

BSSE FINAL PROJECT

Vision Forge



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Vision Forge

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Abstract

In response to the lack of comprehensive career guidance in schools and colleges, Vision Forge addresses this critical issue by providing an intuitive solution to help students navigate their career choices. Many students face challenges due to inadequate counseling and often make important decisions without sufficient information or under familial pressure. Vision Forge is designed to bridge this gap by offering a user-friendly platform where students can input their grades, interests, and preferences to receive tailored career advice. The system utilizes advanced machine learning techniques to analyze the input data, providing personalized recommendations on potential career paths, necessary courses, and relevant educational opportunities. This analysis helps students align their academic achievements with their career goals and suggests alternative courses if needed. Vision Forge also includes features that enable students to explore universities and programs related to their chosen career fields, offering a wide range of options to consider. Through its comprehensive approach, Vision Forge aims to empower students with the knowledge and confidence needed to make well-informed career decisions. The application's ability to provide personalized guidance and connect students with suitable educational resources significantly enhances their career planning process. By leveraging real-time data and smart technology, Vision Forge not only helps students make better choices but also prepares them for a successful and fulfilling professional journey. This project ultimately contributes to developing a more informed and motivated generation of professionals.

Dedication

All this we owe it to our families. Thank You for giving us a chance and Thank You for believing in us.

Acknowledgements

We thank Allah Almighty who blessed us everything and gave us the strength to complete our research.

We would like to thank one-person particularly our advisor Ms. Rubab Javaid for their guidance and for their recommendations that helped us to complete our project.

We would also like to thank each other for helping each other and be cooperative to each other and maintaining a peaceful environment.

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Revision History

Name	Date	Reason For Changes	Version

Chapter 1. Introduction

"Vision Forge" transforms career guidance using advanced machine learning. It caters to students, offering personalized career paths often missing in traditional methods. By analyzing academics and interests, it provides tailored options, empowering students for their future journeys. The motivation lies in simplifying complex decisions. The significance is profound: it helps students align their passions and strengths with career choices, ensuring a more fulfilling and successful future. Through this innovative approach, "Vision Forge" becomes a guiding light, making career decisions accessible and meaningful for every student.

1.1 Product (Problem Statement)

Vision Forge is a simple-to-use software made to assist students in making career decisions. Many schools and colleges don't provide enough help for students to plan their future careers. With this software, students can input their grades and interests. Then, they get personalized suggestions for careers. It uses smart technology not just to look at the data, but also to give advice on which jobs might be suitable, what courses they might need, and which universities offer those courses. It's more than just a program; it's a helpful tool that guides students in making smart choices about their future careers. Vision Forge lets students check their eligibility for multiple universities based on their grades and program. It combines what students tell it, smart technology, and career exploration to help students feel confident about choosing their careers.

1.2 Background

In the realm of career guidance systems, "Career Vista" focuses on providing insights through assessments, while "Future Track" offers basic career advice without advanced features. However, my project, "Vision Forge," goes beyond by integrating cutting-edge machine learning algorithms, offering personalized career counseling, learning recommendations, university eligibility assessments, and detailed course information. Unlike its predecessors, "Vision Forge" takes a holistic approach to redefine the landscape of career guidance. It stands out as a comprehensive and tailored decision-making tool, providing students with an all-encompassing resource to make well-informed and rewarding choices for their career paths.

1.3 Objective(s)/Aim(s)/Target(s)

- Create an easy-to-use career help system called "Vision Forge" that uses smart technology to give personalized advice.
- Give suggestions for careers, recommend courses to take, and check if you can get into different universities.
- Compare "Vision Forge" to other career help systems to see which one works better.
- See how "Vision Forge" affects students' decisions about their careers and what jobs they end up in.
- Make sure that "Vision Forge" covers everything students need for career help, and make sure our goals match what we can realistically do in the time we have

1.4 Scope

"Vision Forge" is a big project designed to assist students in selecting their career paths. It involves creating a user-friendly system that takes into account students' academic records and interests. Using advanced machine learning, it provides personalized career suggestions, recommends learning paths, and assesses university eligibility. The project also aims to offer comprehensive insights, making "Vision Forge" a complete tool for well-informed career decisions. Its ultimate goal is to empower students with a holistic approach to confidently navigate their academic and professional journeys.

1.5 Business Goals

Vision Forge doesn't just aid educational aims; it also fuels financial prosperity. By drawing in students and institutions, the system earns revenue through increased user visits. Simplifying administrative duties cuts expenses, boosting earnings. The software's popularity bolsters the institution's standing, drawing more students and meshing with core business goals. Additionally, after completion, we're in discussions with two companies to promote it to relevant businesses, solidifying Vision Forge's role as a tech-driven education leader, ensuring ongoing financial growth and triumph in the competitive educational field.

1.6 Learning Outcomes

- Learn various machine learning algorithms.
- Acquire skills to analyze and maintain large datasets.
- Develop proficiency in constructing fully operational websites.
- Gain expertise in integrating machine learning algorithms.
- Learn to use APIs for seamless integration of resources.
- Develop skills in documenting the project journey.
- Enhance research and communication skills.
- Understand and apply machine learning technology.
- Learn techniques for analyzing and maintaining datasets.
- Acquire the ability to train models and make predictions based on analyzed data.

1.7 Nature of End Product

The end product of this project will be a comprehensive software application that leverages machine learning algorithms to guide students in selecting optimal career paths. It is a practical tool born out of extensive research and data analysis. While it encompasses various components, including a dataset and algorithm integration, its primary goal is to provide students with a powerful, user-friendly system for making informed career decisions. In essence, it combines software engineering, data science, and machine learning to create a valuable resource for academic and professional guidance.

1.8 Related Work

"Career Vista" and "Future Track" are two prevalent career guidance systems. "Career Vista" specializes in career counseling, providing insights into various career options through assessments. On the other hand, "Future Track" offers basic career advice but lacks advanced features. Both systems fall short in comparison to "Vision Forge," which not only delivers personalized career counseling but also incorporates cutting-edge machine learning algorithms. Unlike its counterparts, "Vision Forge" offers a holistic approach, including personalized learning recommendations, university eligibility assessments, and detailed course information, redefining the landscape of comprehensive career guidance for students.

1.9 Document Conventions

Font Size for Text: 12

Font Size for Headings: 14

Font Size for Main Heading: 18

Line Spacing: 1.0

Highlighted Items: Enclosed in "inverted commas"

Bullet Points: Used for clear and concise understanding

Chapter 2. Overall Description

2.1 Product Features

- Intuitive design for easy navigation and accessibility.
- Tailored career suggestions based on individual academic records and interests.
- Cutting-edge algorithms integrated for precise and reliable predictions.
- Personalized paths for skill enhancement and continuous learning.
- Evaluates eligibility criteria for various universities.
- Offers comprehensive insights into associated courses and educational opportunities.
- Holistic approach combining user input and machine learning for well-informed decisions.
- Boosts institutional reputation, attracting more students and supporting core business goals.

2.2 Functional Description

"Vision Forge" functions as an interactive career guidance system, helping students make informed decisions about their academic and professional paths. Users input their academic records and interests, and the system, powered by advanced machine learning, generates personalized career suggestions. It offers learning recommendations, assesses university eligibility, and provides insights into associated courses. The system's intuitive interface ensures easy navigation, making it a comprehensive tool for students to confidently explore and choose their career journeys

2.3 User Classes and Characteristics

User Class	Characteristics	Functions
Students	Varied educational levels, technical expertise	Input academic data, explore career options, view university eligibility
Educational Counselors	Educational expertise, occasional users	Oversee student data, provide guidance, monitor career suggestions
Administrators	High privilege levels, technical expertise	Manage user accounts, oversee system security, handle data privacy

Table 2.3

2.4 Design and Implementation Constraints

"Vision Forge" developers face specific guidelines to ensure effective functionality. The machine learning processes are limited to Python, and web development follows the MERN framework. Advanced analysis techniques are used for dataset management. The application access is restricted to students who have completed matriculation and intermediate studies. In addition, the development is subject to specific hardware constraints, ensuring compatibility with standard computing devices commonly used by students. Design and development adhere to the Software Development Life Cycle (SDLC) methodology, using Unified Modeling Language (UML) diagrams for planning. The interface prioritizes user-friendliness for enhanced accessibility and usability.

2.5 Assumptions and Dependencies

Assumed Factors	Description
Third-Party Components	Integration of external ML libraries. Changes in these libraries may impact the project.
Operating Environment	Stable internet connectivity is assumed for real-time data processing and server interactions.
Data Availability	The project assumes the availability of relevant datasets for training ML algorithms. Limited data might affect prediction accuracy.
External Services	The project depends on the continued availability of external services/APIs for real-time updates and information retrieval.
Development Tools	The assumed availability of necessary software tools and licenses for development and testing purposes.
Team Collaboration	Effective collaboration among team members is assumed for consistent development progress and issue resolution.
Documentation Accuracy	The project assumes the accuracy of information in the existing project documentation, forming the basis of development decisions.
Hardware Reliability	The project relies on the reliability of hardware components and servers hosting the application to ensure uninterrupted service delivery.

Table 2.5

Chapter 3. System Requirements

3.1 Functional Requirements

3.1.1 User Authentication and Login

Identifier	UC-1	
Purpose	Allow users to create accounts and log in.	
Priority	Medium	
Pre-conditions	The user is not logged in.	
Post-conditions	The user is authenticated and gains access to system features.	
Typical Course of Action		
S#	Actor Action	System Response
1	User Navigate to login page	
2	User Enter username and password	System processes the entered information.
3	System Validate credentials	System checks if the entered credentials match a registered user and redirects to homepage
4	User comes to the home page	
Alternate Course of Action		
S#	Actor Action	System Response
1	User enters incorrect username or password or both	System displays an error message.
2	System validates and provide an error message	System redirects the user back to the login page
3	User Retry entering correct credentials	System checks entered credentials with the authentic credentials and redirects to homepage
4	User is being displayed the home page	

Table 3.1.1: UC-1

3.1.2 Career Field Option

Identifier		UC-2
Purpose		Enable users to explore and select a career path based on their academic performance and interests.
Priority		High
Pre-conditions		The user has successfully logged in..
Post-conditions		<ul style="list-style-type: none"> • The user has selected a specific career path. • The system provides additional resources and guidance related to the chosen career.
Typical Course of Action		
S#	Actor Action	System Response
1	Clicks on "Explore Careers"	Display analyzer form.
2	Enter basic information, such as name, academic background, and areas of interest.	Validates and saves the entered information, providing a confirmation message.
3	Completes the form and Clicks on "Explore Careers"	Generates and displays a list of recommended career paths
4	selects a specific career path for more information.	provides detailed information about the selected career, including potential job roles, required skills, and educational pathways.
5	Explores additional features, click "Learn More"	Offers relevant resources, success stories, and educational recommendations to further guide the user.
Alternate Course of Action		
S#	Actor Action	System Response
1	Encounters difficulties during form completion.	Provides helpful tooltips, inline assistance, or the option to contact support for guidance.

Table 3.1.2: UC-2

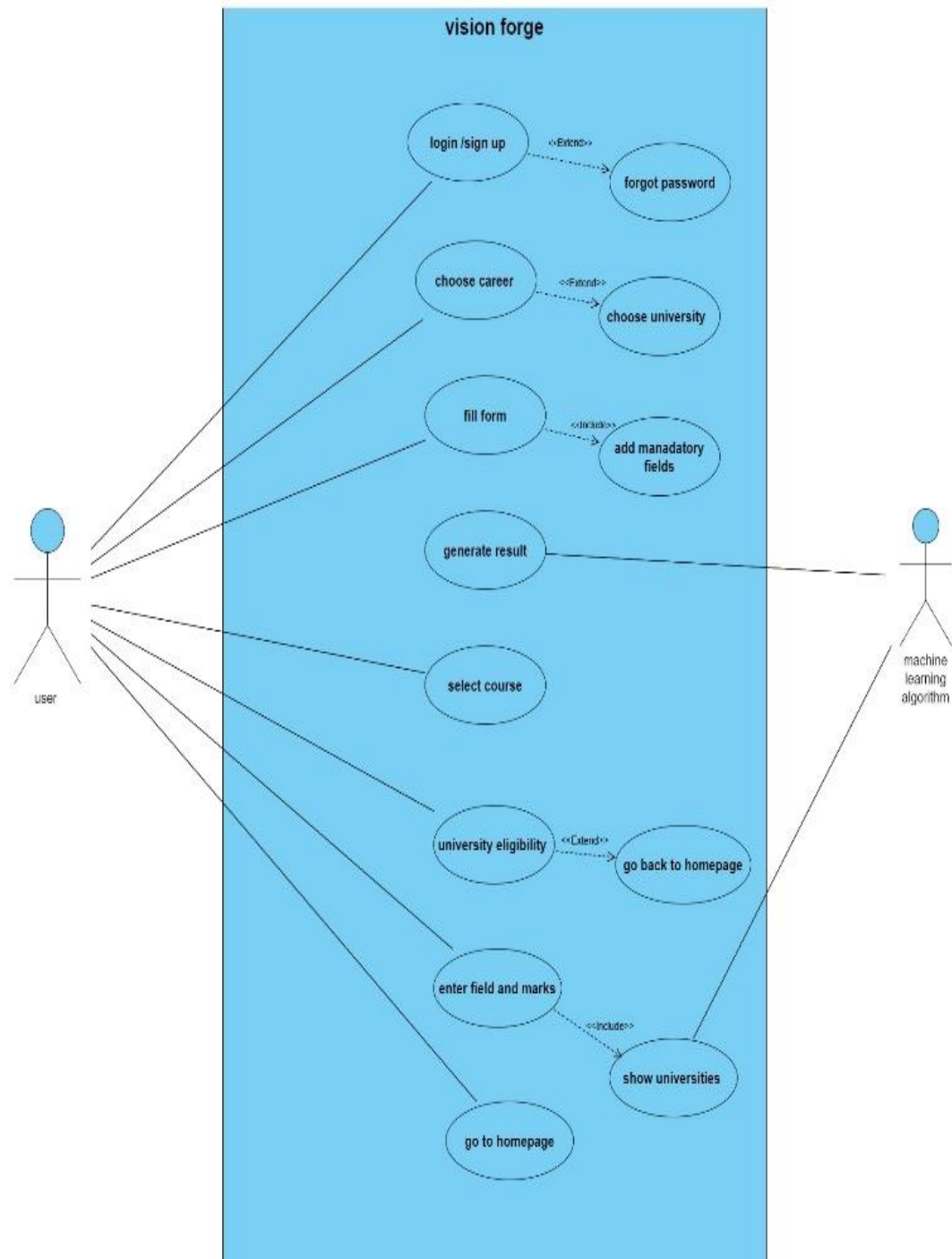
3.1.3 University Eligibility Assessment

Identifier		UC-3
Purpose		Assist users in exploring and selecting universities based on their academic preferences and career goals.
Priority		High
Pre-conditions		<ul style="list-style-type: none"> The user has successfully logged into "Vision Forge." The user has completed the profile setup, including academic preferences and career goals.
Post-conditions		The user has selected a university or universities that align with their academic and career objectives.
Typical Course of Action		
S#	Actor Action	System Response
1	Navigate to the "Explore Universities"	prompts the user to explore universities.
2	filters universities based on input provided of its preferred choice career and his/her marks to check eligibility	Presents a list of universities that match the user's specified criteria of marks and career eligibility.
3	Clicks on a specific university to view detailed information.	Provides comprehensive details about the selected university, including programs, faculty, campus facilities, and admission procedures.
4	Selects a university as a potential choice.	Adds the selected university to the user's list of preferred universities and offers the option to explore more
Alternate Course of Action		
S#	Actor Action	System Response
1	Encounters difficulties during the university exploration or application process.	provides support options
2	Decides to save university choices for later consideration.	Offers a "Save for Later" feature, allowing users to revisit and modify their list of preferred universities at a later time.

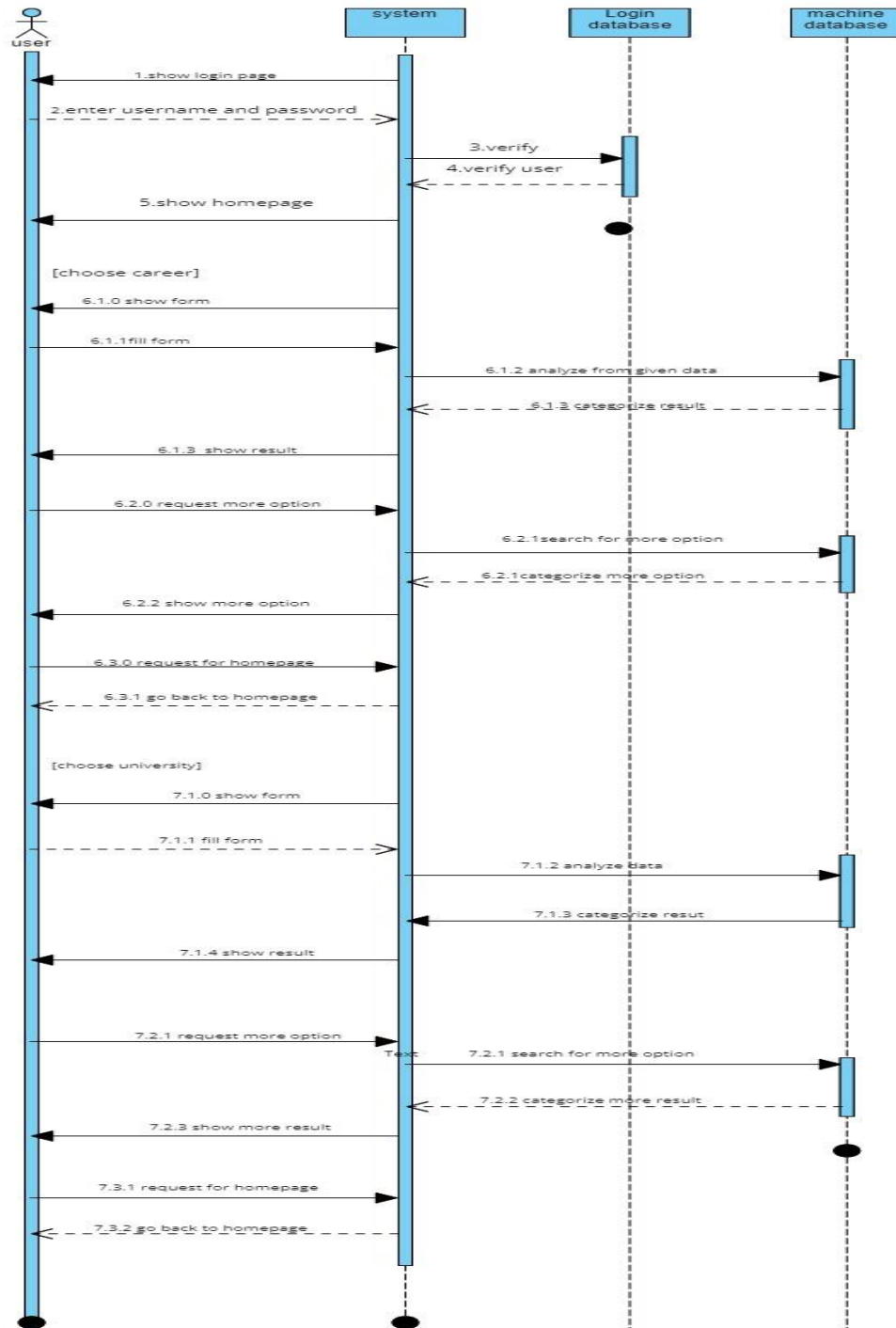
Table 3.1.3: UC-3

3.1.4 Requirements Analysis and Modeling

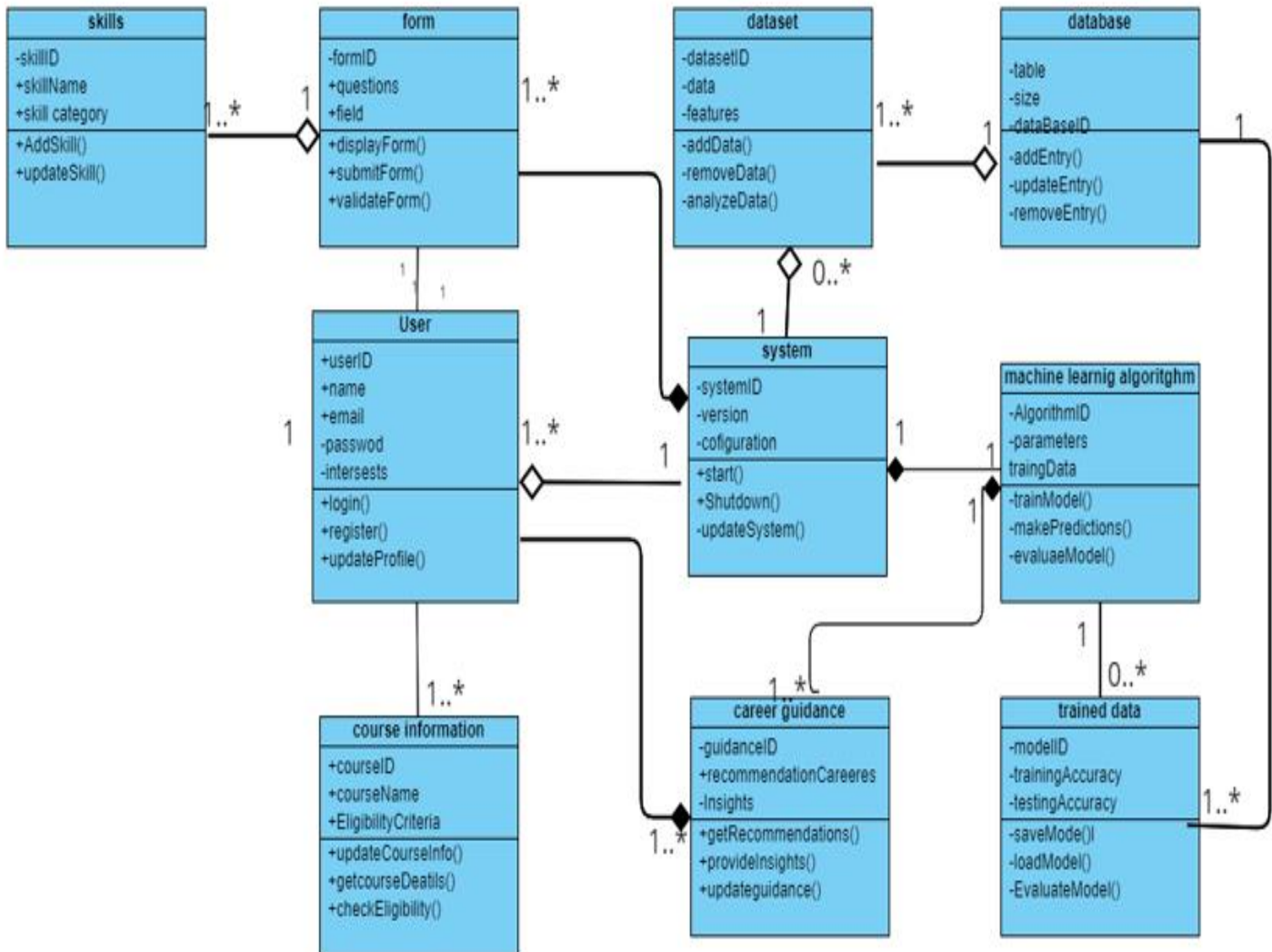
3.1.4.1 Use Case Diagram



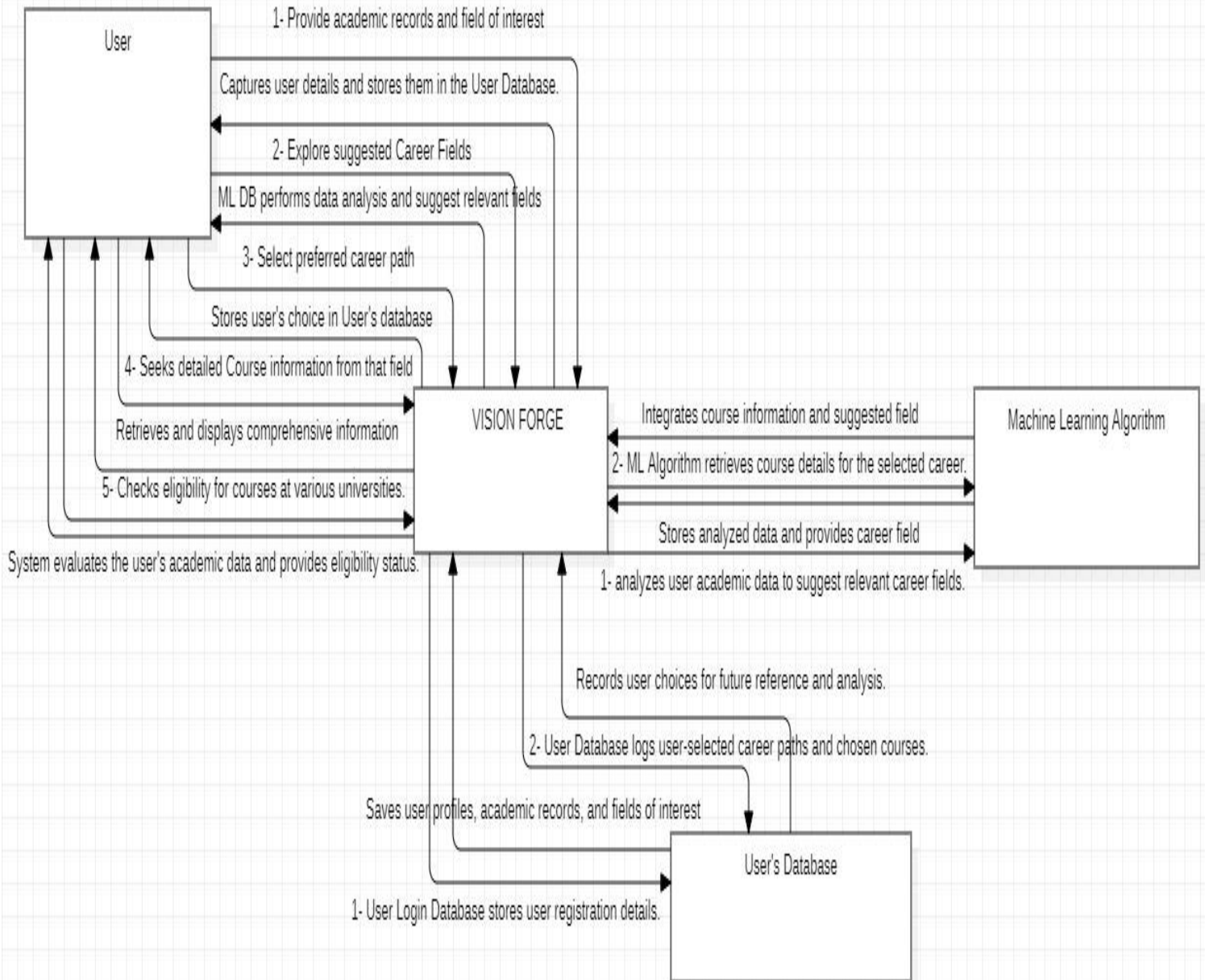
3.1.4.2 Sequence Diagram



3.1.4.3 Class Diagram



3.1.4.4 DFD Diagram



3.2 Nonfunctional Requirements

3.2.1 Performance Requirements

Performance requirements ensure the system functions optimally under various conditions. In the case of "Vision Forge," the following performance requirements are essential:

- **Response Time:** The system should respond to user queries within 2 seconds to provide a seamless user experience.
- **Scalability:** The application should be capable of handling an increasing number of users, with a minimum of 100,000 concurrent users.
- **Data Processing Speed:** Data analysis and career recommendations should be generated in real-time, ensuring prompt feedback to users.
- **System Availability:** The system should be available 99.9% of the time, with minimal downtime for maintenance.

3.2.2 Safety Requirements

Safety is a critical consideration for "Vision Forge." To ensure user safety and data security, the following requirements are in place:

- **Data Privacy:** The system must comply with data privacy regulations to protect user information.
- **User Identity Authentication:** Users must undergo secure authentication to access personal data.
- **Data Backup and Recovery:** The system should regularly back up user data and provide a recovery mechanism in case of data loss.
- **Security Certifications:** The application must meet relevant security certifications to ensure user data and privacy.

3.2.3 Security Requirements

Security and privacy are paramount for "Vision Forge." The following security requirements are specified:

- **Data Encryption:** User data and communication should be encrypted to prevent unauthorized access.
- **Access Control:** Access to sensitive user data should be restricted to authorized personnel.

- **Security Certifications:** The application must meet security and privacy certifications to ensure data protection.

3.2.4 Additional Software Quality Attributes

In addition to the primary functional requirements, the following software quality attributes are essential for "Vision Forge":

- **Usability:** The system should have a user-friendly interface with a user satisfaction rating of at least 90%.
- **Reliability:** The system should have a reliability rate of 99.9% to ensure consistent service.
- **Maintainability:** The system should be easy to maintain and update as needed.

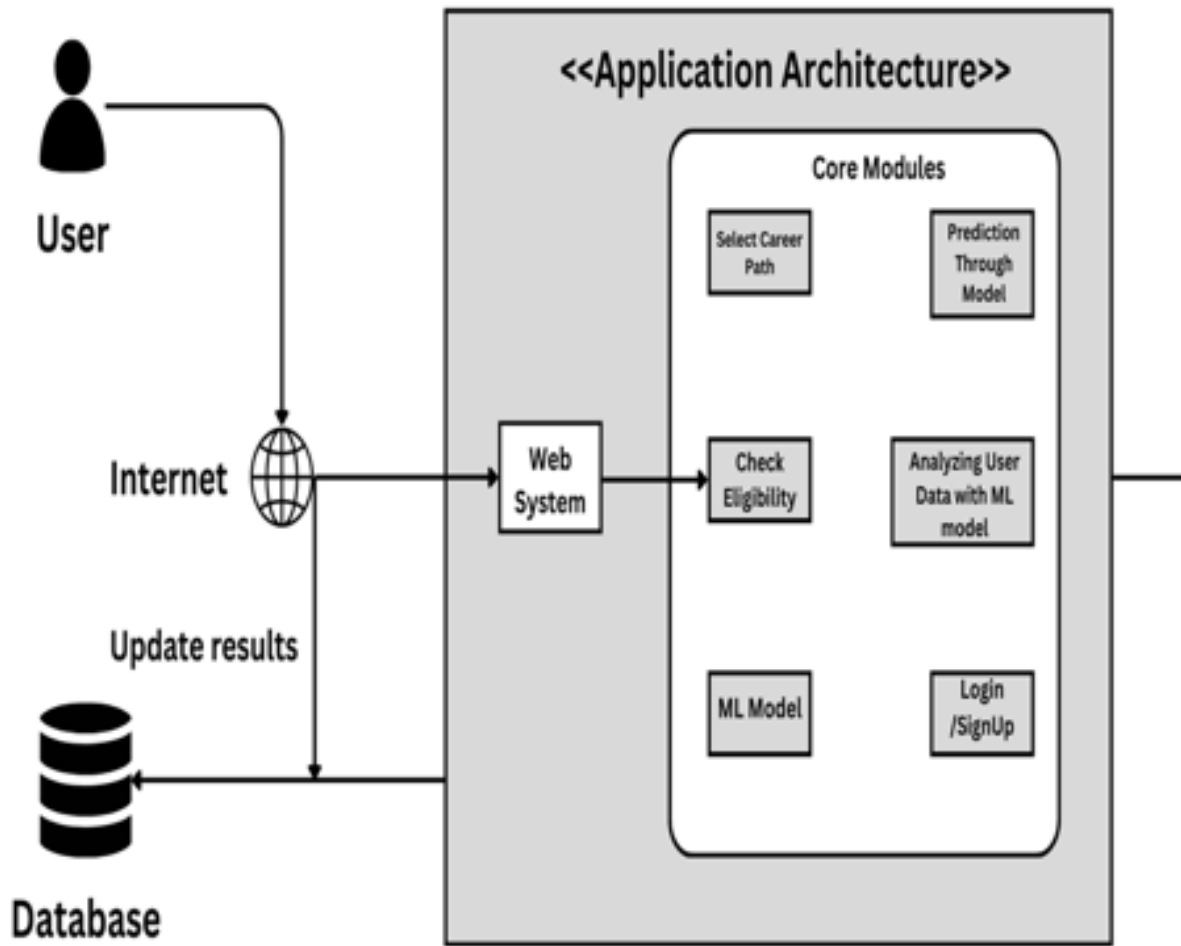
3.3 Other Requirements

- **Database Requirements:** The system should utilize a secure and scalable database system for efficient data storage and retrieval.
- **External Interface Requirements:** The system should integrate with external data sources and APIs for enriching career data.
- **Internationalization Requirements:** The application should support multiple languages to cater to a diverse user base.
- **Legal Requirements:** The system must adhere to all relevant legal regulations regarding data privacy and security.

Chapter 4. Technical Architecture

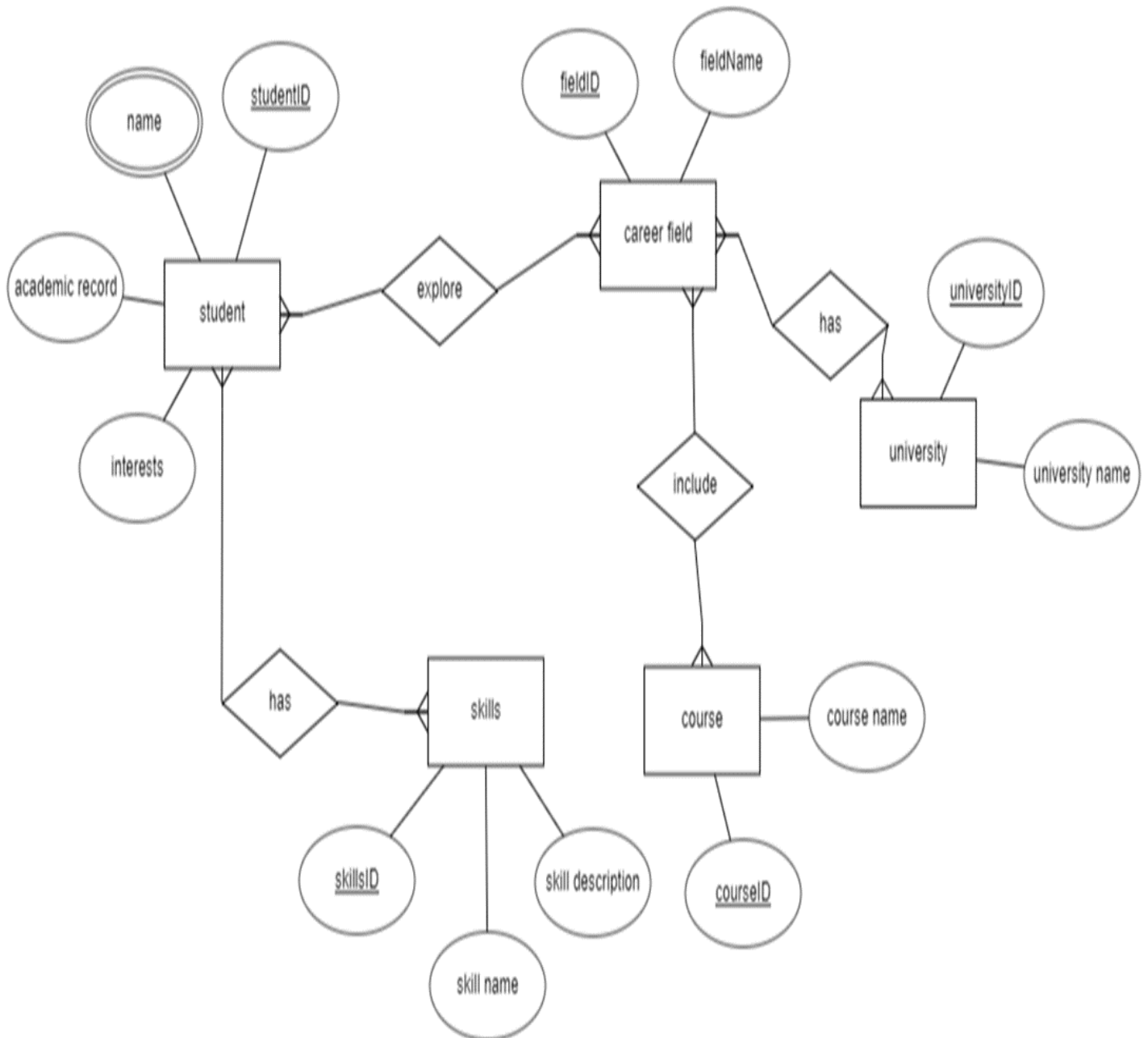
- **System Type:**
The current system is custom-built, specifically designed to address the unique requirements of career guidance and counseling.
- **Processing Type:**
The system is primarily responsible for online transaction processing, handling real-time data input, and providing instantaneous career suggestions.
- **Application Components:**
Major components include a user interface for students, an administrative interface, a machine learning module for career prediction, and a database for storing academic and user data.
- **Data Management:**
The system collects and manages academic records, career interest data, and university eligibility criteria, ensuring a comprehensive dataset for accurate predictions.
- **Application Architecture:**
The basic architecture is a client-server model where the client (user interface) interacts with the server (backend processing and data storage).
- **Programming Language:**
The system is built using the MERN (MongoDB, Express.js, React.js, Node.js) stack, combining JavaScript technologies for efficient development.
- **Hardware Platform:**
The system is hosted on cloud servers, ensuring scalability and accessibility. It does not rely on specific on-premise hardware.
- **Database Platform:**
MongoDB is used as the database platform, providing a flexible and scalable solution for managing diverse data types.
- **User Interface:**
The end-user interface is browser-based, allowing students and administrators to access the system through web browsers.
- **Network Architecture:**
The system is designed to be accessible over the internet, providing flexibility for users on different networks.
- **Hosting Environment**
The system is hosted on external cloud servers, offering reliability and accessibility to users from various locations.

Technical Architecture

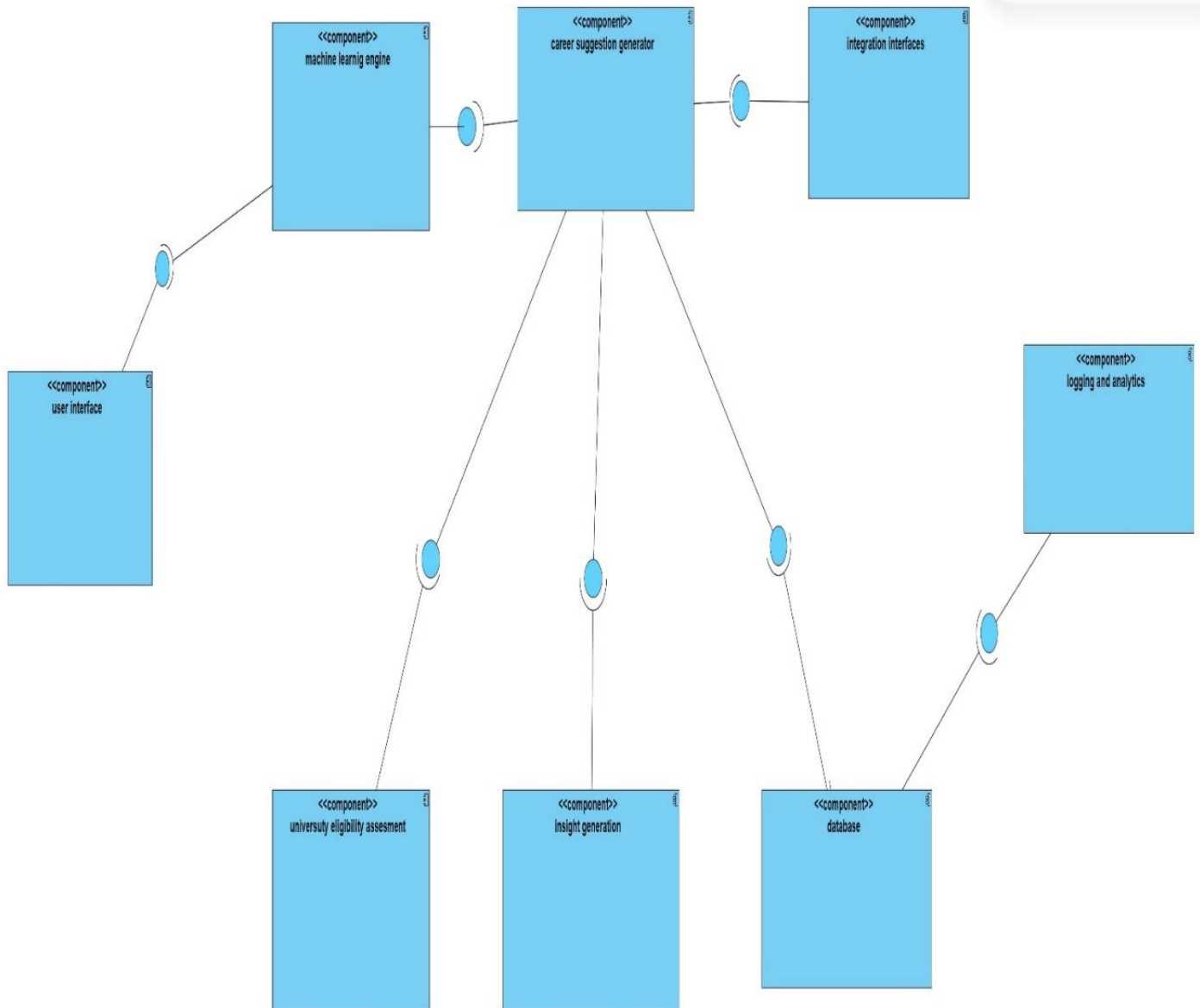


4.1 Application and Data Architecture

4.1.1 Entity Relationship Diagram



4.1.2 Component Diagram



4.1.3 Decision Table

- Login Decision Table

Condition	Rule 1	Rule 2	Rule 3	Rule 4
Valid Username	T	F	F	T
Valid Password	F	F	T	T
Action				
Successful Login	F	F	F	T

- Career Path Decision table

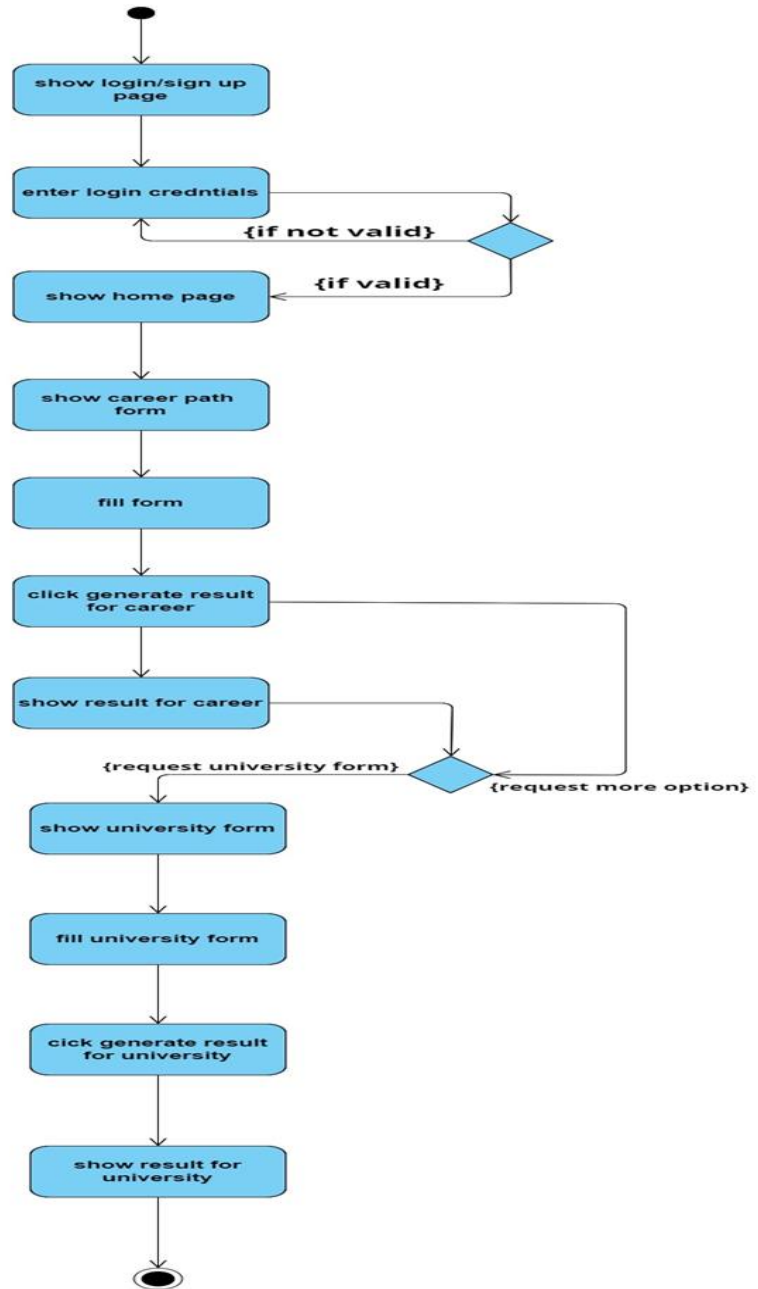
Condition	Rule 1	Rule 2	Rule 3	Rule 4
Matriculation Degree complete	T	F	F	T
Intermediate Degree complete	F	F	T	T
Action				
Career Path Prediction	F	F	F	T

- University Eligibility decision table

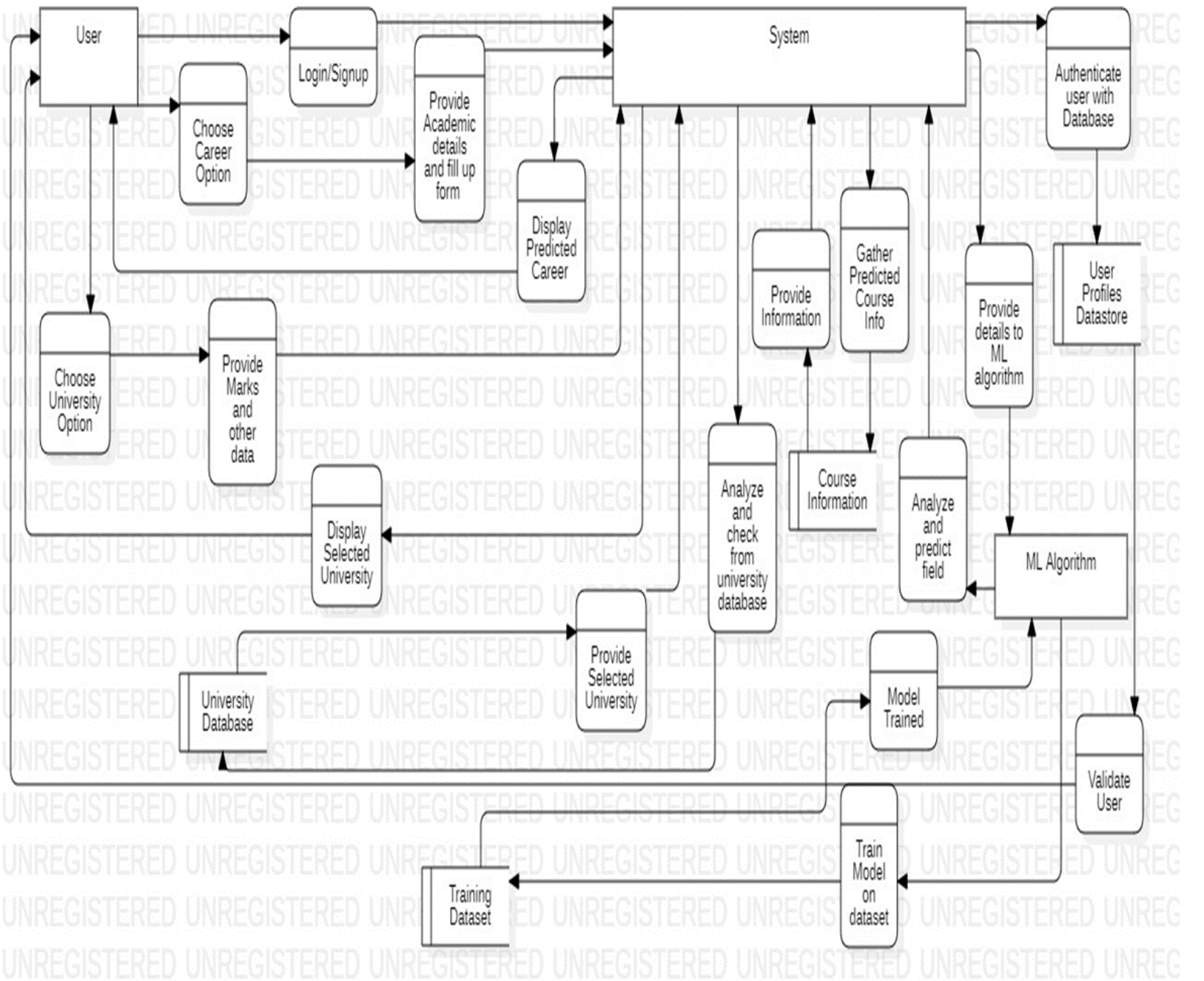
Condition	Rule 1	Rule 2	Rule 3	Rule 4	Rule 5	Rule 6	Rule 7	Rule 8
Matriculation Marks	F	F	F	F	T	T	T	T
Intermediate Marks	F	F	T	T	F	F	T	T
Career Field Name	F	T	F	T	F	T	F	T
Action								
Displaying Eligible University	F	F	F	T	F	F	F	T

4.2 Component Interactions and Collaborations

4.2.1 Activity Diagram



4.2.2 Detailed DFD



4.3 Design Reuse and Design Patterns

- **User Profile Module:**
The user profile creation and management components are reused for various sections, ensuring a unified and consistent user experience.
- **Data Input Forms:**
Common input forms, such as academic data entry forms, are reused across modules for collecting relevant information from users.
- **Machine Learning Integration:**
The machine learning prediction module is reused for different career-related predictions based on user data and preferences.
- **University Eligibility Assessment:**
Components used for assessing a user's eligibility for various universities are reused within the university exploration feature.
- **Result Display Components:**
The display components for presenting career suggestions and university eligibility results are reused across relevant sections.

4.4 Technology Architecture

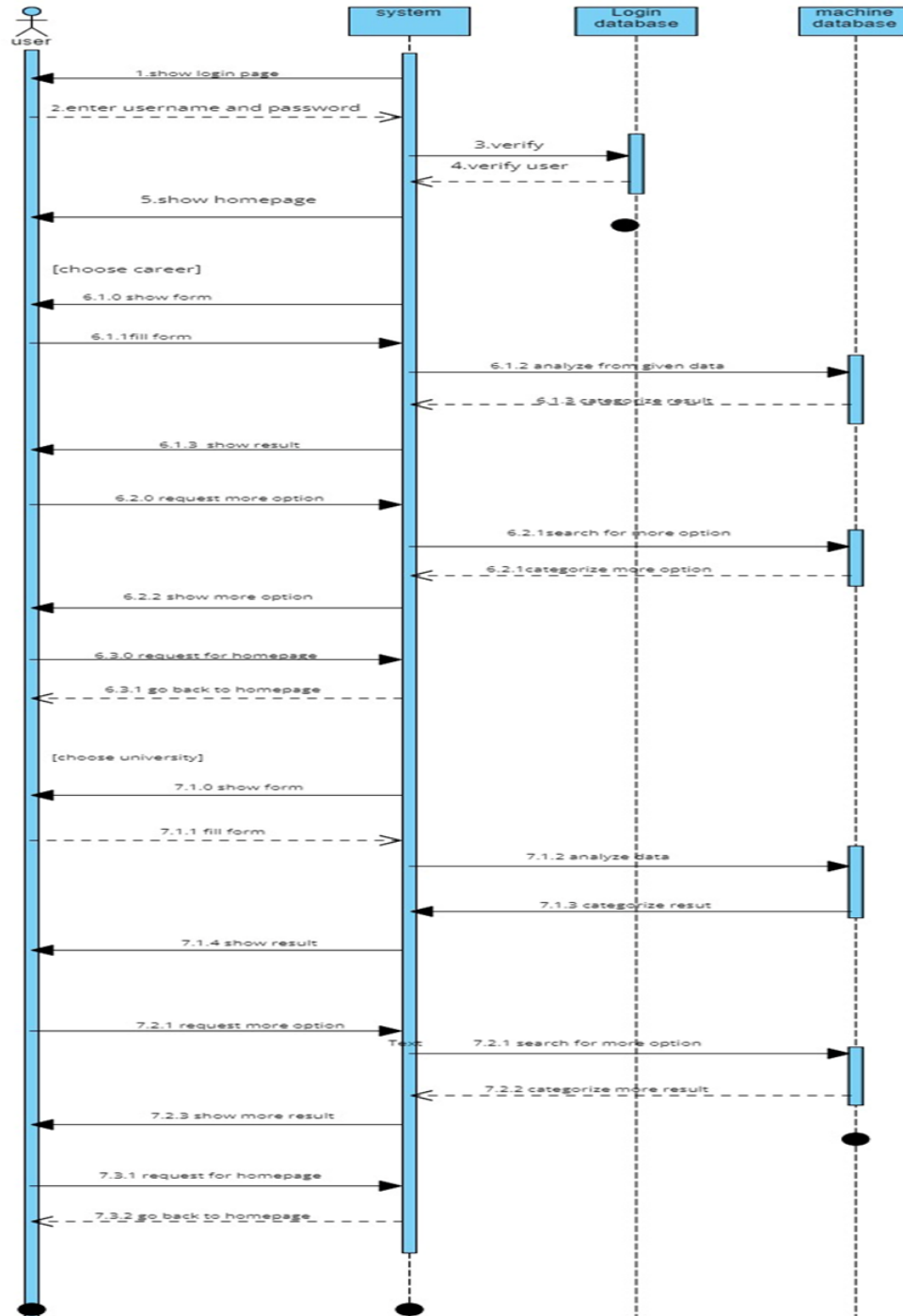
- **Platform:**
The application will be designed to run on the MERN (MongoDB, Express.js, React, Node.js) stack, ensuring a robust and scalable foundation.
- **System Hosting:**
Hosting will be cloud-based, leveraging services like AWS or Azure for flexibility, scalability, and efficient resource management.
- **Connectivity Requirements**
Stable internet connectivity will be a prerequisite, leading to real-time data processing interactions.
- **Modes of Operations:**
The application will operate in online mode, providing users with instant access to personalized career guidance and educational insights.

4.5 Architecture Evaluation

We chose the MERN (MongoDB, Express.js, React.js, Node.js) stack because our team knows how to use these technologies well. We've learned about them, so we understand how they work together to build web apps. Adding machine learning to our system makes it even better. Machine learning helps us understand data and make guesses, so we can give advice to users. By putting machine learning with the MERN stack, we're making our system smarter and more helpful. It's like adding an extra layer of cleverness to a strong base (the MERN stack). This makes our system a great tool for exploring jobs. We want our system to be easy for students to understand and use. We want them to feel sure about their choices for the future. With the MERN stack and machine learning, we believe we can do that. By continuously refining our approach and leveraging these advanced technologies, we aim to create a seamless and intuitive experience for all users. We are excited about the potential impact of our system in helping students confidently navigate their career paths.

Chapter 5. Detailed Design and Implementation

5.1 Component-Component Interface



5.2 Component-External Entities Interface

- **User Authentication component:**

This module is responsible for verifying users' identities during signup or login. It interacts with the User Profile module to access user data needed for authentication. When a user attempts to sign in, the User Authentication module requests the necessary user information from the User Profile module to verify their identity. Once authentication is successful, the User Authentication module grants access to the user.

- **User Profile component:**

The User Profile module stores and manages user data, including preferences and academic records. It communicates with the User Authentication module to provide the required user information for authentication. Additionally, the Career Recommendation Engine interacts with the User Profile module to access user preferences and academic records needed to generate personalized career suggestions. This module serves as a central repository for user data that is utilized by various components of Vision Forge.

- **Career Recommendation component:**

This component generates personalized career suggestions based on user data, such as preferences and academic records. It interacts with the User Profile module to access this user data and Machine Learning component to predict results. When a user requests career recommendations, the Career Recommendation Engine retrieves relevant information from the User Profile module to tailor the suggestions to the user's individual needs and aspirations.

- **Machine Learning component:**

The Machine Learning module utilizes machine learning algorithms to analyze user data and provide insights for career recommendations. It interacts with the Career Recommendation Engine to enhance the accuracy of the recommendations. By leveraging machine learning techniques, this module can uncover patterns and trends in user data that may not be immediately apparent, leading to more refined and accurate career suggestions. The Career Recommendation Engine utilizes the insights provided by the Machine Learning module to improve the quality of its recommendations, creating a feedback loop that continuously enhances the user experience.

- **University Eligibility Module:**

This module allows users to input their grades and courses to determine eligibility for universities. It interacts with the User Profile module to access user academic records for input. After processing, it communicates with external university APIs to fetch eligibility criteria. Once completed, it provides the eligibility list back to the User Profile module for user viewing and career exploration within Vision Forge.

5.3 Component-Human Interface

In our project, we follow several Human-Computer Interaction (HCI) norms to ensure an intuitive and user-friendly interface. Some of these norms include:

1. **Consistency:** We maintain consistency in the interface design by using standardized elements such as buttons, menus, and navigation bars across all screens. Consistency helps users predict the behavior of the interface and reduces cognitive load.
2. **Feedback:** We provide immediate and informative feedback to users for every action they perform. This includes visual feedback such as animation or color changes or toasts to indicate that an action has been successfully executed or if there's an error.
3. **Visibility:** We ensure that all important features and functionalities are visible and easily accessible to users. We avoid hiding critical elements or burying them in menus, as this can frustrate users and hinder their ability to accomplish tasks.
4. **User Control:** We give users control over the interface by allowing them to customize settings, adjust preferences, and navigate freely. Providing user control enhances the sense of agency and empowers users to tailor the interface to their needs.
5. **Simplicity:** We strive for simplicity in the interface design, avoiding unnecessary complexity and clutter. We use clear and concise language, minimize the number of steps required to complete tasks, and prioritize essential information to enhance usability.
6. **Accessibility:** We design the interface to be accessible to users with diverse needs, including those with disabilities. We follow accessibility guidelines such as WCAG (Web Content Accessibility Guidelines) to ensure that all users can access and interact with the interface effectively.

Screens that Receive Input from User

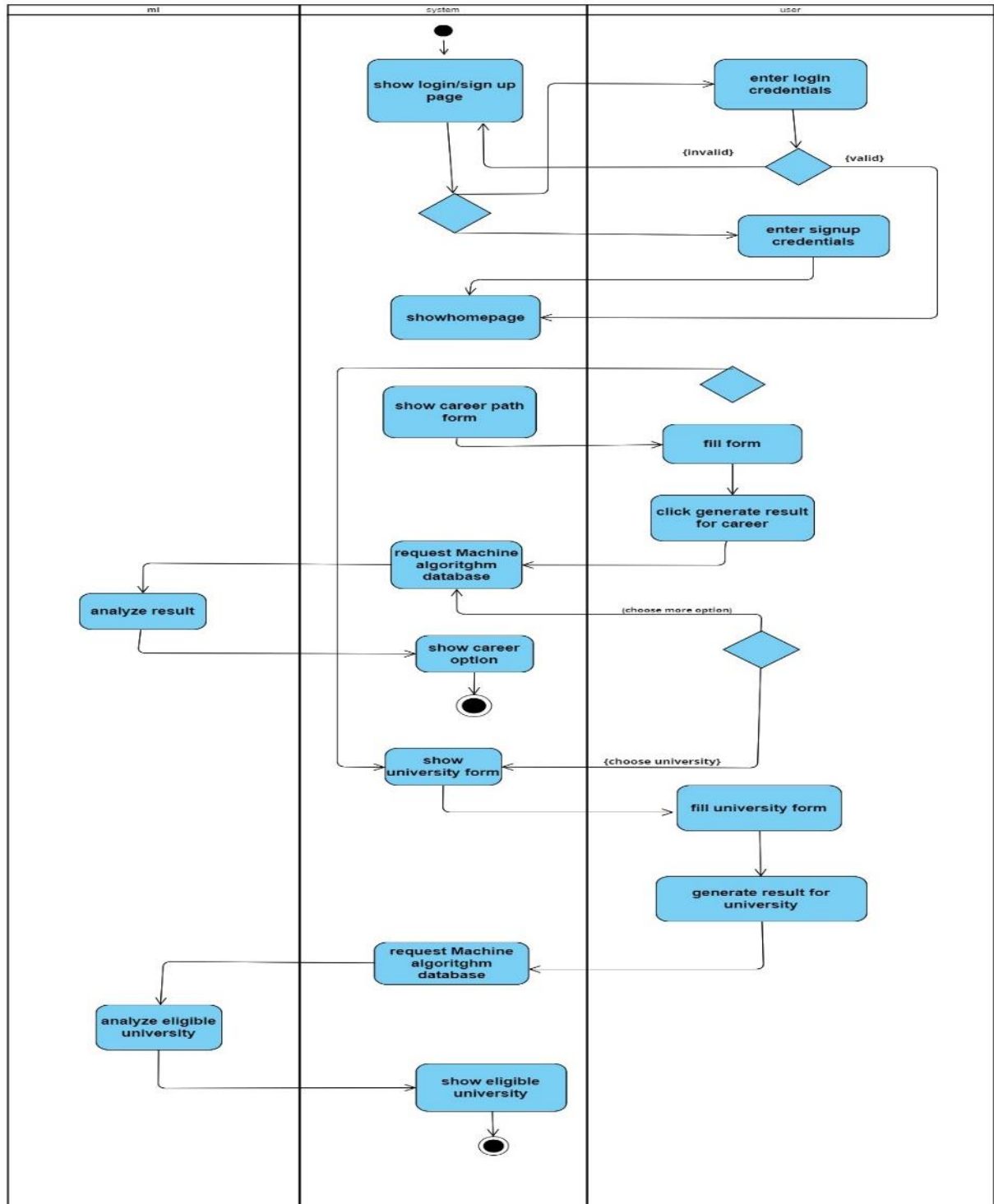
- Login Screen
- Sign Up Screen
- Career Form
- Selecting University Form

Screens That Provide Output to User

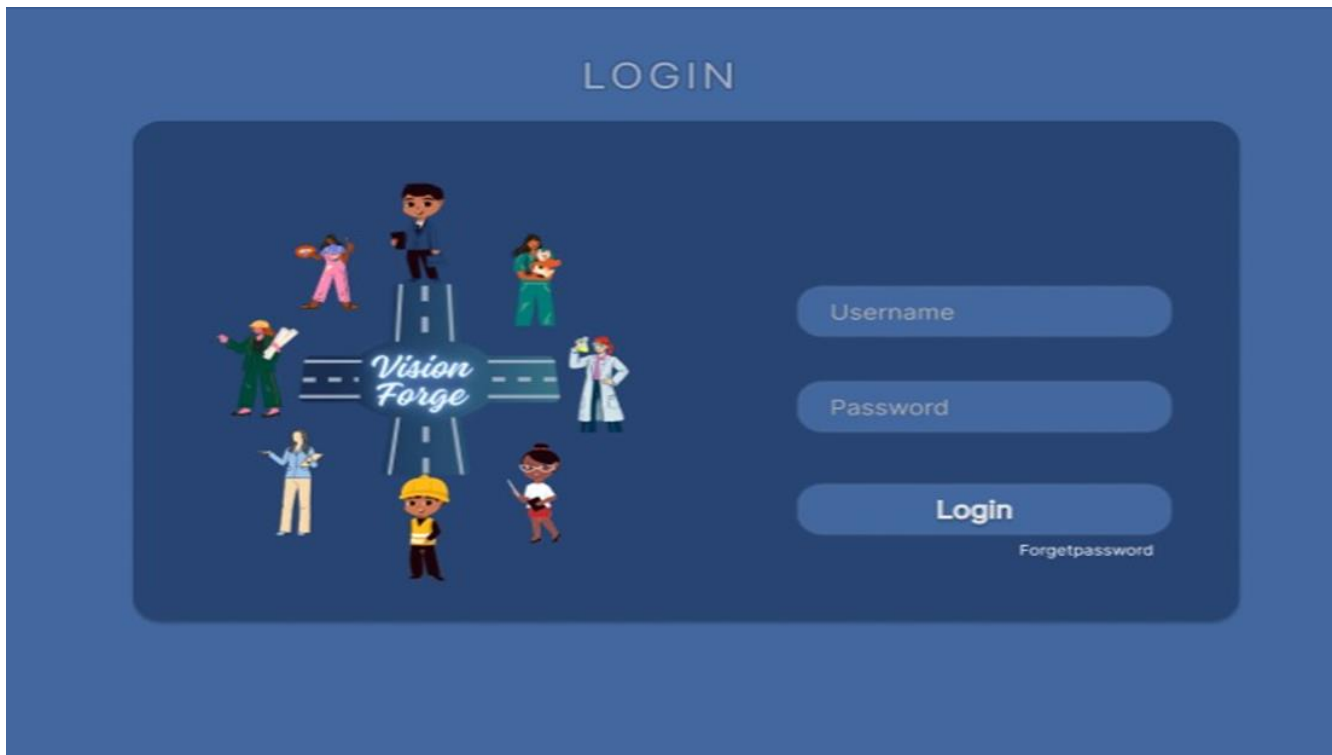
- Home Screen
- Career Suggestions Screen
- University Suggestions Screen

5.4 Screenshots/Prototype

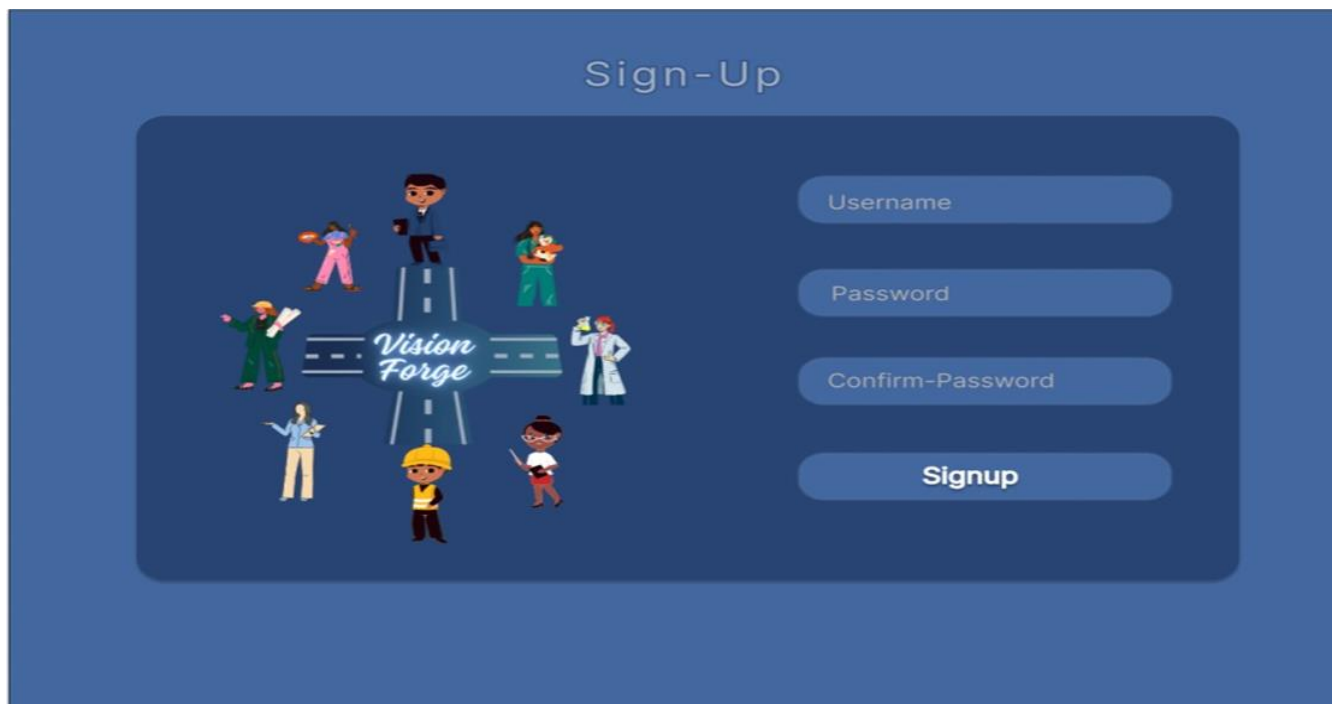
5.4.1 Workflow



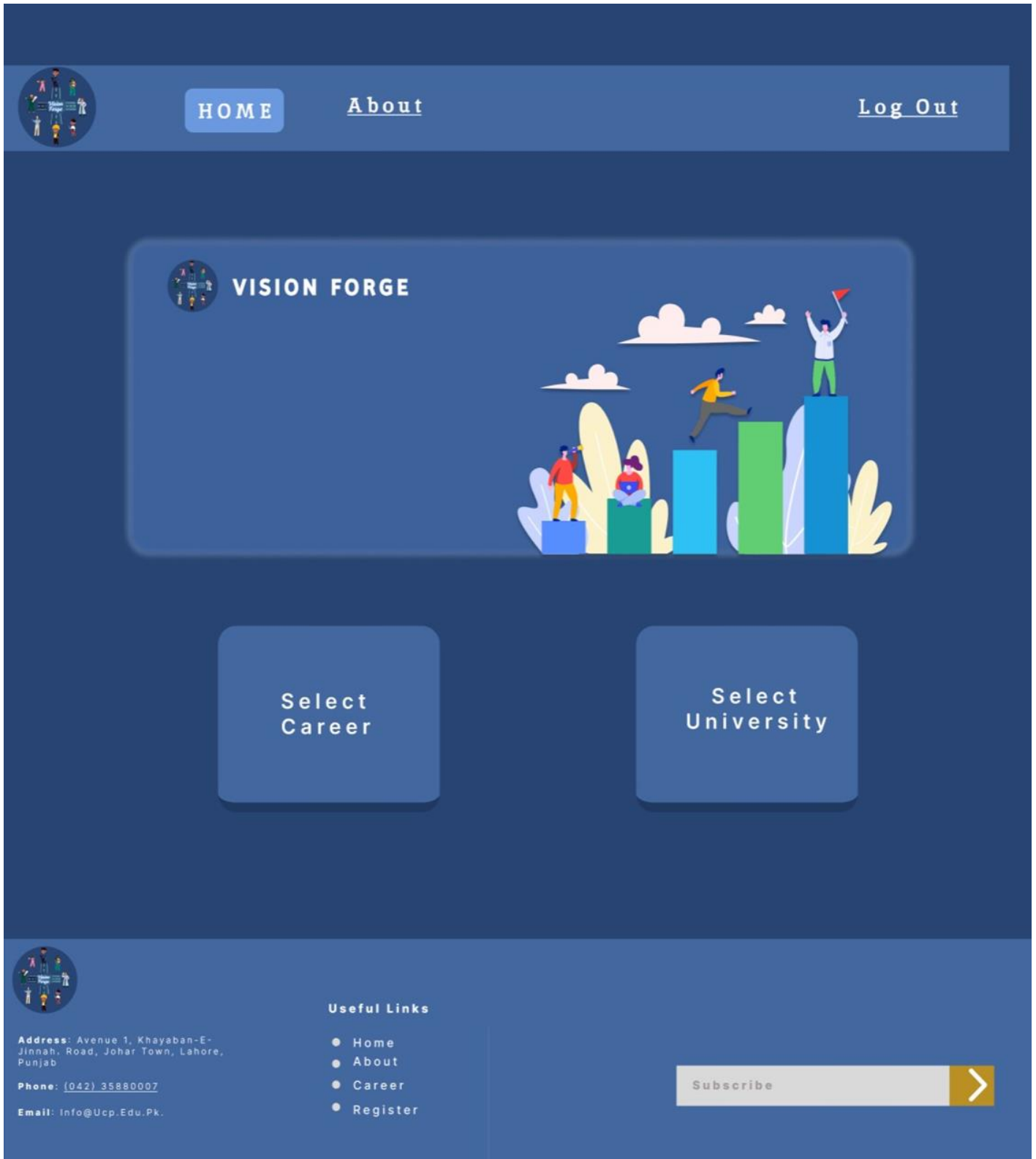
5.4.2 Screens



This is the login Page where user will enter his credentials through which he registered himself as a user in this and the he will be able to access the system.



This is Sign Up page where user will enter his name, email and password to register himself as a user and he come again to use this system through these credentials.



This is the home page where user will come after logging in and then he will have two features to use. One for career recommendation and other for university eligibility.

Select A Career

Name

Matriculation Field:

Matriculation Marks:

Intermediate Field

Intermediate Marks:

Your Field Of Interest

SUBMIT

This is the career form where user will enter his previous academic data and the fields of interests he has. User can choose multiple interests.

Select A University

Career Field Name

Matriculation Field:


Matriculation Marks:

Intermediate Field

Intermediate Marks:

SUBMIT


This is the university eligibility form where user will enter his course to study and his marks. It will check through the available universities that where that course is offered and are his marks eligible to study in that university.

**VISION FORGE**


UserLogout

Your Personality Test is Complete


Following is the List Of Careers That Are Suitable For You




Computer
Programmer



Business
Analyst



Electrical
Engineer




Address: Avenue 1, Khayaban-E-
Jinnah, Road, Johar Town, Lahore,
Punjab
Phone: (042) 35880007
Email: Info@Ucp.Edu.Pk.

Useful Links

- Home
- About
- Career
- Register

Subscribe>


This is the result page for career recommendations. It will be displayed as a result of input data you gave in career form. That data will be processed and display courses suitable to that data like this.

**VISION FORGE**


UserLogout

Your Personality Test is Complete


Following is the List Of Careers That Are Suitable For You




**UCP
UNIVERSITY**



**FAST
UNIVERSITY**



**COMSATS
UNIVERSITY**



Address: Avenue 1, Khayaban-E-Jinnah, Road, Johar Town, Lahore, Punjab
Phone: (042) 35880007
Email: Info@Ucp.Edu.Pk.

Useful Links

- Home
- About
- Career
- Register

Subscribe>

This is the result page for university feature. It will be displayed as a result of input data you gave in university eligibility form. That data will be processed and display universities suitable to that data like this.

Chapter 6. Test Specification and Results

6.1 Test Case Specification

Identifier	TC-1
Related requirements(s)	Security controls, authentication, session management
Short description	Test case for logging into the application
Pre-condition(s)	User already sign up
Input data	Username, Password
Detailed steps	<ol style="list-style-type: none"> 1. Open the system login page. 2. Enter valid username and password. 3. Click on the "Login" button.
Expected result(s)	The system should authenticate the user and redirect them to the homepage.
Post-condition(s)	User is logged in and can access the system features
Actual result(s)	User is successfully redirected to the dashboard/homepage after entering valid credentials.
Test Case Result	Pass

Table 6.1.1

Identifier	TC-2
Related requirements(s)	Customization and personalization, data privacy and security
Short description	Test case for evaluating the functionality of assisting with career path decisions.
Pre-condition(s)	The User is already logged in
Input data	Student's academic records, interests, and career goals.
Detailed steps	<ol style="list-style-type: none"> 1.Open the system login page. 2.Log in with valid credentials or create a new account if necessary. 3.Input academic records, including grades and courses completed. 4.Input interests 5.Specify career goals or areas of interest. 6.Submit the input data
Expected result(s)	<ul style="list-style-type: none"> • The system generates personalized career suggestions based on the input data. • Relevant career options are displayed, along with recommended courses to pursue.
Post-condition(s)	The user receives tailored career guidance and recommendations.
Actual result(s)	The system successfully generates personalized career suggestions, recommends relevant courses based on the input data.
Test Case Result	Pass

Table 6.1.2

Identifier	TC-3
Related requirements(s)	Accuracy, reliability, performance
Short description	Test case for evaluating the functionality of determining university eligibility based on academic records and career goals.
Pre-condition(s)	User already sign up
Input data	Student's academic records, desired career path.
Detailed steps	<ol style="list-style-type: none"> 1.Open the system login page. 2.Log in with valid credentials or create a new account if necessary. 3.Navigate to the "University Eligibility" section. <p>Input academic records, including grades and courses completed.</p> <ol style="list-style-type: none"> 4.Specify the desired career path or area of study. 5.Submit the input data.
Expected result(s)	<ul style="list-style-type: none"> • The system evaluates the input academic records against admission criteria for relevant universities. • It generates a list of universities where the student meets the eligibility requirements.
Post-condition(s)	The user receives a list of universities where they are eligible for admission based on their academic records and desired career path.
Actual result(s)	The system successfully evaluates the input academic records and generates a list of eligible universities based on the specified career path.
Test Case Result	Pass

Table 6.1.3

Identifier	TC-4
Related requirements(s)	Customization and personalization, data privacy and security
Short description	Test case for evaluating the handling of invalid input data in the career guidance section
Pre-condition(s)	1.The system is accessible and properly configured. 2.User is logged in
Input data	Invalid academic records or incomplete input
Detailed steps	1.Open the system login page. 2.Log in with valid credentials or create a new account if necessary. 3.Input incomplete or incorrect academic records, such as missing grades or incomplete course information. 4.Submit the input data
Expected result(s)	<ul style="list-style-type: none"> • The system should detect the invalid input and display an error message indicating the issue. • It should not generate personalized career suggestions or recommendations.
Post-condition(s)	The user is notified of the invalid input and prompted to correct it.
Actual result(s)	The system fails to detect invalid input and proceeds to generate career suggestions based on incomplete or incorrect data.
Test Case Result	Fail

Table 6.1.4

6.2 Summary of Test Results

Module Name	Test cases run	Number of defects found	Number of defects corrected so far	Number of defects still need to be corrected
Authentication	TC-1	0	0	0
Career Guidance	TC-2, TC-4	1	0	1
University Eligibility	TC-3	0	0	0
Complete System	TC-1 to TC-4	1	0	1

Table 6.2.1

Defects Found:

TC-4: The system fails to detect invalid input and proceeds to generate career suggestions based on incomplete or incorrect data.

Fixing Defect: We fixed this issue by adding some validation on the form page where validations were added for marks and some validations were added for interests like if user has selected computer as interest then only computer related interest should be displayed in results. This made sure the correct execution and better predictions of courses.

Chapter 7. Project Completion Status/Conclusion

Module Name	Status
Front-end	Completed
Dataset Collection and Preparation	Completed
Model Training On dataset	Completed
Backend of system	Completed
API's for University Data	Majorly Implemented
Documentation	Completed
Login authentication and Data retrieval	Completed
Integration of System and Machine Learning Model	Completed
Complete System	Completed

Table 7.1

Target/Objective	Status (Completed, Partially Completed, Not Completed)	Reason(s)
Create an easy-to-use career help system called "Vision Forge" that uses smart technology to give personalized advice.	Completed	–
Give suggestions for careers, recommend courses to take, and check if you can get into different universities.	Completed	–
Compare "Vision Forge" to other career help systems to see which one works better.	Completed	–
See how "Vision Forge" affects students' decisions about their careers and what jobs they end up in.	Partially Completed	Separate study to determine if the career chosen based on interest is being properly focused on
Make sure that "Vision Forge" covers everything students need for career help, and make sure our goals match what we can realistically do in the time we have.	Majorly Implemented	Some university APIs are still pending; ongoing study to determine if recommended courses match students' interests and maintain engagement.

Table 7.2

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<https://www.youtube.com/@codewithyousaf>

Appendix A Glossary

Acronym	Full Form
UML	Unified Modeling Language
SDLC	Software Development Life Cycle
AWS	Amazon Web Services
COTS	Commercial off-the-shelf
API	Application Programming Interface

Appendix B IV & V Report

(Independent verification & validation)

IV & V Resource

Name

Signature

S#	Defect Description	Origin Stage	Status	Fix Time	
				Hours	Minutes
1					
2					
3					
...					

Table B.1: List of non-trivial defects

Appendix C Deployment/Installation Guide

"Vision Forge" is a web-based system designed to assist students in selecting their career paths. Users do not need to install any software to use it. The system will be hosted on a particular domain, and users can access it through the provided URL. Simply open a web browser, enter the URL, and start using the system. "Vision Forge" is free to use, making it accessible to everyone. There is no need for complex installation procedures; just ensure you have an internet connection and a web browser to get started. Enjoy exploring career options effortlessly!

Appendix D User Manual

This guide will help you navigate and use the features of our system efficiently. Vision Forge is designed to provide personalized career and university recommendations based on your academic records and interests.

1- Accessing Vision Forge

1. **Open Web Browser:** Launch your preferred web browser.
2. **Enter URL:** Type the Vision Forge URL (e.g., www.visionforge.com) into the address bar and press Enter.

2- Signing Up

1. **Navigate to Sign Up Page:** On the homepage, click on the "Sign Up" button.
2. **Fill Out Sign Up Form:** Enter the required information, including:
 - Full Name
 - Email Address
 - Password (create a strong password)
 - Confirm Password
3. **Submit Sign Up Form:** Click the "Submit" button to create your account.

3- Logging In

1. **Navigate to Login Page:** On the homepage, click on the "Login" button.
2. **Enter Login Credentials:** Enter your registered email address and password.
3. **Submit Login Form:** Click the "Login" button to access your profile.

4- Home Page

After logging in, you will be directed to the Home page. Here, you have two main options:

1. **Career Path**
2. **University Eligibility**

5- Career Path Feature

1. **Click Career Path:** On the Home page, click the "Career Path" button.
2. **Fill Out Career Path Form:**
 - **Academic Records:** Enter your grades, courses, and any other relevant academic details.
 - **Interests:** Select your areas of interest from the provided list.
3. **Submit Career Path Form:** Click the "Submit" button.
4. **Processing Information:** The system will process your data and display a loading message.
5. **View Recommendations:** After processing, you will see a list of recommended courses tailored to your academic background and interests.
6. **Navigate:** You can either:
 - Return to the Home page by clicking the "Home" button.
 - Visit your user profile by clicking the "Profile" button.
 - Log out by clicking the "Logout" button.

6- University Eligibility Feature

1. **Click University Eligibility:** On the Home page, click the "University Eligibility" button.
2. **Fill Out University Eligibility Form:**
 - Personal Details: Enter your name, email, and other required personal information.
 - Academic Records: Provide details about your grades, test scores, and any other relevant academic achievements.
3. **Submit University Eligibility Form:** Click the "Submit" button.
4. **Processing Information:** The system will process your data and display a loading message.
5. **View Universities:** After processing, you will see a list of universities that match your academic profile.
6. **Navigate:** You can either:
 - Return to the Home page by clicking the "Home" button.
 - Visit your user profile by clicking the "Profile" button.
 - Log out by clicking the "Logout" button.

7- User Profile

1. **Access Profile:** Click on the "Profile" button either from the Home page or after receiving recommendations.
2. **View/Edit Information:** In your profile, you can view and edit your personal and academic information.
3. **Save Changes:** After making any changes, click the "Save" button to update your profile.

8- Logging Out

1. **Click Logout:** To log out of the system, click the "Logout" button available on any page.
2. **Confirm Logout:** You will be redirected to the login page, confirming that you have been logged out.