SRAVYA POLA

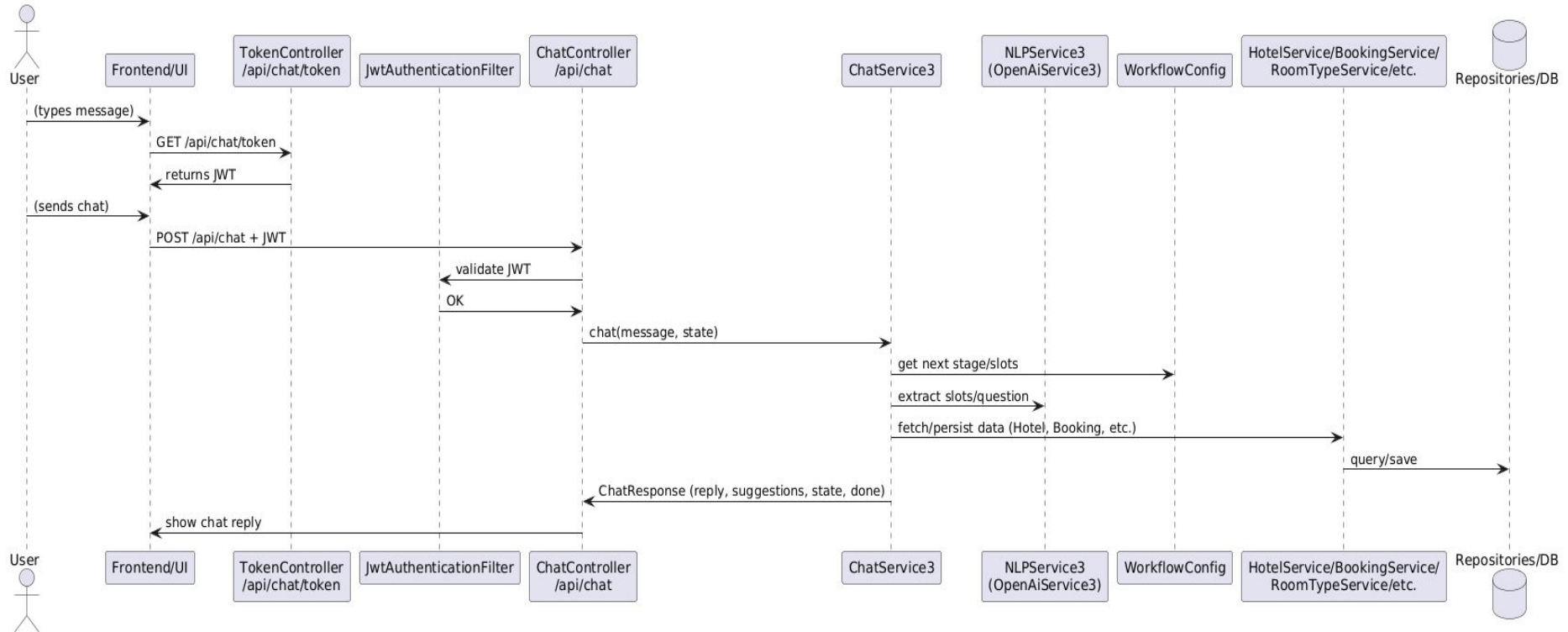## AI-Based Chatbot for Hotel Management Homepage

OVERVIEW :

- Our chat solution puts the entire guest journey at your users' fingertips: they describe what they need in plain language (destination, dates, party size, preferences), and the bot immediately finds available hotels, filters by stars/price/amenities, and presents options with quick-reply buttons.
- From there it guides them through room selection, add-on services (spa, room service, housekeeping), and loyalty-discount offers, calculates subtotals in real time, and lets them confirm and "pay" without ever leaving chat.
- After checkout, it collects structured feedback via one-tap ratings plus comments, then gracefully hands off to a live agent whenever someone types "agent," preserving the full conversation context.
- All of this works in multiple languages, upsells intelligently based on history, and runs over secure, JWT-protected REST APIs.

- Our solution features a Java-based backend built with Spring Boot and Spring AI, seamlessly integrating OpenAI's APIs to power natural-language understanding, slot filling, and dynamic response generation.
- We persist application data in PostgreSQL—augmented with pg vector for efficient embedding storage—and secure every request with Spring Security using JWT for stateless authentication.
- All chat interactions are exposed via RESTful endpoints, while our optional frontend leverages plain JavaScript and jQuery with Axios for lightweight, responsive API calls.
- For deployment, we containerize services with Docker, orchestrate them in Kubernetes, and host on your choice of AWS, Azure, or GCP; automated CI/CD pipelines ensure rapid, reliable builds and rollouts.

Complete Workflow for Hotel ChatBot Application :

To ensure secure and personalized interactions, the chatbot implements robust authentication using JSON Web Tokens (JWT). Each user session is assigned a short-lived token that protects sensitive operations and maintains privacy throughout the chat experience.
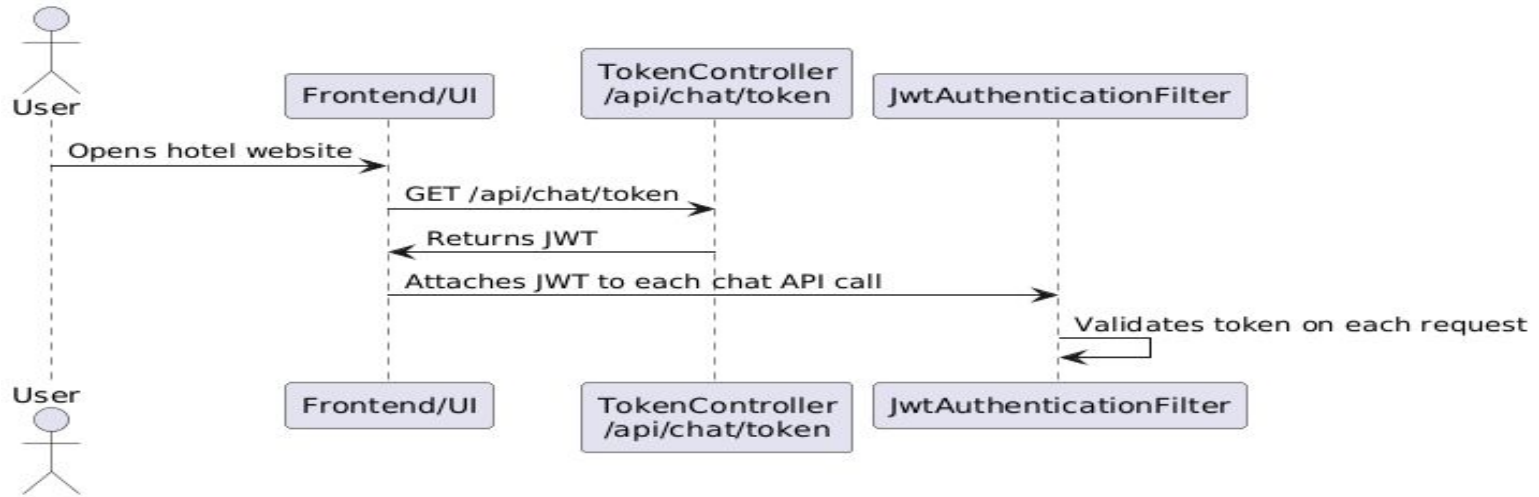
- Users authenticate via the Login Page (POST /api/auth/login)
- Backend issues a JWT (accessToken) on successful login
- Session Duration: JWT expires after 1 hour
- Key Rotation: Signing keys rotated every 7 days for enhanced security
- JWT stored in an HttpOnly cookie (or secure in-memory store)
- Each API call (search, chat, etc.) includes Authorization: Bearer <token>
- JwtAuthenticationFilter verifies signature, expiry, and validity
- Logout" button clears the access Token cookie (or storage)
- Frontend then redirects back to the Login Page

Please sign in

Username

admin

Password

••••••

Login

24/7 Availability
AI-powered support is online around the clock on desktop, tablet, and mobile.

Quick Search & Booking
Top search bar accepts destination (hotel/city/state), dates, number of rooms and guests.
"Search" button returns live availability.

Powerful Filtering
Left sidebar lets users refine by star rating (1–5), price range (up to $500), and amenities (Wi-Fi, parking, pool, etc.).

Clear Results & Next Steps
Central panel shows each hotel's name, star count, and location.
"View Details" & "Search Rooms" buttons guide guests seamlessly onward.

Continuous AI Assistance
Chatbot icon remains in the bottom-right on every page, ready to help at any stage.

Instant Chat Access
Chat widget auto-appears on page load—no extra clicks or logins needed.Guests simply click the bubble or start typing to begin.

Welcome to Booking Hotels Page

Search your desired hotel Below:

Narrow your search results

Hotel/City/State	No. Rooms	No. Guests	Check-In Date	Check-Out Date	
	1	1	mm/dd/yyyy	mm/dd/yyyy	**SEARCH**

Star Rating:
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5

Range:

Price: $500

Filters:
- ☐ Parking
- ☐ Breakfast
- ☐ WiFi
- ☐ Fitness Center
- ☐ Bar / Lounge
- ☐ Spa Services
- ☐ Swimming Pool
- ☐ Pet-Friendly
- ☐ Airport Shuttle
- ☐ Business Center

FILTER

List of Hotels:

Lakeview Lodge (4)	Lake Tahoe, CA	View Details / Search Rooms
Urban Oasis (5)	San Diego, CA	View Details / Search Rooms
Desert Sands Resort (5)	Palm Springs, CA	View Details / Search Rooms
Forest Haven (4)	Asheville, NC	View Details / Search Rooms
Coastal Breeze (3)	Myrtle Beach, SC	View Details / Search Rooms
Grand Vista (4)	Highland, TX	View Details / Search Rooms
Beachcomber Suites (3)	Santa Monica, CA	View Details / Search Rooms

Multilingual Support :

Automatic Language Detection
On the first user message, the chatbot detects the message's language (e.g., English, Spanish, French, German).

Seamless Reply Localization
All bot responses and button labels are generated in the user's language—no manual translation needed.

Manual Language Override
A visible dropdown lets guests switch languages on the fly (e.g. English ↔ Español ↔ Français ↔ Deutsch).

Persistent Session Language
Once set (auto or manual), the chosen language remains for the entire chat session. If user wanted to switch in between it's always available.

UI & Emoji Consistency
Translated quick-replies, suggestions, and even localized emojis/emblems keep the experience natural and engaging.

You: Me gustaría reservar un hotel en Miami.

Bot:
¡Hola! 🌴 Aquí tienes las opciones de hoteles disponibles en Miami, Florida:

🏨 Sunset Motel
- **Precio:** $120.00 por noche
- **Estrellas:** ⭐⭐⭐
- **Amenidades:**
  - Desayuno 🍽️
  - Centro de Fitness 💪
  - Piscina 🏊
  - Acepta Mascotas 🐾
  - Centro de Negocios 💼

Si necesitas más información, ¡aquí estoy para ayudar! 😊

¿Cuáles son las fechas de check-in y check-out que planeas para tu estancia en

Españo ˅   Type a message…

Guest Query Handling — Instant FAQs & Slot Extraction

You: Do you have pet-friendly rooms in San Diego from next monday to next thursday

Bot:

⭐ Welcome to San Diego, CA! Here are some lovely hotel options for you:

🏨 Urban Oasis

- **Price:** $180.00 per night
- **Stars:** ⭐⭐⭐⭐⭐
- **Amenities:**
    - 🍳 Breakfast included
    - 🏋️ Fitness Center

You: next monday to next thursday ❌

Bot:
Booking Information Needed
To assist you better, may I know how many guests will be staying?

Feel free to ask if you have any questions! 😊

1 2 3 4 5

You: 2

Bot:
Hotel Booking Options in San Diego

- **Check-In Date:** 2025-10-13
- **Check-Out Date:** 2025-10-16
- **Guests:** 2

Instant FAQ Answers
Answers on room availability, pricing, check-in/out policies, amenities in under 1 second

AI-Driven Slot Filling
Extracts key details (city, check-in/check-out dates, number of guests, room preferences) from any free-form text

Built-In Validation
Converts dates to ISO format, sums adults/children into a single "guests" value, enforces price caps Eg: maximum price above $500 is reset to $500 automatically.

State-Driven Follow-Ups
If any required slot is missing or invalid, the bot asks one concise question (e.g., "Which dates would you like?")

Natural Conversation Flow
Guests never feel like they're filling out a form—each prompt reads like a human follow-up

Booking Assistance :

A)Real-Time Availability & Reservation

In-Chat Availability Check
Guests type requests like "Show me rooms June 10-12" directly in chat
Bot calls your REST endpoint (/api/booking) under the hood
Live Room & Rate Display
Lists available room types, room number after confirmation, policies everything is real time
Seamless Reservation Trigger
"Yes, Book Now" button in chat sends a booking request to your backend
No page reloads—everything stays within the conversation

B)Context-Aware Suggestions & Quick-Reply Buttons

Dynamic Suggestion Chips
Presents user with button choices (e.g. hotel names, date ranges) based on context
Reduces Typing Effort & Errors
Guests click "Lakeview Lodge" instead of typing the name
Localized to User's Language
Button labels auto-translate to match chat language
Consistent, Friendly UI
Visually distinct, color-coded chips guide the next step

⭐ Please choose a hotel by typing the number or name!

Check-in and Check-out Details:

- **Check-in:** 2025-06-28
- **Check-out:** 2025-06-29
- **Guests:** 2

To assist you further, could you please let me know your preferred hotel? ⭐

Feel free to ask if you have any questions!

Lakeview Lodge   Urban Oasis

Desert Sands Resort

Beachcomber Suites   Desert Oasis Inn

Coastal Cliff Resort

Bot:
Please provide your payment details to proceed, or simply type 'paid' to confirm your payment for the booking.

[Yes, Pay now]   [No, Pay later]

You: Yes, Pay now

Bot:
Here is your booking summary:

- **Hotel Name:** Desert Oasis Inn
- **Room Price:** $265.00
- **Check-in:** After 3 PM
- **Check-out:** By 11 AM
- **Guests:** 2
- **Rooms:** 1
- **Services:** Virtual Reality City Tour
- **Subtotal:** $305.00
- **Customer Name:** spola

Would you like to confirm the booking? (yes/no)

[Yes, Book Now]   [No]

Bot:
🎉 Thank you, Spola! Your reservation has been successfully confirmed! 🎉

Here are your booking details:

🏨 **Hotel Name:** Desert Oasis Inn
🛏 **Room Type:** Standard Queen
📅 **Check-in Date:** June 28, 2025
📅 **Check-out Date:** [Check-out not specified, but please remember to check out by 11 AM]
👤 **Number of Guests:** 2
🛏 **Number of Rooms:** 1
🔧 **Services Included:** Virtual Reality City Tour
💲 **Subtotal:** $305.00
🖱 **Booking ID:** 30

Please make sure to save your Booking ID: **30** for future reference! 🌟

C)End-to-End In-Chat Booking :

Room Selection & Details
Choose room type and specify number of rooms
Enter guest names or confirm default guest count

Booking Summary & Subtotal
Calculates total cost (room × nights × rooms)
Applies loyalty discounts automatically if eligible

Confirmation & Payment
Guest confirms booking by clicking "Yes, book it"
Simulated payment: guest types "paid" or clicks "Pay Now"

Booking ID & Receipt
Bot returns reservation ID and summary in chat
Encourages guest to save or screenshot their booking

You: Buckeye Lodge

Bot:
⭐ Available Services at Buckeye Lodge ⭐

1. **Ice-Carving Masterclass**
   💲 Price: $80.00

2. **Bioluminescent Cruise**
   💲 Price: $140.00

3. **Private Stargazing Dome**
   💲 Price: $100.00

Would you like to add any of these services to your booking, or would you prefer to proceed to the booking? 😊

Ice-Carving Masterclass — $80.00

Bioluminescent Cruise — $140.00

Private Stargazing Dome — $100.00

You: okay, lets add stargazing

Bot:
🏨 Service Summary
Selected Service:

- 🌌 Private Stargazing Dome

Subtotal:

- 💲 $100.00

Ancillary Services Catalog
Comprehensive, numbered list of add-on offerings (e.g. Ice-Carving Masterclass, Private Stargazing Dome). Each entry features itemized pricing and iconography for quick recognition

Dynamic Confirmation Panel
Immediately displays the guest's chosen service(s) with subtotal calculation. Ensures transparent pricing and next-step clarity within the same chat interface

Seamless Backend Invocation
Selection triggers REST API calls to the corresponding hotel service modules (room service, spa reservations, etc.)

Smart Recommendations — AI-Powered Personalized Offers

- Services: Private Stargazing Dome
- Subtotal: $235.00
- Customer Name: spola

Please confirm your booking (yes/no).

Yes, Book Now **No**

You: Yes, Book Now

Bot:
⭐ Great news! 🎉 You are eligible for a loyalty discount of **5%** on your booking!

Would you like to apply this discount to your reservation? Please let me know with a simple Yes or No. 😊

Yes **No**

⭐ Great news! 🎉 You are eligible for a loyalty discount of **5%** on your booking!

Would you like to apply this discount to your reservation? Please let me know with a simple Yes or No. 😊

Yes **No**

You: Yes

Bot:
Great news, Spola! Your loyalty discount of 5% has been applied to your booking at Buckeye Lodge.

Here are the details for your stay:

1. Room Type: Standard Queen
2. Subtotal: $223.25
3. Services: Private Stargazing Dome

Automatic Eligibility Detection
Bot checks `user Has Booked Hotel Before(...)` and room discount rate

In-Chat Discount Offer
🎉 "Great news! You're eligible for a **5 %** loyalty discount on your booking!"
Yes / No quick-reply buttons

Instant Discount Application
On **Yes**, recalculates `subtotal = subtotal × (1 − discount)`
Persists via `booking Service.create(...)`

Booking Confirmation
"Your loyalty discount of 5 % has been applied to your booking at Buckeye Lodge."
Shows **updated subtotal**, room type, services

Next Steps
Invite user to **save booking ID**, book another stay, or request support

Customer Support — Feedback Collection

Post-Stay Feedback Prompt
"Please rate your experience (1–5) and share any comments."

One-Tap Ratings & Free-Text Comments
Clickable buttons 1–5 minimize friction
Optional comment field for open-ended insights

AI-Driven Slot Extraction
LLM parses numeric rating into feedback Rating
Captures feedback Comments verbatim

Seamless Persistence
feedback@Service.save(rating, comments)
Aggregates data for real-time dashboards and analytics

Friendly Acknowledgment
"Thank you for your feedback! How else can I assist you today?"

I would love to hear your thoughts! Could you provide your feedback rating and any comments regarding your experience?

If you have any follow-up questions, feel free to ask! 😊

(1) (2) (3) (4) (5)

You: Average, 3

Bot:
Thank you for using our hotel booking service! If you have any other inquiries or would like to start a new booking in the future, feel free to reach out. Have a great day!

Human Escalation & Agent Handoff :

You: I would like to talk to an agent

Bot:
Could you please provide your full name and phone number so we can connect you to a live support agent?

Provide your full name

Provide your phone number

You: Sravya, 156-437-7712

Bot:
Thank you for providing your information. An agent will reach out to you shortly. How else can I help you today?

Yes, continue my booking

No, end chat

You: No, end chat

Bot:
Would you like to continue with your hotel booking or end the chat?

You: End the chat

Bot:
Thank you for contacting support! If you need anything else, I'm here to help. Have a great day!

Escalation Trigger
Guest types "agent," "representative," or "human" at any point

Context Preservation
Bot records previous Stage so no data is lost

Contact Info Collection
Asks for **Full Name** & **Phone Number** via LLM slot-filling

Ticket Creation
Calls supportService.save(new AgentRequest(name, phone))

Guest Choice
Yes, continue my booking → resumes from saved stage
No, end chat → thanks user and closes conversation

Seamless Handoff
Your support team receives full transcript + state
Agents pick up the conversation exactly where the bot left off

Thank you!