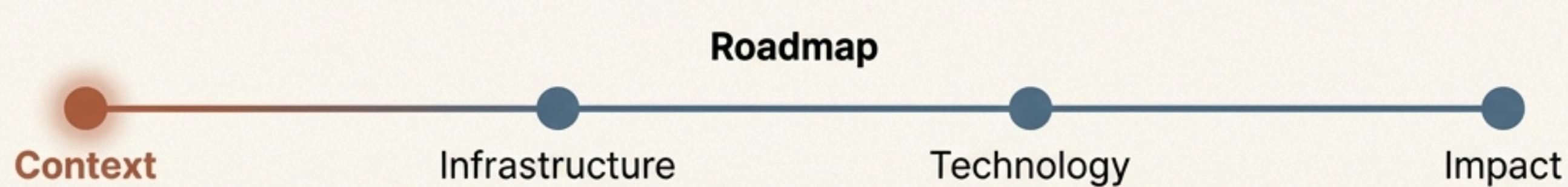
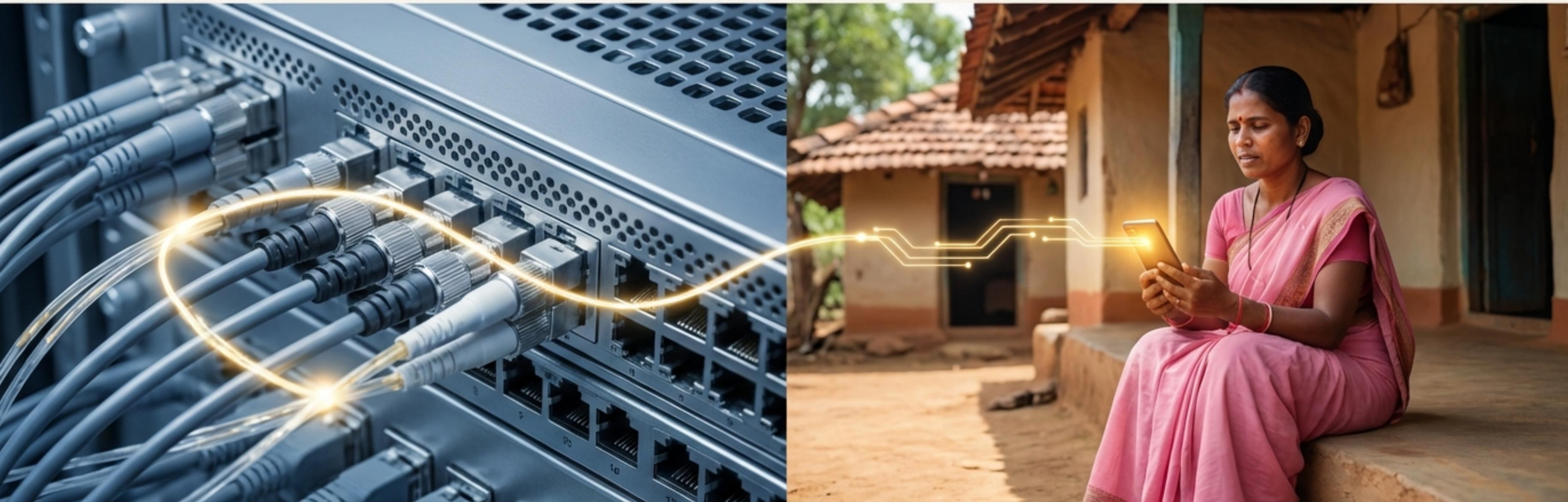


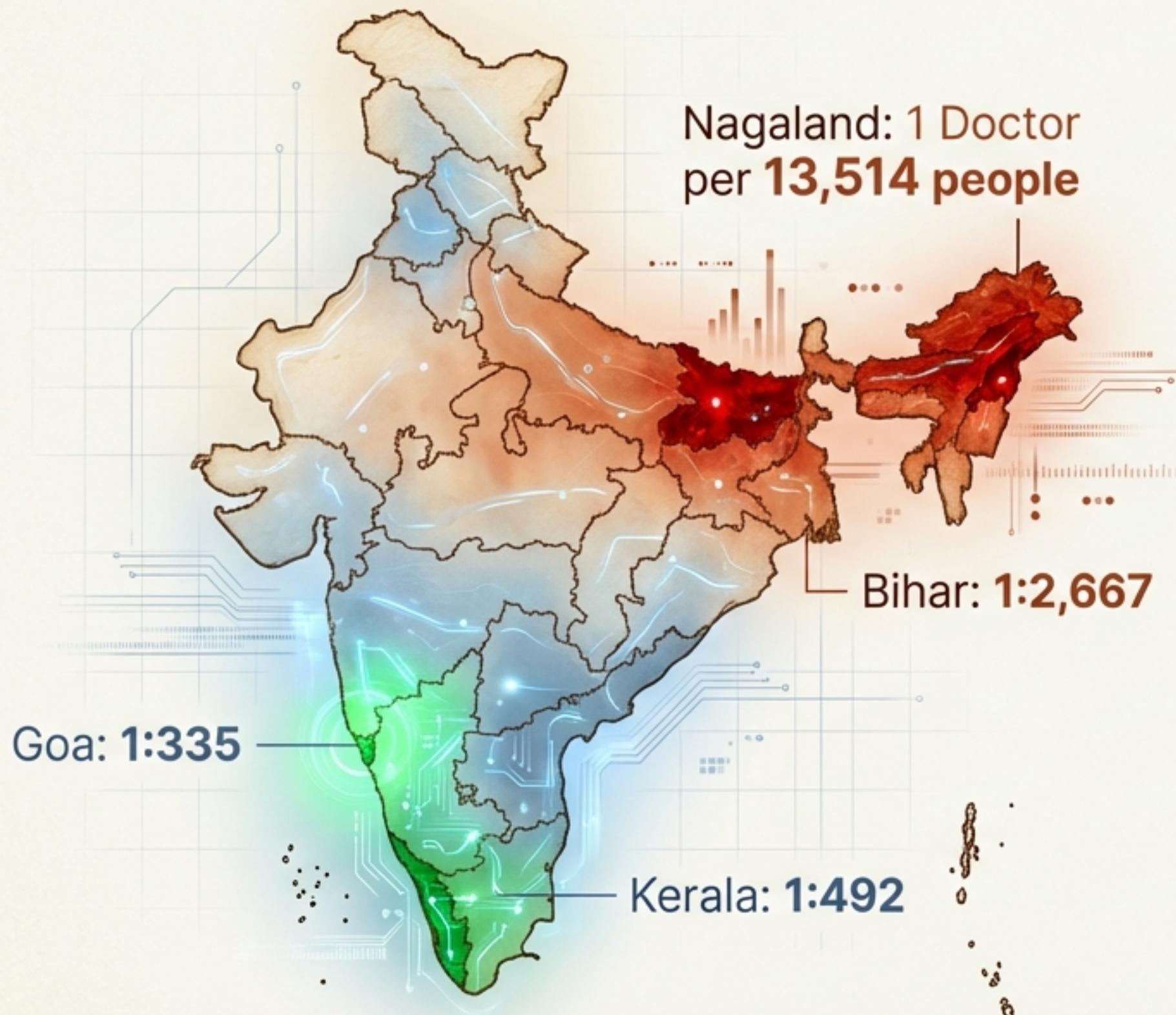
Bridging the Last Mile: Digital Infrastructure & AI in Indian Healthcare

Leveraging the Ayushman Bharat Digital Mission (ABDM), AWS Cloud, and LLMs to solve the rural access paradox.



The Doctor-Population Paradox

National averages mask catastrophic regional inequalities.



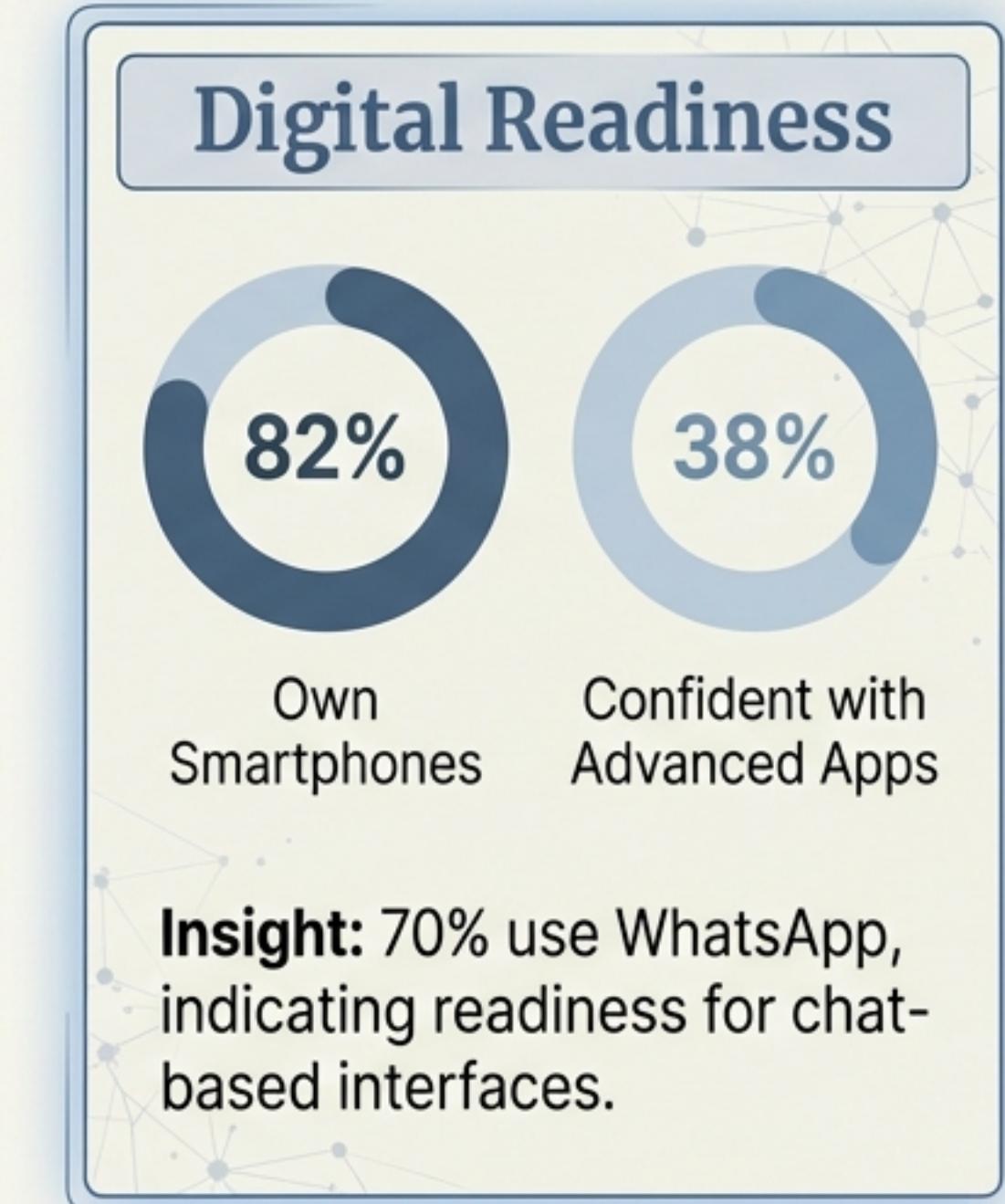
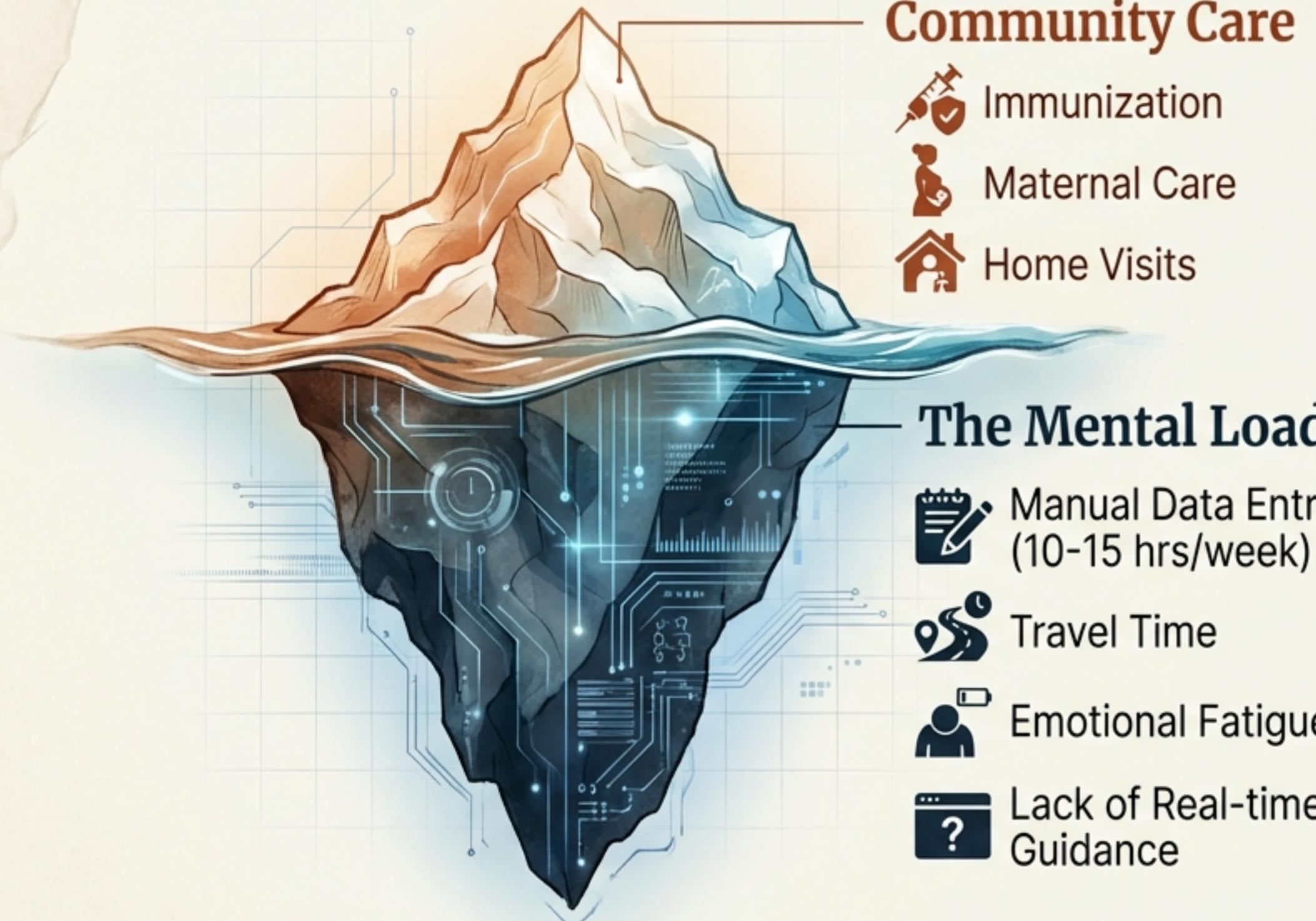
The National Mirage

- ✓ **Official Ratio: 1:811**
(Surpasses WHO 1:1000 norm)
- ⚠ **The Reality:** 80% of specialists missing from rural Community Health Centers.
- ⚠ **The Urban Vacuum:** 70% of doctors serve only 30% of the population (Urban areas).

Source: National Health Profile, Government of India & WHO Data.

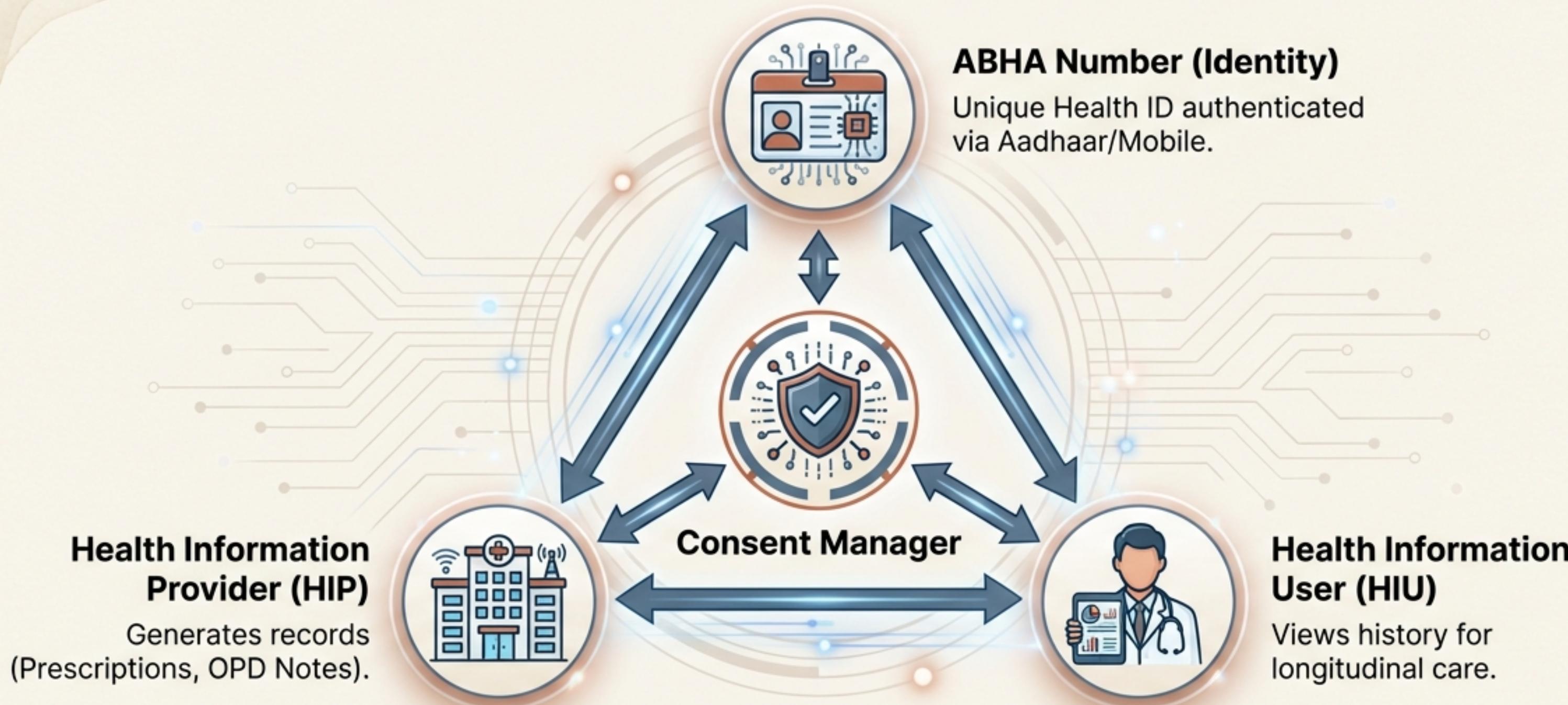
The Overburdened Frontline: ASHA Workers

1 million workers serving 900 million people face immense mental load.



The Digital Highway: Ayushman Bharat Digital Mission (ABDM)

The interoperable building blocks connecting the ecosystem.



'The digital infrastructure developed is now accessible to health facilities and health tech players for integration.' — ABDM Sandbox Documentation

The Integration Roadmap: Three Milestones to Interoperability

Milestone 1: Identity



Capture & Verification
of ABHA Number.

Milestone 2: The Provider (HIP)



Sharing digital records via
Consent Manager (Rx,
OPD Notes, Diagnostics).

Milestone 3: The Viewer (HIU)



Viewing patient history
with consent for better
decision making.

The Sandbox: From Prototype to Production

Rigorous compliance ensures safety before deployment.



Registration

API Credential Generation (3-4 Days).

Functional Testing

Validating ABHA creation and Data Share workflows.

Security Certification

'Safe-to-Host' certificate from CERT-IN agency.

Go-Live

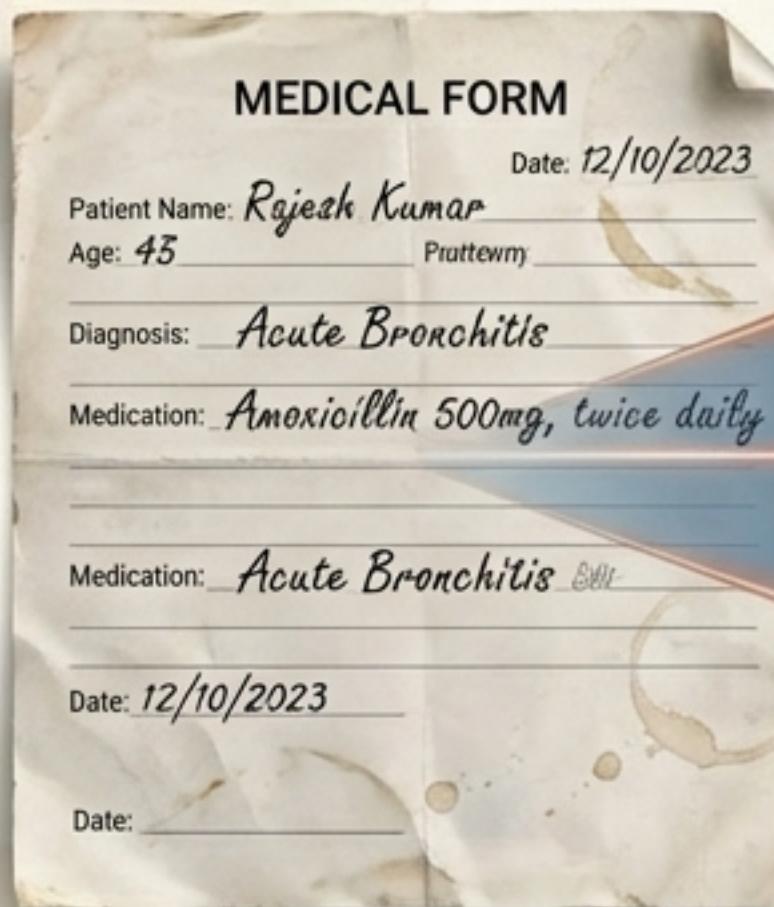
Production Access Approved.

i Note: Functional testing is conducted by NHA empaneled agencies like FIME or Tata Communications.

Digitizing the Analog: Amazon Textract

Converting legacy paper records into structured intelligence.

Unstructured Dark Data



Unstructured Dark Data

Structured Intelligence

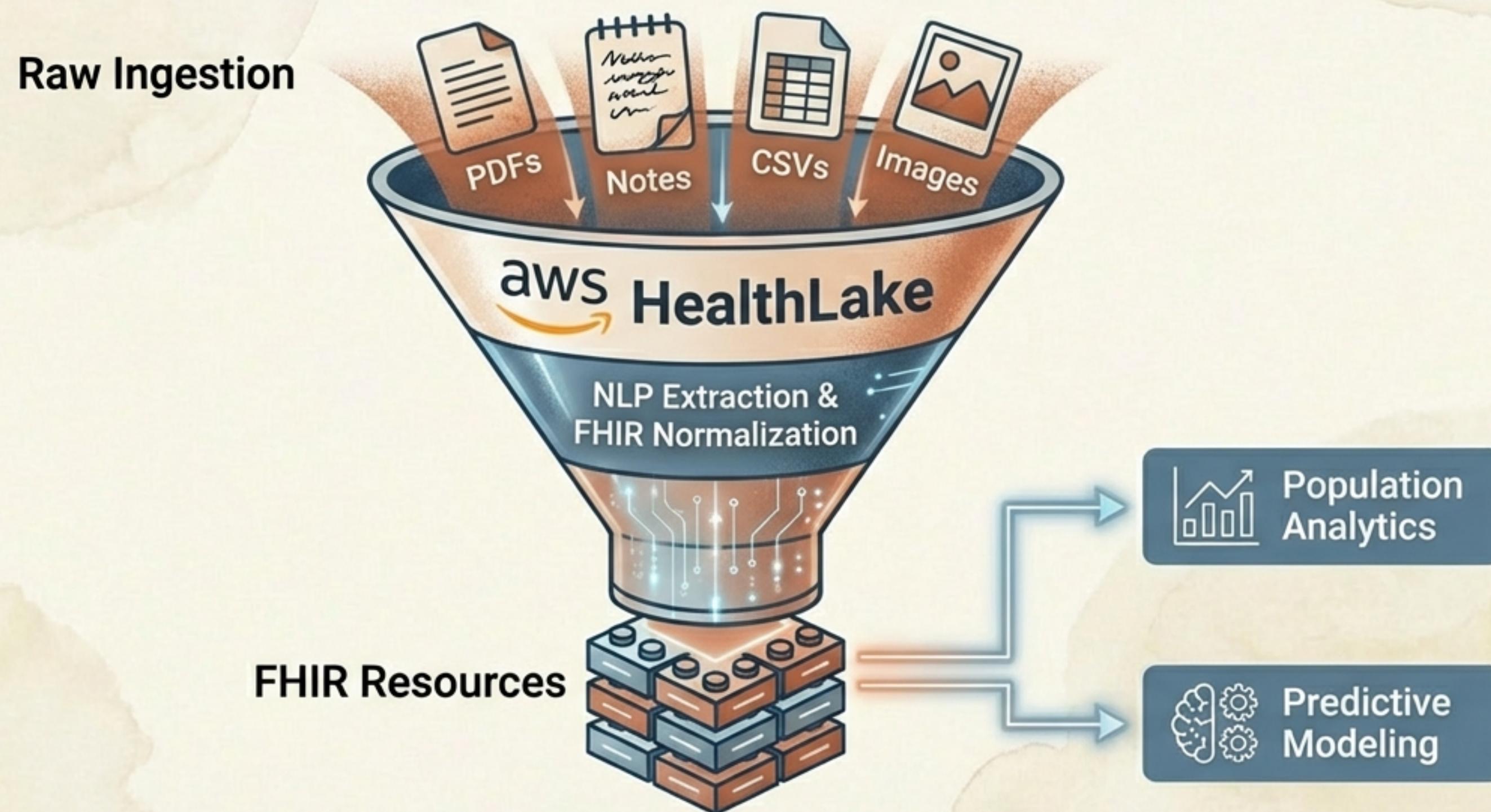
```
{  
  "Patient_Info": {  
    "Patient_Name": "Rajesh Kumar",  
    "Age": "45"  
  },  
  "Medical_Data": {  
    "Diagnosis": "Acute Bronchitis",  
    "Medication": "Amoxicillin 500mg, twice daily",  
    "Date": "12/10/2023"  
  }  
}
```

Structured Intelligence

Key Features: Handwriting Recognition (OCR), Form & Table Extraction, Multilingual Support.

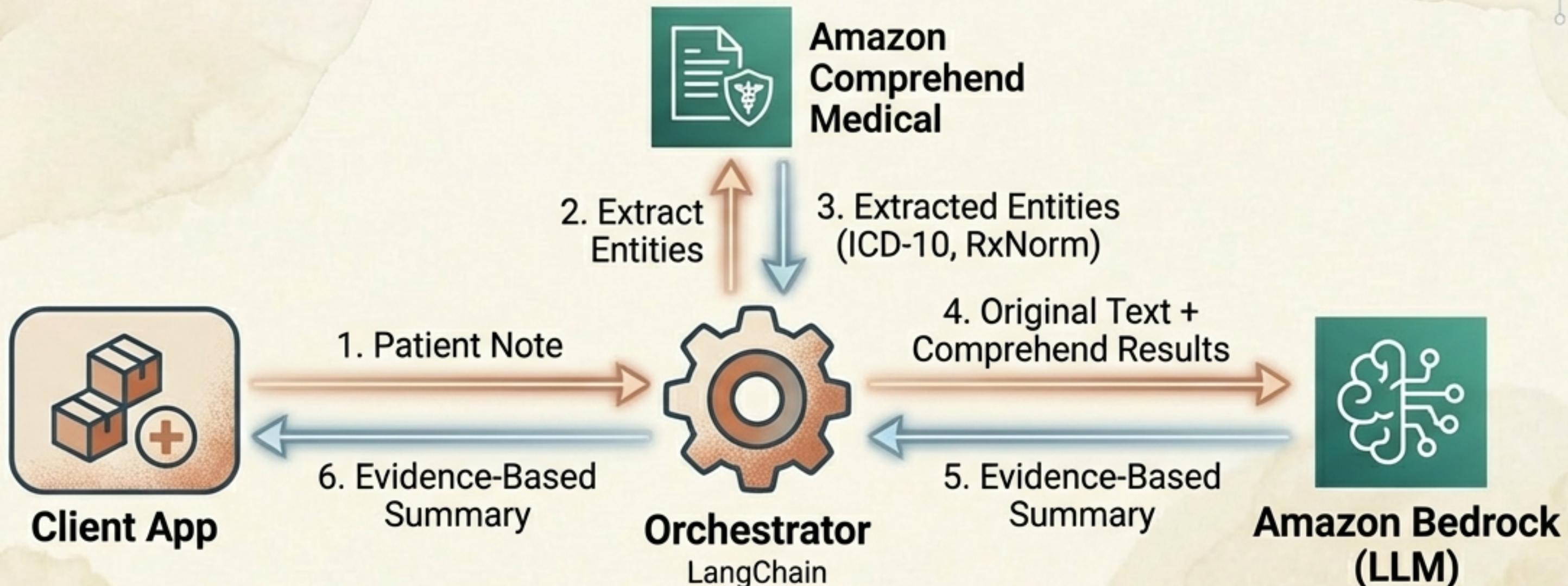
Structuring Chaos: AWS HealthLake & FHIR

Normalizing data for analytics and machine learning.



The Brain: RAG Architecture with Comprehend Medical

Grounding LLMs in medical truth to prevent hallucination.



Why RAG? It forces the LLM to use medically extracted entities as facts, drastically reducing hallucination risk.

Prompt Engineering for Medical Accuracy

Technique: Separating Ground Truth from Generative Request.

```
<medical_text>
  [Patient complains of seizure...]
</medical_text>

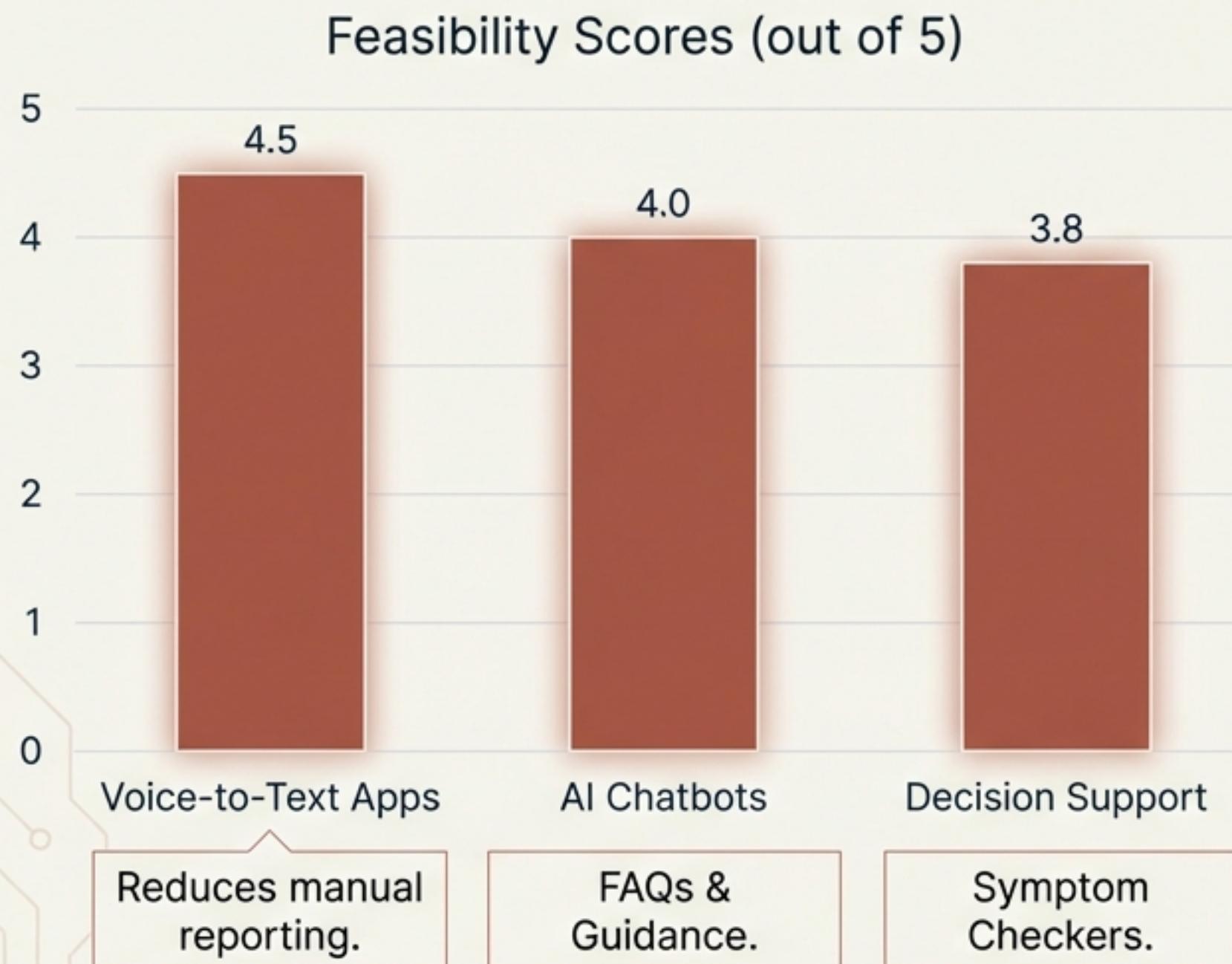
<comprehend_medical_results>
  [Entity: Seizure, Code: R56.9, Score: 0.83]
  [Entity: Headache, Code: R51, Score: 0.40]
</comprehend_medical_results>

<prompt>
  "Given the patient note and Comprehend results, select
  the most relevant ICD-10 diagnosis..."
</prompt>
```

Safety Filter: Only pass entities with High Confidence Scores (>0.50).

AI for the Frontline: A Feasibility Study

ASHA workers are ready for AI, if it is voice-enabled and vernacular.

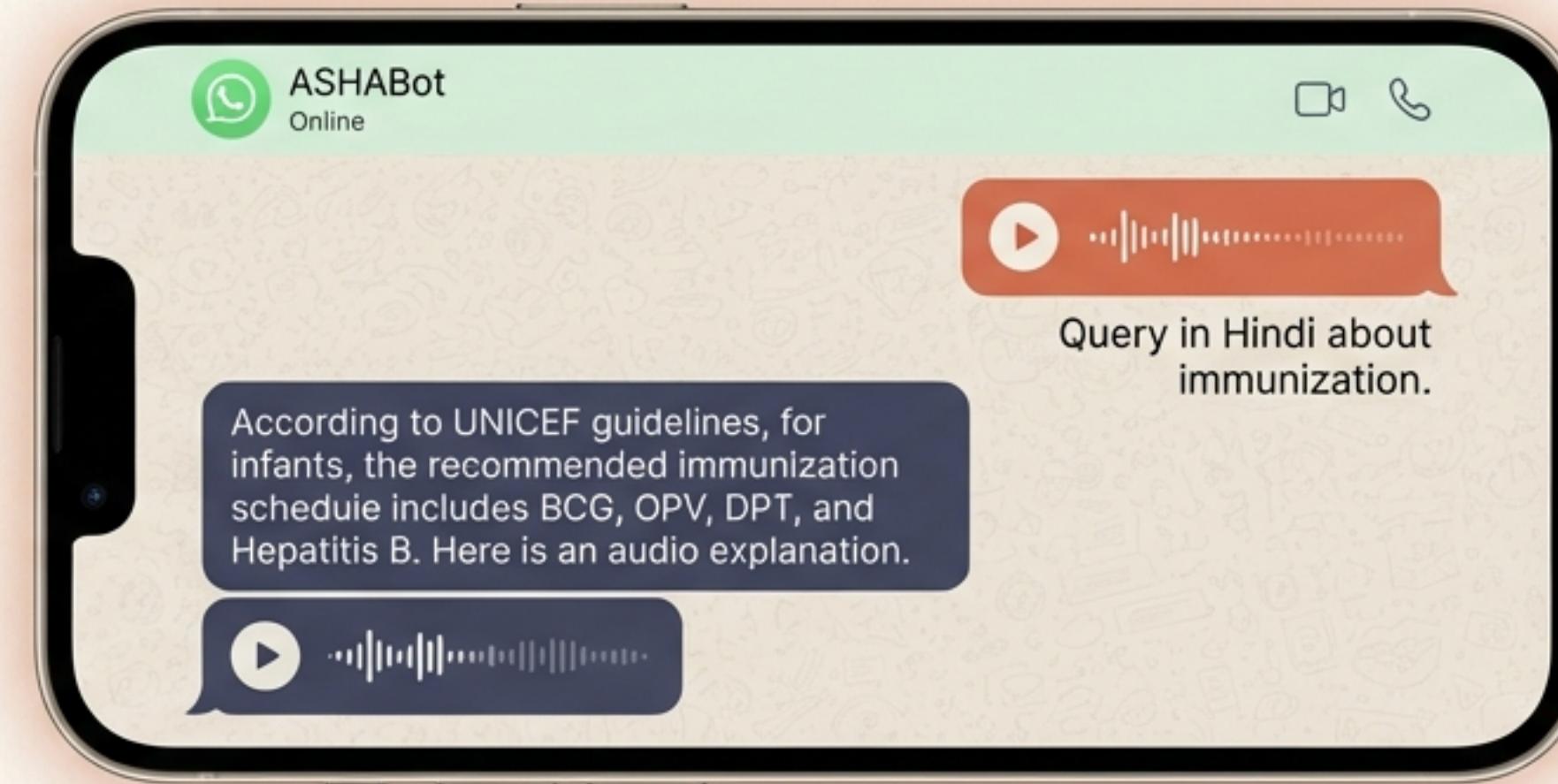


“

“AI tools must be human-centered—designed to assist, not replace. Offline functionality is critical.”

Case Study: ASHABot & Khushi Baby

Reducing distance and time with WhatsApp-based AI.



24,000+

Messages Processed

Multilingual Support

Hindi/English/Hinglish

12%

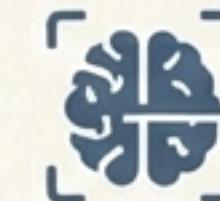
Improvement in Infant Immunization

Case Study: CureBay's Hybrid E-Clinics

Bridging the 'Missing Middle' with Phygital Care.



Tech Stack



AI Diagnostics



FDA-Approved IoT Vitals

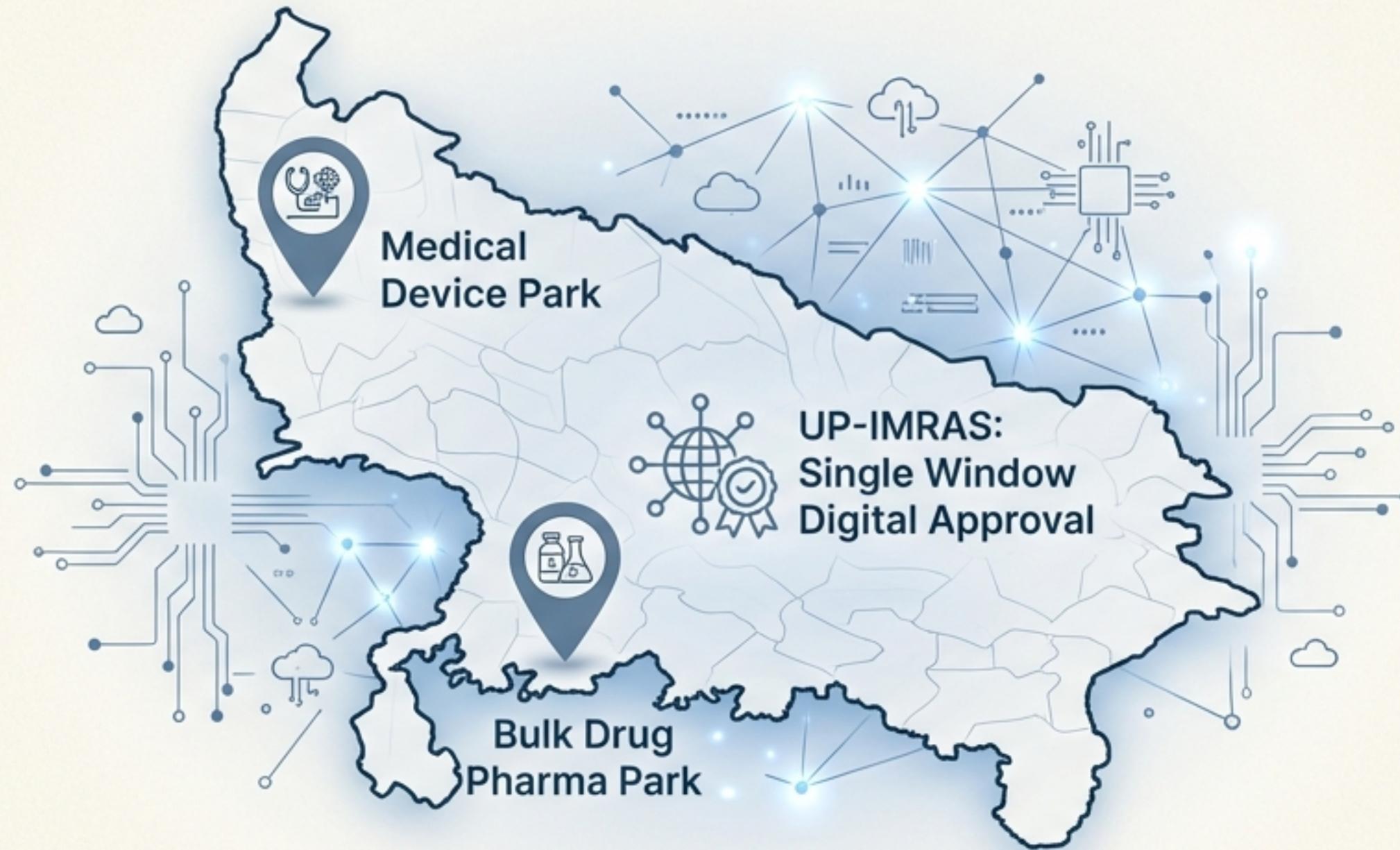


Cloud Teleconsultation

Impact: 550,000+ Patients Served | ₹599 Annual Membership

The Future Landscape: Uttar Pradesh MedTech Hub

Scaling innovation to serve 35 crore people.



Strategic Vision: Moving from startups to state-wide infrastructure.

A photograph of a young woman in a blue uniform, likely a healthcare worker, sitting on a wooden railing and showing a smartphone to an elderly woman in a sari. They are both smiling, suggesting a positive interaction. The background shows a rural setting with traditional houses and trees at sunset.

The Gap: 1:11,000 Doctor Ratio.
The Bridge: ABDM & Digital Identity.
The Engine: AI & Cloud Intelligence.

From 10km to From 10km to Zero Distance

The Result: The future of healthcare has arrived, one conversation at a time.