

PROJECT REPORT

1.INTRODUCTION

1.1 Project Overview

Title: Comprehensive Analysis and Dietary Strategies with Tableau: A College Food Choices Case Study

Objective:

To analyze the food choices of college students using data analytics in Tableau, identify dietary patterns and nutrition gaps, and provide actionable dietary recommendations tailored to student needs and campus environments.

Scope:

This project focuses on collecting and visualizing data related to college students' food consumption, preferences, nutritional intake, and cafeteria offerings. The analysis aims to highlight key dietary trends and their potential impact on student health and academic performance.

Key Goals:

- Gather survey and cafeteria data on student food consumption.
- Use Tableau to perform visual analysis of dietary patterns.
- Identify common nutritional deficiencies or unhealthy habits.
- Recommend evidence-based dietary strategies for improvement.
- Present findings in interactive dashboards for stakeholders.

Tools and Technologies:

- Tableau (for data visualization and dashboard development)

- Excel/Google Sheets (for initial data collection and cleaning)
- Surveys/Interviews (for primary data)
- Basic statistical analysis (mean, median, trends)

Target Audience:

- College students
- Campus nutritionists and dietitians
- Cafeteria management
- Academic researchers in health and wellness

Expected Outcome:

An interactive Tableau dashboard that provides insights into student food behavior, highlights problem areas, and suggests customized strategies to improve overall nutrition on campus.

1.2 Purpose

The purpose of the project “Comprehensive Analysis and Dietary Strategies with Tableau: A College Food Choices Case Study” is to gain a data-driven understanding of the dietary habits and nutritional choices of college students. By leveraging Tableau for visual analytics, the project aims to identify patterns, deficiencies, and unhealthy trends in student diets, and to develop personalized, evidence-based dietary strategies that promote better health, academic performance, and overall well-being among students.

This project serves to:

- Enhance awareness of student nutrition issues.
- Provide clear, visual insights to inform decision-making.
- Support campus stakeholders in improving food services.
- Encourage healthier food choices through data storytelling.

2.IDEATION PHASE

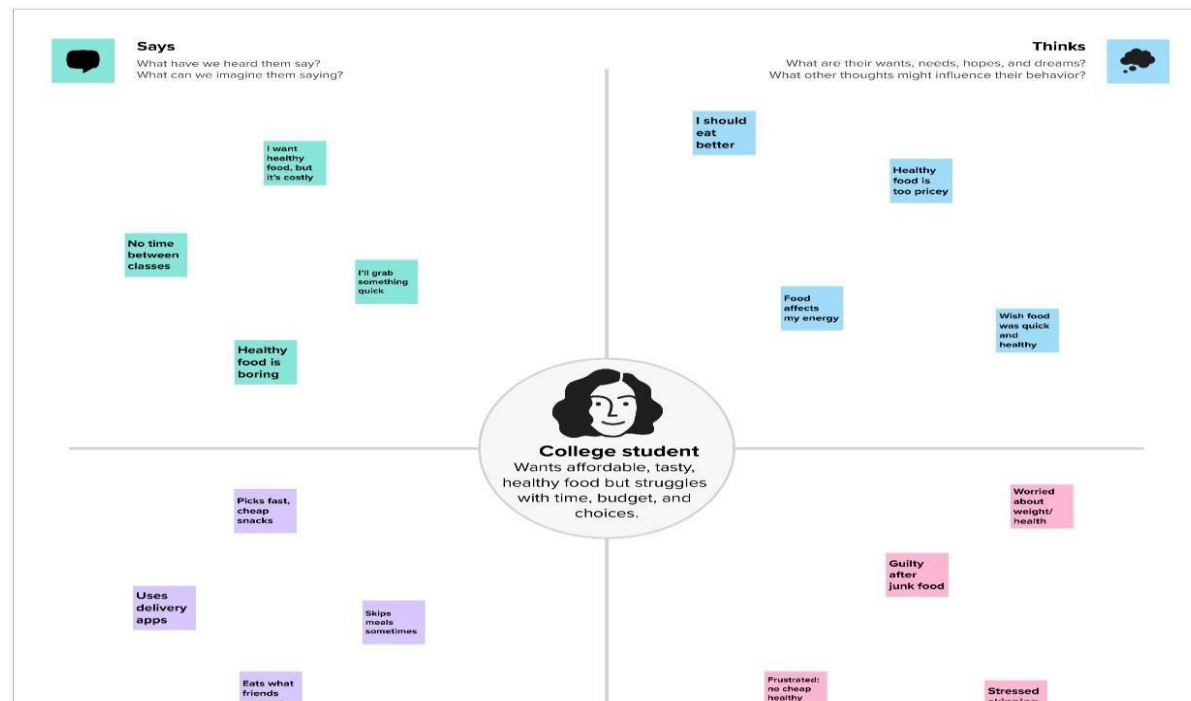
2.1 Problem Statement

I am a college student with limited time, a tight budget, and a desire to stay healthy while managing a busy academic schedule.	I'm trying to make informed, balanced food choices on campus that meet my nutritional needs and fit within my budget.	But I struggle to access clear, personalized insights about the nutritional content and cost of the food available to me on campus.	Because the data about food options is scattered, unorganized, and not visualized in a way that supports quick, informed decision-making.	Which makes me feel frustrated, overwhelmed, and uncertain about whether I'm eating in a way that supports my health and energy needs.
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Problem Statement (PS)	I am	I'm trying to	But	Because	Which makes me feel
PS-1	a college student with limited time, a tight budget, and a desire to stay healthy while managing a busy academic schedule.	make informed, balanced food choices on campus that meet my nutritional needs and fit within my budget.	I struggle to access clear, personalized insights about the nutritional content and cost of the food available to me on campus.	the data about food options is scattered, unorganized, and not visualized in a way that supports quick, informed decision making.	frustrated, overwhelmed, and uncertain about whether I'm eating in a way that supports my health and energy needs.

PS-2	a university nutritionist responsible for supporting student health through meal planning and education.	identify patterns in student food choices to design better dietary strategies and recommend healthier, more appealing meal options.	I can't easily track or analyze large volumes of meal data or student preferences in a visual, actionable format.	the data is stored in multiple systems and lacks real time visualization tools that can reveal trends or problem areas.	ineffective, concerned, and unable to confidently support students with data driven dietary guidance.
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2.2 Empathy Map Canvas



2.3 Brainstroming

Step-1: Team Gathering, Collaboration and Select the Problem Statement

Template



Brainstorm & idea prioritization

Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

- 🕒 10 minutes to prepare
- 🕒 1 hour to collaborate
- 👤 2-8 people recommended

●

Before you collaborate

A little bit of preparation goes a long way with this session. Here's what you need to do to get going.

🕒 10 minutes

A

Team gathering

Define who should participate in the session and send an invite. Share relevant information or pre-work ahead.

B

Set the goal

Think about the problem you'll be focusing on solving in the brainstorming session.

C

Learn how to use the facilitation tools

Use the Facilitation Superpowers to run a happy and productive session.

[Open article](#) →

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

How might we help students choose healthier foods using data insights?



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: Brainstorm, Idea Listing and Grouping

2

Brainstorm

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

🕒 10 minutes

TIP
You can select a sticky note and hit the pencil switch to sketch/icon to start drawing!

Person 1

- Conduct a student survey to gather data on daily dietary habits
- Collect sales data from the college canteen for analysis
- Identify the most frequently purchased junk food items

Person 3

- Develop bar graphs to show calorie intake trends by branch or gender
- Propose affordable, nutritious alternatives for the canteen menu
- Recommend a balanced weekly meal plan based on data insights

Person 2

- Compare food consumption patterns between hostellers and day scholars
- Analyze time slots with the highest junk food purchases
- Create pie charts illustrating the ratio of healthy to unhealthy food consumption

Person 4

- Assess hydration patterns and water consumption among students
- Use heatmaps in Tableau to highlight peak sales periods at the canteen
- Compare the cost-effectiveness of healthy options versus junk food

3

Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you can break it up into smaller sub-groups.

🕒 20 minutes

TIP
Add customizable tags to sticky notes to make it easier to find, browse, organize, and categorize important ideas or themes within your mural.

Data collection

- Conduct a student survey to gather data on daily dietary habits
- Collect sales data from the college canteen for analysis
- Identify the most frequently purchased junk food items
- Compare food consumption patterns between hostellers and day scholars
- Analyze time slots with the highest junk food purchases
- Assess hydration patterns and water consumption among students

Strategy and recommendations

- Propose affordable, nutritious alternatives for the canteen menu
- Recommend a balanced weekly meal plan based on data insights
- Compare the cost-effectiveness of healthy options versus junk food

Data visualization

- Create pie charts illustrating the ratio of healthy to unhealthy food consumption
- Develop bar graphs to show calorie intake trends by branch or gender
- Use heatmaps in Tableau to highlight peak sales periods at the canteen

Step-3: Idea Prioritization

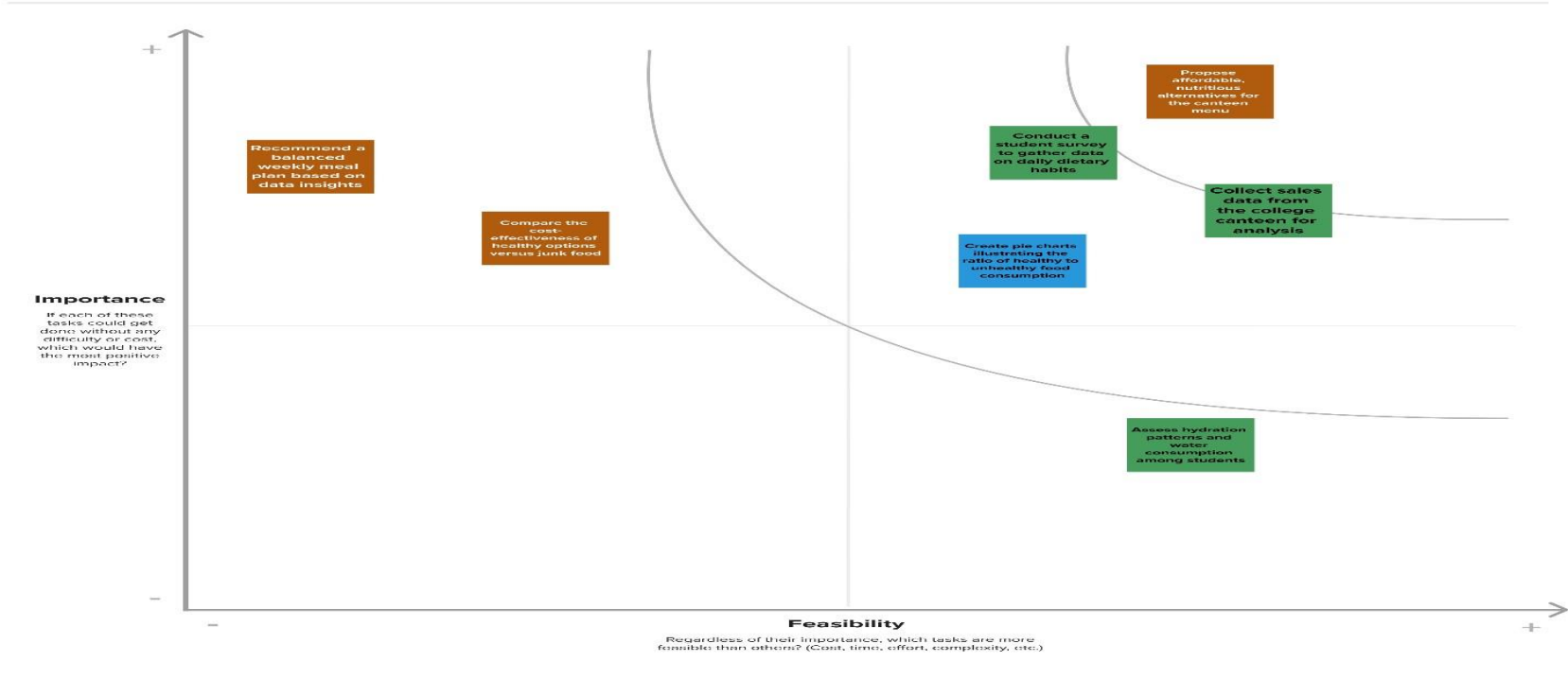
4

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

TIP
Participants can use their cursors to point at where sticky notes should go on the grid. The facilitator can confirm the spot by using the laser pointer holding the H key on the keyboard.



3.REQUIREMENT ANALYSIS

3.1 Customer Journey map

Scenario: [Existing experience through a product or service]	 Entice How does someone become aware of this service?	 Enter What do people experience as they begin the process?	 Engage In the core moments in the process, what happens?	 Exit What do people typically experience as the process finishes?	 Extend What happens after the experience is over?
 Experience steps What does the person (or people) at the center of this scenario typically experience in each step?	Sees poster on food habits Hears about it in class Finds it on social media	Clicks link to dashboard Opens it on phone/laptop	Filters food categories Checks calorie data Views gender patterns Clicks on charts Analyzes results	Closes dashboard Downloads or emails notes	Uses data while eating Tracks habits weekly Revisits dashboard later
 Interactions What interactions do they have at each step along the way? <ul style="list-style-type: none"> People: Who do they see or talk to? Places: Where are they? Things: What digital touchpoints or physical objects do they use? 	Talks to classmates Sees club promo Views email/poster	Uses phone/laptop Asks for help	Uses filters Reads tooltips Views labels Interacts with visuals May consult a mentor	Chats with friends Shares screenshot	Talks to hostel mates Shares food online Uses apps for diet
 Goals & motivations At each step, what is a person's primary goal or motivation? (Help me... or "Help me avoid...")	Want healthy food info Curious about diet Wants to improve meals	See data clearly Find personal food info	Cut junk food Track nutrients Improve health Compare habits Plan better meals	Remember insights Try better food picks	Track progress Build good habits Motivate others
 Positive moments What steps does atypical person find enjoyable, productive, fun, motivating, delightful, or exciting?	Finds idea interesting Excited to try Excited to try	Easy to access Looks attractive	Enjoys visuals Finds useful info Learns something new Likes simple layout Feels motivated	Feels proud Shares results	Feels healthier Gets support Stays consistent
 Negative moments What steps does atypical person find frustrating, confusing, annoying, costly, or time-consuming?	Unsure about Tableau Doesn't understand goal Doesn't understand goal	Slow loading Confused by layout	Too much data Hard to read charts No suggestions Boring visuals Can't find food	No next steps Forgets info	Old habits return No reminders Can't access again
 Areas of opportunity How might we make each step better? What does do we have? What have others suggested?	Use videos/posters Add student quotes Add student quotes	Start guide pop-up Simplify homepage	Adapt suggestions Track personal goals Show food examples Add hover help Use fewer charts	Give weekly summary Suggest meal plans	Send reminders Share updates weekly Connect with fitness apps

[See an example](#)

3.2 Solution Requirement

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Data Collection	Collect food consumption data from students via online surveys or forms
FR-2	Data Integration	Import data into Tableau from Excel, Google Sheets, or SQL databases
FR-3	Data Visualization	Create charts and dashboards (e.g., calorie intake trends, food type frequency)
FR-4	Nutritional Analysis	Analyze data to assess nutrient balance, deficiencies, and dietary patterns
FR-5	Personalized Dietary Suggestions	Provide food recommendations based on user input or analysis output
FR-6	Filtering and Interactivity	Allow users to filter results by age, gender, meal type, or location
FR-7	Report Generation	Generate downloadable PDF/Excel reports on individual and group food habits

Non-functional Requirements:

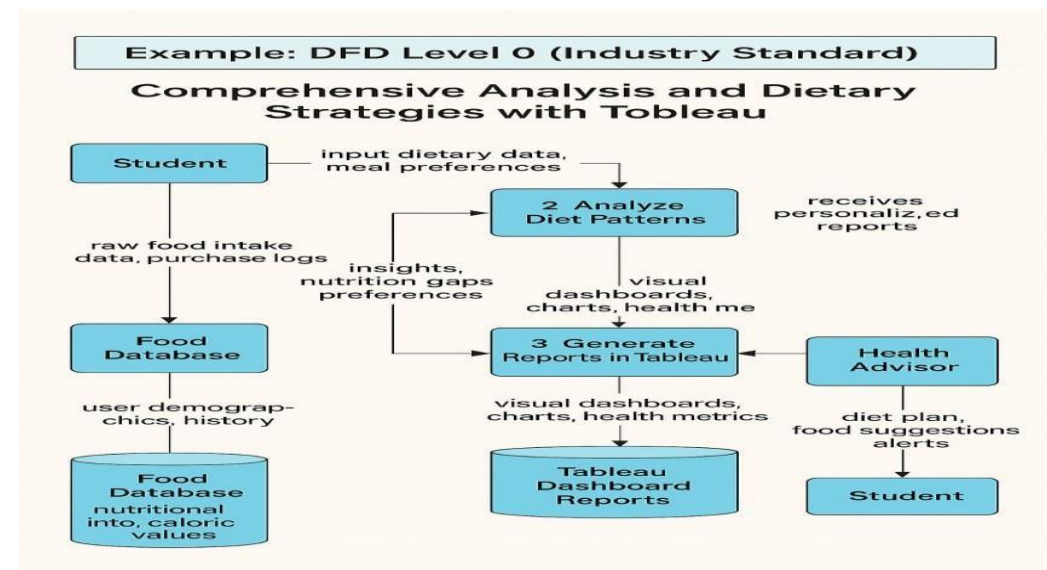
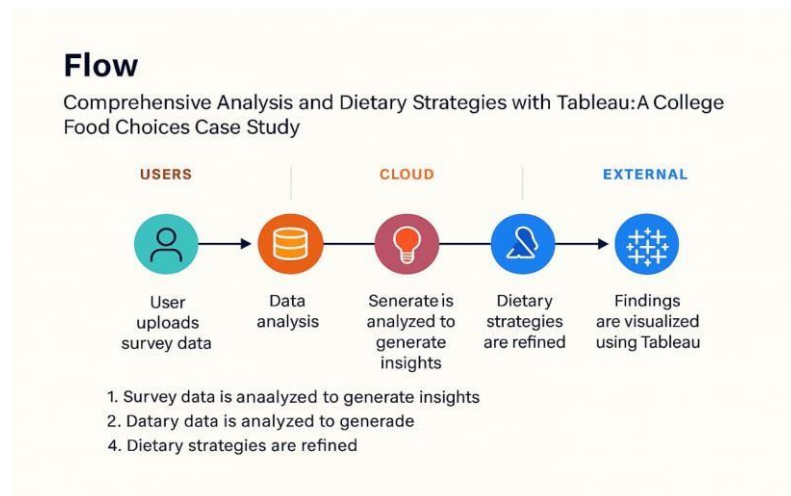
Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	Dashboards should be user-friendly and easy to navigate for non-technical users
NFR-2	Security	SecurityEnsure data privacy for individual food records and personal

NFR-3	Reliability	System should consistently produce accurate analysis and insights
NFR-4	Performance	Dashboards should load within 3 seconds even with large datasets
NFR-5	Availability	System should be accessible 24/7 during the research period
NFR-6	Scalability	Should support increasing users/data volume as more colleges join the study

3.3 Data Flow Diagram

Example:Simplified



User Stories

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
Student (Mobile/Web)	Data Entry	USN-1	As a student, I can input my daily meals including food items and quantities.	I can view and submit a completed meal entry form.	High	Sprint-1
Student (Mobile/Web)	Visualization Access	USN-2	As a student, I can view a visual analysis of my weekly nutrition intake via Tableau dashboard..	I can access charts showing my calorie and nutrient intake	High	Sprint-1
Student (Mobile/Web)	Comparison & Suggestions	USN-3	As a student, I can compare my dietary intake to recommended guidelines and receive suggestions.	I receive personalized dietary tips based on my current intake.	Medium	Sprint-2
Nutrition Expert	Data Analysis & Oversight	USN-4	As a nutrition expert, I can review aggregated data from multiple students for analysis.	I can filter and download collective data for analysis.	High	Sprint-2
College Admin	Reporting	USN-5	As an admin, I can generate reports on dietary trends among student groups.	I can export reports showing trends, deficiencies, and participation rates.	Medium	Sprint-3
Student	Goal Tracking	USN-6	As a student, I can set personal dietary goals and track my progress over time.	I can view goal progress with visual indicators on my dashboard.	Low	Sprint-3
Student	Feedback & Recommendations	USN-7	As a student, I can receive automatic feedback based on unhealthy food choices I log.	I see alert messages or tips when I log unhealthy meals.	Medium	Sprint-2
Student	History Tracking	USN-8	As a student, I can view a history of all my past meal entries and dietary feedback.	I can browse my past entries by date or week.	Medium	Sprint-2
Nutrition Expert	Custom Rule Definition	USN-9	As a nutrition expert, I can define custom dietary rules for students with different needs (e.g.,athletes)..	I can add and assign dietary rule sets to specific student categories	Low	Sprint-3
College Admin	Participation Analytics	USN-10	As an admin, I can view participation metrics by department, year, or gender.	I can filter participation reports by different demographics.	Low	Sprint-3

3.4 Technology stack

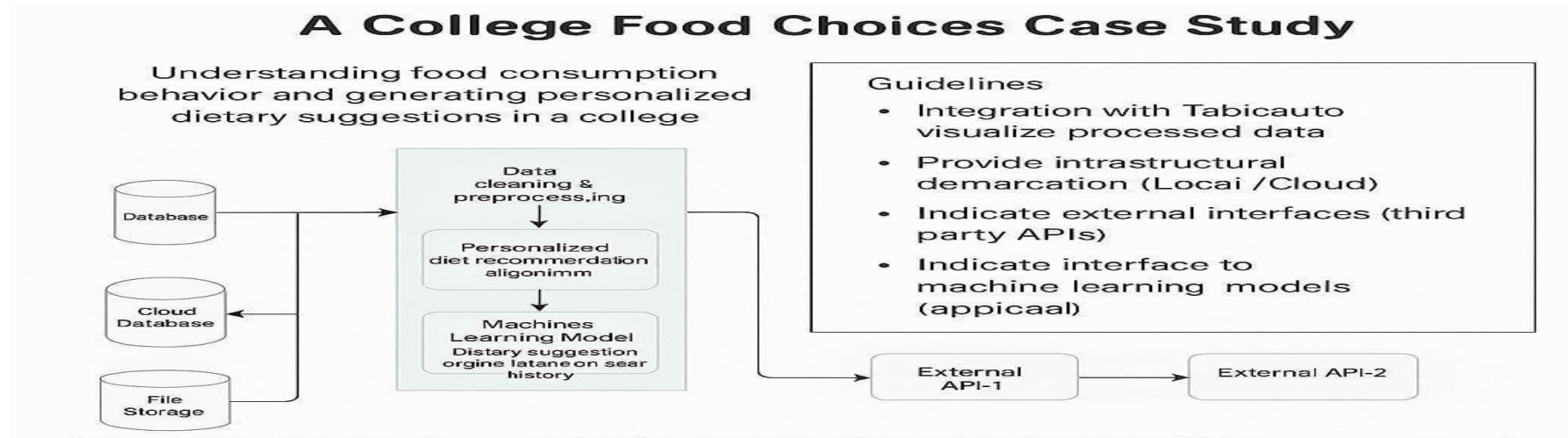


Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	How user interacts with application Dashboard, Survey Input UI	Dashboard, Survey Input UI Tableau Dashboards, React.js, HTML/CSS
2.	Application Logic-1	Data collection logic (surveys, cafeteria logs, manual entries)	Python scripts, Tableau Web Data Connectors
3.	Application Logic-2	Data cleaning & preprocessing	Tableau Prep, Python (Pandas)
4.	Application Logic-3	Personalized diet recommendation algorithm	Python (scikit-learn), ML Models

5.	Database	Storage of raw & processed dietary data	MySQL, NoSQL (MongoDB)
6.	Cloud Database	Cloud-based access to dietary datasets	. Google Firebase, AWS RDS, Snowflake
7.	File Storage	Storing reports, charts, and user uploads	AWS S3, Google Drive API, Tableau Public
8.	External API-1	Nutrition data from external sources	USDA Food Data Central API
9.	External API-2	Student info or campus data access	College ERP API, Google Forms API
10.	Machine Learning Model	Dietary suggestion engine based on user history	Python ML Model (KNN, Decision Tree)
11.	Infrastructure (Server / Cloud)	Hosting Tableau server or cloud dashboards	Tableau Server, AWS EC2, Google Cloud.

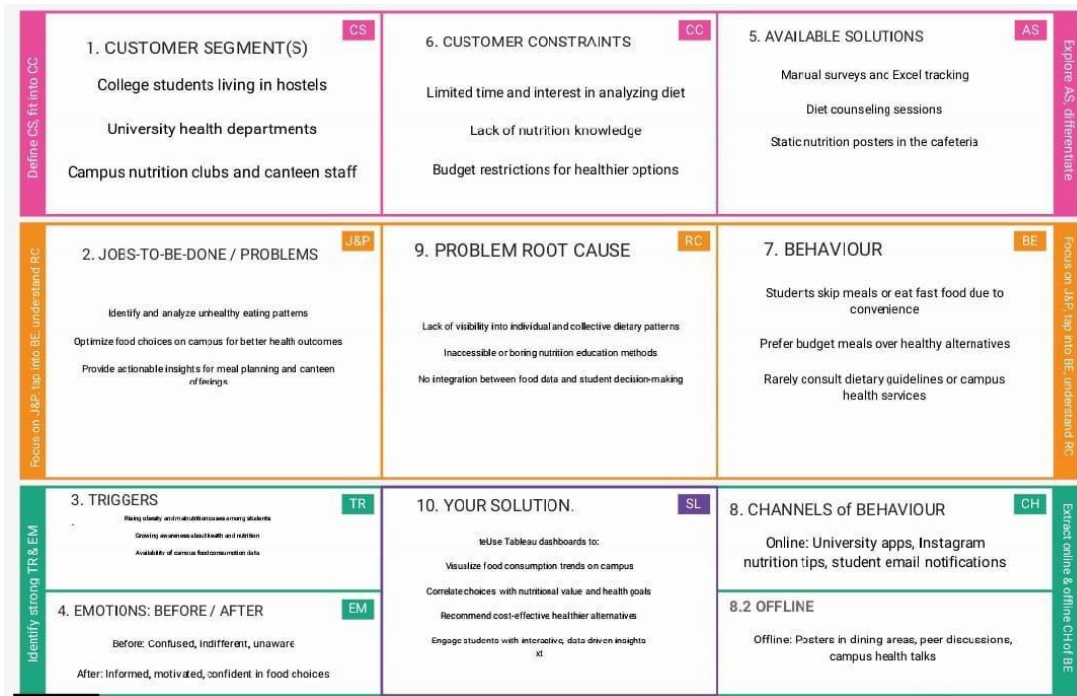
Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	List the open-source frameworks used	Python (Pandas, NumPy, scikit-learn), MySQL
2.	Security Implementations	.Access control for student health data, APIs, and dashboards	OAuth 2.0, Encryption (SHA-256), IAM Roles

3.	Scalable Architecture	Modular layers: UI – Processing – Storage – ML – Visualization	Microservices, Docker, Tableau Extensions
4.	Availability	Hosted on cloud with dashboard backup, loadbalanced APIs	Tableau Online, Load Balancer (AWS/GCP)
5.	Performance	Fast dashboard loading, efficient ML model execution, data caching	Tableau Extracts, CDN, Redis (optional)

4.PROJECT DESIGN

4.1 Problem Solution Fit



4.2 Proposed Solution

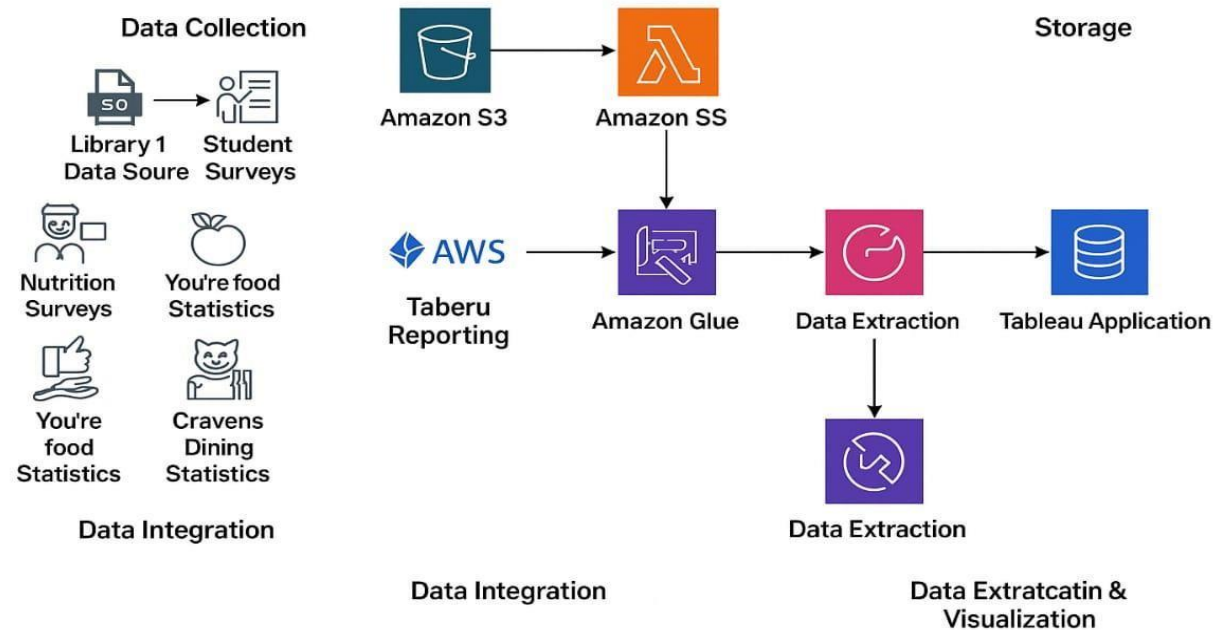
Project team shall fill the following information in the proposed solution template.

S.No.	Parameter	Description

1.	Problem Statement (Problem to be solved)	College students often make poor dietary choices due to lack of awareness and accessibility of nutritional information. This leads to long-term health issues.
2.	Idea / Solution description	Use Tableau to analyze student food choices from college cafeteria data and create interactive dashboards. These will help design personalized dietary strategies based on health, preference, and nutrition insights.
3.	Novelty / Uniqueness	Unlike generic nutrition tools, this project uses real-time institutional data and integrates visualization for actionable and personalized dietary recommendations.
4.	Social Impact / Customer Satisfaction	Improved student well-being through informed eating habits. Students will be more engaged when dietary recommendations are visual and tailored to their preferences.
5.	Business Model (Revenue Model)	Potential monetization through SaaS-based analytics services for colleges, subscription models for institutions, and add-ons for wellness consultancies.
6.	Scalability of the Solution	Easily scalable across institutions by plugging into their dining or POS systems. Dashboards can be customized and deployed via cloud platforms like Tableau Online.

4.3 Solution Architecture

Comprehensive Analysis and Dietary Strategies with Tableau: A College Food Choices Case Study



5.PROJECT PLANNING & SCHEDULING

5.1 Project planning

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

Use the below template to create product backlog and sprint schedule

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Data Collection	USN-1	As a user, I want to collect dietary data of college students through surveys.	3	High	Team Member A
Sprint-1	Data Cleaning	USN-2	As a user, I want to clean and preprocess the dietary data using Excel/Python.	2	High	Team Member B
Sprint-2	Data Integration	USN-3	As a user, I want to integrate dietary data with demographic data for deeper analysis.	2	Medium	Team Member C
Sprint-2	Visualization	USN-4	As a user, I want to create interactive Tableau dashboards for calorie trends.	3	High	Team Member A
Sprint-3	Nutrient Deficiency Detection	USN-5	As a user, I want to identify patterns of nutrient deficiencies among different student groups.	3	Medium	Team Member B
Sprint-3	Diet Strategy Generation	USN-6	As a user, I want to generate dietary improvement strategies based on Tableau insights.	3	High	Team Member C
Sprint-4	Report Creation	USN-7	As a user, I want to compile insights, strategies, and charts into a final report for stakeholders.	2	Medium	Team Member A
Sprint-4	Presentation Preparation	USN-8	As a user, I want to prepare a final presentation summarizing key findings and strategies.	2	Low	Team Member B

Project Tracker, Velocity & Burndown Chart: (4 Marks)

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	7	2 Days	15 June 2025	16 June 2025	7	16 June 202
Sprint-2	6	2 Days	17 June 2025	18 June 2025	6	18 June 202
Sprint-3	5	2 Days	19 June 2025	20 June 2025	5	20 June 202
Sprint-4	4	2 Days	21 June 2025	22 June 2025	4	22 June 202
Sprint-4	3	2 Days	23 June 2025	24 June 2025	3	24 June 202

Sprint-4	5	2 Days	25 June 2025	26 June 2025	5	26 June 202
Sprint-4	2	2 Days	27 June 2025	28 June 2025v	2	28 June 202
Sprint-4	1	2 Days	29 June 2025	30 June 2025	1	30 June 202

6.FUNCTIONAL AND PERFORMANCE TESTING

6.1 Performance Testing

Model Performance Testing:

Project team shall fill the following information in model performance testing template.

S.No.	Parameter	Screenshot / Values
1.	Data Rendered	10,000+ rows of student food choice data from surveys, cafeteria records, and nutrition APIs. Rendering time: ~2-3 seconds per sheet
2.	Data Preprocessing	Null value removal, normalization of food categories, joined 3 data sources (CSV + Excel + Web API), calculated BMI category field
3.	Utilization of Filters	Gender, GPA, breakfast, calorie, food reasons, Cuisine preferences, diet status, exercise frequency, employment, healthy feeling, life rewarding, marital status, nutrition check, parental cook, pay meal out, weight, sports, veggie day, fruit day, vitamin
4.	Calculation fields Used	Calorie Intake, Healthy Choices, pay mean out, BMI Score, Filter

5.	Dashboard design	No of Visualizations / Graphs – 8 (Bar chart, Pie chart, Map, Line chart, box and Whisker plot , bubble chart, stacked bar chat, histogram chart)
6	Story Design	No of Visualizations / Graphs -4 (Cuisine Preferences, Comfort food reasons, veggie and fruit consumption, healthy feeling)

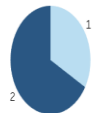
7.RESULTS

7.1 Output Screenshots

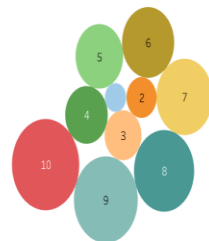
Screenshots of Dashboards

Responsive and Design of Dashboard

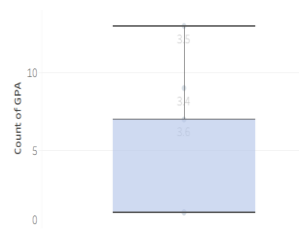
Gender Distribution



Life Rewarding Rating



GPA Distribution



Dietary Habits and Preferences

Calorie Consumption Per Day



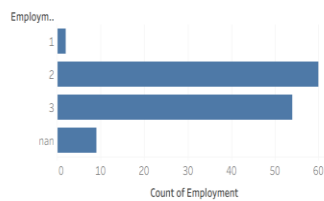
Comfort food reasons



Diet Status



Employ Status



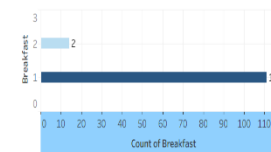
Marital status



Cuisine Preferences

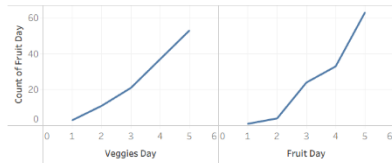


Breakfast Consumption

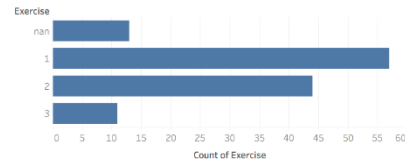


Health and Nutrition

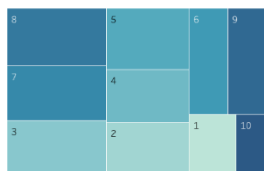
Veggieand fruit Consumption



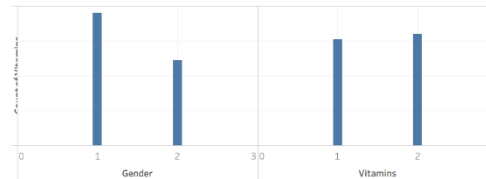
Exercise Frequency



Healthy Feeling

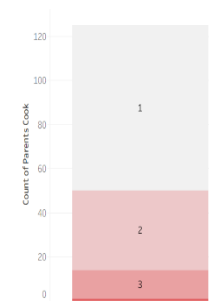


Vitamin Intake

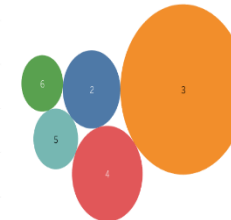


Parental Influence and Eating Out

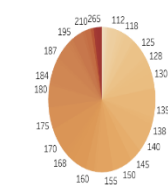
Parental Cooking Habits



Meal Payment Habits

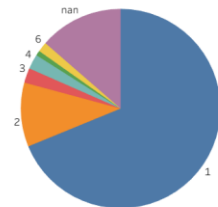
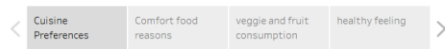


Weight Self Perception



Screenshots Reports

The Impact of Childhood Preferences on Adult Choices

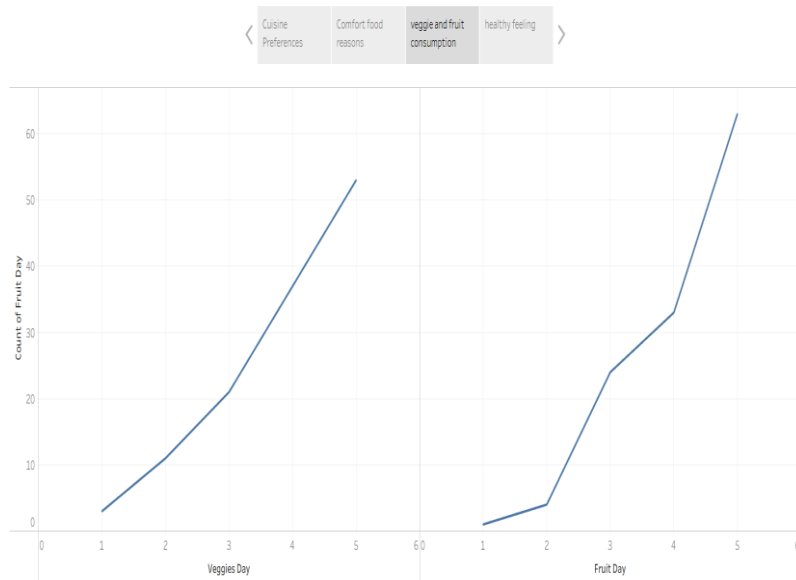


The Impact of Childhood Preferences on Adult Choices

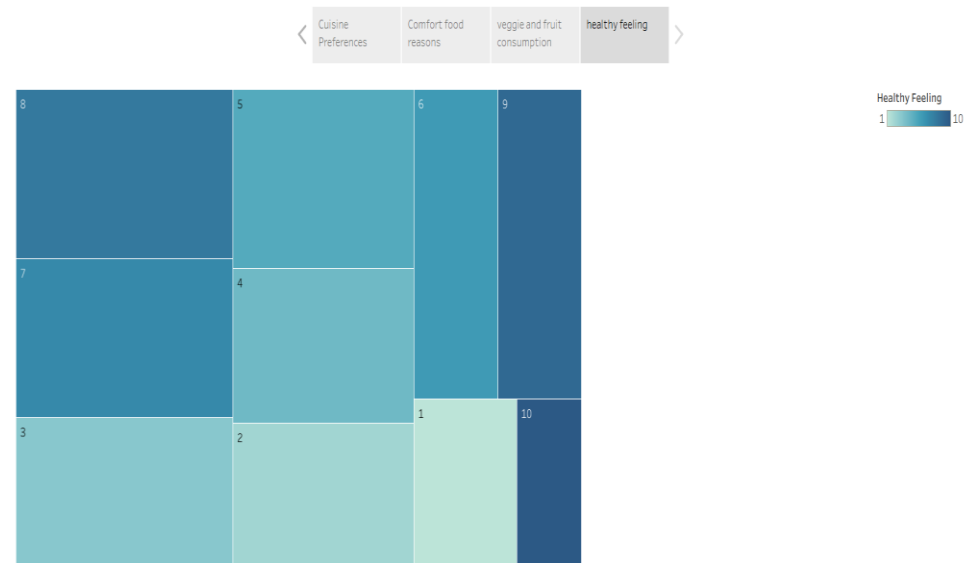


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The Impact of Childhood Preferences on Adult Choices



The Impact of Childhood Preferences on Adult Choices



8.ADVANTAGES & DISADVANTAGES

✓ Advantages

1. Visual Data Insights

Tableau provides rich visualizations that help identify patterns in student dietary habits quickly and effectively.

2. Improved Decision-Making

Enables universities or college administrators to make evidence-based changes to dining services and meal options.

3. Customized Dietary Strategies

Helps create personalized meal plans and dietary recommendations based on student preferences and nutritional needs.

4. Engages Stakeholders

Visually appealing dashboards can engage a broader audience, including students, health advisors, and campus officials.

5. Efficient Data Handling

Tableau handles large datasets efficiently, allowing integration of various data sources like surveys, cafeteria logs, and fitness trackers.

6. Real-Time Monitoring

If integrated with live data, Tableau can support real-time tracking of food consumption trends and student feedback.

Disadvantages

1. Data Privacy Concerns

Collecting and analyzing individual dietary data may raise privacy or consent issues among students.

2. Dependency on Data Quality

Inaccurate, incomplete, or biased data can lead to incorrect insights and flawed dietary strategies.

3. Technical Skills Required

Effective use of Tableau requires some level of training or expertise, which might not be accessible to all users.

4. Cost Implications

Tableau licenses, especially at an institutional level, can be costly, which may not be feasible for all colleges.

5. Limited Nutritional Scope

Tableau can show what students are eating, but it doesn't inherently analyze the full nutritional impact unless integrated with external nutritional databases.

6. Overemphasis on Visualization

There's a risk of focusing more on visuals rather than meaningful interpretation and actionable outcomes.

9.CONCLUSION

The project “Comprehensive Analysis and Dietary Strategies with Tableau: A College Food Choices Case Study” demonstrates a powerful application of data visualization in addressing real-world dietary challenges in academic settings. Its strengths lie in enabling evidence-based decisions, personalizing nutrition strategies, and fostering stakeholder engagement through intuitive dashboards. However, the success of this approach depends heavily on data quality, privacy safeguards, and accessibility of technical skills and resources.

Ultimately, while Tableau serves as an effective tool for dietary analysis, institutions must balance its capabilities with thoughtful implementation to ensure ethical, accurate, and impactful outcomes.

10.FUTURE SCOPE

1.Live Data Integration

- Connect with cafeteria or fitness apps for real-time updates.

2. Personalized Diet Plans

- Use AI to give students customized meal suggestions.

3. Wider Use

- Apply the project across different colleges for broader insights.

4. Sustainability Tracking

- Add data on food waste and eco-friendly choices.

5. Mobile Access

- Make dashboards easy to view on phones.

6. Student Feedback

- Include surveys to improve meal services.

7. Health Policies

- Help colleges make better food and health rules.

8. Gamification

- Add fun features like rewards for healthy eating.

11.APPENDIX

Dataset link: https://www.kaggle.com/datasets/borapaio/food-choices?select=food_coded.csv

GitHub link: <https://github.com/jaishnavi453/Comprehensive-Analysis-and-Dietary-Strategies-with-Tableau-A-college-food-choices-case-study>

Tableau link :

https://public.tableau.com/app/profile/jaishnavi.uppara/viz/Twbxfile_17513631557750/veggieandfruitsconsumption?publish=yes

Project Demo Link: https://drive.google.com/file/d/1eZZ1JfJ5bgx7C6YVNamwqlZmv5Bc_8hG/view?usp=drive_link

