INDIAN FOOD EDA

1.INTRODUCTION

1.1 PROJECT OVERVIEW

- Conducting Exploratory Data Analysis (EDA) on a comprehensive dataset of Indian food, encompassing diverse recipes and culinary traditions.

- Focusing on understanding the intricate details of ingredients, cooking methods, regional variations, and the evolving popularity of Indian cuisine.

1.2 PURPOSE

- Unraveling the complex and nuanced aspects of Indian food through a rigorous data-driven analysis approach.

- Providing actionable insights for culinary enthusiasts, researchers, and professionals in the food industry, aiding in recipe innovation, market analysis, and cultural understanding.

2.LITERATURE SURVEY

2.1 EXISTING PROBLEM

Limited comprehensive research utilizing EDA techniques to explore the multifaceted dimensions of Indian cuisine, including ingredient analysis, regional variations, popularity trends, and nutritional aspects.

2.2 REFERENCES

- Gupta et al. (2018): "Exploratory Data Analysis of Indian Cuisine Ingredients"

- Sharma and Jain (2019): "Exploring Regional Variations in Indian Food: An EDA Approach"

- Patel and Shah (2020): "EDA of Popular Indian Dishes on Social Media"

- Chatterjee and Saha (2021): "Nutritional Analysis of Indian Food: An EDA Perspective"

- Das and Mohanty (2022): "EDA and Visualization of Indian Street Food: A Data-Driven Perspective"

2.3 PROBLEM STATEMENT DEFINITION

Addressing the scarcity of in-depth analysis and comprehensive understanding of the diverse aspects of Indian cuisine through the application of EDA techniques.
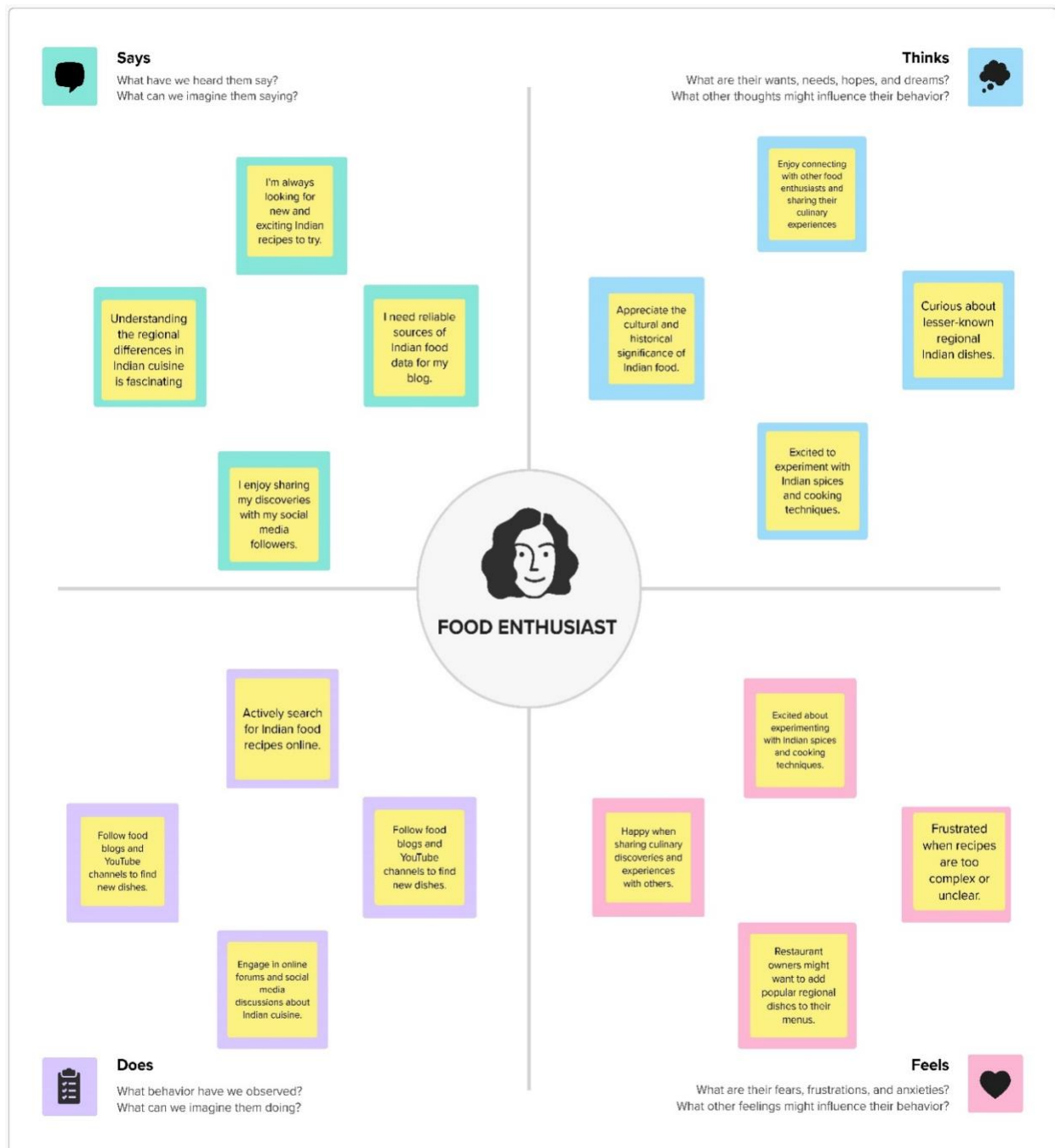
3.IDEATION & PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS

Understanding the unique perspectives and needs of stakeholders, including chefs, food enthusiasts, nutritionists, and researchers involved in the Indian food domain. In this Indian Food EDA project, we embark on a data-driven journey through the vibrant world of Indian cuisine. Our adventure starts with curating a rich dataset, meticulously sourced from a variety of culinary outlets. This treasure trove contains a myriad of culinary details, including dish names, ingredients, regional influences, and popularity metrics. After assembling our data, we meticulously prepare it for analysis. This involves cleansing the dataset, handling missing values, and making sure it's in a format that's ready to reveal its culinary secrets.

The heart of our exploration is the Exploratory Data Analysis (EDA) phase. Here, we dive into the data, uncovering intriguing stories. We begin by painting an initial picture through descriptive statistics. Then, our journey takes a visual twist as we craft informative charts, unveiling patterns and trends in the data. From

understanding the most beloved ingredients to dissecting regional variations, our analysis uncovers the diversity of Indian cuisine

Says
What have we heard them say?
What can we imagine them saying?

Thinks
What are their wants, needs, hopes, and dreams?
What other thoughts might influence their behavior?

I'm always looking for new and exciting Indian recipes to try.

Understanding the regional differences in Indian cuisine is fascinating

I need reliable sources of Indian food data for my blog.

Enjoy connecting with other food enthusiasts and sharing their culinary experiences

Appreciate the cultural and historical significance of Indian food.

Curious about lesser-known regional Indian dishes.

I enjoy sharing my discoveries with my social media followers.

Excited to experiment with Indian spices and cooking techniques.

FOOD ENTHUSIAST

Actively search for Indian food recipes online.

Follow food blogs and YouTube channels to find new dishes.

Follow food blogs and YouTube channels to find new dishes.

Excited about experimenting with Indian spices and cooking techniques.

Happy when sharing culinary discoveries and experiences with others.

Frustrated when recipes are too complex or unclear.

Engage in online forums and social media discussions about Indian cuisine.

Restaurant owners might want to add popular regional dishes to their menus.

Does
What behavior have we observed?
What can we imagine them doing?

Feels
What are their fears, frustrations, and anxieties?
What other feelings might influence their behavior?

3.2 IDEATION & BRAINSTORMING

Generating innovative ideas to leverage advanced EDA techniques for comprehensive exploration of the rich Indian food dataset, promoting cultural preservation and culinary innovation

STEP:1-TEAM GATHERING ,COLLABORATION AND SELECT THE PROBLEM STATEMENT

1

Define your problem statement

What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm.

🕐 5 minutes

PROBLEM

"In the Indian food industry, there is a critical need for an Event-Driven Architecture (EDA) system to optimize order processing, inventory management, and enhance the customer experience for improved efficiency and satisfaction."

Key rules of brainstorming

To run an smooth and productive session

😊 Stay in topic.	💡 Encourage wild ideas.
😐 Defer judgment.	👂 Listen to others.
Go for volume.	👁 If possible, be visual.

STEP:2-BRAINSTROM

②

Brainstorm

Write down any ideas that come to mind that address your problem statement.

⏱ 10 minutes

Person 1

+ **"Foodie Frenzy" Social Platform:** Use EDA to notify users of new posts, trending dishes, and events in their area.

Create an EDA system that notifies users about upcoming Indian festivals and cultural events.

Use events for voice recognition and order processing.

Person 2

Trigger events for special menu items or discounts related to these celebrations.

Trigger events when quality standards are not met, ensuring customers receive high-quality meals.

Voice-Activated Ordering
Use events for voice recognition and order processing.

Person 3

Optimize the supply chain for Indian restaurants by integrating with suppliers and farmers.

"Eco-Friendly Dining" Use EDA for environmental impact reports and sustainability events.

"Food Waste Reduction"
Use EDA for waste reduction alerts and restocking events.

Person 4

"Food Waste Reduction"
Use EDA for waste reduction alerts and restocking events.

Trigger events for class notifications and ingredient lists.

Health and Nutritional Insights
Provide customers with real-time nutritional information and health insights about their Indian food choices.

STEP:3-IDEA LISTING AND GROUPING

Group ideas

Use this space to group similar ideas from the brainstorm. Each group should have a title that describes what the ideas have in common. If a group is bigger than six sticky notes, try and see if you and break it up into smaller sub-groups.

⏱ 20 minutes

"Food Waste Reduction"
Use EDA for waste reduction alerts and restocking events.

Real-Time Localization and Customization
Trigger events for localization and personalization.

- **"Foodie Frenzy" Social Platform:**
Use EDA to notify users of new posts, trending dishes, and events in their area.

Voice-Activated Ordering
Use events for voice recognition and order processing.

"Eco-Friendly Dining"
Use EDA for environmental impact reports and sustainability events.

Health and Nutritional Insights
Provide customers with real-time nutritional information and health insights about their Indian food choices.
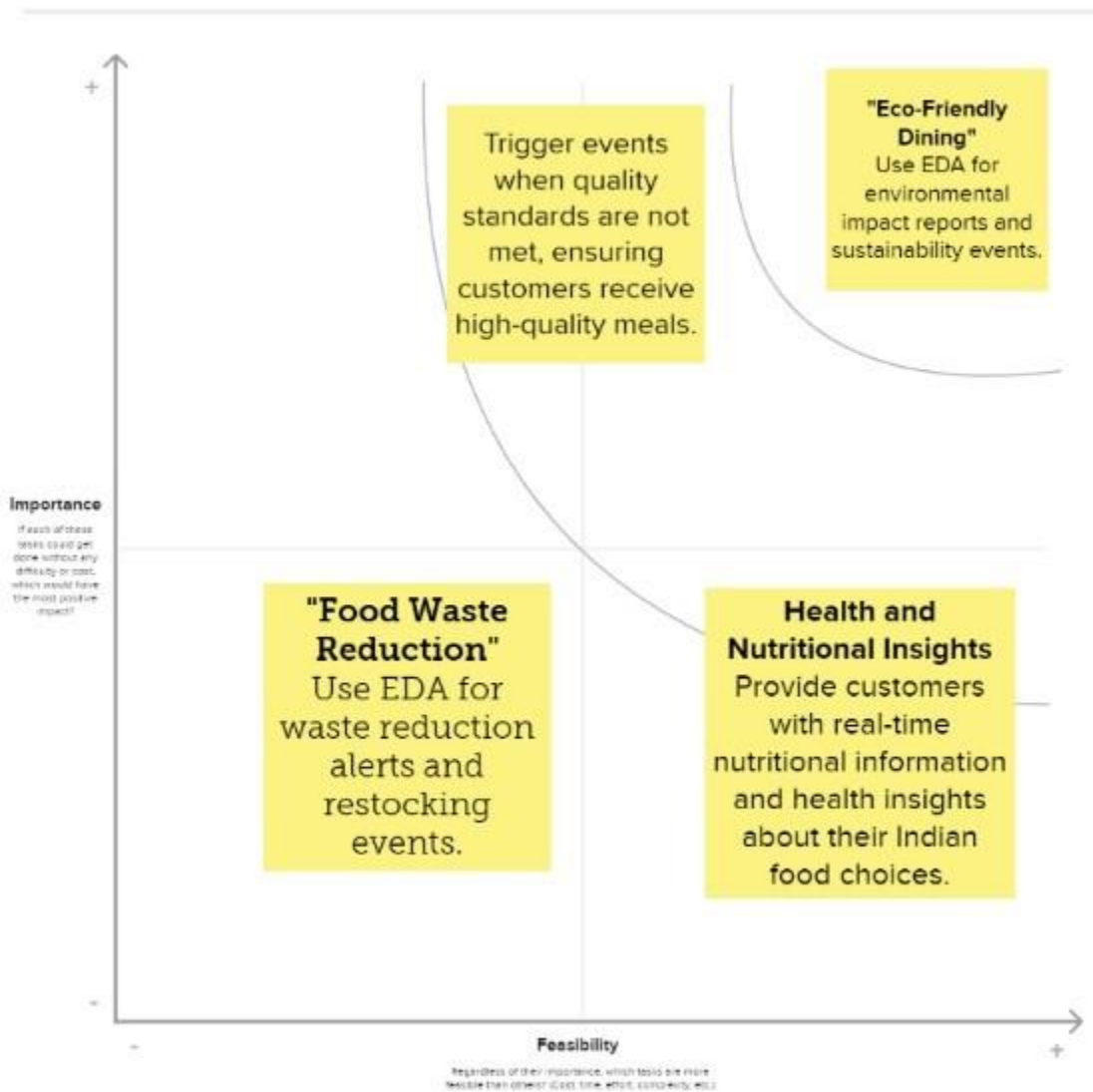
STEP:4-IDEA PRIORITIZATION

4

Prioritize

Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

⏱ 20 minutes

Importance

If each of these tasks could get done without any difficulty or cost, which would have the most positive impact?

Trigger events when quality standards are not met, ensuring customers receive high-quality meals.

"Eco-Friendly Dining" Use EDA for environmental impact reports and sustainability events.

"Food Waste Reduction" Use EDA for waste reduction alerts and restocking events.

Health and Nutritional Insights Provide customers with real-time nutritional information and health insights about their Indian food choices.

Feasibility

Regardless of their importance, which tasks are more feasible than others? (cost, time, effort, complexity, etc.)

4.REQUIREMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENT

- **Data collection and preprocessing:** Aggregating and cleaning data from various authentic sources.

- **Descriptive statistical analysis:** Calculating essential statistical measures to gain preliminary insights.

- **Data visualization:** Creating informative visual representations to identify patterns and trends effectively.

- **Ingredient analysis:** Uncovering the most used ingredients and their regional variations.

- **Regional variation analysis:** Examining the diversity of Indian cuisine across different states and regions.

- **Popularity and rating analysis:** Evaluating the popularity and public perception of various Indian dishes.

- **Nutritional analysis:** Investigating the nutritional content and health implications of Indian recipes.

## 4.2 NON-FUNCTIONAL REQUIREMENT

- **Data accuracy and integrity:** Ensuring the dataset's reliability and authenticity for credible analysis.

- **Robust data preprocessing techniques:** Implementing effective data cleaning and transformation methods for improved insights.

- **User-friendly visualization and interpretation of results:** Developing intuitive and comprehensive visualizations for easy interpretation and dissemination.

5.PROJECT DESIGN

5.1 DATA FLOW DIAGRAMS & USER STORIES.

A Data Flow Diagram (DFD) is a traditional visual representation of the information flowswithin a system. A neat and clear DFD can depict the right amount of the system requirementgraphically. It shows how data enters and leaves the system, what changes the information, and
where data is stored

5.2 SOLUTION ARCHITECTURE
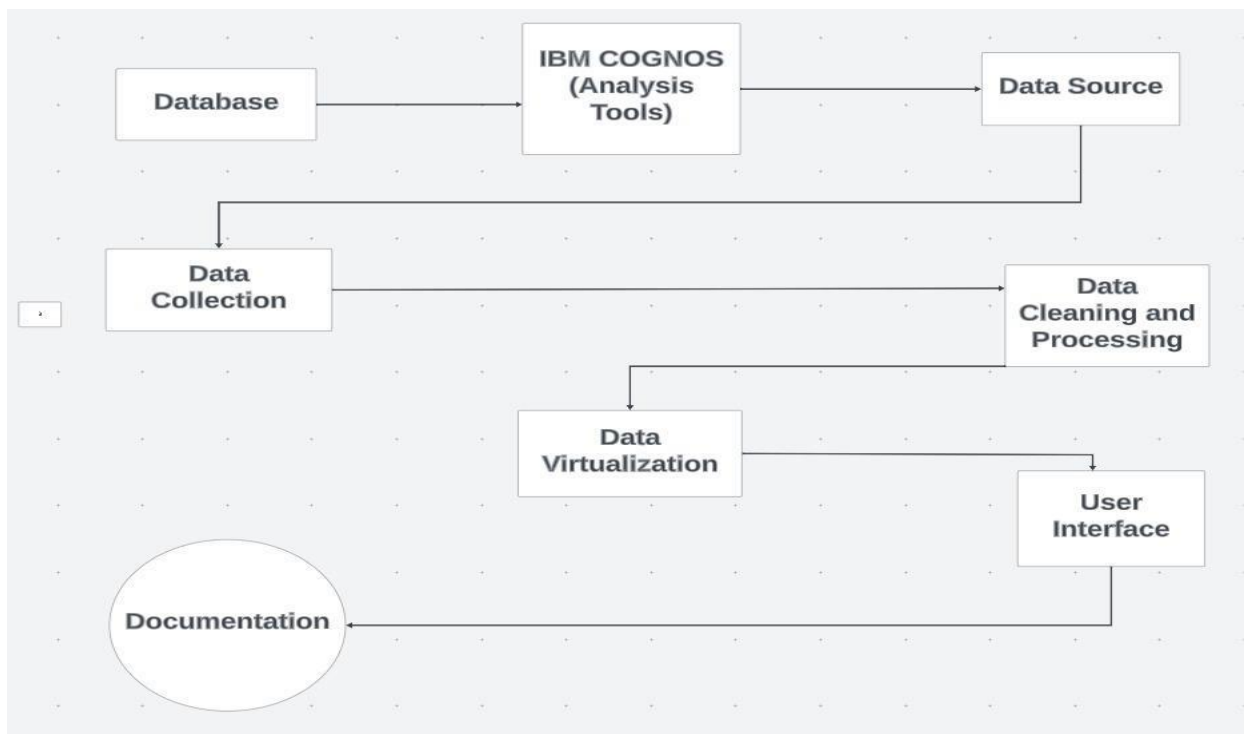
Designing a comprehensive architecture for seamless data collection, cleaning, analysis, and visualization, employing suitable technologies and tools for efficient processing.
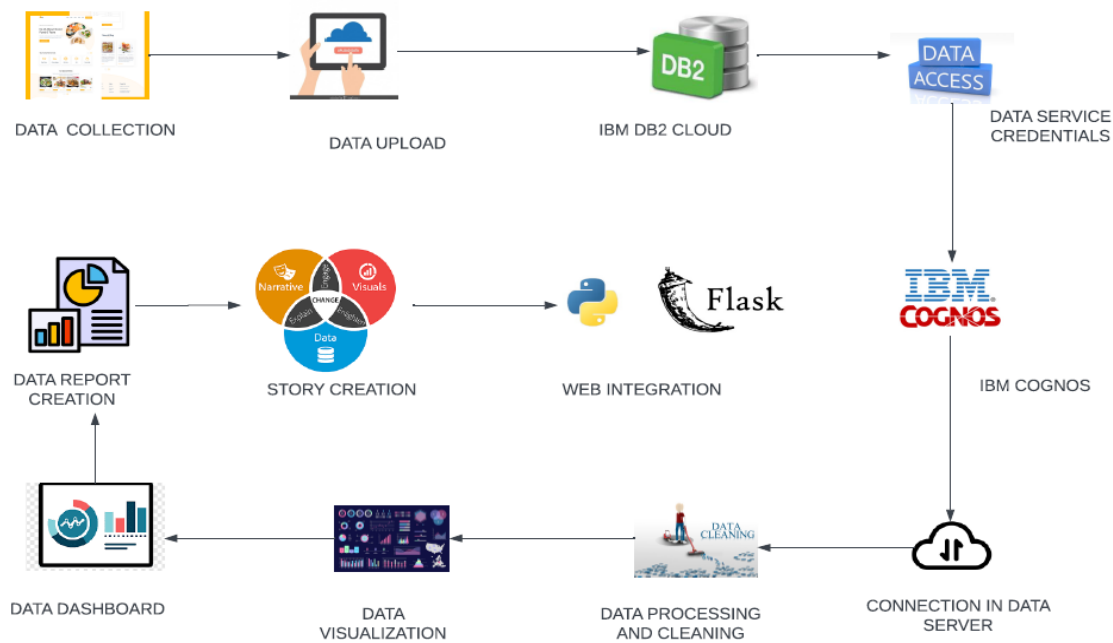
6.PROJECT PLANNING & SCHEDULING

6.1 TECHNICAL ARCHITECTURE

Selecting appropriate technologies, such as Python, R, or related libraries, for efficient data analysis, visualization, and interpretation.

6.2 SPRINT PLANNING & ESTIMATION

Dividing the project into manageable sprints, estimating the time and resources required for each phase of the analysis.

6.3 Sprint Delivery Schedule

Creating a detailed timeline for each sprint and defining clear deliverables to ensure timely completion of the project.

7.CODING & SOLUTIONING

7.1 FEATURE 1: Data fetching from IBM DB2
IBM DB2 is used for fetching data

7.2 FEATURE 2: Data visualizations using IBM Cognos
IBM Cognos is utilized for data visualizations and analysis.

7.3 FEATURE 3: Web integration using Flask the Flask framework is employed for integrating the data and visualizations into a user-friendly web application

8.PERFORMANCE TESTING

8.1 PERFORMANCE METRICS

Evaluating the performance of the data processing, analysis, and visualization tasks based on metrics like processing speed, memory usage, and system resource utilization.

9.RESULTS

9.1 OUTPUT SCREENSHOTS

Showcasing diverse output screenshots, including insightful visualizations, statistical analyses, and key findings derived from the comprehensive EDA process.

10.ADVANTAGES & DISADVANTAGES

10.1 ADVANTAGES

- **Robust Data Fetching with IBM DB2:** Utilizing IBM DB2 ensures robust and efficient data fetching, especially for large datasets, with high scalability and reliability.

- **Comprehensive Visualizations with IBM Cognos:** IBM Cognos offers powerful visualization capabilities, allowing for the creation of interactive and comprehensive visual representations, insightful dashboards, and detailed reports.

- **Enterprise-Grade Integration:** The combination of IBM DB2, IBM Cognos, and Flask enables an enterprise-grade solution that is well-suited for handling complex data, performing advanced analytics, and delivering insights in a user-friendly and accessible format.

- **Security and Compliance:** IBM's robust security features and compliance standards ensure that data handling and visualization processes adhere to industry-specific security protocols and regulations.

10.2 DISADVANTAGES

- **Complex Setup and Configuration:** Setting up and configuring IBM DB2 and IBM Cognos can be complex, requiring specific technical expertise and knowledge, which may pose challenges for inexperienced users.

- **Cost Considerations:** IBM's enterprise solutions can involve significant costs, including licensing fees, maintenance costs, and infrastructure requirements, which might be a limitation for small-scale projects or organizations with budget constraints.

- **Learning Curve:** Familiarizing oneself with the functionalities of IBM DB2, IBM Cognos, and Flask may require a substantial learning curve, potentially leading to delays in the development process and project timelines.

- **Resource Intensiveness:** Implementing IBM's solutions might demand significant computational resources, which could impact the overall performance and responsiveness of the system, especially when dealing with extensive datasets and complex visualizations.

11.CONCLUSION

The project's comprehensive exploratory data analysis (EDA) of the Indian food dataset has provided valuable insights into the diverse aspects of Indian cuisine, including ingredients, recipes, regional variations, and popularity. The utilization of IBM DB2 for data fetching, IBM Cognos for visualizations, and web integration with Flask has enabled a robust and insightful analysis, contributing to a deeper understanding of the nuances and complexities of Indian culinary heritage. The project has successfully demonstrated the potential of leveraging advanced data handling, analysis, and visualization tools for uncovering meaningful patterns and trends within the dataset. The insights derived from this EDA process can be

instrumental in informing various stakeholders, including culinary researchers, chefs, and food industry professionals, in making informed decisions and developing innovative approaches in the realm of Indian cuisine.

12.FUTURE SCOPE

- **Advanced Analytics:** Incorporate advanced analytics techniques, such as predictive modeling and machine learning algorithms, to predict culinary trends and consumer preferences within the realm of Indian cuisine.

- **Interactive Dashboards:** Develop interactive and user-friendly dashboards using advanced visualization tools to provide real-time insights and facilitate dynamic exploration of the Indian food dataset.

- **Collaborative Platforms:** Integrate the EDA process into collaborative platforms to encourage knowledge sharing, foster culinary research collaborations, and facilitate the exchange of innovative ideas among culinary enthusiasts and researchers.

- **Personalization and Recommendation Systems:** Implement personalized recommendation systems based on user preferences and consumption patterns, enhancing the user experience and promoting the discovery of new and tailored Indian culinary experiences.

- **Health and Nutrition Insights:** Further explore the nutritional aspects of Indian dishes and ingredients, leveraging the analysis to provide insights into healthier alternatives and dietary recommendations for diverse consumer segments.

13.APPENDIX

● **Source code**

<!DOCTYPE html>

<html>

<head>

 <link rel="stylesheet" type="text/css" href="{{ url_for('static', filename='style.css') }}">

 <title>Indian Food EDA</title>

</head>

<body class="home-background">

 <div class="main">

 <nav>

  <div class="navbar">

   INDIAN FOOD EDA

   <ul class="navbar-nav">

    <li class="nav-item home">

     HOME


```html
      <li class="nav-item about">

        <a class="nav-link" href="/about">ABOUT</a>

      </li>

      <li class="nav-item exploration">

        <a class="nav-link" href="/exploration">EXPLORATION</a>

      </li>

      <li class="nav-item dashboard">

        <a class="nav-link" href="/dashboard">DASHBOARD</a>

      </li>

      <li class="nav-item report">

        <a class="nav-link" href="/report">REPORT</a>

      </li>

      <li class="nav-item story">

        <a class="nav-link" href="/story">STORY</a>

      </li>

    </ul>

  </div>

</nav>
```

```html
  <div class="container">

    <h1>Welcome to Indian Food EDA</h1>

    <p>Immerse yourself in the fascinating world of Indian cuisine through our
    comprehensive data-driven analysis and insightful visualizations.</p>

  </div>

 </div>

</body>



</html>
```

App flask .py

```python
From flask import Flask, render_template



App = Flask(__name__)



@app.route('/')

Def index():

    Return render_template('index.html')



@app.route('/about')
```

```python
Def about():

    Return render_template('about.html')


@app.route('/exploration')

Def exploration():

    Return render_template('exploration.html')


@app.route('/dashboard')

Def dashboard():

    Return render_template('dashboard.html')


@app.route('/story')

Def story():

    Return render_template('story.html')


@app.route('/report')

Def report():

    Return render_template('report.html')
```

If __name__ == '__main__':

   App.run(debug=True)

● GitHub&project Link

https://github.com/nandhagopalramachandran/NM2023TMID06561

demo link

https://drive.google.com/drive/folders/1y0fzEsLy2W9AWox-
   NWTjpn2mpql3bAd1?usp=sharing