Project Report Documentation

Date	9 November 2023
Team ID	591194
Project Name	Pediatric Allergies Unveiled:A Tableau Exploration of Prevalence and Demographics

1.INTRODUCTION:

1.1 Project Overview:

Title: Pediatric Allergies Data Analytics Project

Overview: The Pediatric Allergies Data Analytics Project is a data-driven initiative focused on collecting, cleaning, and analyzing data related to pediatric allergies. By identifying risk factors, allergen exposure, and developing predictive models, the project seeks to improve our understanding of pediatric allergies, ultimately enhancing prevention and management strategies to benefit children's health and healthcare systems. The project also aims to raise awareness and disseminate findings to healthcare professionals and the public.

1.2 Purpose:

Purpose Overview for the Pediatric Allergies Unveiled Data Analytics Project:

The purpose of the "Pediatric Allergies Unveiled Data Analytics Project" is to address the pressing issues surrounding pediatric allergies by leveraging data analytics and research methodologies. This project seeks to achieve the following key purposes:

1. Understanding Pediatric Allergies: Gain comprehensive insights into the prevalence, causes, and patterns of pediatric allergies, including identifying common allergens and their impact.

2. Risk Factor Identification: Investigate the risk factors contributing to pediatric allergies, such as genetic predisposition, environmental factors, and lifestyle choices.

3. Data-Driven Predictions: Develop predictive models to forecast the likelihood of children developing allergies based on identified risk factors, enabling early intervention and prevention strategies.

4. Healthcare Impact Analysis:Analyze the healthcare utilization and economic burden associated with pediatric allergies, providing essential information for healthcare systems and policymakers.

5. Preventive Measures:Develop evidence-based recommendations for preventive measures and interventions to reduce the prevalence of pediatric allergies and improve patient care.

6. Public Awareness: Create educational materials and resources to raise public awareness about pediatric allergies, promoting informed decision-making and proactive health management.

7. Data Dissemination: Share research findings with healthcare professionals, medical journals, conferences, and the general public, fostering knowledge exchange and collaboration.

8. Continuous Improvement: Maintain an agile approach to research and analysis, continually updating strategies based on new data and emerging research in the field.

2. LITERATURE SURVEY:

2.1 Existing Problem:

A literature survey for the "Pediatric Allergies Unveiled Data Analytics Project" should start by reviewing existing research to understand the current problems and challenges in the field of pediatric allergies.

1. Rising Prevalence of Pediatric Allergies: Existing literature often highlights the alarming increase in the prevalence of pediatric allergies, such as asthma, food allergies, and eczema. Studies show that these conditions have become a significant public health concern, affecting a growing number of children globally. Understanding the reasons behind this surge is a crucial issue to address.

2. Complexity of Allergic Reactions: Pediatric allergies can manifest in various ways, and the literature often points to the complexity of allergic reactions. Understanding the different types of allergies, their triggers, and the varying severity of symptoms is essential for accurate diagnosis and treatment.

3. Lack of Predictive Models: While some studies have developed predictive models for pediatric allergies, there is room for improvement. Current models may not be comprehensive or accurate enough to guide preventive measures or early intervention effectively.

4. Environmental and Genetic Factors: Literature often emphasizes the role of environmental factors and genetic predisposition in pediatric allergies. However, a comprehensive understanding of how these factors interact and contribute to allergies is necessary for more effective prevention and management.

5. Healthcare Utilization and Economic Burden: Studies frequently highlight the economic burden of pediatric allergies on healthcare systems and families. Analyzing the existing literature can help identify gaps in knowledge related to healthcare utilization patterns, costs, and the potential for cost-effective interventions.

6. Regional Variability:There is significant regional variability in the prevalence and types of pediatric allergies. Understanding these regional differences and their causes is crucial for tailoring prevention and intervention strategies.

7. Allergen Exposure: The literature points to the importance of allergen exposure in allergy development. However, further research is needed to comprehensively identify common allergens, their sources, and their impact on pediatric allergies.

2.2 References:

https://www.sciencedirect.com/science/article/abs/pii/S0091674909008045

https://onlinelibrary.wiley.com/doi/10.1111/pai.13306

https://www.researchgate.net/publication/347696971_Artificial_intelligence_in_the_diagnosis_of_pediatric_allergic_diseases

2.3 Problem Statement Definition:

Problem Statement for the Pediatric Allergies Unveiled Data Analytics Project:

Pediatric allergies represent a growing public health concern, with an increasing prevalence of conditions such as asthma, food allergies, and eczema among children. These allergies are associated with a significant burden on healthcare systems and a reduced quality of life for affected children and their families. The current understanding of pediatric allergies is limited, with gaps in knowledge regarding the underlying causes, risk factors, allergen exposure, and effective preventive strategies. To address these challenges, there is a pressing need for a data-driven approach to comprehensively collect, analyze, and interpret diverse data sources related to pediatric allergies. The objective is to uncover the factors contributing to pediatric allergies, develop predictive models, assess the economic impact, and propose evidence-based preventive measures. The 'Pediatric Allergies Unveiled Data Analytics Project' aims to fill these knowledge gaps, ultimately improving the well-being of children and healthcare systems by providing actionable insights and solutions for the prevention and management of pediatric allergies.

3. IDEATION AND PROPOSED SOLUTION:

3.1 Empathy Map Canvas:

Stakeholder: Parents of Children with Allergies

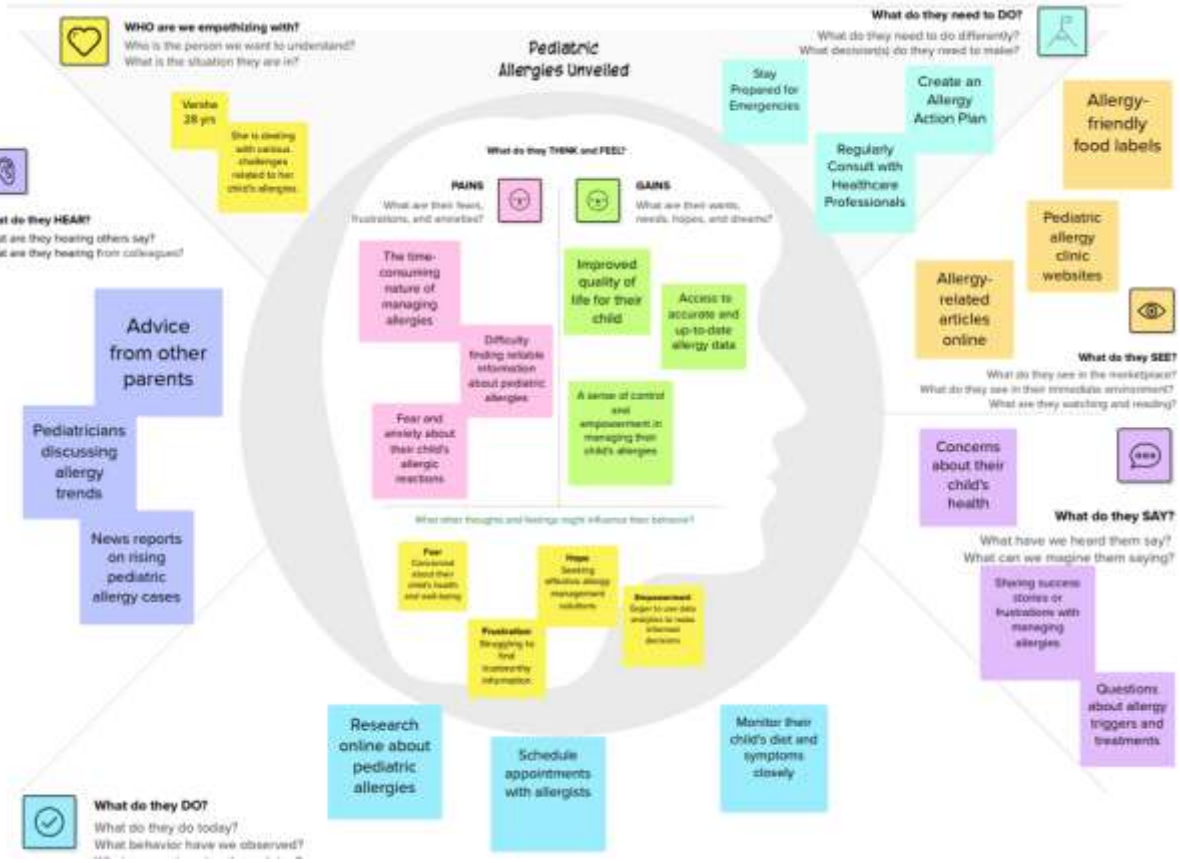
Seeing: They see their children suffering from allergies, often struggling with symptoms like wheezing, itching, or digestive issues. They also see the frustration in their children.

Hearing: They hear their children's complaints about discomfort, which can be emotionally challenging for them. They also hear various advice and information from healthcare professionals, which can sometimes be overwhelming.

Saying and Doing: They might be saying things like "I wish there was a way to prevent this" or "I want to find better treatments for my child." They are actively searching for information and resources to help their children.

Thinking and Feeling: They are concerned about their child's well-being and are often stressed about finding the right foods, avoiding allergens, and managing allergic reactions. They feel the need for support, information, and effective treatments.

Pain Points: Their main pain points include the stress of not knowing what will trigger an allergic reaction, the fear of anaphylaxis, and the struggle to find reliable information and resources.



3.2 Ideation and Brainstorming:

Ideation and Brainstorming for the "Pediatric Allergies Unveiled Data Analytics Project":

1. Defining Research Questions: Start by brainstorming key research questions, such as "What are the primary risk factors for pediatric allergies?" and "How can we predict allergic reactions in children?"

2. Data Sources:Identify potential data sources, including medical records, environmental data, genetic information, and surveys. Consider how these sources can be leveraged for analysis.

3. Predictive Models:Brainstorm ideas for developing predictive models that can forecast the likelihood of pediatric allergies based on identified risk factors.

4. Allergen Exposure Analysis: Explore methods for analyzing allergen exposure data, such as collecting data on common allergens in different regions and their impact on allergies.

5. Healthcare Impact: Discuss the potential economic and healthcare impact of pediatric allergies. Brainstorm ways to assess healthcare utilization patterns and costs.

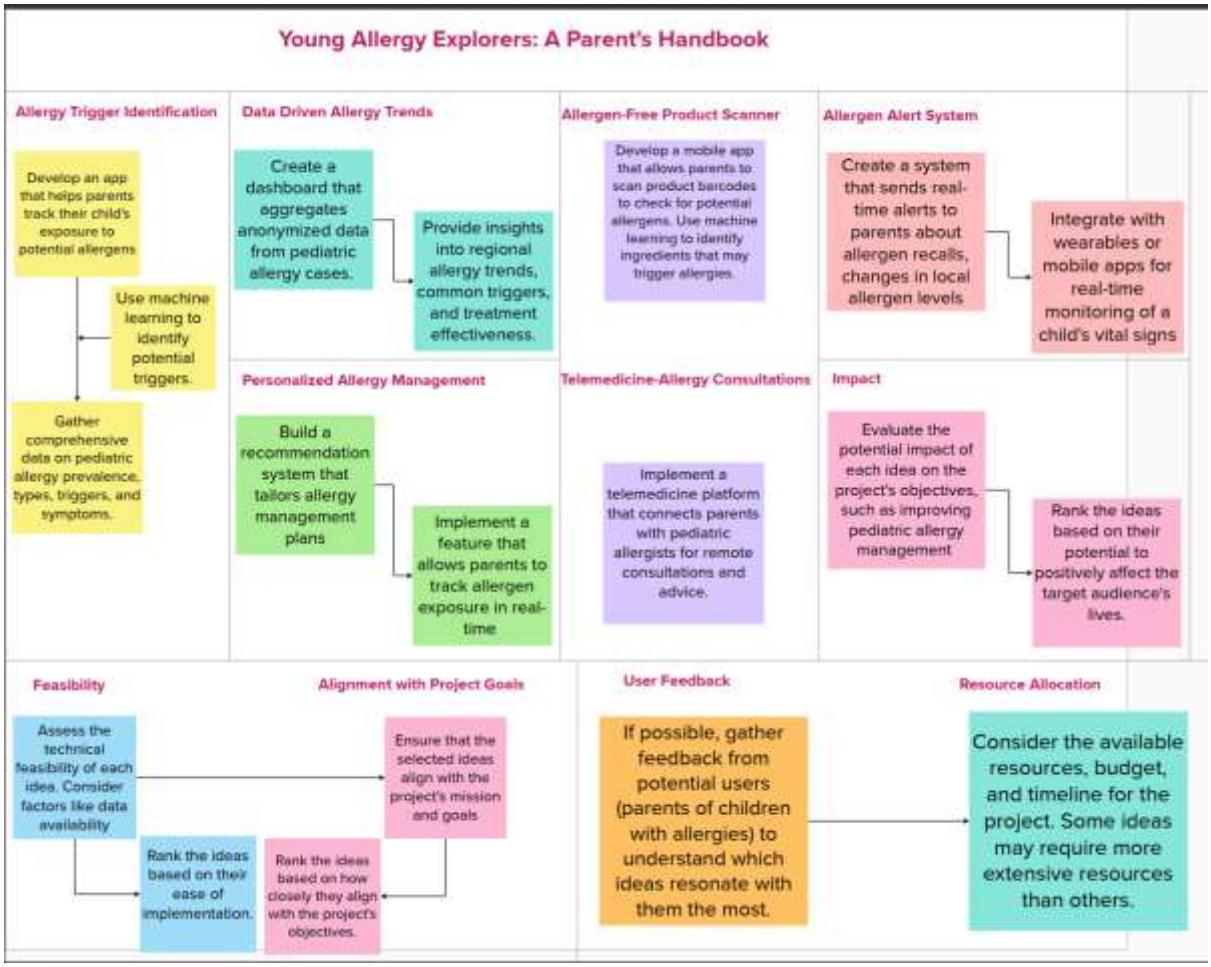
6. Preventive Strategies: Generate ideas for evidence-based preventive measures and intervention strategies, including dietary recommendations, environmental changes, and awareness campaigns.

7. Data Privacy and Ethics:Brainstorm strategies to ensure data privacy and ethical considerations in data acquisition and management.

8. Collaboration: Consider potential collaborations with healthcare professionals, researchers, policymakers, and other stakeholders to enhance the project's impact.

9. Communication and Dissemination:Discuss how to effectively communicate research findings to the medical community, parents, and the public. Brainstorm ideas for educational materials and awareness campaigns.

10. Continuous Improvement: Brainstorm ways to maintain an agile approach to research and analysis, with the flexibility to update strategies based on new data and emerging research in the field.



Varshith

Real-time allergen alerts tailored to your child's allergies, powered by AI.

Access educational resources on allergies to child's unique health needs in one app.

Personalized action plans for managing allergies, customized to your child's medical history.

Ushasree

Your personalized virtual allergy assistant providing guidance and advice for effective allergy management.

Navigate allergy challenges with a virtual assistant designed to meet your unique needs and situations

Accessible 24/7, offering tailored solutions and answers to your allergy-related queries.

Prasanna

Allergen-detecting wearables, safeguarding your child with personalized solutions in real-time.

Wearable sensors detecting allergens, sending instant alerts to keep your child safe.

Customized recommendations based on your child's allergy profile, delivered to your smartphone.

Varsha

A platform for caregivers to exchange experiences and insights, building a supportive allergy management network

Connect with a community of parents, offering strategies and support in managing pediatric allergies together.

Join our online community to share and learn from fellow parents navigating pediatric allergies.

Suraj

Smart home system ensuring a safe, allergen-free environment for allergic children

Automated allergen mitigation through air purification and specialized materials, creating a secure haven

A sanctuary for allergic children with intelligent allergen detection and mitigation within the household

Pranav

Virtual consultations and personalized allergy management plans tailored for your child's well-being.

Specialized telemedicine platform connecting parents to pediatric allergists for expert guidance

Expert allergist guidance at your fingertips, ensuring the best for your child's allergies through telemedicine.

Group ideas

1. Each participant is given 3 votes.
2. Participants vote on the ideas they find most promising or impactful.

3. Collect and tally the votes for each idea.

4. Rank the ideas based on the number of votes received.

5. Initiate discussions to further refine and prioritize the top ideas for potential implementation based on the ranking.

4. REQUIREMENTS ANALYSIS:

4.1 Functional Requirements:

Functional requirements for the "Pediatric Allergies Unveiled Data Analytics Project" outline the specific capabilities and features the project should possess to meet its objectives. These requirements should align with the project's goals, stakeholders' needs, and technical capabilities. Here are some key functional requirements for the project:

1. Data Collection and Integration:

- Collect data from diverse sources, including medical records, surveys, environmental data, and genetic information.

- Integrate and standardize data formats for seamless analysis.

2. Data Cleaning and Preprocessing:

- Implement data cleaning processes to remove noise, inconsistencies, and missing values.

- Standardize and transform data for compatibility.

3. Exploratory Data Analysis (EDA):

- Conduct EDA to understand pediatric allergy demographics, common allergens, and patterns of allergic reactions.

- Visualize data to identify trends and anomalies.

4. Risk Factor Identification:

- Develop algorithms to identify risk factors contributing to pediatric allergies.

- Explore the interactions between genetic, environmental, and lifestyle factors.

5. Predictive Modeling:

- Create machine learning models to predict the likelihood of pediatric allergies based on risk factors.

- Evaluate model performance and refine algorithms.

6. Allergen Exposure Analysis:

- Analyze exposure to common allergens in different regions and their correlation with allergy prevalence.

- Create heatmaps or visualizations to represent allergen exposure.

7. Healthcare Utilization and Cost Analysis:

- Analyze healthcare utilization patterns, including doctor visits, emergency room visits, and hospitalizations related to pediatric allergies.

- Calculate the economic burden of pediatric allergies on healthcare systems and families.

8. Preventive Measures and Interventions:

- Develop recommendations for preventive measures and interventions based on research findings.

- Quantify the potential impact of these strategies on reducing allergy prevalence.

9. Data Privacy and Security:

- Ensure strict data privacy and security measures to protect sensitive healthcare information.

- Comply with relevant data protection regulations.

10. Reporting and Visualization:

- Generate comprehensive reports with data visualizations and insights.

- Create user-friendly dashboards for real-time monitoring and decision-making.

11. Public Awareness and Education:

- Develop educational materials and resources to raise awareness about pediatric allergies and prevention.

- Disseminate findings through various channels to healthcare professionals, parents, and the public.

12. Collaboration and Stakeholder Engagement:

- Facilitate collaboration with healthcare providers, researchers, policymakers, and other stakeholders to ensure the project's findings are relevant and actionable.

4.2 Non Functional Requirements:

Non-functional requirements for the "Pediatric Allergies Unveiled Data Analytics Project" are essential to ensure that the project operates efficiently, securely, and in a manner that meets the expectations and standards of the stakeholders.

1. Data Security and Privacy:

- The project must adhere to the highest standards of data security and privacy to protect sensitive medical and personal information.

2. Scalability:

- The data analytics infrastructure should be scalable to handle large volumes of data, accommodating future growth and new data sources.

3. Performance:

- The system should provide real-time or near-real-time data processing and analysis, ensuring timely insights and responses.

4. Accuracy and Precision:

- Data analytics models and algorithms should aim for a high degree of accuracy and precision to provide reliable predictions and insights.

5. Reliability and Availability:

- The project should be available 24/7, and data analytics processes should be highly reliable to ensure uninterrupted service.

6. Compliance:

- The project should comply with relevant healthcare regulations, data protection laws, and ethical guidelines to ensure the responsible use of data.

7. User Interface and Usability:

- The project's user interface should be user-friendly, intuitive, and accessible to a broad range of stakeholders, including healthcare professionals and parents.

8. Accessibility:

- The project should be designed to be accessible to users with disabilities, ensuring inclusivity.

9. Interoperability:

- Data analytics systems should be compatible with existing healthcare systems and standards to facilitate data exchange and integration.

10. Documentation and Reporting:

- All processes, data sources, and findings should be thoroughly documented, and comprehensive reports should be generated for healthcare professionals, researchers, and the public.

11. Response Time:

- Data analytics processes should provide prompt responses to queries and requests, supporting timely decision-making.

12. Data Quality Assurance:

- Mechanisms for data quality assurance, including data cleaning, validation, and monitoring, should be in place to maintain the integrity of the data.

13. Disaster Recovery and Backup:

- Plans for data backup and disaster recovery should be established to prevent data loss and ensure business continuity.

14. Ethical Considerations:

- Ethical considerations should be integrated into the project's design, implementation, and decision-making processes.

15. Collaboration and Communication:

- The project should facilitate efficient collaboration among research teams and communication with stakeholders through appropriate channels.

16. Cost-Effectiveness:

- The project should be cost-effective in terms of infrastructure, resources, and technology utilization.

17. Maintenance and Support:

- A clear plan for ongoing maintenance, updates, and support should be in place to address issues and keep the project current.

5. PROJECT DESIGN:

5.1 Data Flow Diagrams and User Stories:

A short data flow diagram (DFD) for the "Pediatric Allergies Unveiled Data Analytics Project" might look like this:

1. External Entities:

- Data Sources (e.g., Medical Records, Surveys, Environmental Data, Genetic Information): These external entities provide data to the system for analysis.

- Healthcare Professionals and Researchers: Users who interact with the system to access research findings and insights.

2. Processes:

- Data Collection and Ingestion: Data is collected from various sources, cleaned, and ingested into the system.

- Data Cleaning and Preprocessing:Raw data is cleaned and preprocessed to ensure its quality and consistency.

- Data Analysis:Advanced analytics and machine learning models are applied to the preprocessed data to extract insights.

3. Data Storage:

- Data Warehouse: Processed and cleaned data is stored in a data warehouse for further analysis and reporting.

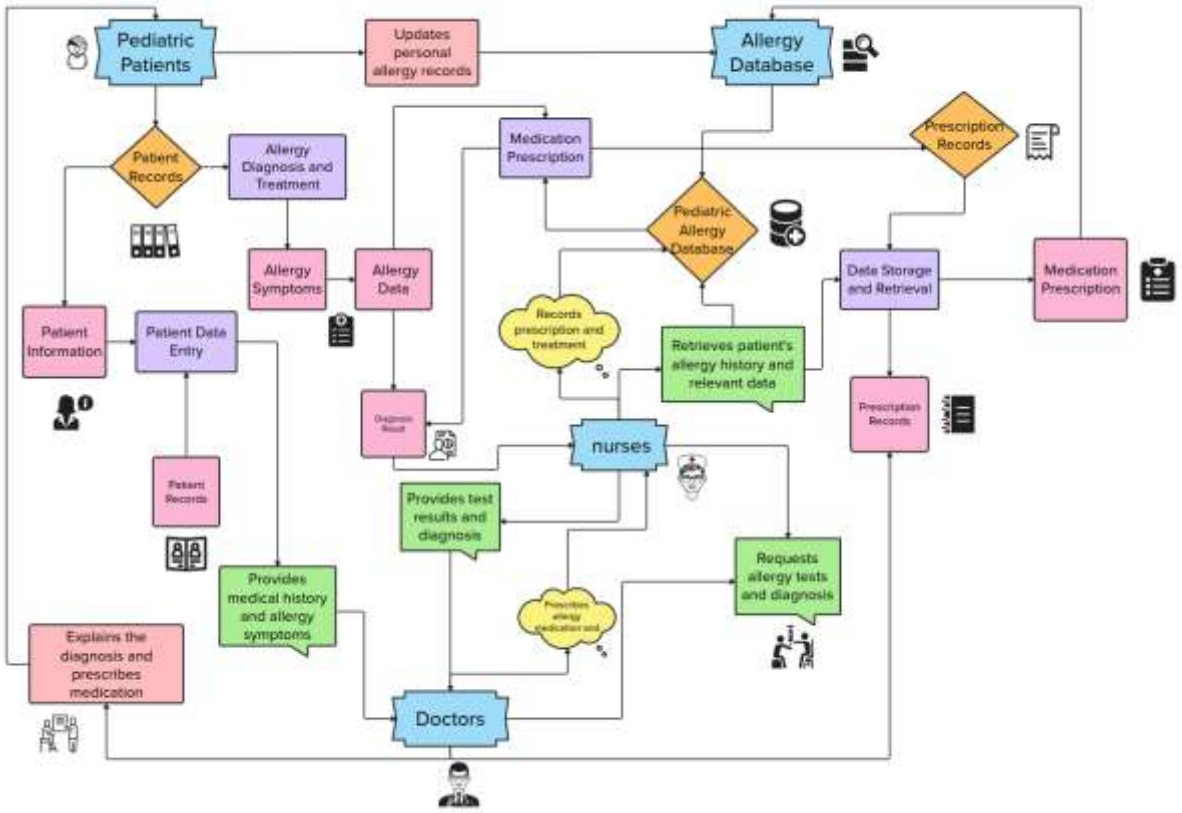
4. Data Flows:

- Data flows from external data sources to data collection and ingestion.

- Cleaned and preprocessed data flows to the data warehouse.

- Analyzed data flows to reporting and visualization processes.

- Research findings and insights flow to healthcare professionals and researchers.



Use the below template to list all the user stories for the product.

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Researcher (Web User)	Data Access	USR-1	As a researcher, I can access the project's allergy prevalence and demographics data.	I can log in to the platform, access data related to pediatric allergies, and view relevant visualizations.	High	Sprint-1
	Demographic Analysis	USR-2	As a researcher, I can analyze pediatric allergy prevalence by age group.	I can filter and visualize allergy data by age groups, gaining insights into prevalence rates within specific age brackets.	High	Sprint-2
		USR-3	As a researcher, I can analyze pediatric allergy prevalence by geographic location.	I can filter and visualize allergy data by regions, allowing me to study prevalence variations based on location.	Medium	Sprint-3
Healthcare Professional(Web User)	Allergy Trends	USHP-1	As a healthcare professional, I can access the platform to stay updated on current pediatric allergy prevalence trends.	I can log in and view visualizations that display the latest data and trends in pediatric allergies.	High	Sprint-1
	Data Contribution	USHP-2	As a healthcare professional, I can contribute anonymized patient data to enhance the project's database.	I can securely upload and share patient data, knowing that it will be anonymized and used for research purposes.	Medium	Sprint-2
Project Administrator	User Management	USAdmin-1	As an administrator, I can manage user accounts, including adding, updating, or disabling accounts.	I can perform these user management actions with appropriate permissions.	High	Sprint-1
Public User (Web and Mobile User)	General Access	USPublic-1	As a public user, I can access basic allergy prevalence information without the need to create an account.	I can view public visualizations and summaries without logging in.	Low	Sprint-1
	Reporting Data Errors	USPublic-2	As a public user, I can report data errors or inaccuracies within the platform.	I can easily submit reports, and the platform provides a process for verifying and rectifying data errors	Medium	Sprint-2

5.2 Solution Architecture:

Solution architecture is a complex process with many sub-processes that bridges the gap between problems and solutions. For obtaining the solution for pediatric allergies we should use below processes

● Medical Examination: is a physical examination performed on a patient for medical screening purposes.

● Family History: Checking whether ancestors of the family are affected by pediatrics.

● Testing: A medical procedure performed to detect diseases, disease processes, or to determine a course of treatment.

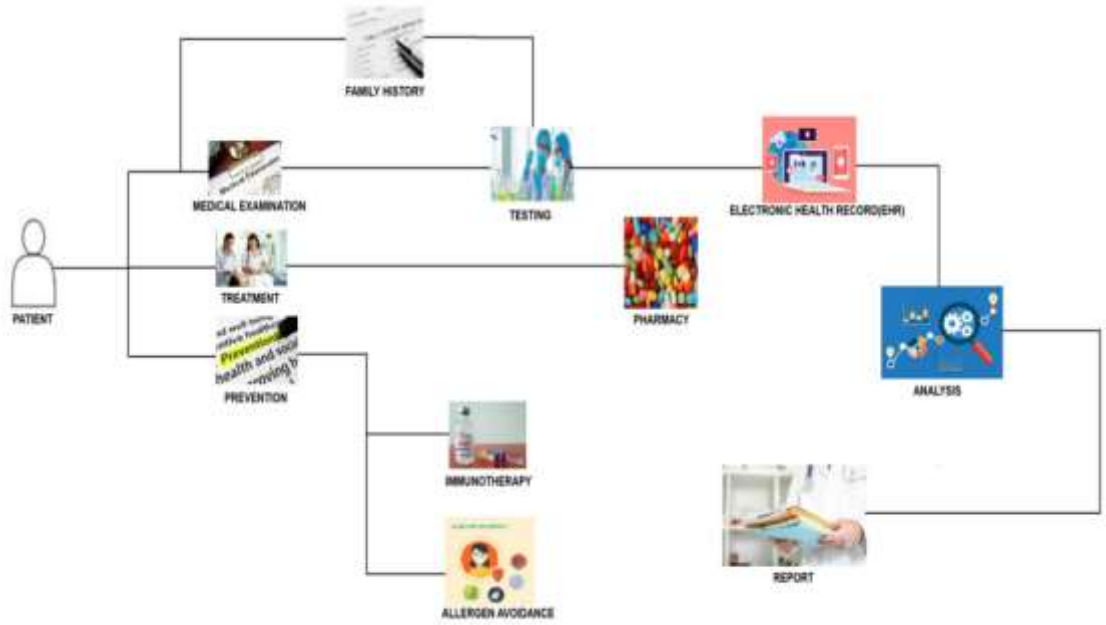
● EHR: An Electronic Health Record (EHR) is a collection of various medical records that get generated during any clinical encounter or events.

● Analysis: Using EHR we will analyze the records and make insights from the data and create valuable visualizations.

● Report: Using visualizations and insights prepared during analysis we will make reports which will be helpful for Doctors,nurses and Research people.

● Treatment: If the patient needs medical treatment he will be advised to take medicines.

● Prevention: To prevent Pediatric allergies one should practice immunotherapy and should avoid taking allergen products.



6. PROJECT PLANNING AND SCHEDULING:

6.1 Technical Architecture:

1. Data Collection:

- Gather patient data, including medical history, allergy triggers, and treatment outcomes.
- Incorporate real-time data from wearable devices or sensors for more accurate and dynamic information.

2. Data Storage:

- Utilize a secure and scalable database to store both structured and unstructured data.
- Implement data lakes or warehouses for efficient retrieval and analysis.

3. Interoperability:

- Ensure compatibility with existing healthcare systems for seamless data exchange.
- Use standardized formats and protocols to facilitate integration with other platforms.

4. Privacy and Security:

- Implement strong encryption protocols to safeguard patient data.
- Adhere to healthcare regulations (like HIPAA) to maintain compliance.
- Role-based access control to restrict data access based on user roles.

5. Data Analytics Tools:

- Integrate powerful analytics tools for processing and extracting insights from large datasets.
- Machine learning algorithms can help identify patterns, predict outcomes, and personalize treatment plans.

6. Visualization:

- Develop a user-friendly interface for healthcare professionals to interpret data easily.
- Include customizable dashboards for personalized views and quick decision-making.

7. Scalability:

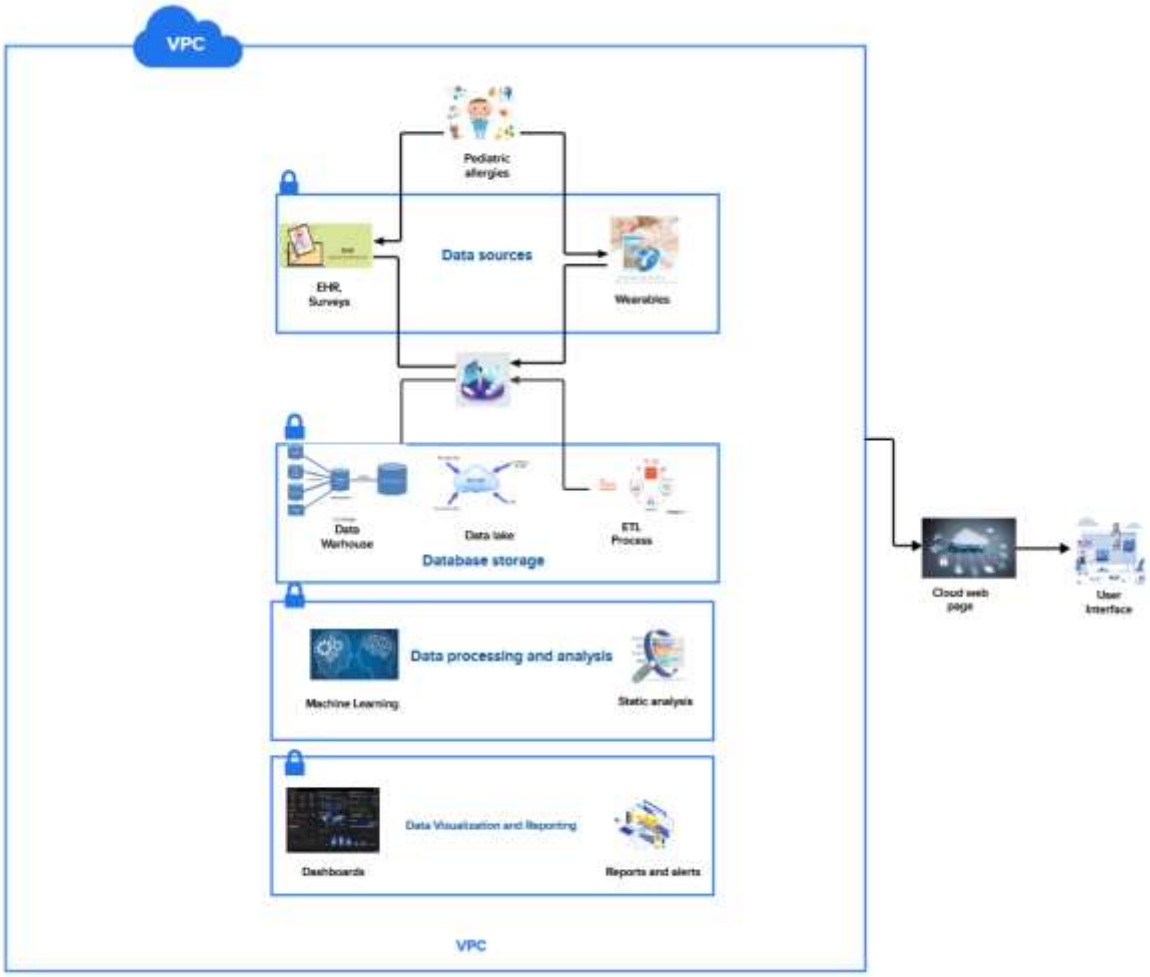
- Design the architecture to scale horizontally to accommodate a growing volume of data and users.

8. Cloud Integration:

- Consider leveraging cloud services for flexibility, scalability, and accessibility.
- Cloud platforms like AWS, Azure, or Google Cloud offer various tools for data storage and analytics.

9. Feedback Mechanism:

- Implement a feedback loop for healthcare providers to contribute insights and refine the analytics mode



8. Sprint Planning and Estimation:

Sprint 1: Project Setup

Define goals, set up tools, establish communication.

Sprint 2: Data Collection

Develop mechanisms, integrate with healthcare systems.

Sprint 3: Database Setup

Design schema, implement storage, ensure scalability.

Sprint 4: Analytics Prototype

Implement basic algorithms, prototype analysis.

Sprint 5: UI Development

Design user-friendly interface, create dashboards.

Sprint 6: ML Model Integration

Integrate advanced algorithms, train models.

Sprint 7: Cloud Integration

Explore cloud solutions, optimize, test in the cloud.

Sprint 8: Feedback Loop

Implement feedback mechanism, fine-tune models.

Sprint 9: Documentation

Document project, create training materials.

Sprint 10: Testing and Deployment

Comprehensive testing, bug fixes, production deployment.

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	Data Collection	Gathering Pediatric allergy data from various sources	Data Collection Tools and APIs
2.	Data Integration	Combining and integrating data from diverse sources	ETL (Extract, Transform, Load) Tools
3.	Data Cleaning	Ensuring data accuracy and consistency	Data Cleaning and Preprocessing Tools
4.	Data Analysis	Analyzing pediatric allergy prevalence and demographics	Statistical Analysis Tools, Machine Learning Libraries
5.	Visualization	Creating interactive visualizations to present data	Tableau, Power BI, Data Visualization Libraries
6.	Reporting	Generating reports on allergy trends and insights	Reporting Tools, Custom Dashboards
7.	Machine Learning	Implementing machine learning models for predictive analysis	Python, R, Machine Learning Frameworks
8.	Data Security	Ensuring data privacy and compliance with regulations	Data Encryption, Access Control
9.	Performance Optimization	Optimizing analytics processes for efficiency	Performance Tuning Tools
10.	Data Storage	Storing analyzed data for future reference	Databases, Data Warehouses
11.	Collaboration	Facilitating collaboration among data analysts and stakeholders	Collaboration Software, Communication Tools

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	List the open-source frameworks used	HTML, CSS, JavaScript, Tableau, Python, R, etc.
2.	Security Implementations	List all the security / access controls implemented, use of firewalls etc.	Data Encryption, Access Control, Secure Data Transmission, OWASP, etc.
3.	Scalable Architecture	Justify the scalability of architecture (3 – tier, Micro-services)	Cloud Deployment, Modular Design, Scalable Infrastructure, etc.
4.	Availability	Justify the availability of application (e.g. use of load balancers, distributed servers etc.)	Load Balancers, Redundancy, Cloud Services, High Availability Setup, etc.
5.	Performance	Design consideration for the performance of the application (number of requests per sec, use of Cache, use of CDN's) etc.	Caching Mechanisms, Content Delivery Networks (CDNs), Performance Optimization Tools, etc.

Product Backlog, Sprint Schedule, and Estimation (4 Marks)

Sprint	Functional Requirement (Epic)	User Story Number	User Story/Task	Story Points	Priority	Team Members
Sprint 1	Registration	USN-1	As a user, I can register for the application by entering my email credentials and confirming my password	2	High	Usha Sree
Sprint 1	Registration	USN-2	As a user,I will receive a confirmation email once I have registered for the application	1	High	Sree Venkat
Sprint 2	Registration	USN-3	As a user, I can register for the application through Facebook	1	Low	Prasanna
Sprint 2	Registration	USN-4	As a user, I can register for the application through Gmail	2	Medium	Usha Sree
Sprint 3	Login	USN-5	As a user,I can log into the application by entering my email and password	1	High	Sree Venkat
Sprint 3	Dashboard	USN-6	As a user,I can access my personalized dashboard for viewing pediatric allergy prevalence and demographics data	3	High	Prasanna
Sprint 4	Data Collection	USN-7	As a Data analyst, I can collect and integrate pediatric allergy data from various sources	5	High	Sree Venkat
Sprint 4	Data Integration	USN-8	As a Data analyst,I can perform data cleaning and integration to ensure accuracy	3	Medium	Usha Sree
Sprint 5	Data Analysis	USN-9	As a Data analyst, I can create visualizations and dashboards using Tableau	3	High	Sree Venkat
Sprint 6	Reporting	USN-10	As a Data analyst I can generate reports on pediatric allergy trends and insights	3	Medium	Sree Venkat
Sprint 6	Machine Learning	USN-11	As a Data analyst, I can implement Machine learning models to implement predictive analysis on pediatric allergy trends	5	High	Prasanna

Dates	Planned	Completed
12-Oct	20	18
15-Oct	11	11
18-Oct	32	28
21-Oct	17	17
23-Oct	26	14
23-Oct	28	22
27-Oct	14	14
31-Oct	15	9
04-Nov	25	17
06-Nov	36	20
08-Nov	15	9
09-Nov	40	30

6.3 Sprint Delivery Schedule:

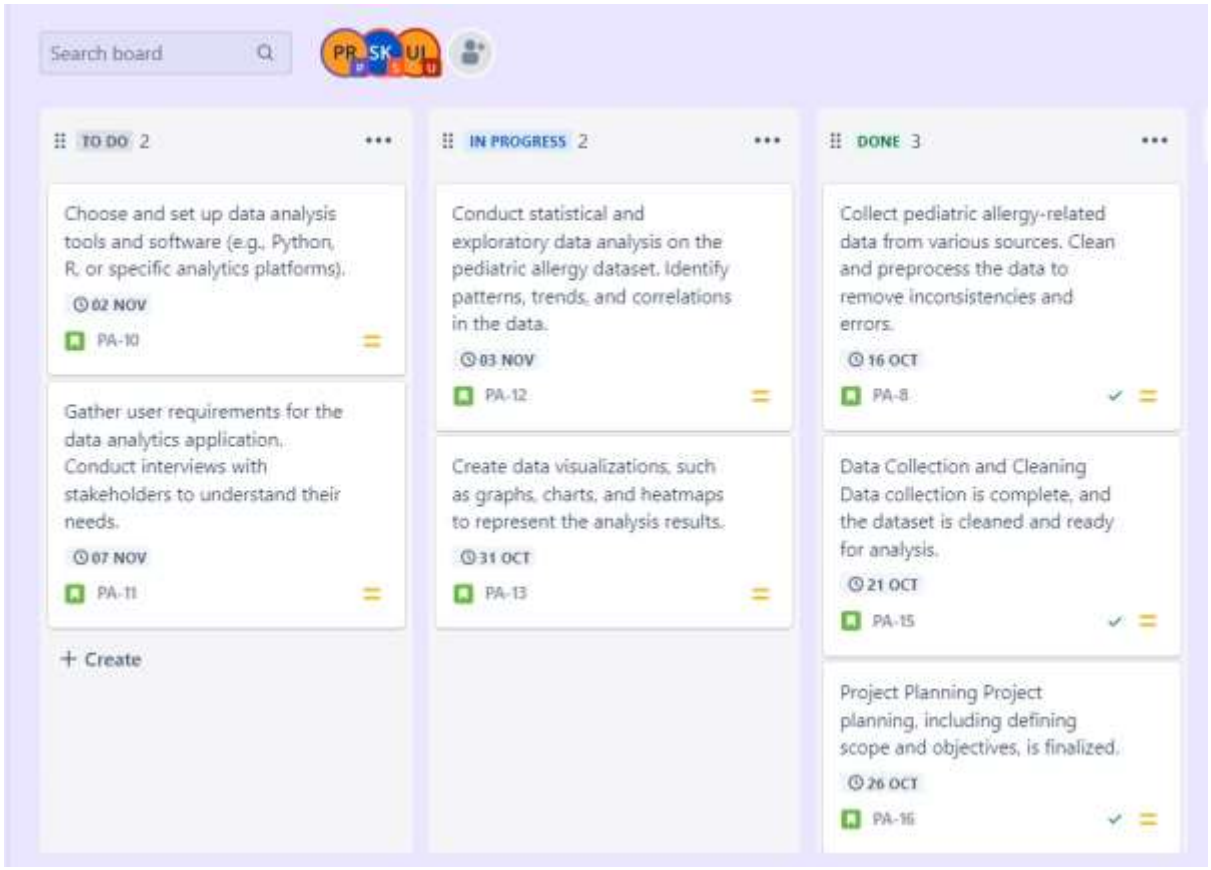
1. Sprint Review Meeting:
   - Objective: Showcase completed features and functionalities.
   - Actions:
     - Demonstrate the implemented data collection mechanisms.
     - Highlight the initial data analytics and visualization capabilities.
     - Collect feedback from stakeholders on the progress.
2. Feedback Analysis and Iteration:
   - Objective: Incorporate feedback for continuous improvement.
   - Actions:
     - Analyze feedback from healthcare professionals and end-users.
     - Prioritize actionable feedback for the next sprint.
     - Make iterative improvements to the system based on feedback.
3. Quality Assurance and Testing:
   - Objective: Ensure the reliability and accuracy of implemented features.
   - Actions:
     - Conduct rigorous testing of data collection and analysis components.
     - Address any identified bugs or issues promptly.
     - Verify that the system meets security and compliance standards.
4. Documentation Update:

- Objective: Keep project documentation up-to-date.
- Actions:
  - Update documentation to reflect the latest changes.
  - Include any new features, functionalities, or configurations.
  - Ensure that documentation is easily accessible to the team.

5. User Training and Support:
- Objective:Prepare users for the new features and functionalities.
- Actions:
  - Develop training materials and resources.
  - Conduct training sessions for healthcare professionals.
  - Provide ongoing support and address user queries.

6. Preparation for the Next Sprint:
- Objective: Set the stage for the upcoming sprint.
- Actions:
  - Conduct sprint retrospective to review what went well and areas for improvement.
  - Plan and prioritize tasks for the next sprint based on project goals.
  - Ensure the team is aligned on the upcoming objectives and deliverables.

7. Communication and Transparency:
- Objective: Maintain clear communication with stakeholders.
- Actions:
  - Share sprint outcomes, challenges, and successes with all relevant parties.
  - Foster a transparent and collaborative environment.
  - Address any concerns or questions raised during the sprint review.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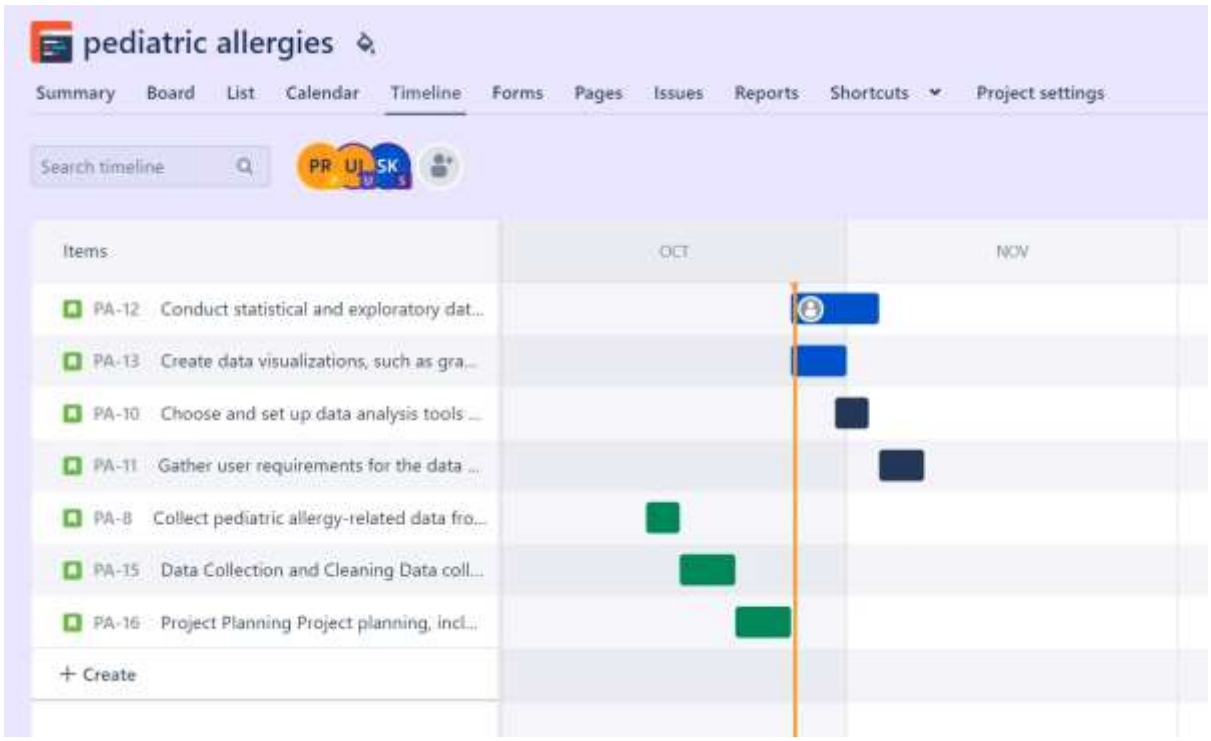
TO DO 2
Choose and set up data analysis tools and software (e.g., Python, R, or specific analytics platforms).
02 NOV
PA-10
Gather user requirements for the data analytics application. Conduct interviews with stakeholders to understand their needs.
07 NOV
PA-11
+ Create
IN PROGRESS 2
Conduct statistical and exploratory data analysis on the pediatric allergy dataset. Identify patterns, trends, and correlations in the data.
03 NOV
PA-12
Create data visualizations, such as graphs, charts, and heatmaps to represent the analysis results.
31 OCT
PA-13
DONE 3
Collect pediatric allergy-related data from various sources. Clean and preprocess the data to remove inconsistencies and errors.
16 OCT
PA-8
Data Collection and Cleaning Data collection is complete, and the dataset is cleaned and ready for analysis.
21 OCT
PA-15
Project Planning Project planning, including defining scope and objectives, is finalized.
26 OCT
PA-16


pediatric allergies
Summary
Board
List
Calendar
Timeline
Forms
Pages
Issues
Reports
Shortcuts
Project settings
Search timeline
Items
OCT
NOV
PA-12 Conduct statistical and exploratory dat...
PA-13 Create data visualizations, such as gra...
PA-10 Choose and set up data analysis tools ...
PA-11 Gather user requirements for the data ...
PA-8 Collect pediatric allergy-related data fro...
PA-15 Data Collection and Cleaning Data coll...
PA-16 Project Planning Project planning, incl...
+ Create

7. CODING & SOLUTIONING (Explain the features added in the project along with code)

7.1 Feature 1

Html code: https://drive.google.com/file/d/1gT5P1XdyKPctIeqMwUC-U0JWZ_uhHjRq/view?usp=sharing

The HTML code, provided represents a web page for the project "Pediatric Allergies Unveiled." The key features and sections of the HTML code are following:

1. Meta Information:

- `<meta>` tags are used to define character encoding and provide descriptions and keywords for search engine optimization.

- `<link>` tags are used to specify the favicon and apple-touch-icon for the web page.

2. Header Section:

- The header (`<header>`) contains the website's logo, navigation menu, and a "Get Started" button.

- The navigation menu (`<nav>`) contains links to various sections of the page.

3. Hero Section:

- The hero section (`<section id="hero">`) includes a large heading, a subheading, and a "Get Started" button.

- This section is often the first thing users see when they visit the page and is meant to grab their attention.

4. About Section:

- The "About Section" (`<section id="about">`) provides information about the project.

- It explains the project's mission and the use of Tableau for data visualization.

- It also has two columns, with one side dedicated to text content and the other side potentially for images or visual elements.

5. Dashboard Section:

- The "Dashboard Section" (`<section id="Dashboard">`) is intended for displaying data visualizations created with Tableau.

- An embedded Tableau visualization is included using an iframe.

6. Story Section:

- The "Story Section" (`<section id="Story">`) appears to contain another Tableau visualization, which is also embedded via an iframe.

- This section might be used to present a specific data story or narrative related to pediatric allergies.

7. Services Section:

- The "Services Section" (`<section id="services">`) presents information about the measures and medication related to pediatric allergies.

- Four individual "icon boxes" contain text describing different measures and medication options for managing pediatric allergies.

8. Frequently Asked Questions (FAQs) Section:

- The "FAQs Section" (`<section id="faq">`) contains frequently asked questions presented in an accordion-style list.

- Users can click on questions to reveal answers.

9. Back-to-Top Button:

- At the end of the page, there is a "back-to-top" button that allows users to quickly return to the top of the page.

10. JavaScript and CSS:

- Various JavaScript and CSS files are included to provide functionality and styling to the web page.

- These include files for animations, lightboxes, and other visual elements.

7.2 Feature 2

By Using Flask (web framework)

- Flask is a lightweight Python web framework.
- It's used for web integration in the project, providing a web interface to access and interact with data and visualizations.
- Flask simplifies routing, templates, and database integration.
- It can be used to create web-based user interfaces for Tableau visualizations and serve dynamic content.
- Flask's flexibility and simplicity make it a valuable tool for adding web functionality to the project.

Code:

```
from flask import Flask, render_template, request
pediatric = Flask(__name__)
@pediatric.route('/')
def helloworld():
    return render_template("index.html")
if __name__ == '__main__':
    pediatric.run(debug=False, port = 8985)
```

The provided Flask code serves as the backend for your project. It allows your web page, created using HTML and CSS, to be hosted locally. When you run the code, the Flask application listens on a specific port (in this case, 8985) and, when accessed, serves the "index.html" template to users, making your project's web page accessible through a web browser. It acts as a bridge between your HTML/CSS frontend and the user's browser, handling requests and responses. This enables you to present the pediatric allergies project on a web page for easy access.

7.3 Database Schema:

Based on the columns provided in the "food-allergy-analysis-Zenodo" dataset, we can design a database schema to store and manage this data.

Database Name: FoodAllergyAnalysisDB

Tables:

1. Patients:
   - PatientID (Primary Key)
   - BIRTH_YEAR
   - GENDER_FACTOR
   - RACE_FACTOR
   - ETHNICITY_FACTOR
   - PAYER_FACTOR

2. Allergies:
   - AllergyID (Primary Key)
   - PatientID (Foreign Key referencing Patients)
   - AllergyType (e.g., Shellfish, Milk, Soy, etc.)
   - StartStatus (e.g., Shellfish_ALG_START, Milk_ALG_START)
   - EndStatus (e.g., Shellfish_ALG_END, Milk_ALG_END)

3. Age Details:
   - AgeDetailID (Primary Key)
   - PatientID (Foreign Key referencing Patients)
   - AGE_START_YEARS
   - AGE_END_YEARS

4. Asthma Medications:
   - MedicationID (Primary Key)
   - PatientID (Foreign Key referencing Patients)
   - FIRST_ASTHMARX
   - LAST_ASTHMARX
   - NUM_ASTHMARX

5. Health Conditions:

- ConditionID (Primary Key)
- PatientID (Foreign Key referencing Patients)
- ATOPIC_MARCH_COHORT
- ATOPIC_DERM_START
- ATOPIC_DERM_END
- ALLERGIC_RHINITIS_START
- ALLERGIC_RHINITIS_END
- ASTHMA_START
- ASTHMA_END

In this schema:

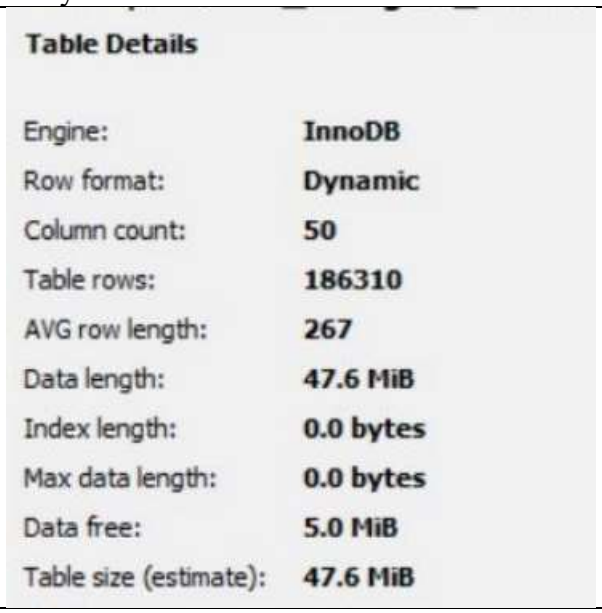
- The "Patients" table stores general patient information.
- The "Allergies" table is used to record different allergy statuses (e.g., Shellfish, Milk) at the start and end of the study.
- The "Age Details" table contains data related to patient ages at the start and end of the study.
- The "Asthma Medications" table stores information about asthma medications, including the first and last medications prescribed and the number of medications prescribed.
- The "Health Conditions" table captures data related to health conditions like the ATOPIC_MARCH_COHORT, ATOPIC_DERM_START/END, ALLERGIC_RHINITIS_START/END, and ASTHMA_START/END.

This schema allows you to organize and manage the dataset's information efficiently. You can create relationships between tables using the PatientID as a foreign key to connect patient data with their allergies, age details, asthma medications, and health conditions.

8. PERFORMANCE TESTING

8.1 Performace Metrics

S.No.	Parameter	Screenshot / Values
1.	Dashboard design	We have created 2 Dashboards namely "Pediatric Allergies Insights" and Childhood Allergies: Understand Prevalence and Demographics. Dashboard 1 Includes 5 Visualizations and Dashboard Includes 4 Visualizations. Dashboard 1 1)Allergy Prevalence Deltas Visualization by Gender. 2)Comparison of Allergy Prevalence Changes with Asthma. 3)Delta Analysis: Number of Asthma Medications Prescribed. 4)Delta Analysis: Allergic Rhinitis Study. 5)Delta Analysis: Atopic Derm Study. Dashboard 2

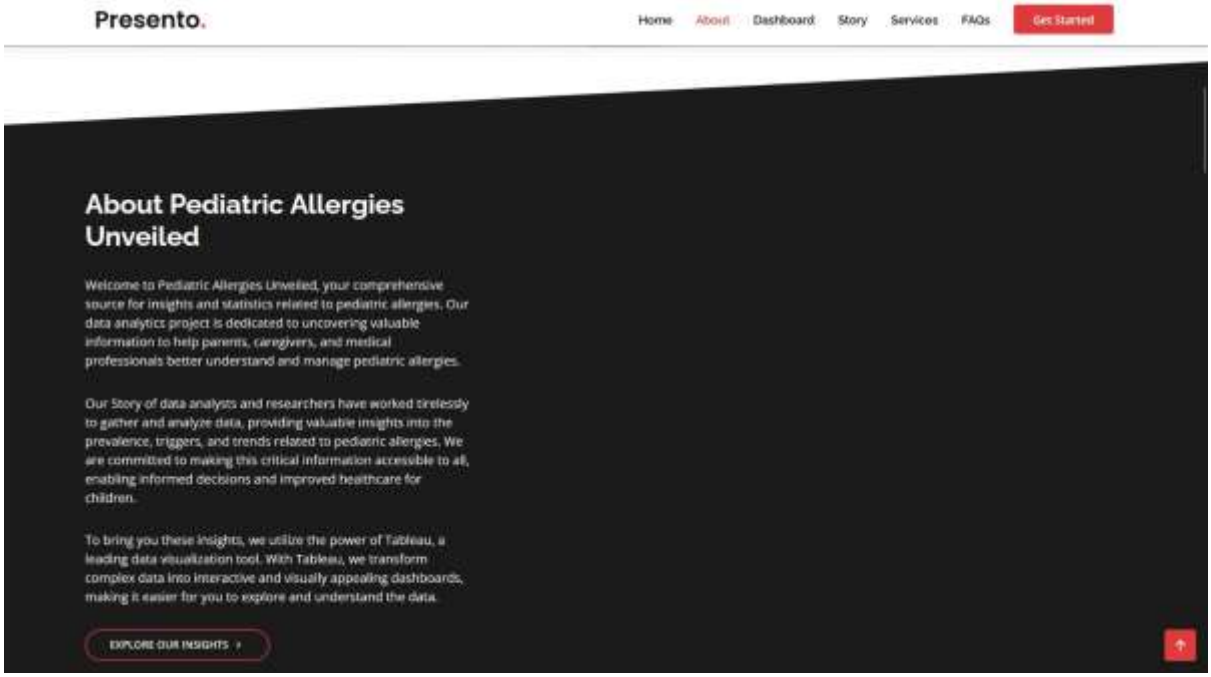
		1)Allergy Analysis: Milk And Wheat Sensitivity Patterns. 2)Comparative Study of Allergic Reactions to Egg, Fish, and Shellfish. 3)Initial Allergy Status Analysis: Walnut, Tree Nuts, and Peanut Allergies. 4)Allergy Status Comparison: Almond, Cashew, Hazelnut, and Pistachio Allergies.
2.	Data Responsiveness	Time elapsed for Loading Dataset Into SQL: 3 minutes Data filter response time:03 sec Visualizations: 05 sec Dashboard Design: 09 sec Story: 12 sec
3.	Amount Data to Rendered (DB2 Metrics)	
4.	Utilization of Data Filters	Data filters allow you to selectively focus on specific subsets of data, eliminating irrelevant or overwhelming information. This streamlines the data analysis process, making it easier to identify patterns, trends, and anomalies.We have utilized Data filters to exclude the values which are marked as NA. Also we have taken some values of all to make visualizations more understandable and beautiful.
5.	Effective User Story	We have added 5 scenes to our story they are 1)Explore the gender-specific variations in allergy prevalence Analyze key allergens,understand deltas, and uncover Insights for Improved healthcare strategies. 2)Delve Into the relationship between allergy prevalence and asthma incidence Discover how changes in allergy

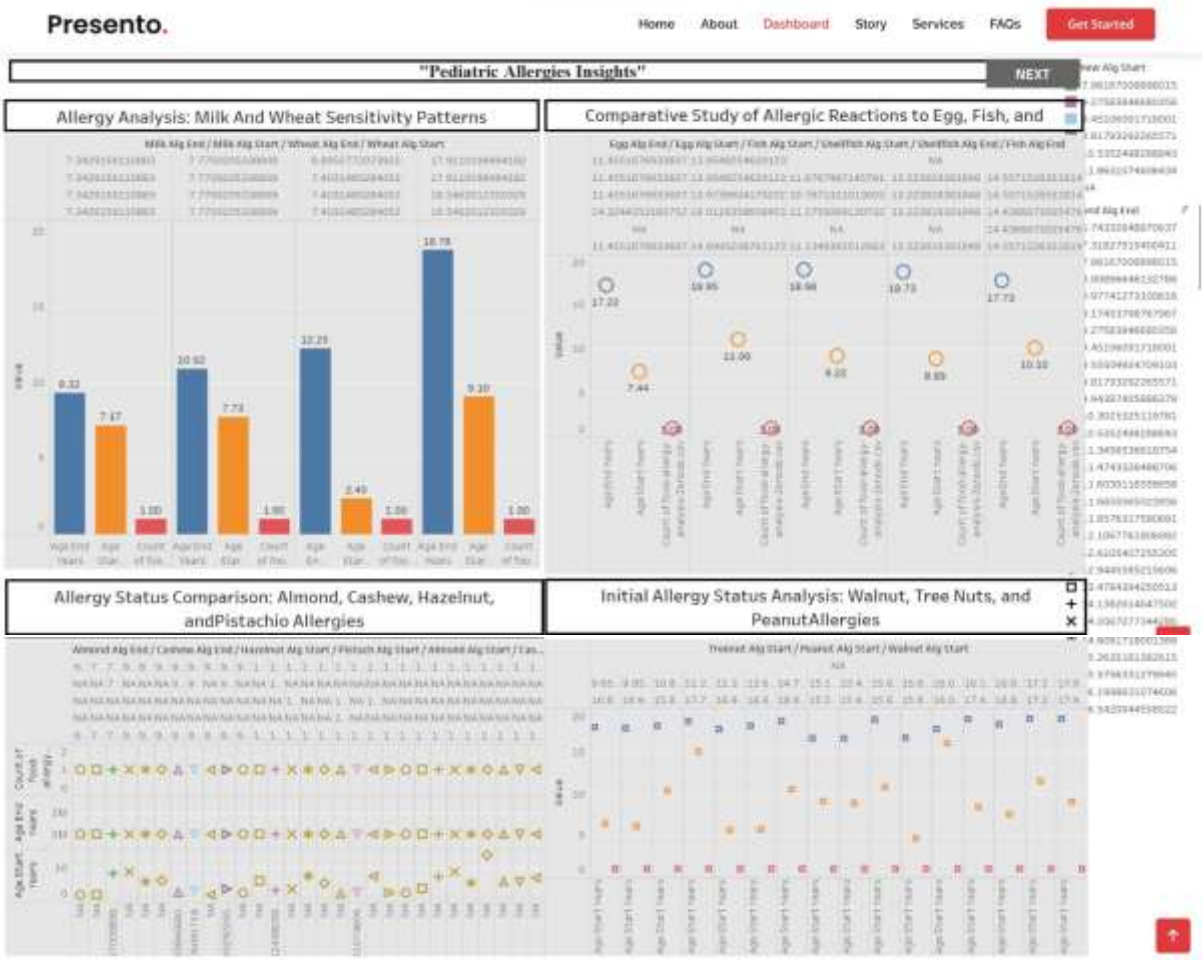
		races correlate with asthma cases,shading light on potential links and healthcare implications. 3)Exploring the dynamics of Rhintis prevalence through a delta analysis. Investigate how this common allergy evolved over the time,pinpointing key trends and potential factors behind prevalence changes. 4)Delve into the world of milk and wheat sensitivity patterns.Analyze prevalence,demographics and regional variations to gain insights into how these common allergies affect different populations. 5)Exploring the allergies caused by Eggs,Fish and Shellfish. Discovering the allergen factors of this daily used products and Seafood.Analyzing the prevalences and demographics to gain insights into how these food products affected mankind.
6.	Descriptive Reports	We have created 9 Visualizations they are: 1)Allergy Prevalence Deltas Visualization by Gender. 2)Comparison of Allergy Prevalence Changes with Asthma. 3)Delta Analysis: Number of Asthma Medications Prescribed. 4)Delta Analysis: Allergic Rhinitis Study. 5)Delta Analysis: Atopic Derm Study. 6)Allergy Analysis: Milk And Wheat Sensitivity Patterns. 7)Comparative Study of Allergic Reactions to Egg, Fish, and Shellfish. 8)Initial Allergy Status Analysis: Walnut, Tree Nuts, and Peanut Allergies. 9)Allergy Status Comparison: Almond, Cashew, Hazelnut, and Pistachio Allergies.

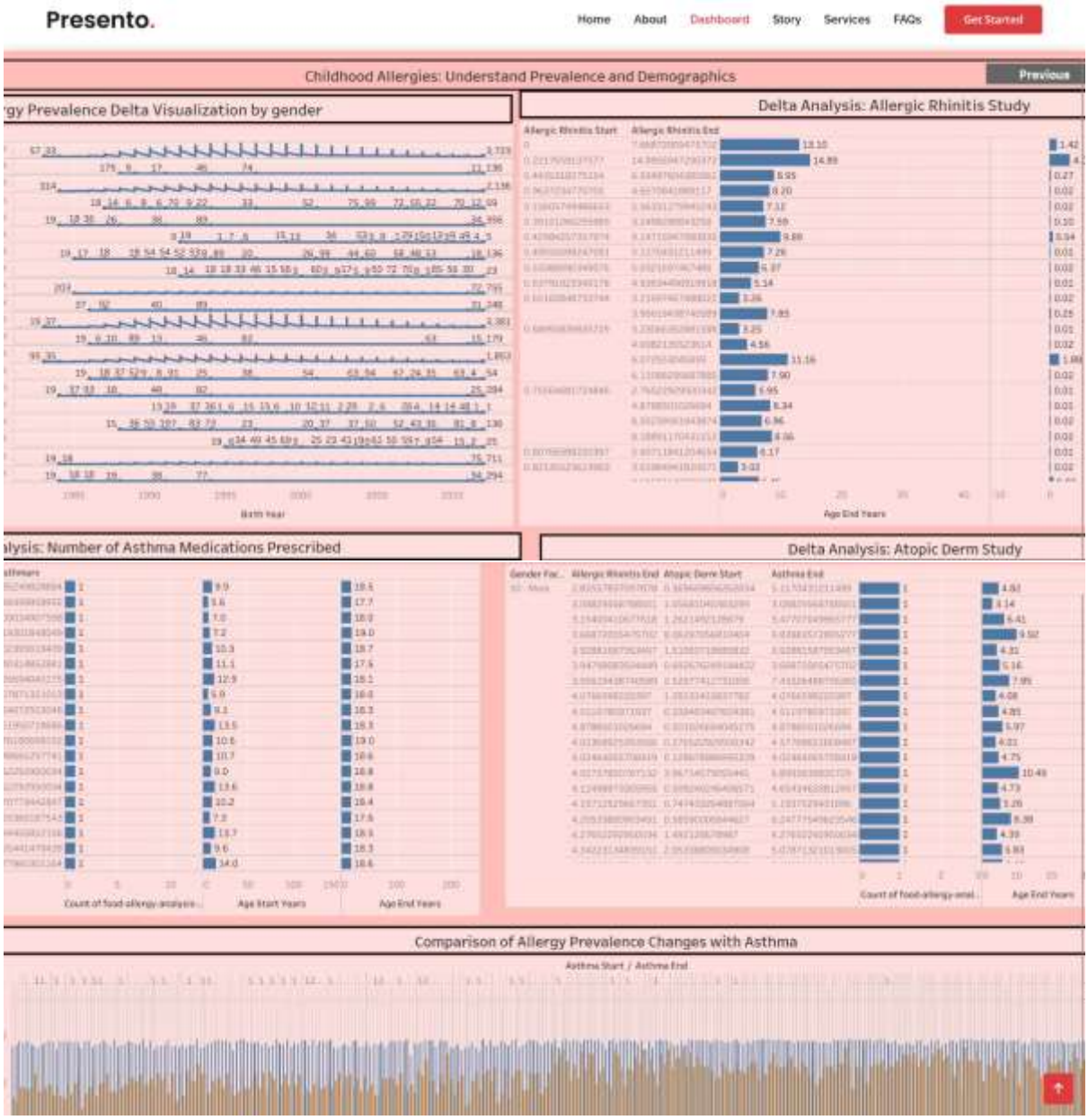
9. RESULTS

9.1 Output Screenshots

Bootstrap




Presento.
Home
About
Dashboard
Story
Services
FAQs
Get Started
"Pediatric Allergies Insights"
NEXT
Allergy Analysis: Milk And Wheat Sensitivity Patterns
Comparative Study of Allergic Reactions to Egg, Fish, and
Allergy Status Comparison: Almond, Cashew, Hazelnut, andPistachio Allergies
Initial Allergy Status Analysis: Walnut, Tree Nuts, and PeanutAllergies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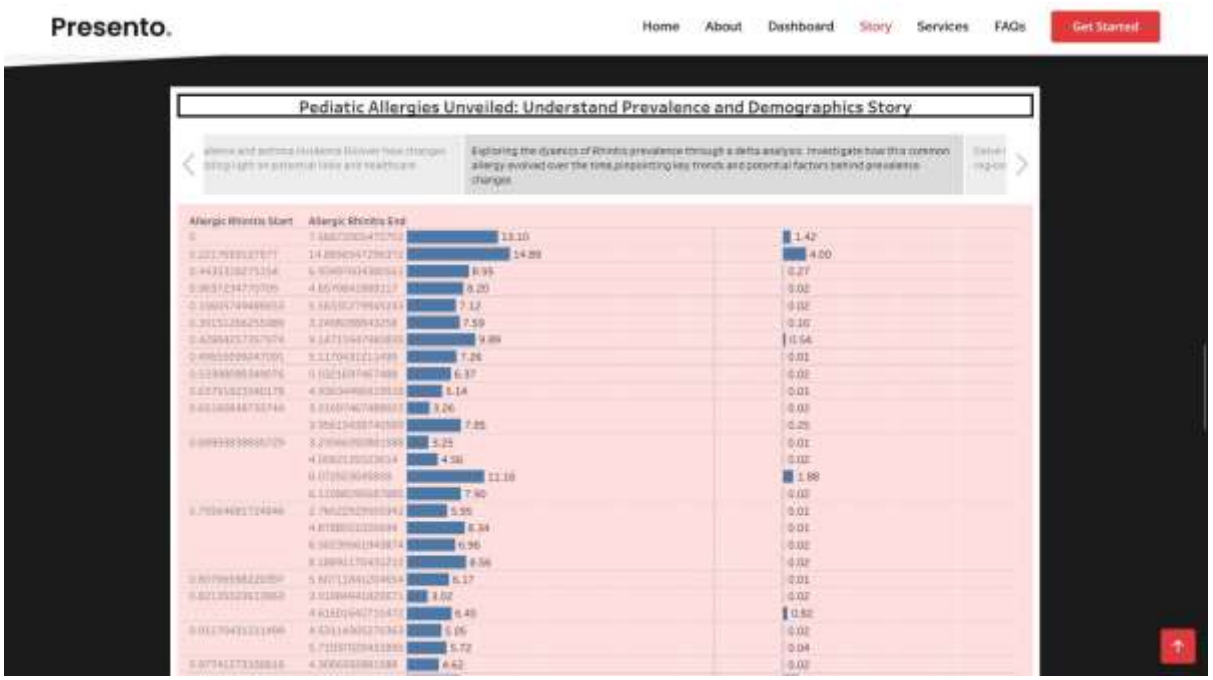
Childhood Allergies: Understand Prevalence and Demographics
Previous
gy Prevalence Delta Visualization by gender
Delta Analysis: Allergic Rhinitis Study
Allergic Rhinitis Start
Allergic Rhinitis End
Age End Years
alysis: Number of Asthma Medications Prescribed
Delta Analysis: Atopic Derm Study
Gender Fac...
Allergic Rhinitis End
Atopic Derm Start
Asthma End
Count of food-allergy-analysis...
Age Start Years
Age End Years
Count of food-allergy-anal...
Comparison of Allergy Prevalence Changes with Asthma
Asthma Start / Asthma End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Home
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Dashboard
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Services
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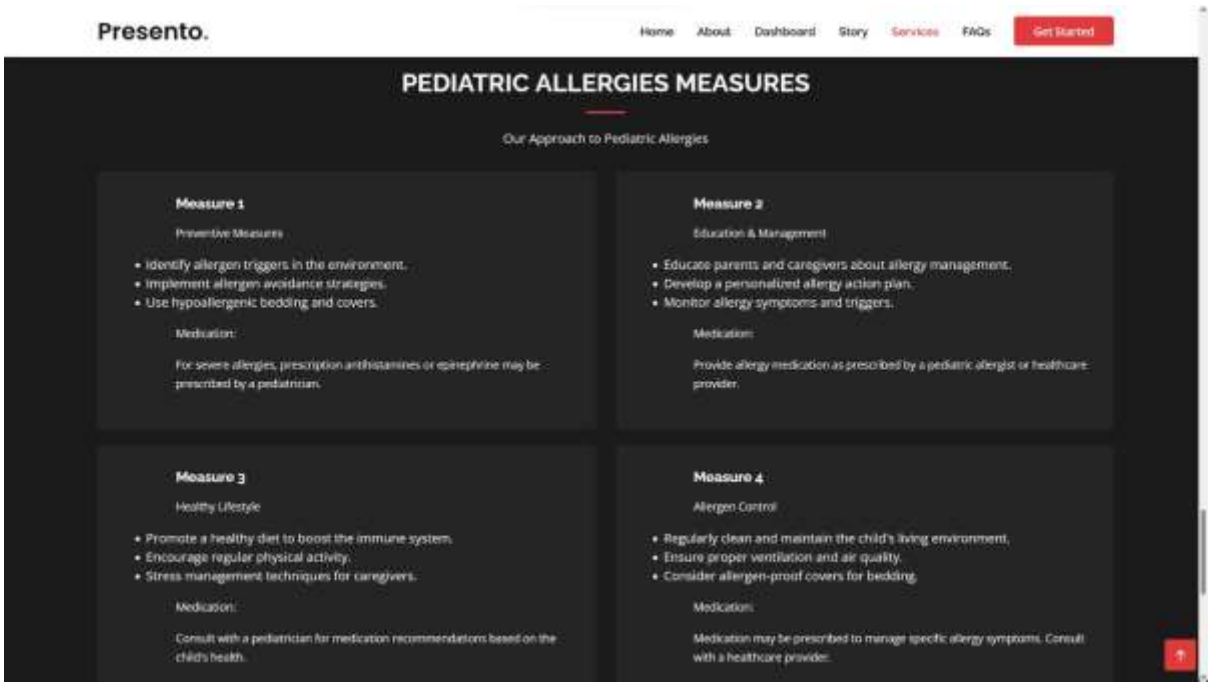
Get Started
Pediatric Allergies Unveiled: Understand Prevalence and Demographics Story
Exploring the dynamics of Rhinitis prevalence through a delta analysis. Investigate how this common allergy evolved over the time pinpointing key trends and potential factors behind prevalence changes
Allergic Rhinitis Start
Allergic Rhinitis End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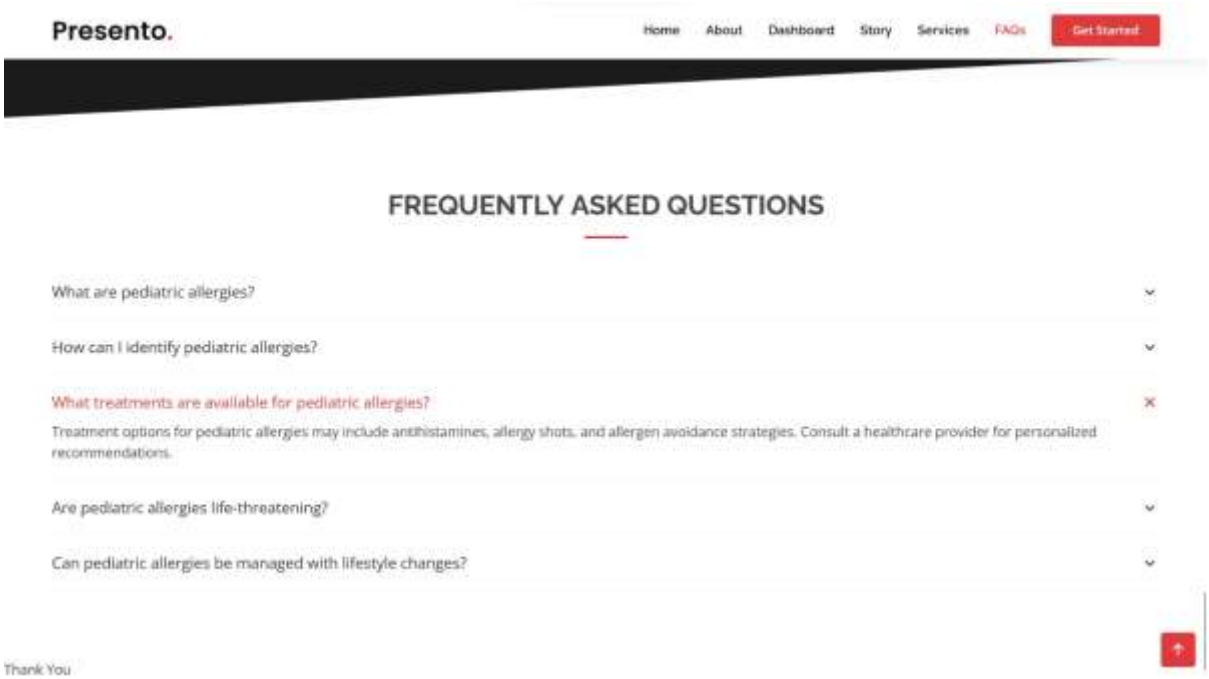
Get Started
PEDIATRIC ALLERGIES MEASURES
Our Approach to Pediatric Allergies
Measure 1
Preventive Measures
• Identify allergen triggers in the environment.
• Implement allergen avoidance strategies.
• Use hypoallergenic bedding and covers.
Medication:
For severe allergies, prescription antihistamines or epinephrine may be prescribed by a pediatrician.
Measure 2
Education & Management
• Educate parents and caregivers about allergy management.
• Develop a personalized allergy action plan.
• Monitor allergy symptoms and triggers.
Medication:
Provide allergy medication as prescribed by a pediatric allergist or healthcare provider.
Measure 3
Healthy Lifestyle
• Promote a healthy diet to boost the immune system.
• Encourage regular physical activity.
• Stress management techniques for caregivers.
Medication:
Consult with a pediatrician for medication recommendations based on the child's health.
Measure 4
Allergen Control
• Regularly clean and maintain the child's living environment.
• Ensure proper ventilation and air quality.
• Consider allergen-proof covers for bedding.
Medication:
Medication may be prescribed to manage specific allergy symptoms. Consult with a healthcare provider.



10. ADVANTAGES & DISADVANTAGES

Advantages:

Data Visualization: The project uses Tableau for data visualization, making complex data more accessible and understandable through interactive and visually appealing dashboards. This aids in conveying insights effectively to a wide audience.

Comprehensive Insights: The project aims to provide comprehensive insights into pediatric allergies, covering aspects such as prevalence, triggers, and demographic information. This information can be valuable for parents, caregivers, and medical professionals.

Informed Decision-Making: By making critical information accessible, the project helps individuals and healthcare providers make more informed decisions about managing pediatric allergies. This can lead to better healthcare and improved quality of life for children with allergies.

Educational Resource: The project serves as an educational resource for those seeking knowledge about pediatric allergies. It can help parents and caregivers understand the condition and its management better.

User-Friendly Design: The use of interactive dashboards and a well-designed user interface in Tableau enhances user experience and engagement, making it easier for users to explore the data.

Disadvantages:

Data Limitations: The project's effectiveness relies on the quality and completeness of the underlying data. If the data used is incomplete or outdated, it can limit the accuracy of the insights provided.

Data Privacy Concerns: Handling medical and demographic data, especially in a public project, raises privacy concerns. Ensuring data security and anonymity is crucial, and any breaches could have legal and ethical consequences.

Accessibility: While Tableau offers visually appealing dashboards, it may not be fully accessible to individuals with disabilities, potentially excluding a portion of the audience.

Dependency on Technology: The project's functionality relies on Tableau, which means that users need access to Tableau or compatible software to explore the insights. This may limit accessibility to some users.

Interpretation Required: While the project provides data and insights, users may still need to interpret the information correctly. Misinterpretation of the data can lead to incorrect conclusions or decisions.

Potential for Bias: Depending on how the data was collected and processed, there may be inherent biases in the insights presented. It's important to be transparent about potential biases and limitations.

11. CONCLUSION

In conclusion, "Pediatric Allergies Unveiled: A Tableau Exploration Of Prevalence And Demographics" is a valuable project that aims to provide insights into pediatric allergies, offering a range of advantages and some potential disadvantages. The project leverages Tableau for data visualization, making complex information more accessible and engaging for a wide audience. It serves as an educational resource, helping parents, caregivers, and medical professionals better understand and manage pediatric allergies.

However, it's important to acknowledge the limitations of the project. The quality and completeness of the underlying data, as well as concerns related to data privacy, must be addressed to ensure the accuracy and ethical handling of medical and demographic information. Accessibility for individuals with disabilities and the need for Tableau or compatible software for full exploration are also considerations.

In light of these factors, "Pediatric Allergies Unveiled" should be viewed as a valuable starting point for gaining insights into pediatric allergies. It can guide informed decision-making, but users should exercise caution in interpreting the data and be aware of potential biases and limitations. Overall, this project has the potential to improve healthcare and the

quality of life for children with allergies by providing a comprehensive and visually appealing resource for understanding and managing pediatric allergies.

12. FUTURE SCOPE

The "Pediatric Allergies Unveiled: A Tableau Exploration Of Prevalence And Demographics" project has significant potential for future enhancements and expansions. Here are some avenues for future development:

Data Enrichment: Enhance the dataset with more detailed information on demographics, allergy triggers, and medical histories.

Real-time Data Integration: Incorporate real-time data feeds for up-to-date insights.

Predictive Analytics: Implement machine learning for forecasting allergy prevalence and trends.

User Interaction Features*:* Add features for user input and personalized recommendations.

Mobile Application: Develop a mobile app for wider accessibility.

Multilingual Support: Translate content for an international audience.

Community and Forum: Create a community for discussion and support.

Data Security and Privacy: Continue to invest in data security measures.

Accessibility: Ensure full accessibility compliance.

Educational Partnerships: Collaborate with educational institutions for wider adoption.

Feedback Mechanism: Implement a feedback system for user input.

Research Collaboration: Partner with medical researchers for studies and advancements.

These streamlined prospects offer a clear direction for the project's future development.

13. APPENDIX

Source Code
Html code: https://drive.google.com/file/d/1gT5P1XdyKPctIeqMwUC-U0JWZ_uhHjRq/view?usp=sharing

GitHub & Project Demo Link
https://drive.google.com/file/d/1VmAQfdCZ-uVmP6ML02LpW88ZZevAljTZ/view?usp=sharing