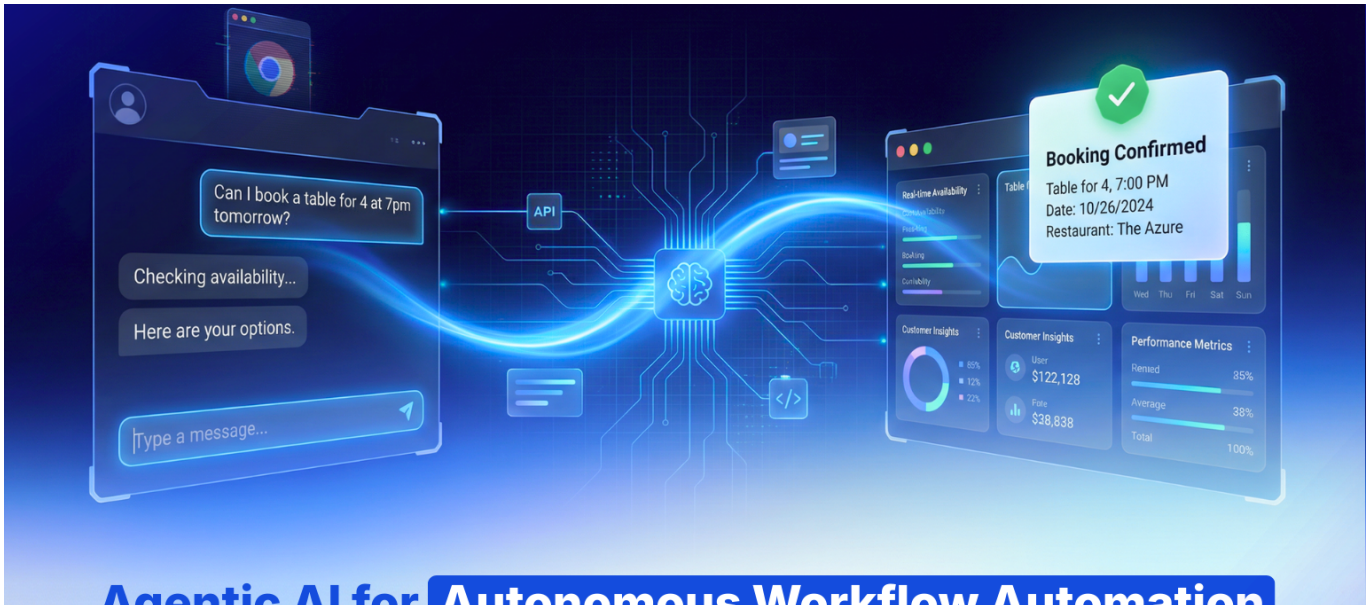
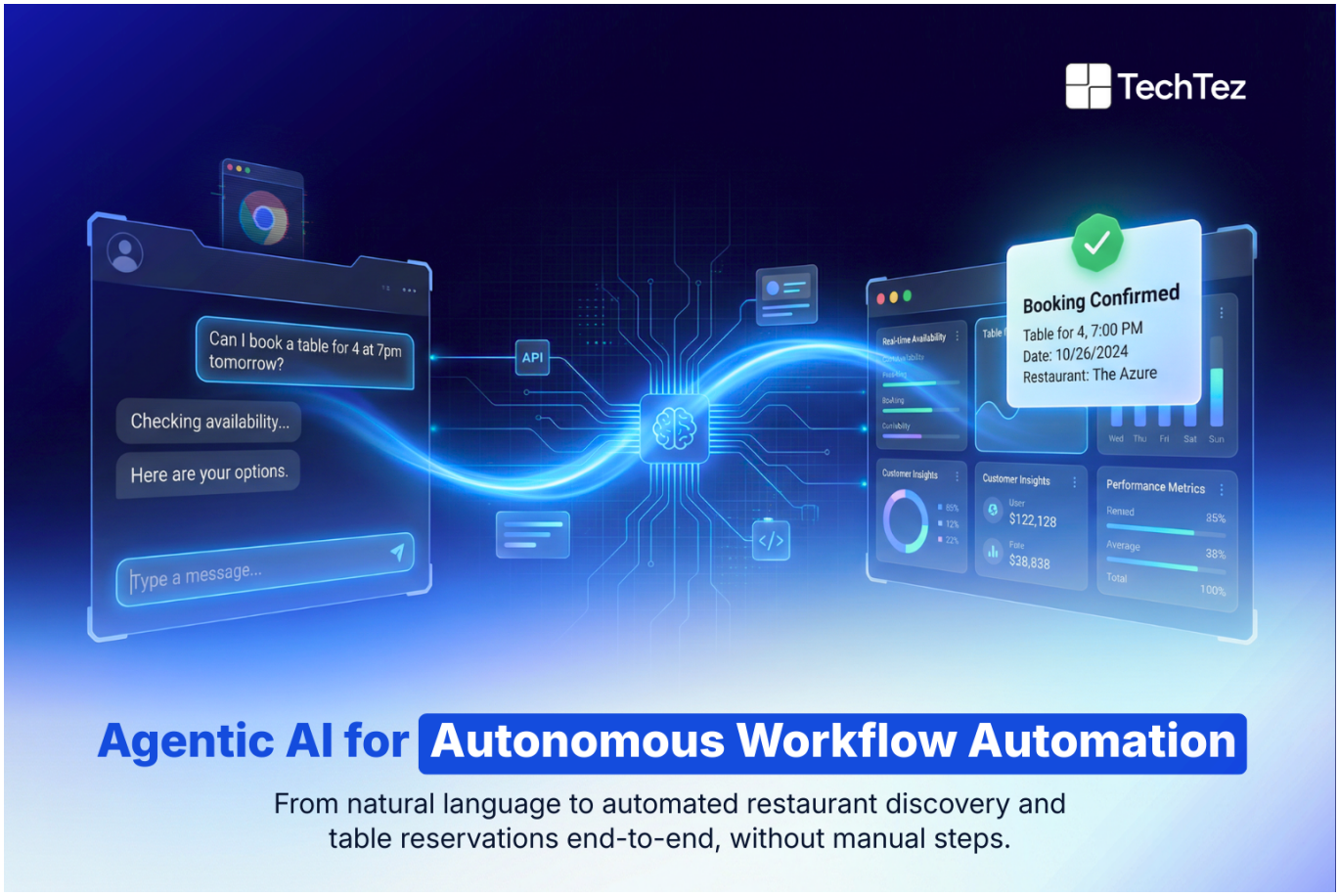


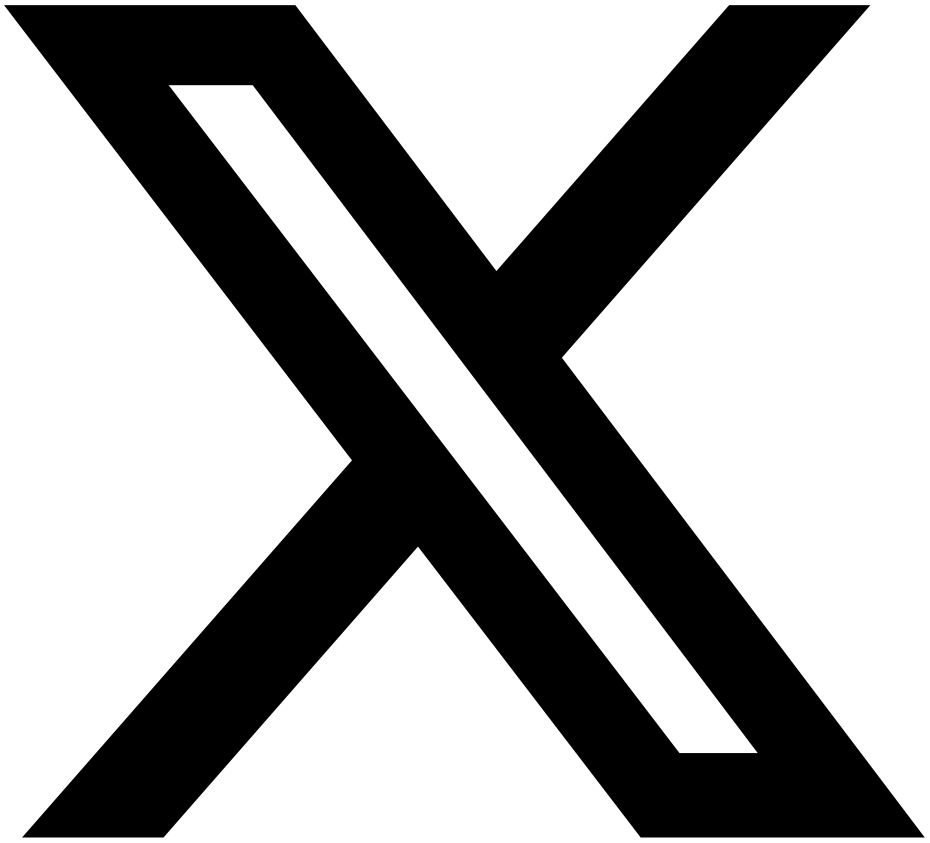
Agentic AI Assistant Framework for Autonomous Task Execution

Posted on March 10, 2026 by Sony Battina


TechTez
Can I book a table for 4 at 7pm tomorrow?
Checking availability...
Here are your options.
Type a message...
API
Booking Confirmed
Table for 4, 7:00 PM
Date: 10/26/2024
Restaurant: The Azure
Agentic AI for Autonomous Workflow Automation
From natural language to automated restaurant discovery and table reservations end-to-end, without manual steps.

Case Study

Linkedin X-twitter



Facebook

Agentic AI Assistant Framework for Autonomous Task Executions

From Conversation to Action: Multi-Agent AI That Plans, Executes, and Delivers Outcomes

Client

A product user aimed to build an intelligent AI assistant capable of going beyond basic chat responses. The requirement was to create a multi-agent AI system that could understand user intent, dynamically select tools, interact with external APIs, and autonomously complete real-world tasks such as bookings, research, and planning.

Challenges

During analysis, we found that most booking and assistance platforms operate in silos, requiring users to manually connect multiple tools to complete a single task.

- **Manual Search & Booking Fatigue:** Users had to search reviews, compare options, and complete booking steps manually across different apps.

- **Lack of Personalization:** Existing systems couldn’t adapt to specific user needs like cuisine type, time slot, or proximity.

- **Disconnected Systems:** Integrating review platforms, location APIs, and booking portals required manual input and cross-referencing.

- **Poor User Experience:** Switching contexts (from maps to reviews to bookings) created friction and increased user drop-offs.

These gaps highlighted the need for an autonomous, agent-driven AI assistant capable of orchestrating tools within a unified workflow.

Our Strategy:

TechTez implemented a **multi-agent orchestration framework** supported by a centralized **FastMCP tool server** to enable intelligent, secure, and scalable task execution.

Instead of building a single monolithic AI assistant, we designed a modular architecture where specialized agents collaborate to understand user intent, break down complex requests into structured tasks, select appropriate tools, and execute them autonomously

Tech Stack:

- **LLMs:** GPT-4o, LLaMA 3.1

-  **Orchestration Framework:** CrewA

- **Tool Server:** FastMCP

- **Framework Layer:** LangChain

- **Integration Layer:** REST APIs, Google APIs, External Service Platforms

- **Core Architecture:** Multi-Agent Orchestration with Centralized Tool Execution

Use Cases Implemented:

Restaurant Booking Assistant

- Processes inputs such as cuisine, time, and group size

- Uses sentiment analysis to identify top-rated restaurants

- Integrates Google APIs and booking platforms (Zomato, Swiggy, Dineout)

-  Completes reservations autonomously and Sends confirmations to users

Outcome: End-to-end automated booking workflow from a single user prompt.

General Assistance Agent

- Handles travel research, comparisons, budgeting, and planning

- Executes fully autonomous multi-step workflows

- Gathers real-time information via APIs

-  Delivers complete, useful, human-like responses

Outcome: Conversational query transformed into structured, actionable execution.

Technical Approach:

- **LLM-Powered Intent Interpretation:** Using GPT-4o-mini, the system interprets diverse natural language queries and generates structured reasoning pipelines.

- **Tool-Oriented Architecture:** The assistant operates as a toolbox of functions and services, dynamically assembling tool-augmented workflows.

- **Multi-Agent Orchestration:** CrewAI agents coordinate planning, execution, and response generation, enabling intelligent task decomposition.

- **Centralized Tool Server (FastMCP):** All tools and services are managed via a centralized server to ensure secure, scalable execution.

-  **Live API Integration:** The system fetches real-world data through external APIs and platforms to complete tasks autonomously.

- **Structured Output Generation:**The assistant returns context-aware, structured, and actionable responses rather than plain text replies.


TechTez
How Agentic AI Replaces Fragmented Booking Journeys
Before Agentic AI
After Agentic AI
Multiple apps & tabs
Single conversational interface
Manual review comparison
Intent-aware personalization
Repetitive data entry
AI-ranked restaurant recommendations
High drop-offs
Automated booking execution
Time-consuming bookings
Faster, frictionless confirmations

Results & Impact

The solution delivered measurable efficiency, accuracy, and scalability improvements.

- 100% automation from user query to restaurant booking no manual steps required

- 70% reduction in average search-to-booking time during internal trials

- Increased booking success rate by 25%, thanks to intelligent sentiment filtering and real-time availability matching

- Improved user satisfaction scores in test sessions (measured via feedback survey)

- Validated the real-world potential of Agentic AI for transforming customer-facing workflows

- Built scalable foundation for expanding to 50+ cities and multiple food platforms

- Reduced manual intervention in booking and planning workflows

- Scalable framework adaptable to multiple business use cases

- Accelerated deployment of agentic AI solutions

-  Enabled AI-driven autonomous task execution

Our Thought Leadership Guides

- Case Study

[Agentic AI Assistant Framework for Autonomous Task Execution]

An agentic, multi-agent AI assistant that plans, executes, and completes tasks via secure tool orchestration and live APIs turning user prompts into real outcomes like bookings and itineraries.

- Case Study

AI-Driven Dermatology Platform for Accurate Diagnosis and Secure Digital Care

A mid-sized SaaS company specializing in HR and payroll management faced a growing barrier:

- Case Study

Tailored AI Integration in Legacy Systems: A Step-by-Step Practical Guide

Imagine this: Your team spends hours each week chasing approvals on email threads, entering data...


TechTez
Tailored AI Integration in Legacy Systems
A Practical, Step-by-Step Guide for Real Enterprise Modernization
AI