

Tabibi Mobile App Ecosystem: A Comprehensive Concept Document

Author: Manus AI

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1. Executive Summary

To successfully transition Tabibi from a standard symptom checker into an **Active Healthcare Navigator**, the platform must bridge the critical gap between digital diagnosis and physical treatment. This document outlines a comprehensive blueprint for the Tabibi ecosystem, detailing the mechanics of its core **Smart Assessment Engine (T-SAE)**, its rigorous safety protocols, and its unique hyper-local care routing system. The primary strategic focus is to provide users with actionable, medically sound recommendations and to seamlessly guide them to the nearest equipped healthcare facility, thereby transforming the reactive nature of healthcare into a proactive, user-centric experience. This expanded concept moves beyond the initial technical specifications to include a full business model, go-to-market strategy, risk analysis, and a future-facing product roadmap.

2. Deep Dive: The Tabibi Smart Assessment Engine (T-SAE)

The T-SAE is designed to simulate the deductive reasoning of a master diagnostician. It abandons rigid, static questionnaires in favor of a dynamic, conversational AI architecture grounded in localized medical guidelines.

2.1. Natural Language Intake & Entity Extraction

- **The Input:** The user states their chief complaint via text or voice note in local Arabic dialects or English (e.g., "My lower right stomach is killing me and I feel sick.").
- **NLP Processing:** The Natural Language Processing (NLP) layer extracts clinical entities and maps colloquial terms to standardized medical ontologies (like SNOMED CT).
- **Extracted:** [Symptom: Right Lower Quadrant Pain, Severity: Severe] , [Symptom: Nausea] .
- **Emergency Red Flag Filter:** Before generating a single question, the AI runs the entities through a deterministic "Red Flag" database. If triggers like "crushing chest pain," "sudden facial drooping," or "migrating abdominal pain" (signs of appendicitis) are detected, the AI halts the assessment. The screen transitions to a **Code Red Overlay**,

providing a one-tap button to call local emergency services and automatically routing to the nearest 24/7 Hospital ER.

2.2. Dynamic & Adaptive Questioning

If no red flags are present, the AI initiates a differential diagnosis (DDx) tree using Bayesian inference.

- **Contextual Memory:** The AI calculates the most probable conditions and asks the exact questions needed to narrow them down. Instead of a generic list, it asks adaptively to rule in or rule out specific diseases.
- **Targeted Prompts:** "Does the pain get worse when you press on it and let go quickly?" (Checking for rebound tenderness), "Have you had a fever today?"

3. Pharmacological Evaluation & Safety Guardrails

A cornerstone of Tabibi's clinical safety is establishing the patient's chemical baseline before generating a recommendation.

3.1. The OCR "Medicine Scanner"

Before finalizing the assessment, the app prompts: "Are you currently taking any medications, supplements, or vitamins?"

- **Smart Capture:** Users utilize the app's camera (powered by Google Cloud Vision OCR) to scan medication boxes, blister packs, or written prescriptions. The AI instantly extracts the drug names, dosages, and active ingredients in both Arabic and English.

3.2. The Pharmacological Conflict Engine

The AI runs two distinct safety checks using a localized pharmacological database:

- **Side-Effect vs. Symptom Analysis:** Is the user's symptom actually an Adverse Drug Reaction (ADR)?
 - **Logic:** If a user reports a "persistent dry cough" and the OCR scanned Lisinopril (blood pressure medicine), the AI pivots. It will not recommend cough syrup; it will state: "Your dry cough is a highly common side effect of Lisinopril. We recommend consulting your prescribing doctor."
- **Drug-Drug Interaction (DDI) Guardrails:** If the AI intends to recommend a new Over-The-Counter (OTC) medicine, it first checks for fatal conflicts. (e.g., It will block the recommendation of NSAID painkillers like Ibuprofen if the OCR detected the user is currently taking blood thinners).

4. The Actionable Recommendation Matrix

Once the interview and medication checks are complete, Tabibi synthesizes a concrete **Care Plan**—shifting from "You might have X" to "Here is exactly what you need to do to treat or confirm X."

4.1. Pathway A: Medicine Recommendations (Self-Care)

For minor, self-limiting conditions (e.g., tension headache, allergic rhinitis, mild GERD):

- **Precision Output:** The AI recommends specific classes of OTC active ingredients (e.g., "Proton Pump Inhibitors" or "Second-generation antihistamines").
- **Contextual Dosage:** In "Pediatric Mode," the AI uses the child's exact logged weight and age to calculate precise mg/kg liquid dosage limits, avoiding overdose risks.
- **Action Trigger:** Activates the Pharmacy Routing Engine.

4.2. Pathway B: Tests & Imaging Needed (Further Diagnosis)

When symptoms are ambiguous or point to conditions requiring clinical verification, the AI acts as a pre-triaging doctor, outputting the exact diagnostic data required.

- **Lab Tests:** "Your symptoms of fatigue, weight gain, and cold intolerance suggest a potential thyroid issue. Recommendation: A Comprehensive Thyroid Panel (TSH, Free T3, Free T4) and a Complete Blood Count (CBC) are required."
- **Medical Imaging:** "The inability to bear weight on your knee and rapid swelling requires structural imaging. Recommendation: An MRI of the Right Knee (without contrast) is required."
- **Action Trigger:** Activates the Lab/Clinic Routing Engine.

5. Hyper-Local Care Routing: The "Last Mile" Execution

An accurate recommendation is useless if the patient cannot act upon it. Standard map apps fail in healthcare because they do not know what medical equipment is inside a building. Tabibi solves this via a proprietary **Capability-Matched Geospatial Database**.

5.1. Finding the Nearest Pharmacy (Medicine Fulfillment)

- **Geospatial Radius & Status:** When an OTC medicine is recommended, the app pings the user's GPS and draws a dynamic radius (e.g., 1km - 3km). It instantly filters out any pharmacies that are currently closed based on local time.
- **The UI Experience:** A map interface slides up, dropping pins on the 3 nearest open pharmacies. It displays the exact distance, estimated driving/walking time, and user

ratings.

- **Phase 2 - Live Inventory API:** Tabibi will integrate with the Point-of-Sale (POS) APIs of major Middle Eastern pharmacy chains. The map will only highlight pharmacies where the recommended medicine is verified as "In Stock Right Now."

5.2. Finding the Nearest Lab or Clinic (Test/Imaging Fulfillment)

- **Capability Tagging (The Smart Map):** Every medical facility in Tabibi's database is tagged with metadata.
 - Lab A: [Phlebotomy, Urinalysis, Open 24/7]
 - Clinic B: [X-Ray, MRI_1.5T, Closes_1800]
- **Algorithmic Filtering:** If the AI recommends an MRI, the routing engine runs a strict spatial query. It completely hides "Lab A" (because it only does blood work) and exclusively routes the patient to facilities tagged with `has_mri = TRUE` that are currently open.
- **Accuracy & Quality:** Facilities are ranked by proximity and a "Tabibi Trust Score" (aggregated patient ratings for hygiene, accuracy of results, and wait times).
- **Direct Navigation:** The user clicks on the nearest capable lab and taps "Navigate" to open Google Maps, seamlessly bridging the digital assessment with physical care.

6. End-to-End User Journey Walkthrough: "Fatima's Case"

- **The Trigger:** Fatima (50, diabetic in Dubai) wakes up with a burning sensation when urinating and lower back pain.
- **The Assessment:** She opens Tabibi. The AI dynamically asks about fever and if the pain radiates. She confirms a mild fever.
- **Medication Check:** She scans her daily medicine box using the camera. Tabibi registers Metformin (Diabetes).
- **AI Evaluation:** The AI concludes: High probability of a Urinary Tract Infection (UTI), potentially progressing to the kidneys (due to back pain). Diabetic status increases complication risk.
- **The Recommendation Matrix:**
 - **Warning:** Do not rely on OTC painkillers; antibiotics are required.
 - **Tests Needed:** Urinalysis and Urine Culture are urgently required to identify the bacteria before a doctor can prescribe the correct antibiotic.

- **Medicine Needed (Relief):** Phenazopyridine (OTC urinary pain relief) while waiting for test results.
- **The Routing Execution:**
 - **Action 1 (The Test):** Tabibi's map opens. It filters out nearby pharmacies and standard GP clinics. It strictly highlights Diagnostic Labs within 3km that are currently open and capable of microbiology (Urine Cultures). Fatima selects a highly-rated lab 1.5km away.
 - **Action 2 (The Medicine):** Tabibi maps a 24/7 pharmacy located exactly on the route between her house and the lab so she can pick up the pain relief on the way.

7. Technical Architecture Requirements

To execute this instantly and accurately, Tabibi requires a highly specific cloud architecture:

- **Database (Crucial for Routing):** PostgreSQL with the PostGIS extension. Standard databases cannot handle complex geographical mapping. PostGIS allows the backend to run rapid radius queries (e.g., "Find all facilities within a 5km polygon that possess an MRI machine").
 - **AI Orchestration:** Google Gemini 1.5 Pro (for complex clinical reasoning and dynamic questioning), integrated with Google Cloud Vision API for the Arabic/English medication OCR.
 - **Mapping Provider:** Google Maps Platform (Places API for standard POIs, Distance Matrix API for accurate travel times based on current traffic).
 - **Frontend (Mobile):** React Native (iOS/Android) for a fluid UI with deep integration to native location services and camera. Native Right-to-Left (RTL) Arabic support.
 - **Backend:** Node.js microservices hosted on Google Cloud Run to ensure the app scales seamlessly during high-traffic periods (e.g., flu season) without latency.
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8. Business Model and Monetization Strategy

While the core, safety-critical features of Tabibi will remain free to ensure accessibility, a multi-pronged monetization strategy will ensure the platform's long-term sustainability and growth. The model is designed to create value for both users and partners within the healthcare ecosystem.

8.1. Freemium Subscription Model

A premium tier, **Tabibi Plus**, will be offered to users seeking enhanced proactive and preventative care features. This subscription will provide a recurring revenue stream.

Feature Tier	Core (Free)	Tabibi Plus (Subscription)
AI Assessment	Unlimited, for acute symptoms	Included, plus proactive wellness checks
Care Routing	Unlimited, for recommended tests/medicines	Included
Medication Scanner	Unlimited	Included
Family Accounts	Single user profile	Up to 5 linked profiles (for caregivers)
Health History	Basic log of past assessments	Detailed, exportable health journal
Telemedicine	N/A	One free consultation per quarter; discounted rates
Wellness Analytics	N/A	Personalized health trends and insights

8.2. B2B Partnership Ecosystem

Strategic partnerships with healthcare providers will form a significant revenue channel, creating a symbiotic relationship where partners gain access to a targeted, high-intent user base.

- **Pharmacy & Lab Networks (Lead Generation Fee):** Partner pharmacies and diagnostic labs will pay a nominal, fixed fee for each user successfully routed to their facility via the Tabibi app. This is a performance-based model that directly ties cost to patient footfall.
- **Insurance Provider Integration (Subscription Model):** Insurance companies can subscribe to a dedicated provider portal. This portal will allow them to offer Tabibi Plus subscriptions as a value-added benefit to their members, encouraging preventative care and potentially reducing long-term claim costs. The portal can also streamline pre-authorization for tests and procedures recommended by the AI.
- **Telemedicine Providers (Revenue Share):** Integration with third-party telemedicine platforms will operate on a revenue-sharing basis for each consultation initiated through the Tabibi app.

8.3. Anonymized Data Insights

Aggregated, fully anonymized data on public health trends will be packaged into valuable reports for government health ministries, research institutions, and pharmaceutical companies. For example, tracking the real-time spread of flu-like symptoms on a neighborhood level can provide unprecedented insights for public health planning. Strict ethical guidelines will ensure that no personally identifiable information (PII) is ever shared.

9. Go-to-Market Strategy

The go-to-market strategy is focused on a phased rollout, beginning with a hyper-local focus to build density and validate the model before scaling.

- **Phase 1: Initial Launch City (e.g., Dubai, UAE):** The initial launch will target a single, tech-savvy metropolitan area with a high smartphone penetration and a diverse mix of healthcare facilities. This allows for concentrated marketing efforts and rapid iteration based on user feedback.
- **Target Audience Segmentation:**
 - **The Tech-Savvy Millennial:** Individuals aged 25-40 who are comfortable with digital solutions and actively manage their health.
 - **The Caregiver:** Individuals responsible for the health of children or elderly parents, who will benefit from the Family Account features.
 - **The Chronic Patient:** Individuals managing long-term conditions (e.g., diabetes, hypertension) who need regular monitoring and support.
- **Marketing & Acquisition Channels:**
 - **Digital Marketing:** Targeted advertising on social media platforms (Instagram, Facebook, TikTok) and search engines (Google) focusing on common health queries.
 - **Content Marketing:** A blog and social media presence providing valuable health and wellness information, establishing Tabibi as a trusted authority.
 - **Healthcare Influencer Partnerships:** Collaborating with trusted doctors and health professionals on social media to explain and endorse the app's benefits.
 - **App Store Optimization (ASO):** Optimizing the app's listing on the Apple App Store and Google Play Store to rank highly for relevant keywords.
 - **On-the-Ground Partnerships:** Establishing referral relationships with non-competing healthcare entities like private clinics and insurance brokers.

10. Risk Analysis and Mitigation

A proactive approach to risk management is essential, particularly in the health-tech domain. The following table outlines key risks and the strategies to mitigate them.

Risk Category	Specific Risk	Mitigation Strategy
Clinical & Medical	Misdiagnosis or incorrect recommendation: The AI provides a faulty assessment, leading to adverse health outcomes.	<p>1. Medical Advisory Board: Establish a board of qualified physicians to review and refine AI algorithms and clinical pathways.</p> <p>2. Rigorous Testing: Use standardized clinical vignettes to continuously test the AI's diagnostic accuracy against human doctors.</p> <p>3. Prominent Disclaimers: Clearly communicate in the UI that Tabibi is a support tool, not a replacement for a doctor.</p> <p>4. Tiered Confidence Scores: The AI will only make high-confidence recommendations; lower-confidence results will always default to "Consult a Doctor."</p>
Technical & Operational	Data Breach: Sensitive user health data is compromised.	<p>1. End-to-End Encryption: All data, both at rest and in transit, will be encrypted using industry-best standards.</p> <p>2. Compliance with Local Regulations: Adherence to data protection laws like GDPR and local equivalents (e.g., UAE's PDPL).</p> <p>3. Regular Security Audits: Conduct frequent penetration testing and vulnerability scans by third-party security firms.</p>
	OCR & NLP Errors: The system incorrectly extracts information from a medication box or user input.	<p>1. Confidence Thresholds: OCR results below a 99% confidence score will require manual user confirmation.</p> <p>2. User Verification: Always display the extracted text to the user for confirmation before processing.</p> <p>3. Fallback to Manual Entry: Provide a simple interface for users to</p>

		manually input medication or symptom information if automated extraction fails.
Regulatory & Legal	Classification as a Medical Device: The platform is classified as a regulated medical device, requiring lengthy and expensive approvals.	<p>1. Focus on Triage & Navigation: Position the app as a triage and information tool, not a diagnostic device. The AI <i>recommends</i> tests; it does not <i>diagnose</i> a condition.</p> <p>2. Ongoing Legal Counsel: Retain legal experts specializing in health-tech regulations in each target market to ensure compliance.</p>
Market & Business	Low User Adoption: Users are hesitant to trust an AI with their health concerns.	<p>1. Transparency & Trust: Be transparent about the AI's capabilities and limitations. Publish accuracy data and medical board endorsements.</p> <p>2. Exceptional User Experience: A seamless, intuitive, and empathetic UI/UX is critical to building user confidence.</p> <p>3. Freemium Model: The free, high-value core offering will lower the barrier to entry and allow users to experience the benefits firsthand.</p>

11. Product Roadmap (24-Month Outlook)

The product roadmap is designed for iterative development, focusing on delivering core value quickly and then expanding capabilities based on user feedback and strategic opportunities.

- **Phase 1: MVP Launch & Validation (Months 0-6)**
 - **Features:** Core T-SAE, OCR Medication Scanner, Hyper-Local Routing for Pharmacies & Labs.
 - **Market:** Single city launch (e.g., Dubai).
 - **Goal:** Achieve product-market fit, validate the core user journey, and gather initial user feedback.

- **Phase 2: Expansion & Enhancement (Months 7-12)**
 - **Features:** Launch of Tabibi Plus subscription, Family Accounts, integration with one major pharmacy chain for Live Inventory API.
 - **Market:** Expand to two additional major cities within the launch country.
 - **Goal:** Begin monetization, enhance the value proposition, and prove the model's scalability.
- **Phase 3: Deepening Clinical Integration (Months 13-18)**
 - **Features:** Basic telemedicine integration (chat/call a doctor), integration with wearable devices (e.g., Apple HealthKit, Google Fit) to incorporate vitals into the assessment engine.
 - **Market:** Regional expansion to a second country.
 - **Goal:** Bridge the gap between digital triage and virtual care, and begin incorporating real-time health data.
- **Phase 4: Platform Ecosystem & B2B Focus (Months 19-24)**
 - **Features:** Launch of the B2B portal for insurance providers, exploration of Electronic Health Record (EHR) integration, advanced predictive analytics for public health insights.
 - **Market:** Solidify position as a regional leader.
 - **Goal:** Establish the B2B revenue stream and position Tabibi as an integral part of the digital health infrastructure.

12. Ethical Considerations and Data Privacy

Trust is the single most important asset for a health-tech platform. A commitment to ethical principles and robust data privacy is not just a legal requirement but a core tenet of the Tabibi brand.

- **Patient Anonymity:** All data used for trend analysis will be fully and irreversibly anonymized. The system will be designed to make it impossible to link aggregated data back to an individual.
- **Explicit Consent:** The app will use a clear, easy-to-understand consent model. Users will have granular control over what data they share and how it is used. There will be no hidden clauses or confusing legal jargon.
- **Algorithmic Transparency:** While the proprietary nature of the AI must be protected, Tabibi will be transparent about the *types* of data the AI uses to make its recommendations. The role of the Medical Advisory Board in overseeing the AI will be prominently featured.

- **Primum Non Nocere (First, Do No Harm):** This ancient medical principle will be the guiding light for all product decisions. The AI will be explicitly programmed with a conservative bias, prioritizing safety above all else. When in doubt, the AI will always err on the side of caution and recommend consulting a human healthcare professional.