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Certificate

This is to certify that the project report entitled **"Artificial Intelligence Based Career Guidance - A web application along with chatbot."** is hereby approved as a creditable study carried out and presented by

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Abstract

Career guidance in the era of life-long learning faces challenges related to building accessible services that bridge education and employment services. So far, only limited research has been conducted on using artificial intelligence to support guidance across higher education and working life. This paper reports on development on using artificial intelligence to support and further career guidance in higher education institutions. Results from focus groups, scenario work and practical trials are presented, mapping requirements and possibilities for using artificial intelligence in career guidance from the viewpoints of students, guidance staff and institutions. The findings indicate potential value and functions as well as drivers and barriers for adopting artificial intelligence in career guidance to support higher education and life-long learning. The authors conceptualize different modes of agency and maturity levels for the involvement of artificial intelligence in guidance processes based on the results. Recommended future research topics in the area of artificially enhanced guidance services include agency in guidance interaction, developing guidance data ecosystem and ethical issues.

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We would like to take this opportunity to express our heartfelt thanks to our guide **Prof. V.N. Bhonge** for his esteemed guidance and encouragement, especially through difficult times. His suggestions broaden our vision and guided us to succeed in this work. We are also very grateful for his guidance and comments while designing part of our project and learnt many things under his leadership. Also we would like to thank to **Dr. M. N. Tibdewal**, Head of Electronics and Telecommunication Department, all teaching and non-teaching staff of EXTC Department for their encouragement and suggestions for our project.

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List of Figures

Figure	Page No.
Figure 1.1: Students who chose based on peer/ parent pressure, lack of information	03
Figure 1.2: Algorithm of the system	07
Figure 4.1: : The website home page	20
Figure 4.2: The student login page	20
Figure 4.3: The page for students to sign up	20
Figure 4.4: The admin's login page	21
Figure.4.5: The page for admin to monitor student activities	21
Figure 4.6: The Results of attempted tests will be on this page	22
Figure 5.1: Algorithm of the system	32
Fig.8.1: Dashboard of Teacher's module	32
Fig.8.2: Dashboard of Admin module	32
Fig.8.3: Test Panel	33

Contents

Abstract *i*

Acknowledgement *ii*

List of Figures *iii*

Contents *iv*

1. Introduction 1

1.1. Motivation 4

1.2. Problem Statement 4

1.3. Literature Survey 5

1.4. Objectives 6

1.5. Role Of AI 7

2. **Methodology** 10

2.1. Framework and Research Questions 10

2.2. Basic Methodology of the system 10

2.3. Methodology of chatbot 12

3. Software Specifications 13

3.1. Language used in the system 13

3.2. Database used in the system 14

3.3. Framework used in the system 14

4. System Overview 16

4.1. Proposed System 16

4.2. Overview of the model 17

4.3. Chatbot Overview 22

5. Working Principle 23

6. Benefits of Career Guidance 25

7. Research Findings 29

8. Experimental Results 30

Conclusion and Future Scope 34

References *36*

Chapter 1

Introduction

In India, there are more than a thousand universities, and thousands of undergraduate, graduate, and doctoral courses are offered at these institutions. In order to select the institution or course based on numerous characteristics, students applying to these universities must compare many options. For obtaining course information, comparing courses, faculties, and facilities, admission, monitoring student movement, examining outcomes, evaluating and certifying students, verifying certificates, and participating in collaborative online courses (MOOCs), a PAN India university information bank is necessary. Through comparison and imitation, this will benefit the communities of students and professors. Lack of information encourages professor and student inbreeding and self-glorification at universities and colleges.

Summary:

The universities in India offer a wide range of courses in numerous academic fields, and the students have to evaluate these programs in light of many factors. The courses include undergraduate, graduate, and doctoral programs. The consolidation of various facts onto a single platform would increase transparency and ease the difficulties that students are currently experiencing owing to informational gaps.

We currently lack a master data base on students at different levels, which makes it challenging to formulate policies relating to education and the improvement of the student body. A uniform platform that connects all of the data from school, higher education, and technical education will be made available, aiding the government in identifying the ambiguous areas that require real focus. Additionally, it is possible to identify the proportion of kids who drop out of school and the percentage of students who enter other fields of study. This information can be used to target reform efforts in these areas.

The construction of accessible services that link education and job services presents difficulties for career advising in the era of lifelong learning. The use of artificial intelligence to provide guidance in higher education and the workforce has received very little research to far. This study examines how artificial intelligence is being used to help and advance career counseling in higher education institutions. Results from

focus groups, scenario work, and practical experiments are provided, outlining requirements and potential for applying AI in career advising from the perspectives of students, guidance personnel, and institutions. The results show possible benefits and uses as well as motivations and obstacles for implementing artificial intelligence in career counseling to enhance postsecondary education and lifelong learning.

Based on the findings, we developed several agency and maturity levels for the inclusion of artificial intelligence in guiding procedures. Future study on agency in guidance interactions, the growth of the guidance data ecosystem, and ethical concerns are all suggested as possible directions.

The supply and development of career advice services are under increasing pressure, with the intended purposes and service offerings expanding. Career counseling is offered by a number of players in the social and health sectors, the job market, and the educational system.

The use of artificial intelligence (AI) to improve career advising services in higher education is covered in methodologies research. Analysis of the needs and potential for guide interventions using intelligent technology is based on the findings of focus groups, scenario work, and real-world tests. On the basis of this, it is advised to pursue more study in the areas of agency effects, evolving career information environments, and maturity levels for utilizing AI in career advising.

Many people now regret pressing their professional decisions early in life, and many regret forcing their career choices with unrealistic paths. The majority of kids are aware that finishing high school is a big milestone since it is the first time they will have to make a decision that will affect their whole life about their undergraduate degree. According to previous surveys, a lot of students said their parents tried to steer them in the direction of a particular vocation. It's not surprising that university students who are now enrolled claim they would have selected a different course if they had known about it, and it's also plausible that applicants who received strong results on their admission exams would have done so.

Since it is the first time, they will have to make a decision that will have a lasting impact on their lives about their undergraduate degree, graduation from high school is a crucial milestone for the majority of pupils. Our online career guidance tool strives to be a beneficial and useful place to start during this confusing time. There is a lot of

information and tools accessible for students who are interested in any subject. Most students currently don't have enough time to do the required research. We strive to help students by giving them thorough information on universities, including Institute details, travel instructions, and the courses the college offers.

Quizzes to gauge their understanding and pinpoint their areas of interest, thorough information on competitive exams, a forum to solve technical issues, College Prediction, and a Counseling Chatbot to offer immediate guidance and respond to queries. A forum to debate technical subjects and problems, quizzes to test their knowledge and identify their areas of interest, College Prediction, and a Counseling Chatbot to provide real-time guidance and answer queries.

In order to assist students in plotting a route for a bright future free from uncertainty and regret, our Career Counseling online application will gather all of these resources and data in one location.

Our career counseling system is created to offer students career-related guidance, advice, and information in a way that includes the evaluation of students' abilities and personalities, which aids them in improving and developing realistic academic and career goals over time.

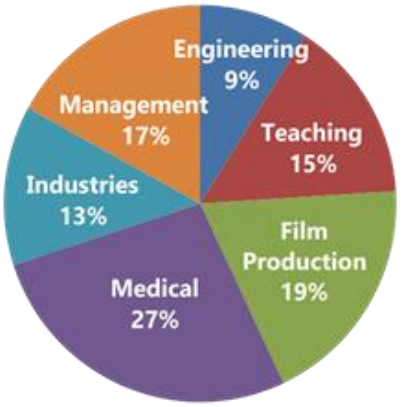

Fig.1.1. Students who chose based on peer/ parent pressure, lack of information.

1.1 Motivation

There have been many purposes of counseling and guidance in all aspects; but in this case, the significant purpose has been identified from the perspective of education and the purposes have been stated as follows:

1. The individuals have to be made aware of their basic personal prerequisites, abilities, assets, liabilities and potentialities; hence they have to be made aware about their own positive points and negative points.
2. Effective, meaningful and significant information has to be provided to them in solution of their problems.
3. The students should learn how to scrutinize their weaknesses and then overcoming them; the role of the counselor and a guide is to help them how to catch the fish on their own and not catching fish by themselves and giving it to them.
4. Students may also need counseling and guidance services regarding the selection of a career; in this case, they should assist them in making appropriate, satisfying and interesting educational choices.

1.2 Problem Statement

Career guidance in the era of life-long learning faces challenges related to building accessible services that bridge education and employment services. Most of the students across the world are always in confusion after they complete higher secondary and the stage where they have to choose an appropriate career path. At the age of 18, the students don't have adequate maturity to accurately know about what an individual has to follow in order to choose a congenial career path. As we pass through the stages, we realize that every student undergoes a series of doubts or thought processes on what to pursue after 12th which is the single tallest question. Then comes the next agony whether they have essential skills for the stream they've chosen. Parent or peer influenced career choices, lack of interest in the selected stream and an awful educational or professional guidance results to increase in probability of failure, dropout, lack of skills and unemployment.

1.3 Literature survey

1. [AI based Career Guidance - Firdosh sayyed1, Ronak Sanghani2, Abhishek Vora3, Nikita Lemos4] The solution offered by this paper has, to a certain extent, positively influenced the development of our project. This paper summarizes every feature and object between students and their career choice pattern or path.
2. "Technology in Education - Artificial Intelligence for Career Guidance - Current Requirements and Prospects for the Future" in the IAFOR Journal of Education This study examined the potential and requirements for employing AI in career counselling, outlining potential future research directions.
3. [ResearchGate - Creation of an AI Chatbot to Support University Admissions and Career Guidance] This thesis demonstrates how the topic of "Building AI Chatbot to Support Admissions and Career Guidance for Universities" has been investigated, analyzed, and comprehended in terms of the challenges, shortfalls, and issues that arise in career counselling andenrollment assistance.Besides, A structured dataset concerning enrollment orientation has been successfully created by the thesis, and identification models have been generated using machine learning and natural language processing.
4. Seyoum,Yilfashewa (2011), the aim of this study was to see the impact of implementation of guidance and counseling to enhance the quality of higher education institutions.The outcomes of this research revealed that this research could serve to identify opportunities and challenges; development of strategies for future guidance counseling effort in the Haramaya University in particular and Ethopian University in general.4this research also found the fact that students do not have sufficient knowledge of guidance counseling services of the University
5. [C3-IoC: A Career Guidance System for Assessing Student Skills Using Machine Learning and Network Visualization] International Journal of Artificial Intelligence in Education The AI-based C3-IoC solution, which enables students to see and explore the employment role space in accordance with their skill set, has been observed and comprehended in this work.

6. [ResearchGate - Tahseen Mehraj and Asifa Mehraj Baba, Scrutinizing Artificial Intelligence based Career Guidance and Counselling Systems: An Appraisal] This study, which we saw, examined a number of modern career coaching platforms that were built using AI approaches. The notable accomplishments and deficiencies of the corresponding AI-based solutions have been listed openly.
7. [Artificial intelligence-based job counselling chatbot a system for counselling by D Zaidi, S Raza, and L Sharma] This research study suggested an intelligent chatbot system for career counselling that will assist users in selecting the best career by providing pertinent answers to users' questions

1.4 Objectives

The objective of an AI-based career guidance system is to provide personalized and accurate career advice to individuals, using artificial intelligence algorithms and machine learning techniques. The goal is to help individuals make informed decisions about their career path by taking into account their unique skills, interests, personality traits, and goals.

Some of the specific objectives of an AI-based career guidance system website may include:

1. Providing personalised career advice: By using AI algorithms to analyse individual data, a career guidance system can offer tailored career advice that takes into account an individual's specific skills, interests, and career goals.
2. Identifying suitable career paths and job opportunities: AI-based career guidance systems can use labor market data and other relevant information to recommend suitable career paths and job opportunities that align with an individual's skills and goals.
3. Providing guidance on skill development: A career guidance system can recommend training and education programs that can help individuals develop the skills they need to succeed in their desired career path.

4. Helping individuals make informed decisions: By offering comprehensive career advice, a career guidance system can help individuals make informed decisions about their career development and avoid making career choices that are not well-suited to their skills and interests.
5. Overall, the objective of an AI-based career guidance system is to provide individuals with the tools and resources they need to make informed decisions about their career path and achieve their professional goals.
6. The individuals have to be made aware of their basic personal prerequisites, abilities, assets, liabilities and potentialities; hence they have to be made aware about their own positive points and negative points.
7. Effective, meaningful and significant information has to be provided to them in solution of their problems.
8. The students should learn how to scrutinize their weaknesses and then overcoming them; the role of the counselor and a guide is to help them how to catch the fish on their own and not catching fish by themselves and giving it to them.

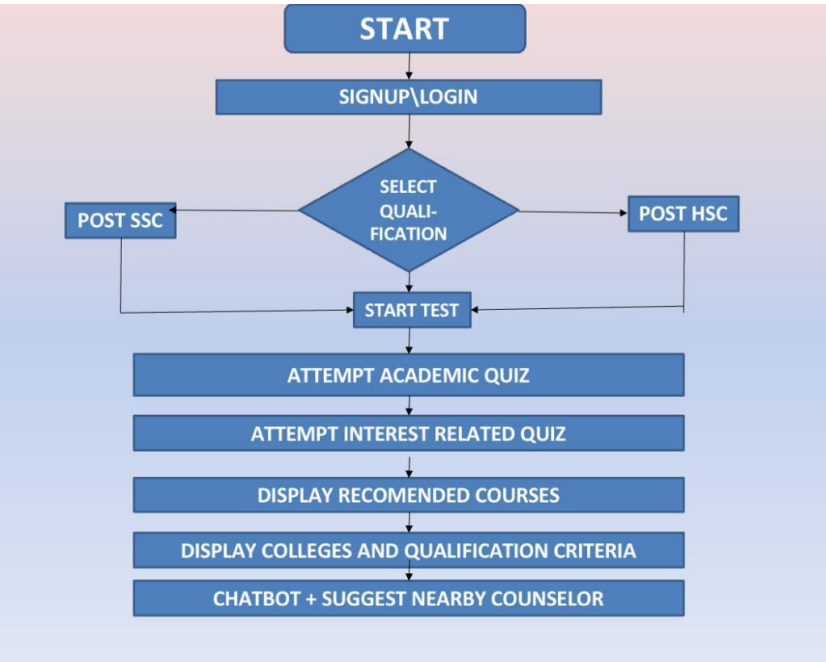

Fig.1.2: Algorithm of the system

1.4 Role of AI in Career Guidance

In focus groups, students and staff envisioned similar roles for the AI in information delivery, case management and intelligent analytics. Students tended to form concrete service ideas and describe interactions with the AI tool. Students cast AI into roles that ranged from discovery tool to pedagogical companion in their education, extending the uses to self-management tasks IAFOR Journal of Education: Technology in Education Volume 9 – Issue 4 – 2021 51 (Sampson et al., 2003). Staff described AI-enabled guidance processes where the AI was an assistant to staff, rather than directly to the student. Scenarios prompted guidance professionals to conceptualize (Tsekleves et al., 2017) new career services, where AI could be leveraged for the benefit of the student, staff and institutions. Staff even named these services and described what functionalities they should have, what data they would run on and how they would be used. When discussing the potential of AI, staff estimated that would depend on the student and their needs. References were made to matching the type and level of guidance to individual needs and types of students (Sampson et al., 2003). Staff raised discussion about the respective roles of humans and AI. They voiced concerns, stressing the importance and role of human interventions even when facilitated by the AI process. This might reflect cautionary attitudes towards new technology and the need to mediate the interaction of students with technology. Participants envisioned a career guidance process where human and artificial effort and competences would be combined, similarly to Khare et al. (2018) who argue for a synergistic integration of human and AI support for student success. In addition to maximizing benefits, an integrated approach also moderates the risks of technology use (Fusco et al., 2020). By Bandura's (2006) criteria, AI is not an agent as it lacks moral agency. However, the concept of proxy agency can be employed for the joint agency that users and tools possess (Neff & Nagy, 2018). This is indeed how participants described the process of developing and using AI-powered tools in guidance: extending their own competences and resources with the tools, wanting to "outsource" or "delegate" tasks to their envisioned AI collaborators capable in information retrieval, optimization, and visualization. The construction of agency in AI-enabled guidance can be seen as an interactive process where agency can manifest via multiple modes. Table 1 details the potential role of AI in guidance on a continuum, giving examples

from the study. The role of AI moves along a continuum from tool to assistant, then collaborator and eventually to coach (Kantharaju et al., 2018). This echoes the reality-virtuality continuum posited by Milgram and Kishino (1994) and the concept of augmenting human capabilities with technology (Raisamo et al., 2019). The agency construed along the continuum expands from direct personal agency exercised with the aid of AI, to proxy agency mediated through the AI, to collective agency created together with AI and possibly even the type of symbiotic or artificial agency. Symbiotic agency is agency constructed within the human-technology interaction, where technology mediates human experiences, perceptions and behaviour, and human agency affects the uses of technology (Neff & Nagy, 2018). Kuijer and Giaccardi (2019) argue that conceptions of "artificial agency" should not focus on autonomy but the process of learning, situated and sustained in interaction. In both these constructs and along the agency continuum, the respective roles of human and machine adapt in interaction to perform optimally together. Leveraging AI in career services may affect existing structures. Further study on the effect of AI-enabled interventions on the construction and mediation of agency in guidance is necessary in order to develop services that leverage the affordances of students, staff and technology. The construction and modes of agency should be made visible as this would further students' selfreflection and self-regulation as well as the development of guidance practices.

Chapter 2

Methodology

2.1 Framework and Research Questions.

This article contributes to the body of work on digital technologies, namely artificial intelligence, in career guidance, education and lifelong learning. This study was conducted using the theoretical framework of socio-cognitive agency and its extensions to human technology interaction. The following research questions were posed:

- What requirements for using artificial intelligence in career guidance are identified by students?
- What possibilities exist for using artificial intelligence in career guidance?

2.2 Basic Methodology of the system.

1. Data Collection--

The main job of the chatbot is to respond to parents' and students' questions concerning admissions counseling. As a result, the data offered needs to be precise, legitimate, and reliable. To ensure that data sets cover all potential scenarios, we must choose two separate data sources from the list below:

- The sets of questions and database are backed by many entrance test papers of various levels.
- The sets of questions are provided by students and parents from various network groups.

2. Data Sets--

After extracting a set of queries, we systematize and synthesize a list of the most popular topics and material.. We create a thorough list of question sets that include the appropriate topics as well as substance for each topic. Following that, we draught questions with similar meanings.

To begin with compiling equivalent questions based on the original question collected, we discover guidelines for creating identical questions based on sentence structure and language adjustments.

After completing the questionnaire set, the structure of the data sheets and the answer set, the research team should carry out the task of cross-checking and editing the data set to avoid unnecessary errors. Defects detected during testing will be noted, checked and corrected many times.

2. Training Model--

To develop data models for machine learning training, data sets in the form of excel sheets will be needed. Following pretreatment, the first stage is to create a bag of words based on a list of phrases that will be used to vectorize the sentences in each subject. The chatbot will be given the input data to process before being included into the model when a session is initiated.

4. Processing--

After preprocessing user-provided raw text, the result of the procedure will be standardized text that can be used to input the algorithm model to determine the speaker's intent. In response to the user's input command, the system will recognize the subject and source the user is referring to throughout the processing to create results, then map with the response set to produce the results as well as run the required API or functions.

•Step 1: After identifying the outcome of the preprocess, the model will move on to identifying the topic group.

•Step 2: Use the machine learning training model that was established in the model building phase to load the content that users want to discuss.

•Step 3: Once the user's intent has been ascertained, from the output of the function that executes the identification model, and then continue processing to provide a series of requests for the response process.

5. Interface--

Our team focused on the internal container communication space between the chatbot and user when designing and developing a dialogue interface with a chatbot that was nice and simple to use, based on proximity, and had a structure of simple functional areas and few symbols.

2.3. Methodology of a Chatbot.

This chatbot that we have generated is a computer program designed to simulate conversation with human users. Here's a general overview of how our chatbot works:

1. Input: The chatbot receives input from a user in the form of text, voice, or other types of data.
2. Natural Language Processing (NLP): The chatbot uses Natural Language Processing (NLP) techniques to understand the user's input. NLP involves breaking down the user's input into its constituent parts (words, phrases, etc.) and analyzing their meanings.
3. Dialogue Management: Based on the user's input, the chatbot determines what type of response is appropriate. This involves using dialogue management techniques to keep track of the conversation and maintain context.
4. Output: The chatbot generates a response to the user's input. This response can be in the form of text, voice, or other types of data.
5. Machine Learning: Chatbots can improve their responses over time through machine learning techniques. This involves analyzing past interactions to identify patterns and improve the chatbots understanding and response generation.

Overall, a chatbot is a complex system that combines a range of technologies to create the illusion of human-like conversation. By understanding the user's input, generating appropriate responses, and continually learning and improving, chatbots can provide a useful tool for businesses and individuals alike.

Chapter 3

Software Specifications

3.1 Languages Used in the system:

HTML –

We employed techniques for mining content from websites and social networks in our study. In order to process HTML texts and pages and obtain data, we employed the computer language. To extract the text from the webpage, we can utilize some straightforward string splitting techniques by determining the partial layout and tag structure.

We gathered information by examining HTML sites as we built the dataset for Chatbot. To finish and create the database for the Chatbot, rely on the data analyzed from the HTML page.

CSS –

CSS is used to provide the styles for web pages. It describes the appearance and formatting of a document written in a markup language. It adds a new functionality to HTML. Usually, it works with HTML to change the appearance and feel of internet pages and user interfaces. Presenting web pages is made easier via CSS. It is simple to learn and understand and may be used to control how an HTML content is presented. CSS gives us the ability to manage a wide range of components, including text color, font style, paragraph spacing, column size, layout styles, and more. It is not reliant on HTML and may be used with any XML-based markup language.

JAVASCRIPT-

Web pages are created using the scripting language JavaScript. JS, which was created in Netscape, enables programmers to construct dynamic and interactive web pages that interact with users and carry out complicated tasks. Additionally, it allows users to insert material into a document without refreshing the page.

PYTHON -

We used Python to develop using the object-oriented programming paradigm. Code, properties, execution methods, and data are all combined to make up the objects in the chatbot model. Every item has a distinct name, and references to that object are handled according to that name. Each object in OOP can therefore receive messages, handle data internally, and send or respond to other objects or the environment.

NLP-

Natural language processing (NLP) refers to the branch of computer science—and more specifically, the branch of artificial intelligence or AI—concerned with giving computers the ability to understand text and spoken words in much the same way human beings can.

NLP combines computational linguistics—rule-based modelling of human language—with statistical, machine learning, and deep learning models. Together, these technologies enable computers to process human language in the form of text or voice data and to 'understand' its full meaning, complete with the speaker or writer's intent and sentiment.

3.2 Database used in the system:

MySQL –

The information is kept in tables, which are smaller storage spaces used in relational databases with addition to making, it simpler to find the information you require, this also aids with data organization.

Consider storing both the most recent purchases a consumer made and their contact details. The items you would be asked to store are rather simple. Each of these components would be kept in its own table in MySQL.

3.3 Framework used in the system:

Flask and Django are both web frameworks for building Python-based chatbots. Here are the two frameworks that we used for preparing our website and create a flexible and reliable model:-

Flask:

1. Lightweight: Flask is a lightweight web framework that provides only the bare essentials for building web applications, making it a good choice for small to medium-sized chatbot projects.

2. Flexible: Flask is highly customizable and allows developers to choose which libraries and tools they want to use to build their chatbots, providing more flexibility in development.

3. Simple to use: Flask is easy to set up and use, making it a good choice for beginners who are just getting started with building chatbots.

4. Minimalistic: Flask provides only the basic features and components required to build a chatbot, making it easier to maintain and deploy.

Django:

1. Full-featured: Django is a full-featured web framework that provides a wide range of tools and components to build complex web applications, including chatbots.

2. Built-in components: Django provides built-in components for common web development tasks, such as user authentication and database management, which can save time in chatbot development.

3. Scalable: Django is designed to handle large-scale applications and can be easily scaled to support high traffic and large volumes of data.

4. Security: Django has built-in security features, such as protection against cross-site scripting and SQL injection attacks, which can help to make chatbots more secure.

Chapter 4

System Overview

4.1. Proposed System

An AI-based career guidance website is an online platform that provides personalized career guidance and recommendations to individuals using artificial intelligence and machine learning algorithms. These websites use a combination of user inputs and data sources to provide recommendations on suitable career paths, job opportunities, and skill development.

The website may prompt users to answer a series of questions related to their skills, education, interests, and work experience. The AI algorithms then use this data to generate a personalized career profile and provide recommendations for suitable job roles and industries. The recommendations may also include information on relevant education and training programs to help individuals build the necessary skills for their desired career.

In addition to personalized career guidance, AI-based career guidance websites may also offer features such as job listings, resume builders, and interview preparation tips to help individuals secure employment. These websites may also collect data on user behavior and preferences to improve the accuracy and relevance of their recommendations over time.

When recommending individuals to a certain university, one of the major hurdles is accurately evaluating their skill sets.

The candidates are frequently transferred immediately to the institutes without taking into account their aptitude and domain-related skills and knowledge when they are first screened based on their prior performances or during telephone interviews.

Both the time involved and the misfit ratio rise as a result. The lengthy process might additionally contribute to professional failure.

Our distinctive collection of evaluation resources can be utilized for all stages of career advising, including for freshmen and those in grades 10 and 12.

Cognitive abilities are just as crucial to choosing the best institutions as subject-matter competence.

These abilities will indicate a candidate's capacity for success in demanding circumstances and problem-solving on the spot.

In the system, we have designed and developed a web-based application for a career guidance system which provides suitable recommendations for a candidate in choosing an appropriate department. The recommendation provided in the proposed system is more accurate than the existing career guidance system. This system proposes an intelligent Chatbot system for career guidance based on Skill Set which will help the user in choosing the right career by giving an appropriate response. Due to an accurate knowledge base, quick answers will be given to the user.

4.2. Overview of model:

There are three module in the website:

- Student module
- Teacher module
- Admin module

1. Student module:

- Student module contains two parts in it. First includes sign up for student and second is login option. Sign up is for the new student as they need to create an account and fill the asked information in it and login is for that student those who have already signed up.
- Now student need to login in the student login panel with the help of user login credentials.
- After login, student see available exams and the marks section, in exam section there are two exams:

    1. Psychometric test

    Psychometric tests are a standard and scientific method used to measure individuals' mental capabilities and behavioral style. Psychometric tests are

designed to measure candidates' suitability for a role based on the required personality characteristics and aptitude (or cognitive abilities).

Basic usecase of psychometric tests :-
Psychometric tests are standardized assessments designed to measure an individual's mental abilities, personality traits, and other psychological attributes. These tests are commonly used in various settings, such as education, employment, and clinical psychology.

Psychometric tests can be categorized into several types, including intelligence tests, personality tests, aptitude tests, and achievement tests. Intelligence tests, such as the Wechsler Adult Intelligence Scale, are used to measure cognitive abilities like problem-solving, verbal comprehension, and perceptual reasoning. Personality tests, such as the Myers-Briggs Type Indicator, are used to measure personality traits like extroversion, agreeableness, and neuroticism. Aptitude tests are used to measure specific skills or abilities, like spatial reasoning or numerical ability, that are relevant to a particular job or field. Achievement tests, such as standardized academic tests, measure an individual's level of knowledge or proficiency in a specific area.

Psychometric tests can provide valuable insights into an individual's strengths and weaknesses, and can be useful in making decisions about education, career development, and clinical diagnosis. However, it's important to use these tests in conjunction with other sources of information, such as interviews, work samples, and observation, to make well-informed decisions. Additionally, it's important to ensure that psychometric tests are administered and interpreted by qualified professionals to avoid misinterpretation or misuse of the results.

2. Aptitude test

Aptitude tests can also be used for on-project training and succession planning. Tests can be designed based on project requirements. The test results will help trainers identify skill and knowledge gaps, which can be used to create a training plan.

Basic usecase of aptitude tests:-

Aptitude tests are commonly used in various settings to assess an individual's ability to perform specific tasks or succeed in a particular role. The basic use cases of aptitude tests include:

1. Employment: Many companies use aptitude tests as part of their recruitment process to assess candidates' skills and abilities that are necessary for the job. For example, a software development company may use aptitude tests to measure a candidate's programming ability or problem-solving skills.

2. Education: Aptitude tests are commonly used in the educational setting to measure a student's potential to succeed in a particular field or program. For example, colleges and universities may use aptitude tests to assess a student's potential in fields like engineering or medicine.

3. Career development: Aptitude tests can be used to help individuals identify their strengths and weaknesses, and explore career options that align with their skills and interests. This can be useful for individuals who are considering a career change or seeking professional development opportunities.

4. Personal development: Aptitude tests can be used for personal growth and development by helping individuals understand their strengths and areas for improvement. This can be useful for individuals who want to

improve their skills or abilities in a particular area, such as leadership or communication.

Overall, the basic use case of aptitude tests is to assess an individual's abilities and potential in a specific area, and to help make informed decisions about education, employment, or personal development.

- Student needs to appear that exams first student appear the psychometric test and they will get the result of that test and student will able to find a interest in a one particular field with the help of psychometric test , Psychometric test contain five fields in this agriculture, engineering, arts, commerce and medical field. So after attending the test student able to find the interest in one of the particular field.
- After finding the interest, students appear for the aptitude test, aptitude test which is specially designed for the engineering field interested student. In that test there is physics, chemistry, and mathematics related question are present, so student appear for that test and getting a result of that test.
- After getting a result of aptitude test there is a one college allotment system of the student, on the basis of the marks the college will be allotted the student in the form of tier 1, tier 2 and tier 3 The student score maximum marks then they will be able to tier 1 college whose contain a all IIT colleges and the student score medium range of marks the they will be able to the tier 2 college whose contain Government colleges and those student gets a less marks then they will able to the tier 3 college whose contain all private college.

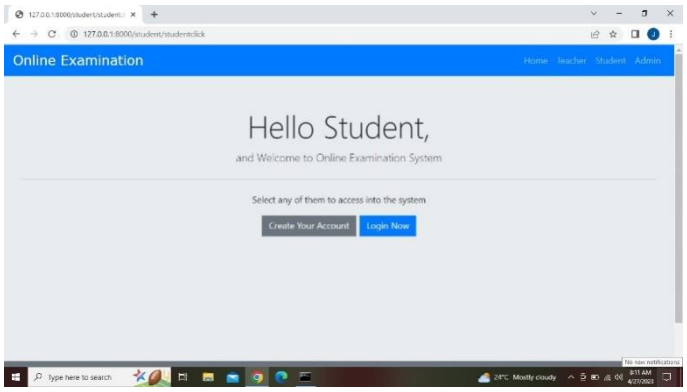

Fig.4.1: The website home page

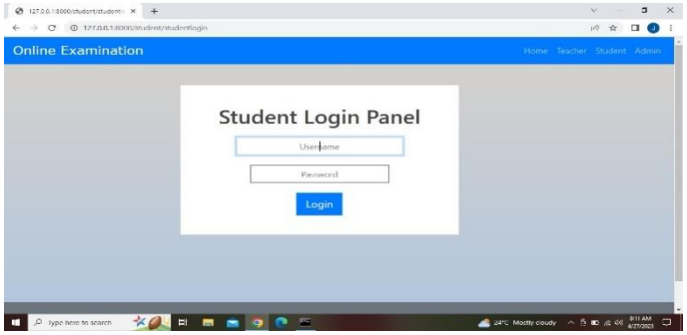

Fig.4.2: The student login page

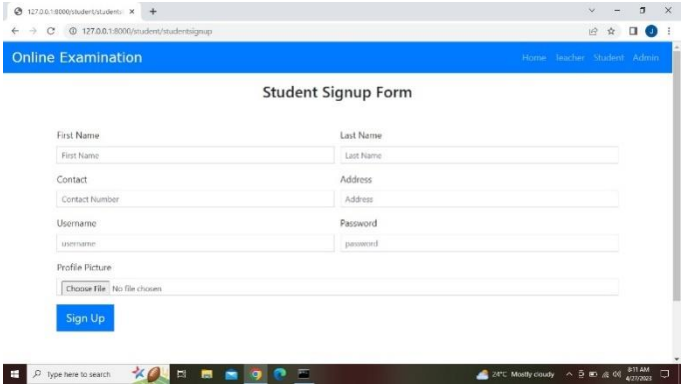

Fig.4.3: The page for students to sign up

3. Admin module:

- Admin module is can handle by admin only.
- There is a admin login panel admin need to fill the username and password and then login into that panel.
- In this module there is a four sections registered student, total teachers, total courses and available questions.
- In registered student section the admin can see how may student are enroll for the exams and the complete information about that student, also admin can reject a student in that section
- In total teachers section admin can able to see how many teachers are available in it and also admin can accept the pending teachers approval in this section.
- In total courses admin can find how many courses are available in it and also admin can able to add or delete a courses.

- In total questions admin can find the how many questions in which particular field are available, and also it can add or remove questions in that section.

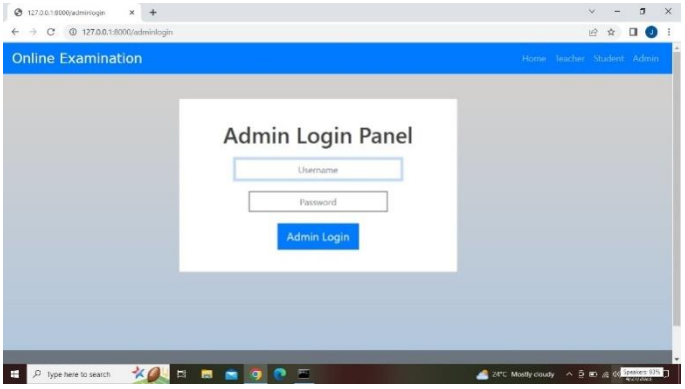

Fig.4.4: The admin's login page

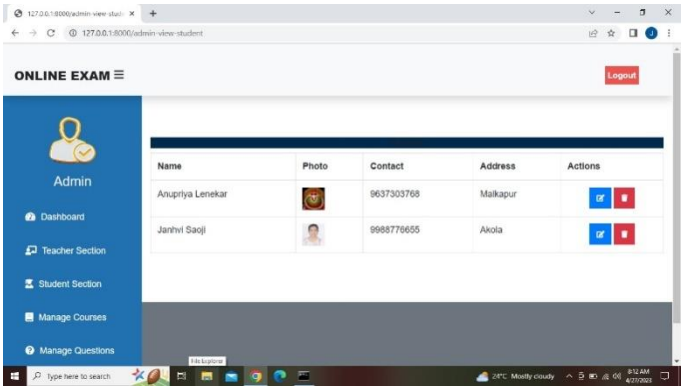

Fig.4.5: The page for admin to monitor student activities.

3. Teacher's module:

- In teacher module first there is a teacher login panel teacher need to fill the username and password there.
- If the teacher is new the teacher need to wait for the approval by the admin, admin first can approve that new teacher after that it enter in the teacher section.
- If the teacher is already approved by the admin then they don't need to the approval by the admin it can directly enter to the section.
- In teacher module there is also three section register student, total course and total question.

- Like admin, teacher can also handle these three sections.

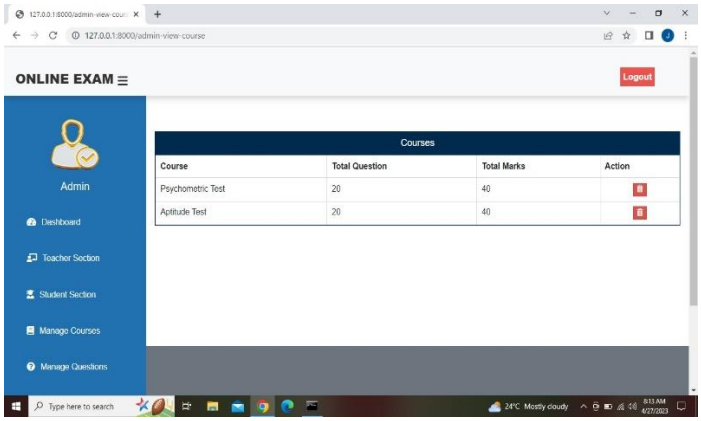

Fig.4.6: The Results of attempted tests will be on this page

So after a complete process there is a logout option. So student as well as admin and teacher can log out the system successfully.

4.3. Chatbot Overview

1. User initiates a conversation: The user sends a message to the chatbot through a messaging platform, such as Facebook Messenger or Slack.
2. Chatbot greets the user: The chatbot recognizes that the user has initiated a conversation and sends a greeting message, such as "Hello, how can I assist you today?"
3. User provides information: The user provides information about their query or request, such as "I would like to know the balance on my account."
4. Chatbot processes user input: The chatbot processes the user's input using natural language processing and dialogue management techniques to understand the user's intent.
5. Chatbot retrieves data: The chatbot retrieves relevant data from a database or other source based on the user's input, such as the account balance.

Chapter 5

Working Principle

A web based application along with an integrated Chatbot that aims to answer the queries of post SSC & post HSC students, who are unable to choose their stream.

Apart from suggesting streams, it will also recommend colleges of that respective stream along with its selection criteria.

Digital tools can provide individuals with novel opportunities to access guidance any time or place as well as expanding the range of services offered. The potential benefits of using technology in career guidance include improved accessibility, increased access to information, assessment, and networks as well as lowered overall costs and improved cost-effectiveness. The ongoing pandemic has increased the need for distance and digital services for guidance.

We traditionally used technology in three ways, providing:

1) learning and career information supporting career building,

2) automated interaction like career assessments, simulations.

3) choices of communication

The development of integrated or blended guidance – guidance via digital means – requires guidance professionals and service designers to plan what technologies to use and how. The integration of new and emerging technologies into guidance services depends not only on the users' skills or technical solutions, but also on the willingness of guidance organizations and professionals to adapt. The extent to which technology is integrated into guidance practices varies based on the capacity and technological orientation of staff.

AI-enabled guidance services were considered inherently more accessible due to digital delivery. It was noted that their utilization requires digital devices and competences. This creates a potential conflict if students are unable to benefit from digital services, expected to enhance accessibility in temporal and spatial aspects. In order to account for accessibility, we need to pay attention to factors in the socio-technical system design, underlying algorithms and the interplay between automated and human actions.

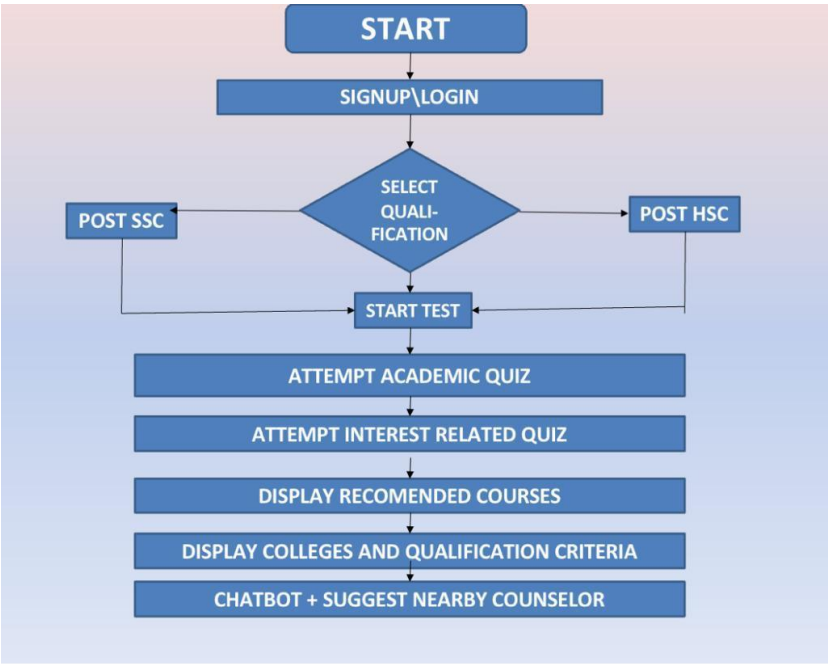

Fig.5.1: Algorithm of the system

Chapter 6

Benefits of Career Guidance

The responsibilities of a career guidance system is same as that of an offline career guide. However, some common responsibilities of a career guide may include:

1. Helping clients identify their interests, strengths, and values to determine potential career paths that align with their goals and personality.

2. Assisting clients in developing career plans, including setting career goals, creating action plans, and identifying necessary skills and qualifications.

3. Providing information and guidance on educational and training programs that may be necessary for certain career paths.

4. Offering advice on job search strategies, including networking, job application processes, and interview techniques.

5. Providing feedback on resumes, cover letters, and other job application materials.

6. Conducting mock interviews to help clients prepare for job interviews.

7. Offering advice on negotiating job offers and employment contracts.

8. Helping clients navigate career transitions, such as changing jobs or industries.

9. Providing guidance on career advancement and professional development.

Overall, the primary responsibility of a career guide is to help their clients make informed decisions about their careers and to provide them with the tools and resources

they need to achieve their goals.

After completing 10th grade, students in many educational systems have to choose a stream or specialization for their higher education, which can be a challenging decision. Here are some common problems students may face after choosing their stream:

1. Difficulty in adjusting: After choosing a stream, students may find it difficult to adjust to the new curriculum and expectations of their courses, especially if the new subject matter is vastly different from what they were studying in 10th grade.

2. Interest mismatch: Some students may realize that they are not interested in their chosen stream, despite having chosen it based on their initial interests or career goals. This mismatch between their interests and the chosen stream can lead to boredom, lack of motivation, and poor academic performance.

3. Limited career options: Certain streams may have limited career options or may require further education and training, which can make it challenging for students to find employment opportunities immediately after completing their degree.

4. Peer pressure: Students may feel pressure to conform to their friends' or family's expectations and choose a particular stream, even if it is not aligned with their interests or career goals.

5. Career uncertainty: Some students may feel uncertain about their future career prospects after choosing a stream, especially if they are unsure about the specific jobs or industries they want to pursue.

6. Inadequate guidance: Students may not have access to adequate guidance or counseling services to help them make informed decisions about their stream or to navigate the challenges they face after choosing a stream.

Overall, choosing a stream after 10th grade can be a challenging decision, and students may face various problems after making this decision. However, with proper planning, guidance, and self-reflection, students can overcome these challenges and make the most of their chosen stream.

Career guidance is a process of helping individuals make informed choices about their careers by providing them with the necessary information, resources, and support. Here are some benefits of career guidance:

1. Self-awareness: Career guidance helps individuals understand their strengths, weaknesses, interests, values, and personality traits. This self-awareness can help individuals make informed decisions about their career paths.

2. Exploration of career options: Career guidance provides individuals with information about different career options, their job duties, and the required qualifications. This helps individuals make informed decisions about which careers are a good fit for them.

3. Goal setting: Career guidance helps individuals set career goals and develop plans to achieve those goals. This helps individuals focus their efforts and stay motivated to achieve their objectives.

4. Job search strategies: Career guidance helps individuals develop job search strategies, such as networking, resume writing, and interview skills. This helps individuals increase their chances of finding employment that aligns with their career goals.

5. Personal development: Career guidance can help individuals develop personal skills, such as communication, leadership, and time management, that are essential for success in any career.

6. Improved job satisfaction: Career guidance helps individuals make informed decisions about their careers, which can lead to improved job satisfaction and

performance.

Overall, career guidance is beneficial for individuals who want to make informed decisions about their careers and achieve their career goals. It helps individuals develop self-awareness, explore career options, set career goals, develop job search strategies, improve personal skills, and increase job satisfaction

Chapter 7

Research Findings

- **Requirements for AI in Career Guidance:**

In focus groups, artificial intelligence solutions were envisioned to support students in studies and career planning but also in self-management. Students welcomed the use of AI in career guidance. They emphasized the importance of accessible and timely guidance, whether delivered by AI or humans. AI was seen to have a role via detecting weak signals and potentially giving a "nudge" towards guidance interventions before either the student or staff would know to act. Students described that any AI-enabled process should be part of everyday learning activities, not a separate application. Students brought up needs to manage their schedules and workloads, and to find suitable study methods. Students described needs for better communication and feedback with teachers and students. Students also mentioned the importance of peer support and discussed the potential role of AI in mediating this.

Students envisioned that artificial intelligence could support them in recognising their strengths and weaknesses, enabling their development. They wanted to use AI to compare their skills to the competence requirements of specific fields or positions, as well as general working life competences. They saw potential in AI applications that propose studies, thesis topics, work placements and jobs based on skills, experiences and interests. Staff envisioned a role for AI in recognition and accreditation of prior learning as well as predicting future competence needs. Staff discussed the competence or skill data used by AI. They recognized that while various data sources already exist, these are not necessarily available for students. Collating this data via AI would enable students to have a more active role in their own learning and career planning.

Finding, accessing and relaying information on for example curricula and schedules was considered difficult and time-consuming. Students and staff envisioned that AI could assist in delivering the right information at the right time. They described a proactive process, extending to information not yet needed to be known. Students and staff envisioned that AI would advise to book a guidance session when needed, supporting case management. This would enable staff to "triage" cases, taking action

more quickly when needed. Staff stressed the significance of designing how to determine the urgency and importance of issues. Both students and staff hoped AI would aid in detecting and visualizing study progress based on the act.

In future we can create effective web application that can gather information by evaluating and examining. Analytical, Memory

Based, Technical, Logical, Hobbies, interests in Technical/Non Technical, Performance of the student from the child hood and skill based tests can be conducted and information collected can be used to improve the accuracy. The Dataset can be built from several thousands of student's data. We can try to use the clustering methods for better understanding. We can also implement the techniques like Deep Neural Networks and Time series Analysis.

Scenarios encapsulated the potential roles of AI in career guidance into narratives. The scenarios were linked to various phases along the study path, from initial application to studies, across studies and transition to employment, and linked to competence development within the continuous learning paradigm. The working of intelligent technology was described both from the viewpoints of student and staff as well as describing implications for the higher education institutions at large. The following were the most elaborated among the resulting twenty-one scenarios: -

Supporting career planning: supporting decision making throughout career, promoting available career services based on situational information .

- Enhancing interaction in counseling: matching students and counselors, collating previous guidance discussions to a knowledge base.
- Recognizing and verbalizing existing skills: creating a competence portfolio, recognizing generic competences from work experience
- Comparing competences to goals and needs from working life: offering self assessment tools for competence mapping, inferring competence gaps based on profile data
- Anticipating guidance needs and case management: collating information on the student for staff to see at a glance, prioritizing tasks for staff - Recognizing networks: enabling access to up-to-date information sources on career services, leveraging existing contacts for employment opportunities.

Chapter 8

Experimental results

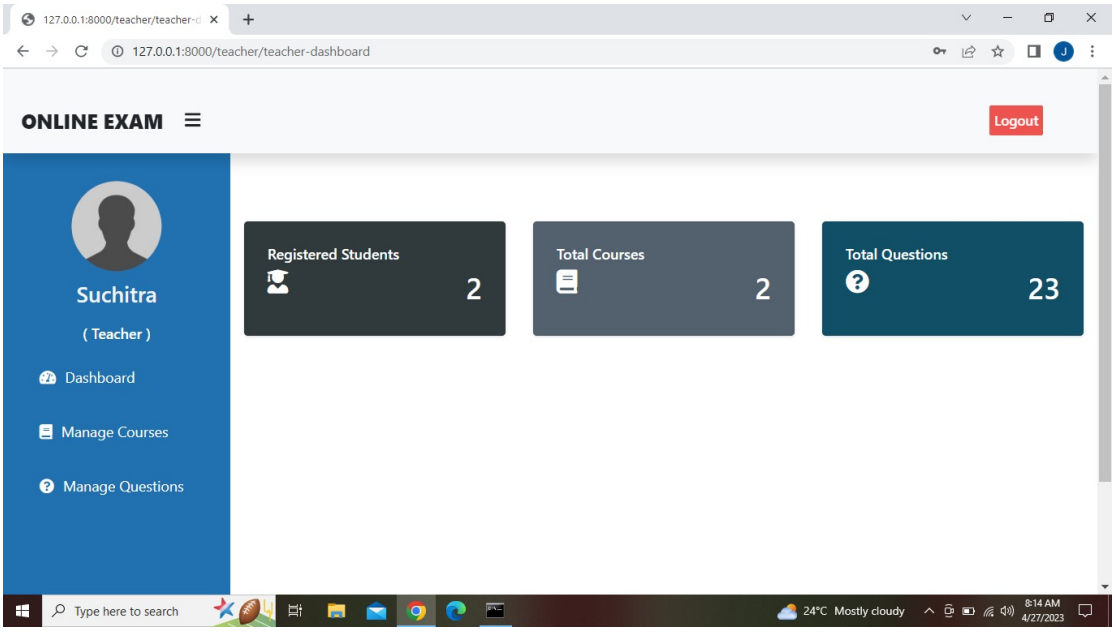

Fig.8.1: Dashboard of Teacher's module

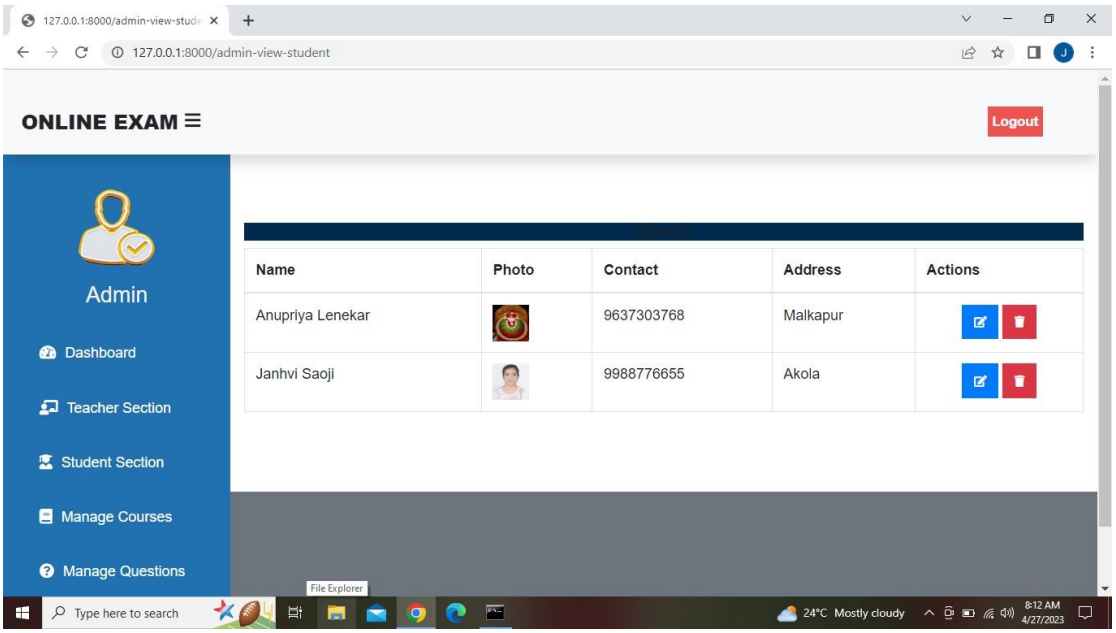

Fig.8.2: Dashboard of Admin module

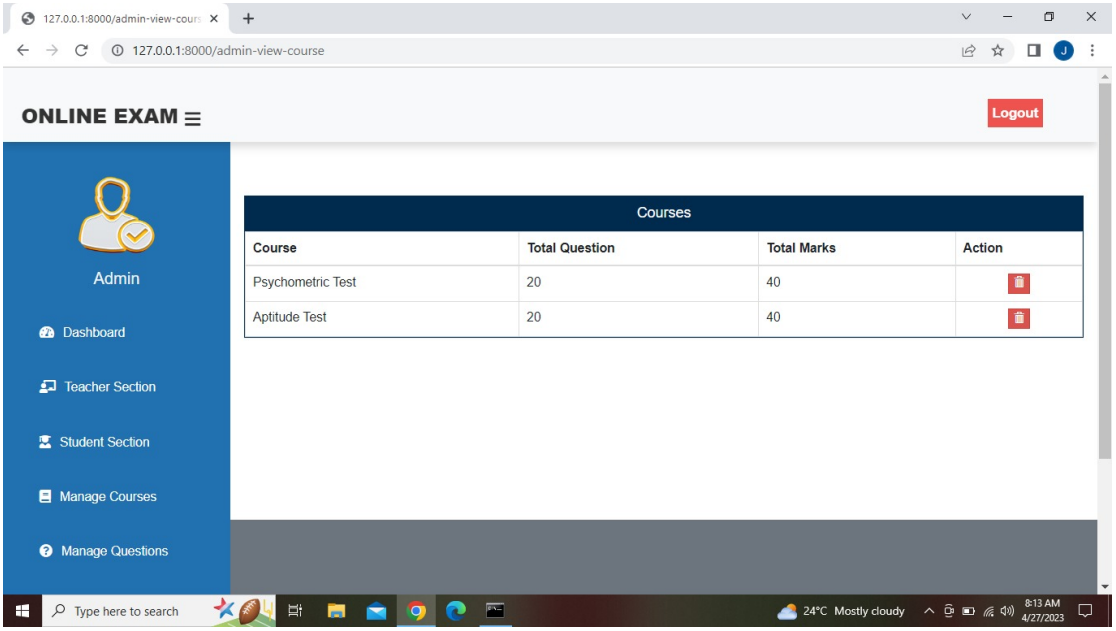

Fig.8.3: Test Panel

Conclusion and Future Scope

The main worries among young people today are career-related issues. More people are changing careers as a result, therefore many people must familiarize themselves with emerging fields of work and professions that offer new career chances in addition to job openings. Consequently, there is a critical need for automated employment.

In order to protect students' future, educational institutions employ counseling specialists. In this essay, an AI-based contemporary system for career counseling is critically analyzed. The relevant AI-based solutions' salient successes and shortcomings have been freely documented. It is determined that the suggested solution is unchallengeable and unrefusable. Additionally, understanding of the factors influencing career choice is apparent. This comprehension, which is significant and crucial, is a prerequisite for the design of a number of policies in career advising and counseling. The system also provides a reliable method for identifying a person's personality traits, which are a crucial component in the development of automated career counseling and selection processes.

This AI system can be enhanced using deep learning-based solutions to become smarter and more effective. removing the shortcomings of traditional AI methods as a result. Additionally, relevant data is chosen and examined in order to create a standard data collection and eventually provide fresh perspectives on career paths, patterns, and success factors. In addition, further unresolved issues have been identified that should be considered while developing solutions, despite efforts to draw the community's attention to them.

In future we can create effective web application that can gather information by evaluating and examining. Analytical, Memory based, Technical, Logical , Hobbies, interests in Technical/Non Technical, Performance of the student from the child hood and skill based tests can be conducted and information collected can be used to improve the accuracy. The Dataset can be built from several thousands of student’s data. We can try to use the clustering methods for better understanding. We can also implement the techniques like Deep Neural Networks and Time series Analysis.

Career counselor system is an interesting idea. The opportunities that we are providing to the students through an online medium can make the use of this software for choosing

the career based on the appropriate skills. There is a need of career counseling or career guidance in today's world of increasing career paths day by day.

This system is comprising of chatbot which delivers best career choices on the data of industry leading professional and with the help of AI applications system will perform accurately and at high performance. This system will be helpful to very individual seeking career guidance.

The student arriving at our portal will first select the options of their interest and then will go for the questionnaires presented on their screen The answers that they have selected will be then directed to the DATABASE of our system which will become our testing data.

This project presents Student Career Guidance and Recommendation System using the inherent student skills for choosing right career. Choosing a right career by is significant due to the diversified human abilities. Many students are choosing their career path without receiving proper advice from suitable professional or university services. This may potentially cause mismatch between academic achievements, personality, interest and abilities of the students. In order to recommend students in career selection, it is essential to build a recommendation system that provides direction and guidance to students in choosing their career. The key challenge in this project is selecting key attributes/skills that help in predicting the right path to meet diversified students goals. Detailed research and advancement in the domain of Artificial Intelligence can eliminate the faced challenges in the further developed systems.

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