



## Software Documentation and Technical Writing Project

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Table 1:

## Abstract

Given the speed at which technology is developing, people have a hard time locating trustworthy and thorough sources of computer-related instructional knowledge. In order to provide access to trustworthy educational and professional materials, this project proposes the creation of a comprehensive digital application targeted at technical professionals, graduates, and students. The application stands out for offering a wide range of features, including locating trustworthy educational channels on YouTube, evaluating approved training programs, looking for books and scholarly materials, and showcasing available specializations and the related professional certifications. In order to guarantee excellent performance and stability, the program uses a strong technical infrastructure that includes storage tools, Amazon EC2 servers, and a PostgreSQL database. It also offers users an intuitive interactive interface. Additionally, the program uses JavaScript (Node.js) to facilitate smooth database and user interface integration, enabling fast response times and an all-encompassing user experience. By offering a unified platform that integrates several information sources required for making well-informed and efficient decisions, the initiative seeks to assist users' academic and professional development.

## Executive Summary of the Project

By offering a single interface for accessing several knowledge sources, this project seeks to create and construct a comprehensive technological platform that satisfies the demands of anyone interested in computer areas, including students, graduates, academics, and specialists. The application tackles a number of issues, including the difficulty of locating trustworthy information, the distribution of learning materials, and the time lost looking for available content. The application incorporates a number of sophisticated functions to accomplish this, such as:

### **Advanced resource search:**

It offers a dedicated section for reviewing specialized books and directing users to trustworthy academic sources, as well as the ability to search for reputable educational channels on YouTube and evaluate different training courses on recognized platforms like edX and Coursera.

### **Overview of specialties and professional certifications:**

The program shows the certified professional certificates offered in each computer science specialization in addition to offering thorough information on university specializations in that field.

### **Interactive user interface:**

Enhances the platform's value as a collaborative and instructional resource by offering an interactive communication environment that enables users to share experiences and provide assessments and reviews of the application's materials.

For handling complicated relational data, the application uses a PostgreSQL database, which offers excellent security and dependability. In order to achieve high availability and improved performance, the application also makes advantage of Amazon EC2 servers, which offer capabilities like comprehensive security management and auto-scaling. The application guarantees a seamless user experience by integrating programming in the backend and user interfaces through the usage of JavaScript and Node.js, enabling tight data integration and quick response.

This project is a significant step toward offering a dependable and all-inclusive platform that facilitates professional growth and ongoing education, helping users make knowledgeable decisions about their education and careers, and reducing the time and effort required to obtain accurate and helpful technical information.

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# **1 chapter introduction**

## **Overview**

In a fast-paced world characterized by rapid technological advancement, many people face significant challenges related to access to knowledge and educational resources. These difficulties lead to feelings of confusion and disorientation, especially in light of the vast amount of information available.

## **Introduction**

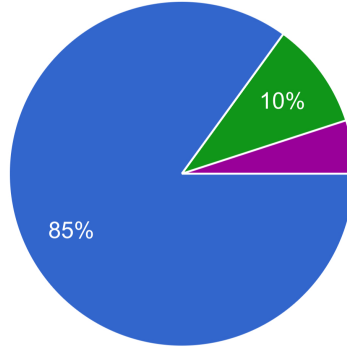
In this vast world, human beings live in the highest stages of technological advancement, where sources of technical information have become abundant and diverse, transcending any geographical or ideological boundaries. This has led to a loss of reliable sources. Here we are now to assist that unfortunate tech enthusiast who struggles greatly in searching for trustworthy technical information sources

### **1.1 Problem domain**

Many people in the technical field face numerous difficulties, as there is no comprehensive platform for technical resources. This causes them a significant concern in seeking reliable information and accessing appropriate educational and informative resources.

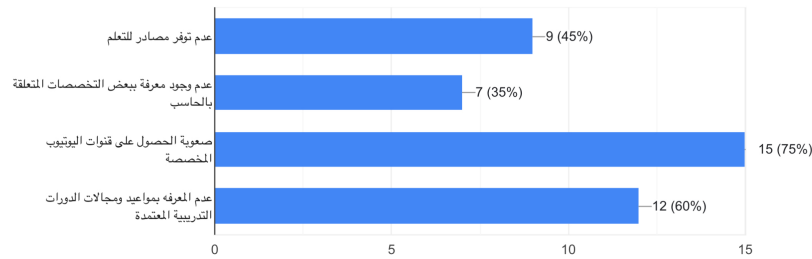
### **1.2 Problem statement**

We conducted a survey to identify the issues faced by those interested in this field. The survey was distributed via social media to reach as many participants as possible from various academic and professional backgrounds. We first asked respondents to classify themselves as students, teachers, enthusiasts, recent graduates, or content creators. We found that the largest group was students, making up 85% , while content creators represented 5% and recent graduates 10% (as shown in Figure 1).



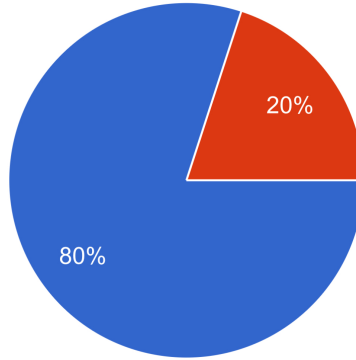
(Figure 1)

Accordingly, we asked them to specify the difficulties they encounter, and the most common issue identified was the difficulty in finding dedicated YouTube channels, with a rate of 75% (as shown in Figure 2)



(Figure 2)

We also inquired about the challenges they face when searching for scientific research related to technical fields, and 80% of them reported struggling with this (as shown in Figure 3)



(Figure 3)

Finally, we asked them to identify what would make accessing information related to technology easier, and the most requested solution was a platform that consolidates everything related to computers.

### **1.3 Proposed system**

The problem that prompted us to design this application is for computer graduate students and students who wish to join any of the computer fields and current students who face many difficulties in research, with the aim of having a comprehensive background in computer fields, including comprehensive information about the specializations, and inquiring about the jobs that are available for your specialty after Graduation. The application provides platforms for courses and overviews of professional certificates, the best educational channels on the YouTube platform, and the opinions of previous users, as searching on regular platforms can take a longer time... and this is what prompted us to try to reduce and waste time and effort to no avail

#### **1.3.1 Aims and objectives**

Our application aims to help those wishing to join any computer-related field current students, or recent graduates in finding everything they might need regarding their academic field in a comprehensive platform that helps them acquire sufficient information in record time and in an easier manner.

### **1.3.2 Proposed system features**

This application serves as a comprehensive platform for people who want to pursue careers in computer science. Students and recent graduates find it difficult to locate trustworthy information regarding courses, programs, and employment possibilities due to the growing demand for technical skills. In order to simplify the process of learning and guiding, the application has been created to serve as a single source that compiles all the relevant data. The app's user-friendly layout enables users to look up instructional materials, read course reviews, and get in touch with industry experts. It also offers study advice, career counseling, and tools to assist build the skills required by employers.

## **1.4 Overview of existing projects**

### **1.4.1 AN OVERVIEW OF A SIMILAR APPLICATION (edX Application):**

The benefits: excellent scholarly material from reputable universities The choice to get certified credentials Numerous courses and free resources The shortcomings: Some courses need payment of fees to acquire the certificate Academic content can be tough for beginners

### **1.4.2 Unique specifications only exist in application TECHNICAL:**

Resources are inclusive because they compile a variety of sources in one location, which facilitates access Career counseling: It offers users individualized counsel according to their requirements Interactive community: It enables people to communicate and share their experiences

## **1.5 Innovations of our project**

### **1.5.1 All-inclusive platform: offering a centralized database containing details on classes, books, learning materials, and employment openings**

Academic Guidance: Offering students direction and counsel regarding their academic and professional choices

### **1.5.2 interactive community**

establishing a platform for user communication to exchange knowledge and experiences.

## **conclusion**

The regulation needs this program urgently, as it has greatly simplified their effort and struggle to access information.

## **2 chapter**

# **Software Requirements Specifications**

## **Introduction**

n this vast world, human beings live in the highest stages of technological advancement, where sources of technical information have become abundant and diverse, transcending any geographical or ideological boundaries. This has led to a loss of reliable sources. Here we are now to assist that unfortunate tech enthusiast who struggles greatly in searching for trustworthy technical information sources

### **2.1 System Requirements**

#### **2.1.1 user data**

the system must show the login or new account creation page by including the user name, phone number, or personal email. The system will then send a message to confirm the successful login to your account or the creation of a new account.

#### **2.1.2 provide a personal**

he system must provide a personal account for each user who logs into the application, which can include his personal photo by taking a photo directly from his camera or from his photo library. He can add his personal data such as his user name, private name, and a general overview of him. He can also modify this data whenever he wishes. Moreover, each account will contain two main entries, one of which is Recommendations, which contains everything that the user talks about or recommends regarding computer fields, and Favorites, which includes everything that the user has expressed his liking for in the application

#### **2.1.3 Search YouTube Channels**

When logging in, the system must make the Channels section available to the user who enables the user to add recommendations to the best YouTube channels involved in explaining computer courses. The user will

be able to search for the channels he wants to watch by writing the name of the channel or course he wants to watch. The user will be able to rate the channels shown in the program and send comments. The user will be able to add a new channel link. The link sent by the software developer team will be verified. A five-star rating will be available, through which the user can choose two stars, for example, as the minimum rating level. A notification will appear through which the user can accept or reject the rating

#### **2.1.4 Courses section**

When logging in, the system must make the Courses section available to the user who enables him to access the resources of the platforms that offer the courses. The user will be able to search for the name of the platform or domain that he wishes to view. The user will be able to rate the courses offered in the program and send comments. The user will be provided with a warning that the user will be able to accept the performance of his or her rating or reject the rating with five stars from which the user can select a minimum of two stars and a maximum of five. The user will also have the possibility to add a resource to the course

#### **2.1.5 search for the name of the book**

When logging in, the system must make the Books section available to the user who enables him to search for the name of the book he desires and access the best books in its field. The system also shows the places where the book is available for reading or sale. The user will be able to rate the books appearing in the program and send comments. The user should be able to add a new book name. The book sent will be verified by the developer team working on the program. The rating will be made available in five stars from which the user can choose two stars, for example as the minimum rating level, where a notification will appear in which the user can accept or reject the rating

#### **2.1.6 Majors section**

When logging in, the system must make the Majors section available to the user who enables it him to search and access universities, their majors, acceptance rates, as well as an overview of the majors available to male or

female students and their functional fields, directly or by searching for the name of a specific major

### **2.1.7 Professional Certificates section**

When logging in, the system must make the Professional Certificates section available to the user, which contains everything related to the available professional certificates, from the expiration date, and how to obtain them. The system also allows the user to search by the name of the field he desires, and then the professional certificates available specifically for his field will appear.

## **2.2 User Requirements**

### **2.2.1 Login to the app**

The user can download the application and then log in or create an account by adding the username, secret code, phone number, or personal email

### **2.2.2 Search for custom content on YouTube platform**

the user can search and view the best YouTube channels in various computer fields, and the user can evaluate the channel, add comments, and can add recommendations for other channel names

### **2.2.3 Search of Training Courses**

The user can search and view the best training courses in various computer fields, evaluate the courses, and add comments

### **2.2.4 find books**

the user can search and see the best books in various computer fields, and the user can evaluate books, add comments, and can add recommendations for new book names



### **2.2.5 overview of the computer majors**

The user is able to take an overview of the computer majors, know the majors available for each gender, and clarify the acceptance rate in each majors and the universities that provide the major they wish to study

### **2.2.6 Research in scientific certificates**

The user can search and view information about the best professional certificates in various specializations in the computer field and can add comments.

## **2.3 Non-Functional Requirements**

### **2.3.1 External requirements**

### **2.3.2 ethical requirements**

**2.3.3** It does not contain permission for comments and opinions that contain bad language, as the system automatically deletes any comments that contain inappropriate content.

**2.3.4** It is reported if offensive comments are not automatically deleted

## **2.4 Product requirements**

### **2.4.1 Security requirements**

**2.4.2** Scan and verify all links added by users

**2.4.3** Send the temporary verification code to your phone number or email

### **2.4.4 usability requirements**

**2.4.5** A short explanation clip that explains to the user how the application works

## **2.5 Organizational requirements**

### **2.5.1 development requirements**

**2.5.2** System developers update certificates and courses monthly

## **conclusion**

From our previous discussion, it is clear how happy the regulators are with this application, as accessing information has become faster and easier. They are now able to comment and search with great ease, reliability, and security.

## 3 chapter

# Software Design

## Introduction

At this chapter, we will explain the requirements comprehensively using several diagrams:

### 3.1 diagram:

#### 3.1.1 Use Case Diagram:

This diagram will illustrate the functional requirements of the system by depicting the interactions between users (actors) and the system. It will highlight the core functions and how users interact with these functions(as shown in Figure 4 ).

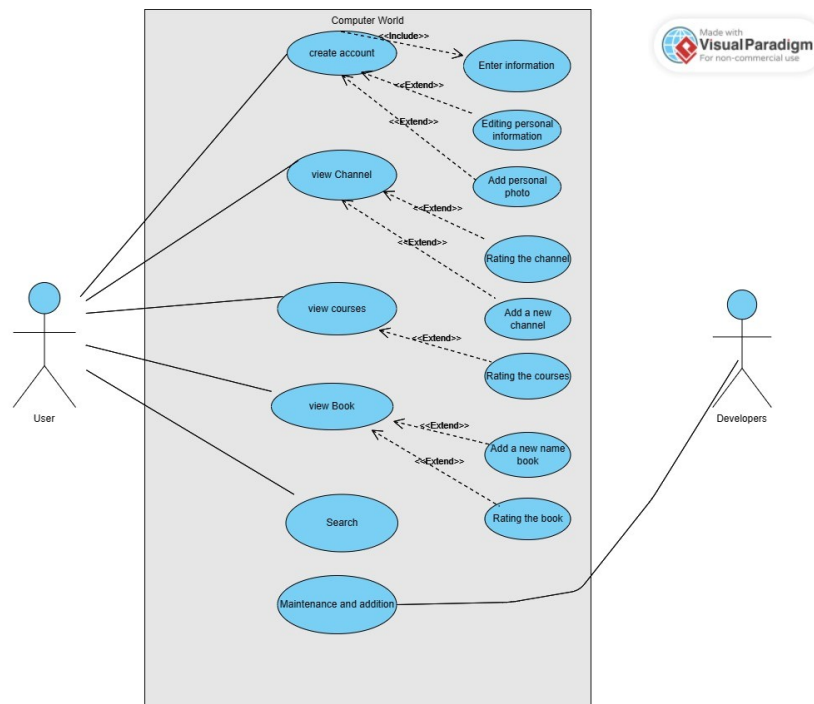
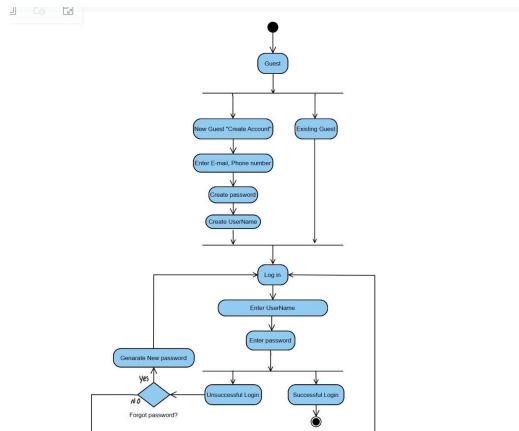


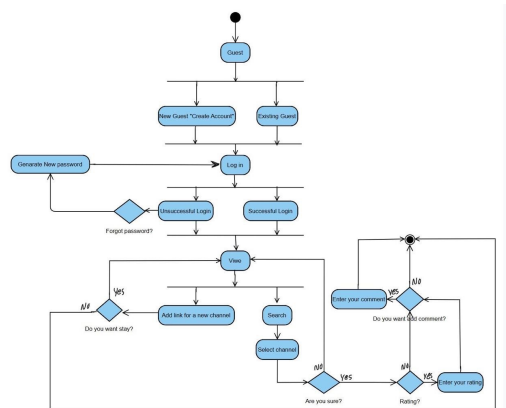
Figure 4

### 3.1.2 Activity Diagram:

We will present a diagram that illustrates the workflow, activities, and data processing within the application. This diagram will illustrate the sequence of operations and decision points involved in user interactions(as shown in Figure 5,6)



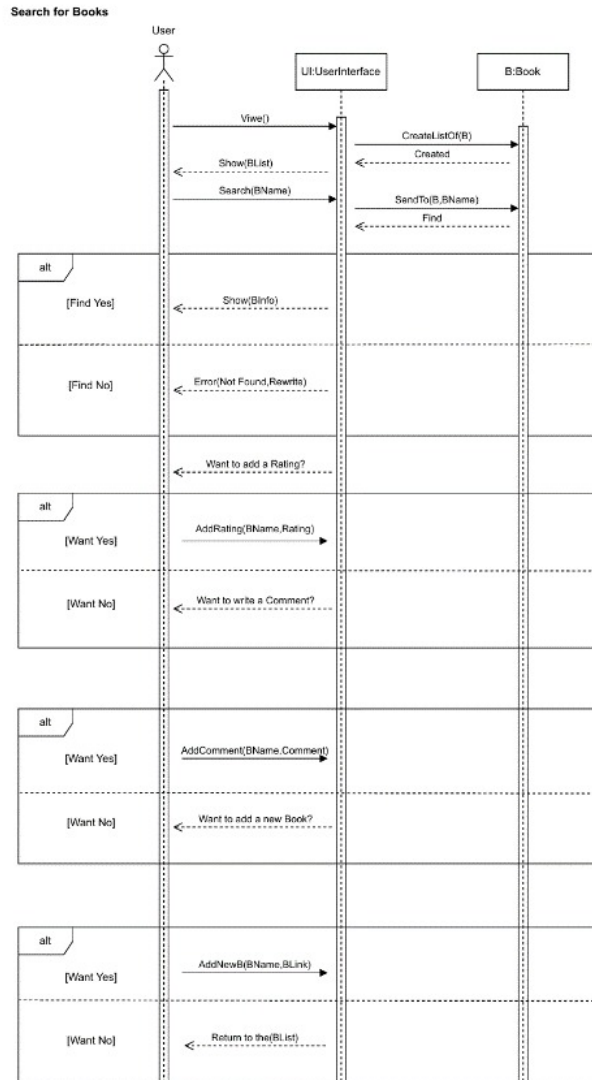
(figure 5.Create an account and Login)



(Figure 6.View channel)

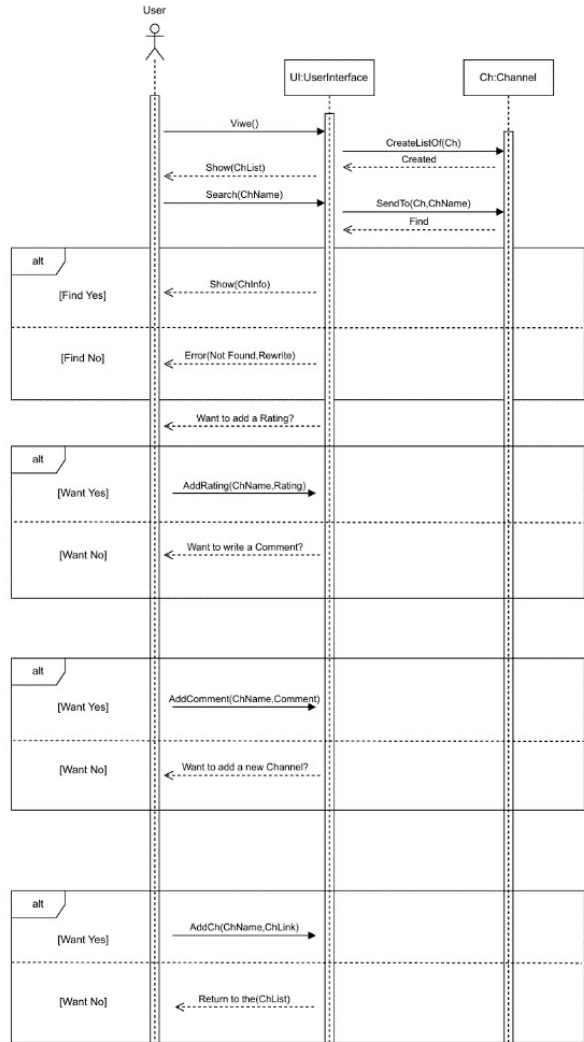
### **3.1.3 Sequence Diagram:**

This diagram will capture the dynamic interactions between the actors and the system, as well as the interactions between the different components of the system. It will explain how messages are exchanged over time, making it easier to understand the flow of processes within the system(as shown in Figure 7,8,9,10,11,12).

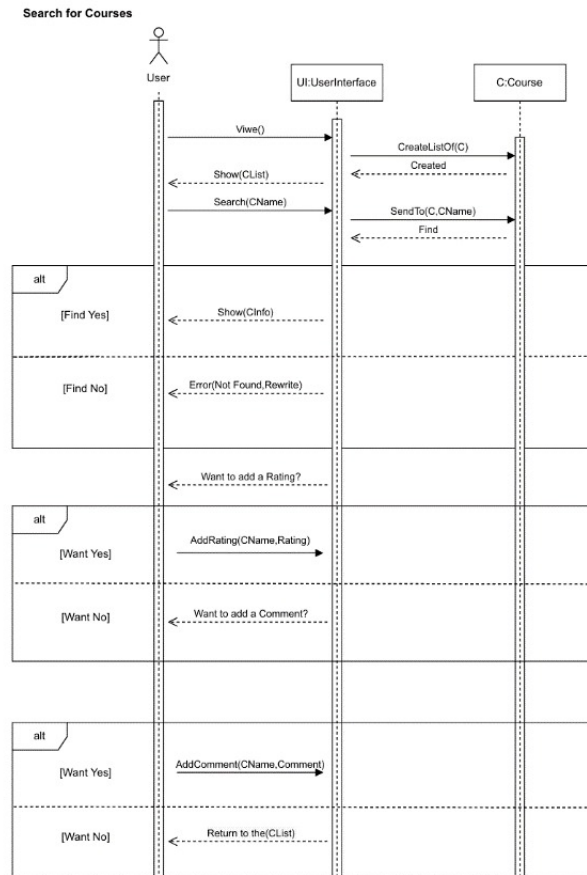


(Figure 7)

Search for Channels



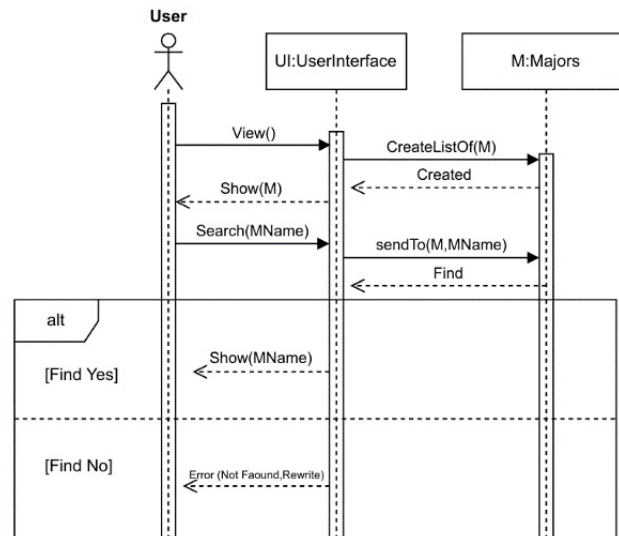
(Figure 8)



(Figure 9)

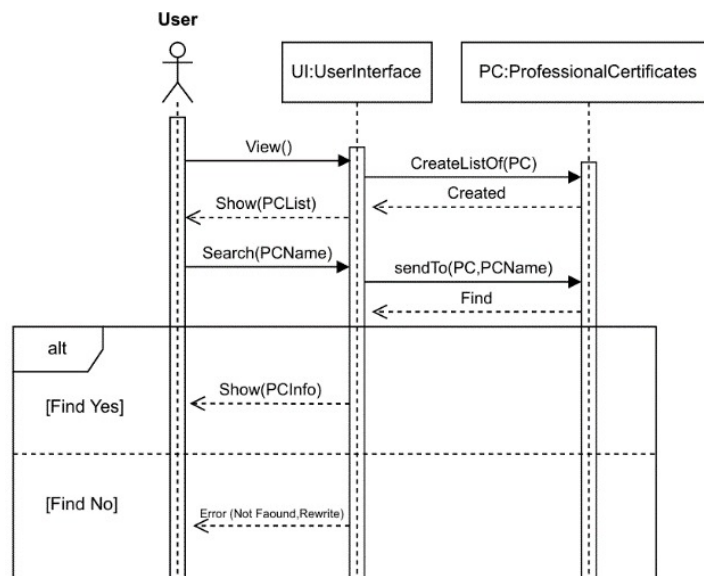


### Search for Major



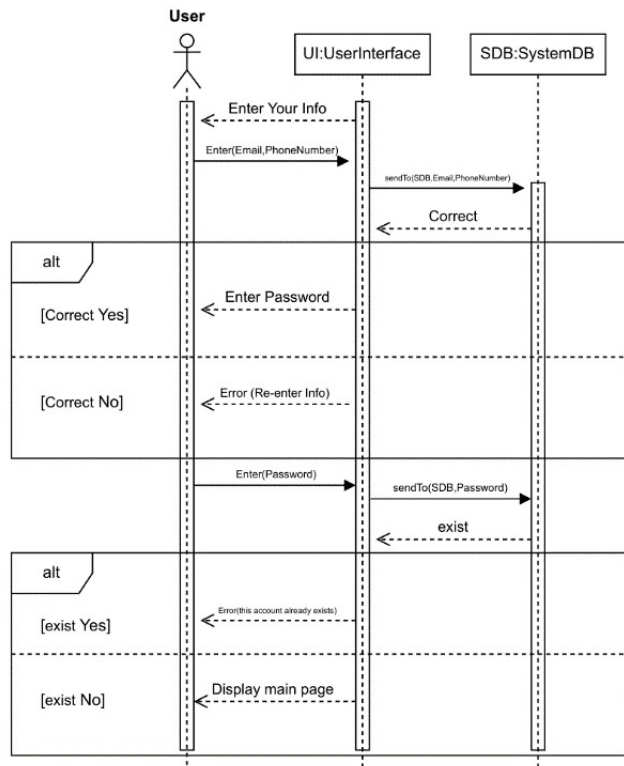
(Figure 10)

### Search for Professional Certificates



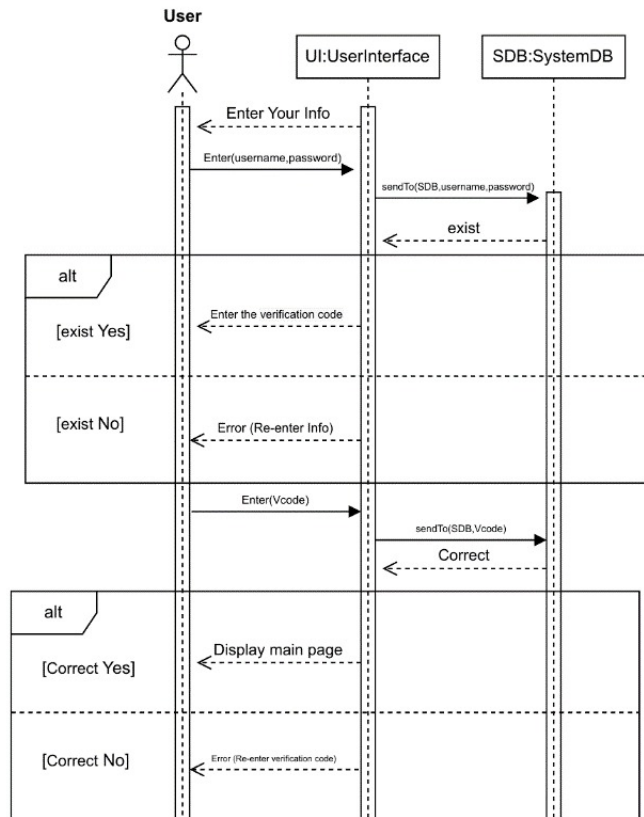
(Figure 11)

## Create account process



(Figure 12)

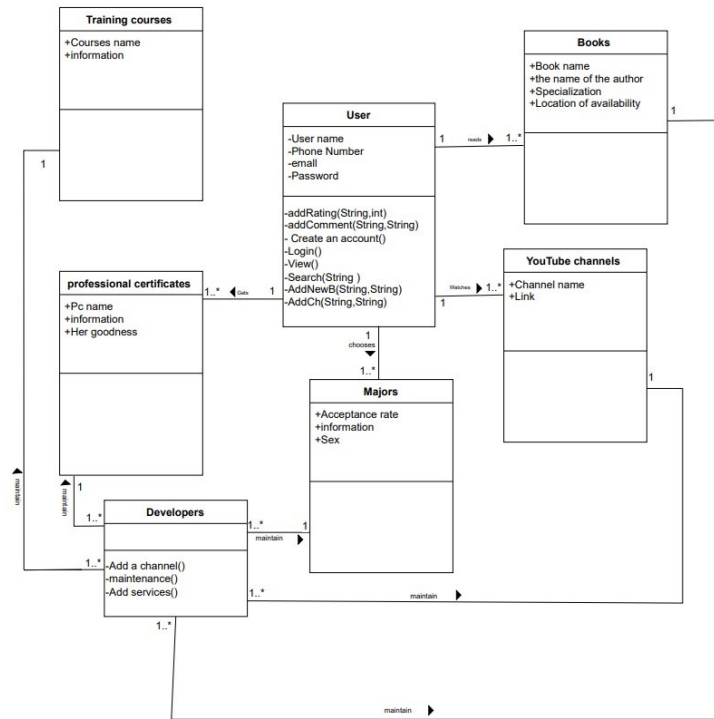
## log in process



(Figure 13)

### 3.1.4 Class Diagram:

We will provide a diagram that illustrates the object-oriented design of the system. This diagram will cover various entity classes, their attributes, methods, and the relationships between them, forming the fundamental structure of the application. By using these diagrams, we aim to provide a clear and organized view of the system's requirements and architecture, ensuring that all stakeholders have a shared understanding of the application's design and functionality(as shown in Figure 14).



(Figure 14)

## 3.2 User Interface Design

### 3.2.1 Login Interface

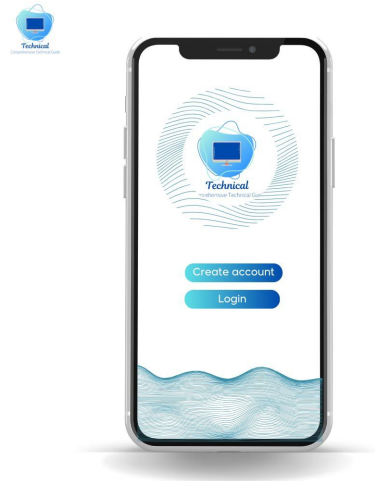


Figure 1: Login Interface

In order to improve the user experience by making interaction easier, the Technical Comprehensive Technical Guide application's login interface was created. The main application logo is shown at the top of the interface, which helps to strengthen the visual identity. There are two primary buttons on the interface:

**create account:**

this is where new users can make their first account.

**login:**

Enables existing users to access their accounts. The buttons' usage of a

color gradient between blue hues ensured that the alternatives were easily distinguishable while also creating a unified and modern visual design. A wavy design has been incorporated at the bottom of the screen to provide a soothing visual element without detracting from the user experience. While

retaining a high level of visual appeal, the design prioritizes accessibility and navigation.

### 3.2.2 Main Interface

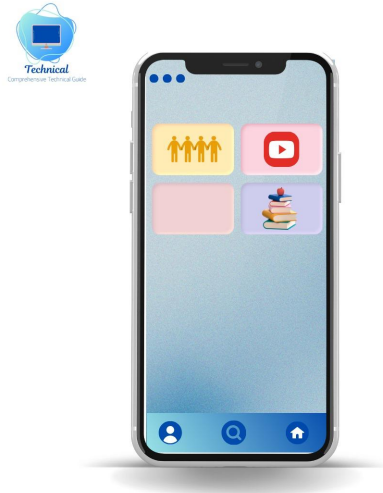


Figure 2: Main Interface

With an emphasis on organization and clarity to ensure a seamless user experience, this interface is intended to serve as the primary screen of the Technical Comprehensive Technical Guide application. The application's primary features are represented by a grid of four icons at the top of the interface:

- Access to community- or user-specific content is represented by the first icon, which is the yellow shape.
- The YouTube emblem, which is the second icon, denotes the instructional channels that are accessible on the platform.
- Comprehensive educational literature resources are the focus of the third icon, which is pink in hue.
- Books, the fourth icon, are devoted to training sessions. Three icons make up the navigation bar at the bottom of the interface: Access to the profile

page is provided via the user code. For instant access to the in-app search function, use the search code. The home icon returns the user to the main page. Calm hues and gradients used in the interface's design improve the visual experience without drawing the user's attention away from the primary content.

### 3.2.3 Youtube Interface

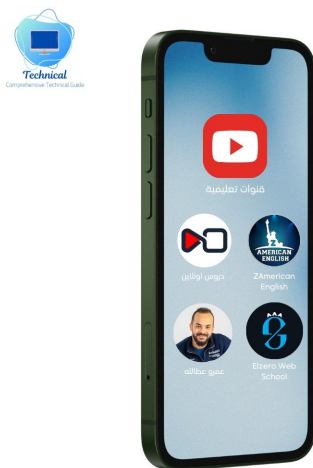


Figure 3: Youtube Interface

The interface of a technological application showcasing a number of instructional channels is depicted in the image.

- YouTube (YouTube icon): Shows that the instructional material is accessible on the YouTube network.
- Online Lessons: An Arabic-language YouTube instructional channel that provides instruction in a number of subjects, including self-study, design, programming, and photography.
- ZAmerican English: A channel dedicated to providing professional and simple English instruction. It focuses on using video lessons to teach vocabulary, grammar, and pronunciation.
- Amr Attallah: This appears to be a personal channel that offers instructional material on technical subjects or personal growth.
- Elzero Web School: A well-known educational channel that specializes in teaching web development and programming. It offers thorough instruction on JavaScript, HTML, CSS, and other programming languages.

With a primary emphasis on the YouTube platform for content delivery, the interface displays a number of digital resources for learning languages and technical skills.



### 3.2.4 Courses Interface



Figure 4: Courses Interface

The picture depicts the user interface of a technological program that shows recognized learning environments that provide online courses, such as:

- edX: An online learning platform that specializes in science, engineering, and programming and provides courses and certified degrees from esteemed colleges like Harvard and MIT.
- Coursera: An online learning platform that provides classes from universities and other educational establishments throughout the world. Users can get recognized certifications by enrolling in paid or free courses.
- Khan Academy: A free educational website that emphasizes offering straightforward instruction in a variety of areas, including science, math, and engineering.
- Udemy: A platform for education that provides a large selection of courses in a variety of subjects, from design and programming to company management and personal growth. Independent trainers provide the courses. With the ability to earn authorized credentials via different sites,

the interface showcases the variety of alternatives available to students seeking to access higher education online.

### 3.2.5 Jobs Interface



Figure 5: Jobs Interface

The interface of a technical program intended to show job platforms is depicted in this image. The following well-known job platforms' logos can be found on the interface:

- Masar: A platform that offers a variety of professional pathways and chances to help with the hiring process.
- Bayt: One of the most well-known job boards in the Arab world, it assists job searchers in locating appropriate online positions.
- Taqnip Platform: This term describes a technology platform that may be devoted to employing programmers, technicians, and other technical personnel.
- Jadarat: A platform designed to help people enter the workforce and build the skills and competences required for employment. The main goal

of the application interface is to portray these platforms as resources that help prospective workers or job searchers locate possibilities that fit their needs quickly and simply.

### **3.3 Data Base**

#### **PostgreSQL:**

#### **Why is it appropriate?**

##### **3.3.1 Handling relational data**

PostgreSQL is regarded as a potent relational database management system (RDBMS), which makes it perfect for applications that need intricate table relationships, such connecting training programs and employment with specialized information.

##### **3.3.2 Advanced data support**

PostgreSQL has the ability to store JSON data, which gives you the flexibility to enter unstructured data—like user opinions—into the database.

##### **3.3.3 Scalability**

PostgreSQL is suited for applications that anticipate steady expansion in data volume and user count since it can manage enormous volumes of data without compromising performance.

##### **3.3.4 Security and Reliability**

PostgreSQL is suited for applications involving sensitive data because of its strong security and support for cutting-edge systems.

##### **3.3.5 Geographic data extension**

PostgreSQL supports Geographic Information Systems (GIS), which facilitates the addition of features based on geographic data to the application.

## 3.4 Server Infrastructure

### 3.4.1 Amazon EC2 (Elastic Compute Cloud)

Amazon EC2 provides a robust and flexible infrastructure for hosting applications. It offers various functionalities to ensure optimal performance, scalability, and security.

**Auto-scaling (Auto Scaling)** Amazon EC2 offers auto-scaling, which enables you to automatically scale up or down resources in response to traffic volume or performance requirements. With the help of this functionality, you may save resources while still offering a flawless user experience, even during peak usage.

### 3.4.2 Excellent performance with an array of choices: Optimal server sizes

**AWS EC2 provides a range of instance types** From high-performance instances devoted to compute-intensive applications, including C6g and M6g instances, to small instances for start-up projects. These options assist you in selecting the instance that best meets your demands for both cost and performance.

**Network optimization** You may achieve a data transfer rate of up to 100 gigabits per second with instances such as the Elastic Network Adapter (ENA), enabling extremely rapid data flow between the server and the application.

### 3.4.3 Advanced security - Access and encryption management:

**AWS provides many security levels** Such as key management assistance via AWS Key Management Service (KMS) and data encryption both in transit and at rest. International security standards like ISO and SOC are also met by EC2.

**Virtual Firewalls (Security Groups)** Using the firewalls that EC2 offers, you can define exactly which traffic is permitted to reach your instances.

#### **3.4.4 Worldwide availability with quick reaction times:**

**Availability Zones** AWS has data centers spread over several global locations (Areas). To increase response time and prevent any interruptions from nearby natural disasters, you might decide to host your application in a location that is convenient for your user base.

#### **3.4.5 Connectivity to more AWS services:**

**Adaptable storage** EC2 seamlessly combines with other AWS services, including Amazon RDS for managed databases and Amazon S3 for flexible, limitless storage. You can establish a complete and user-friendly cloud environment with this connection.

**Performance analysis and monitoring** You can track the real-time performance of servers and applications using Amazon CloudWatch, and you can set up automated alerts based on particular parameters like CPU or RAM utilization.

## 3.5 Programming Language

### 3.5.1 JavaScript (Node.js)

A programming language that balances flexibility, high performance, and scalability must be selected in order to provide the optimum user experience in terms of speed and ease of use. JavaScript with Node.js is the best choice for constructing this application, it was discovered after examining the particular requirements of the project.

### 3.5.2 Why JavaScript (Node.js) was chosen:

**Asynchronous and high-performance processing** Node.js uses an asynchronous (event-driven, non-blocking I/O) execution architecture, which enables it to efficiently handle numerous requests at once. For an application that anticipates a high volume of users looking for data at once, this approach is ideal.

**Prompt response and prevention of processing delays** By guaranteeing a prompt response and preventing order processing delays, this feature improves user experience.

### 3.5.3 Uniformizing JavaScript throughout the system

Node.js offers a single development environment, lowering the complexity and expenses associated with managing various languages by utilizing JavaScript in both the frontend and backend.

**Project execution speed** Project execution speed is increased and coding errors are decreased when front-end and back-end development teams collaborate more effectively.

### 3.5.4 A vast network of support

JavaScript is one of the most extensively used languages in the world, and as such, it has a large and supportive community that offers pre-made libraries and plugins, cutting down on development time and providing quick fixes for issues that may arise. Node.js community is very vibrant, offering up-to-date tools and documentation on a constant basis.

### **3.5.5 Flowing database integration**

Node.js offers excellent flexibility in storing and managing both structured and unstructured data by integrating with relational databases like PostgreSQL and NoSQL databases like MongoDB with ease.

The application's requirements, which include storing data regarding academic majors, occupations, assessments, and user opinions, are supported by this flexibility in interfacing with other databases.

### **3.5.6 Applications in Real-Time**

Using WebSockets and other technologies, Node.js can give great solutions for constructing interactive apps, especially when it comes to providing users with recommendations or instant updates.

These features improve the user experience for those who require up-to-date, real-time information on training programs or employment that are available.

### **3.5.7 Scalability**

Node.js is perfect for apps that anticipate steady expansion in their user base because it is made to scale readily with an increase in the number of users or the volume of data.

Node.js can retain high performance without compromising the responsiveness of the application, regardless of the scaling direction (horizontal or vertical).

### **3.5.8 Summary**

JavaScript combined with Node.js is thought to be the best option for creating the application, given the suggested application needs and anticipated usage situations. High performance, flexible data handling, a seamless user experience, and excellent scalability with increasing user counts are all offered by this choice.

## Conclusion

In conclusion, we hope that we have succeeded in producing an application that serves the largest possible segment of those interested in computer-related fields. The application will provide users with an easy-to-use interface and a seamless experience in finding what they want. The main points in our project: Users will be able to create an account and access various features such as searching, watching YouTube channels, training courses, books, specializations, and professional certificates in the field of computers, commenting on them, and evaluating them. The user can also add information to develop Our application is more. The outcome of the project will be to provide a comprehensive platform that significantly reduces the time and effort required for individuals to obtain the necessary information in the computer field. It also helps users make correct and useful decisions about their education, career paths, and personal development. Limitations to consider, such as availability and accuracy of information, quality of user-generated content, ratings, platform accessibility, and language limitations.



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