HackAP Hackathon – IT
Problem Statements

Problem 1: **Compliant, Scalable & Autonomous Social Media Management Platform**

Challenge:

Build a globally compliant, self-operating social media management platform that automates pricing, taxation, invoicing, and renewals while handling 10,000+ users securely.

Key Requirements

1. Fully Autonomous Operations

✅ Zero-Touch User Management

- Self-service signup, cancellations, and plan changes
- AI-driven email sequences (trial reminders, payment failures)

✅ Automatic Compliance Engine

- Tax Calculations: Auto-adds GST for India (18%) and VAT/Sales Tax for US (varies by state)
- Regulatory Invoicing: Generates legally valid invoices with:
- Business ID (GSTIN for India, EIN for US)
- Tax breakdowns per local laws
- Data Privacy: GDPR/CCPA-ready (cookie consent, right-to-delete tools)

2. Intelligent Dynamic Pricing

Geo-Based Pricing

- US visitors: $9.99/month (ex. tax) → Shows final price with tax at checkout
- India visitors: ₹799/month (incl. GST)
- Manual currency switch with live forex rates

Localized Payment Compliance

- PCI-DSS compliant card processing
- Supports India's UPI AutoPay for recurring INR payments

3. Enterprise-Grade Security & Scalability

Security Must-Haves

- SOC2-ready architecture (data encryption at rest/transit)
- Automated tax filing logs for audits (stores 7 years of records)
- Role-based access (e.g., restrict finance data to admins)

Scalability Targets

- 100ms max response time under 10K users
- Auto-scaling cloud deployment (show cost-saving measures)

Judging Criteria

Category	Weight	Key Questions
Compliance	30%	Does it handle taxes, invoices, and data laws correctly?
Autonomy	25%	How many operational tasks are fully automated?
Security	20%	Are payments, data, and access controls enterprise-secure?
Scalability	15%	Can it handle traffic spikes without breaking?
UX	10%	Is the interface intuitive for global users?

Goal: A platform so compliant & automated, it could pass a government audit on Day 1.

Problem 2: **Veteran Talent Finder: Build a tool to identify domain experts with 10+ years of experience using minimal inputs.**

Challenge:

Create a lightweight tool or API-integratable feature that:

1. Takes **two inputs** from users:

- A **domain** (e.g., "Cybersecurity," "Renewable Energy").
- Optional **keywords** (e.g., "Python, Fintech, Cloud Migration").

2. Searches across **publicly available data sources** (e.g., LinkedIn, GitHub, research papers) to find individuals with:

- **At least 10 years of verifiable experience** in the specified domain.
- Keyword relevance (if provided)

3. Returns **clean, readable results** including:

- Name, contact info (email/Social handles), location.
- Confidence score (0-100%) for match accuracy.

Key Requirements

✅ Minimalist UI/API

- Single input form (domain + optional keywords).
- Returns results in <10 seconds for 90% of queries.

✅ Experience Validation

- Uses AI/NLP to infer experience duration (e.g., LinkedIn job titles/dates, GitHub commit history).
- Flags anomalies (e.g., "Claims 15 years but first patent was 5 years ago").

✅ Confidence Scoring

- Score based on:
- Cross-source verification (e.g., same claim on LinkedIn + personal website).
- Keyword density in profiles/publications.

✅ Ethical Compliance

- Only uses publicly accessible data (no scraping violations).
- Optional: GDPR-friendly "opt-out" mechanism for results.

Judging Criteria

Category	Weight	Evaluation Questions
Accuracy	30%	How reliable are the experience claims and confidence scores?
Speed	20%	Does it deliver results in near-real-time?
UX	20%	Is the output intuitive and actionable?
Innovation	20%	Does it use creative methods to verify experience?
Compliance	10%	Does it respect data privacy laws?

Example Workflow

1. User Input:

Domain: "Biomedical Engineering"

Keywords: "Prosthetics, FDA Compliance"

2. Output:

Name	Contact	Location	Confidence
Dr. Alice Chen	alice@lab.edu	Boston	92%
L. Raj Kumar	Linkedin.com/lrk	Bhimavaram	85%

Goal: A mentee's secret weapon to find hidden industry veteran mentors with 3 clicks.

Presented by:

Problem 3: **WorkVerify: Trustless Employment Verification for the Suspicious, Global, and Privacy-Conscious.**

Challenge:

Build a system that lets anyone **instantly verify work history** with:

✅ **Zero employer cooperation required**

✅ **No centralized databases**

✅ **Mathematically unforgeable proofs**

✅ **Candidate-controlled privacy**

...while handling **real-world messiness**: defunct companies, international work, and gig economy chaos.

User Stories You Must Solve

1. The Skeptical Startup

Verify a '10 years at Google' claim in <60 seconds without contacting HR.

2. The Disappearing Employer

Confirm a 2015-2017 stint at a now-bankrupt crypto startup.

3. The Borderless Contractor

Validate patchwork employment across Germany, India, and Upwork.

Demo Requirements

Every team must show:

1. Live Trust Test

- Verify a real work claim → Generate shareable proof → Detect tampering

2. Fraud Gauntlet

- Catch at least **2 sophisticated fakes**:

  Example: “Senior VP at Amazon (2018-2022)" when their LinkedIn shows internship

3. Edge Case Crucible

Handle one nightmare scenario:

- Company acquired & records lost
- Pre-digital era paper records
- Gig work with deleted client accounts

Judging Criteria

Criteria	Weight	Killer Question
Trust without authority	35%	Why can’t this be faked?
Global Grit	25%	Does it work for a Tokyo salaryman **&** a Nairobi freelancer?
Privacy Paradox	20%	How do candidates reveal less but prove more?
HR Whisperer	20%	Would an overworked recruiter actually use this?

Why this matters? The winning solution could replace reference checks forever.

Goal: A future where credentials are as trustworthy as Bitcoin, but human-readable.

Presented by:

Problem 4. "Ghost Network Detection" – Identify Invisible IoT Devices

30% of IoT devices in homes/offices are "ghost devices" – either rogue (e.g., unauthorized spy cameras) or malfunctioning (e.g., zombie smart plugs). Standard tools like *nmap* miss them because they:

- Use proprietary protocols
- Sleep intermittently
- Spoof MAC addresses

Challenge:
Build an **ML-powered network sniffer** that:

✅ **Detects ghosts** via:

- Micro traffic anomalies (e.g., 3-byte packets at 2:17 AM)
- RF interference patterns (for non-WiFi devices like Zigbee)
- Power draw fluctuations (correlate with smart plugs)

✅ **Visualizes threats** as:

- Interactive network topology graphs
- Risk scores (e.g., "85% chance this is a hidden camera")

Judging Criteria:

Category	Weight	Key Questions
Detection Rate	40%	Can it find devices nmap misses?
False Positives	30%	Does it confuse Alexa with a spy device?
Real-Time UX	20%	Can a non-techie understand alerts?
Innovation	10%	Novel detection methods?

Demo Requirement:

- Catch a **custom-hidden device** we'll introduce during judging.

Problem 5: **Noise Pollution Heatmap via Smartphones**

WHO estimates 1.6M healthy life years are lost annually in Europe alone due to noise pollution. Existing solutions:

- Rely on sparse, expensive sensors
- Lack hyperlocal data (e.g., school zones at recess)

Challenge:
Create a **crowdsourced mobile app** that:
Collects Data:

- Uses phone mics (calibrated for common devices)
- Tags location, time, and device type (Android/iOS model)
- Detects noise types (horns vs. construction vs. alarms)

Generates Heatmaps:

- Real-time LEQ (Equivalent Sound Level) maps
- "Quiet Route" recommendations (like Google Maps avoids hills)

Judging Criteria:

Category	Weight	Key Questions
Data Accuracy	30%	Within 3dB of professional meters?
Scalability	25%	Can handle 10K+ concurrent submissions?
Privacy	20%	Anonymizes users/locations properly?
Actionability	25%	Useful for city planners or parents?

Demo Requirement:

- Show live noise spikes during a simulated "school pickup hour."

Problem 6. **"Smartphone-Powered Eye Disease Screener"**

80% of blindness cases are preventable with early detection, but 2 billion people lack access to ophthalmologists.

Challenge:
Build a **mobile app** that:
Screens For:

- Cataracts (via red-eye reflex analysis)
- Diabetic retinopathy (blood vessel patterns)
- Glaucoma (optic disc cupping)

Works With:

- Any smartphone camera + flashlight
- Offline mode for rural areas
- <5% false negatives (critical for medical use)

Judging Criteria:

Category	**Weight**	**Key Questions**
Medical Accuracy	40%	Validated against clinical datasets?
Accessibility	30%	Works on $50 Android phones?
Speed	20%	Diagnosis in <30 seconds?
UX	10%	Clear instructions for non-doctors?

Demo Requirement:

- Correctly flag synthetic eye conditions from a random test dataset.