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AI for Bharat Hackathon

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Problem Statement : AI-Powered Insurance Defense for India’s Missing Middle

Brief about the Idea:

BimaSahayak — Your AI Insurance Defense Lawyer

The Problem:

- 500M+ Indians in the 'missing middle' can afford basic insurance but can't navigate it
- Policies are in English with complex jargon — most never read them
- 70% of health insurance complaints are about claim denials (IRDAI)

Our Solution:

BimaSahayak is an AI-powered, mobile-first platform that acts as a personal insurance defense lawyer. It uses RAG, OCR, and Bhashini (AI4Bharat) multilingual NLP to shift insurance from "helping you buy" to "helping you claim" — in 12+ Indian languages.

Key Insight:

Nobody is solving post-purchase insurance — the hard part where people actually need help. BimaSahayak fills this gap with AI-powered policy analysis, claim prep, and Ayushman Bharat enrollment assistance.

Your solution should be able to explain the following:

How is it different from existing solutions?

- Existing apps (PolicyBazaar, Ditto) focus on selling insurance — BimaSahayak focuses on claiming it
- No current tool scans policy PDFs for hidden traps (sub-limits, co-pays, waiting periods) and explains them in local languages
- Pre-claim document triage via OCR catches errors before the insurer rejects your claim

How does it solve the problem?

- RAG-based Trap Detector reads policy PDFs and flags unfair/hidden clauses in plain language
- OCR + AI validates claim documents for completeness & consistency before submission
- Voice-first interface in 12+ Indian languages removes the English literacy barrier
- Ayushman eligibility checker + CSC locator brings uninsured into the system

USP of the Proposed Solution

- India's first AI 'Insurance Defense Lawyer' — shifts power from insurers to policyholders
- Multilingual voice-first: powered by Bhashini (AI4Bharat) for native Indian language support
- End-to-end claim defense: from policy analysis → document prep → filing → appeal

List of features offered by the solution

🛡️ Trap Detector
Upload a policy PDF — AI flags hidden traps (sub-limits, waiting periods, co-pays) with severity ratings in your language

📋 Pre-Claim Document Triage
Photograph claim docs — OCR + AI checks completeness, consistency, and flags missing documents before you file

🎙️ Multilingual Voice Assistant
Ask about your policy by speaking in Hindi, Tamil, Telugu, Kannada & 8+ languages via Bhashini STT/TTS

🏥 Ayushman Bharat Eligibility
Check PM-JAY eligibility, discover state schemes, and find nearest CSC for enrollment

📂 Policy Vault & Family Manager
Store all family policies in one place with auto-renewal reminders via SMS & push notifications

📨 Claim Filing Assistant (Premium)
Guided claim filing, amount estimation, communication templates, and AI-powered appeal for rejections

Process flow diagram or Use-case diagram

Core User Journey — Claim Defense Flow

1. User registers via Phone + OTP (no password needed)
2. Uploads insurance policy PDF → Trap Detector scans & flags red flags
3. AI explains hidden clauses in user's language (Hindi, Tamil, etc.)
4. When hospitalized: User photographs claim documents (bills, discharge summary)
5. OCR extracts text → AI validates completeness & cross-checks consistency
6. Missing docs flagged with actionable steps (what to get, from where)
7. Voice assistant answers policy questions in 12+ Indian languages
8. For uninsured: Eligibility check → CSC locator → Enrollment guidance
9. Premium users: Guided claim filing → Amount estimation → Appeal if rejected

Key Flow: Policy Upload → Red Flag Detection → Claim Prep → Filing → Appeal

Wireframes/Mock diagrams of the proposed solution (optional)

Key Screens — Mobile-First UI

▸ Home Dashboard

Policy cards with renewal countdown, quick actions (Scan Policy, Check Docs, Voice Ask), red flag summary badge per policy

▸ Trap Detector Results

Policy red flags grouped by category (Waiting Period, Sub-Limits, Exclusions) with HIGH/MEDIUM/LOW severity chips, tap to see original clause highlighted in PDF

▸ Document Triage Camera

Camera viewfinder with document type selector (Bill, Discharge Summary, Prescription), real-time OCR preview, green/red validation indicators per field

▸ Voice Assistant

Chat-style interface with mic button, speech waveform animation, response bubbles showing text + audio playback + cited policy clauses

▸ Ayushman Eligibility

Simple form wizard (3 steps), result screen with eligible/not-eligible status, map view of nearest CSCs with directions link

▸ Claim Filing Wizard (Premium)

Step progress bar (Details → Docs → Review → Submit), amount estimator showing deductions, pre-filled communication templates

Architecture diagram of the proposed solution:

4-Layer Cloud-Native Architecture on AWS

Client Layer

React Native (Android + iOS) + Next.js PWA → API Gateway (AWS API Gateway)

Backend Services (EKS / Kubernetes)

6 FastAPI microservices: Auth | Policy Analyzer | Document Triage | Voice Interface | Eligibility | Claim Assistant

Async task processing via Celery + Redis (OCR, notifications)

AI/ML Layer

RAG Engine: LangChain + Claude/GPT-4o + Pinecone (vector DB) for policy Q&A

OCR: Google Cloud Vision API + Tesseract fallback

Multilingual: Bhashini (AI4Bharat) — ASR, TTS, NMT for 12+ Indian languages

Data Layer

PostgreSQL (RDS Multi-AZ) | Redis (ElastiCache) | S3 (encrypted docs) | Elasticsearch

Deployed on AWS ap-south-1 (Mumbai) for low latency. Blue-green deployments via K8s.

Technologies to be used in the solution:

Frontend: React Native (mobile), Next.js PWA (web)

Backend: Python FastAPI (microservices), Celery + Redis (async tasks)

AI/LLM: Claude API (Anthropic) / GPT-4o — RAG-based policy analysis & red flag detection

Embeddings & Vector DB: OpenAI text-embedding-3-small + Pinecone / ChromaDB

OCR: Google Cloud Vision API + Tesseract (fallback for offline/cost)

Speech (STT/TTS): Bhashini ASR + TTS (AI4Bharat) — native Indian language voice support

Translation (NMT): Bhashini NMT / IndicTrans2 — 12+ Indian language translation

Database: PostgreSQL (RDS), Redis (ElastiCache), Elasticsearch

Storage: AWS S3 with AES-256 encryption for policy documents

Infrastructure: AWS EKS (Kubernetes), CloudFront CDN, Route 53, API Gateway

Auth: Phone + OTP via MSG91/Firebase Auth, JWT tokens

CI/CD & Monitoring: GitHub Actions, Docker, Prometheus + Grafana, Sentry

Estimated implementation cost (optional):

MVP Phase (12 Weeks) — Estimated Monthly AWS Cost

AWS EKS + EC2 (6 microservices): **$400-600/mo**

RDS PostgreSQL (Multi-AZ, db.t3.medium): **$150-200/mo**

ElastiCache Redis (cache.t3.small): **$50-80/mo**

S3 (document storage, 100GB initial): **$5-10/mo**

CloudFront CDN: **$20-40/mo**

API Gateway: **$10-30/mo**

Google Cloud Vision API (OCR): **$50-100/mo (based on usage)**

LLM API costs (Claude/GPT-4o): **$200-500/mo (based on usage)**

Bhashini APIs (STT/TTS/NMT): **Free (Government API)**

Pinecone (Vector DB): **$70/mo (Starter)**

Estimated Total: $950 — $1,640/month (~₹80K — ₹1.4L/month)

Note: Bhashini APIs are free, significantly reducing multilingual costs.

Why BimaSahayak Matters — Impact & Scalability

Problem Scale

- 500M+ Indians in the 'missing middle' — can afford basic insurance but can't navigate it
- 70% of health insurance complaints are claim denials (IRDAI data)
- Only 3% of PM-JAY eligible families have used the scheme due to awareness gaps

Impact

- Reduce claim rejection rates by catching document errors before submission
- Empower non-English speakers with voice-first policy understanding
- Bridge the Ayushman enrollment gap by simplifying eligibility + CSC discovery

Scalability

- Cloud-native microservices on AWS EKS — auto-scales with demand
- Supports all 5 insurance types: Health, Life, Motor, Travel, Home
- Extensible to all 28 states' government health schemes

Revenue Model

- Free tier: Policy analysis + eligibility check (ad-supported)
- Premium tier: Claim filing assistant + appeal support (subscription)

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Thank You