

Talk to Your Data: How OmniAgent Makes Data Science Conversational

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In a Summary:

OmniAgent gives the power to the users to communicate with their data, taking away the technical limitations and allowing data science to be part of everyday decision making.

🔗 Project Repository: <https://github.com/hoomanesteki/omniagent/>

The Problem: Data is Everywhere, but Insight is Not

Every day organizations generate huge amounts of data such as sales records, customer behavior, marketing metrics, and operational logs. However, it is still difficult for most decision-makers to do their own data explorations. Even for the simplest of queries like *“What changed last month?”* they depend almost entirely on analysts.

This reliance on analysts delays the decision-making process and prevents organizations from fully utilizing their data resources. The problem is not that data is hard to come by, it is that it is hard to access.

Why Data Feels Hard for Non-Technical Users

The majority of the tools expect the following technical skills from the users:

- Writing SQL queries
- Using Python or R

- Understanding statistical outputs
- Interpreting complex dashboards

Dashboards are not only informative but also unchanging. Any data that is outside the limits of pre-made charts needs a technical expert's help.

Business users are looking for solutions, not programming.

Existing Solutions Still Create Friction

Numerous solutions attempt to make analytics easier, but still some deficiency exists:

- Dashboards lack comprehensiveness
- Chatbots provide standard responses and make up facts
- Analysts give precise conclusions but take a long time
- AutoML has great capability but is not engaging

Currently, non-technical users cannot simply and risk-free communicate through data exploration.

The Solution: OmniAgent (Problem → Solution Framework)

OmniAgent is an AI-powered assistant that allows users to ask data questions in plain English and automatically generates insights, visualizations, and predictions through specialized agents.

Instead of learning tools, users simply talk to their data.

How OmniAgent Works (Layered Explanation)

OmniAgent is a virtual assistant that operates on artificial intelligence technology which enables users to interact with data using simple English, thus producing insights, visualizations, and forecasts via dedicated agents.

Instead of mastering tools, users just chat with their data.

How OmniAgent Works (Layered Explanation)

OmniAgent employs a multi-agent structure similar to that of a team:

- Master Agent directs queries
- Stats Agent interprets data
- Visualization Agent creates graphs
- Aggregation Agent organizes data
- Prediction Agent trains ML models
- SQL Agent checks out data sets
- Dynamic Agent conducts tailored analysis
- Voice Agent transcribes spoken words

Every agent is assigned a specific task and operates like a professional analytics team, which is quite similar to a real analytics team working behind the scenes.

Metaphor: OmniAgent as a Data Team

Imagine asking a question in a meeting room full of specialists. A coordinator listens and assigns your request to the right expert instantly.

OmniAgent recreates that experience using AI.

Real-World Example

A product manager submits a CSV file and questions:

- "Display monthly trend of income"

- "What area lost the most?"
- "Forecast sales for the next quarter?"

OmniAgent seamlessly interprets the data and generates visuals and forecasts—again, no programming needed!

Discussion turns into examination.

Safe AI Execution

For complex activities, OmniAgent relies on artificial intelligence to generate Python code. However, the code is not executed directly:

1. The analysis is suggested by the system
2. The plan is displayed
3. The execution is conducted only after user's approval

The code is executed in a secure sandbox environment to ensure that no unsafe operations occur.

Voice Makes Data Even More Accessible

Microphone input allows users to ask their questions in spoken form. Furthermore, using one's voice minimizes effort and lowers the barrier even more.

The process of data exploration now feels humanlike — as if speaking.

Why This Matters

OmniAgent is showcasing a fresh approach to science communication in the data field:

- It opens up analytics to everyone

- Enables faster decision-making
- Cuts down on the need for analysts' help
- Connects people and machines via dialogue

This is exactly the case with the main tenet of data science communication that is comprehensible and usable by non-technical audiences.

Takeaway

The future of data science is not only about the development of intelligent models, but rather it is about having more human interaction and communication with data.

OmniAgent proves that the ability of users to communicate with their data makes the process of obtaining insights much quicker, simpler, and available to all.

Note: I used ChatGPT to assist with improving grammar, clarity, and wording in this document.