HACK-CSE-LERATE

Abstract – 01

Problem Title: AI-Powered Legal Aid Chat Bot

Team Name: Code Mavericks

Team Members details:

Role	Name	USN	Email id	Phone no.
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Team Member 4				

Problem Description:

Access to legal assistance is a significant challenge for low-income individuals due to various barriers:

1. **Financial Barriers**: High legal fees and additional costs (court fees, document filing, etc.) make hiring a lawyer unaffordable for many people.
2. **Lack of Awareness**: Many individuals are unaware of their legal rights or struggle with complex legal language, leading to poor decision-making or missed opportunities for justice.
3. **Overburdened Legal Aid Services**: Public legal aid services are often understaffed and underfunded, causing long wait times and limited availability, especially for non-urgent cases.
4. **Geographic & Social Barriers**: Rural populations, non-native speakers, and vulnerable groups (e.g., undocumented immigrants, domestic violence victims) face additional challenges accessing legal support due to geographic isolation, language barriers, or fear of retaliation.
5. **Consequences**: Without legal assistance, individuals may suffer from issues like eviction, wrongful termination, or unfair treatment, which can lead to lasting social and financial problems.

This system creates an environment where the most vulnerable individuals are denied access to justice.

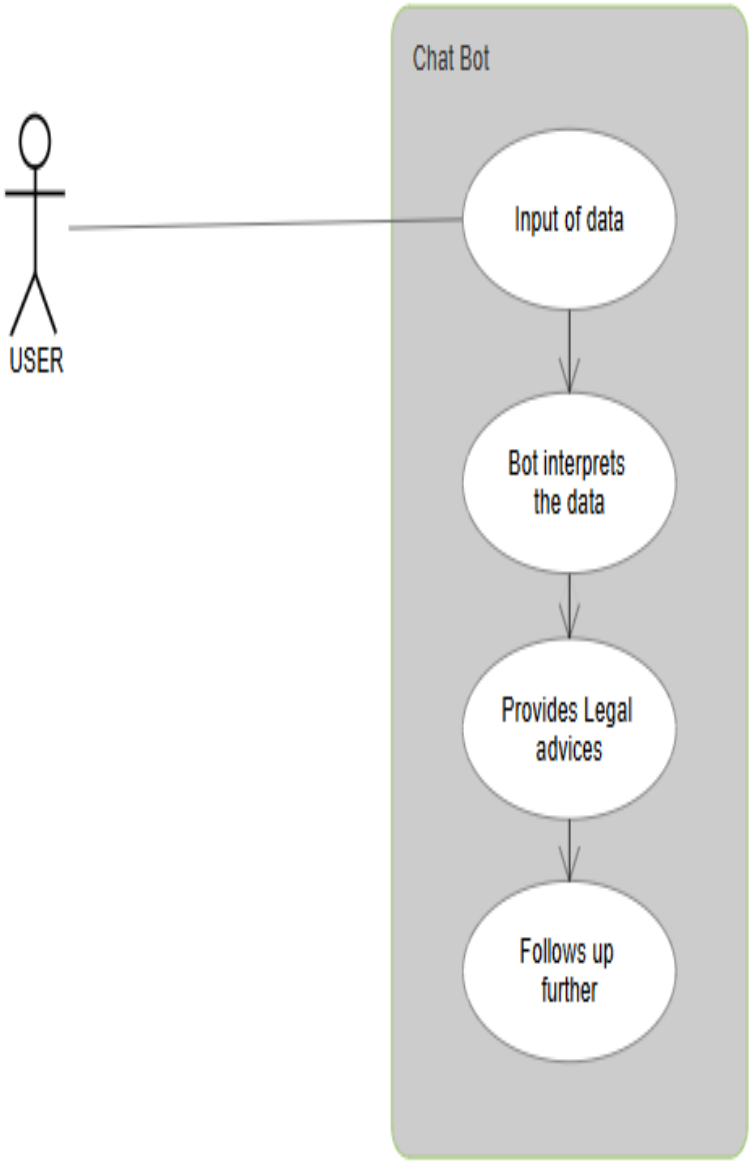
Proposed solution:

The AI-powered legal aid chat bot provides free, instant legal guidance to individuals, particularly those who are low-income or underserved. Here's a brief overview of its functionality:

1. **NLP Understanding**: The chat bot uses Natural Language Processing (NLP) to interpret users' legal queries and identify their intent, such as tenant rights, labor laws, or immigration issues.
2. **General Legal Advice**: Based on predefined legal frameworks, it provides general legal advice on common issues like eviction, employment disputes, or consumer rights, helping users understand their rights and options.
3. **Guidance on Next Steps**: The chat bot suggests actionable next steps, such as filing complaints, drafting documents, or referring users to legal resources and services.
4. **Connecting to Legal Professionals**: For more complex issues, the chat bot connects users to real legal professionals or local legal aid services for further assistance.

This chat bot empowers users with instant, accessible, and free legal support, reducing barriers to justice.

Use Case Diagram



Technology Stack

Tech Stack Breakdown for AI-Powered Legal Aid Chatbot

1. **AI Model (NLP & Legal Query Processing)**
    - **OpenAI GPT**: Handles natural language understanding and generates responses to legal queries.
    - **Google Dialog flow**: Manages chat bot conversations with intent recognition and contextual responses.
2. **Backend (API & Business Logic)**
    - **FastAPI (Python)**: A high-performance, asynchronous web framework for handling chat bot interactions efficiently.
    - **Django (Python)**: A robust framework for managing authentication, case tracking, and legal database interactions.
3. **Database (Storage & Retrieval)**
    - **Postgre SQL**: A scalable, relational database for storing legal knowledge, user interactions, and case records.
    - **Firebase**: Used for real-time data sync, especially for chat history and mobile interactions.
4. **Frontend (User Interface)**
    - **React.js (Web)**: Provides a smooth, responsive chatbot interface for web users.
    - **Flutter (Mobile App)**: Enables cross-platform mobile access with a seamless UI experience.
5. **Cloud Services (Scalability & Deployment)**
    - **AWS Lambda**: Server less architecture for handling chat bot requests efficiently, ensuring scalability and cost-effectiveness.

This stack ensures the chat bot is **fast, scalable, and accessible** across multiple platforms while offering **real-time legal assistance** powered by AI.

Applications

Key Applications of the AI-Powered Legal Chatbot

1. **Public Legal Aid & Access to Justice**
   - Provides free legal guidance to low-income individuals.
   - Reduces pressure on public legal aid services by answering common legal queries.
2. **Tenant & Employment Rights**
   - Assists with evictions, rental disputes, and tenant rights.
   - Guides employees on unfair dismissal, workplace harassment, and wage theft.
3. **Consumer Protection & Business Support**
   - Helps users resolve consumer disputes (refunds, faulty products, contract violations).
   - Assists small businesses with legal compliance, contracts, and startup laws.
4. **Family & Domestic Violence Assistance**
   - Provides confidential support for domestic violence victims (legal protections, restraining orders).
   - Guides users on divorce, child custody, and alimony.
5. **Immigration & Criminal Law Support**
   - Educates users on visa applications, asylum, and residency laws.
   - Helps individuals understand rights during police encounters and criminal proceedings.

Conclusion:

This chat bot bridges the legal access gap by providing instant, free, and easy-to-understand legal assistance, making justice more accessible for everyone.

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Abstract - 02

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PROBLEM DESCRIPTION:

Food waste is a major global issue, with **over 1.3 billion tons of food wasted annually** while millions suffer from food insecurity. The problem is worsened by inefficiencies in food distribution:

- **Restaurants, supermarkets, and farms generate surplus food**, which often goes to waste due to logistical challenges.
- **NGOs and food banks struggle to match supply with demand efficiently**, leading to uneven food distribution.
- **Limited real-time coordination** between food donors, logistics providers, and recipient organizations results in food spoilage.
- **Lack of optimized delivery routes** increases transportation costs and delays, making redistribution ineffective.

A **technology-driven solution** is needed to **bridge the gap** between food donors and recipients, optimizing redistribution efforts while minimizing waste.

PROPOSED SOLUTION:

An AI-driven platform that connects food donors (restaurants, supermarkets, farms) with NGOs and food banks to efficiently redistribute surplus food. The system includes:

Smart Food Matching System (AI-powered):

- Uses TensorFlow AI models to predict where surplus food is most needed based on demand patterns and food expiration data.

Real-Time Platform for Food Donations:

- Food businesses list surplus food, and AI recommends the best recipients (NGOs, shelters, food banks).

Optimized Delivery & Logistics:

- Google Maps API & AI-based route optimization ensure efficient delivery routes, minimizing delays and costs.

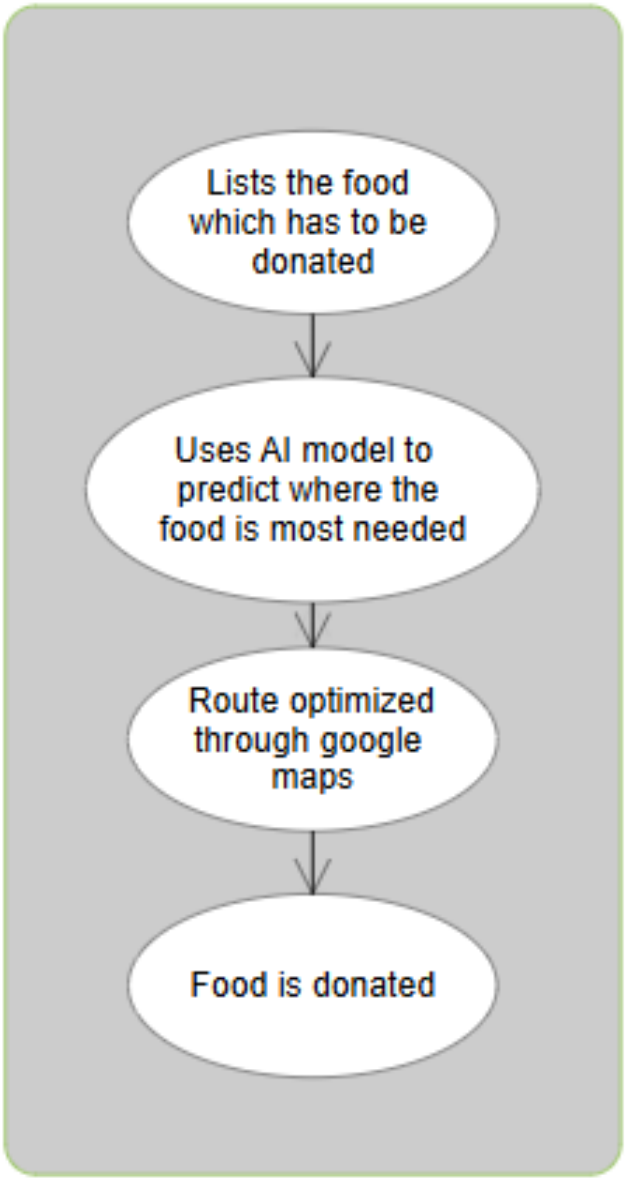
Mobile & Web Access for All Users:

- Web app (React.js) and mobile app (Flutter) provide an easy interface for food donors, NGOs, and drivers.

Cloud-Powered & Scalable Solution:

- AWS Lambda (Server less Execution) ensures high scalability with minimal infrastructure costs.

USE CASE DIAGRAM:



TECHNOLOGY STACK:

1. Backend (API & Business Logic)

- **Node.js (Express)** – Fast, scalable backend for handling API requests.
- **Django (Python)** – Manages business logic, user authentication, and AI integration.

2. Database (Storage & Real-Time Updates)

- **PostgreSQL** – Stores structured data (food inventory, users, donation records).
- **Firebase** – Provides real-time database updates for mobile and web users.

3. Frontend (User Interface)

- **React.js (Web App)** – Ensures a smooth and responsive interface for food donors, NGOs, and logistics teams.
- **Flutter (Mobile App)** – Provides a cross-platform mobile experience for on-the-go users.

4. AI & Machine Learning

- **TensorFlow / PyTorch** – AI-driven demand prediction and food-donor matching.
- **Google Maps API / Mapbox API** – Optimized delivery route planning and real-time tracking.

5. Cloud Services (Scalability & Hosting)

- **AWS Lambda / Google Cloud Functions** – Serverless architecture for high scalability and cost efficiency.
- **Docker & Kubernetes** – Containerized deployment for robust system performance.

APPLICATIONS :

1. **Restaurants, Supermarkets & Farms** – Donate surplus food efficiently, track expiring products, and distribute excess produce to food banks.
2. **NGOs & Food Banks** – Optimize food distribution, reduce manual efforts, and ensure equitable food allocation based on real-time demand.
3. **Logistics & Delivery Services** – Improve food transportation with AI-driven **route optimization** and real-time tracking, reducing delivery costs and delays.
4. **Government & Municipal Programs** – Support **hunger relief efforts, disaster response, and food waste reduction policies**, ensuring surplus food reaches those in need.
5. **Corporate Social Responsibility (CSR) Initiatives** – Help businesses meet **sustainability goals**, track donations, and strengthen partnerships with non-profits.
6. **Smart Cities & Sustainability** – Reduce food waste in urban areas, support **zero-waste city initiatives**, and encourage community-based food-sharing programs.
7. **Hotels, Catering & Event Management** – Minimize post-event food waste by **redistributing leftover food** to shelters and food banks efficiently.

This system **bridges the gap between food surplus and food scarcity**, ensuring efficient, tech-driven redistribution to minimize waste and fight hunger.