

# HOMII : Conversational AI for Instant Home Service Booking

## Introduction

Booking a home service should be as simple as sending a message.

Our system eliminates app navigation by converting natural conversation directly into confirmed service bookings within seconds.

Traditional home service applications often require users to browse multiple categories, navigate complex interfaces, and manually complete booking steps. This creates friction, particularly for elderly users, busy professionals, and individuals who are not comfortable using technology.

To address this gap, we propose a conversational AI-driven platform that enables instant service booking through simple chat interactions.

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## Problem Statement

Current service-booking platforms demand excessive user effort before a request can be placed. In urgent situations, users should not have to scroll through applications to find the right service.

There is a clear need for a faster, more intuitive, and accessible solution that minimizes interaction time while maximizing efficiency.

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## Proposed Solution

We propose **HOMII**, an **AI-powered** conversational system that allows users to request home services via a web chat interface or Telegram bot using natural language in English, Hindi, or Hinglish.

The AI engine interprets user messages, extracts key booking details, assigns a helper automatically, and generates instant confirmation.

The platform transforms unstructured conversational input into structured transactional data, removing friction from the booking process.

Additionally, the system is designed as a foundation for hyperlocal service marketplaces, enabling seamless expansion in real-world deployments.

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## Objectives

### Primary Objective

- Enable instant booking of home services through a conversational AI interface.

### Secondary Objectives

- Reduce the time required to place a booking
  - Eliminate complex app navigation
  - Support multilingual communication
  - Automate provider assignment
  - Provide immediate confirmation with estimated arrival time
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## System Workflow

The proposed system follows a structured and automated workflow:

### Step 1 – User Interaction

The user sends a message such as “*Mujhe plumber chahiye urgent*” via the web chat or Telegram bot.

### Step 2 – Intent Detection

The AI engine analyzes the message to extract:

- Service type
- Urgency level
- Location (if available)

If the request is unclear, the system intelligently suggests relevant services, ensuring graceful failure handling and uninterrupted user experience.

### **Step 3 – Structured Booking Creation**

The extracted information is converted into structured booking data containing service type, priority level, and booking status.

### **Step 4 – Provider Assignment**

The system automatically matches the request with an available helper using service mapping and availability checks.

Dynamic provider allocation ensures minimal waiting time.

### **Step 5 – ETA Generation**

An estimated arrival time is generated to enhance transparency and build user trust.

### **Step 6 – Instant Confirmation**

The user immediately receives:

- Booking ID
- Assigned helper
- Estimated arrival time

### **Step 7 – Chat History Storage**

Conversations are securely stored to enable context-aware interactions and future personalization.

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# System Architecture

The platform follows a lightweight, scalable architecture optimized for real-time conversational workflows.

## Architecture Flow:

User → Chat Interface → Backend Server → AI Engine → Booking Service → Database → Confirmation

A unified backend serves both the web application and Telegram bot, ensuring consistency and maintainability.

The system follows a stateless backend design, enabling horizontal scalability while maintaining low latency.

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# Technology Stack

Layer	Technology
Frontend	Web Chat Interface (Vercel – Free Tier)
Backend	Node.js with Express
Database	MongoDB Atlas (Free Tier)
AI/NLP	Gemini API with rule-based fallback
Messaging	Telegram Bot API

The solution is built entirely on free-tier services, making it highly cost-efficient and deployable within hackathon constraints.

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# Implementation Strategy

To ensure successful delivery within the hackathon timeframe, development will follow a modular approach:

## Phase 1 – Backend Foundation

- Set up Node.js server
- Configure MongoDB database
- Develop booking APIs

## Phase 2 – AI Integration

- Connect Gemini API for intent extraction
- Implement rule-based fallback for reliability

## Phase 3 – Provider Automation

- Develop helper assignment logic
- Enable ETA generation

## Phase 4 – Interface Development

- Build web-based chat interface
- Integrate Telegram bot

## Phase 5 – Testing & Optimization

- Validate complete booking flow
- Reduce response latency
- Ensure real-time confirmations

This structured approach minimizes development risk while ensuring a fully functional prototype.

The architecture avoids unnecessary complexity to maximize stability during live demonstrations.

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## What Makes This Solution Different

- Removes the need to browse service categories
  - Converts chat directly into transactions
  - Supports code-mixed language (Hinglish)
  - Designed specifically for urgency-driven scenarios
  - Enables booking without application friction
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## Real-World Impact

This solution significantly improves accessibility to home services for elderly individuals, busy professionals, and users unfamiliar with complex mobile applications.

By simplifying the booking experience, the platform has the potential to redefine how people access urgent household assistance.

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## Feasibility

The proposed system prioritizes functional efficiency over feature overload, ensuring reliability within constrained development time.

Its modular architecture and use of free-tier technologies make it fully achievable within a 24-hour hackathon while maintaining performance and scalability.

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## Future Scope

The platform can be further enhanced with:

- Real-time GPS tracking for helpers
- Voice-based booking
- AI-driven provider recommendations

- Secure digital payment integration
  - Predictive demand analysis
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## Conclusion

The proposed system demonstrates how conversational AI can transform everyday service access into a seamless, instant, and intelligent experience.

By merging conversational AI with automated booking workflows, Chat-to-Book minimizes user effort, reduces waiting time, and delivers a faster, smarter way to access home services.