

Project Proposal: “Ilm Hotspot” — The Offline Knowledge Server

1. Project Overview

Project Title: Ilm Hotspot — Empowering Education Through Offline Knowledge Access

Domain: Education & Health (EdTech + Community Development)

Target Audience: Under-resourced schools, community centers, and rural educational institutes in Pakistan and similar developing regions.

2. Problem Statement

In many rural and low-income areas, schools face a **triple deficiency**:

1. **No Internet Access:** Teachers and students cannot perform research or access online learning platforms.
2. **No Library Resources:** Schools lack physical books, references, or updated educational content.
3. **Limited Teaching Aids:** Teachers struggle to find updated or interactive materials to make learning effective.

As a result, both **teaching quality and student learning outcomes** suffer severely. Students are cut off from the digital world of knowledge, and teachers rely on outdated or limited resources.

3. Proposed Solution: “Ilm Hotspot”

Ilm Hotspot is a **community-driven offline knowledge server** — a self-contained, Wi-Fi-enabled digital library that provides **educational and health resources** without requiring an internet connection.

Using a **low-cost computer** (e.g., Raspberry Pi or any old laptop), this system transforms into a **local Wi-Fi hotspot** hosting massive educational content. Students and teachers can connect using any smartphone, tablet, or laptop and access rich learning materials through a simple, browser-based interface.

4. Key Features

1. **Offline Digital Library**
 - Preloaded with **Wikipedia (via Kiwix)**
 - **Khan Academy Lite (Urdu and English)** video lectures
 - **Khyber Pakhtunkhwa (KP) Textbook PDFs** (Primary to Secondary level)
 - **Health & First Aid Guides** in Urdu and Pashto
 - Optional: Science simulations, storybooks, and vocational skills content
2. **Local Wi-Fi Hotspot**
 - Works **without internet**
 - Connects up to **50 users simultaneously**
 - Simple captive portal — auto-redirects users to the local learning site
3. **Web-based Interface (Custom Built)**

- User-friendly design for teachers and students
- Categorized content by **Subjects, Grades, and Topics**
- Multi-language support (Urdu, English, Pashto)

4. Plug-and-Play Setup

- Portable, runs on power bank or solar panel
 - Auto-starts on boot; minimal maintenance
 - Can be replicated easily across schools and communities
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5. Technical Architecture

Component	Description
Hardware	Raspberry Pi 4 (or old laptop/PC) with microSD card / SSD
Software Stack	RACHEL, Kiwix, Kolibri (for Khan Academy), Apache/Nginx Web Server
Network Setup	Local Wi-Fi hotspot using hostapd; no internet
Frontend	HTML/CSS/JS interface for browsing resources
Content Sources	Wikipedia, Khan Academy, KP Textbooks, WHO Health Guides

6. Implementation Plan

Phase	Activities	Duration
Phase 1: Research & Content Collection	Gather KP textbooks, health materials, and download offline content (Wikipedia, Khan Academy Lite)	2 weeks
Phase 2: System Setup & Configuration	Install Kiwix, Kolibri, and local web server on Raspberry Pi; set up Wi-Fi network	2 weeks
Phase 3: UI/UX Development	Build a simple, bilingual web interface	2 weeks
Phase 4: Pilot Testing	Deploy in one school, gather feedback from teachers & students	3 weeks
Phase 5: Evaluation & Scaling	Optimize based on feedback, prepare for replication in other schools	2 weeks

7. Expected Impact

- **Educational Access:** Gives students access to thousands of books, videos, and articles.
 - **Teacher Empowerment:** Teachers get ready-to-use teaching resources and lesson aids.
 - **Cost Efficiency:** One device serves an entire school for the cost of a single textbook set.
 - **Health Awareness:** Provides essential health and first-aid guides in local languages.
 - **Sustainability:** Works without internet, can run on renewable energy, and is easy to maintain.
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8. Scalability and Future Scope

- Integration with **solar-powered setups** for off-grid schools.
- Addition of **AI tutor modules** for interactive Q&A (when internet available).
- Collaboration with **NGOs, Education Departments, and EdTech startups** for nationwide rollout.
- Expansion to other languages and provinces.

9. Budget Estimate

Item	Estimated Cost (PKR)
Raspberry Pi / Old Laptop	20,000
Storage (1TB HDD/SSD)	10,000
Power Supply + Casing	5,000
Local Router (optional)	5,000
Miscellaneous / Maintenance	5,000
Total (Per Unit)	≈ 45,000 PKR

Each unit can serve ~50 students simultaneously.

10. Sustainability Plan

- Local school staff can manage and maintain the device after a short training.
 - Periodic updates (every 6 months) can be done by connecting the device briefly to the internet.
 - Open-source software ensures **no licensing costs**.
 - Community involvement ensures long-term ownership and care.
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11. Conclusion

The **Ilm Hotspot** project bridges the digital divide by delivering the power of the internet — without needing the internet. It turns isolated schools into digital learning hubs, empowering teachers, students, and communities through accessible knowledge.

This initiative represents a **low-cost, high-impact, and scalable solution** for transforming education in resource-limited environments.