**CryptoAlarm — AI-Powered Crypto Alert & Automation System**

**🧠 Overview**

**CryptoAlarm** is an advanced, AI-powered cryptocurrency alert and automation platform designed to keep traders and investors informed and in control — even when they’re away from the screen.  
The app monitors real-time crypto market data, identifies price or volume triggers, and notifies users instantly through **browser push**, **email**, **SMS**, or even **Twilio voice calls** that read alerts aloud.

Beyond alerts, CryptoAlarm can be extended into a **smart trading automation assistant** — executing trades automatically through connected exchange APIs based on user-defined thresholds or AI-generated strategies.

It’s built for users who want **zero missed opportunities**, **24/7 market awareness**, and **customized control** over when and how they get notified or act.

**🚀 Key Features**

**🔔 1. Real-Time Alerts**

* Set alerts for:
  + Price thresholds (e.g. BTC crosses $65,000)
  + Volume spikes or volatility levels
  + Market cap or dominance changes
* Get instant notifications via:
  + Push Notifications (Browser / PWA)
  + Email Alerts (via MailerSend / Supabase functions)
  + SMS or Voice Calls (via Twilio)
* Multi-channel redundancy to ensure you never miss a signal.

**🤖 2. AI Signal Engine (Powered by OpenAI)**

* Analyze market trends and sentiment using AI.
* Generate predictions or trading recommendations.
* Identify abnormal patterns or upcoming breakout conditions.
* Personal AI assistant for trading insights and strategy refinement.

**💸 3. Automated Trading (Optional Advanced Mode)**

* Connect your **exchange API keys** (Binance, Coinbase, Kraken, etc.).
* Let CryptoAlarm **buy/sell automatically** when:
  + Your conditions are met.
  + AI models confirm trend direction.
* Define safe trading rules:
  + Max trade amount
  + Stop-loss / Take-profit levels
  + Daily trade limits
* All transactions are logged and visible in the dashboard.
* Uses **read-only or trade-only API keys** (never withdrawal rights).

**🧭 4. Alert Dashboard**

* Intuitive **Next.js + TailwindCSS** dashboard.
* Manage, edit, or delete alerts easily.
* Live crypto price charts and AI insights.
* Light/Dark mode with responsive mobile support.
* “Load Sample Data” option for demo or preview use.

**🧑‍💼 5. User Accounts & Roles**

* Authentication via **Supabase Auth** (Email / OAuth).
* Role-based access:
  + **User:** Can create and manage alerts.
  + **Admin:** Can monitor alerts, manage users, view logs.
  + **Super Admin:** Full system control, data management, and configurations.
* Multi-language support (**English & French**).
* Session timeout and re-authentication for security.

**🔐 6. Security & Reliability**

* Email verification required on signup.
* Account lockout after multiple failed logins.
* Encrypted API key storage (AES or field-level encryption).
* Audit logs for every system or trading action.
* IP restriction for admin access (optional).
* Security notifications (e.g., unusual login, role changes).

**📊 7. Data & Storage**

* Database: **Supabase (PostgreSQL)**  
  Tables include:
  + users
  + alerts
  + trigger\_logs
  + exchange\_accounts
  + audit\_logs
  + ai\_recommendations
* Realtime WebSocket updates for live alerts.
* Historical data tracking and exportable reports.

**🌍 8. Multi-Environment Deployment**

* **Localhost (Development):** Testing with mock crypto data.
* **Staging (Testing):** Preview new features.
* **Production:** Public domain, live market data enabled.
* Hosting:
  + Frontend on **Netlify or Vercel**
  + Backend on **Render or Supabase Edge Functions**

**📱 9. Notification System (MailerSend + Twilio)**

* MailerSend for transactional emails (alerts, verifications, invoices).
* Twilio for:
  + SMS notifications.
  + Automated voice calls reading alerts.
* Supabase triggers automate email dispatch after alert conditions are met.

**🧩 Tech Stack Breakdown**

| **Component** | **Technology** | **Purpose** |
| --- | --- | --- |
| **Frontend** | Next.js + TailwindCSS | Dashboard UI & interactions |
| **Backend API** | FastAPI | Core logic, AI orchestration, trading API integration |
| **Database** | Supabase (PostgreSQL) | Users, alerts, logs, trades |
| **AI/ML Layer** | OpenAI API | AI signals & market insights |
| **Notifications** | MailerSend + Twilio | Multi-channel alert delivery |
| **Hosting** | Netlify / Vercel (Frontend), Render / Supabase Edge (Backend) | Deployment & scalability |
| **Realtime Data** | WebSockets + Exchange APIs | Live crypto feed |
| **Security** | Supabase Auth + Encryption + Rate Limiting | Account & data protection |

**🧠 AI Integration Capabilities**

* **Predictive models**: price direction or volatility forecasting.
* **Natural-language commands**: “Alert me when ETH gains 10%.”
* **Automated trading**: AI executes trades based on learned strategies.
* **Continuous learning**: Model adjusts alerts based on historical success.

**⚙️ Future Roadmap**

1. Add Telegram/Discord bot integration.
2. Support portfolio tracking & balance visualization.
3. Add DEX integration for DeFi alerts.
4. Expand AI analytics (sentiment, correlation analysis).
5. Offer premium tier with more AI-driven automation.

**🧾 Example Workflow**

1. User signs up via email → verifies account.
2. Sets alert: “Notify me when BTC > $70,000.”
3. AI engine monitors in real-time.
4. Condition triggers → Twilio voice call + push alert sent.
5. If automation enabled, FastAPI executes trade instantly via exchange API.
6. Result logged → visible in user dashboard.
7. Admin can view all user activities and logs.

**🔔 Task Summary (for Builder AI / Dev Agent)**

**Task:** Build a full-stack, AI-powered crypto monitoring and automation app called **CryptoAlarm**.  
The system will allow users to create alerts, receive multi-channel notifications, and optionally execute automated trades when conditions are met. Include AI signal generation, user roles, authentication, admin dashboard, Supabase integration, and Twilio/MailerSend-based notification delivery.