

# Bank Bot AI Chatbot For Banking FAQs

**Transforming Banking Through AI-Powered Conversations**

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# Project Overview: Automating the Banking Experience

## The Challenge

Traditional banking customer service relies heavily on manual systems, leading to lengthy wait times and high operational costs for routine queries.

## The Solution: BankBot

An intelligent AI chatbot leverages Natural Language Processing (NLP) and Machine Learning (ML) to provide instantaneous, accurate responses.

## Key Benefits

Ensures 24/7 availability, significantly reduces staff workload, and leads to measurably improved customer satisfaction scores.

# Milestone 1: Intent & Entity Recognition

The foundation of BankBot's intelligence relies on accurately understanding customer requests.



## Define Key Intents

Defined and cataloged core user goals, such as “Check Balance,” “Apply for Loan,” and “Report Lost Card,” providing diverse training examples.

## NLU Model Development

Built and rigorously tested the NLU model using the spaCy library for rapid and accurate language processing and analysis.

## Entity Extraction & Slot Filling

Implemented logic to extract critical details (entities) like account numbers or loan amounts and use them to fill necessary data slots for task completion.

- ❑ Outcome: The model successfully identifies and processes the top 10 banking intents and associated entities with high precision.

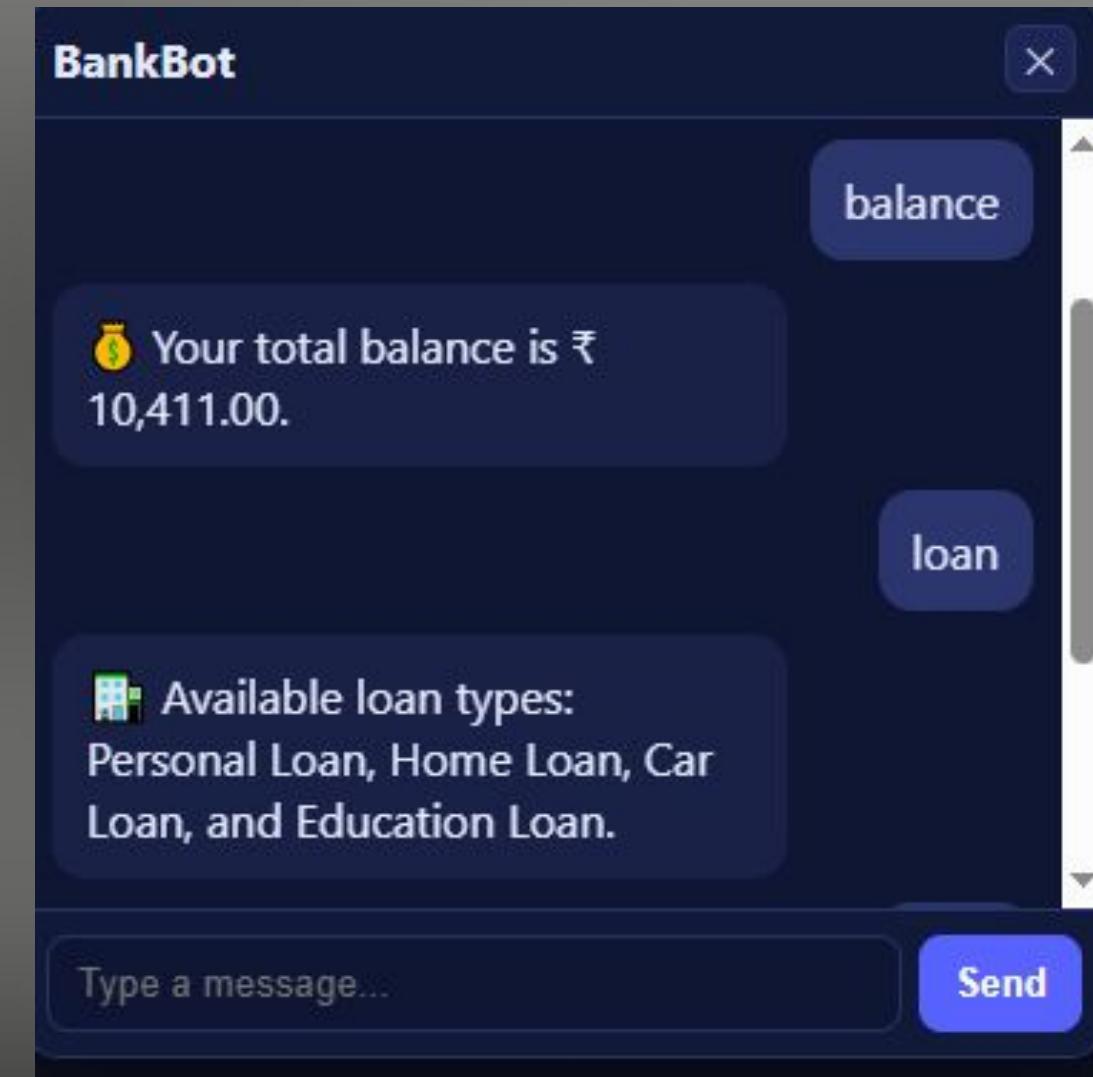
# Milestone 2: Dialogue Flow and Context Handling

## Ensuring Coherent Multi-Turn Conversations

A superior chatbot must maintain context across multiple user exchanges to feel natural and effective.

- **Conversation Flow:** Structured the dialogue using state-of-the-art ML-based stories and rules, ensuring a logical progression.
- **Context Tracking:** Implemented robust mechanisms for tracking context to support sophisticated multi-turn interactions and follow-up questions.
- **Graceful Fallback:** Developed specialized handlers to gracefully manage ambiguous, irrelevant, or unknown user intents, preventing frustrating dead ends.

Outcome: Successfully achieved a smooth, consistent, and context-aware dialogue flow that mimics human interaction quality.



# Milestone 3: UI Integration and User Experience

## Web Interface Development

Utilized Streamlit for rapid development of a dynamic, interactive, and responsive web interface for the chatbot.

## Real-Time Backend Connection

Established a stable, real-time connection between the Streamlit UI and the Flask-based chatbot backend via a secure REST API.

## Error Handling & Design

Focused on a user-friendly layout with robust error handling and mechanisms for graceful restarts following any potential system failures.

BankBot

👋 Hello! Ask me about balance, last transactions, loans, cards or transfers.

loans

🏦 Available loan types:  
Personal Loan, Home Loan, Car  
Loan, and Education Loan.  
Which one would you like?  
Entity : [loan\_flow]

Type a message...

Send

BankBot

Loan, and Education Loan.  
Which one would you like?  
Entity : [loan\_flow]

education loan

🏦 Available info for Education  
Loan: rates, EMI calculator and  
eligibility details. Would you like  
EMI or eligibility?  
Entity : [loan\_info]

Type a message...

Send

# Milestone 4: Admin Panel & Knowledge Base Management

The Admin Panel provides necessary controls for maintenance and continuous learning.

1

## Dashboard for Maintenance

Developed a secure admin dashboard to manage intents, FAQs, and review raw user query logs.

2

## Analytics & Reporting

Integrated features for CSV export, providing insights into intent distribution, top queries, and system performance metrics.

3

## Model Retraining

Enabled a critical feature allowing administrators to trigger and execute model retraining directly from the UI using new data.

The screenshot shows the Admin Panel's 'Training Data' section. It displays a list of CSV-like training content entries:

```
text,intent,response
hi,greet,👋 Hello! How can I help you today?
hello,greet,👋 Hi there! Ask me about
balance, transactions, loans, cards or
transfers.
hey,greet,👋 Hey! What can I do for you?
bye,goodbye,👋 Goodbye! Have a great day.
goodbye,goodbye,👋 See you next time.

what is my balance,balance_check,💰 Your
total balance appears on the left. I can also
read it out if you want.
check balance,balance_check,💰 Sure –
showing your account balance above.
```

Below the text area are two buttons: 'Save Changes' and 'Retrain Now'.

Further down, under 'Export / Utilities', is a button for 'Download Logs (CSV)'.

A note at the bottom indicates a 'Recent window size: 40'.

# Core Technology Stack

A selection of robust and scalable open-source technologies powers the BankBot system.



## Python & Flask

Used for all backend logic, handling REST API calls, and orchestrating component interactions.



## spaCy

The primary NLP engine, providing highly efficient intent recognition and entity extraction capabilities.



## Streamlit

Empowers the responsive and user-friendly frontend web interface for seamless customer interaction.



## SQLite / MySQL

Selected for reliable and persistent data management, storing conversation logs and the knowledge base.



## Render / Vercel

Chosen deployment infrastructure, enabling fast, scalable, and reliable cloud-based hosting.

# Outcomes

## Current Achievements

→ **Automation of Core Queries**

Successfully handles key banking queries in real-time, reducing the need for human intervention.

→ **Scalability & Real-Time Performance**

Built on a scalable architecture that ensures fast response times even during peak load periods.

→ **Retrainable & Adaptable**

Easy integration of new data and quick retraining cycles to adapt to evolving customer needs.

# Thank You

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