

# Hackathon Project Phases

## Project Title:

Shikshak Mahoday: Palm-Powered Data Science Tutor.

## Team Name:

DataGuru

## Team Members:

- M.Laxmi Namitha
  - G.Navya Sree
  - A.Sai Tejasri
  - K.Girija Sanjana Rani
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## Phase-1: Brainstorming & Ideation

### Objective:

Develop an AI-based personalization expert tool using the application of Google's PaLM (Pathways Language Model) to help users to explore an adaptive learning pathways and interactive engagement to reinforce learning through feedback and follow-up questions.

### Key Points:

#### 1. Problem Statement:

- Many users struggle to explore themselves to new technologies, up-to-date information about emerging courses and doesn't have proper idea of how to start the learning path of those trending technologies.

- Users also need guidance on how to start their learning journey and clarify their doubts during their journey. Users provide the topic area where they have doubt such that we analyse their understanding level and provide a text or video solution for that.

## 2. **Proposed Solution:**

- Shikshak Mahoday aims to revolutionize learning in data science using a personalized, adaptive learning process. With the application of **Google's PaLM**, it dynamically adjusts learning streams based on learner input and progression, making learning relevant yet challenging.
- The platform also leverages **up-to-the-minute** arXiv and Google Scholar research, keeping learners up to date on current industry trends. Interactive simulations and AR-based data visualizations give a more tangible learning experience to abstract concepts.

## 3. **Target Users:**

- Students & Aspiring Data Scientists.
- Working Professionals & Researchers.
- Educators & Institutions.

## 4. **Expected Outcome:**

- A functional **AI-powered Shikshak Mahoday app** that provides lessons based on real-time solution in the form of texts and video lectures to the user queries.
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# Phase-2: Requirement Analysis

## Objective:

Define the technical and functional requirements for the Shikshak Mahoday App.

## Key Points:

### 1. **Technical Requirements:**

- Programming Language: **Python**
- Backend: **JavaScript (Node.js with Express) OR Python (Django)**
- Frontend: **Streamlit Web Framework**
- Database: **SQL (PostgreSQL) + NoSQL (MongoDB)**

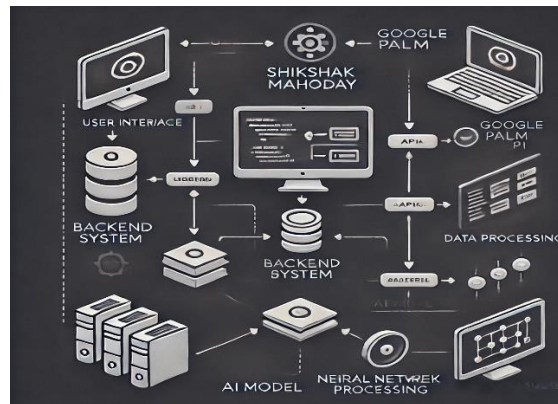
### 2. **Functional Requirements:**

- User authentication (OAuth 2.0, JWT-based login).

- ### 3. Constraints & Challenges:

- ## Phase-3: Project Design

Develop the architecture and user flow of the application.



### 1. System Architecture:

- ## 2. User Flow:

- Step 1: User enters a query.
- Step 2: The backend **calls the Google's PaLM** to retrieve the data.

- Step 3: The app processes the data and **displays results** in an easy-to-read format.

### 3. UI/UX Considerations:

- **Minimalist, user-friendly interface** for seamless navigation.
- **Filters for level of difficulty of doubts.**
- **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 1	Environment Setup & API Integration	● High	6 hours (Day 1)	End of Day 1	Sanjana	Google API Key, Python, Streamlit setup	API connection established & working
Sprint 1	Basic UI Development	● Medium	2 hours (Day 1)	End of Day 1	Member 2	Wireframe design finalized	Basic learning dashboard ready
Sprint 2	Adaptive Learning Engine	● High	3 hours (Day 2)	Mid-Day 2	Sai Tejasri	Google PaLM API, User Progress Data	Dynamic content recommendations
Sprint 2	Research Integration (arXiv & Scholar)	● High	1.5 hours (Day 2)	Mid-Day 2	Member 1&4	API Access, Parsing Scripts	Real-time research updates visible
Sprint 3	AR & Interactive Simulations	● Medium	1.5 hours (Day 2)	Mid-Day 2	Laxmi Namitha	3D Model Assets, AR Framework	Immersive learning modules
Sprint 4	Final Presentation & Deployment	● Low	2 hour (Day 2)	End of Day 2	Entire Team	Working prototype, hosting setup	Demo-ready project

### Sprint Planning with Priorities




#### Sprint 1 – Setup & Integration (Day 1)

-  High Priority: Set up the environment & install dependencies.
-  High Priority: Integrate Google PaLM API for adaptive learning.
-  Medium Priority: Develop a basic UI with user authentication & dashboard.



#### **Sprint 2 – Core Features & Debugging (Day 2)**

-  High Priority: Implement adaptive learning streams based on user progress.
-  High Priority: Integrate real-time research updates from arXiv & Google Scholar.
-  High Priority: Debug API issues & improve system response time.

#### **Sprint 3 – Enhancements & Immersive Learning (Day 2)**

-  Medium Priority: Implement AR-based data visualizations & interactive simulations.
-  Medium Priority: Integrate sentiment analysis for emotional adaptation in learning.
-  Low Priority: Enhance peer collaboration tools & mentorship simulation.

#### **Sprint 4 – Testing, Refinements & Deployment (Day 2)**

-  Medium Priority: Test AI-generated learning pathways, UI responsiveness & bug fixes.
-  Low Priority: Final demo preparation, documentation, and deployment.

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## **Phase-5: Project Development**

### **Objective:**

Implement core features of the Shikshak Mahoday App.

### **Key Points:**

### 1. Technology Stack Used:

- **Frontend:** Streamlit
- **Backend:** JavaScript (Node.js with Express) OR Python (Django)
- **Programming Language:** Python

### 2. Development Process:

- Implement **API key authentication** and **Google's PaLM**.
- Develop **solutions and tips logic** in answer to the users queries.
- Optimize **search queries** for performance and relevance.

### 3. Challenges & Fixes:

- **Challenge:** Delayed API response times.  
**Fix:** Implement **caching** to store frequently queried results.
- **Challenge:** Limited API calls per minute.  
**Fix:** Optimize queries to fetch **only necessary data**.

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## Phase-6: Functional & Performance Testing

### Objective:

Ensure that the Shikshak Mahoday App works as expected.

Test Case ID	Category	Test Scenario	Expected Outcome	Status	Tester
TC-001	Functional Testing	Query " <b>Latest research on deep learning from arXiv</b> "	Relevant & recent research papers should be displayed.	✅ Passed	Sanjana
TC-002	Functional Testing	Query " <b>Explain Gradient Descent with an AR visualization</b> "	AR-based visualization should load & explain the concept.	✅ Passed	Sai Tejasri
TC-003	Performance Testing	API response time under 500ms	AI should generate adaptive learning paths within time..	⚠ Needs Optimization	Tester 3
TC-004	Bug Fixes & Improvements	Fixed incorrect <b>research paper citations</b>	Data accuracy should be improved.	✅ Fixed	Developer
TC-005	Final Validation	Ensure UI is responsive across devices.	UI should work on mobile & desktop.	❌ Failed - UI broken on mobile	Tester 2
TC-006	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**