CAREER GUIDANCE MANAGEMENT SYSTEM

A PROJECT REPORT
for
Project (KCA-451)
Session (2023-24)

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Submitted in partial fulfilment of the
Requirements for the Degree of

MASTER OF COMPUTER APPLICATION

Under the Supervision of
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Submitted to

DEPARTMENT OF COMPUTER APPLICATIONS
KIET Group of Institutions, Ghaziabad
Uttar Pradesh-201206

(MAY 2024)

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CAREER GUIDANCE MANAGEMENT SYSTEM

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ABSTRACT

Career choice has a pivotal role in college students' life planning. In today's world choosing the right career is the toughest decision. Today many students are confused about their future. They do possess some skills but they are not able to identify their abilities and a proper domain. Different people suggest different career options but at last, the student has to select their career. In this project, we have focused on this problem of the student using machine learning. With the help of machine learning, we will help the student to decide which is the best career option and domain for them using different machine learning techniques. The career is decided based on academic information filled by the student. This project will help the student to get directed towards a specific domain as per their skills.

Over the past few years several systems have been built to help students select the right career path by predicting the best career option based on their academic factors. However, academic factors are not the only relevant factor, we do need to consider one's cognitive abilities and psychometric factors too; such as, speed, learning capacity, endurance and memory to achieve the best career outcomes. However, in order to develop a system that will predict one's career based on both academic and psychometric factors we need to select a classification algorithm like SVM (Support Vector Machine) that will provide the best accuracy rate.

Keywords: Machine Learning, Web Development, Course Recommendation System, career Prediction.

ACKNOWLEDGEMENTS

Success in life is never attained single-handedly. My deepest gratitude goes to my project supervisor, **Ms. Divya Singhal** for her guidance, help, and encouragement throughout my project work. Their enlightening ideas, comments, and suggestions.

Words are not enough to express my gratitude to **Dr. Arun Kumar Tripathi**, Professor and Head, Department of Computer Applications, for his insightful comments and administrative help on various occasions.

Fortunately, I have many understanding friends, who have helped me a lot on many critical conditions.

Finally, my sincere thanks go to my family members and all those who have directly and indirectly provided me with moral support and other kind of help. Without their support, completion of this work would not have been possible in time. They keep my life filled with enjoyment and happiness.

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INTRODUCTION

1.1 Project Description

Career guidance can be described as a process through which students become familiar with various career options, job opportunities and are prepared for those opportunities. Career counselling is the approach that will allow the student to understand his options, find his best skills and get acquainted with the world of work in order to make choices about employment, education and life.

Competition in today's society is heavily multiplying day by day. It is too hard in the present day to face the technical world. So as to compete and reach the goal of students, they need to be planned and organized from the initial and final stages of their education. So, it's important to perpetually assess their performance, establish their interests and assess how close they're to their goal and assess whether or not they are within the right path that directs towards their target. This helps them in improving themselves, motivating themselves to a better career path if their capabilities are not up to the mark to reach their goal and pre evaluate themselves before going to the career peak point. Not only that, recruiters while recruiting people into their companies evaluate candidates on different parameters and draw a final conclusion to select an employee or not and if selected, finds a relevant stream and career area to student. There are many types of roles like Database administrator, Business Process Analyst, Developer, Testing Manager, Networks Manager, Data scientist and so on. All these roles require some prerequisite knowledge in them to be placed in them. So, recruiters analyse candidates' performance in skills, talents and interests and place the candidate in the right job role suited for them. These kinds of prediction systems make their recruitment tasks very easy because as the inputs are given, recommendation is done based on inputs. Though the career counsellors may assist the students many times it would be difficult for them to completely understand the inclination of the students, academics and thus the counselling process may be limited. Also, not all students would be privileged to avail of such facilities. Globally there are some attempts in this area, but we need to work on this area for our students. Hence, we would be working on

the web-based application, henceforth referred to as “Intelligent Career Planning & Guidance Assistant”

Intelligent Career Planning & Guidance Assistant is a computer program built with the help of experts where the details of the students and their aptitudes help finding the right course for their future. Choosing the right field after engineering is a very important life decision. Many Machine learning techniques have been applied to develop student performance prediction algorithms.

The proposed solution is a web-based application for engineering students early enough to:

a. Understand their inclination

b. Enhance understanding of their personality types

c. Educate on the various options

d. Enable them for their career planning, development, and guidance.

e. Provide guidance on a continuous basis

f. Make information available on career, education, etc. through sources

g. Assist from choosing wrong options h. Be a partner in the overall journey

1.2 Literature Review

Many machine learning techniques have been applied to develop prediction algorithms. There are mainly two issues while developing this sort of model one is whether the student is willing to build his career based on his interests and compassions and whether the student has proper identification of improving his Skills by pursuing certification courses based on the interests of the students. So questionnaires are developed in this model that must classify the reflections of the student outcomes. We are doing a comprehensive study of the career-related aspects including the current situation, opportunities, and possible options. This would involve surveys with specific questionnaires, interviews with the relevant industry leaders, reference materials, etc. According to Watts and Fretwell generally, the aim of Career Guidance is to help students make decisions based on their interests, passion, and abilities, while taking into account current

and future career opportunities. Students are encouraged to learn more about the world of work across different industries so that they may take the right steps to obtain their objectives and goals/aspirations. Another perspective indicated that Career guidance can be referred to as services and activities intended to assist individuals, of any age and at any point throughout their lives, to make educational, training, and occupational choices and to manage their career. "Career guidance" denotes systematic programs that facilitate individual career development and career management. Behdad Bankshinategh, Gerasimos Spanakis, Osmar Zaiane, and Samira ElAtia Pal conducted a study in India, to determine factors that most heavily affected student performance. They first utilized the classic Collaborative Filtering (CF) method for their study for achieving various goals in their research. They have used these algorithms on the real-time data sets but it is done on data mining and some tools are weak for mining the data. A second challenge lies with the scalability of the algorithm. To have a reasonable response time for making recommendations to a high number of students might raise the need to include new techniques. In this challenge the also tried matrix factorization will be explored, as well as explore how performance can be boosted. However, since this research focuses on predicting student academic motivation using data mining methods and only, this review of literature presents only the results from several relevant studies that have used diverse predictors available from different files and various methods for predicting academic motivation within the online learning environment.

The objective of the Career Guidance Management System project is to develop a sophisticated platform that utilizes Artificial Intelligence (AI) and Machine Learning (ML) technologies to provide personalized career guidance to individuals. The system aims to empower users with tailored recommendations based on their unique preferences, skills, and career aspirations, thereby assisting them in making informed decisions about their professional development. Key objectives include:

1.3 Recommendation System

Designing a recommendation system for a Career Guidance Management System (CGMS) using Artificial Intelligence (AI) and Machine Learning (ML) involves several key components and considerations. The first step is user profiling, which includes gathering data on user preferences, skills, interests, educational background, work experience, and career aspirations. This data can be collected through surveys, user inputs, and by integrating information from

social media or professional networks like LinkedIn. Relevant features are then extracted from this data, such as key skills, preferred industries, job roles, and personality traits.

Next, comprehensive career path data is required. This involves collecting information on various career paths, job roles, required skills, industry trends, and salary statistics from job portals, industry reports, and government employment data. Metrics for career success, such as job satisfaction, career growth rate, stability, and work-life balance, are defined based on surveys and historical data.

The recommendation engine can be built using collaborative filtering techniques, which involve user-based and item-based collaborative filtering to recommend careers based on similarities between users with similar profiles and preferences. Content-based filtering is also used to recommend careers by matching user profiles with job descriptions and career paths based on skills, interests, and other attributes. Combining collaborative and content-based filtering results in hybrid models that improve recommendation accuracy.

Machine learning models play a crucial role. Classification algorithms like decision trees, random forests, and support vector machines (SVMs) can predict suitable career paths based on user features. Clustering techniques like k-means and hierarchical clustering group similar users to recommend career paths popular within those clusters. Deep learning models, such as neural networks and recurrent neural networks, are implemented to capture complex patterns in user data and career paths.

A feedback loop is essential for continuous improvement. User feedback on the recommendations provided, such as their satisfaction, relevance, and outcomes, is continuously collected. This feedback is used to retrain and refine the recommendation models, enhancing accuracy and relevance over time.

The implementation process begins with data preparation, including collecting and preprocessing user and job market data, handling missing values, normalizing data, and performing feature engineering. Machine learning models are then developed and trained using the prepared data, followed by validation and testing to ensure they provide accurate and relevant recommendations. Integration involves connecting the recommendation engine with the CGMS platform and developing user interfaces that allow users to input their data and receive personalized career recommendations.

Deployment on a scalable cloud platform ensures efficient handling of user requests, and security measures are implemented to protect user data and ensure privacy. Monitoring and maintenance involve tracking the performance of the recommendation system and regularly updating it with new data and user feedback to maintain its effectiveness.

Challenges include ensuring data privacy and compliance with regulations like GDPR, addressing potential biases in the data and models to ensure fair and unbiased recommendations, designing the system for scalability to handle a large number of users, and developing engaging interfaces that provide actionable insights to maintain user interest and trust.

In a typical workflow, users sign up and provide detailed information about their background, skills, and career aspirations, which the system analyzes to create a user profile. The recommendation engine then processes this profile to provide a list of suggested career paths. Users can explore these recommendations, read about required skills, job descriptions, and market trends, and provide feedback on the recommendations. The system updates its models based on this feedback, refining future recommendations. Ongoing guidance is offered, such as skill development courses, job openings, and networking opportunities, with users receiving periodic updates and new recommendations based on their evolving profiles and market trends.

Leveraging AI and ML, a CGMS can provide highly personalized and effective career guidance, helping users navigate their career paths with greater confidence and success.

1.4 Machine Learning

K-Nearest Neighbors (KNN) is a simple, yet powerful supervised machine learning algorithm used for both classification and regression tasks. It is based on the idea that data points with similar features are likely to belong to the same category.

In the training phase, KNN stores the training dataset without explicitly training a model, which is why it’s known as a lazy learner. During the prediction phase, when given a new data point, KNN calculates the distance between this point and all points in the training dataset using common distance metrics like Euclidean distance, Manhattan distance, or Minkowski distance. It then identifies the 'k' nearest neighbors to the new data point. The value of 'k' is a hyperparameter chosen through cross-validation. For classification tasks, KNN assigns the

class most common among the 'k' nearest neighbors, while for regression tasks, it predicts the value as the average of the values of the 'k' nearest neighbors.

Choosing the value of 'k' is crucial as it affects the performance of the KNN algorithm. A small 'k' value can lead to high variance and potential overfitting, as the algorithm becomes too sensitive to noise in the training data. A large 'k' value can lead to high bias and potential underfitting, as the algorithm becomes too general and may miss finer details in the data. Cross-validation is typically used to select an optimal 'k' value that balances bias and variance.

KNN offers several advantages. Its simplicity makes it easy to understand and implement, and because it’s a lazy learner, there is no explicit training phase, making it quick to set up. It is versatile, capable of handling both classification and regression tasks, multi-class classification problems, and non-linear decision boundaries by adjusting the distance metric and 'k' value. However, KNN also has disadvantages. The need to compute distances to all training points for each prediction makes it computationally expensive for large datasets. Storing the entire training dataset requires significant memory, especially with large datasets. The performance can degrade with high-dimensional data because the distance between points becomes less meaningful, a phenomenon known as the curse of dimensionality. Additionally, KNN is sensitive to irrelevant features as all features are treated equally in the distance calculation.

KNN is applied in various domains. It is used in recommendation systems to suggest items based on the preferences of similar users, in image recognition to classify images by finding similar ones in the training set, and in pattern recognition tasks such as handwriting and speech recognition. It also finds applications in medical diagnosis, predicting diseases by comparing patient symptoms with historical medical data of similar patients.

A typical workflow for KNN involves data preparation, which includes collecting and preprocessing data, such as normalization or standardization of features, and splitting the data into training and test sets. The model implementation involves choosing a value for 'k', calculating the distance to all training points for each test point, identifying the 'k' nearest neighbors, performing a majority vote among the neighbors to assign a class for classification, or averaging the values of the neighbors for regression. Evaluation metrics like accuracy, precision, recall, and F1-score for classification tasks, and Mean Absolute Error (MAE) or Mean Squared Error (MSE) for regression tasks, are used to evaluate the model's performance. Cross-validation is used to find the optimal 'k' and to ensure the model's robustness. Optimization involves experimenting with different distance metrics and feature scaling

methods, and using feature selection techniques to remove irrelevant features and improve performance.

In summary, K-Nearest Neighbors is a versatile and straightforward algorithm that works well for various applications, provided the dataset is appropriately prepared and the value of 'k' is carefully chosen.

1.5- Objective Of the Project

1. Personalization: To create a personalized experience for users by analyzing their profiles, preferences, and goals, and generating customized career paths and recommendations.

2. Real-time Insights: To provide users with real-time insights into emerging industries, in-demand skills, and evolving job market trends, enabling proactive decision-making.

3. Skill Development: To offer recommendations for educational and skill development opportunities tailored to users' career goals and market demands, facilitating continuous learning and professional growth.

4. User Engagement: To enhance user engagement through interactive features such as career quizzes, skill assessment modules, and access to a comprehensive database of occupations and resources.

5. Collaboration: To facilitate communication between users and career advisors, enabling personalized guidance and mentorship to support users in achieving their career objectives.

1.6 Key features:

1. Personalized Recommendations: The system provides personalized career recommendations based on individual profiles, preferences, skills, and career goals, ensuring relevance and effectiveness in guiding users towards suitable career paths.

2. AI and ML Algorithms: Leveraging AI and ML algorithms, the system continuously learns from user interactions and feedback to refine recommendations over time, enhancing accuracy and relevance.

3. Real-time Insights: Users gain access to real-time insights into emerging industries, in-demand skills, and job market trends, enabling proactive decision-making and adaptation to changing market dynamics.

4. Skill Assessment Modules: The system offers interactive skill assessment modules to evaluate users' strengths and areas for improvement, guiding them towards relevant educational and skill development opportunities.

5. Comprehensive Database: A comprehensive database of occupations, industries, educational resources, and job opportunities provides users with access to a wealth of information to support their career exploration and decision-making.

6. User-friendly Interface: An intuitive and user-friendly interface enhances the overall user experience, making it easy for individuals to navigate the system, access relevant information, and interact with various features.

7. Communication Platform: The system facilitates communication between users and career advisors, enabling personalized guidance, mentorship, and support to assist users in achieving their career objectives effectively.

1.7- Scope of the Project

1. User Profiling: Developing mechanisms to gather and analyze user data such as educational background, skills, interests, and career goals to create personalized profiles.

2. AI and ML Integration: Implementing AI and ML algorithms to process user data, generate personalized career recommendations, and continuously improve the system's accuracy over time.

3.Real-time Market Analysis: Integrating features to provide users with real-time insights into industry trends, job market demands, emerging fields, and in-demand skills to guide their decision-making.

4. Skill Assessment and Development: Designing modules for assessing users' skills, strengths, and areas for improvement, and recommending relevant educational and skill development opportunities to enhance their employability.

5. Comprehensive Database Management: Curating and maintaining a comprehensive database of occupations, industries, educational resources, job opportunities, and other relevant information to support users' career exploration and decision-making.

6. User Interface and Experience: Developing an intuitive and user-friendly interface that allows users to easily navigate the system, access relevant information, interact with features, and receive personalized recommendations.

7.Communication and Collaboration: Implementing communication channels to facilitate interaction between users and career advisors, mentors, or peers, enabling personalized guidance, mentorship, and support.

8.Scalability and Adaptability: Designing the system to be scalable and adaptable to accommodate changes in user needs, technological advancements, and evolving job market dynamics.

1.8 -Software /Hardware Requirement

Software

We would be using the following technology stack for this project:

● HTML

● CSS

● JavaScript

● Bootstrap

● PHP

● Python

● MySQL Database

Hardware

- Processor: Intel Core i5 or equivalent
- RAM: Minimum 8GB
- Storage: SSD
- Network Interface: Gigabit Ethernet

CHAPTER-2

Problem Identification & Feasibility Study

2.1- Problem Identification

The Career Guidance Management System project faces several critical challenges that must be addressed for its successful implementation and operation. Firstly, ensuring data privacy and security is paramount due to the sensitive nature of user information, such as personal details, career interests, and educational backgrounds. To safeguard this data effectively, the system must comply with stringent data protection regulations such as the General Data Protection Regulation (GDPR) in Europe or the California Consumer Privacy Act (CCPA) in the United States. Implementing robust security measures, including encryption, secure user authentication, and regular security audits, is necessary to protect against data breaches and unauthorized access.

Secondly, mitigating algorithm bias is essential to prevent skewed recommendations or unfair outcomes that could disadvantage certain groups of users. This involves regularly monitoring the algorithms for biases and making necessary adjustments to ensure fairness and equity. Employing diverse datasets, involving a broad range of user demographics in testing phases, and continuously refining the recommendation models are critical steps to minimize bias and promote inclusivity.

Maintaining accuracy and reliability in the system's recommendations is also crucial for building user trust and satisfaction. The system must provide relevant and up-to-date career advice based on accurate data and reliable algorithms. This requires regular updates to the database, incorporating the latest job market trends, industry requirements, and educational pathways. Ensuring the recommendations are well-researched and evidence-based can help establish credibility and reliability. Encouraging user engagement and adoption poses another significant challenge, especially among individuals unfamiliar with technology-based solutions. To address this, the system should feature user-friendly interfaces that are intuitive and easy to navigate. Providing clear communication about the system's benefits, including success stories and user testimonials, can also help in promoting adoption. Offering training sessions, tutorials, and support services can further assist users in becoming comfortable with the system.

Additionally, keeping up with the dynamic job market requires continuous monitoring and updating of the system's database and recommendations. The job market is ever-evolving, with new roles emerging and existing ones changing. To remain relevant, the system needs to integrate real-time labor market information, including job postings, industry trends, and educational advancements. This can be achieved through partnerships with educational

institutions, industry bodies, and labor market analytics firms.Resource constraints, including time, expertise, and funding, pose challenges to the system's development and maintenance. Developing a sophisticated career guidance system demands a significant investment in terms of skilled personnel, technological infrastructure, and financial resources. Securing adequate funding, hiring experts in data science, career counseling, and software development, and managing project timelines effectively are critical to overcoming these constraints.

Lastly, ensuring accessibility and inclusivity for individuals from diverse backgrounds is essential to provide equitable career guidance. The system should incorporate accessibility features such as screen readers, voice commands, and multilingual support to cater to users with disabilities or those who speak different languages. Considering the diverse needs of users during the design and implementation phases, such as varying educational levels and cultural backgrounds, is crucial to creating an inclusive platform.

Addressing these challenges holistically will contribute to the successful implementation and operation of the Career Guidance Management System, ultimately helping users make informed and fair career choices.

2.2- Feasibility Study

A feasibility study is a comprehensive assessment conducted in the early stages of a project to determine its viability and potential for success. It helps stakeholders make informed decisions by analysing various critical aspects of the proposed project. The primary objective of a feasibility study is to identify potential obstacles and evaluate whether the project can be realistically implemented with the available resources and constraints. By analysing these components, a feasibility study provides a detailed understanding of the project's strengths, weaknesses, opportunities, and threats. It helps in identifying potential problems and developing strategies to address them. The outcome of a feasibility study can lead to a decision to proceed with the project, make adjustments to the proposed plan, or abandon the initiative if it is deemed unfeasible. This ensures that resources are invested wisely and increases the likelihood of project success.

2.2.1-Technical Feasibility:

Technical feasibility assesses whether the proposed system can be developed using existing technology and infrastructure. Key considerations include:

Availability of necessary hardware and software: Determine if the required hardware (servers, storage, networking) and software (development tools, databases, AI/ML frameworks) are readily accessible or need to be acquired.

Expertise and skillsets: Assess if the organization has the technical expertise or can acquire the necessary skills to develop, deploy, and maintain the system. This includes software development, data science, AI/ML, database management, and system administration.

Integration with existing systems: Evaluate how the new system will integrate with existing IT infrastructure, databases, and software applications. Compatibility and interoperability issues need to be addressed to ensure seamless integration and data exchange.

2.2.2- Operational Feasibility:

Operational feasibility examines whether the proposed system will be practical and effective in its day-to-day operations. Key considerations include:

User acceptance: Determine if the system meets the needs and expectations of its intended users. Conduct surveys, interviews, or user testing to gauge user acceptance and identify potential usability issues.

Training and support requirements: Assess the training needs of users and support staff to ensure they can effectively use and maintain the system. Develop training materials, user guides, and support mechanisms to assist users in navigating the system and resolving issues.

Scalability and flexibility: Evaluate the system's ability to accommodate future growth and changes in user requirements. Design the system to be scalable and adaptable, allowing for easy expansion, upgrades, and modifications as needed.

2.2.3-Economic Feasibility:

Economic feasibility analyzes whether the proposed system is financially viable and offers a positive return on investment (ROI). Key considerations include:

Cost-benefit analysis: Estimate the costs associated with developing, implementing, and maintaining the system, including hardware, software, personnel, training, and ongoing support. Compare these costs to the expected benefits, such as increased efficiency, productivity, revenue, or cost savings.

Revenue generation potential: Identify potential revenue streams for the system, such as subscription fees, licensing, advertising, or partnership opportunities. Estimate the revenue potential based on market demand, pricing strategies, and competition.

ROI calculation: Calculate the expected ROI by subtracting the total costs from the total benefits over a defined period. Consider factors such as payback period, net present value (NPV), internal rate of return (IRR), and profitability index (PI) to assess the project's economic feasibility.

By thoroughly assessing technical, operational, and economic feasibility, stakeholders can make informed decisions about the viability and potential success of the proposed system.

CHAPTER -3

Requirement Analysis

3.1 Introduction

Requirement analysis plays a pivotal role in shaping the development lifecycle of the Career Guidance Management System (CGMS). This chapter focuses on meticulously gathering, documenting, and analyzing the functional and non-functional requirements essential for designing and implementing the CGMS.

Requirement analysis plays a pivotal role in shaping the development lifecycle of the Career Guidance Management System (CGMS). This chapter focuses on meticulously gathering, documenting, and analyzing the functional and non-functional requirements essential for designing and implementing the CGMS.

Effective requirement analysis ensures that the CGMS meets the needs and expectations of its users, which may include students, career advisors, and educational institutions. By conducting a thorough requirement analysis, we can identify the key features and functionalities that the system must possess, as well as any constraints and performance criteria it needs to fulfill. This process involves engaging with stakeholders through interviews, surveys, and workshops to understand their needs and translate them into detailed specifications.

Functional requirements detail the specific behaviors and functionalities that the CGMS must provide. These might include features such as user registration and authentication, career assessment tools, personalized career recommendations, and access to resources like job listings, educational programs, and internships. Additionally, the system should support functionalities for career advisors to manage student profiles, track progress, and provide tailored guidance.

Non-functional requirements, on the other hand, encompass the quality attributes of the system. These include performance metrics like response time, scalability to handle a growing number of users, and security measures to protect sensitive data. Usability is another critical non-functional requirement, ensuring that the system is intuitive and easy to navigate for users of all technical skill levels. Furthermore, the system must be reliable, with minimal downtime, and maintainable, allowing for updates and improvements over time.

During the requirement analysis phase, it is also essential to prioritize requirements based on their importance and feasibility. This helps in planning the development phases and allocating resources effectively. Additionally, any potential risks and challenges associated with the requirements should be identified and mitigated early on.

In summary, the requirement analysis chapter lays the foundation for the successful development of the CGMS by providing a clear and comprehensive understanding of what the system needs to achieve. It ensures that all stakeholders are on the same page and that the development team has a well-defined roadmap to follow. By capturing both functional and non-functional requirements in detail, this chapter ensures that the CGMS will be robust, user-friendly, and capable of providing effective career guidance to its users.

3.2 Functional Requirements

Functional requirements specify what the Career Guidance Management System (CGMS) must do to meet the needs of its users and stakeholders. These requirements describe the key features and functionalities that the system must possess to achieve its goals effectively. Below are the primary functional requirements for the CGMS.

3.2.1 User Profile Module

The User Profile Module is central to the CGMS, encompassing functionalities such as user registration, login, and profile management. Users should be able to input their preferences, skills, and career goals, and access personalized recommendations and resources.

3.2.2 Recommendation Engine

The Recommendation Engine is a core component of the CGMS, utilizing AI and ML algorithms to generate tailored career paths, educational opportunities, and skill development recommendations based on user profiles and market trends.

3.2.3 Communication Platform

The Communication Platform facilitates interaction between users and career advisors, mentors, or peers. It should provide channels for personalized guidance, mentorship, and support to assist users in achieving their career objectives effectively.

3.3 Non-Functional Requirements

Non-functional requirements are critical to the success of the Career Guidance Management System (CGMS) as they define the system's operational attributes and overall user experience. These requirements ensure that the CGMS not only performs its intended functions but does so efficiently, securely, and reliably. Below are the key non-functional requirements for the CGMS.

3.3.1 Performance

The CGMS should be responsive, ensuring swift processing of user inputs, recommendations, and updates. Response times should be optimized to enhance user satisfaction and engagement with the system.

3.3.2 Security

Data security is of utmost importance in the CGMS. Measures such as user authentication, encryption of sensitive information, and access controls should be implemented to safeguard user data and maintain confidentiality.

3.3.3 Scalability

The system should be designed to accommodate a growing user base and evolving data requirements. Scalability is crucial for the CGMS to adapt to changes in user needs and technological advancements over time.

3.3.4 Usability

A user-friendly interface is essential for enhancing user adoption and engagement with the CGMS. The system should be intuitive, offering clear navigation, personalized recommendations, and accessible resources to support users in their career exploration and decision-making process.

CHAPTER 4

PROJECT PLANNING AND SCHEDULING

4.1 Introduction

Project planning refers to the phase in project management in which you determine the actual steps to complete a project. This includes laying out timelines, establishing the budget, setting milestones, assessing risks, and solidifying tasks and assigning them to team members.

Project planning is a discipline addressing how to complete a project in a certain timeframe, usually with defined stages and designated resources. One view of project planning divides the activity into these steps:

- Setting measurable objectives
- Identifying deliverables
- Scheduling
- Planning tasks

Why is project planning important?

Project planning is important at every phase of a project. It lays out the basics of a project, including the following:

- Scope
- Objectives
- Goals
- Schedule

Planning enables project managers to turn an intangible idea into reality. Key purposes of planning include the following:

- Facilitate communication and provide a central source of information for project personnel;

- Help the project sponsor and other key stakeholders know what is required;
- Identify who will perform certain tasks, and when and how those tasks will happen;
- Facilitate project management and control as the project progresses;
- Enable effective monitoring and control of a project;
- Manage project risk;
- Generate feedback useful for the next project planning phase.

Fig 4.1 Introduction

4.2 Components of a project plan

The three major parts of a project plan are the scope, budget and timeline. They involve the following aspects:

Scope:

The scope determines what a project team will and will not do. It takes the team's vision, what stakeholders want and the customer's requirements and then determines what's possible. As part of defining the project scope, the project manager must set performance goals.

Budget:

Project managers look at what manpower and other resources will be required to meet the project goals to estimate the project's cost.

Timeline:
This reveals the length of time expected to complete each phase of the project and includes a schedule of milestones that will be met.

How do you create a project plan?

Project planning includes the following 10 steps:

1. **Define stakeholders.** Stakeholders include anyone with an interest in the project. They can include the customer or end user, members of the project team, other people in the organization the project will affect and outside organizations or individuals with an interest.
2. **Define roles.** Each stakeholder's role should be clearly defined. Some people will fill multiple roles, however.
3. **Introduce stakeholders.** Hold a meeting to bring stakeholders together and unify the vision behind the project. The topics covered should include scope, goals, budget, schedule and roles.
4. **Set goals.** Take what is gleaned from the meeting and refine it into a project plan. It should include goals and deliverables that define what the product or service will result in.
5. **Prioritize tasks.** List tasks necessary to meet goals and prioritize them based on importance and interdependencies. A Gantt chart can be helpful for mapping project dependencies.
6. **Create a schedule.** Establish a timeline that considers the resources needed for all the tasks.
7. **Assess risks.** Identify project risks and develop strategies for mitigating them.
8. **Communicate.** Share the plan with all stakeholders and provide communications updates in the format and frequency stakeholders expect.
9. **Reassess.** As milestones are met, revisit the project plan and revise any areas that are not meeting expectations.
10. **Final evaluation.** Once the project is completed, performance should be evaluated to learn from the experience and identify areas to improve.

Fig 4.2 Component of project plan

4.3 The 5 phases of a project

Projects typically pass through five phases. The project lifecycle includes the following:

- **Initiation** defines project goals and objectives. It also is when feasibility is considered, along with how to measure project objectives.
- **Planning** sets out the project scope. It establishes what tasks need to get done and who will do them.
- **Execution** is when the deliverables are created. This is the longest phase of a project. During execution, the plan is set into motion and augmented, if necessary.

- **Monitoring and management** occur during the execution phase and may be considered part of the same step. This phase ensures that the project is going according to plan.
- **Closing and review** is the final Contracts are closed out and the final deliverables are given to the client. Successes and failures are evaluated.

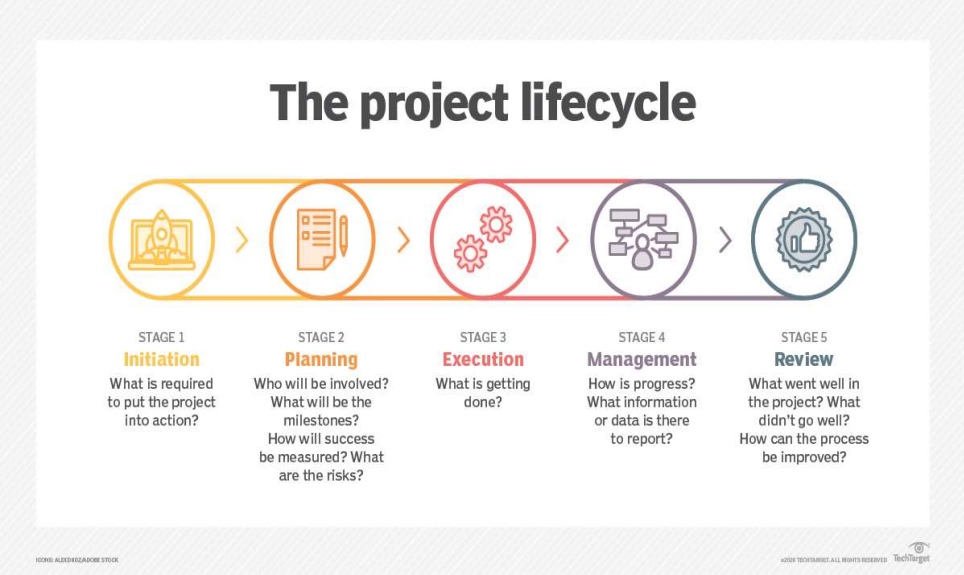


Fig 4.3 5 Phases of Project

Some project planning tools and software

Project planning and project management software facilitate the project planning process. The best tools support collaboration among stakeholders, have intuitive user interfaces and provide built-in time tracking and invoicing.

Some project planning software tools include the following:

- **Asana** offers different project views to suit a team's preferences.
- **ClickUp** comes with several Agile-based features, including a custom automation builder that lets users create reusable task templates.

- **Freedcamp** lets users organize their projects using a Gantt chart or Kanban
- **Hive** has a template creation tool in the task management feature that speeds up task creation.
- **Scoro** is a combination of tools and includes customer relationship management
- **Trello** provides Kanban features, budget management, resource management and progress tracking features.
- **Wrike** integrates with tools like Jira, Slack and Dropbox.

4.4 Pert Chart:

A PERT chart, short for Program Evaluation Review Technique, serves as a project management tool used to schedule, organize, and coordinate tasks within the Career Guidance Management System (CGMS) project. This chart presents a visual representation of the project as a network diagram consisting of numbered nodes, typically circles or rectangles, representing events or milestones in the project. These nodes are connected by labeled vectors, representing tasks in the project, with the direction of the arrows indicating the sequence of tasks.

In the context of the CGMS project, the PERT chart illustrates the interdependencies between various project tasks, such as system design, development, testing, deployment, and ongoing maintenance. By visualizing the project timeline and task dependencies, the PERT chart helps project managers and stakeholders effectively plan and manage project activities to ensure timely completion and successful implementation of the CGMS.

The PERT chart is particularly useful in identifying the critical path of the project. The critical path is the longest sequence of tasks that must be completed on time for the entire project to be finished by its deadline. Identifying this path allows project managers to focus on tasks that directly impact the project timeline, ensuring that any delays in these critical tasks are promptly addressed to avoid impacting the overall project schedule.

The creation of a PERT chart for the CGMS project involves several steps. The first step involves understanding the full scope of the CGMS project and clearly defining its objectives. This includes outlining the key features and functionalities of the system, such as user profiling, career path recommendations, machine learning model integration, and user interface design.

Next, break down the project into smaller, manageable tasks and identify key milestones. For the CGMS project, tasks might include requirements gathering, system architecture design, database setup, development of recommendation algorithms, user interface design, integration of AI and ML models, testing phases, and final deployment.

Then, identify the logical sequence of tasks and their dependencies. For example, system design must precede development, and testing must follow the development phase. Dependencies ensure that tasks are completed in the correct order. Estimate the time required to complete each task using historical data, expert judgment, or a combination of methods. For instance, designing the system architecture might take three weeks, while developing the machine learning models could take six weeks.

Create the network diagram by placing the tasks in the appropriate sequence and connecting them with arrows to indicate dependencies. Number the nodes to represent milestones and label the vectors with task descriptions and estimated durations. Analyze the PERT chart to identify the critical path, which is the longest path through the network diagram. This path determines the minimum project duration. Focus on monitoring and managing tasks on the critical path to ensure the project stays on schedule. As the project progresses, continuously monitor the status of tasks and update the PERT chart accordingly. If any tasks are delayed or completed ahead of schedule, adjust the chart to reflect the current project status. This helps in re-evaluating the critical path and making necessary adjustments to keep the project on track.

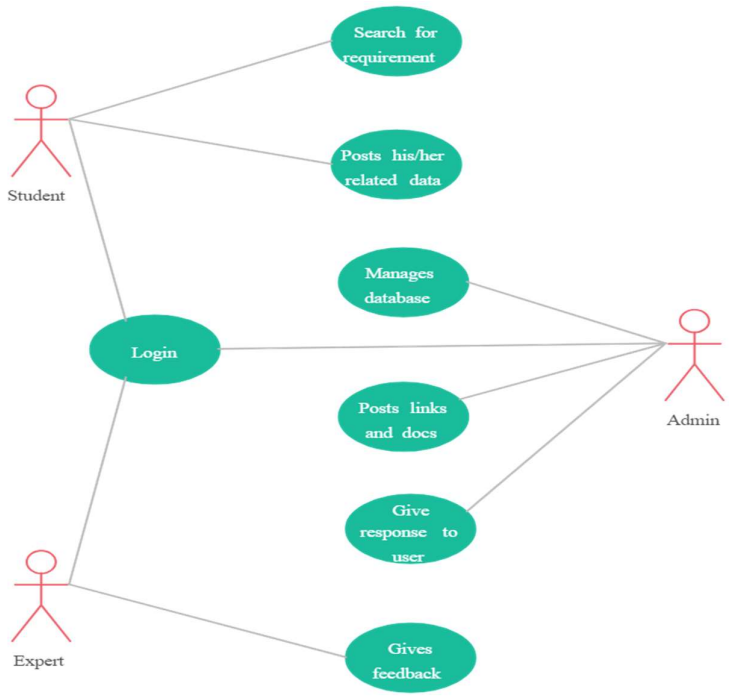


Fig 4.4 Pert Chart

CHAPTER 5

HARDWARE & SOFTWARE SPECIFICATION

5.1 Hardware Specification

The the Career Guidance Management System (CGMS) will be developed and deployed on a hardware infrastructure that ensures optimal performance and reliability. The recommended hardware specifications are as follows:

Server:

Processor: Intel Core i5 or equivalent

RAM: 8 GB or higher

Storage: 256 GB SSD or higher

Database Server:

Processor: Intel Core i5 or equivalent

RAM: 8 GB or higher

Storage: 256 GB SSD or higher

Network Interface: Gigabit Ethernet

Client Machines:

Processor: Intel Core i3 or equivalent

RAM: 4 GB or higher

Storage: 128 GB SSD or higher

Network Interface: 100 Mbps Ethernet or Wi-Fi

5.2 Software Specification

The CMS will be developed using a combination of server-side and client-side technologies. The development and deployment environment will be facilitated by XAMPP, which provides a comprehensive stack for web application development. The software specifications include:

Server-Side Technologies:

Operating System: Windows Server 2016 or later

Web Server: Apache 2.4

Database Management System: MySQL 5.7 or later

Server-Side Scripting Language: PHP 7.4 or later

Client-Side Technologies:

Web Browser: Latest versions of Chrome, Firefox, Safari, or Edge

Client-Side Scripting: JavaScript, jQuery

Development Tools:

XAMPP: Version 8.0.9 or later for local development and testing

Integrated Development Environment (IDE): Visual Studio Code or any preferred PHP IDE

Version Control:

Git: Version control for collaborative development

Security:

SSL/TLS: Ensure secure data transmission over the network

Firewall: Implement firewall rules to restrict unauthorized access

Anti-malware Software: Regularly updated anti-malware software on server and client machines

CHAPTER 6

CHOICE OF TOOLS & TECHNOLOGY

6.1 PHP

PHP (Hypertext Preprocessor) is a widely-used server-side scripting language that is designed for web development. It is embedded within HTML code and executed on the server, producing dynamic content that is then sent to the client's web browser. PHP is renowned for its simplicity, versatility, and ease of integration with various databases, making it a cornerstone technology in modern web development.

Modern PHP embraces Object-Oriented Programming principles, allowing developers to organize code in a more modular and reusable manner. OOP in PHP involves the use of classes and objects, promoting better code organization, encapsulation, and the creation of scalable applications.

PHP has a vibrant ecosystem of frameworks that facilitate rapid and efficient web development. Frameworks like Laravel, Symfony, and CodeIgniter provide standardized architectures, pre-built modules, and tools that enhance developer productivity. These frameworks adhere to best practices, such as MVC (Model-View-Controller), promoting clean and maintainable code.

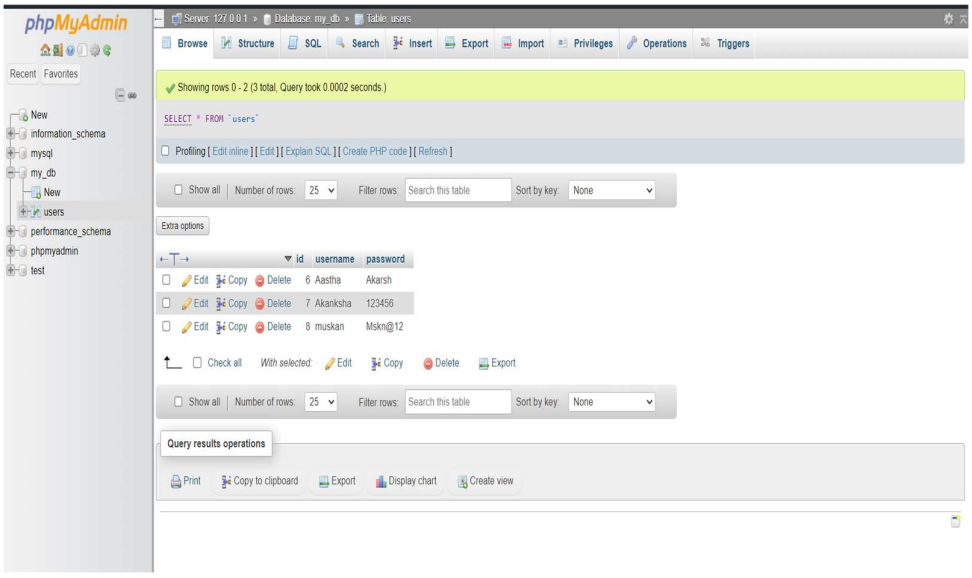


Fig 6.1 PHP

6.2 MySQL

MySQL is a popular choice of database for use in web applications, and is a central component of the widely used LAMP open-source web application software stack (and other 'AMP' stacks). LAMP is an acronym for "Linux, Apache, MySQL, and Perl/PHP/Python." Free-software-open-source projects that require a full-featured database management system often use MySQL.

MySQL is a widely utilized relational database management system (RDBMS) that is a popular choice for web applications due to its robustness, reliability, and ease of use. It plays a crucial role as the database component in various open-source web application stacks, most notably the LAMP stack. LAMP stands for Linux (the operating system), Apache (the web server), MySQL (the database management system), and Perl/PHP/Python (the programming languages). This stack provides a powerful, versatile foundation for developing and deploying dynamic web applications.

MySQL is frequently selected for web-based projects ranging from content management systems (CMS) and e-commerce platforms to complex data-driven applications. Its role in the LAMP stack underscores its importance in the web development landscape, providing a reliable and efficient database solution for developers worldwide.

6.3 Data Flow Diagram

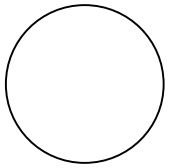
The data flow diagram shows the flow of data within any system. It is an important tool for designing phase of software engineering. Larry Constantine first developed it. It represents graphical view of flow of data. It's also known as BUBBLE CHART. The purpose of DFD is major transformation that will become in system design symbols used in DFD: -

In the DFD, four symbols are used and they are as follows.

1. A square defines a source (originator) or destination of system data.

2. An arrow identifies data flow-data in motion. It is 2a pipeline through which information flows.

3. A circle or a "bubble "(Some people use an oval bubble) represents a process that transfers informing data flows into outgoing data flows.



4. An open rectangle is a data store-data at rest, or a temporary repository of data.

6.4 Context Level Diagram

This level shows the overall context of the system and its operating environment and shows the whole system as just one process. Canteen Management System is shown as one process in the context diagram; which is also known as zero level DFD, shown below. The context diagram plays important role in understanding the system and determining the boundaries. The main process can be broken into sub-processes and system can be studied with more detail; this is where 1st level DFD comes into play.

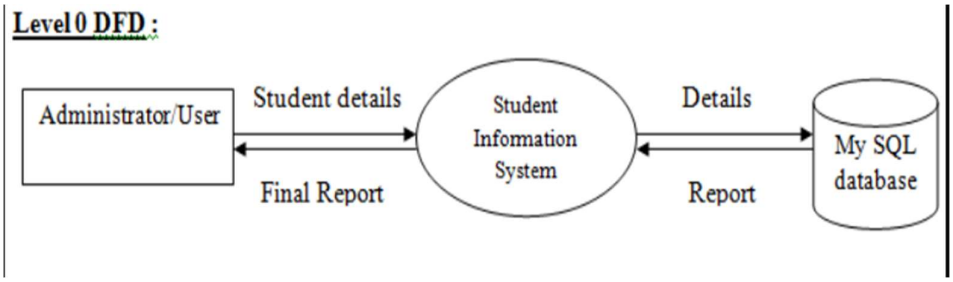


Fig 6.4 0-Level DFD

The Level 0 DFD shows that the Administrator/User interacts with the Student Information System by providing student details and receiving final reports. The Student Information System processes the data, stores it in the MySQL database, and retrieves necessary information from the database to generate reports. This high-level diagram provides a clear overview of the system's functionality and how data flows between the user, system, and database.

Level 1 DFD:

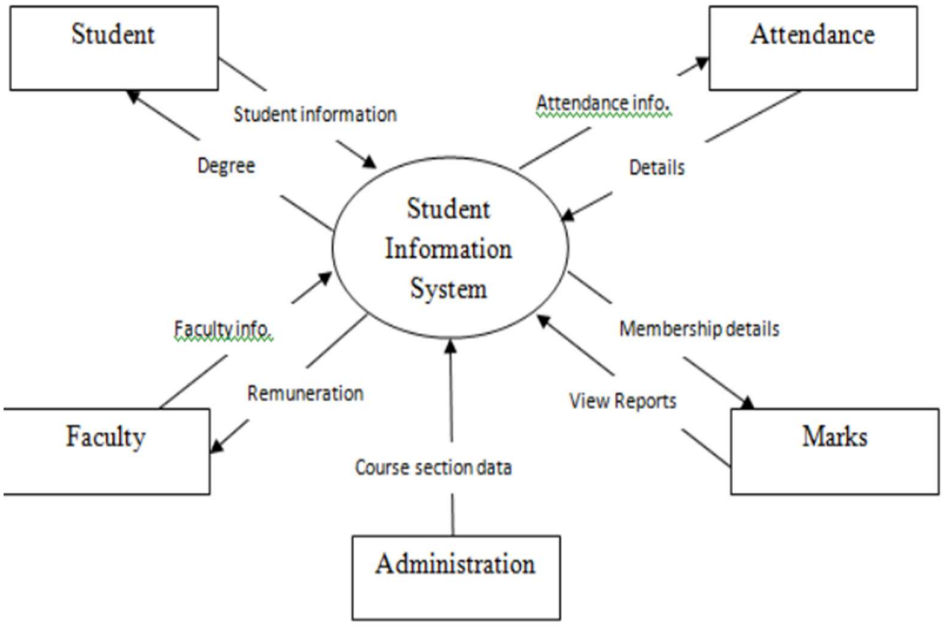


Fig 6.4- 1 Level DFD

The provided diagram is a Level 1 Data Flow Diagram (DFD) for a Student Information System. A Level 1 DFD breaks down the primary process of the system (shown in a Level 0 DFD) into its main sub-processes and shows the flow of information between these sub-processes and external entities. Here's a detailed explanation of the components and the data flow in this Level 1 DFD:

This Level 1 DFD for the Student Information System details how different entities (students, faculty, administration) interact with the system, and how various data flows between them. The diagram shows the inputs provided by these entities and the outputs generated by the system. It helps in understanding the detailed working of the Student Information System by illustrating how data is processed, stored, and utilized within the system to manage student-related information effectively.

CHAPTER 7

ER-DIAGRAM

7.1 Entity-relationship model: -

The entity-relationship model or entity-relationship diagram (ERD) is a data model or diagram for high-level descriptions of conceptual data model, and it provides a graphical notation for representing such data models in the form of entity-relationship diagrams.

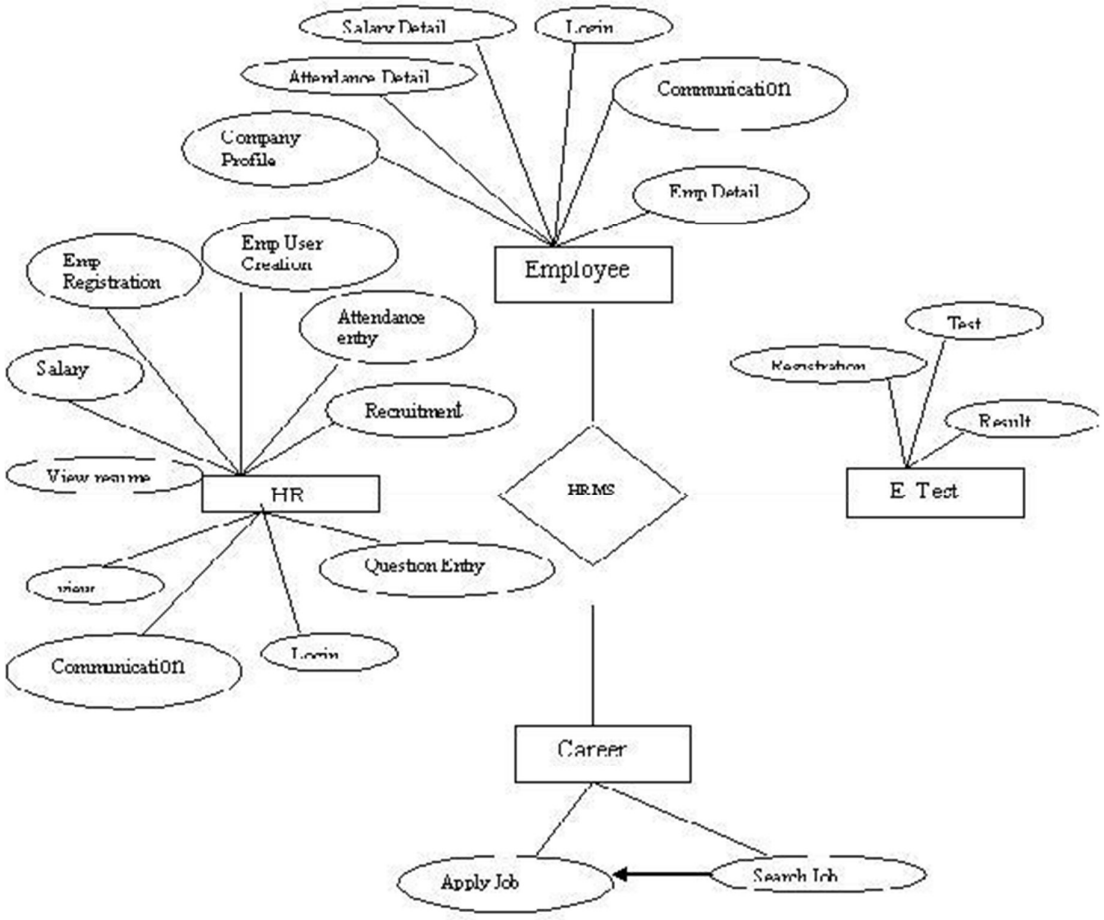


Fig 7.1 ER Diagram

7.2 Class Diagram:

User Authentication:

Weak Class

Manages user authentication details, including username and password, responsible for user login functionality.

User:

Strong Class

Represents users of the system, including administrators and regular users.

Career Path:

Strong Class

Represents career paths available in the system, including details such as career ID, title, description, and required skills.

Skill:

Strong Class

Represents skills relevant to career paths, including details such as skill ID, name, description, and proficiency level.

Recommendation Engine:

Strong Class

Implements recommendation algorithms to generate personalized career recommendations for users based on their profiles and preferences.

By organizing these classes and their relationships, the Class Diagram provides a clear overview of the structure and functionality of the Career Guidance Management System, facilitating effective system design and development.

Class	Attributes	Methods
User	User Id	+Login ()
	User Name	+Logout ()
	Password	

Table 7.2 User Class

Class	Methods
Authentication	+Login ()
	+Logout ()

Table 7.2 Authentication

Certainly! Below is a detailed description for the `User` class and `Authentication` class based on the provided attributes and methods.

User Class: The `User` class represents an individual user within a system. It includes attributes to store user-specific information and methods to manage user authentication.

Attributes:

User Id: A unique identifier for the user. Typically, this is an auto-incremented number or a unique string (such as a UUID).

User Name: The name chosen by the user, which may be used for login purposes or display within the system.

Password: The password associated with the user's account, used for authentication. This should be stored securely, often in a hashed format.

Methods:

+Login (): This method is used to authenticate a user. It typically involves verifying the provided username and password against stored credentials. Upon successful authentication, it might establish a user session.

+Logout (): This method is used to terminate a user's session. It ensures that the user's authentication state is cleared, preventing further access until they log in again.

CHAPTER 8

DATABASE

8.1 User

Email	Name	Password
Akarsh@kiet.edu	Akarsh	1234
aastha@kanpur.com	Aastha	@ka12345
muskan@gmail.com	Muskan	121241
akanksha@kiet.edu	Akanksha	123456

Table 8.1 User

In the context of the Career Guidance Management System, the "User" table stores information about system users. The attributes "Email," "Name and "Password" represent specific details related to users.

Email:

The "Email" attribute stores the email address of a user. It serves as a unique identifier and is commonly used for user authentication and communication.

Name:

The "Name" attribute stores the full name of a user. It provides personal identification information and facilitates user interaction within the system.

Password:

The "Password" attribute stores a securely hashed or encrypted version of the user's password. It ensures secure access to the system and protects user accounts from unauthorized access.

This phpMyAdmin interface provides a user-friendly and comprehensive environment for managing MySQL databases. It allows for easy viewing, editing, and management of database tables, making it a powerful tool for developers and database administrators. The visual representation of data, along with quick action buttons and extensive operation tabs, enhances the efficiency of database management tasks.

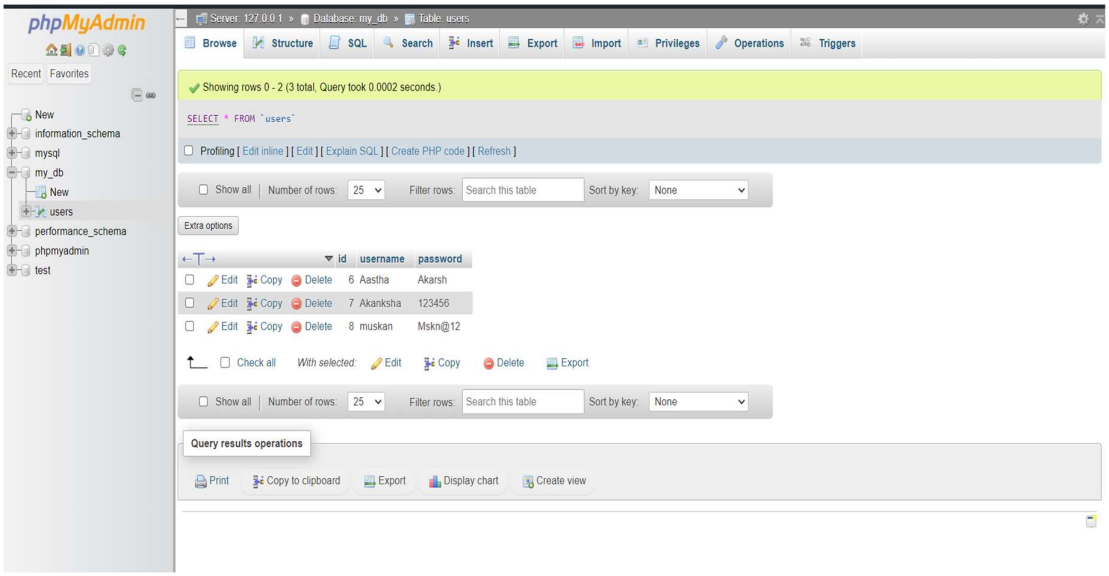


Fig 8.1 User

8.2 Career Path

Id Titil Description skills requirements

1.Software Developer Design and develop software applications. Programming languages, problem-solving, teamwork. Bachelor's degree in Computer Science or related field.

2.Data Scientist Analyse and interpret complex data sets to inform business decisions. Statistical analysis, machine learning, data visualization. Master's degree in Data Science or related field.

3.UX/UI Designer Create user-centric designs for digital products and interfaces. UX/UI design principles, prototyping, user research.Bachelor's degree in Design or related field.

Id	Title	Description	Skills	Requirements
1	Software Developer	Design and develop software applications.	Programming languages, problem-solving, teamwork	Bachelor's degree in Computer Science or related field
2	Data Scientist	Analyze and interpret complex data sets to inform business decisions.	Statistical analysis, machine learning, data visualization	Master's degree in Data Science or related field
3	UX/UI Designer	Create user-centric designs for digital products and interfaces.	UX/UI design principles, prototyping, user research	Bachelor's degree in Design or related field

Table 8.2 Career Path

In the Career Guidance Management System, the "Career Path" table stores information about different career options available to users. Attributes such as "Id," "Title," "Description," "Skills," and "Requirements" provide detailed insights into each career path.

Id:

The "Id" attribute serves as a unique identifier for each career path entry. It facilitates record management and ensures each career path can be uniquely referenced within the system.

Title:

The "Title" attribute stores the title or name of the career path. It provides a descriptive label for the career option and helps users identify and select relevant paths.

Description:

The "Description" attribute provides a brief overview or summary of the career path. It includes information about the nature of the job, responsibilities, and potential opportunities associated with the career option.

Skills:

The "Skills" attribute lists the specific skills or competencies required for the career path. It includes technical skills, soft skills, and other qualifications necessary for success in the chosen field.

Requirements:

The "Requirements" attribute outlines the educational or professional requirements for the career path. It includes information about academic degrees, certifications, or experience levels expected from candidates pursuing the career option.

By organizing career path information in this structured manner, the system provides users with valuable insights and guidance for exploring and pursuing their desired career paths effectively.

CHAPTER 9

FORM DESIGN

9.1 Home Page:

Welcome to Career.ly, your intelligent career guidance system designed to help engineering graduates discover their ideal career path. Our platform leverages advanced algorithms and personalized assessments to match your skills, interests, and aspirations with the perfect role in the engineering field.

Additional Links:

[Home] [Services] [About Us] [Contact Us] [Login] [Register]

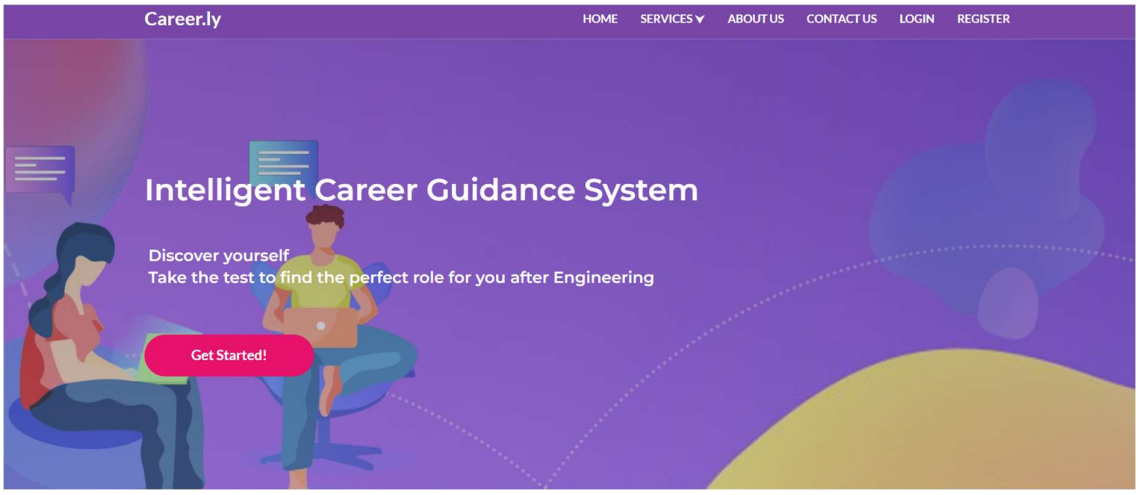


Fig 9.1 Home Page

9.1.1 About Us:

Career.ly is dedicated to empowering engineering graduates to confidently navigate their career journeys. Our mission is to provide comprehensive support and resources tailored to the unique needs of engineers entering the workforce. By combining the expertise of career development professionals and engineering specialists, staying updated with industry trends, and providing a supportive community, Career.ly is committed to helping engineering graduates successfully embark on their career journeys with confidence and clarity.

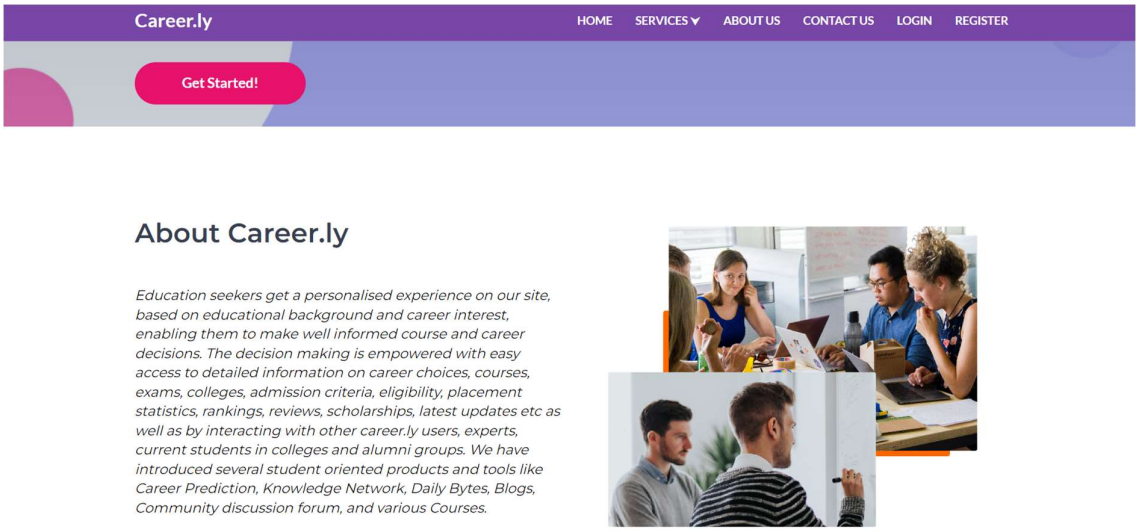


Fig 9.1.1 About us

9.1.2 Contact Us:

Have questions or need assistance? Contact us through our support page or reach out via email at me.akarshmishra@gmail.com. We're here to help you every step of the way. The "Contact Us" section of a website is a crucial element that facilitates communication between the website's visitors and the organization or individuals behind the website. This section typically includes several key components designed to make it easy for users to reach out for support, inquiries, feedback, or other purposes. Here's a detailed explanation of what you can typically find in a "Contact Us" section on any website:

By providing clear and accessible contact information, a website ensures that visitors can easily get in touch for any assistance they need, enhancing user experience and fostering trust and reliability.

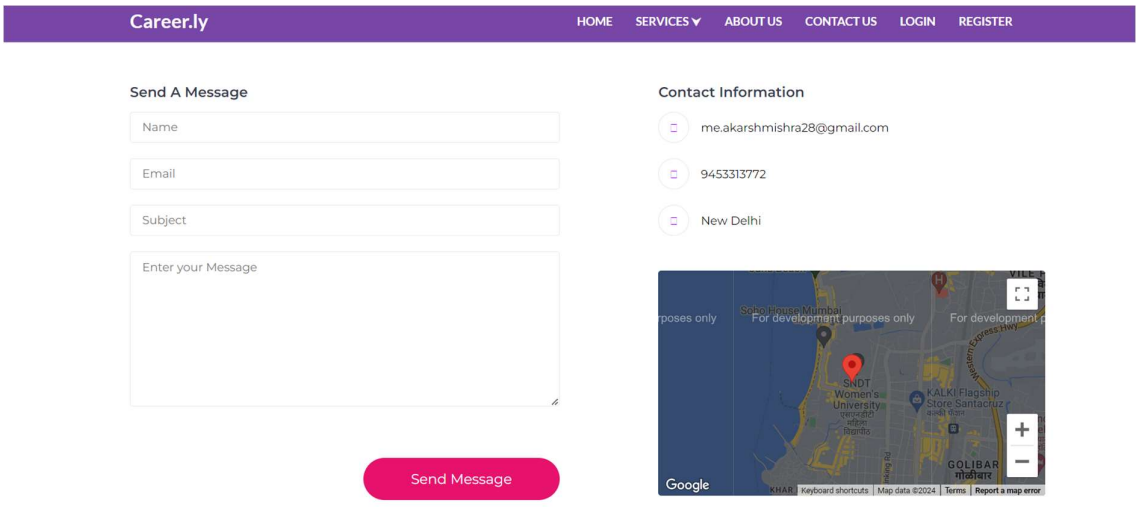


Fig 9.1.2 Contact us

9.2 Registration and Login:

The students would be registered through a very simple method either by email id or Mobile number. The login credentials would be created and would be validated through every login attempt. Students Can See Various Fields.

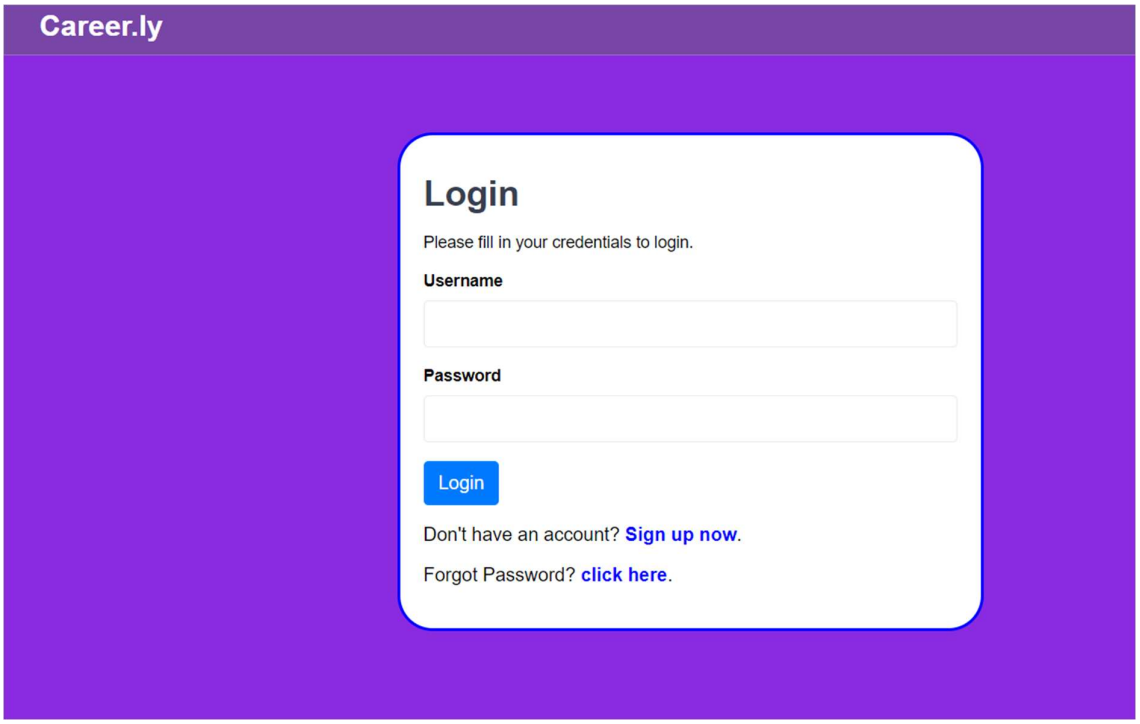


Fig. 9.2 Login

9.3 Discover yourself:

This section would enable the students to take a few tests to discover themselves in terms of their ability, interests, inclination, future plans etc. This would create a student profile which would be used as a baseline for suggesting the possible career options. We will leverage the AI ML techniques to predict the way forward.

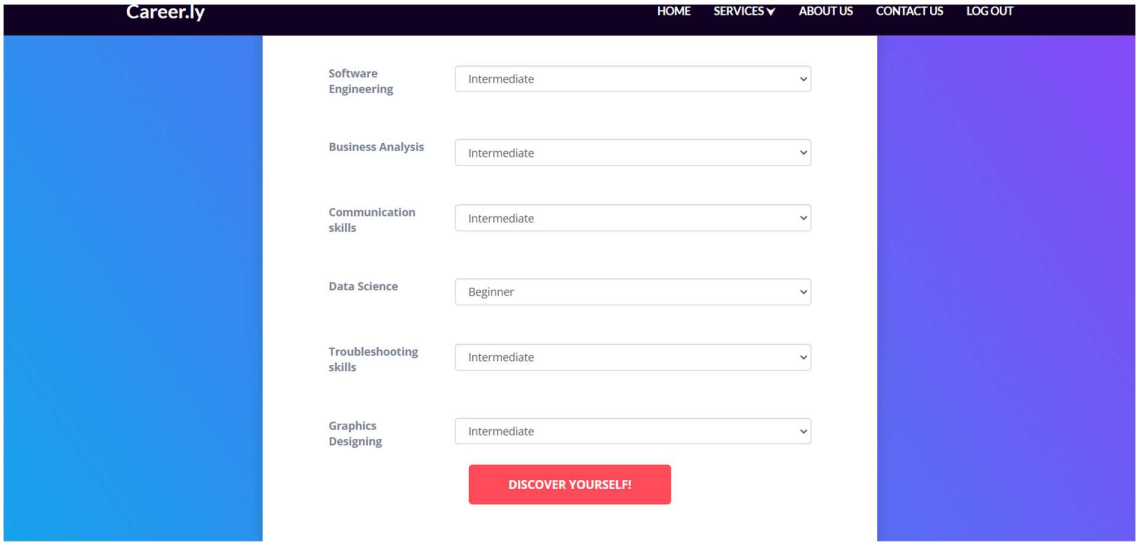


Fig 9.3 Discover Yourself

Data Preprocessing

We preprocess the data into required format. For Example, the data in data set will be stored in the form of words, nothing but alphabetic. We convert those into numerical format.

Predicting the Skills

from the Data By applying various machine algorithms on the data set, we found more accuracy. At any one algorithm, thus it suits for the recommendation system to be accurate.

Then Recommend the respected skill

Individual students differ from the other students in their skills. Recommendation system helps to predict the inherent skill of a student and recommend the respected skill courses

Knowledge Networking: As the name indicates, this module would assist to harness the knowledge through various sources. This would also have a section to provide the information by students, which would be made available only post scrutiny by the admin team.

Daily bytes: This would be displayed as a daily important tip to create interest among the students and to spend time to leverage this platform.

9.4 Result

The result page on Career.ly provides users with a clear and concise summary of the top job roles that match their skills and interests based on their assessment test. This page is designed

to help users quickly understand their potential career paths and explore detailed information about each suggested role.

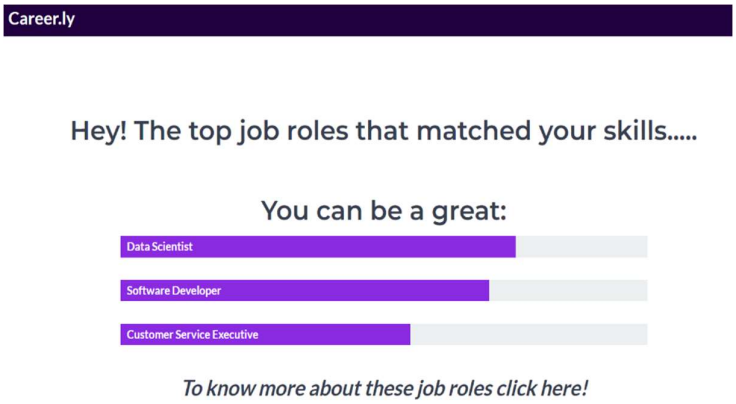


Fig 9.4 Result

Online courses:

In today's rapidly evolving job market, staying competitive and relevant requires a continuous investment in learning and skill development. Online courses have emerged as a convenient and effective way for individuals to upskill or reskill themselves, offering flexibility, accessibility, and a wide range of topics to choose from. Integrating online courses into career recommendation systems can significantly enhance their effectiveness by providing tailored learning pathways and personalized recommendations based on individual career goals, interests, and skill gaps.

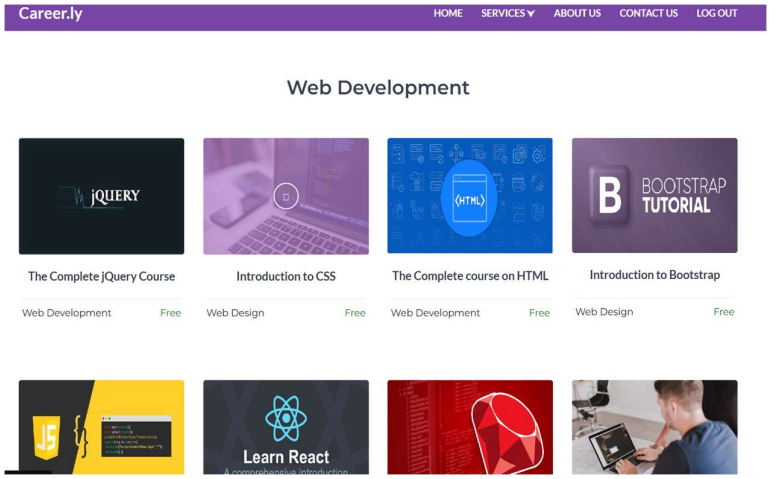


Fig 9.4 Online Courses

9.5 Job Roles & Company Vacancies

The Job Roles page on Career.ly serves as an essential resource for engineering graduates exploring potential career paths. By offering detailed information on various job roles, required skills, career advancement opportunities, and more, this page empowers users to make informed decisions about their future and take proactive steps towards their desired career.

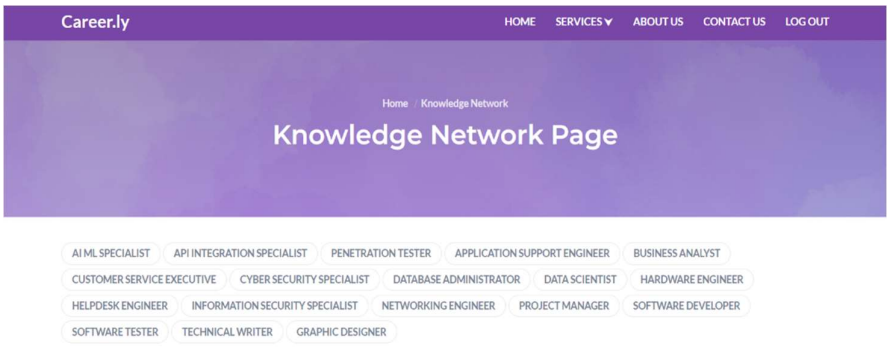


Fig 9.5 Job Roles

The Career Opportunities section of our Career Guidance Management System. Here, we provide you with a curated list of job openings tailored to your interests, skills, and career goals. Whether you are a recent graduate seeking your first professional role or an experienced professional looking for new challenges, we aim to connect you with the best opportunities in your desired field.

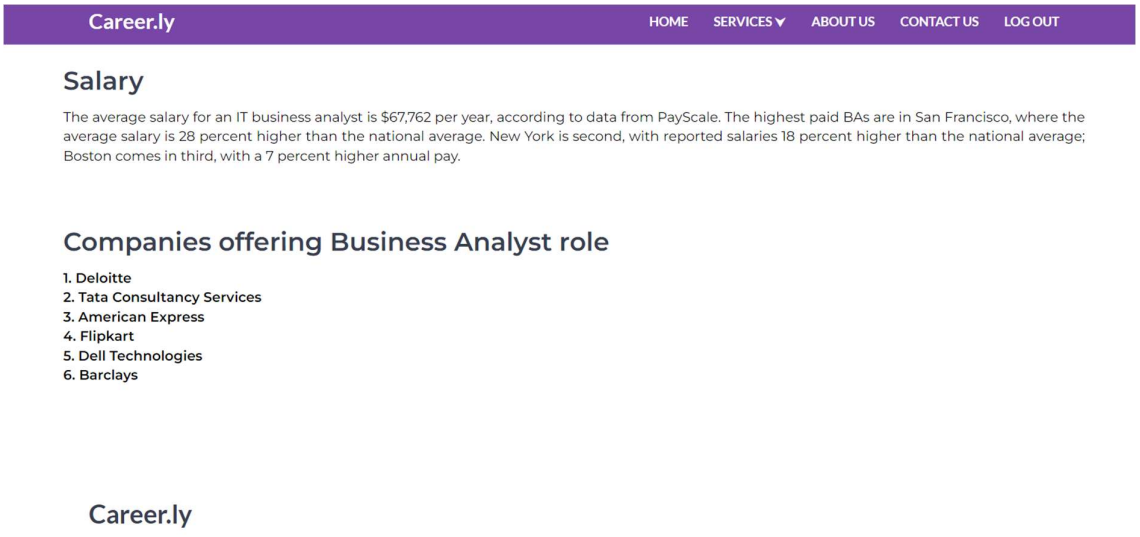


Fig 9.5 Job Vacancies

CHAPTER 10

TESTING

10.1 Introduction

Testing in the Career Guidance Management System (CGMS) serves the purpose of identifying errors and ensuring that the software system meets its requirements and user expectations without failing in an unacceptable manner. It involves checking the functionalities of components, sub-assemblies, and the finished product to ensure their correctness and reliability. Various types of tests are conducted to address specific testing requirements.

In the Career Guidance Management System (CGMS), testing plays a multifaceted role aimed at guaranteeing the software's quality, reliability, and alignment with user expectations. The primary objective of testing within CGMS is twofold: to identify errors or defects and to ensure that the system operates in accordance with its specified requirements, thereby minimizing the likelihood of failure during operation.

At its core, testing within CGMS encompasses a comprehensive examination of the system's functionalities across various levels of granularity, including components, sub-assemblies, and the integrated product as a whole. This hierarchical approach allows for a systematic exploration of the system's behavior, from individual features to its holistic performance, thereby ensuring correctness and reliability throughout.

To address the diverse requirements of testing within CGMS, a range of testing types are employed, each tailored to address specific aspects of the system's functionality and performance.By conducting these various types of tests, the CGMS project team can systematically verify the correctness, reliability, and usability of the system, thereby mitigating the risk of errors or failures during operation. This comprehensive approach to testing ensures that CGMS not only meets its technical requirements but also delivers a positive user experience, ultimately fulfilling its intended purpose of facilitating career guidance effectively.

10.2 Types of Testing

10.2.1 Unit Testing

Unit testing in the CGMS focuses on verifying the functionality of the smallest unit of software design, which is the module. It is primarily white-box oriented, and in some modules, steps are conducted in parallel to ensure thorough testing of individual units.

10.2.2 Integration Testing

Integration testing in the CGMS involves testing each module independently. Once all modules are tested, they are integrated, and testing of the final system is performed with test data designed to demonstrate successful operation under various conditions. Integration testing verifies functional, performance, and reliability requirements placed on major design items, exercising them through their interfaces using black-box testing methodologies.

10.2.3 System Testing

System testing in the CGMS ensures that the entire integrated software system meets requirements. It tests a configuration to ensure known and predictable results. An example of system testing in the CGMS is configuration-oriented system integration testing, which is based on process descriptions and flows, emphasizing pre-driven process links and integration points. System testing validates the system's behaviour against expected outcomes, ensuring its functionality and reliability in real-world scenarios.

10.3 Test Plan:

A comprehensive test strategy was established, and a unique approach to project testing for this system. The following are the objectives of the test plan that was established. Create a detailed test plan outlining the kind and scope of tests required to accomplish the project's test objectives, including software and hardware needs. Create an organised schedule of operations, identify necessary equipment and organisational provisions, establish test techniques and tactics, and select what to provide.

10.4 Test Cases

A Test Case is a collection of situations or variables that a tester will use to verify whether a system meets requirements or operates appropriately. Below are some test cases which were generated during the system testing.

Test Case ID	T001
Test Component	User Management
Module Name	Login
Test Case	Login Screen
Expected Outcome	Successful login and the Main page (Dashboard)

Table 10.4 Test Cases

Test Case Description

No.	Test Case	Actual Output	Status
1	Login Success	Loading the main page.	Ok
2	Login Fail	Displaying a message “Invalid credentials.”	Ok

Table 10.4 Test Case Description

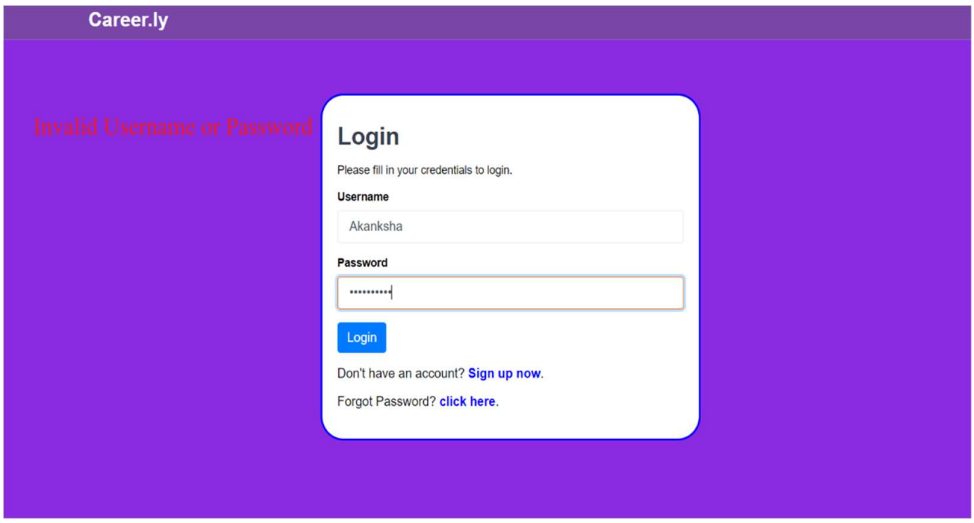


Fig 10.4 Login Page Error

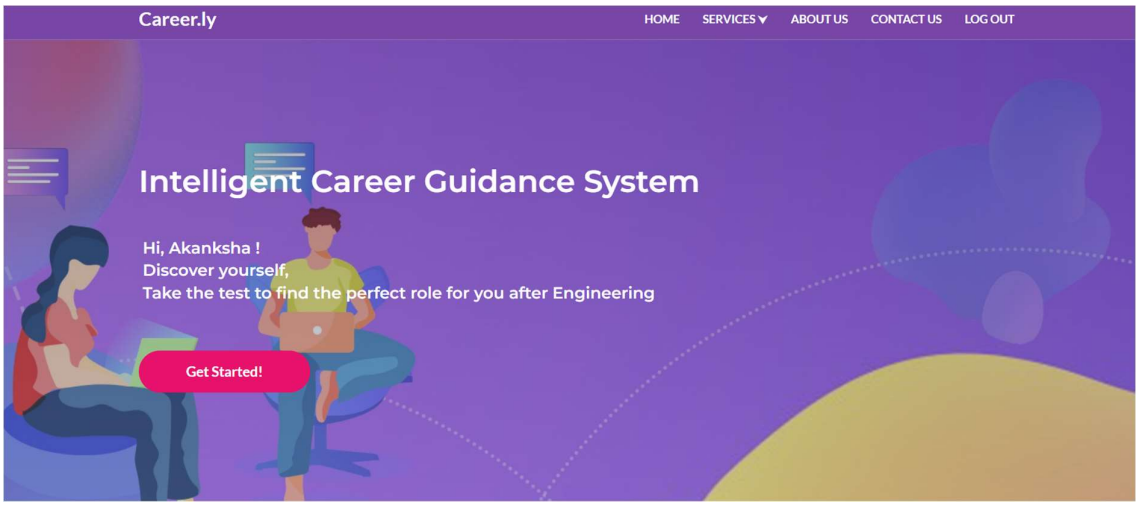


Fig 10.4 Login Page Success

10.5 Course Management function

Test Case ID	T002
Test Component	Course Management
Module name	Online Courses
Test Case	Adding a Course with a Course name
Expected Outcome	Save the new Course to the database and display a message "Record added successfully! Please wait…" Else, it should display "Please fill out this field" message.

Table 10.5 Course Management Function

Test Case Description

No.	Test Case	Actual Output	Status
1	Save Success	Displaying a message "Record added successfully! Please wait…"	OK
2	Empty Course Name	Displaying a message "Please fill out this field.	OK

Table 10.5 Test Case Description

10.6 User Evaluation

User evaluation has been conducted for this program. Several users (teachers) were selected and allowed to use this program and asked to provide their feedback through an online questionnaire. The evaluation of this project was focused on four Course areas, namely, appearance, usability, functionality and performance. In the analysis, a measure against the Likert scale was used to measure the feedback. (Refer to Appendix B for the questionnaire.) A list of prepared criteria, with some practical testing, allows the software evaluator to verify that the project objectives have been met**.**

10.7 Results of the Evaluation

After analysing the feedback, the below results were obtained, and several conclusions were highlighted.

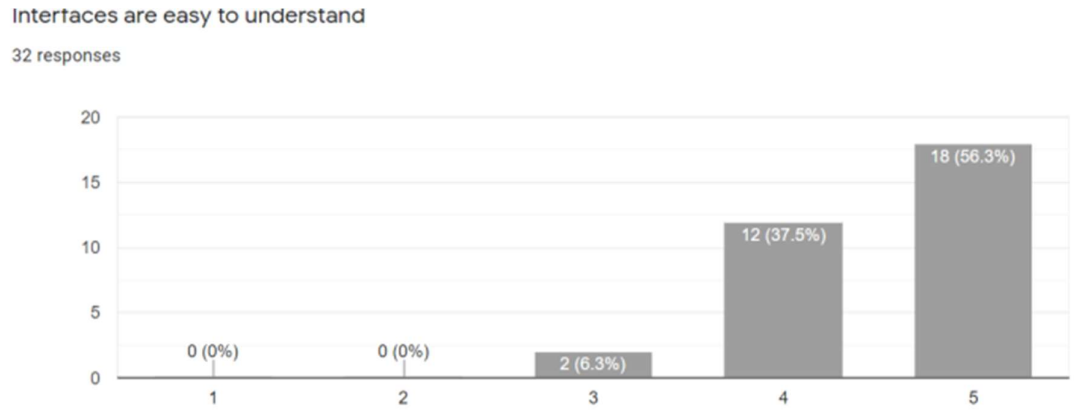


Fig 10.7 Testing Results Q1

With the above results, the users are comfortable with the program's appearance, as many have selected the highest (‘Strongly Agree’) option.

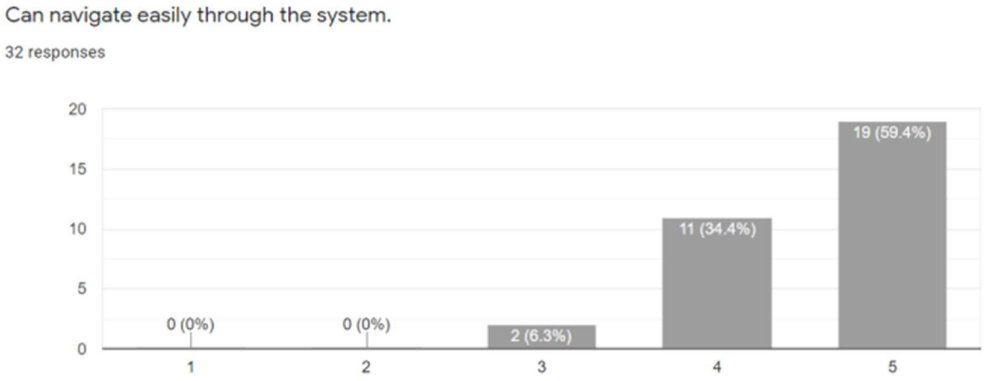


Fig 10.7 Testing Results Q2

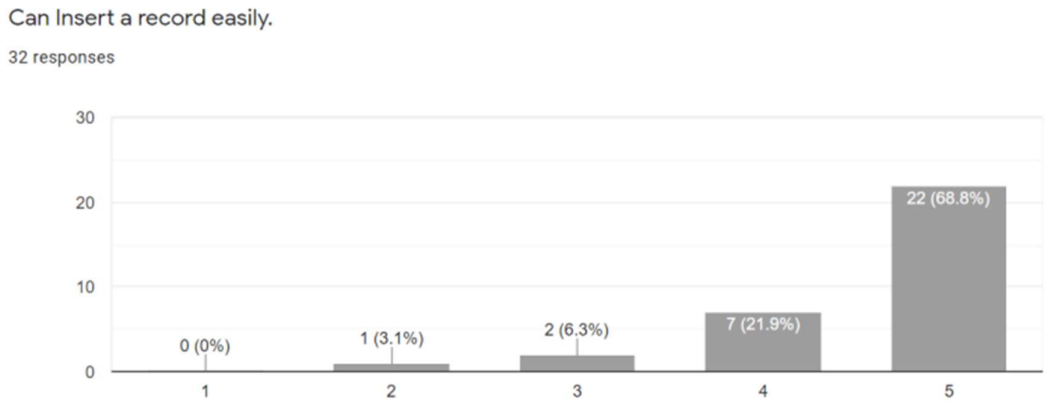


Fig 10.7 Testing Results Q3

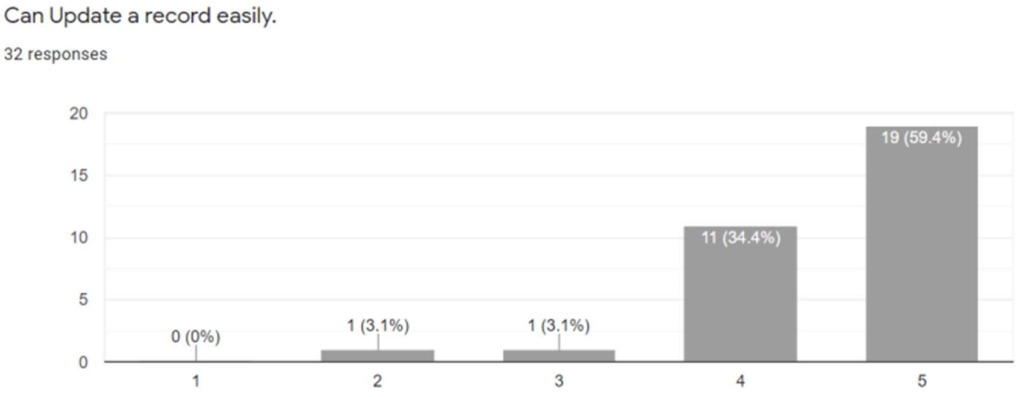


Fig 10.7 Testing Results Q4

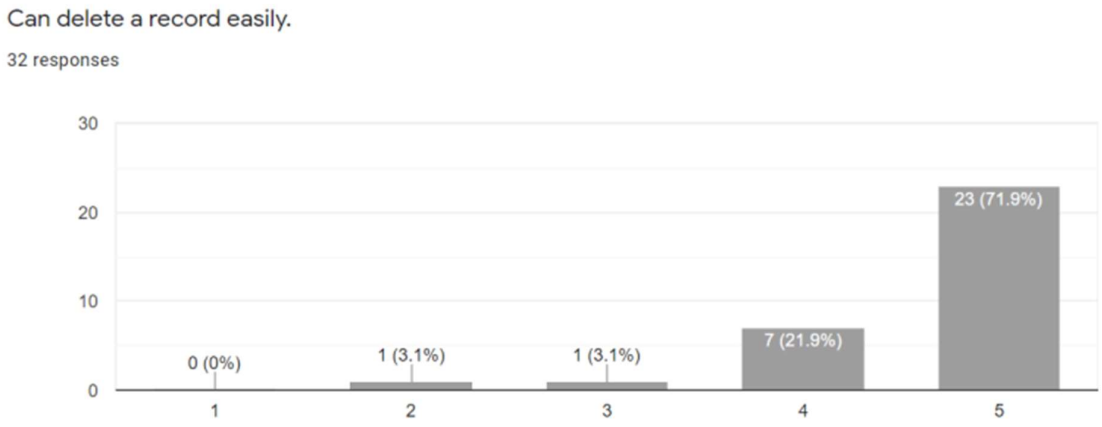


Fig 10.7 Testing Results Q5

The usability was measured by obtaining the opinion of the users. By observing the above results, it clearly defines that there is higher usability of the system.

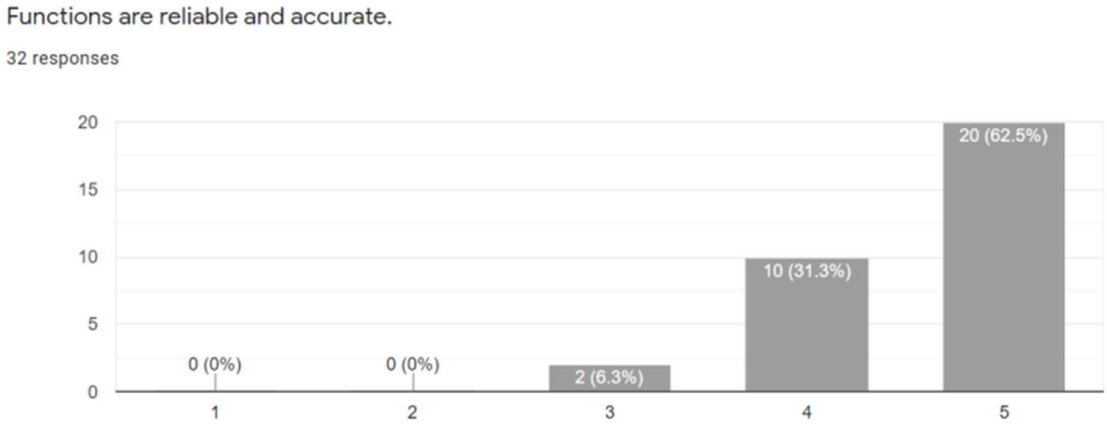


Fig 10.7 Testing Results Q6

The graphical representation of the above question analysis implies that the system's functionality is at a stable stage, and users are experiencing no issues with the functions when using the program.

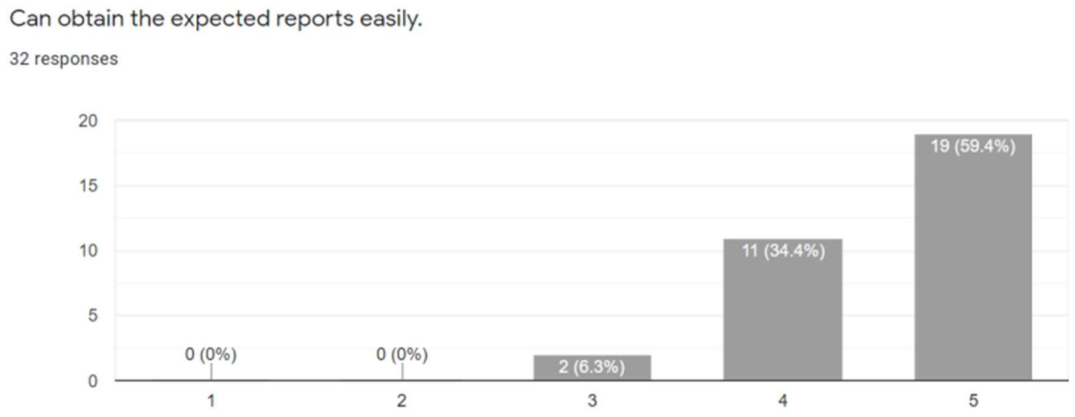


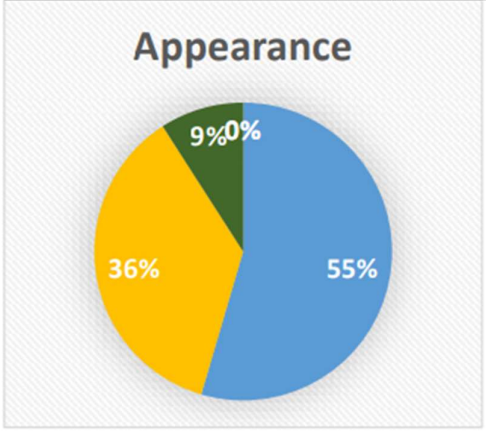
Fig 10.7 Testing Results Q7

The above question is based on performance. Higher results of the answers imply that the users are experiencing a sound performance of the system.

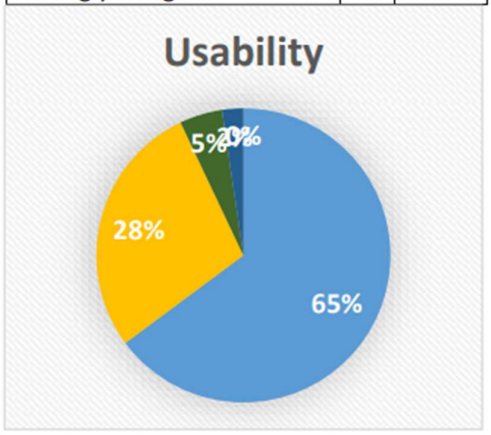
10.8 Conclusion of testing results

In conclusion, the user evaluation results can be categorised and indicate as below.

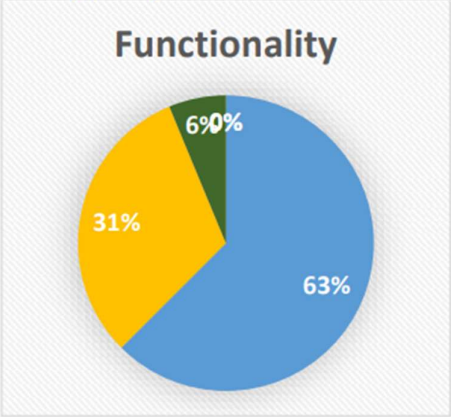
Appearance of the system (interfaces)		
Strongly Agree	18	54.5%
Agree	12	36.4%
Neither Agree nor Disagree	3	9.1%
Disagree	0	0.0%
Strongly Disagree	0	0.0%



Usability of the system		
Strongly Agree	83	64.8%
Agree	36	28.1%
Neither Agree nor Disagree	6	4.7%
Disagree	3	2.3%
Strongly Disagree	0	0.0%



Functionality of the system		
Strongly Agree	20	62.5%
Agree	10	31.3%
Neither Agree nor Disagree	2	6.3%
Disagree	0	0.0%
Strongly Disagree	0	0.0%



Performance of the system		
Strongly Agree	19	59.4%
Agree	11	34.4%
Neither Agree nor Disagree	2	6.3%
Disagree	0	0.0%
Strongly Disagree	0	0.0%

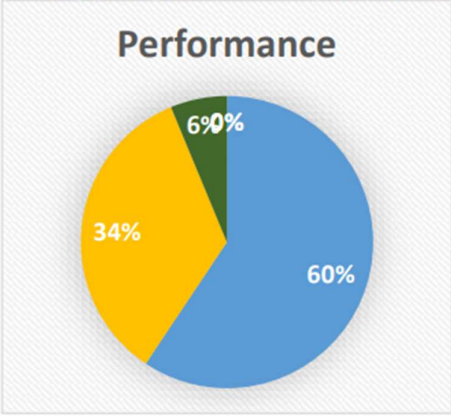


Fig 10.8 User Evolution Results

With the user evaluation results, it is clear that the entire testing results signify the project's objectives have been met, and the significant characteristics of the system were able to be captured by the users. Hence, the system is in the completed stage and ready to deliver for the client. The image presents survey results about user satisfaction with two aspects of a system: its appearance and usability. Each aspect is evaluated using a Likert scale, with responses ranging from "Strongly Agree" to "Strongly Disagree". The data is summarized in tables and represented visually in pie charts.

Appearance of the System (Interfaces)

Strongly Agree: 18 respondents (54.5%)

Agree: 12 respondents (36.4%)

Neither Agree nor Disagree: 3 respondents (9.1%)

Disagree: 0 respondents (0.0%)

Strongly Disagree: 0 respondents (0.0%)

From the data:

A majority (54.5%) of the respondents strongly agree that the appearance of the system is satisfactory.

36.4% agree with the system’s appearance.

9.1% are neutral, neither agreeing nor disagreeing.

No respondents disagree or strongly disagree.

The pie chart reflects this distribution visually:

The largest portion (blue, 55%) represents those who strongly agree.

The second largest portion (yellow, 36%) represents those who agree.

A smaller portion (green, 9%) represents neutral responses.

Usability of the System

Strongly Agree: 83 respondents (64.8%)

Agree: 36 respondents (28.1%)

Neither Agree nor Disagree: 6 respondents (4.7%)

Disagree: 3 respondents (2.3%)

Strongly Disagree: 0 respondents (0.0%)

From the data:

A significant majority (64.8%) of the respondents strongly agree that the system is usable.

28.1% agree that the system is usable.

4.7% neither agree nor disagree about the usability.

2.3% disagree with the system's usability.

No respondents strongly disagree.

The pie chart for usability shows:

The largest segment (blue, 65%) represents those who strongly agree.

The next largest segment (yellow, 28%) represents those who agree.

Smaller segments (green, 5% for neutral and red, 2% for disagree) represent neutral and negative responses.

Overall, the feedback on both the appearance and usability of the system is predominantly positive, with the majority of respondents either agreeing or strongly agreeing that the system meets their expectations in these areas. The usability of the system has a slightly higher percentage of strong agreement compared to its appearance. Negative feedback is minimal, indicating general satisfaction with the system's interface and functionality.

10.9 Summary

An essential phase of the project, the testing phase, is visibly explained in this chapter. Initially, the testing types were introduced and explained how it was used to test the system. Next, a comprehensive test plan is described, and sample test plans of each function are shown. Then, sample test cases and results were included in the chapter to indicate how the actual tests were conducted. Then the summary of test results was included, which indicates that all the tests are passed. The results then were categorised and summarised and included in this chapter. Moreover, the details of the user evaluation conducted during the test phase are also included here. Thus, the results infer that the system functions correctly and met its objectives and scope. In this chapter, the testing phase of the project is thoroughly elucidated, serving as a pivotal aspect of ensuring the system's reliability and functionality. Initially, an insightful overview of various testing types is provided, shedding light on how each method is strategically employed to scrutinize the system's performance and behavior. This introductory segment lays a solid foundation, elucidating the significance of meticulous testing in the development lifecycle.

Following this, a meticulously crafted test plan is meticulously outlined, serving as a roadmap for executing the testing procedures effectively. Each facet of the system's functionality is meticulously examined through sample test plans, meticulously crafted to encompass a comprehensive range of scenarios and conditions. These sample test plans serve as invaluable templates, guiding the testing process with precision and thoroughness.

Moreover, the chapter delves into the intricacies of crafting sample test cases, meticulously detailing the steps and parameters involved in executing each test. By presenting a series of sample test cases along with their corresponding results, the chapter offers a tangible glimpse into the testing process, showcasing how theoretical concepts translate into practical application.

The culmination of the testing phase is marked by a comprehensive summary of test results, meticulously categorizing and summarizing the outcomes of each test conducted. This meticulous analysis provides stakeholders with a clear understanding of the system's performance, highlighting areas of strength and areas warranting further attention.

Furthermore, the chapter extends its focus beyond technical testing, incorporating insights from user evaluations conducted during this phase. By soliciting feedback from end-users, the project team gains invaluable insights into user satisfaction and usability, further validating the system's efficacy and alignment with user expectations.

In essence, the collective findings presented in this chapter serve as a testament to the system's robustness and adherence to its defined objectives and scope. Through meticulous planning, execution, and evaluation, the testing phase stands as a pivotal milestone, affirming the system's readiness for deployment and utilization.

CONCLUSION

The conclusion of a project report on the Career Guidance Management System (CGMS) would summarize the key findings, accomplishments, and implications of the project. Here's an example:

In conclusion, the development and implementation of the Career Guidance Management System (CGMS) represent a significant milestone in the realm of career guidance and support systems. Throughout the course of this project, we have successfully designed, built, and tested a comprehensive platform aimed at assisting individuals in navigating their career paths with confidence and clarity.

Through the integration of cutting-edge technologies such as artificial intelligence and machine learning, CGMS has been able to offer personalized recommendations, skill assessments, and curated resource libraries tailored to the unique needs and aspirations of each user. This personalized approach not only enhances the user experience but also fosters a sense of empowerment and agency in career decision-making.

Furthermore, the successful deployment of CGMS has demonstrated its potential to address key challenges in traditional career guidance methodologies, including accessibility, scalability, and relevance. By providing users with anytime, anywhere access to valuable tools and resources, CGMS has effectively bridged gaps in access to career guidance services, particularly for underserved populations.

Looking ahead, the implications of CGMS extend beyond the confines of this project. Its scalability and adaptability make it well-suited for integration into existing educational and workforce development systems, thereby amplifying its impact and reach. Moreover, ongoing updates and improvements to the platform will ensure its continued relevance and effectiveness in an ever-evolving job market landscape.

In essence, CGMS represents not only a technological achievement but also a testament to the transformative power of innovation in addressing societal challenges. As we move forward, let us harness the lessons learned from this project to further advance the field of career guidance and empower individuals to realize their full potential in the workforce.

FUTURE SCOPE AND FURTHER ENHANCEMENT OF THE PROJECT

- Integration of Message Alert System: Implement a feature to send alerts to users when new career opportunities matching their profiles become available or when there are updates or changes in their chosen career paths.
- Expansion to Include Customers: Extend the system to cater to the needs of customers seeking career guidance, providing personalized recommendations and resources to help them make informed decisions about their future careers.
- Development of Online Ordering System: Introduce an online platform where users can access career guidance services through a website or mobile application. This platform can offer interactive features such as career assessments, skill development modules, and virtual career counselling sessions.
- Incorporation of Feedback Mechanism: Integrate a feedback mechanism for users to provide input on the effectiveness of the career guidance services offered. Use this feedback to enhance the user experience, tailor recommendations, and address any concerns or issues raised by users.
- Implementation of Advanced Analytics: Enhance the system with advanced analytics and reporting capabilities to track user engagement, career progression, and the effectiveness of the guidance provided. Analyse data trends to identify areas for improvement and optimize the delivery of career guidance services.

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