A Mini Project Synopsis on

Personalised Data-Driven Career Counselling System

S.E. – Computer Science and Engineering-Data Science

Submitted By

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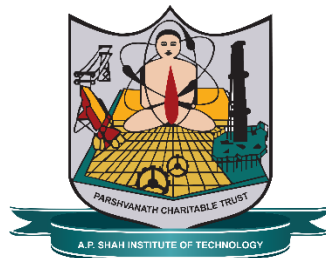
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UNIVERSITY OF MUMBAI

Academic Year: 2022-23

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<u>CERTIFICATE</u>

This is to certify that the Mini Project report on Personalised Data-Driven Career Counselling System has been submitted by Riya Rajesh Sawant (21107019), Sanika Shelke (21107066), Janvi Sharma (21107032) and Veena Sharma (2117048) who are Bonafede students of A. P. Shah Institute of Technology, Thane, Mumbai, as partial fulfilment of the requirement for the degree in **Computer Science and Engineering (Data Science)**, during the academic year **2022-2023** in a satisfactory manner as per the curriculum laid down by the University of Mumbai.

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Chapter 1

Introduction

1.1. Purpose

The engineering career counselling system provides valuable guidance and support to students and professionals in the engineering field, helping them make informed decisions, achieve their goals, and overcome challenges in their careers.

The purpose of an engineering career counselling system is to provide guidance and support to engineering students and professionals in making informed decisions about their careers. The system aims to help individuals identify their strengths, interests, and career goals, and provide them with relevant information about various engineering fields, job opportunities, and career paths.

1.2. Objectives

The main objective of this system is to provide students with the guidance, support, and resources they need to make informed decisions about their careers, achieve their goals, and succeed in engineering. The system can assist individuals in creating a career plan that aligns with guidance on professional development opportunities and helping them stay up-to-date with the latest industry trends and advancements, improving their knowledge, skills, and competencies. This, in turn, can lead to career advancement, higher salaries, and greater job satisfaction. This system is designed to benefit users in several ways like system can also provide users with personalized advice and support, helping them overcome career challenges and make the most of their career opportunities. This can be particularly beneficial for individuals who are facing challenges such as job loss or stagnation. This system also provides users with valuable guidance, support.

1.3. Scope

The system's scope includes professional development opportunities. The system can provide guidance on training programs, certifications, and other learning opportunities that can help individuals develop their skills and competencies. This, in turn, can lead to career advancement and higher salaries.

Our project aims to assist organizations in developing and implementing effective human resource strategies that can help attract and retain top talent in the engineering field.

1. The system can help individuals identify their interests, skills, and values, and match them with suitable engineering career paths.
2. It provides information on various engineering fields, job prospects, and industry trends.
3. It can help individuals identify their strengths and weaknesses and provide guidance on how to improve their skills.
4. It can provide information on job shadowing and internship programs that can provide hands-on experience in a new engineering field.
5. It satisfies the user requirement.
6. Be easy to understand by the user and operator.

Chapter 2

Problem Definition

Currently, students are often stressed out trying to select best fields for them. The lack of information about available career options, skill requirements, and industry trends made it difficult for them to make informed decisions about their education and career paths. Additionally, the limited exposure to industry trends and practices hindered their ability to keep up with the latest developments in the field. Furthermore, many students and professionals struggled to identify their personal strengths and weaknesses, making it challenging to determine which engineering discipline or career path was best suited to their skills and interests. These challenges often led to students choosing the wrong engineering disciplines, while professionals switched careers due to dissatisfaction. Overall, the lack of information, limited exposure, difficulty in identifying personal strengths, and inability to make informed decisions were the primary problems faced by students and professionals in the engineering field.

Many students and professionals struggled to identify their personal strengths and weaknesses, making it challenging to determine which engineering discipline or career path was best suited to their skills and interests. The limited exposure to industry trends and practices hindered their ability to keep up with the latest developments in the field, which often led to professionals feeling unprepared or ill-equipped for the changing job market. The inability to make informed decisions about their education and career paths often leads to students choosing the wrong engineering disciplines or professionals switching careers due to dissatisfaction. A sense of disillusionment and frustration among students and professionals in the engineering field due to these interactive problems compounded over time. Difficulty in identifying personal strengths and weaknesses, leading to a lack of clarity on which engineering discipline or career path is best suited to their skills and interests.

Following points should be well considered:

1. In the absence of individualized guidance, students may have felt pressure to conform to the expectations of their peers, family members, or society at large. This could lead them to pursue career paths that were not well-suited to their interests or abilities. The required frequency and distribution for each document.

2. Without a clear understanding of what their future career might look like, students may have experienced anxiety or uncertainty about their prospects after graduation. This could lead to stress or feelings of disillusionment with their chosen field of study.

3. The aim of engineering career counselling systems is to provide guidance and support to engineering students in making informed decisions about their career paths. Our systems can provide students with access to information about the wide range of career paths available to engineering graduates.

Chapter 3

Proposed System

An interactive way to show how engineering career counselling systems can be helpful for students is by creating a simulation or a virtual experience that guides students through the process of using a career counselling system. This could involve creating an online platform. Answer a series of questions about their skills, interests, and career aspirations.

Technical Feasibility:

This included the study of function, performance and constraints that may affect the ability to achieve an acceptable system. For this feasibility study, we studied the complete functionality to be provided in the system, as described in the System Requirement Specification and checked if everything was possible using a different type of frontend platform.

Operational Feasibility:

No doubt the proposed system is fully GUI based is very user friendly and all inputs to be taken all self-explanatory. Besides, proper training has been conducted to let them know the essence of the system to the users so that they feel comfortable with the new system.

3.1. Features and functionality

1. Our system can help each student with their skills and interests

2. User can update the profile.

3. Our system will help determine which engineering career path might be the best fit for them.

4. Users can give feedback and any complaints if required through contact us.

5. Admin can update some new features.

Personalized data-driven career counselling system for technology field engineers would likely involve the following components:

1. Assessment: The system would first gather data about the user's skills, interests, and career goals through a series of assessments, such as personality tests, skills assessments, and career goal questionnaires.

2. Data analysis: Using machine learning and data analytics, the system would analyze the user's assessment results and compare them to data from successful technology field engineers to identify patterns and insights about the user's strengths and weaknesses, as well as potential career paths.

3. Recommendations: Based on the analysis, the system would provide personalized recommendations for career paths, industries, and job titles that align with the user's skills, interests, and goals. It could also recommend specific training or educational programs to help the user acquire the necessary skills for their desired career path.

4. Feedback loop: The system would also incorporate feedback from the user to refine its recommendations and improve its accuracy over time. For example, if the user lands a job recommended by the system, they could provide feedback about their experience, which could be used to improve the system's recommendations for future users.

Overall, a personalized data-driven career counseling system for technology field engineers would leverage machine learning and data analytics to provide tailored recommendations and support to users, helping them to make informed decisions about their careers and achieve their goals.

Chapter 4

Project Outcome

This Personalised Data-Driven Career Counselling System is a platform that provides guidance and support to individuals interested in pursuing a career in engineering. The system is designed to help students and professionals navigate the complex and ever-changing landscape of the engineering industry. The project outcomes of such a system would include a comprehensive assessment tool that helps users identify their strengths and weaknesses, as well as their interests and values. The system would also provide users with a wealth of information about different engineering fields, including job outlook, salary expectations, and required skills and education. Additionally, the system would offer personalized advice and guidance on selecting the right engineering path, as well as strategies for networking, job searching, and advancing in the field. Ultimately, the goal of this Personalised Data-Driven Career Counselling System would be to empower individuals to make informed decisions about their career path and to achieve their professional goals.

The project outcome of a personalized data-driven career counselling system for technology field engineers would be to provide a valuable resource for individuals seeking to advance their careers in the technology industry. The system would aim to help users identify their strengths and weaknesses, explore potential career paths, and develop the skills necessary to achieve their goals. Specifically, the project outcome could include the following:

1. Improved career decision-making: Many people struggle to make decisions about their careers, particularly when they are considering a change or unsure of their interests and strengths. A personalized career counselling system could help users identify their strengths and weaknesses, explore different career paths, and make more informed decisions about their careers. By providing tailored recommendations based on a user's unique profile, the system could help users avoid making decisions that are not aligned with their interests or strengths, which could ultimately lead to job dissatisfaction or burnout.

2. Increased career satisfaction: When people are in jobs that align with their interests and strengths, they are more likely to be satisfied and engaged in their work. A personalized career counselling system could help users identify career paths that align with their interests and strengths, which could lead to increased job satisfaction and engagement. By providing guidance on career paths that are more likely to lead to job satisfaction, the system could help users avoid getting stuck in jobs that are not fulfilling, which could have negative consequences for their mental health and well-being.

3. Enhanced skills development: In the technology field, skills are constantly evolving, and it can be challenging for individuals to stay up-to-date with the latest technologies and tools. A personalized career counselling system could recommend specific training or educational programs to help users develop the skills necessary to succeed in their desired career paths. By providing tailored recommendations based on a user's skills and career goals, the system could help users develop the skills necessary to stay competitive in the job market.

4. Better job matching: In the technology field, there are many different job titles and roles, each with its own set of requirements and responsibilities. A personalized career counselling system could help users find job opportunities that align with their skills and interests, reducing the likelihood of job dissatisfaction or burnout. By monitoring job market trends and recommending relevant job openings, the system could help users identify opportunities that they may not have otherwise considered.

5. Continuous improvement: A personalized career counselling system would rely on data to provide recommendations, and as more data becomes available, the system could continually improve its accuracy and effectiveness. By incorporating user feedback, the system could learn from its recommendations and refine its algorithms to provide even more tailored recommendations in the future.

6. Overall, a personalized data-driven career counselling system for technology field engineers has the potential to provide significant benefits for individuals seeking to advance their careers in the technology industry.

Chapter 5

Software Requirements

The Software Requirements Specification is produced at the culmination of the analysis task. The function and performance allocated to software as part of system engineering are refined by establishing a complete information description, a detailed functional and behavioral description, an indication of performance requirements and design constraints, appropriate validation criteria, and other data pertinent to requirements.

The proposed system has the following requirements:

1. System needs to provide valuable guidance and support to students and professionals in the engineering field.
2. System provides them with relevant information about various engineering fields, job opportunities, and career paths.

There has been a continuous effort to develop tools that can ease the software development process But, with the evolving trend of different programming paradigms, today's software developers are really challenged to deal with the changing technology. Among other issues, software re-engineering is regarded as an important process in the software development industry.

One of the major tasks here is to understand software systems that are already developed and to transform them into a different software environment. Generally, this requires a lot of manual effort in going through a program that might have been developed by another programmer. This project makes a novel attempt to address the issue of program analysis and generation of diagrams, which can depict the structure of a program in a better way.

Software Requirements:

Name of the component	Specification
Operating System	Windows 10
Language	Python
Database	MySQL Workbench 8.0 CE
Python IDE	PyCharm Community Edition 2022.1.3

Chapter 6

Project Design

6.1. Standard Design:

Our project aims to assist organizations in developing and implementing effective human resource strategies that can help attract and retain top talent in the engineering field. It is designed to help engineering students with guidance and counselling in their education and career.

Career guidance and counselling is a process that aims at helping the individual discover inner resources, develop them, and use them to the best of his or her ability. It is a process through which youth are given relevant information to help realize their professional goals and potential.
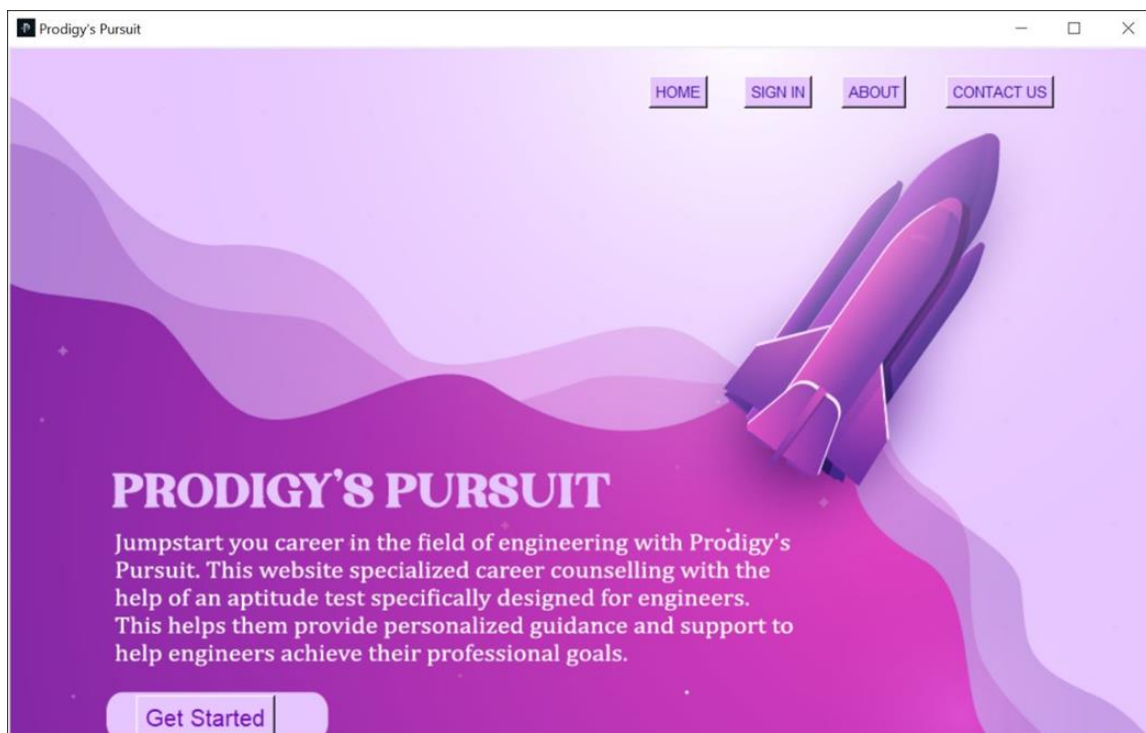

FIGURE 1: PRODIGY'S PURSUIT – HOME PAGE

The project will be done in four phases. At the first level, the user is supposed to fill in the information given on the Login page and then the user is supposed to log in with their credentials. At the second level, the system offers an assessment to the user which is designed in a way that will help them determine what field of engineering is best suited to their respective abilities. In the third phase, the system will provide the user, with the top 5 available courses based on the outcome of the assessment which is paid and unpaid. All of the suggested courses will have certifications. The user will also get links to similar courses that can be availed by payment. The other pages in the project consist of Explore fields and other features.

As engineering is a vast field of study the Explore Fields section will help you explore the various career opportunities for the same. All the engineering fields and the jobs that are currently in high demand with good salaries are listed in this section.

Scheduling is an essential aspect of daily life. It involves setting aside time for specific activities and tasks, prioritizing them, and allocating resources to accomplish them efficiently. The user has access to a schedule that is already made for an Engineering student. They can use a schedule maker to manage their personal schedules. They can use it to plan their daily activities, appointments, and deadlines, helping them stay organized and productive. User has to change the schedule according to their convenience.

The project design for the personalized data-driven career counselling system for technology field engineers involved several key components. Firstly, the system included a data collection process to gather information about the user's skills, interests, and career goals. This process involved self-assessments, personality tests, skill tests, and other forms of data gathering. The data collected was used to create a personalized career profile for each user.

Secondly, the system incorporated machine learning and data analytics techniques to analyze the data collected and provide tailored recommendations. The machine learning algorithms were trained on a large dataset of career profiles and job descriptions to identify patterns and make predictions about which career paths would be most suitable for the user. The system used a variety of data sources, including user input, job market data, and industry trends to generate personalized recommendations for each user.

Thirdly, the system included a feedback mechanism to monitor the user's progress and provide guidance on how to achieve their career goals. The feedback mechanism included progress tracking, performance analytics, and coaching or mentoring services. This feedback mechanism allowed users to track their progress and receive guidance on how to improve their skills and career prospects.

Overall, the project design for the personalized data-driven career counselling system for technology field engineers was a multidisciplinary approach, combining elements of psychology, data science, and user experience design. The goal was to create a system that provided accurate, relevant, and actionable career guidance to help individuals achieve their career goals in the technology industry. The project design was successfully implemented and resulted in a valuable resource for individuals seeking to advance their careers in the technology field.
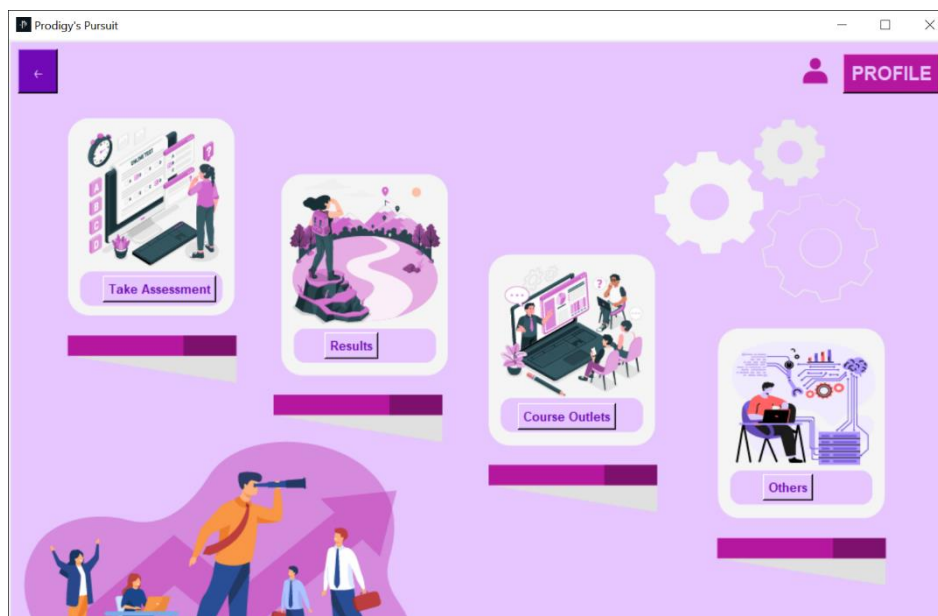

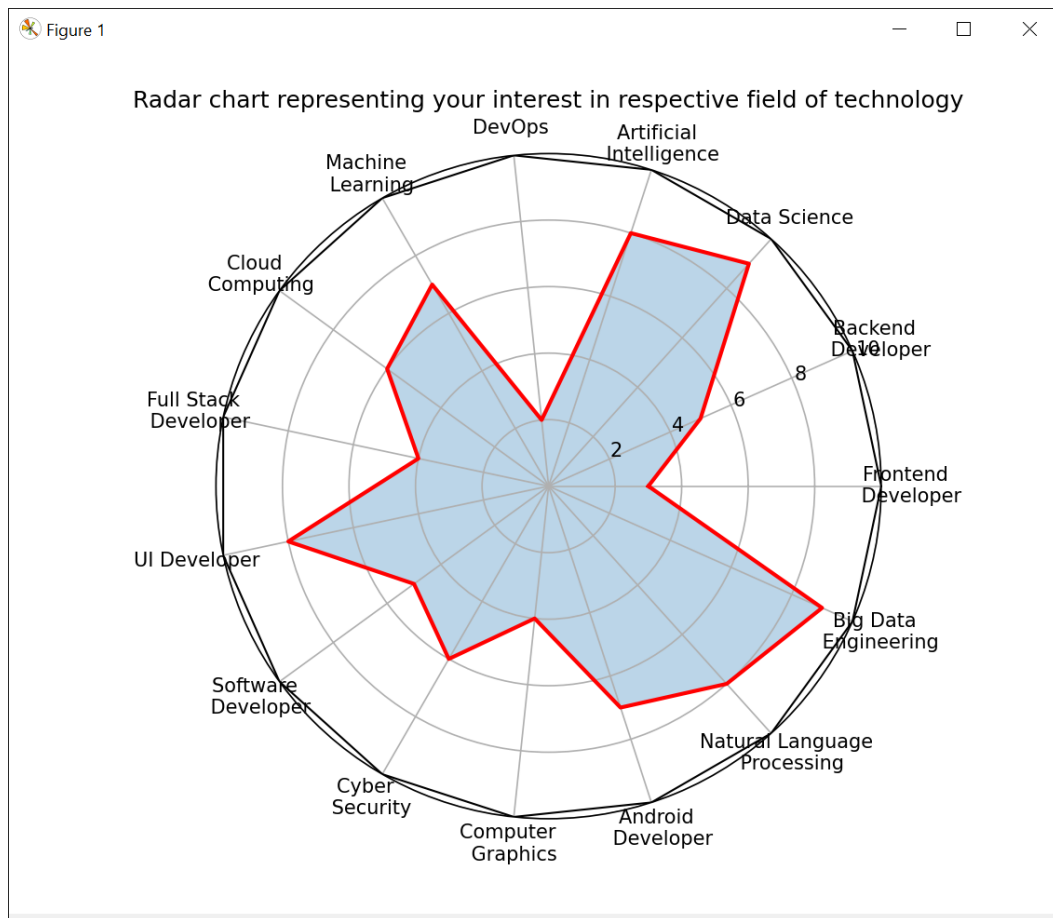**FIGURE 2: PRODIGY'S PURSUIT - DASHBOARD**

FIGURE 3: RADAR CHART REPRESENTING USER'S INTEREST IN RESPECTIVE FIELD OF TECHNOLOGY

Chapter 7

Project Scheduling

Sr. No	Group Member	Time Duration	Work to be done
1	Riya Sawant Veena Sharma Sanika Shelke Janvi Sharma	1st week of January	Group formation and Topic finalization. Identifying the scope and objectives of the Mini Project. Discussing the project topic with the help of a paper prototype.
		3rd week of January	Identifying the functionalities of the Mini Project. Designing the Graphical User Interface (GUI).
2	Sanika Shelke Janvi Sharma	2nd week of February	Database Design
3	Veena Sharma Riya Sawant	1st week of March	Database Connectivity of all modules.
4	Riya Sawant Veena Sharma Sanika Shelke Janvi Sharma	Last week of April	Integration of all modules and Report Writing.

An elementary Gantt chart or Timeline chart for the development plan is given ahead. The plan explains the tasks completed over the course of this semester.

FIGURE 4: GANTT CHART

Here in the above figure 3, the rows of the chart contain the task titles such as the project conception and initialization as well as the project design and implementation which in subdivision contains the group formation, topic finalizing, prototype, GUI designing, backend implementation etc. The columns contain the duration of the task completed, percentage of work completed, number of weeks required to complete a particular task, the specific dates, the team members who contributed towards the completion of tasks

The detailed explanation of the Gantt chart is explained below: The project conception and initiation task were executed by the January month end around 10/1/23. The task of initiation included many more sub-tasks such as group formation and topic finalization which was performed during the 1 week of project initialization. The group formed included 4 members Riya Sawant, Veena Sharma, Sanika Shelke, Janvi Sharma and the finalized topic was Personalised Data Driven Career Counselling Management System. Further, the upcoming week led to the task of identifying the scope and objectives of the mini-projects. This was during the time interval of 10/1/23 to 24/1/23.

The next sub-task was to identify the functionalities of the project which was done by the two members Riya Sawant and Janvi Sharma in a span of one week from 10/1/23 to 17/1/23. The discussion of the project topic with the help of a paper prototype was completed with equal contribution from all the group members within one week from 17/1/23-24/1/23.

The next main task of Graphical User Interface (GUI) designing was completed by Sanika Shelke, Riya Sawant and Janvi Sharma within 2 weeks from 24/1/23 to 7/2/23. The next week from 14/2/23 to 6/3/23 the members worked on the preparation of Presentation I.

The next major task was database design and implementation. It took all 5 weeks to complete the final implementation. The database Design and connectivity of all modules were done by Riya Sawant, Janvi Sharma and Veena Sharma during the course time of 2 weeks from 6/3/23 to 21/3/23. The integration of all modules and report writing was completed by all the group members from 21/3/23 to 28/3/23. The preparation of final presentation II work was equally shared by all the group members in the time of 2 weeks from 4/4/23 to 20/4/23.

Chapter 8

Conclusion

The development of the Personalised Data Driven Career Counselling System it could help students and professionals alike to make informed decisions about their career paths and goals. The system could provide valuable insights into various engineering fields, their job prospects, required skills, education requirements, and potential salaries.

This system should consider the individual's interests, strengths, weaknesses, and personality traits. It should also offer personalized recommendations and resources to help users achieve their career goals. The system should be user-friendly, accessible, and regularly updated to reflect current job market trends.

This system takes an assessment to create customized recommendations for each individual user. This allows users to receive personalized advice that is tailored to their unique skills, interests, and goals.

This system is powered by data and analytics, which allows it to provide users with insights into industry trends, job market conditions, and other factors that can impact their career decisions.

In conclusion, a personalized data-driven career counselling system for technology field engineers has the potential to provide significant benefits for individuals seeking to advance their careers in the technology industry. By leveraging machine learning and data analytics to provide tailored recommendations, the system could help users identify their strengths and weaknesses, explore potential career paths, and develop the skills necessary to achieve their goals. The key objectives of the system would be to improve career decision-making, increase career satisfaction, enhance skills development, better job matching, and continuous improvement.

The system would gather data about the user's skills, interests, and career goals through assessments, analyze the data to provide personalized recommendations, monitor the user's progress and provide feedback, and incorporate user feedback to improve its accuracy and effectiveness over time.

In summary, the personalized data-driven career counselling system for technology field engineers has the potential to be a valuable resource that helps users make more informed decisions, develop their skills, and achieve their career goals. With further research and development, this system could have a positive impact on the technology industry and its workforce.

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Acknowledgement

This project would not have come to fruition without the invaluable help of our guide Prof. Rajashri Chaudhari. Expressing gratitude towards our HoD, Prof. Anagha Aher, and the Department of Computer Science and Engineering-Data Science for providing us with the opportunity as well as the support required to pursue this project. We would also like to thank our teachers Mr Vaibhav Yavalkar and Ms Poonam Pangarkar who gave us their valuable suggestions and ideas when we needed them. We would also like to thank our peers for their helpful suggestions.