



*Igniting Minds, Disrupting Limits, Accelerating the Future*

## 1. HEALTH TECH

*Agentic AI for Preventive, Accessible & Sustainable Healthcare*

### Problem

Healthcare systems in developing countries face persistent and systemic challenges that limit timely, affordable, and effective care. Issues such as **late disease diagnosis**, lack of preventive healthcare awareness, widespread **nutritional deficiencies**, and **uneven access to medical services in rural and underserved areas** continue to impact population health outcomes. At the same time, healthcare professionals are overburdened with high patient volumes, limited time, and fragmented patient information, reducing their ability to deliver proactive and preventive care.

There is a strong need for an **intelligent, ethical, and accessible health support system** that empowers citizens with early guidance while supporting healthcare workers through meaningful, summarized insights.

### Challenge

Participants are challenged to build a **Multi-Agent AI Health System** that collaboratively delivers **preventive, explainable, and user-friendly healthcare guidance**.

The system should demonstrate how **specialized AI agents work together** to analyze health-related inputs, assess risks, and generate clear recommendations—while maintaining strict ethical, safety, and privacy standards.

**The solution should demonstrate the ability to:**

- 1 Analyze Symptoms & Health Indicators**
- 2 Identify Health & Nutrition Risks**
- 3 Provide Preventive Guidance in Simple Language**
- 4 Assist Healthcare Workers with Summarized Insights**

### Deliverables

- Working demo (symptom → analysis → recommendation)
- Clear agent interaction flow
- Explainable health insights

### Public Datasets & Important Links

- WHO Global Health Data  
<https://www.who.int/data>
- Pakistan Bureau of Statistics – Health  
<https://pslm-sdgs.data.gov.pk/health/index>
- NIH Open Clinical Data  
<https://www.ncbi.nlm.nih.gov/gap>



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- Open Food Facts (Nutrition Data)  
<https://world.openfoodfacts.org/data>

## 2. EDU TECH CHALLENGE

### Personalized Learning through Agentic AI

#### PROBLEM STATEMENT

Many students struggle due to **limited teacher availability**, overcrowded classrooms, and a lack of individualized attention. Traditional teaching methods often fail to address diverse learning speeds, prior knowledge gaps, and varying cognitive abilities.

Additionally, **language barriers** further complicate learning, as students may be taught in a language that is not their primary medium of understanding. Teachers, already overburdened, lack tools to continuously assess student progress and adapt instruction accordingly. There is a critical need for **intelligent, scalable, and accessible learning support systems** that can personalize education while remaining aligned with national curricula and local learning contexts.

#### CHALLENGE DESCRIPTION

Participants are challenged to develop a **Student Learning Companion powered by Agentic AI**—a multi-agent system in which specialized AI agents collaborate to deliver **personalized, adaptive, and safe learning experiences**. The system should simulate how multiple AI agents work together to support the full learning cycle, from assessment to content delivery and feedback, while respecting curriculum boundaries and student safety.

The solution should demonstrate the ability to:

- 1 Assess Student Understanding
- 2 Curate Curriculum-Aligned Content
- 3 Explain Concepts in Local Languages
- 4 Adapt Learning Paths Dynamically
- 5 Ensure Safe and Policy-Compliant Learning

#### DELIVERABLE EXPECTATIONS

Teams must submit:

- A **functional demo** showcasing student interaction and learning adaptation
- **Agent collaboration trace or logs** demonstrating how agents coordinate tasks
- An **offline-ready learning pack** (1-day content) usable without internet access
- An **adaptive feedback mechanism** that provides clear, constructive learning guidance

#### Public Datasets & Important Links

- Punjab Curriculum Textbook Board (E-Books)  
<https://pctb.punjab.gov.pk/E-Books>
- National Curriculum Pakistan  
<https://dcar.gos.pk/National%20Curriculum.html>
- Sindh Curriculum  
<https://dcar.gos.pk/Sindh%20Curriculum.html>
- Khan Academy Open Learning Content  
<https://www.khanacademy.org/about>



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### 3. AGRI TECH CHALLENGE

#### Collaborative Farm Intelligence using Agent Swarms

##### PROBLEM STATEMENT

Agriculture remains the backbone of many developing economies, yet farmers continue to face persistent and interconnected challenges. **Unpredictable weather patterns**, increasing climate variability, pest outbreaks, and water scarcity significantly impact crop yield and farm profitability. At the same time, farmers often lack timely access to **reliable advisory services** related to crop planning, irrigation, fertilization, and disease management. Inefficient use of resources such as water, fertilizer, and labor further increases costs, while **volatile market prices** make it difficult for farmers to decide when and where to sell their produce. There is a strong need for an **intelligent, decentralized, and affordable decision-support system** that can assist farmers in making informed, data-driven decisions throughout the farming lifecycle.

##### CHALLENGE DESCRIPTION

Participants are challenged to build a **Collaborative Agricultural Intelligence System powered by Agentic AI**, where multiple autonomous agents work together as a **swarm** to support farm-level decision-making. The system should demonstrate how specialized AI agents can independently analyze different data streams and collaboratively generate **actionable recommendations** for farmers, even in environments with limited connectivity.

The solution should showcase the ability to:

- 1 Analyze Environmental Conditions & Provide Crop & Irrigation Advisory**
- 3 Predict Agricultural Risks**
- 4 Track Markets & Selling Opportunities**
- 5 Operate in Low-Connectivity Environments**

##### DELIVERABLE EXPECTATIONS

- **Agent-to-agent collaboration demo** showing how agents exchange data and negotiate recommendations
- **Clear explanation of decisions**, including why specific advice was given
- **Offline advisory capability**, usable in rural or low-bandwidth settings
- **Market or yield recommendation output**, such as selling time suggestions

##### PUBLIC DATASETS & IMPORTANT LINKS

Participants are encouraged to use the following **authentic, publicly available datasets**:

- **FAO FAOSTAT (Global Agriculture & Food Data)**  
<https://www.fao.org/faostat>
- **Pakistan Bureau of Statistics – Agriculture**  
<https://www.pbs.gov.pk/agriculture-sector-of-pakistan-importance-role-key-statistics/>
- **OpenWeather API (Weather Forecast & Climate Data)**  
<https://openweathermap.org>
- **World Bank Climate Knowledge Portal**  
<https://climateknowledgeportal.worldbank.org>

## 4. FIN TECH CHALLENGE

### Inclusive Financial Intelligence through Agentic AI

#### PROBLEM STATEMENT

Despite the rapid growth of digital finance, a significant portion of the population remains **unbanked or financially underserved**, particularly in developing economies. Barriers such as **low financial literacy**, lack of trust in formal financial institutions, complex documentation requirements, and limited access to banking infrastructure prevent individuals and small businesses from fully participating in the financial system. Many financial products such as savings accounts, loans, insurance, and digital payment services are difficult for users to understand due to technical language, unclear eligibility criteria, and hidden risks. There is a growing need for an **intelligent, transparent, and accessible financial guidance system** that empowers users to make informed financial decisions while promoting inclusion, trust, and responsible financial behavior.

#### CHALLENGE DESCRIPTION

Participants are challenged to create an **Agentic FinTech Assistant**—a multi-agent AI system where specialized agents collaborate to deliver **simple, transparent, and inclusive financial intelligence** to users. The system should demonstrate how multiple AI agents can work together to interpret financial information, evaluate user profiles, and provide personalized, explainable recommendations while operating effectively in low-resource environments.

The solution should demonstrate the ability to:

- 1 Explain Financial Products Simply
- 2 Assess Eligibility for Financial Services
- 3 Support Budgeting & Financial Planning
- 4 Identify Financial Risks & Fraud Patterns
- 5 Encourage Financial Inclusion

#### DELIVERABLE EXPECTATIONS

Teams must submit:

- A **working demo** showing user queries leading to financial guidance
- **Transparent eligibility logic**, clearly explaining decisions
- A **budgeting or savings recommendation module**
- A **degraded mode** that operates under low connectivity or offline conditions

#### PUBLIC DATASETS & IMPORTANT LINKS

Participants are encouraged to use the following **authentic, publicly available datasets**:

- **World Bank Global Findex Database (Financial Inclusion Data)**

<https://globalfindex.worldbank.org>

- **State Bank of Pakistan – Publications & Financial Reports**

<https://www.sbp.org.pk/publications/Pub-Ann.htm>

**International Monetary Fund (IMF) Financial Data**

<https://www.imf.org/en/Data>

- **Open Banking Sandbox (Sample APIs & Use Cases)**

<https://developer.mastercard.com/open-banking>



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## 5. GAMING CHALLENGE

### Agentic AI for Ethical, Adaptive & Intelligent Games

**Organizer:** Innovation District 92 (ID92)

#### PROBLEM STATEMENT

The gaming industry continues to grow rapidly, yet many games still rely on **static mechanics and one-size-fits-all experiences**. Players often encounter repetitive gameplay, poorly balanced difficulty levels, and limited personalization, which reduces engagement and long-term retention. Additionally, the absence of robust **ethical safeguards** can expose players—especially younger audiences—to unsuitable content, addictive patterns, or toxic interactions.

Most traditional game AI systems are rule-based and lack the ability to adapt intelligently to player behavior, skill progression, or emotional responses. There is a growing demand for **smarter, more responsible game design** that enhances engagement while ensuring ethical, safe, and inclusive gameplay experiences.

#### CHALLENGE DESCRIPTION

Participants are challenged to design an **Agentic AI Gaming System**, a multi-agent framework where specialized AI agents collaboratively manage gameplay dynamics, player interaction, and ethical oversight.

The system should demonstrate how autonomous agents can continuously observe player behavior, adapt game mechanics in real time, and maintain safe and enjoyable gameplay across diverse player profiles.

The solution should demonstrate the ability to:

- 1 Dynamically Adjust Game Difficulty**
- 2 Respond Intelligently to Player Behavior**
- 3 Encourage Ethical & Safe Gameplay**
- 4 Enhance Engagement through Agent Collaboration**

#### DELIVERABLE EXPECTATIONS

Teams must submit:

- **A playable demo** showcasing agent-driven gameplay
- **Agent-based decision logic**, explaining how gameplay adapts
- **Difficulty adaptation mechanisms** with clear reasoning
- **An offline playable mode**, ensuring usability without internet access



#### PUBLIC DATASETS & IMPORTANT LINKS

- **OpenGameArt (Open Assets)**  
<https://opengameart.org>
- **OpenAI Gym (Reinforcement Learning Environments)**  
<https://www.gymnasium.dev>
- **Unity ML-Agents Toolkit**  
<https://github.com/Unity-Technologies/ml-agents>
- **Kaggle – Game & Player Behavior Datasets**  
<https://www.kaggle.com/datasets>



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## 6. TOURISM CHALLENGE

### Smart Tourism & Cultural Intelligence via Agentic AI

#### PROBLEM STATEMENT

Tourism holds immense economic and cultural potential, yet in many regions it remains **underutilized due to poor planning tools, fragmented information, and lack of localized guidance**. Travelers often struggle to plan meaningful trips due to limited access to reliable itineraries, cultural context, safety information, and logistical support.

Additionally, many tourism platforms fail to promote **responsible and sustainable tourism**, overlooking local communities, heritage preservation, and traveler safety. In areas with limited internet access, tourists face further challenges navigating destinations without real-time digital support.

There is a strong need for an **intelligent, context-aware tourism assistant** that can enhance traveler experiences while promoting local culture, safety, and sustainability.

#### CHALLENGE DESCRIPTION

Participants are challenged to build an **Agentic Tourism Assistant**—a multi-agent AI system where specialized agents collaborate to plan, explain, and guide travel experiences in a personalized and responsible manner.

The system should demonstrate how agents can combine geographical data, cultural knowledge, and user preferences to deliver **transparent, explainable, and offline-capable travel assistance**.

The solution should demonstrate the ability to:

- 1 Plan Personalized Travel Itineraries
- 2 Provide Cultural & Historical Context
- 3 Advise on Safety & Logistics
- 4 Support Offline & Low-Connectivity Use
- 5 Promote Responsible Local Tourism

#### DELIVERABLE EXPECTATIONS

Teams must submit:

- An end-to-end trip planning demo
- Explainable itinerary recommendations, showing how decisions were made
- An offline travel guide usable without internet access
- A multi-agent decision trace, demonstrating collaboration between agents

#### PUBLIC DATASETS & IMPORTANT LINKS

- Pakistan Tourism Development Corporation (PTDC)  
<https://tourism.gov.pk>
- UNESCO World Heritage List  
<https://whc.unesco.org/en/list>
- OpenStreetMap (Geospatial Data)  
<https://www.openstreetmap.org>
- UN World Tourism Organization (UNWTO) Statistics  
<https://www.unwto.org/statistics>



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## MANDATORY REQUIREMENT: DEGRADED MODE (ALL CATEGORIES)

All solutions submitted to **IDEAX92** must include a **Degraded Mode**—a simplified yet functional version of the system that ensures continued operation when technical resources are constrained. This requirement reflects real-world conditions in developing and low-resource environments and is a **non-negotiable evaluation criterion**.

### ◆ Purpose of Degraded Mode

The degraded mode ensures that AI systems:

- Remain usable during **poor or intermittent internet connectivity**
- Operate under **limited compute, memory, or power constraints**
- Deliver core value without reliance on cloud services or expensive APIs
- Fail gracefully rather than becoming unusable

### Degraded Mode Requirements

Each solution must clearly demonstrate the following capabilities:

#### 1 Offline or Low-Bandwidth Operation

The system should continue to function when:

- Internet connectivity is unavailable, slow, or unstable
- Cloud-based services cannot be accessed

This may include:

- Offline user interaction flows
- Reduced but meaningful feature sets
- Periodic synchronization when connectivity is restored

#### 2 Cached or Preloaded Data Usage

Solutions must utilize:

- Preloaded datasets (e.g., curriculum content, maps, advisories, rules)
- Cached responses or knowledge bases
- Locally stored models or rule sets

This ensures the system can still deliver **relevant guidance and recommendations** without real-time data access.

#### 3 Lightweight Inference or Rule-Based Fallback

When advanced AI models or APIs are unavailable, the system should:

- Switch to lightweight models
- Use heuristic or rule-based decision logic
- Provide simplified but accurate outputs

The fallback mode should preserve **correctness and safety**, even if sophistication is reduced.



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