Problem Statements

1. Intelligent Companion for Context-Aware Accessibility *Theme: Accessibility, Multimodal AI, Assistive Technology*
2. Gamified Digital Financial Literacy for Drivers *Theme: Financial Literacy, Gamification, Low-Literacy User Experience*
3. Smart Alumni Engagement & Networking Platform *Theme: Alumni Management, Networking, Data Automation*
4. Intelligent Timetable Optimization & Scheduling Assistant *Theme: Scheduling, Optimization*
5. Intelligent Disaster Preparedness Training Platform *Theme: Disaster Management, Training, Simulation*
6. AI-Powered Contextual Job Readiness Coach *Theme: Employability, Interview Preparation, Communication AI*
7. AI Heritage Explorer *Theme: Heritage Tech, Multimodal Reasoning, Retrieval Systems*
8. Product Experience & AI-Powered Pitch Enablement Platform *Theme: Pitch Training, Product Visualization, Pitch Analysis*

1. Intelligent Companion for Context-Aware Accessibility

The Challenge: For millions of people with partial vision, hearing, or speech limitations, everyday environments like public spaces, offices, or museums can feel unpredictable and overwhelming. While assistive technologies exist, most are designed for narrow tasks – translating text, reading signs, or describing images – without understanding the context or adapting to real-world surroundings.

There's a growing opportunity to make daily interactions smoother, not by "solving" disabilities, but by enhancing situational awareness through multimodal AI.

What to Build:

Create an AI-powered accessibility companion that:
- Uses speech-to-text (STT) and translation LLMs to convert spoken conversations around the user into live on-screen text or sign language visuals, allowing people with hearing difficulties to either read or view what's being said in real time.
- Leverages text-to-speech (TTS) and image understanding to describe nearby objects, signage, and surroundings, helping people with partial vision or visibility challenges better understand their environment.
- Adapts tone, verbosity, and description level based on user preference (e.g., concise mode for commuting, detailed mode for exploring) across both on-screen text and TTS outputs.
- Includes a conversational response mode where users can type messages or use sign language input, which the AI then converts into natural speech using TTS – enabling people who can't speak to communicate effortlessly with others without requiring them to know sign language.

Demo Requirements:

A mobile or web prototype that demonstrates real-time accessibility assistance across multiple modes – text, speech, translation, and visual cues.
- Live simulation of conversations where spoken words are instantly transcribed into on-screen text or sign language visuals, supporting users with hearing difficulties.
- Scene and object narration demo showing how the system uses image understanding and TTS to describe nearby surroundings for users with limited visibility, adapting the level of detail based on context.
- Conversational response demo where users can type or use sign language input, and the AI converts it into natural-sounding speech via TTS, allowing effortless two-way communication with others.
- Simulate a few scenarios (e.g., navigating a café, museum, or public event) to demonstrate the capabilities of the system to assist users with different accessibility needs.
- Adaptive context summaries (e.g., "This area is crowded," "Your bus is approaching," "Quiet mode activated") that automatically adjust verbosity, tone, and delivery format (speech, text, or sign language) based on environment and user settings.

2. Gamified Digital Financial Literacy for Drivers

Challenge: Drivers in underserved areas lack foundational financial literacy and confidence in using digital financial tools like UPI, mobile wallets, and online banking. Many have limited formal education, low digital fluency, and rely on cash-based systems. This results in poor money management, vulnerability to scams, and exclusion from financial opportunities. Existing literacy programs are either too text-heavy or lack engagement mechanisms.

What to build:

Create a gamified financial literacy platform (preferably mobile app) tailored for drivers that:

- Offers bite-sized lessons using voice and visuals to teach basic financial concepts (e.g., budgeting, savings, UPI use, fraud awareness)
- Features interactive quizzes and real-world scenarios (e.g., "What do you do if a customer sends less money via UPI?")
- Provides daily income/expense tracking and budgeting tools with simple icons and charts, not requiring reading/writing skills
- Includes voice input/output support for low-literacy users
- Implements a reward system (points, badges, streaks) to build engagement and reinforce habit formation
- Delivers security tips and alerts to build trust in digital tools (eg. "Never share your UPI PIN with anyone.")

Demo Requirements:

A prototype simulating a driver's learning and engagement journey, including:

- Completing a learning module
- Passing a quiz
- Logging income and expenses
- Earning a badge or reward
- Metrics dashboard showing user progress, financial knowledge gain, and daily usage streaks

3. Smart Alumni Engagement & Networking Platform

Challenge: Most educational institutions lack a dynamic, data-driven system to manage alumni networks effectively. After graduation, alumni data (contact details, career updates, interests) often become outdated or fragmented across multiple platforms or are lost entirely, while communication typically happens through informal WhatsApp groups or outdated mailing lists, making long-term engagement inefficient.

This absence of a structured alumni management system limits the potential of alumni relationships. Institutions miss opportunities to involve alumni in events, mentoring, internships, and fundraising. In an increasingly digital world, this creates a significant gap in institutional growth, networking, and community development.

What to Build:

Create a smart alumni management platform that:

- Centralizes alumni data with secure storage and real-time updates
- Enables seamless communication and networking between alumni, students, and faculty
- Integrates event management, mentorship matching, and internship opportunities
- Tracks career progress and facilitates collaboration or fundraising initiatives
- Provides analytics and dashboards for institutional administrators to monitor engagement
- Offers an intuitive, mobile-friendly interface for both admins and alumni
- Automates alumni data enrichment using AI – e.g., syncing or scraping professional updates (via LinkedIn APIs, public profiles, or from resumes)
- Recommends personalized connections and mentorships (e.g., "Find alumni working in data science in Germany")
- Generating smart communication content – automated email/newsletter drafting using LLMs based on recent alumni or institutional updates

Demo Requirements:

A prototype (web or mobile) demonstrating:

- Alumni registration and profile management
- Event creation and participation tracking
- Admin dashboard showing alumni engagement metrics and activity analytics
- AI-driven alumni profile enrichment (e.g., auto-updating job titles or skills)
- Smart mentorship or networking recommendations based on interests or industries
- AI drafting event invites, newsletters, or thank-you notes

4. Intelligent Timetable Optimization & Scheduling Assistant

The Challenge: Educational institutions increasingly struggle with dynamic class scheduling due to limited infrastructure, overlapping departmental requirements, faculty constraints, and multidisciplinary course offerings.

Traditional manual or spreadsheet-based timetable generation fails to handle real-time variables like faculty availability, room occupancy, teaching load norms, elective overlaps, and student preferences. The result is timetable clashes, underutilized classrooms, uneven workloads, and frustration for students and staff alike.

What to Build:

Develop a scheduling platform that autonomously generates and optimizes academic timetables across multiple departments, programs, and shifts. The system should consider the following parameters as variables for creating optimized timetables:

- Number of classrooms available
- Number of batches of students
- Number of subjects to be taught in a particular semester
- Names of subjects
- Number of classes to be conducted for a subject per week/per day
- Number of faculties available for different subjects

(Students may also consider additional variables that may help in effective timetable preparation.)

Demo Requirements:

A functional web-based prototype that demonstrates:

- Authorized login and role-based access (admin, department head, faculty)
- Data entry module for faculty, rooms, subjects, and student batches
- Real-time generation of multiple optimized timetable options
- Clash detection and intelligent rearrangement suggestions by AI
- Visualization dashboard showing room utilization, faculty load balance, and scheduling efficiency
- Factor in dynamic inputs – real-time faculty availability, leaves, course prerequisites, room capacities, and elective combinations
- Display workload imbalances or potential scheduling conflicts before finalization
- Offer adaptive rescheduling in response to sudden changes (faculty leave, room unavailability, event scheduling)

5. Intelligent Disaster Preparedness Training Platform

The Challenge: Across India, most schools and colleges remain underprepared for natural disasters such as earthquakes, floods, and fires. While emergency guidelines often exist on paper, they rarely translate into consistent, practical readiness. Institutions lack structured digital tools or integrated curricula for disaster management training, leading to uncoordinated drills and low situational awareness.

Moreover, preparedness education is not localized – students and staff are often unaware of disaster risks specific to their geography (e.g., floods in Assam, earthquakes in Uttarakhand, cyclones in Odisha). Manual drills, when conducted, are infrequent and ineffective, failing to build true behavioral preparedness or quick decision-making skills.

What to Build:

Develop an AI-powered disaster preparedness and training platform that:

- Delivers interactive learning modules on disaster awareness, first aid, and emergency response tailored to local hazards (earthquake, flood, fire, etc.)
- Incorporates real-time regional intelligence – integrating open disaster data (IMD, NDMA, weather APIs) to generate alerts and preparedness tasks
- Employs gamification and adaptive learning – incorporating reward systems, badges, leaderboards, and AI-adjusted difficulty based on user performance
- Includes a real-time emergency response mode – one-tap distress signals, communication with safety teams, and geolocation-based alerts
- Provides admin dashboards for educational institutes to track preparedness scores, drill participation rates
- Supports multilingual and accessibility-friendly content for inclusive disaster education
- Includes scenario-based disaster simulations for preparedness, guided by AI- allowing students to interact dynamically with an AI that walks them through real-time decision-making and safety protocols

Demo Requirements:

A prototype (web or mobile) that demonstrates:

- Personalized disaster learning module for a specific region (e.g., "Flood Preparedness for Assam")
- Interactive or gamified quiz with adaptive feedback
- Scenario-based disaster simulation where an LLM guides users through decisions and responses during virtual emergencies
- Real-time alert and communication feature (mock data acceptable)
- Administrator dashboard showing user progress, risk scores, and participation metrics

6. AI-Powered Contextual Job Readiness Coach

The Challenge: Millions of young job seekers, especially in tier-2 and tier-3 cities, struggle to prepare effectively for job interviews and professional communication. Existing career platforms focus on generic resume templates or aptitude tests, but fail to adapt to each learner's background, skill level, and target industry.

There's a huge gap between learning and employability – candidates often don't know how to present their experience, speak confidently, or tailor their communication to a recruiter's expectations. A personalized, context-aware job readiness coach could bridge this gap using LLMs, speech analysis, and adaptive feedback loops.

What to Build:

Create an AI-driven employability coach that helps users prepare for interviews, professional writing, and communication through multimodal interaction. The system should:

- Analyze resumes using LLMs to detect missing skills for the specified Job role, vague statements, or inconsistent formatting.
- Simulate interviews using speech-to-text and text generation – users respond verbally, the system transcribes their answers and feeds it to a model that will evaluate the clarity, coherence, choice of words and phrasing to provide constructive feedback.
- Provide instant feedback – highlighting filler words, grammatical errors, and overused phrases, while suggesting improved answers tailored to role, industry, or company culture.
- Offer personalized learning paths (e.g., "Improve data storytelling" or "Practice STAR method for behavioral questions") based on recurring weaknesses.
- Include writing assistance for crafting professional emails, cover letters, or short self-introductions, automatically adapting tone and formality.

Demo Requirements:

A functional prototype (web or mobile) demonstrating the end-to-end user journey:

- Profile Upload & Skill Analysis – upload a sample resume and show automated analysis of gaps and recommendations for specified Job role.
- Mock Interview Simulation – user speaks answers; system transcribes, scores, and provides feedback.
- Writing Assistance Demo – user types or dictates a short self-introduction or email; the AI rewrites it with an improved tone and structure, and highlights specific areas for improvement such as word choice, clarity, or sentence flow.
- Feedback Dashboard – displays key communication metrics such as clarity, coherence, vocabulary diversity, filler word frequency, and phrasing quality, providing a structured overview of the user's performance and progress.
- Adaptive Learning Suggestions – generates a customized set of next-step tasks (e.g., "Practice data storytelling," "Work on conciseness").

7. AI Heritage Explorer

The Challenge: India is home to one of the world's richest and most diverse collections of monuments, temples, forts, and artifacts – yet a vast number of them remain poorly documented or misunderstood. Tourists, students, and local travelers often visit these sites without truly uncovering their historical significance, cultural stories, or architectural lineage.

While existing image recognition apps can identify well-known landmarks, they fall short of contextual understanding – they cannot explain why a structure was built, how it evolved across dynasties, or what makes its design unique within India's heritage landscape.

Moreover, information about many lesser-known or regionally significant sites is scattered across multiple online sources, often unstructured or inconsistent, making it difficult for travelers or researchers to discover and connect accurate historical context during exploration.

What to Build:

Create an AI-powered heritage reasoning explorer that:

- Accepts an image of a monument, artifact, or historical object and extracts visual cues to formulate multiple search hypotheses (e.g., "ancient temple with stone pillars and elephant carvings," "Dravidian gopuram structure," "Mughal-era dome") and queries online databases or open sources (Wikipedia, Google Image Search, museum APIs, heritage datasets) to collect more data on it.
- Aggregates snippets, descriptions, or related context from the web, to generate plausible explanations for what the image might depict and construct mini-narratives or "stories" of each interpretation, for example:
  ***"If this structure belongs to the Pallava period, it may depict scenes from Shaivite mythology,"
  vs. "If Mughal-era, it could represent royal ceremonial art."***
- Implements a multi-agent reasoning framework that:
  - Agent 1: "Architectural Historian" – focuses on structure, materials, and stylistic elements.
  - Agent 2: "Cultural Context Analyst" – reasons about iconography, inscriptions, rituals, or mythology.
  - Agent 3: "Data Verifier" – checks the credibility and consistency of online evidence and retrieved sources.

  Each agent generates its own interpretation; a Judge Model evaluates and reconciles these into ranked hypotheses and presents the top hypotheses with confidence scores and concise summaries or interpretive stories for each possible identification.

- Incorporates location data (GPS coordinates, nearby landmarks, or user-entered region hints) to narrow down possibilities – estimating where and when the structure could have originated and correlating it with nearby heritage sites or known dynastic zones.
- Supports multimodal interaction through image + text chat, allowing users to ask follow-up questions such as "Could this be related to South Indian temple art?"

  The system can then refine its reasoning dynamically – by prompting the user to upload more images of surrounding areas or specific features, or by accepting manual text input (e.g., inscriptions, location hints) – thereby improving confidence and accuracy in identifying the site or artifact.

Demo Requirements:

A functional prototype (web or mobile) demonstrating the end-to-end user journey:

- Image Upload & Visual Analysis – user uploads a monument or artifact image; the system detects visual cues (structure, patterns, symbols, materials) and formulates multiple search hypotheses.
- Automated Web Retrieval & Context Aggregation – the system performs online searches (Wikipedia, museum APIs, heritage datasets) based on hypotheses, collects snippets, and extracts contextual data.
- Multi-Agent Reasoning Simulation – generates 3 independent outputs from three reasoning agents – Architectural Historian, Cultural Context Analyst, and Data Verifier – followed by the Judge Model reconciling them into ranked hypotheses with confidence scores.
- Location-Aware Reasoning – integrates GPS coordinates or user-entered region hints to refine hypotheses and identify possible heritage zones or related monuments.
- Narrative Generation & Explanation Display – presents concise interpretive stories for each hypothesis (e.g., "If this is Pallava period…"), along with supporting evidence and confidence scores for different possible identifications of the monument or artifact.
- Interactive Chat Refinement – allows the user to ask follow-up questions or upload additional images; the system dynamically re-evaluates evidence, updates confidence scores, and enhances narrative accuracy.

8. Product Experience & AI-Powered Pitch Enablement Platform

The Challenge: Even the most brilliant product can fall flat if the story behind it isn't told right. Entrepreneurs and innovators often struggle to articulate their vision; to express not just what their product does, but why it matters. Whether it's a Shark Tank pitch, an investor meeting, or a product showcase, founders face three common hurdles:

- Translating complex features into compelling value stories.
- Communicating confidence, clarity, and conviction.
- Ensuring consistency in how their product is presented across the team.

The result? Great ideas fail to make impact; not because they lack potential, but because their pitch wasn't good enough.

What to build:

An interactive platform that empowers entrepreneurs to pitch their ideas.

- **Interactive Product Visualizations**
  - Users can upload or explore 2D or 3D renderings of the product.
  - Each product model will have to include clickable "hotspots" or components (e.g., camera module, battery, material design).
  - Once a user clicks a part of the product they can start explaining that specific feature in their own words.
- **AI-Powered Pitch Simulation & Feedback**
  - When a user explains a clicked feature, the AI:
  - Listens, transcribes, and analyzes the user's speech.
  - Evaluates clarity, confidence, persuasion, storytelling, and technical accuracy.
  - Scores the user per feature, based on how well they communicated that part's value.
  - Suggests improvements for tone, structure, and emotional delivery.
  - A composite pitch score is generated after all parts are covered, showing overall strengths and gaps.
  - An "Investor Mode" that simulates high-pressure, real-world scenarios where the AI acts as a potential investor & asks challenging, targeted questions about the specific product part being presented.

- **Admin Dashboard & Configuration**
  - Admins can upload new product visuals (2D/3D models).
  - Each product to have configurable clickable regions, defined through an editor:
  - Assign feature names, descriptions, and ideal talking points to each region.
  - Set evaluation criteria (e.g., focus on technical accuracy for engineering components, or emotional appeal for design).

Demo Requirements:

A functional prototype (web or mobile) demonstrating the end-to-end user journey:

- Entrepreneur logs in and opens their product showcase.
- The 2D/3D product visualization loads with interactive hotspots.
- User clicks on a feature (e.g., "Battery Module") to review its background.
- They hit the "Pitch This" Feature and start speaking.
- The AI analyzes and provides post-pitch evaluation.
- After completing all components, they receive an overall pitch performance report with insights and improvement.
- User enters "Investor Mode" to let users simulate tougher, high-pressure questions about that specific part.
- Admins can edit the product hotspots, upload new products, or fine-tune AI scoring criteria for each product.