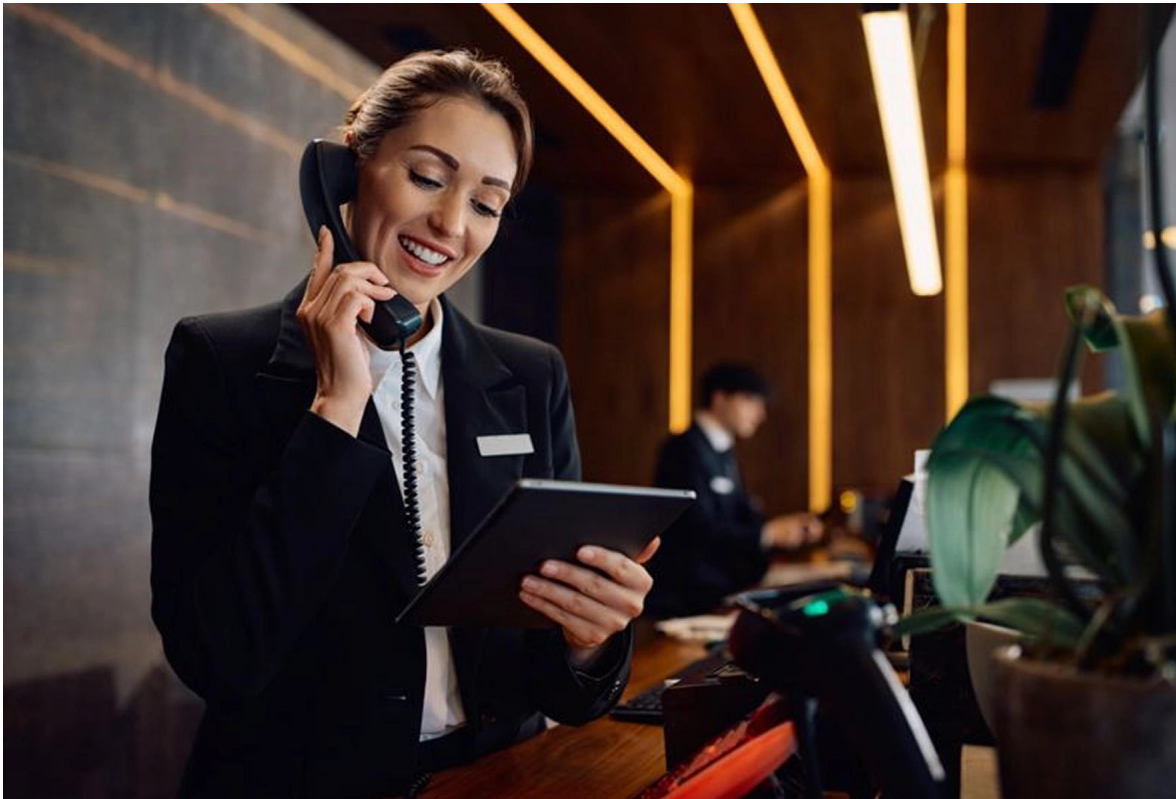


CASE STUDY

AI-Powered Voice Agent for Automated Hotel Bookings (Twilio + LiveKit)



A leading hospitality group in the United States sought to modernize its reservation operations by replacing traditional human-handled call centers with an AI-powered voice agent. The goal was to automate inbound reservation calls while maintaining a natural, conversational experience for guests.

SpringCT designed and implemented an Agentic AI-based Hotel Reservation System that could independently handle booking inquiries, room availability checks, pricing discussions, reservations, cancellations, and rescheduling. The solution leveraged Twilio for telephony and LiveKit for real-time media orchestration, enabling a scalable, production-ready AI voice agent.

Customer Challenge:

The customer faced several operational and business challenges:

- High operational costs due to 24×7 human call center staffing
- Missed or dropped calls during peak booking seasons
- Inconsistent guest experience depending on agent availability and training
- Limited scalability during promotions and holiday periods
- Manual handling of cancellations and rescheduling, leading to delays and errors

The customer wanted a solution that could answer calls instantly, handle multiple concurrent callers, and operate with human-like conversational accuracy, while seamlessly integrating with existing hotel booking workflows.

SpringCT Solution:

SpringCT proposed an AI-powered inbound voice agent designed specifically for hotel reservation workflows. The system acts as a virtual hotel receptionist, capable of:

- Answering inbound calls automatically
- Understanding guest intent using natural language
- Providing room options, rates, and availability
- Capturing guest details and confirming bookings
- Managing cancellations and rescheduling
- Escalating calls to a human agent only when required

The architecture combined Twilio’s telephony APIs with LiveKit’s real-time audio infrastructure, orchestrated by an Agentic AI layer responsible for conversation flow, decision-making, and backend integration.

Product Features

- **AI-Driven Voice Conversations**
Natural, human-like conversations powered by LLM-based Agent AI.
- **Automated Room Availability & Pricing**
Real-time access to room inventory and dynamic pricing logic.
- **End-to-End Booking Management**
Booking creation, modification, cancellation, and rescheduling handled entirely by the AI agent.
- **Multi-Call Concurrency**
Ability to handle hundreds of inbound calls simultaneously without degradation.
- **Fallback to Human Agent**
Seamless transfer to a human operator when complex or exceptional scenarios arise.
- **Call Logging & Analytics**
Structured logging of conversations, intents, and outcomes for reporting and optimization.

Key Technical Achievements

- **Twilio Voice Integration**
Twilio handled inbound PSTN calls, call routing, and SIP connectivity.
- **LiveKit for Real-Time Media Control**
LiveKit enabled low-latency, real-time audio streaming between callers and the AI agent.
- **Agentic AI Orchestration**
The AI agent dynamically controlled conversation flow, decision-making, and backend actions based on user intent.
- **Scalable Cloud-Native Architecture**
Designed to scale elastically during peak demand without service interruption.
- **Low-Latency Response Handling**
Optimized audio pipelines ensured minimal response delay for a natural user experience.

Results

- The AI-powered reservation system delivered measurable business impact:
 - **Reduction** in human call center dependency
 - **Instant call pickup** eliminating missed booking opportunities
 - **Consistent guest experience** across all calls
 - **Improved booking conversion rates** during peak periods
 - **Operational cost savings** through automation

The customer was able to redirect human staff to higher-value guest interactions while allowing the AI agent to handle routine and high-volume calls.

Conclusion

- This case study demonstrates how Agentic AI, combined with Twilio and LiveKit, can transform traditional hotel reservation systems into intelligent, scalable, and cost-efficient platforms.
- By replacing manual call handling with an AI-powered voice agent, the hospitality provider achieved improved guest satisfaction, reduced operational costs, and future-ready scalability.
- SpringCT’s expertise in real-time communications, telephony, and AI-driven automation enabled the successful design and delivery of a production-ready solution tailored for the hospitality industry.