Hackathon Project Phases Template

Project Title:

DataQueryAI: Intelligent Data Analysis with Google TAPAS

Team Name:

QueryCrafters

Team Members:

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Phase-1: Brainstorming & Ideation

Objective:

Develop an AI-powered data analysis tool using Google TAPAS to help users analyze and extract insights from CSV data through natural language queries.

Key Points:

1. **Problem Statement:**
    - Users struggle to analyze large datasets manually, requiring technical expertise in tools like Excel, SQL, or Python.
    - Businesses need faster, more accurate data analysis to make data-driven decisions.
    - Non-technical users find it challenging to derive insights from raw data without coding knowledge.

2. **Proposed Solution:**
    - An AI-powered application using Google TAPAS to process natural language queries over tabular data (CSV files).
    - The app offers **maintenance tips** and **eco-friendly vehicle insights** based on user preferences.
3. **Target Users:**
    - **Business Analysts** who need quick insights from data.
    - **Non-technical users** who want to analyze data without coding.
    - **Educators and Students** learning data analysis concepts.
4. **Expected Outcome:**
    - A functional AI-powered data analysis tool that provides accurate, real-time insights from uploaded CSV files.

Phase-2: Requirement Analysis

Objective:

Define the technical and functional requirements for the DataQueryAI. Define the technical and functional requirements for DataQueryAI.

Key Points:

1. **Technical Requirements:**
    - Programming Language: **Python**
    - Backend: **Google TAPAS Model**
    - Frontend: **Streamlit Web Framework**
2. **Functional Requirements:**
    - Ability to upload CSV files and process natural language queries.
    - Display query results in tables, charts, or text format.
    - Provide accurate, context-aware answers using Google TAPAS.
3. **Constraints & Challenges:**
    - Handling large CSV files efficiently.
    - Ensuring real time query processing with minimum latency.
    - Optimizing Google TAPAS for diverse datasets and query types.

Phase-3: Project Design

Objective:

Develop the architecture and user flow of DataQueryAI.

Key Points:

1. **System Architecture:**
    - User uploads a CSV file and enters query via the streamline UI.
    - The backend processes the query using Google TAPAS.
    - The model analyzes the data and returns the result to the frontend.
2. **User Flow:**
    - Step 1: User uploads a CSV file.
    - Step 2: User enters a query (e.g., "What is the total revenue for Q2?")
    - Step 3: The app processes the query and displays the results.
3. **UI/UX Considerations:**
    - **Simple, intuitive interface** for uploading files and entering queries.
    - **Interactive display** of results (tables, charts, or text).
    - **Dark & light mode** for better user experience.

Phase-4: Project Planning (Agile Methodologies)

Objective:

Break down development tasks for efficient completion.

Sprint	Task	Priority	Duration	Deadline	Assigned To	Dependencies	Expected Outcome
Sprint 0	Environment Setup & Planning	High	2 hours	2 hours	Member 1	Python, Streamlit, Google Colab	Ready-to-code environment.
Sprint 1	Integrate Google TAPAS & Set Up Streamlit	High	6 hours	8 hours	Member 1 & 2	TAPAS API, Streamlit	TAPAS integrated, basic app running.
Sprint 2	Build File Uploader & Query Input	High	4 hours	12 hours	Member 2 & 3	Streamlit UI setup	File uploader and query input functional.
Sprint 3	Connect Frontend to Backend & Display Results	High	6 hours	18 hours	Member 1 & 2	TAPAS integration, UI ready	Query processing and results displayed.
Sprint 4	Test, Debug & Optimize	High	6 hours	24 hours	Member 1 & 3	Test logs, API responses	Stable app with minimal bugs.
Sprint 5	Add Visualizations & Deploy App	Medium	5 hours	29 hours	Member 2 & 4	Query results ready	Visualizations added, app deployed.
Sprint 6	Prepare Demo & Final Submission	High	1 hour	30 hours	Entire Team	All tasks completed	Demo video, report, and GitHub link submitted.

Sprint Planning with Priorities

Sprint 0 – Environment Setup & Planning (2 Hours)

- **(🔴 High Priority)** Set up the environment (Python, Streamlit, Google Colab).
- **(🔴 High Priority)** Finalize the project plan and assign roles.

Sprint 1 – Integration & Basic Setup (6 Hours)

- **(🔴 High Priority)** Integrate Google TAPAS for query processing.
- **(🔴 High Priority)** Set up a basic Streamlit app skeleton.

Sprint 2 – Core UI Development (4 Hours)

- **(🔴 High Priority)** Build a file uploader for CSV files.
- **(🔴 High Priority)** Add a query input field for natural language queries.

Sprint 3 – Query Processing & Results Display (6 Hours)

- **(🔴 High Priority)** Connect the frontend to the backend (Google TAPAS).
- **(🔴 High Priority)** Display query results in tables or text format.

Sprint 4 – Testing & Debugging (6 Hours)

- **(🔴 High Priority)** Test the app with diverse datasets and queries.
- **(🔴 High Priority)** Debug and optimize performance (e.g., API response times).

Sprint 5 – Enhancements & Deployment (5 Hours)

- **(🟡 Medium Priority)** Add visualizations (e.g., charts, graphs) for query results.
- **(🔴 High Priority)** Deploy the app on Streamlit Sharing.

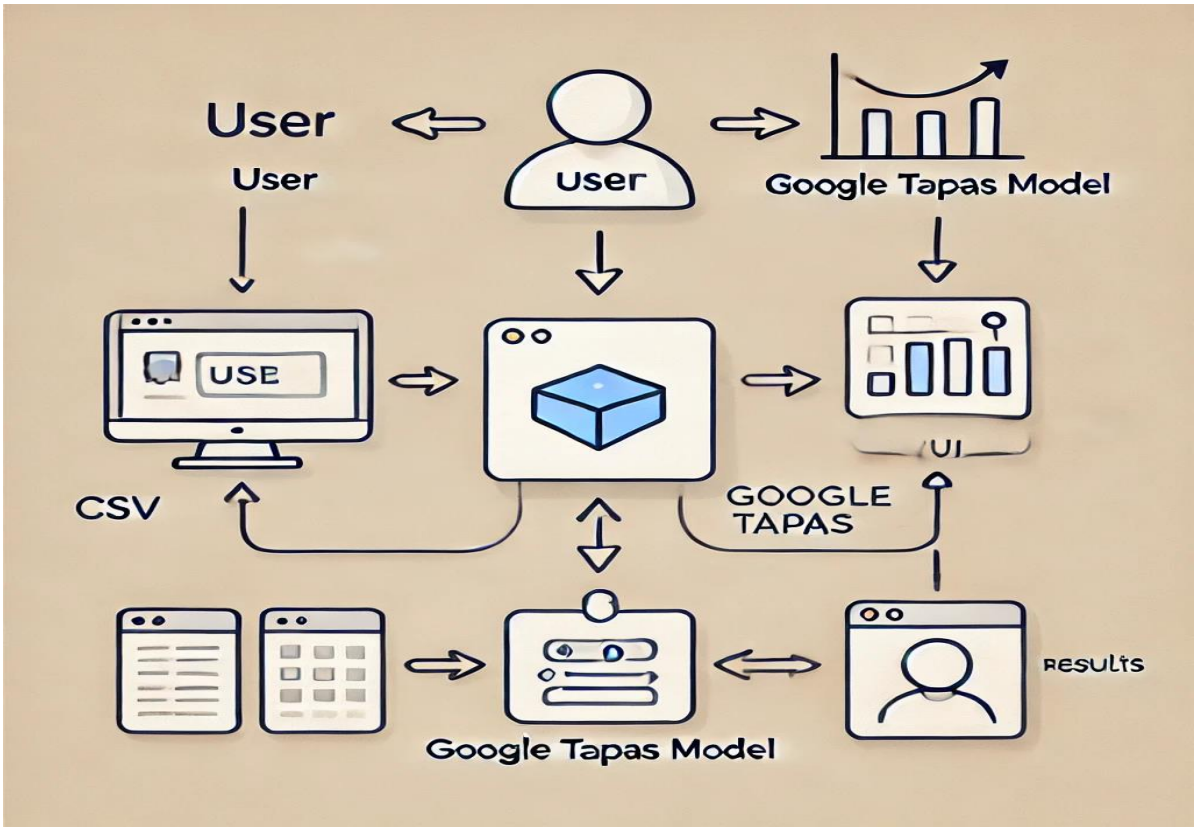
Sprint 6 – Final Submission (1 Hour)

- **(🔴 High Priority)** Prepare a 3-5 minute demo video.
- **(🔴 High Priority)** Finalize documentation and submit the project (report, GitHub link).

Phase-5: Project Development

Objective:

Implement core features of the DataQueryAI App.



Key Points:

1. **Technology Stack Used:**
    - **Frontend:** Streamlit
    - **Backend:** Google TAPAS
    - **Programming Language:** Python
2. **Development Process:**
    - Integrate Google TAPAS for query processing.
    - Develop the Streamlit UI for file uploads and query input.
    - Optimize query handling for performance and accuracy..
3. **Challenges & Fixes:**
    - **Challenge:** Delayed response times for large datasets.
    - **Fix:** Implement data preprocessing and caching.
    - **Challenge:** Difficulty in comparing the columns.

- **Fix:** Proceeded by validating the columns before comparing.

Phase-6: Functional & Performance Testing

Objective:

Ensure that the DataQueryAI works as expected.

Test Case ID	Category	Test Scenario	Expected Outcome	Status	Tester
TC-001	Functional Testing	Query "What is the highest value in units sold?"	Highest value should be displayed	✓ Passed	Tester 1
TC-002	Functional Testing	Query "Compare units sold by region?"	Visualization of comparison should be displayed	✓ Passed	Tester 2
TC-003	Bug Fixes & Improvements	Fixed incorrect API responses.	Data accuracy should be improved.	Fixed	Tester 3
TC-004	Final Validation	Ensure UI is responsive across devices.	UI should work on desktop.	Passed	Tester 2
TC-005	Deployment Testing	Host the app using Streamlit Sharing.	App should be accessible online.	Deployed	DevOps

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Final Submission

1. **Project Report Based on the templates**
2. **Demo Video (3-5 Minutes)**
3. **GitHub/Code Repository Link**
4. **Presentation**