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Data Science

Voice - Enabled Navigator Platform for Data Professionals

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Project Guide
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Introduction

- In the fast-evolving world of data, data professionals require continuous skill enhancement and personalized career guidance.
- Individuals starting or advancing their careers in Data profession, often face several key challenges:
  - Navigating the Job Market
  - Understanding Salary Expectations
  - Continuous Skill Enhancement
- While there are platforms recommending jobs, courses and predicting salaries but, these solutions often operate in fragments.

Introduction

To address these challenges, we propose the **"Voice - Enabled Navigator Platform for Data Professionals"** specifically designed for data professionals. This platform integrates various features to provide:

- Personalized job recommendations
- Accurate salary predictions
- Skill-enhancing course recommendations.
- Voice-based interface for hands-free interaction.

Motivation

For a data professional it is important to constantly upgrade their skills and find new job opportunities to stay competitive:

- It is difficult to navigate through various salary prediction , job and course platforms, as they are often fragmented.
- There are no domain specific platforms.
- Using multiple platforms makes the process time-consuming and less efficient.

This challenge inspired us to create a single, unified platform designed specifically for data professionals, offering all features at one place.

Objectives

- To predict salaries for Data Professionals using gradient boosting algorithm.
- To recommend job opportunities based on content-based filtering / collaborative filtering.
- To recommend relevant courses for skill improvement using content-based filtering / collaborative filtering.
- To develop a voice-Assisted Interface to take input from the user using NLP.
- Users can share their feedback & by analyzing this feedback, system will display this feedback to new users to enhance their decision-making process and overall user experience using php.

Literature Survey of the existing system

- **"Enhanced AI Voice Assistance using Machine Learning and NLP"** focuses on developing a voice assistant that utilizes ML and natural language processing (NLP) to perform tasks through voice commands.(IEEE, 2023)
- **Authors:** J Gowthamy, A Senthilselvi, Aniket Kumar, Aakash S, Gandikota Sreedhar.
- **Technologies Used:**
  - **Natural Language Processing (NLP):** speech-to-text, context understanding,
  - **APIs:** OpenAI for conversational understanding, News API, Weather API
  - **Speech Recognition:** Converts voice commands into text using Python libraries.
  - **Python:** Used for integrating ML models and APIs.
- **Methodologies Used:** Intent Recognition, API Integration and Contextual Responses.
- Inspired by this approach we have built a voice enabled navigator platform which can predict salary and recommend jobs and courses using ML algorithms and NLP.

Literature Survey of the existing system

- **"Salary Prediction Using Machine Learning"** proposes a salary prediction model utilizing **Linear Regression**, based on features like experience, job type, and education. (IJASRET, 2021)
- **Authors:** D. M. Lothe, Prakash Tiwari, Nikhil Patil, Sanjana Patil, Vishwajeet Patil.
- **Technologies Used:**
  - **Algorithm used:** Linear Regression.
  - **Model Evaluation:** Mean Squared Error (MSE)
  - **Back End:** Python, Scikit-learn, NumPy/Pandas, Flask.
  - **Front End:** Html, Css, Javascript.
- **Methodologies Used:** Data Collection & cleaning, Model Selection, Training & Evaluation, Comparison.
- Inspired by this approach, we developed a salary prediction system that leverages **Gradient Boosting** instead of **Linear Regression** to enhance prediction accuracy.

Literature Survey of the existing system

- **"Job Recommendation System Using Machine Learning"** presents an Android application to recommend IT jobs based on user skills and preferences. (IEEE,2023)
- **Authors:** Sakshi Gadegaonkar, Abhijeet Salunke, Darsh Lakhwani, Sahil Marwaha.
- **Technologies Used:**
  - **Android Development:** Kotlin, Jetpack Compose, Material 3 Design Principles
  - **Back End:** Ktor (Kotlin framework), MongoDB, FastAPI (Python)
  - **Machine Learning Model:** Python, Jupyter Notebooks
  - **Algorithm Used:** Content-Based Filtering.
- **Methodologies Used:** Data Collection & Cleaning, Feature Extraction, Model Building, UI/UX Design, Backend Integration, Testing & Evaluation
- Inspired by this approach, we developed an advanced job recommendation system that incorporates collaborative filtering to enhance the personalization of job matches.

Limitations of existing systems

Existing systems that recommend jobs, courses, and predict salaries have certain limitations, including:

- **Fragmentation**: Job recommendations, salary predictions, and course suggestions operate separately, requiring multiple platforms.
- **Voice Navigation**: No voice assistant integration for hands-free use in existing solutions.
- **Domain-specific platform:** There is no specialized system designed to recommend or predict the job, course or salary of a particular profession.

Problem statement

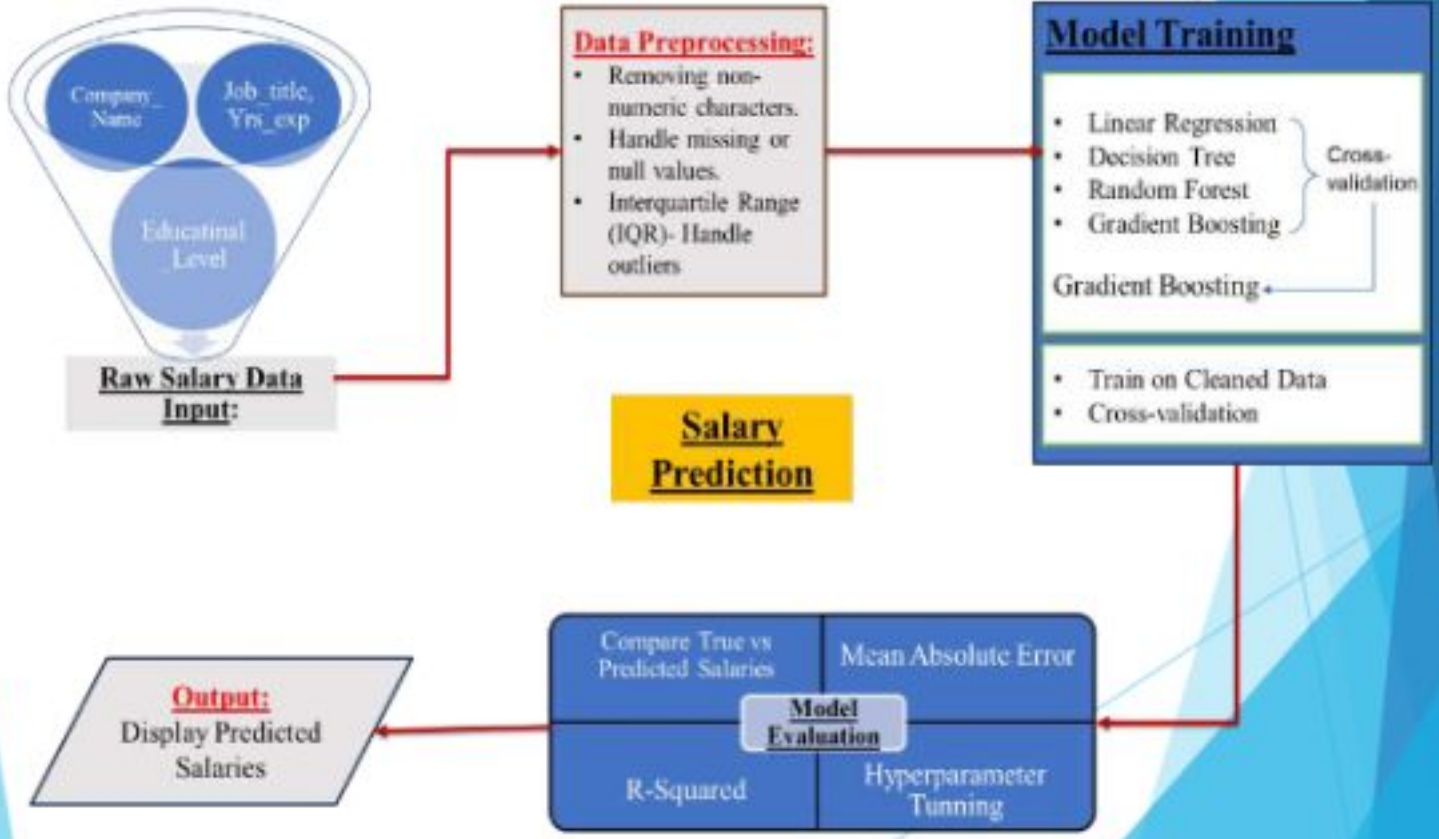
- **Problem statement:**

Existing systems for recommending jobs, courses, and predicting salaries face significant limitations, including fragmentation, lack of voice navigation capabilities, and lack of domain-specific focus.

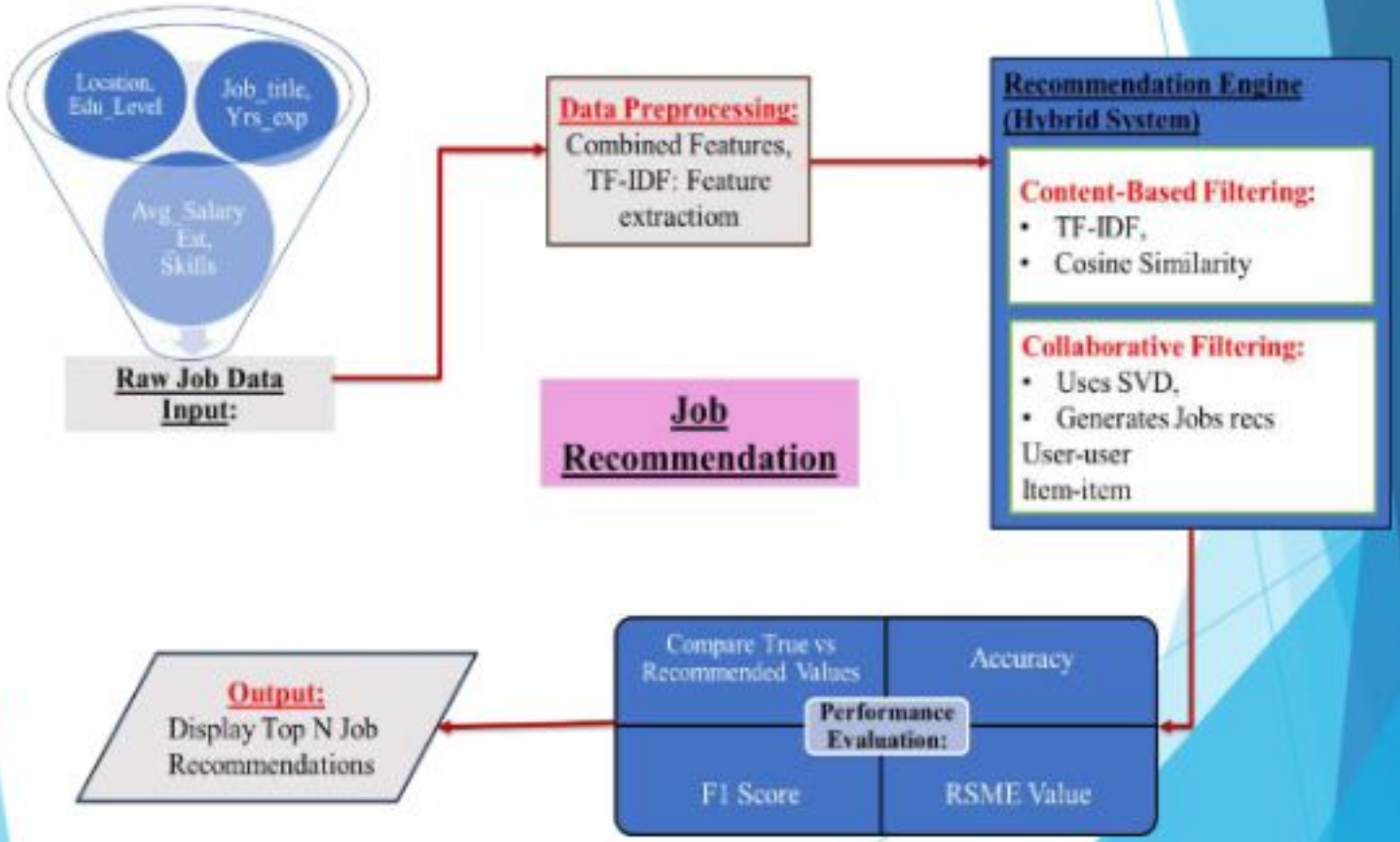
- **Solution:**

Our goal is to address these issues by developing a unified, domain-specific platform that integrates job recommendations, salary predictions, and course suggestions, while incorporating voice navigation to enhance user experience and accessibility.

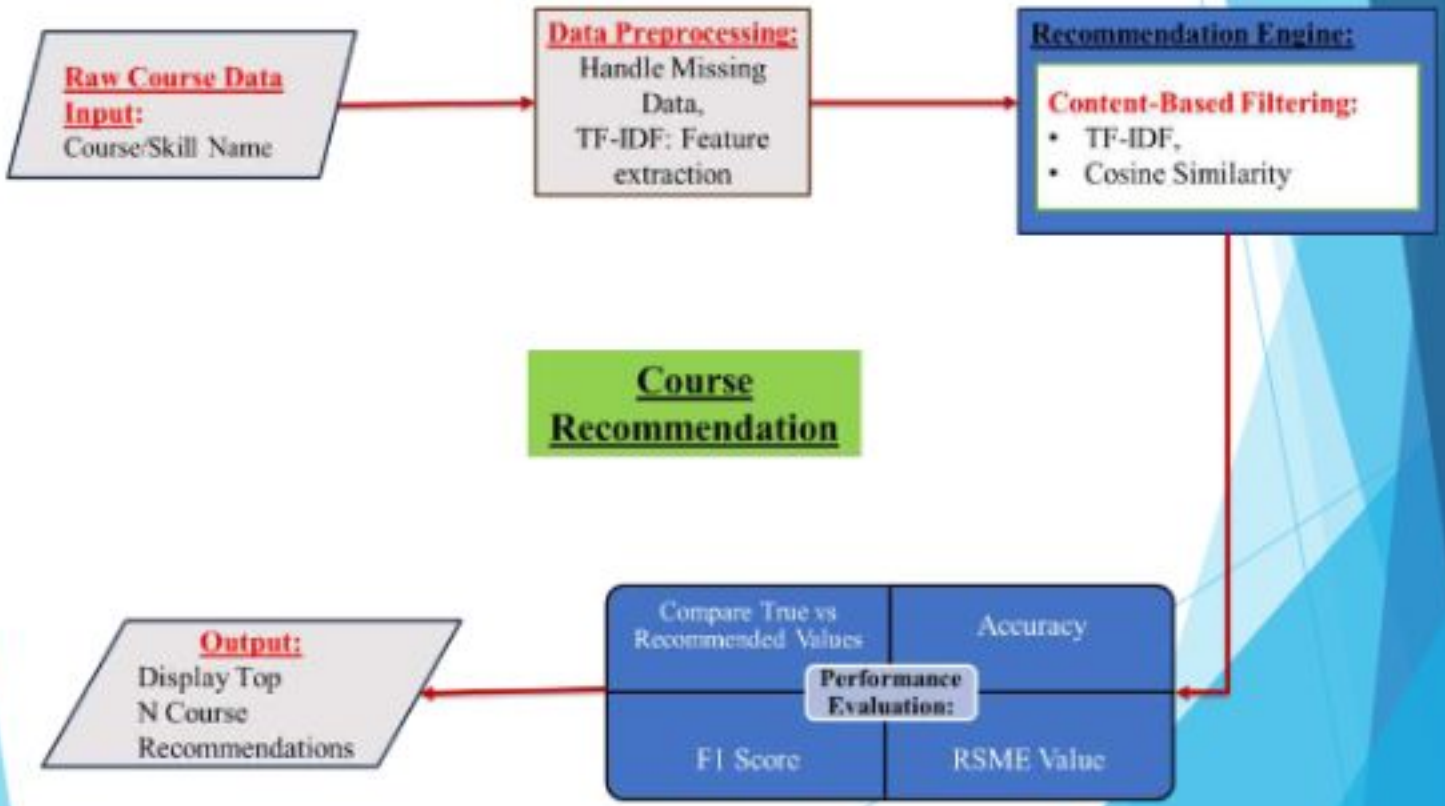
System Design



System Design



System Design



Technologies and methodologies

Algorithm:

- Gradient Boosting.
- Content-based/Collaborative Filtering.
- TF-IDF

Web Technologies:

- Backend: Php, Apache 24, Flask.
- Frontend: HTML, CSS, JavaScript.

Datasets Used:

- **Salary Prediction:**

  Data Science Jobs in India: (1602x8).

  [https://www.kaggle.com/datasets/madhurpant/data-science-jobs-in-].

Technologies and methodologies

- **Course Recommendation:**

1. EdX Courses Dataset 2021: (722 x 6).

   [https://www.kaggle.com/datasets/khusheekapoor/edx-courses-dataset-2021].

2. Coursera Courses Dataset 2021: (3523 x 7).

   [https://www.kaggle.com/datasets/khusheekapoor/coursera-courses-dataset-2021].

3. Udemy Data Science Courses Dataset: (2792 x 9).

   [https://www.kaggle.com/datasets/yasirabdaali/udemy-data-science-courses-dataset].

4. Udacity Courses - Quick Look: (264 x 6).

   [https://www.kaggle.com/code/niekvanderzwaag/udacity-courses-quick-look].

Technologies and methodologies

- **Job Recommendation:**

  1. Glassdoor Job Postings Dataset: (902 x 18)

     [https://www.kaggle.com/datasets/kuralamuthan300/glassdoor-data-science-jobs].

  2. Indeed Data Science Jobs India 2023: (1260 x 9).

     [https://www.kaggle.com/datasets/namantrisoliya/indeed-data-science-jobs-india].

  3. Data Science Jobs in 2022: (1002 x 14).

     [https://www.kaggle.com/datasets/someshjoshi/data-science-jobs-in-2022].

Implementation

Figure 1.1 Dashboard

Implementation

Figure 1.2 Salary Prediction

Implementation

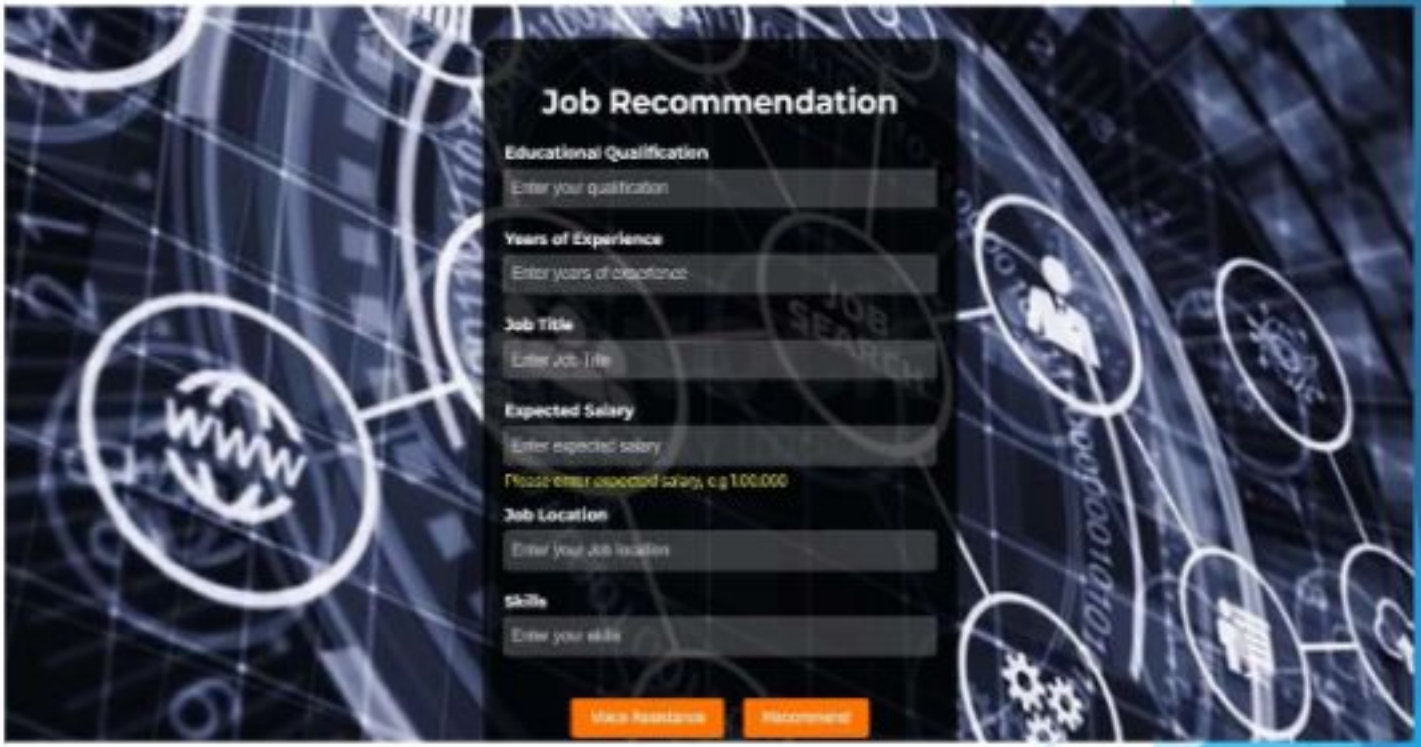


Figure 1.3 Job Recommendation

Implementation

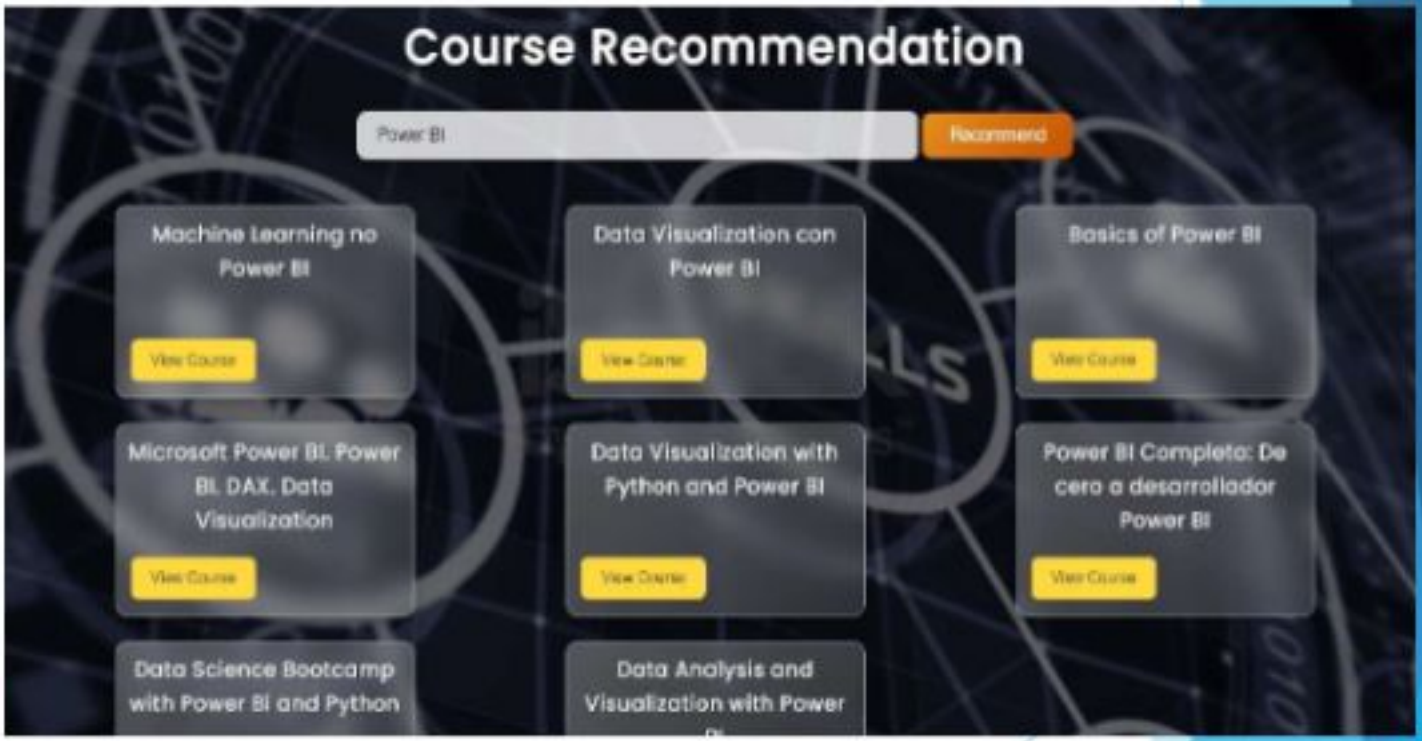


Figure 1.4 Course Recommendation

Conclusion

- The Voice-Enabled Navigator Platform for data professionals addresses the limitations of existing systems and provide a unified solution.
- With its advanced voice navigation capabilities, the platform enhances accessibility and user experience, offering a streamlined approach to career guidance customized specifically for the data professionals.

References

[1] J. Gowthamy, A. Senthilselvi, A. Kumar, S. Aakash and G. Sreedhar, "Enhanced AI Voice Assistance using Machine Learning and NLP," 2023 Third International Conference on Smart Technologies, Communication and Robotics (STCR), Sathyamangalam, India.
[https://ieeexplore.ieee.org/document/10396893].

[2] Prof. D. M. Lothe , Prakash Tiwari , Nikhil Patil , Sanjana Patil , Vishwajeet Patil, "Salary Prediction Using Machine Learning," 2021 International Journal Of Advance Scientific Research And Engineering Trends, (IJASRET) India.
[https://www.ijasret.com/Search.aspx?title=+2456-0774]

[3] S. Gadegaonkar, D. Lakhwani, S. Marwaha and P. A. Salunke, "Job Recommendation System using Machine Learning," 2023 Third International Conference on Artificial Intelligence and Smart Energy (ICAIS). [https://ieeexplore.ieee.org/document/10073757].

Thank You...!!