into small, self-contained components that can be easily reused across different parts of the website. This makes it easier to manage and maintain complex UI structures.
- ✓ With React, we can simply write HTML, CSS and JavaScript at a time in one platform.
- ✓ React utilizes a virtual DOM (Document Object Model) to efficiently update and render UI elements.
- ✓ React can be rendered on both the client-side and the server-side.

### **6. Implement dynamic functionality:**

- ✓ Node.js, Express, and MySQL are commonly used together to build dynamic web applications.
- ✓ Node.js allows us to run JavaScript code on the server-side.
- ✓ Express.js simplifies routing, middleware handling, request/response handling, and other common web development tasks.
- ✓ MySQL is an open-source relational database management system (RDBMS) widely used for storing and managing structured data
- ✓ Use all these 3 technologies together to make our website dynamic.

## **7. Test and debug the website:**

- ✓ Verify that all pages and links work correctly.
- ✓ Test the website's responsiveness and compatibility with different devices and browsers.
- ✓ Check for any errors, bugs, or inconsistencies.
- ✓ Make necessary adjustments and fixes.

## **8. Deploy the website:**

- ✓ Choose a hosting provider and set up the necessary server configurations.
- ✓ Upload the website files to the hosting server.
- ✓ Configure DNS settings if using a custom domain.
- ✓ Monitor the website's performance and make further optimizations if required.

## **9. Maintain and update the website:**

- ✓ Regularly backup the website's files and database.
- ✓ Monitor for security vulnerabilities and apply necessary patches.
- ✓ Update content, fix bugs, and enhance features as needed.

## **10. Continuously improve the website:**

- ✓ Collect and analyze user feedback to identify areas for improvement.
- ✓ Perform A/B testing to optimize user experience.
- ✓ Stay up-to-date with web development trends and technologies.
- ✓ Incorporate new features and technologies to enhance the website's functionality and performance.

## **5.3 Tools and Techniques**

When building a dynamic website, you can utilize various components, libraries, web services, and stubs to enhance functionality and improve development efficiency. Here are some common elements you can consider:

### **5.3.1 Components and UI Libraries (Front End)**

#### **React:**

A JavaScript library for building user interfaces, as mentioned earlier.

**Bootstrap:**

A widely used CSS framework that offers a collection of responsive and customization UI components.

### 5.3.2 State Management Libraries

**Redux:**

A predictable state container for managing application state, particularly useful for large-scale applications with complex data flow.

### 5.3.3 Routing Libraries

**React Router:**

A library that provides routing capabilities for React applications, enabling navigation between different pages or components.

### 5.3.4 Back-end Libraries and framework

**Node JS for Server-side logic:**

Node.js allows you to write server-side JavaScript code, enabling you to handle requests, perform computations, interact with databases, and implement business logic on the server.

Non-blocking, I/O: Node.js utilizes an event-driven, non-blocking I/O model, making it suitable for handling concurrent requests efficiently.

**Package ecosystem:**

Node.js has a vast ecosystem of packages available through npm (Node Package Manager), which allows you to easily integrate third-party libraries and modules into your application.

**Express JS:**

Express.js is a lightweight and flexible web framework built on top of Node.js. It simplifies the process of handling HTTP requests and building APIs and web applications.

**Routing:**

Express.js provides a routing mechanism to define routes and handle different HTTP methods (GET, POST, PUT, DELETE, etc.) for specific endpoints.

**Middleware support:**

Express.js has robust middleware support, enabling you to add functionalities such as request parsing, authentication, logging, error handling, and more.

**Template engines:** Express.js supports various template engines (such as EJS, Pug, Handlebars) to generate dynamic HTML pages by combining data from the server with predefined templates.

**MYSQL:**

**Database storage:** MySQL is a popular relational database management system (RDBMS) that allows you to store, manage, and query structured data.

**Data retrieval:** With MySQL, you can fetch data from the database using SQL queries. This enables you to retrieve specific data based on conditions, join tables, sort results, and perform aggregations.

### 5.3.5 Deployment Environment

When creating a website, the deployment environment refers to the infrastructure and software setup where the website will be hosted and made accessible to users over the internet. The choice of deployment environment depends on various factors such as the type of website, scalability requirements, budget, technical expertise, and specific project needs. Here are some common deployment environments for websites:

**Shared Hosting:** This is a budget-friendly option where multiple websites are hosted on a single server. Shared hosting is suitable for small websites with low to moderate traffic. The hosting provider takes care of server management, making it a user-friendly option for beginners. However, resource limitations and performance issues may arise due to sharing server resources with other websites.

**Virtual Private Server (VPS) Hosting:** In a VPS hosting environment, a physical server is divided into multiple virtual servers, each running its own operating system and hosting

environment. VPS hosting offers more control, scalability, and resources compared to shared hosting. It is suitable for medium-sized websites or those with specific software requirements.

**Dedicated Server:** In dedicated hosting, you have an entire physical server dedicated to your website. This option provides maximum control, performance, and flexibility. Dedicated servers are typically used for large websites with high traffic volumes or specialized requirements. You are responsible for server management, which requires technical expertise or dedicated IT resources.

**Cloud Hosting:** Cloud hosting utilizes virtualized resources from multiple servers to ensure scalability, reliability, and flexibility. Cloud hosting providers offer a pay-as-you-go model, where you pay for the resources you use. This makes it suitable for websites with fluctuating traffic or those requiring high scalability. Cloud hosting providers handle server management, allowing you to focus on website development.

**Platform as a Service (PaaS):** PaaS platforms provide a complete development and deployment environment for websites. They offer preconfigured infrastructure and tools, making it easier to deploy and manage your website. PaaS solutions abstract the underlying infrastructure, allowing developers to focus on coding and application logic rather than server management.

**Content Delivery Network (CDN):** CDNs are networks of servers distributed geographically, designed to deliver website content efficiently. CDNs cache website content in multiple locations, reducing latency and improving performance for users worldwide. CDN services can be used in combination with other hosting options to enhance website speed and availability.

It's important to consider factors such as website requirements, expected traffic, scalability, security, and budget when choosing a deployment environment. Each option has its own pros and cons, so it's recommended to evaluate your specific needs and consult with technical experts if required.

## 5.4 Best Practices / Coding Standards

When developing a dynamic website, it's important to follow best practices and coding standards to ensure maintainability, scalability, and readability of your code. Here are some commonly recommended practices:

**Modular and organized code structure:** Break your code into reusable modules and components. Use separate files for different functionalities such as routes, controllers, models, views, and utilities. This helps in keeping your codebase organized and makes it easier to manage and maintain.

**Consistent and meaningful naming conventions:** Use clear and descriptive names for variables, functions, and classes. Follow a consistent naming convention, such as camelCase or snake case, and be mindful of naming collisions.

**Proper indentation and formatting:** Use consistent indentation to improve code readability. Follow a consistent style guide for code formatting, such as using spaces or tabs, and placing braces and parentheses. Consider using tools like ESLint or Prettier to enforce consistent formatting automatically.

**Use comments for clarity:** Add comments to explain complex logic, algorithms, or any code that might not be immediately obvious to other developers. Use comments sparingly, but when necessary, they can greatly improve code understanding and maintainability.

**Error handling and validation:** Implement proper error handling and validation mechanisms to ensure data integrity and prevent security vulnerabilities. Validate user input on both the client and server sides, and handle errors gracefully by providing meaningful error messages.

**Security considerations:** Implement security best practices to protect your website and its users. Sanitize user input to prevent common security vulnerabilities like SQL injection or cross-site scripting (XSS). Use encryption for sensitive data transmission, enforce strong password policies, and keep your dependencies updated to address any security vulnerabilities.

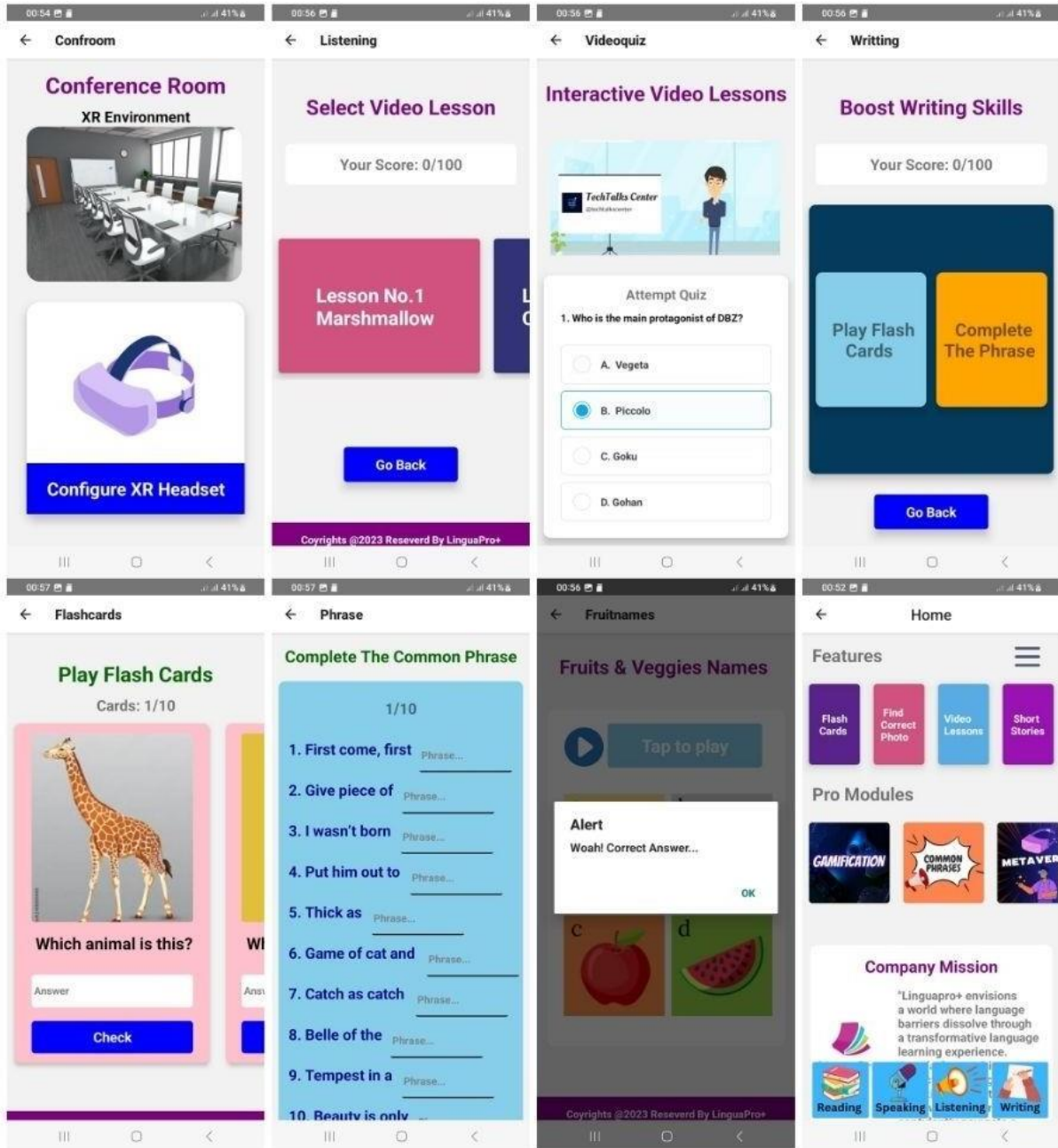
## 5.5 Version Control System

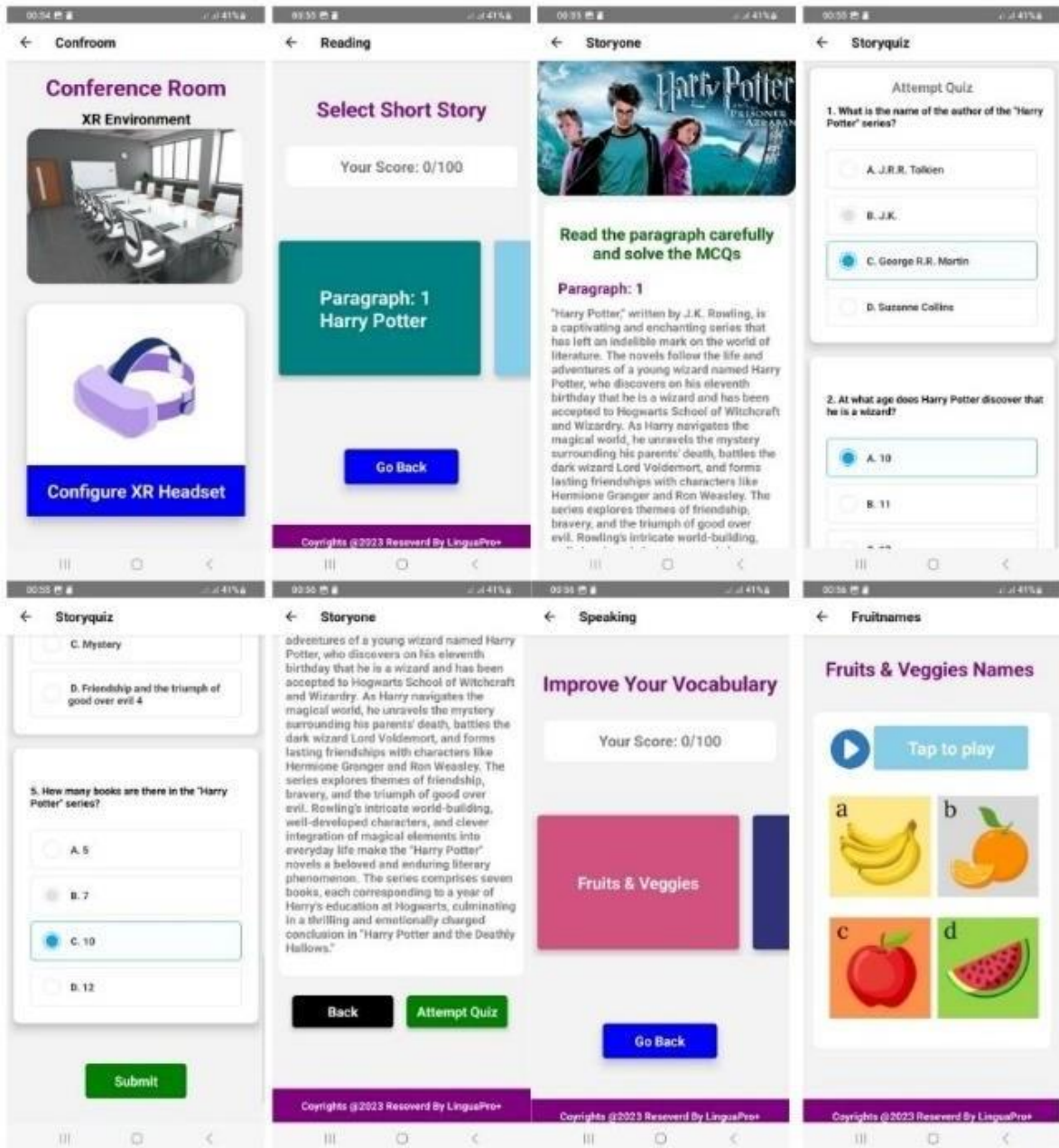
When it comes to version control for dynamic websites, Git is widely regarded as one of the best options available. Git is a distributed version control system that offers excellent features for tracking changes in your codebase, collaborating with others, and managing different versions of your website.

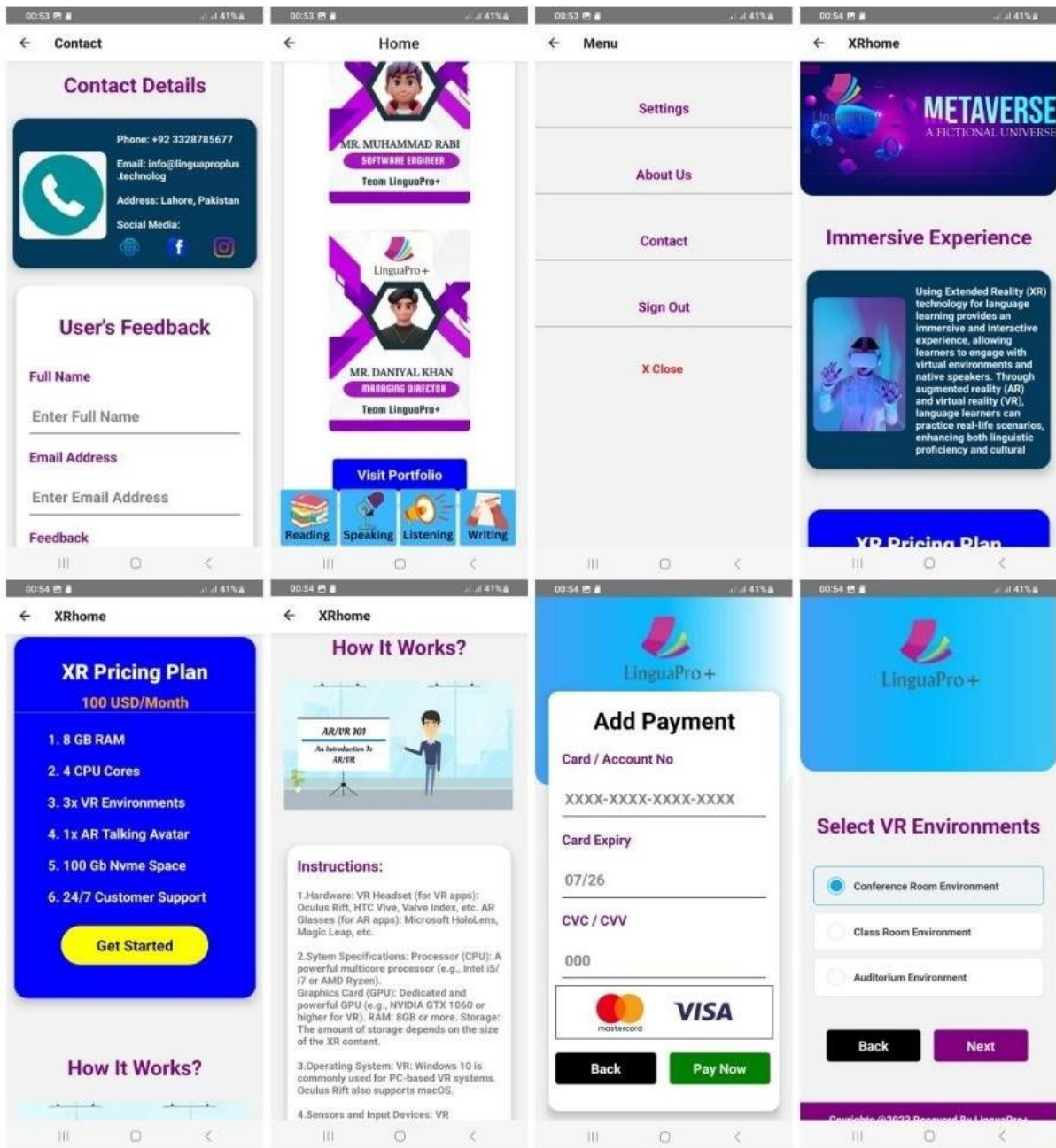
Here are some reasons why Git is often the preferred choice for version control:

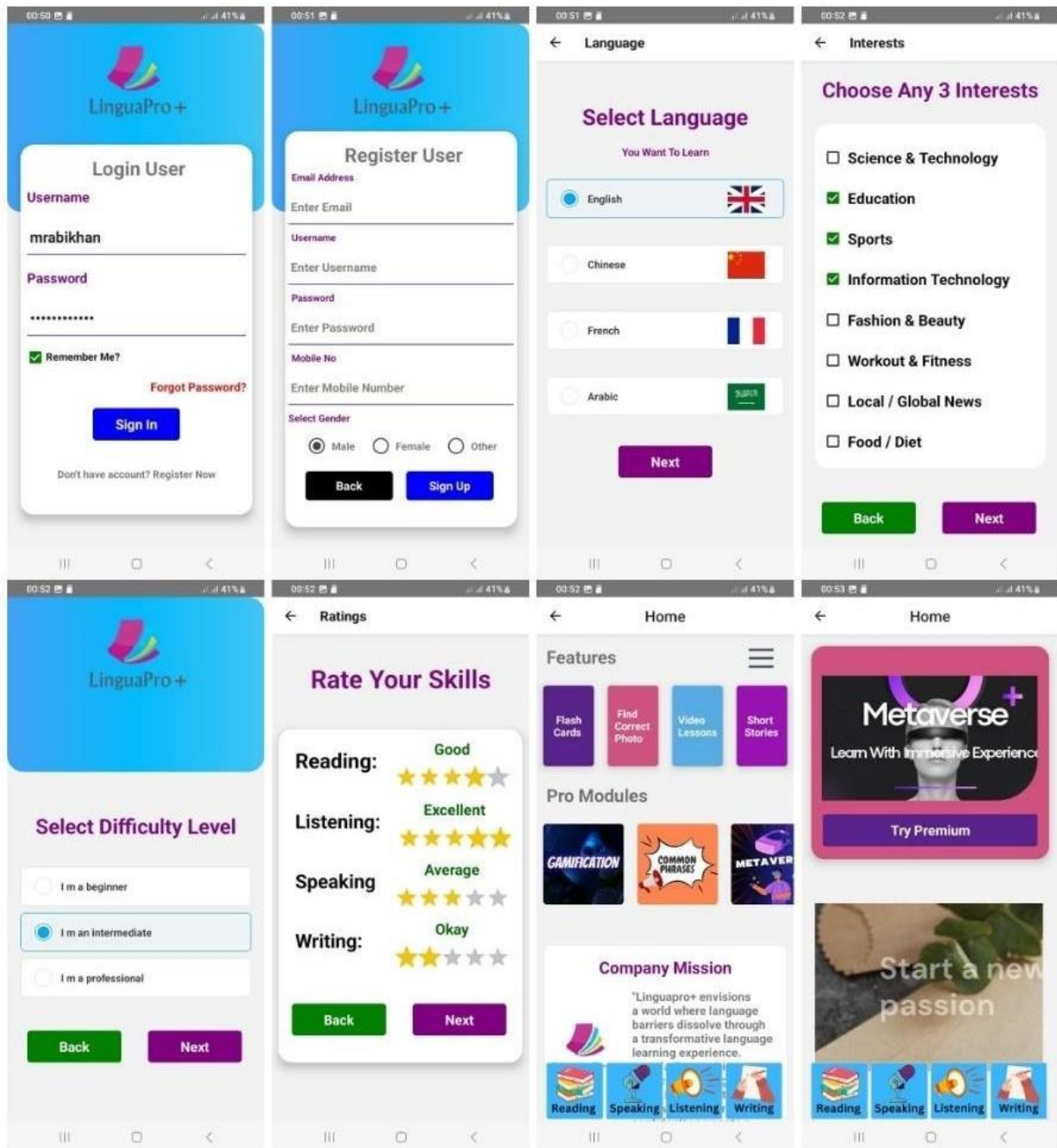
- Distributed architecture
- Branching and merging
- Version tracking
- Collaboration and code review
- Large community and ecosystem

## 5.6 Prototype Images









**Personal Information**

First Name:	Muhammad
Last Name:	Rabi
Email Address:	Muhammadrabi59@gmail.com
Password:	*****
Standard:	Medium <span>Get Info</span>

**Track Your Progress**

1. Listening	✓ Completed 100%
2. Speaking	✓ Completed 100%
3. Reading	✗ Pending 60%
4. Writing	✓ Completed 100%

**Claim Your Certificate**

Download

**Give Feedback**

Enter Full Name

Enter Email Address

Write Comments

Submit

**Learning Modules**

- LISTENING
- WRITING
- SPEAKING
- READING

**Frequently Asked Questions**

What kind of platform is LinguaPro+?

What is the goal of LinguaPro+?

What is the main purpose of this platform?

Who are our target audiences?

How many foreign languages you are providing?

**Interactive Video Lessons**

**Cooking Words**

- 01 Name Of Animals
- 02 Food Names
- 03 Digestive System Parts
- 04 Parts Of Brain

**Play Flashcards**

0/100

Write The Name Of That Device.

Next



# **Chapter: 6**

## **System Testing**

## Chapter 6: System Testing

### 6.1 Introduction

System testing is an important phase in the development of any software application, including a language learning platform. It involves testing the entire system as a whole to ensure that it meets the specified requirements and functions as intended. In the context of a language learning platform, system testing would involve testing all the features and functionalities of the platform, such as user registration, course selection, lesson delivery

The purpose of system testing is to identify any defects or issues in the platform before it is released to the end-users. This helps to ensure that the platform is reliable, efficient, and user-friendly. System testing can be performed manually or through automated testing tools, depending on the complexity of the platform and the available resources.

To conduct system testing for a language learning platform, a test plan should be developed that outlines the testing objectives, test scenarios, test cases, and expected results. The test plan should also include the testing environment, testing tools, and the roles

Overall, system testing is a critical step in the development of a language learning platform to ensure that it meets the needs of the users and provides a positive learning experience.

### 6.2 Testing Methods

1. White box testing
2. Black box testing

#### 6.2.1 White Box Testing

White box testing is a testing technique that involves examining the internal structure and code of a software application to ensure that it functions as intended. In the context of a language learning platform, white box testing would involve testing the underlying code and database structure to ensure that it supports the platform's features and functionalities.

To perform white box testing for a language learning platform, the testing team would need to have access to the source code and database schema. They would then use various testing techniques, such as code reviews, unit testing, and integration testing, to ensure that the code is free of defects and meets the specified requirements.

Code reviews involve examining the code to identify any syntax errors, logical errors, or other issues that could affect the platform's functionality. Unit testing involves testing individual components of the code to ensure that they function as intended. Integration testing involves testing the interaction between different components of the code to ensure that they work together seamlessly.

In addition to these techniques, the testing team may also use tools such as code analyzers and debuggers to identify and fix any issues in the code.

Overall, white box testing is an important part of the testing process for a language learning platform, as it helps to ensure that the platform is reliable, efficient, and free of defects.

## **6.2.2 Black Box Testing**

Black box testing is a type of testing that focuses on the external behaviour of the the system without considering its internal structure or implementation details. In the context of a language learning platform, black box testing would involve testing the platform's features and functionalities from the perspective of an end-user, without knowledge of the platform's internal workings.

To perform black box testing for a language learning platform, a tester would need to have a good understanding of the platform's requirement and user expectations. The tester would then create test cases that cover all the possible scenarios that an end-user might encounter while using the platform. These test cases would be designed to verify that the platform's features and functionalities are working as intended and that the user experience is positive. Examples of black box testing for a language learning platform might include testing the registration process, course selection, lesson delivery, progress tracking, and assessment. Testers would need to verify that users can easily navigate the platform, access the content they need, and receive feedback on their progress.

Overall, black box testing is an important part of the testing process for a language learning platform, as it helps to ensure that the platform meets the needs of the end-users and provides a positive learning experience.

## 6.3 Unit Testing

Unit testing is a type of testing that focuses on testing individual units or components of a software application, such as functions, methods, or classes. In the context of a language learning platform, unit testing would involve testing the individual components of the platform, such as the registration process, course selection, lesson delivery, progress tracking, and assessment.

The purpose of unit testing is to ensure that each component of the platform functions as intended and meets the specified requirements. Unit testing can be performed using automated testing tools, which can help to identify defects or issues in the code quickly and efficiently.

To conduct unit testing for a language learning platform, a test plan should be developed that outlines the testing objectives, test scenarios, test cases, and expected results for each component of the platform. The test plan should also include the testing environment, testing tools, and the roles and responsibilities of the testing team.

Overall, unit testing is an important step in the development of a language learning platform to ensure that each component of the platform functions correctly and contributes to a positive learning experience for the users.

## 6.4 Integration Testing

Integration testing is a type of testing that focuses on verifying the interactions between different components or modules of a software application. In the context of a language learning platform, integration testing would involve testing the interactions between various components such as the user interface, database, course content, and assessment modules. The purpose of integration testing is to ensure that the different components of the platform work together seamlessly and that any issues or defects that arise from the interaction between these components are identified and resolved before the platform is released to end-users.

To conduct integration testing for a language learning platform, a test plan should be developed that outlines the testing objectives, test scenarios, test cases, and expected results. The test plan should also include the testing environment, testing tools, and the roles and responsibilities of the testing team.

During integration testing, the testing team would simulate different scenarios to ensure that the different components of the platform work together as expected. For example, they may test the registration process, course selection, lesson delivery, progress tracking, and assessment to ensure that all these components work together seamlessly.

Overall, integration testing is an important step in the development of a language learning platform to ensure that it is reliable, efficient, and user-friendly. By identifying and resolving any issues or defects during integration testing, the platform can be released to end-users with confidence that it will provide a positive learning experience.

## 6.5 Validation Testing

When documenting the validation testing process for a language learning platform, you can create a detailed report that includes the following information:

**Test Objectives:** Clearly state the objectives and goals of the validation testing, such as verifying functionality, assessing usability, and evaluating the effectiveness of the language learning platform.

**Test Scope:** Define the scope of the testing, including the specific components, features, and functionalities that were tested. Specify if the testing covered the entire platform or focused on specific modules or aspects.

**Test Environment:** Describe the testing environment, including the hardware, software, operating systems, browsers, and devices used for testing. Specify any specific configurations or settings that were applied during testing.

**Test Cases:** Provide a list of test cases or scenarios that were executed during the validation testing. Include a description of each test case, the expected results, and the actual results observed during testing. If automated testing tools were used, mention the test scripts or automation frameworks utilized.

**Test Results:** Summarize the results of the validation testing. Include details about any defects, issues, or bugs identified during testing, along with their severity and priority. Provide information on the number of test cases executed, passed, and failed, as well as any areas of concern or improvement identified.

**Test Coverage:** Evaluate the extent to which the language learning platform was covered by

the validation testing. Provide an analysis of the percentage of functionalities or features that were tested and any areas that were not covered, along with the rationale for the coverage choices.

**User Feedback:** Include feedback gathered from users during the testing process. This can include survey responses, interviews, or focus group findings. Highlight any common themes, suggestions, or concerns raised by the users and their impact on the overall validation process.

**Lessons Learned:** Document any lessons learned during the validation testing, including insights, observations, and recommendations for future improvements. This can include suggestions for enhancing functionality, improving usability, or addressing performance or security issues.

**Conclusion:** Summarize the overall findings and conclusions from the validation testing. Highlight the strengths and weaknesses of the language learning platform based on the testing results. Provide an assessment of whether the platform meets the desired objectives and recommend any necessary actions or further testing.

Validation testing process in a comprehensive report, you can provide stakeholders and development teams with a clear understanding of the testing activities, results, and recommendations for the language learning platform.

## 6.6 User Acceptance Testing

User Acceptance Testing (UAT) for a language learning platform typically involves testing the platform's functionality, usability, and performance to ensure it meets the requirements and expectations of its intended users. Here are some key steps you can follow to conduct UAT for a language learning platform:

**Define Test Scenarios:** Identify the different use cases and scenarios that users are likely to encounter while using the language learning platform. For example, signing up, accessing lessons, submitting exercises, tracking progress, interacting with other users, etc. Document these scenarios as test cases.

**Recruit Testers:** Find a diverse group of testers who represent the target audience of the language learning platform. This can include language learners at different proficiency levels,

individuals with varying learning styles, and users with different technical backgrounds.

**Prepare Test Environment:** Set up a dedicated testing environment that closely resembles the production environment of the language learning platform. Ensure that the testers have access to all the necessary tools and resources required for testing.

**Test Functionality:** Have the testers go through the defined test scenarios and evaluate whether the platform performs as expected. Verify that users can complete tasks such as signing up, accessing lessons, taking quizzes, and tracking their progress without encountering any critical issues.

**Evaluate Usability:** Assess the platform's usability by gathering feedback from the testers. This can be done through surveys, interviews, or observation sessions. Pay attention to the ease of navigation, clarity of instructions, intuitiveness of user interfaces, and overall user experience.

**Verify Compatibility:** Test the language learning platform on different devices and operating systems to ensure compatibility across various platforms. This includes testing on desktops, laptops, tablets, and mobile devices with different browsers and screen sizes.

**Validate Localization:** If the platform supports multiple languages, verify the localization aspects by testing the platform using different language settings. Ensure that all the language-specific features, content, and interfaces are correctly displayed and functional.

**Assess Performance:** Evaluate the platform's performance by simulating real-world usage scenarios with a significant number of concurrent users. Measure the response times, loading times, and overall system performance under different load conditions to identify any bottlenecks or performance issues.

**Document and Track Issues:** Create a bug tracking system or use project management tools to document and track any issues or defects identified during the UAT process. Categorize the issues based on their severity and prioritize them for resolution.

**Iterative Testing and Feedback:** Collaborate with the testers to address their feedback and suggestions. Conduct multiple rounds of testing, incorporating changes and improvements based on the feedback received, until the language learning platform meets the desired quality standards.

Remember to involve the development team and stakeholders throughout the UAT process to ensure effective communication and collaboration. UAT helps identify any gaps or shortcomings in the language learning platform before its release, improving the overall user experience and increasing user satisfaction.

# **Chapter: 7**

## **System Maintenance**

## Chapter 7: System Maintenance

### 7.1 Introduction

The maintenance phase in the Software Development Life Cycle (SDLC) is the stage where the software or application is actively deployed and used by end-users. During this phase, the focus shifts from development to the ongoing support, enhancements, and maintenance of the software to ensure its smooth functioning and to address any issues that may arise.

The maintenance phase typically involves the following activities:

**Corrective Maintenance:** This type of maintenance involves identifying and fixing defects or bugs reported by users. It includes troubleshooting, root cause analysis, and applying patches or updates to resolve issues.

**Adaptive Maintenance:** Adaptive maintenance involves modifying the software to accommodate changes in the external environment, such as hardware or operating system upgrades. It ensures the software remains compatible and functional with the evolving technology landscape.

**Perfective Maintenance:** Perfective maintenance aims to improve the software's performance, efficiency, and user experience. It involves enhancing existing features, optimizing code, improving usability, and adding new functionality requested by users.

**Preventive Maintenance:** Preventive maintenance focuses on proactively identifying and addressing potential issues before they cause significant problems. It involves activities such as code refactoring, performance tuning, security enhancements, and regular system health checks.

Statistics related to the maintenance phase can vary based on the software and the organization's specific context. Here are a few notable statistics and insights related to software maintenance:

**Maintenance Effort:** According to industry studies, maintenance can account for up to 60-80% of the total software development effort, indicating the significant investment required to support and enhance deployed software.

**Bug Resolution Time:** The average time taken to resolve reported bugs varies depending on their complexity and severity. Studies have shown that critical or high-priority bugs are typically resolved more quickly compared to lower-priority issues.

**Enhancement Requests:** A software in active maintenance phase often receives enhancement requests from users or stakeholders. These requests are evaluated based on their feasibility, impact, and alignment with the software's road-map and user needs.

**Customer Satisfaction:** The maintenance phase plays a crucial role in ensuring customer satisfaction by promptly addressing issues, delivering enhancements, and maintaining the software's reliability. Customer feedback and satisfaction metrics provide valuable insights for further improvements.

**Maintenance Costs:** The costs associated with maintenance can vary depending on factors such as the complexity of the software, the size of the user base, the frequency of updates, and the level of support required. Organizations need to allocate budget and resources for ongoing maintenance activities.

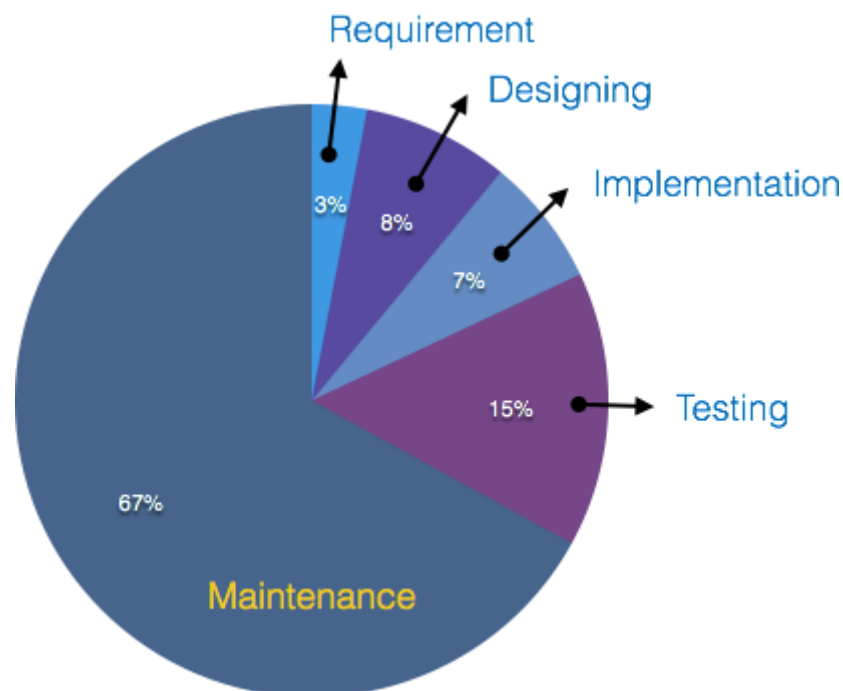


Figure 14: Maintenance Pie Chart

Pi Chart represent the importance of maintenance

## 7.2 The types of maintenance in software development

- Corrective Maintenance
- Adaptive Maintenance
- Perfective Maintenance
- Preventive Maintenance

### 7.2.1 Corrective Maintenance

The activities performed to address and resolve reported defects or issues encountered by users. It involves identifying and fixing bugs, errors, or malfunctions that affect the functionality or performance of the platform. The objective of corrective maintenance is to ensure that the our platform operates smoothly and meets the expected standards.

When a defect or issue is reported, the corrective maintenance process typically involves the following steps:

**Bug Reporting:** Users or administrators report the observed defect or issue to the platform's support team or through designated channels such as a bug tracking system.

**Bug Identification:** The support team or developers analyze the reported bug to understand its nature, reproduce it if necessary, and identify the root cause of the issue.

**Bug Fixing:** Once the root cause is determined, developers work on fixing the bug by making the necessary code modifications, configuration changes, or database updates.

**Testing and Validation:** After the bug is fixed, thorough testing is conducted to verify that the issue has been resolved and that the fix does not introduce any new problems or regressions.

**Deployment of Fix:** Once the fix is validated, it is deployed to the production environment, making the updated version of the English learning platform available to users.

We have a dedicated team responsible for handling corrective maintenance tasks promptly and efficiently. They prioritize reported bugs based on their severity, impact on users, and urgency. Critical issues that severely hinder the platform's functionality or compromise user experience are given higher priority for immediate resolution. Our goal is to provide users with a stable, bug-free platform by promptly addressing reported issues. By continuously improving the platform's quality and resolving defects, corrective maintenance helps to ensure a smooth and satisfactory learning experience for users.

## 7.2.2 Adaptive Maintenance

The activities undertaken to adapt the platform to changes in the external environment. This type of maintenance ensures that the platform remains compatible, functional, and up-to-date with evolving technologies, industry standards, and user expectations. Here's how adaptive maintenance is typically delivered by Us:

**Compatibility Updates:** As new versions of web browsers, operating systems, or mobile devices are released, adaptive maintenance involves updating the platform to ensure compatibility with these changes. This may involve modifying code, optimizing performance, and testing the platform on different devices and browsers.

**Technology Upgrades:** New technologies or frameworks to enhance the platform's capabilities. This could involve migrating to the latest programming languages, libraries, or development tools that offer improved performance, security, or user experience.

**Integration with External Systems:** We integrate with external systems, such as learning management systems (LMS), content delivery networks (CDN), or payment gateways. Adaptive maintenance involves updating the platform to support this integration, ensuring smooth data exchange and seamless user experiences.

**Responsive Design:** With the increasing use of mobile devices, our focus is on implementing responsive design techniques. This ensures that we provide an optimal user experience across different screen sizes and resolutions.

**Accessibility Enhancements:** Our application and websites are accessible to users with disabilities, adhering to accessibility standards (such as WCAG 2.0 or 2.1). This may include incorporating features like alternative text for images, keyboard navigation support, and compatibility with screen readers.

**User Interface and User Experience Improvements:** Our aim is to enhance the user interface (UI) and user experience (UX) of the Application and website. This includes incorporating user feedback, conducting usability tests, and making design updates to improve navigation, readability, and overall user satisfaction.

**Performance Optimization:** Next focus on optimizing the platform's performance, such as reducing page load times, minimizing data usage, and improving responsiveness. This ensures smooth and efficient usage, especially in areas with limited network connectivity.

**Security Updates:** Security measures to protect user data and address potential

vulnerabilities. This involves applying security patches, conducting regular security audits, and staying updated with the latest security practices and standards.

**Content Updates:** We also updating and refreshing the learning content available on the platform. This may include adding new courses, lessons, or resources, as well as updating existing content to reflect changes in language usage, cultural references, or technological advancements.

### 7.2.3 Perfective Maintenance

Our focus is on improving the platform's performance, efficiency, and user experience. It involves enhancing existing features, optimizing code, improving usability, and adding new functionality requested by users.

**User Interface (UI) Enhancements:** refining the platform's UI to improve usability and user experience. This may include redesigning layouts, improving navigation menus, enhancing visual aesthetics, and ensuring consistency throughout the platform.

**Usability Improvements:** make the platform more intuitive and user-friendly. This may involve streamlining workflows, simplifying complex tasks, providing clear instructions, and optimizing user interactions to reduce cognitive load and enhance overall usability.

**Performance Optimization:** optimizing the platform's performance to provide a seamless and responsive experience. This includes reducing page load times, optimizing database queries, minimizing network requests, and implementing caching mechanisms to improve overall performance.

**Scalability Enhancements:** As the user base grows, ensuring that the platform can handle increased traffic and user demands. This may involve optimizing server infrastructure, database scaling, and implementing load balancing techniques to maintain performance under heavy usage.

**Content Enrichment:** regularly updating and expanding the learning content available on the platform. This involves adding new courses, lessons, exercises, and learning materials to keep the content fresh, engaging, and aligned with the latest language learning trends and needs.

**Feature Enhancements:** Based on user feedback and market trends, adding new features and functionalities to the platform. This may include interactive exercises, gamification elements, multimedia integration, progress tracking enhancements, social learning features, and personalized learning recommendations.

**Language Proficiency Assessment:** Integrating advanced language proficiency assessment tools into the platform. This enables users to assess their language skills more accurately and receive personalized feedback on their progress.

**Integration with Language Tools:** Integrating external language tools, such as dictionaries, translation services, speech recognition, or natural language processing (NLP) technologies, to enhance the learning experience and support language comprehension and production.

## 7.2.4 Preventive Maintenance

We ensuring the stability, security, and optimal performance of the platform. By proactively identifying and addressing potential issues before they escalate into significant problems, preventive maintenance helps maintain a reliable and seamless learning experience for users. Here are some key aspects of preventive maintenance:

**Code Review and Refactoring:** Regular code review and refactoring are essential preventive maintenance practices. This involves examining the platform's code-base to identify any potential weaknesses, performance bottlenecks, or security vulnerabilities. By refactoring the code, according to our developer's team we can improve its structure, readability, and maintainability, reducing the risk of future issues and enhancing whole system performance as well.

**Performance Optimization:** optimizing the performance of the platform to ensure smooth and efficient usage. This includes analyzing system performance metrics, identifying resource-intensive processes, and fine-tuning algorithms and database queries to enhance speed and responsiveness. By optimizing performance, the platform can handle increasing user traffic and maintain a high-quality learning experience.

**Security Measures:** implementing robust security measures to protect user data and prevent potential security breaches. This involves regularly updating security protocols, applying patches and security updates, conducting security audits, and implementing strong authentication and encryption mechanisms. By proactively addressing security vulnerabilities, our website and application can safeguard user information and maintain a secure learning environment.

**Regular Backups and Disaster Recovery:** regular backups and disaster recovery mechanisms to ensure data integrity and availability. This includes scheduling automated backups of user

data, course content, and system configurations. Additionally, a well-defined disaster recovery plan ensures that in the event of a system failure or data loss, the platform can be restored quickly and effectively.

**System Monitoring and Alerting:** setting up the comprehensive monitoring systems to track the performance, availability, and health of the platform. This involves monitoring server resources, database performance, network connectivity, and user activity. By closely monitoring these aspects, administrators can identify potential issues, detect abnormal behavior, and take corrective actions promptly, minimizing any potential disruptions.

**Regular Software Updates:** keeping the software components of the platform up to date. This includes applying patches, bug fixes, and updates for the platform's underlying frameworks, libraries, and dependencies. Regular software updates ensure that the platform benefits from the latest features, security enhancements, and performance optimizations provided by the software vendors.

**User Feedback and Iterative Improvements:** Actively seeking and incorporating user feedback to identify areas for improvement. By analyzing user suggestions, requests, and complaints, the platform can identify potential issues and implement iterative improvements. This ensures that Our platform remains aligned with user expectations and evolves to meet their changing needs.

**Continuous Quality Assurance:** continuous quality assurance efforts to identify and address any quality-related issues in the platform. This includes conducting regular testing, performing code reviews, and ensuring compliance with industry standards and best practices. By maintaining high standards of quality, English learning platforms can provide a reliable and enjoyable learning experience for users.

# Methodology

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**Title: LinguaPro+ : A Multi-Platform language learning application for  
enhancing English**

Author: Muhammad Rabi

Co. Authors: Daniyal Khan, Usman Latif, Abdi Karim Sharmarke

Department of Computer Science and Information Technology, Superior  
University

November. 24, 2023

**Abstract:**

This educational paper explores the activities and ability effect of LinguaPro+, a sustainable multilingual learning plugin, designed to offer English-targeted linguistic skills, and for its dominance and important role in deepening get admission to better schooling possibilities, nationally and globally. Virtual Reality (VR) also gives a complete solution through gaining knowledge of. This paper examines the program's purpose of enhancing all research, writing, talking, and listening capabilities, supplying educational a laugh tailor-made to those who struggle with public talking and fear about making mistakes

**Introduction**

English language skill is fundamental to unlocking opportunities in better training and specialized jobs in a worldwide environment. LinguaPro+ emerges as the first solution, addressing the want for a whole language learning platform. This paper pursuits to focus on the notable capabilities of the useful resource, its ability to influence individual organizations, and the importance of addressing complex language studying environments in constrained regions to acquire legacy huge quantities

**System Features**

LinguaPro+ sets itself apart by means of turning in fine time, interactivity and person delight. Key competencies of the device consist of layout to aid procedural expertise, interactive quizzes, paintings-games and dynamic sports which include hassle-fixing and actual-time presentation techniques, including experimentation and mirrored image for monitoring the expertise repute of users. Real-time feedback mechanisms, including assessments and evaluations, contribute to users' proficiency status tracking. The platform focuses on developing English language skills by immersing users in VR environments, simulating real-life situations like classrooms, socializing scenarios, and cafes.

## **Adaptability and Personalization**

The terrific function of LinguaPro+ is its flexibility for the individual in obtaining understanding of paradigms, presenting custom designed packages to gather expertise of interest in accordance with particular tastes. By permitting university students to create customized accounts, the gadget enables them to tune development, in addition to personalized tips based totally on how they perceive positive strategies with centralized help in areas that want improvement Thus, this flexibility permits customers to analyze at their personal tempo, developing an surroundings conducive to ability improvement.

## **Potential Impact**

This paper highlights the power effect of LinguaPro+ in locations like Pakistan, wherein English is a widely taught challenge, however get entry to to nice language studying assets remains a barrier. Offering an interactive and effective manner to acquire language abilities, LinguaPro+ stands to help college students at each college and overseas. Its interventionist technique now not only allows construct confidence in English conversation, but additionally addresses tough mistakes, which are important to growing effective language skills. The non-stop improvement capability of the platform positions it as a valuable useful resource for people, instructional foundations and establishments looking to enhance their language abilities.

## **Conclusion**

Finally, LinguaPro+ represents a remarkable leap forward in language recognition, specifically within the areas of purchaser encounter. Its present day capabilities, suitability for individual mastering fashions, and participatory technique make it a precious asset for people, academic establishments and organizations in search of to polish their language abilities. This research paper highlights its importance of LinguaPro+ in addressing the evolving needs of language learners and its potential to reshape the landscape of language education on a global scale.

# Appendices

## Appendix A: Information / Promotional Material

### A.1. Broacher

**Official Website**  
[www.linguaproplus.com](http://www.linguaproplus.com)

● **About our platform**  
 LinguaPro+ provides a comprehensive language learning experience through its app. It emphasizes immersive learning, including listening, speaking, reading, and writing skills, to develop overall proficiency in learning a foreign language.

● **Fun Learning**  
 Interactive Features like animated video lessons and gamification for kids.

**More Information**

**Phone**  
 +92 3328785677

**Mail**  
[info@linguaproplus.com](mailto:info@linguaproplus.com)

**Address**  
 Bahria Town Sector C  
 Lahore, Pakistan

**Language Learning Platform**

" Say No To Traditional Ways! "

[www.linguaproplus.com](http://www.linguaproplus.com)

**LinguaPro +**

## A.2. Standee

**LinguaPro +** Soften Solution

**PROJECT TEAM ( ID: FYP-BITM-S23-001 )**

- M Rabi Khan (Leader)
- Daniyal Khan
- Usman Latif

**Manager: Mr. Javaid Iqbal**

**LANGUAGE LEARNING APP**  
User-friendly interface with intuitive navigation for seamless language learning experience.

Education Opens up the Mind

**ENHANCE LEARNING SKILLS**

- Listening
- Speaking
- Writing
- Reading

**LEARNING MODULES**

- Interactive Video Lesson
- Flash Card Games
- Pronunciation Corrector
- Short Stories
- Map Games
- Assessment & Certification

Strategy Plan Vision Success

**TOOLS & TECH**

**TECH TOOLS**

Front End: HTML, CSS, JavaScript, React

Back End: node.js

Tools: GitHub

Web Hosting: HOSTINGER

Get more tips at  
**SOFTENSOLUTIONS.COM**

SUPERIOR UNIVERSITY

**THANK YOU!**

END