

**Alright — let's continue the full PRD for your disease-tracking, smart-watch-enabled, real-time doctor alert & delivery system.**

**We already covered 1. Introduction, 2. Objectives, 3. Features, 4. Risks, and 5. Risk Mitigation earlier.**

**Now we'll move forward with 6–12 to complete the PRD.**

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## **6. System Architecture**

### **6.1 Components**

#### **1. Wearable Device (Smartwatch)**

- Sensors: heart rate, SpO<sub>2</sub>, temperature, movement, ECG (optional)
- Bluetooth/Wi-Fi/LTE connectivity to send data to mobile app

#### **2. Mobile App**

- Receives data from smartwatch
- Performs initial anomaly detection using ML model
- Pushes alert to cloud server if risk detected

#### **3. Cloud Backend**

- Stores historical health data securely
- Runs AI/ML/DL models for deep anomaly detection & trend analysis
- Interfaces with doctor network & delivery system

#### **4. Doctor Dashboard**

- Web/mobile portal for doctors to verify alerts
- Displays patient's recent & historical data
- Allows communication with patient & dispatch of medicine

#### **5. Medicine Delivery Module**

- Integration with delivery partners (like Ola, Rapido, Dunzo API)
- Tracks delivery in real-time

#### **6. Emergency Services**

- Integration with ambulance providers if critical condition detected
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## **7. Workflow**

- 1. User wears smartwatch** → health parameters continuously monitored
- 2. Data sent to mobile app** → real-time preprocessing & anomaly detection

3. **If anomaly detected** → alert sent to cloud backend
  4. **Cloud backend AI analysis** → confirms risk & severity
  5. **Nearby doctor alerted** → receives real-time patient health snapshot
  6. **Doctor verifies**
    - If **minor condition** → prescribes medicine → medicine delivered via delivery partner
    - If **critical** → doctor sends emergency alert → ambulance dispatched
  7. **Follow-up tracking** → patient's recovery monitored through wearable data
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## 8. Data Privacy & Security

- **Encryption**
    - AES-256 for data at rest
    - TLS 1.3 for data in transit
  - **Anonymization**
    - Patient PII stored separately from health metrics
    - Use patient IDs instead of names in analytics
  - **Access Control**
    - Role-based access for doctors, admins, delivery agents
  - **Consent Management**
    - Patients explicitly agree to share health data with selected doctors
  - **Compliance**
    - HIPAA (if US market), GDPR (EU), and Indian DPDP Act
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## 9. Technology Stack

- **Frontend:** React Native (mobile), React.js (doctor dashboard)
  - **Backend:** Python (FastAPI/Django)
  - **Database:** PostgreSQL + TimescaleDB for time-series health data
  - **AI/ML/DL Models:** TensorFlow/PyTorch (for anomaly detection & predictive alerts)
  - **Cloud:** AWS/GCP/Azure
  - **Wearable SDKs:** Fitbit API, Apple HealthKit, Wear OS APIs
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## 10. Cost Estimation for Demo

Item	Estimated Cost
Smartwatch (with sensors)	₹3,000 – ₹8,000 each
Mobile App Dev (MVP)	₹1.5–2.5 lakh
Backend & AI Model	₹1–1.5 lakh
Cloud Hosting (3 months)	₹15,000 – ₹25,000
Delivery API Integration	₹20,000 – ₹40,000
Doctor Dashboard	₹50,000 – ₹1 lakh
<b>Total Demo Cost</b>	<b>₹3.5 – ₹6 lakh</b>

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## 11. Success Metrics

- **Detection Accuracy:** >90% for anomalies
  - **Average Doctor Response Time:** <5 minutes
  - **Medicine Delivery Time:** <30 minutes
  - **User Retention Rate:** >75% after 3 months
  - **Data Privacy Incidents:** 0
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## 12. Future Scope

- Add **AI-based diagnosis recommendations**
  - Support **multiple wearable devices**
  - Enable **insurance claims automation**
  - Add **video consultation**
  - Integrate **predictive analytics** for early disease prevention
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