WhatsApp Chatbot for Cyber Crime Helpline (1930)

Odisha

A Comprehensive Solution for Digital Grievance Management

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Problem Statement

Background:

The Cyber Crime Helpline 1930 is a critical platform through which citizens report online financial frauds and cyber-related offenses. However, due to the increasing number of calls received daily, many complainants are required to wait in long call queues before their issues can be addressed.

Objective:

Design and develop a WhatsApp Chatbot that can act as an alternative communication channel to the 1930 Helpline. The chatbot should automatically collect complainant information, register the complaint/query, and generate a reference number for tracking or follow-up.

Key Challenges:

- Long waiting times in call queues
- Limited availability (working hours only)
- Manual data collection process
- High volume of complaints
- Need for 24/7 accessibility

Solution Overview

A comprehensive WhatsApp-based chatbot system that provides an instant, user-friendly, and accessible channel for submitting cybercrime complaints, thereby improving the efficiency of grievance registration under the Cyber Crime Helpline framework.

Key Benefits:

✓ 24/7 availability - No waiting queues

✓ Automated data collection - Step-by-step guidance

✓ Instant reference number generation

✓ Multiple complaint types supported

✓ Document/image upload support

✓ Status tracking capability

✓ Admin dashboard for management

✓ Natural Language Understanding (NLU) integration

Functional Requirements

1. WhatsApp Business API Integration

- Two-way messaging through WhatsApp Business API
- Interactive buttons and lists for better user experience
- Media handling (images, documents)

2. Data Collection

- Name, Father/Spouse/Guardian Name
- Date of Birth, Phone Number, Email ID
- Gender, Village, Post Office
- Police Station, District, PIN Code

3. Natural Language Understanding (NLU)

- Intent detection for common queries ("I have been scammed", "My money is stuck")
- Auto-routing based on user intent
- Intelligent query handling using Google Gemini AI

Complaint Types & Categories

A. New Complaint

A-1. Financial Fraud (23 Types)

Financial Fraud Types (1-12)	Financial Fraud Types (13-23)
1. Investment/Trading/IPO Fraud	13. Lottery Fraud
2. Customer Care Fraud	14. Hotel Booking Fraud
3. UPI Fraud	15. Gaming App Fraud
4. APK Fraud	16. AEPS Fraud
5. Fake Franchisee/Dealership Fraud	17. Tower Installation Fraud
6. Online Job Fraud	18. E-Wallet Fraud
7. Debit Card Fraud	19. Digital Arrest Fraud
8. Credit Card Fraud	20. Fake Website Scam Fraud
9. E-Commerce Fraud	21. Ticket Booking Fraud
10. Loan App Fraud	22. Insurance Maturity Fraud
11. Sextortion Fraud	23. Others
12. OLX Fraud	

Social Media Fraud Support

A-2. Social Media Fraud Platforms:

Facebook: Impersonation/Fake Account/Hack/Obscene Content

Channel: Meta India Grievance Channel

Instagram: Impersonation/Fake Account/Hack/Obscene Content

Channel: Meta India Grievance Channel

X (Twitter): Impersonation/Fake Account/Hack/Obscene Content

Channel: X India Grievance Channel

WhatsApp: Impersonation/Fake Account/Hack (with call forwarding removal)

Channel: WhatsApp India Grievance Channel

Telegram: Impersonation/Fake Account/Hack/Obscene Content

Channel: Telegram India Grievance Channel

Gmail/YouTube: Impersonation/Hack/Obscene Content

Channel: Google Recovery

Fraud Call/SMS: Fraud call and SMS reporting

Channel: Sanchar Saathi

System Workflow
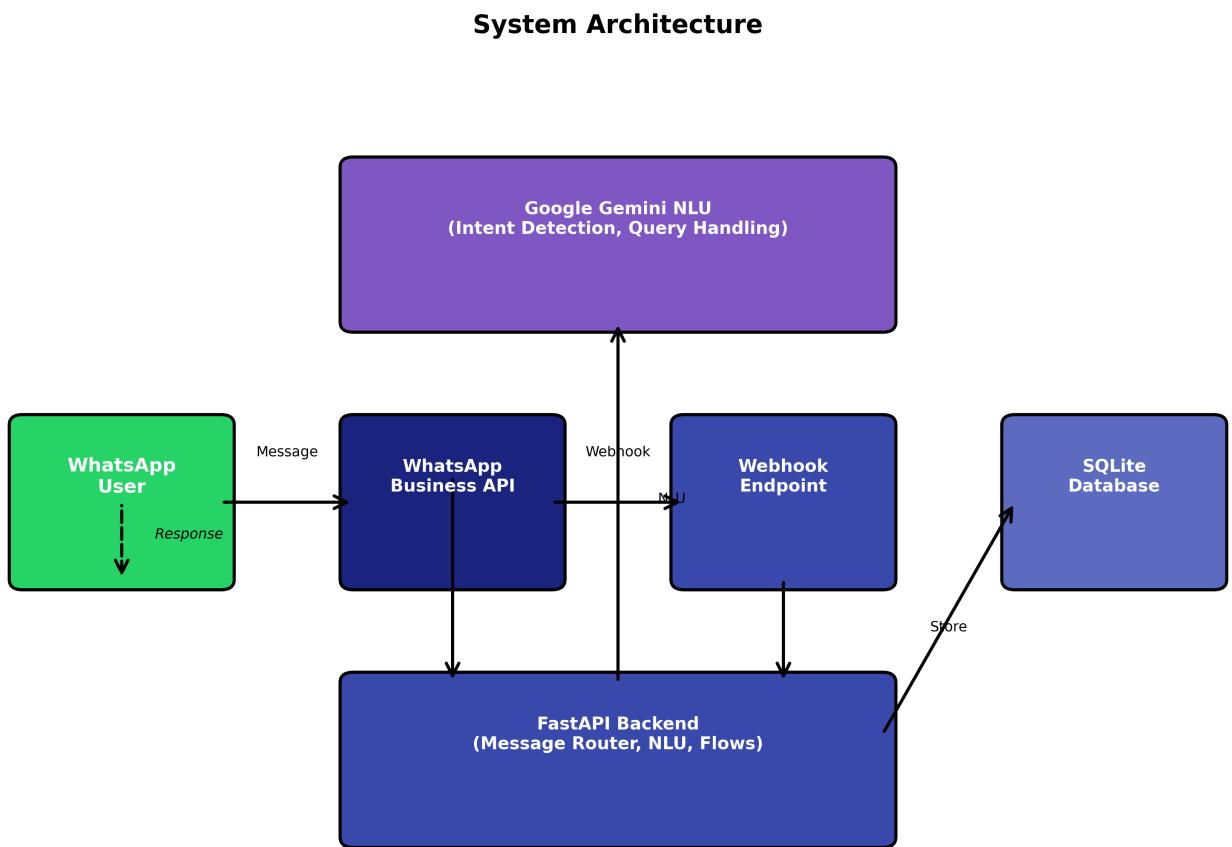
Main Menu Options:

Option	Function	Details
A	New Complaint	Financial Fraud (23 types) or Social Media Fraud (7 platforms)
B	Status Check	Check existing complaint using Acknowledgement Number or Mobile Number
C	Account Unfreeze	Request account unfreezing with account number
D	Other Queries	General queries handled by NLU/Gemini AI

New Complaint Flow:

1. User selects complaint type (Financial/Social Media)
2. Selects specific fraud type or platform
3. Provides personal information (11 fields)
4. Provides address information (5 fields)
5. Uploads supporting documents/images
6. Receives unique Reference Number

System Architecture

Technical Architecture
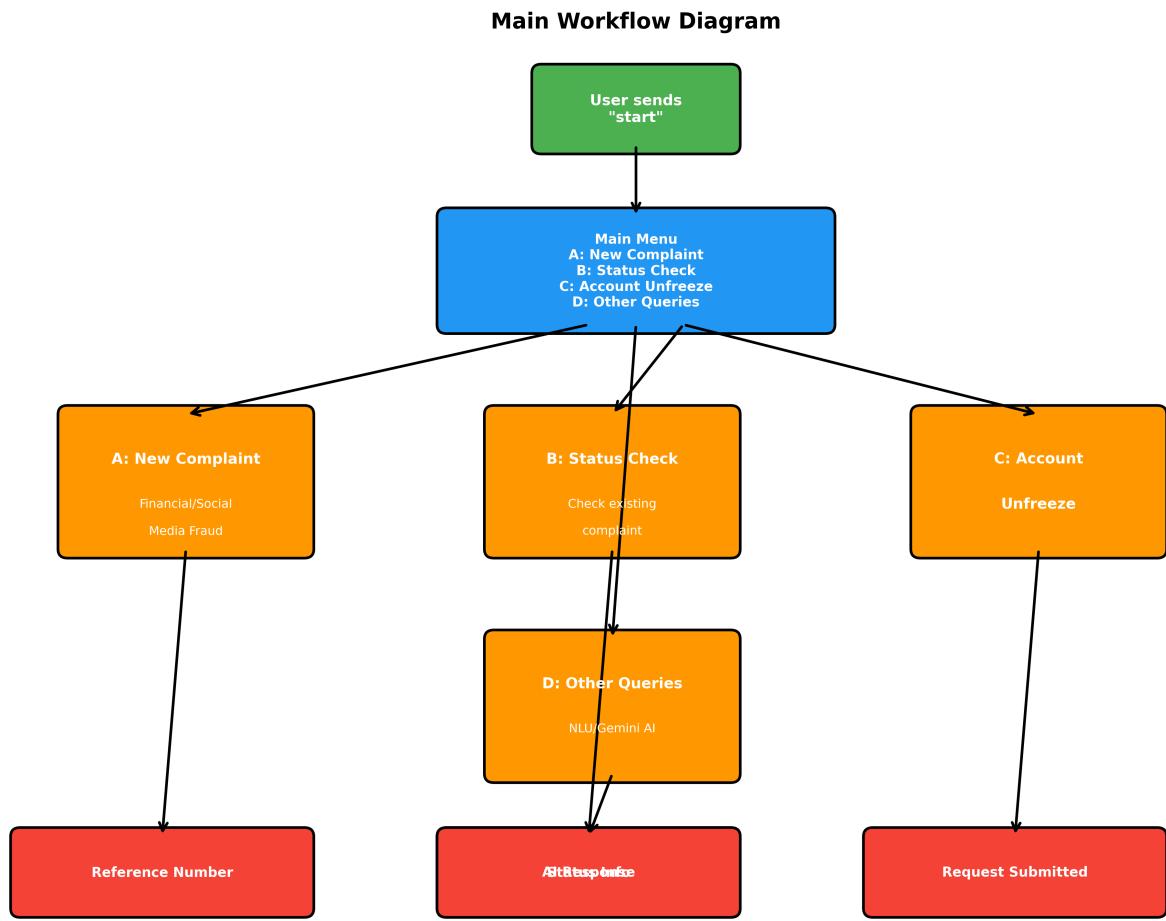
Technology Stack:

| Component	Technology	Purpose
Backend Framework	FastAPI (Python)	RESTful API, Webhook handling
Database	SQLite	Data storage (lightweight, no setup)
ORM	SQLAlchemy	Database abstraction
PDF Generation	ReportLab	Complaint reports
WhatsApp API	Meta WhatsApp Business API	Two-way messaging
NLU/AI	Google Gemini API	Intent detection, query handling
Frontend (Admin)	React + TypeScript	Admin dashboard
Server	Uvicorn	ASGI server
Testing	ngrok	Webhook testing

System Architecture:
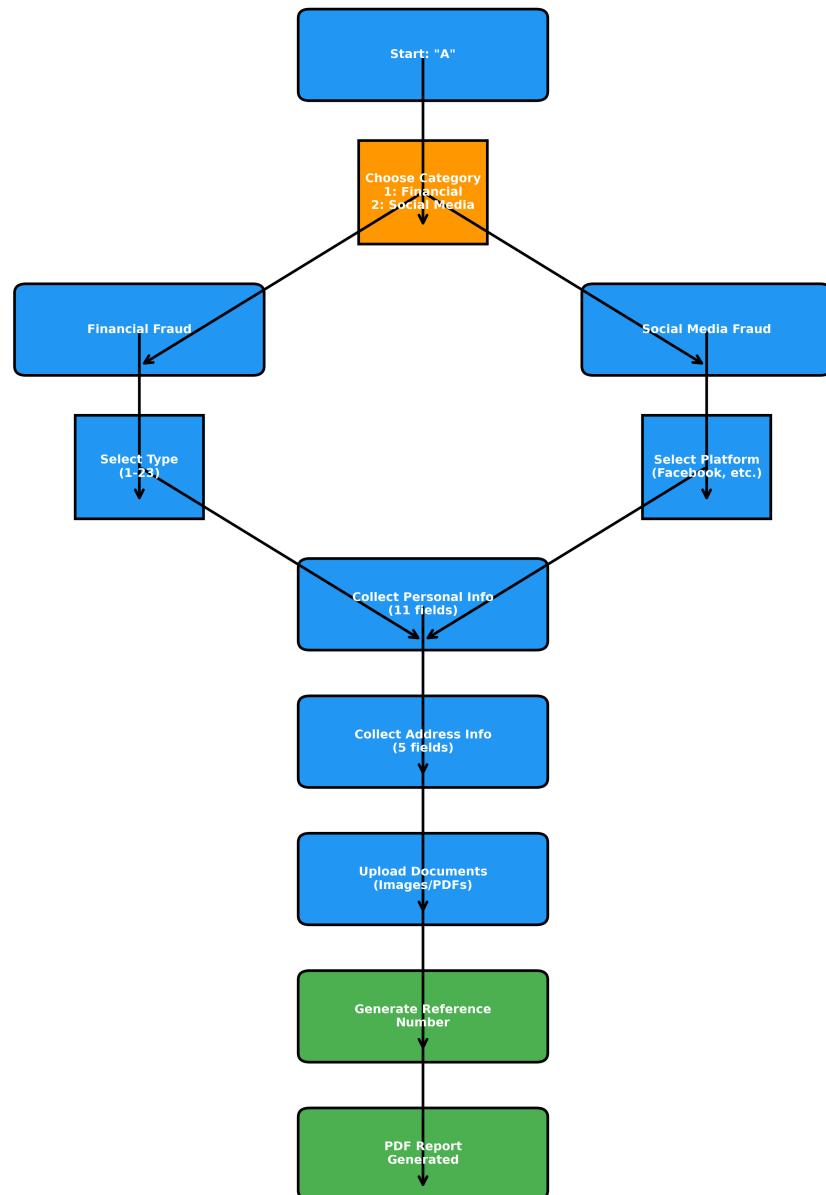
WhatsApp Business API → Webhook Endpoint → FastAPI Backend → SQLite Database → Response Generation → WhatsApp API → User

Main Workflow Diagram

Main Workflow Diagram


```
              ┌─────────────────┐
              │  User sends     │
              │    "start"      │
              └─────────────────┘
                       │
                       ▼
              ┌─────────────────────┐
              │   Main Menu         │
              │ A: New Complaint    │
              │ B: Status Check     │
              │ C: Account Unfreeze │
              │ D: Other Queries    │
              └─────────────────────┘
```

A: New Complaint

Financial/Social

Media Fraud

B: Status Check

Check existing

complaint

C: Account

Unfreeze

D: Other Queries

NLU/Gemini AI

Reference Number

Status Info

Request Submitted
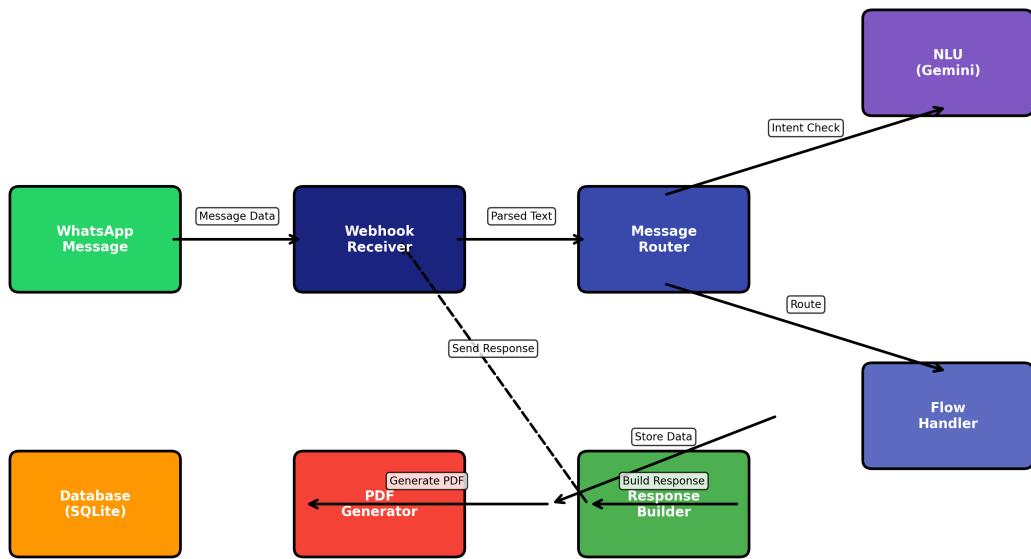
New Complaint Flow Diagram

New Complaint Flow (Option A)

Start: "A"

Choose Category
1: Financial
2: Social Media

Financial Fraud

Social Media Fraud

Select Type
(1-23)

Select Platform
(Facebook, etc.)

Collect Personal Info
(11 fields)

Collect Address Info
(5 fields)

Upload Documents
(Images/PDFs)

Generate Reference
Number

PDF Report
Generated
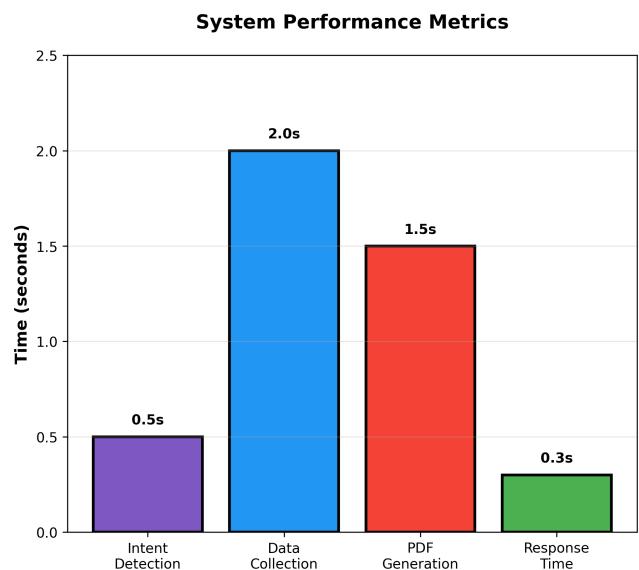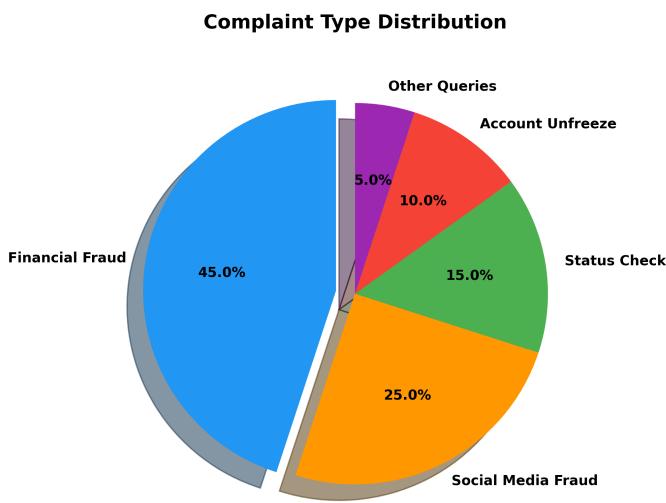
Data Flow Diagram

Data Flow Diagram

System Statistics & Performance

Complaint Type Distribution

- Financial Fraud: 45.0%
- Social Media Fraud: 25.0%
- Status Check: 15.0%
- Account Unfreeze: 10.0%
- Other Queries: 5.0%

System Performance Metrics

- Intent Detection: 0.5s
- Data Collection: 2.0s
- PDF Generation: 1.5s
- Response Time: 0.3s

Key Features & Innovations

- **Interactive UI:** WhatsApp interactive buttons and lists for seamless navigation

- **NLU Integration:** Google Gemini AI for intent detection and natural query handling

- **Auto-routing:** Intelligent routing based on user messages (e.g., "I have been scammed")

- **Data Validation:** Real-time validation for phone numbers, emails, PIN codes, dates

- **Document Upload:** Support for images, screenshots, PDFs with secure storage

- **Reference Generation:** Unique ticket numbers (1930-OD-YYYYMMDD-XXXXX) for tracking

- **PDF Reports:** Automated PDF generation with embedded images for each complaint

- **Admin Dashboard:** React-based admin console with stats, filters, and exports

- **Status Tracking:** Check complaint status using reference number or mobile number

- **Platform Guidance:** Platform-specific links and instructions for social media frauds

Data Validation & Security

Validation Rules:

✓ Phone Number: 10-digit Indian mobile number format

✓ Email ID: Standard email format validation

✓ PIN Code: 6-digit Indian postal code

✓ Date of Birth: DD/MM/YYYY format validation

✓ Account Number: Alphanumeric validation

Security Measures:

✓ SQL injection protection (SQLAlchemy ORM)

✓ Input sanitization and validation

✓ Secure webhook verification

✓ Local data storage (no third-party sharing)

✓ Encrypted API communications

✓ Access control for admin dashboard

Deliverables

Working Prototype:

Fully functional WhatsApp chatbot integrated with WhatsApp Business API, test database, and complete workflow implementation

Admin Dashboard:

React/TypeScript-based admin console with: • View all complaints with filters • Statistics and analytics • Export to CSV/JSON • PDF report generation • Image/document preview • Search and filter capabilities

Documentation:

Comprehensive documentation including: • System architecture diagrams • Data flow documentation • API specifications • Security measures • Deployment guide • User manual • Admin guide

Database Schema:

Structured database with: • User management • Complaint records • Conversation state tracking • Document storage references

PDF Report Generation:

Automated PDF reports for each complaint with: • All collected information • Embedded images/documents • Reference number • Timestamp and status

Evaluation Parameters

User Experience:

• Simple and intuitive interface • Step-by-step guidance • Interactive buttons for easy navigation • Clear prompts and error messages • Fast response times

System Security & Data Protection:

• Input validation and sanitization • SQL injection protection • Secure API communications • Local data storage • Access control mechanisms

Scalability and Performance:

• Stateless backend design • Efficient database queries • Fast response generation • Support for concurrent users • Optimized media handling

Innovation in Design:

• NLU integration for intelligent routing • Auto-detection of complaint intent • Interactive WhatsApp components • Automated PDF generation with images • Real-time admin dashboard • Platform-specific guidance

Impact & Benefits

This solution significantly enhances citizen convenience by offering an instant, user-friendly, and accessible channel for submitting cybercrime complaints, thereby improving the efficiency of grievance registration under the Cyber Crime Helpline framework.

Key Impacts:

✓ Reduced waiting times - No call queues, instant access

✓ 24/7 availability - Citizens can file complaints anytime

✓ Improved efficiency - Automated data collection

✓ Better tracking - Unique reference numbers for all complaints

✓ Enhanced user experience - Interactive, guided process

✓ Comprehensive coverage - 23 financial fraud types + 7 social media platforms

✓ Document support - Easy evidence submission

✓ Admin efficiency - Centralized dashboard for complaint management

Implementation Status

■ Completed Features:

✓ Complete workflow implementation (A, B, C, D)

✓ All 23 financial fraud types

✓ All 7 social media platforms with platform-specific guidance

✓ Complete data collection (11 personal + 5 address fields)

✓ Data validation (phone, email, PIN, DOB)

✓ Document/image upload and storage

✓ Reference number generation

✓ PDF report generation with embedded images

✓ Admin dashboard (React/TypeScript)

✓ Status check functionality

✓ Account unfreeze flow

✓ NLU integration with Google Gemini

✓ Intent detection and auto-routing

✓ Interactive buttons and lists

✓ CSV/JSON export functionality

Conclusion

The WhatsApp Chatbot for Cyber Crime Helpline (1930) provides a comprehensive, user-friendly, and efficient solution for digital grievance management. With its advanced features including NLU integration, interactive UI, and automated workflows, it significantly improves the accessibility and efficiency of the cybercrime reporting process.

The system is ready for deployment and can handle high volumes of complaints while maintaining data security and providing an excellent user experience.

Thank You