The future of Data Analytics In the era of GenAI

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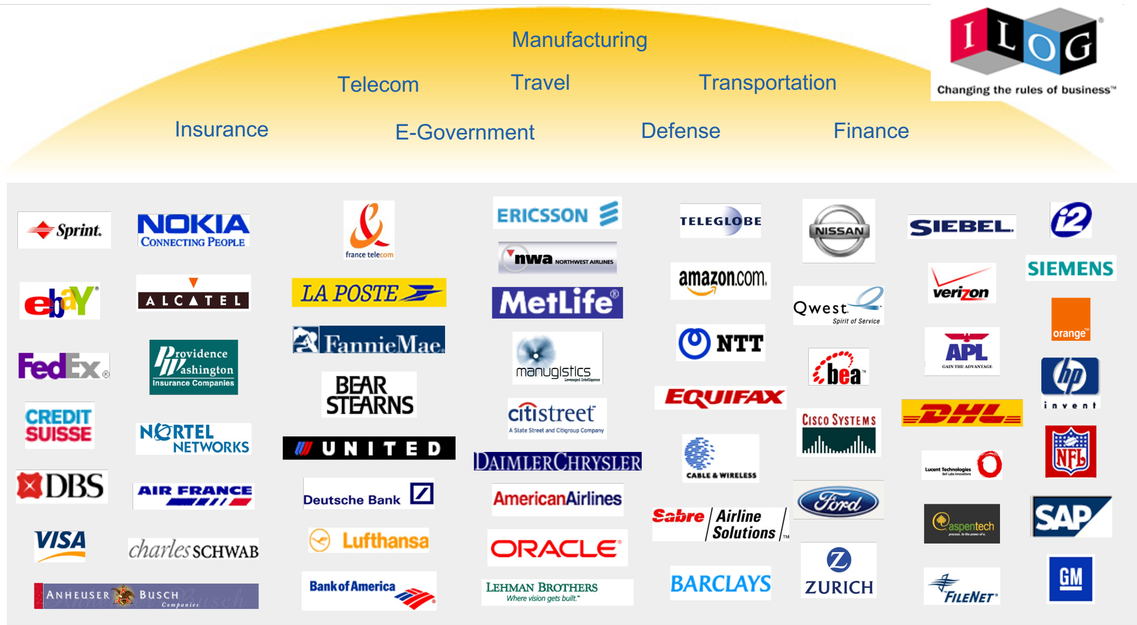
A bit of history of Taipy …

Taipy/Avaiga core team comes from **ILOG**, an AI company incorporated in 1987. Later, in 1997, ILOG went for IPO on NASDAQ.

ILOG software was used by as many as 5,000+ customers worldwide, most of them fortune 500 companies.

ILOG was acquired by IBM in 2009 for US$340M.

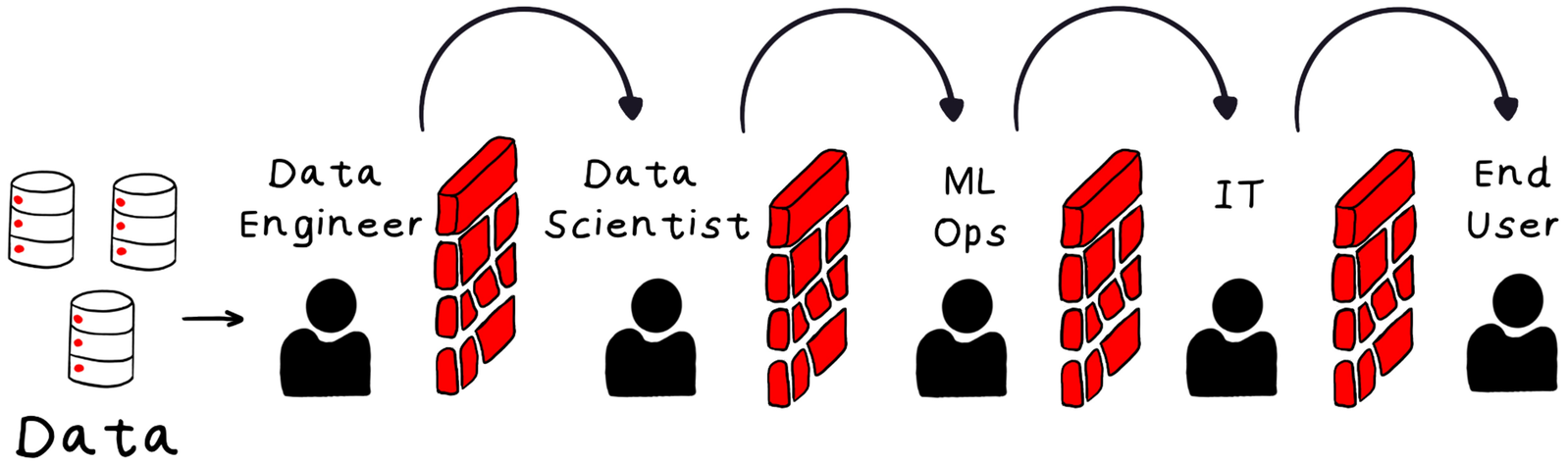
ILOG technologies, under IBM brand, still serve many customers worldwide today. ILOG optimization engine, **CPLEX**, currently powers many applications and most of the major ERP vendors' optimization module (Oracle, SAP, …)



Over 5,000 Customers Worldwide

Why did we create Taipy ...

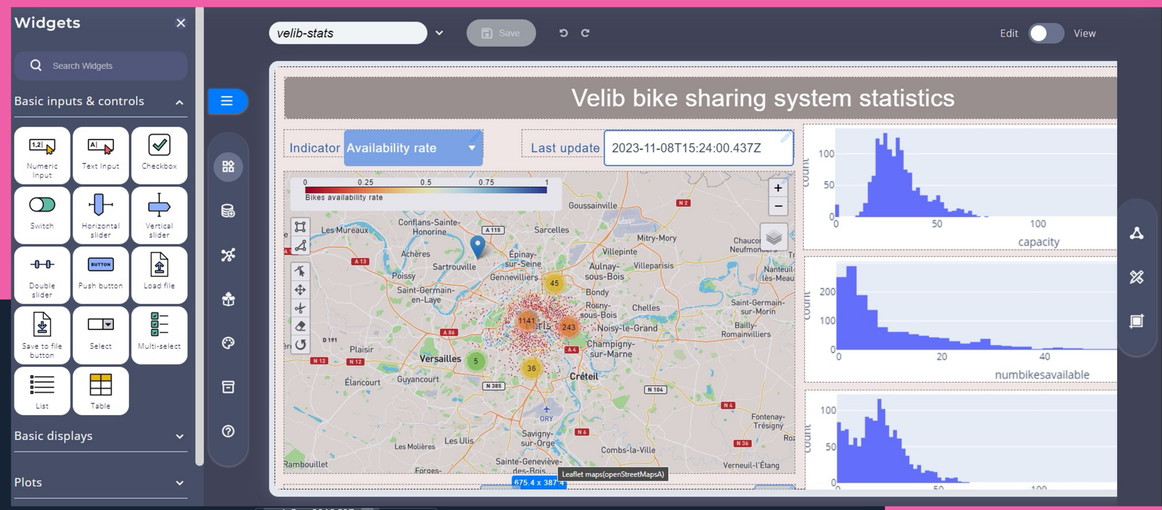
Over 85% failure when building AI solutions !



What is Taipy ?

Taipy covers both Frontend + Backend

- Taipy is designed for full web application development in Python
- Open-Source & Enterprise license
- Easy to learn and to deploy
- Recently released TalktoTaipy (Generative AI)



How do you do with GenAI?

Agenda

01 Business Intelligence, Data Analytics

02 AI in Data Analytics

03 Generative AI

04 Future of Data Analytics

05 Talk to Taipy

06 Q&A

Mr Thanh Nguyen

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Lecturer, Information Technology & Software Engineering Programs at RMIT Vietnam

Research interests: health informatics, AI for healthcare, AI for education, Large Language Models, Gen AI for Data Analytics

Experiences:

- Director of Heath Information System Program
- Director of Technology, eMED JSC
- Consultants of ADB, WHO, GIZ
- Lecturer at RMIT Vietnam
- Director of R&D AI Project, Avaiga, France

What are Business Intelligence and Data Analytics?

- **Business Intelligence (BI):**
  - collecting and presenting historical data to support decision-making
  - track key performance indicators.

- **Data Analytics:**
  - examining and interpreting data
  - discover insights, patterns, and trends for informed decision-making and predictive analysis.

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How are they different?

Aspect	Business Intelligence (BI)	Data Analytics
Purpose	Historical reporting, visualization, and performance monitoring.	Data exploration, analysis, interpretation, and decision support.
Data Sources	Primarily structured, organized data from databases and data warehouses.	Can work with structured and unstructured data from various sources.
Users	Business professionals, decision-makers, and managers.	Data scientists, analysts, specialists, and technical experts.

How are they different? (2)

Timeliness	Provides static or periodic reports, often based on historical data.	Can offer insights in real-time or near-real-time for faster decision-making.
Interactivity	Limited interactivity, often with predefined reports and dashboards.	High interactivity, enabling users to explore data and perform ad-hoc analysis.
Questions Answered	Focuses on "what happened?" questions, offering a snapshot of past events.	Addresses "why" and "how" questions, providing deeper understanding and predictive capabilities.
Tools	Common BI tools include Tableau, Power BI, QlikView, etc.	Common Data Analytics tools include Python, R, Jupyter Notebooks, etc.

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Current state of Data Analytics

- **AI and Machine Learning Integration**
- **Big Data Analytics**
- **Real-time Analytics**

prescriptive analytics → predictive analytics.

automating decision-making
uncovering insights that were previously hidden

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Success stories

Company	Success Story
Netflix	Enhanced content recommendations through data analytics, boosting viewer engagement and satisfaction.
Amazon	Optimized supply chain with data analytics, enabling faster order fulfillment and efficient inventory management.
Facebook	Improved ad targeting with data analytics, driving significant advertising revenue growth.
Google	Leading search engine powered by data analytics, delivering accurate and relevant search results.

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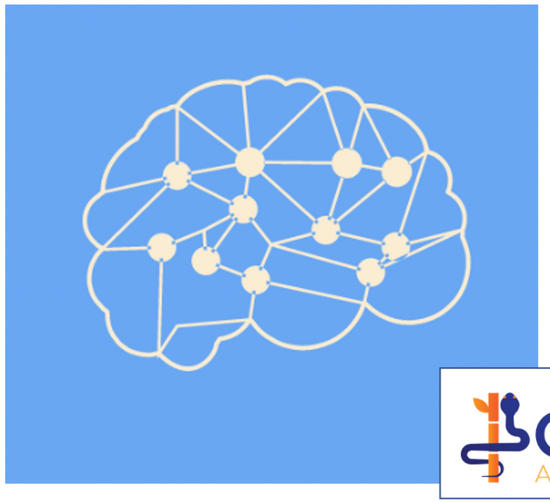
What is Generative AI?

Generative AI is a subset of artificial intelligence

Focuses on creating new content, such as text, images, or other data

Based on patterns and examples from existing data.



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What can GenAI do?

Natural Language:

- Text generation for articles, stories, and code.
- Language translation.
- Conversational agents, chatbots, and virtual assistants.

Image Generation:

- Creating art, designs, and visual content.
- Enhancing images and applying artistic effects.
- Generating realistic human faces.

Audio:

- Composing music and generating melodies.
- Synthesizing human-like voices for text-to-speech.
- Producing sound effects for media and entertainment.

Content Creation:

- Generating video content, including animations and explainer videos.
- Assisting in article and report writing.
- Creating data visualizations and infographics from datasets.

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Top trends Data Analytics

- AI and Machine Learning Integration
- Real-Time Analytics
- Data Governance and Privacy
- Automated Data Preparation
- Augmented Analytics
- Data Democratization
- Predictive and Prescriptive Analytics
- Cloud-Based Analytics
- Advanced Data Visualization
- Edge Analytics
- Natural Language Processing (NLP)
- Explainable AI

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Guess: What is this all about?

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Democratization of Data Insights

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What is Democratization of Data Insights?

Empower a wider range of users to harness the value of data and make informed decisions, regardless of their technical expertise.

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Why does Democratization of Data Insights matter?

- Lower cost, higher efficiency
- Faster insights
- Enable innovation: crowdsourcing
- Make business use cases more inclusive
- Bring more innovation to production, i.e. only 4% innovation turns into application

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Why does Democratization of Data Insights matter? (2)

- We are still not quite sure about what is going on?
- Lots of data, with ease of use, lots people might help
- Bring new folks in the game, may help enhance our comprehension
- Make data available at fingertips
- Allow more inclusive and diverse interpretation of data

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Introduction to TalkToTaipy

https://www.youtube.com/watch?v=E7bQQqugOSA

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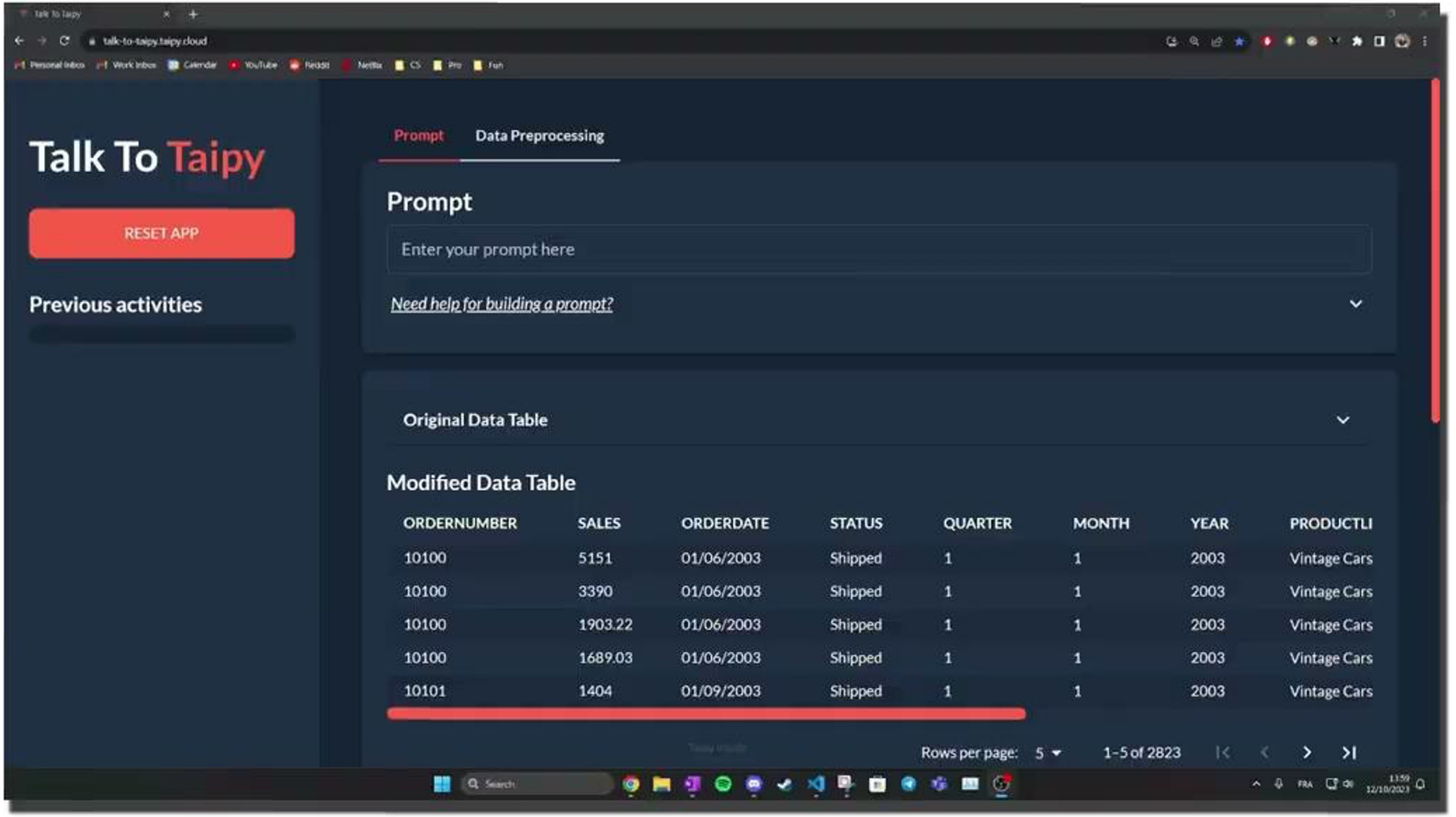
Talk To Taipy
talk-to-taipy.taipy.cloud
Talk To Taipy
RESET APP
Previous activities
Prompt
Data Preprocessing
Prompt
Enter your prompt here
Need help for building a prompt?
Original Data Table
Modified Data Table
ORDERNUMBER SALES ORDERDATE STATUS QUARTER MONTH YEAR PRODUCTLI
10100 5151 01/06/2003 Shipped 1 1 2003 Vintage Cars
10100 3390 01/06/2003 Shipped 1 1 2003 Vintage Cars
10100 1903.22 01/06/2003 Shipped 1 1 2003 Vintage Cars
10100 1689.03 01/06/2003 Shipped 1 1 2003 Vintage Cars
10101 1404 01/09/2003 Shipped 1 1 2003 Vintage Cars
Rows per page: 5
1–5 of 2823

What is TalkToTaipy?

- A web application powered by LLM (Language Model) technology
- Enables non-technical users to query data using natural language
- Supports data upload, including CSV files
- Hosts models locally on standard, cost-effective hardware
- Offers an affordable solution
- Ensures data privacy and confidentiality
- Seamlessly integrates with Taipy's ecosystem

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Key features of TalkToTaipy

- Upload your own dataset, i.e. csv
- Query in natural language: support most common languages
- Simple and easy to use graphical user interface
- Prompt suggestions on your own data and prompt builder
- Data preprocessing
- Based on TaipyGUI

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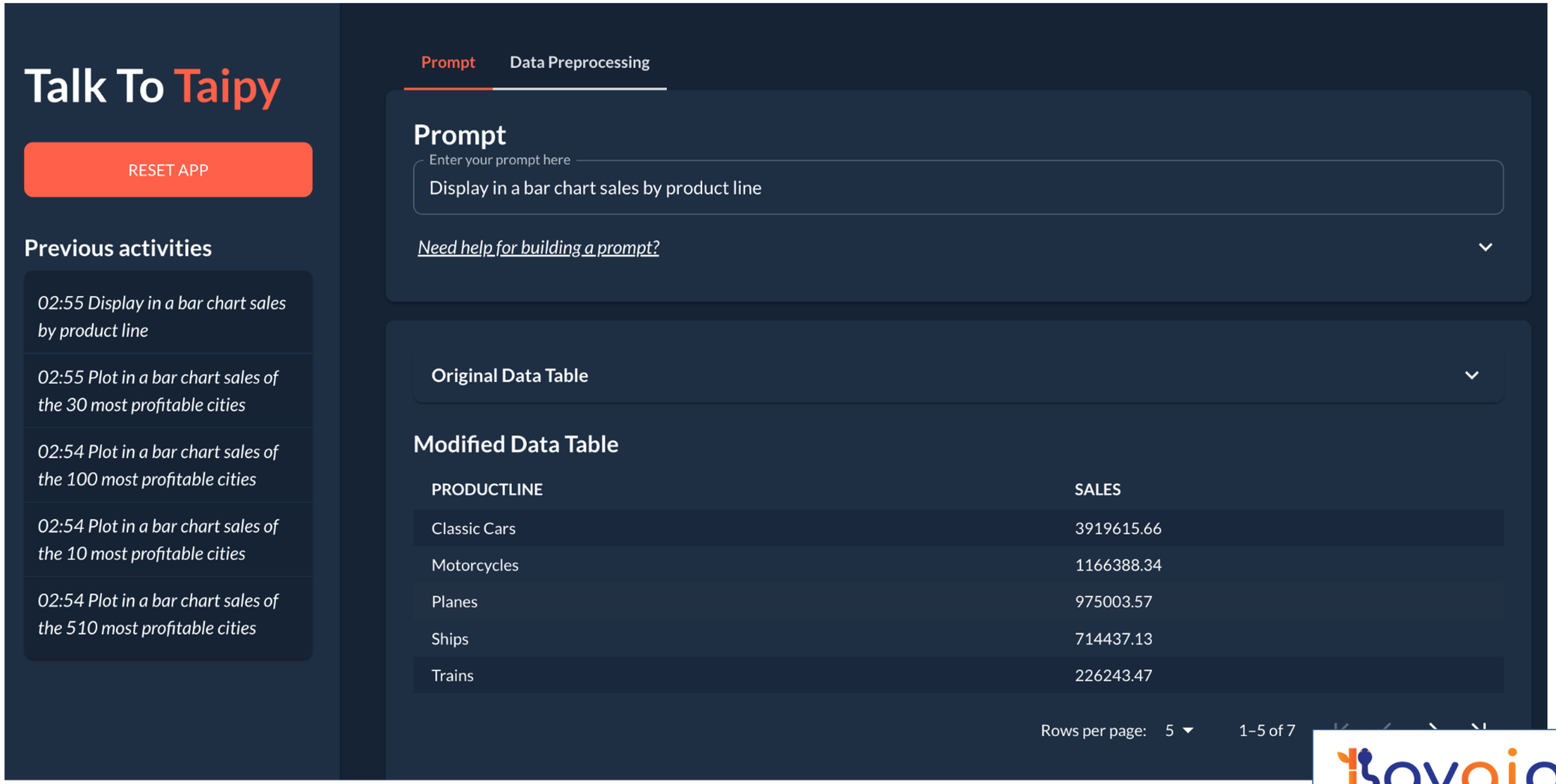
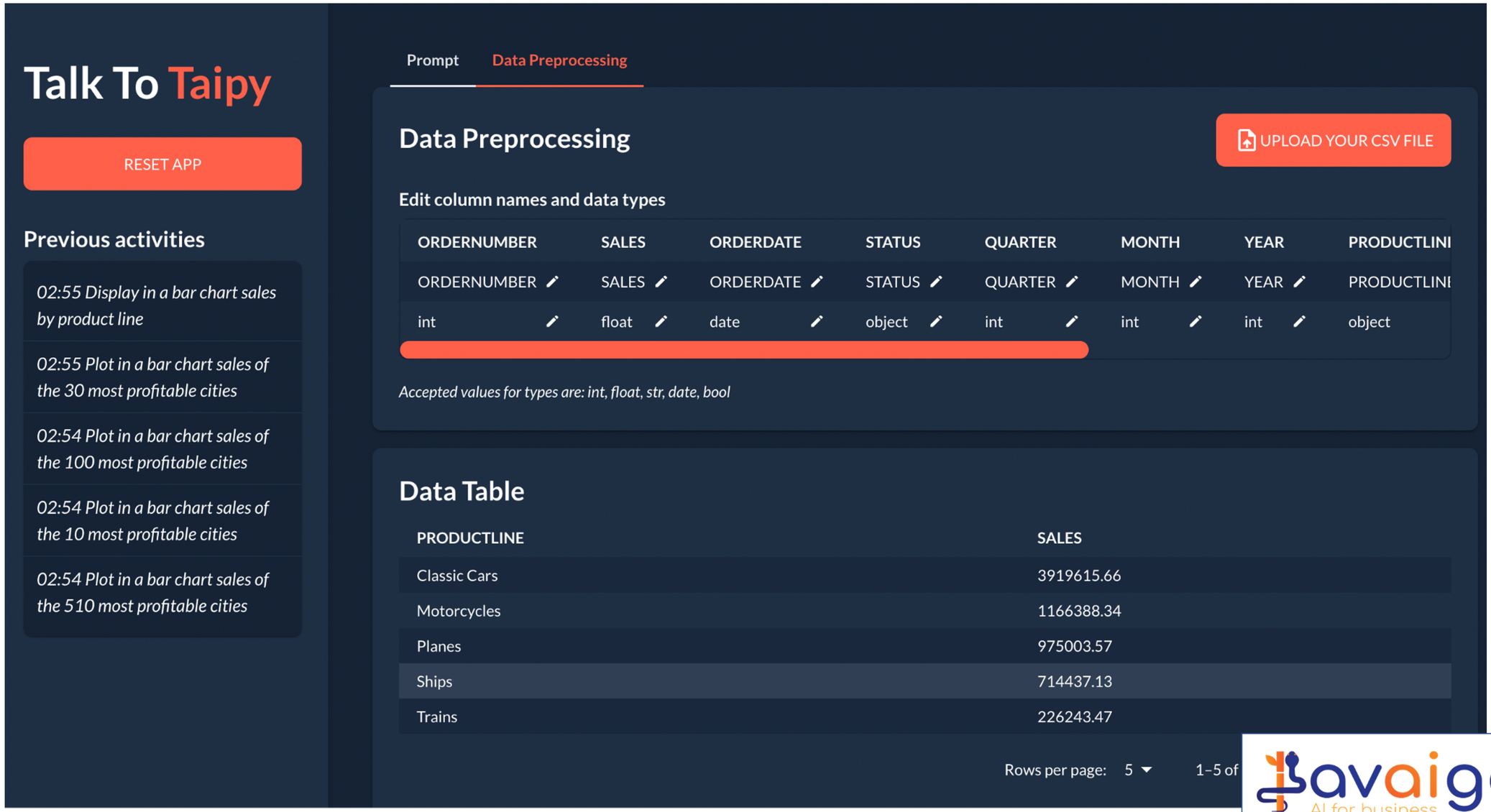
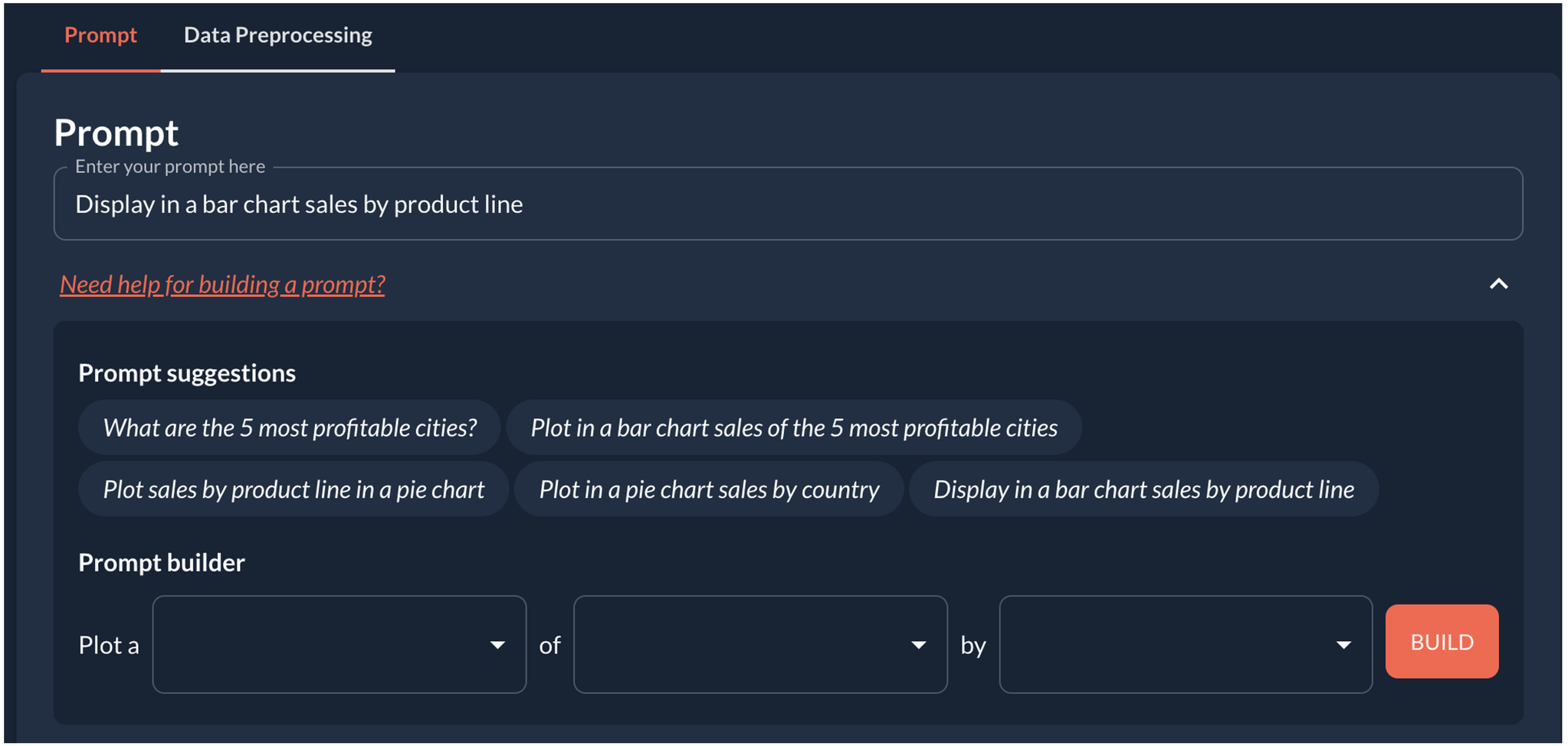
Screenshots: Conversations



Screenshots: Data uploading and processing



Screenshots: Prompt suggestion and builder



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Screenshots: Support human language queries

Prompt

Enter your prompt here

What are the 5 most profitable cities?

Need help for building a prompt?

Original Data Table

Modified Data Table

CITY	SALES
Madrid	1082551.44
San Rafael	654858.06
NYC	560787.77
Singapore	288488.41
Paris	268944.68

Rows per page: 5 1–5 of 5

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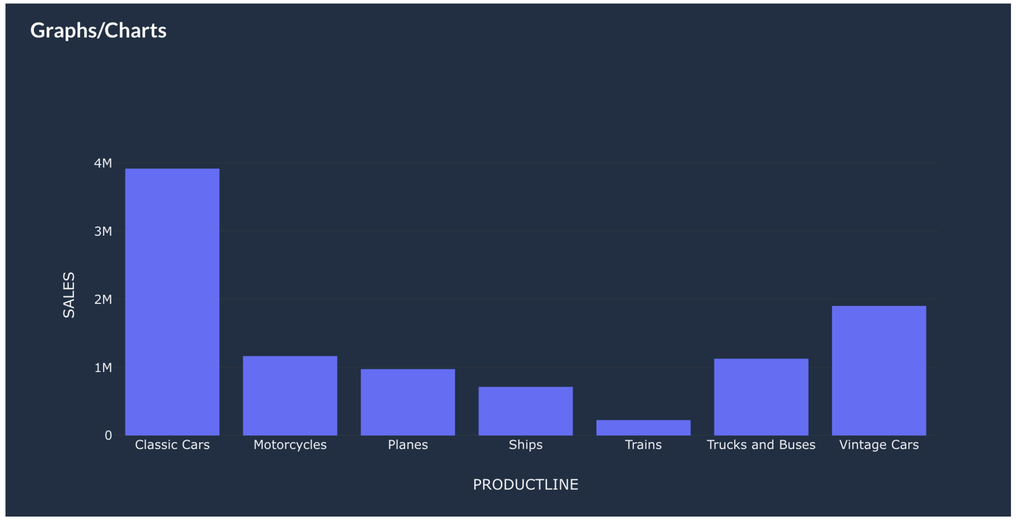
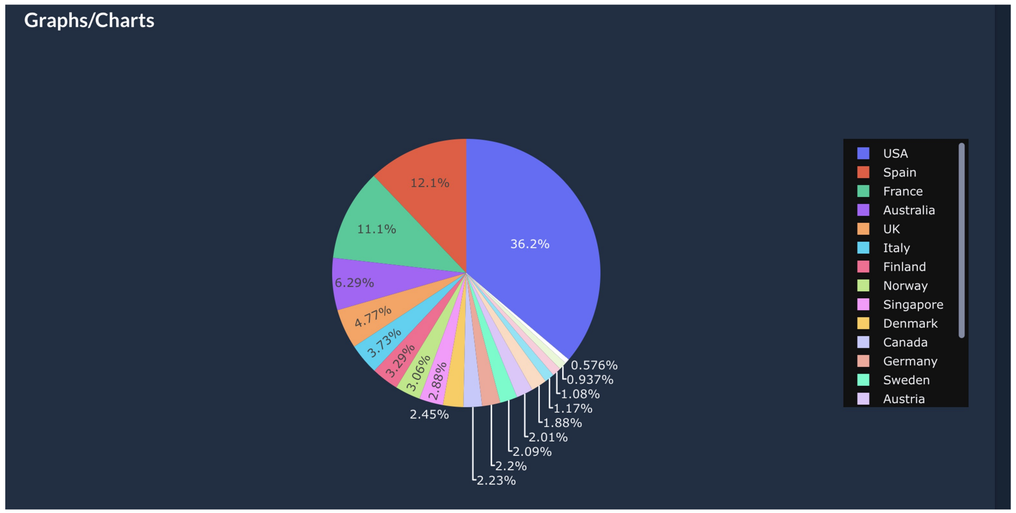
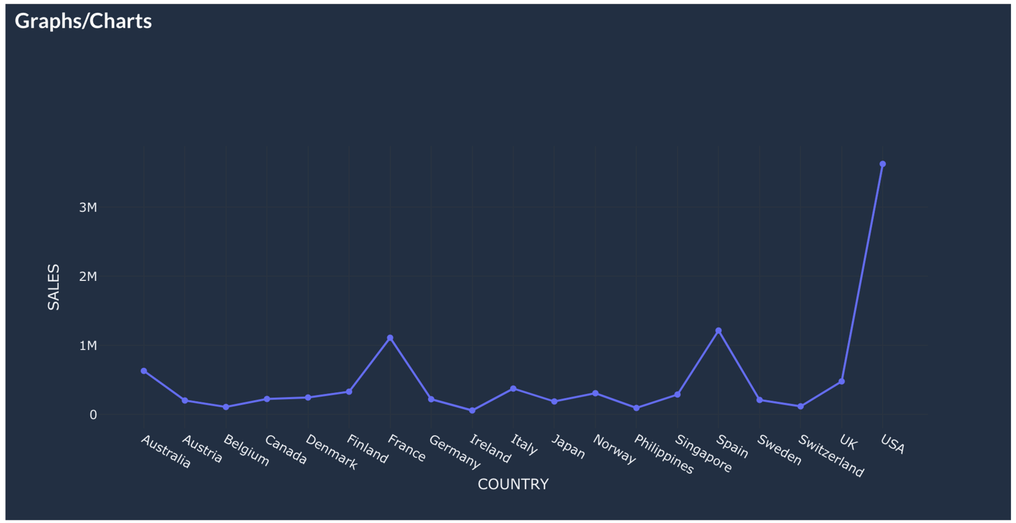
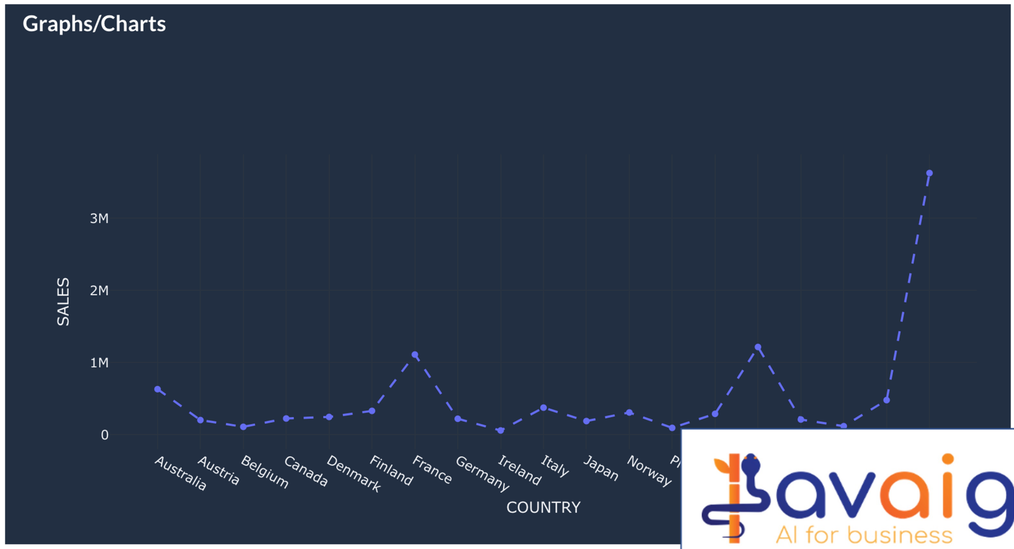
Screenshots: Support diverse chart types









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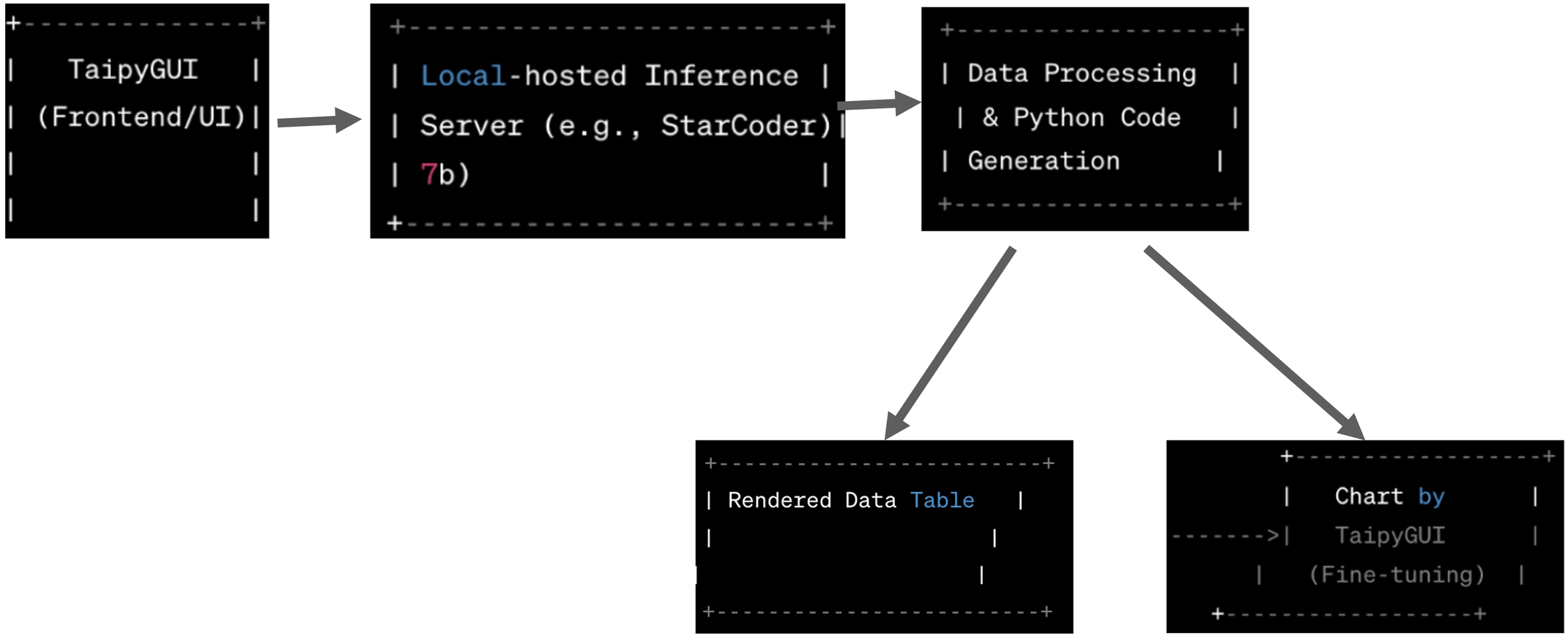
TalkToTaipy’s architecture



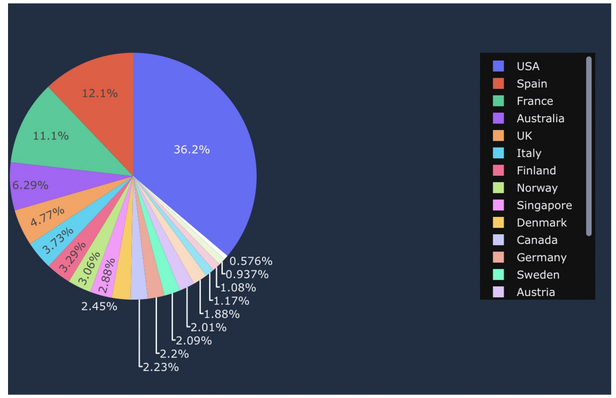
TalkToTaipy's workflows

Upload your dataset → Input your query in natural language → Receive results

UPLOAD YOUR CSV FILE

ORDERNUMBER	SALES	ORDERDATE	STATUS	QUARTER
10100	5151	01/06/2003	Shipped	1
10100	3390	01/06/2003	Shipped	1
10100	1903.22	01/06/2003	Shipped	1
10100	1689.03	01/06/2003	Shipped	1
10101	1404	01/09/2003	Shipped	1

Query: Plot in a pie chart sales by country



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How can TalkToTaipy help with Data Democratization?

- Simple and super-easy to use
- Highly accurate and fast response
- Data transparency
- You can talk, you can analyze data.
- Everyone can get their own insights and interpretation
- Bring data into the fingertips of users

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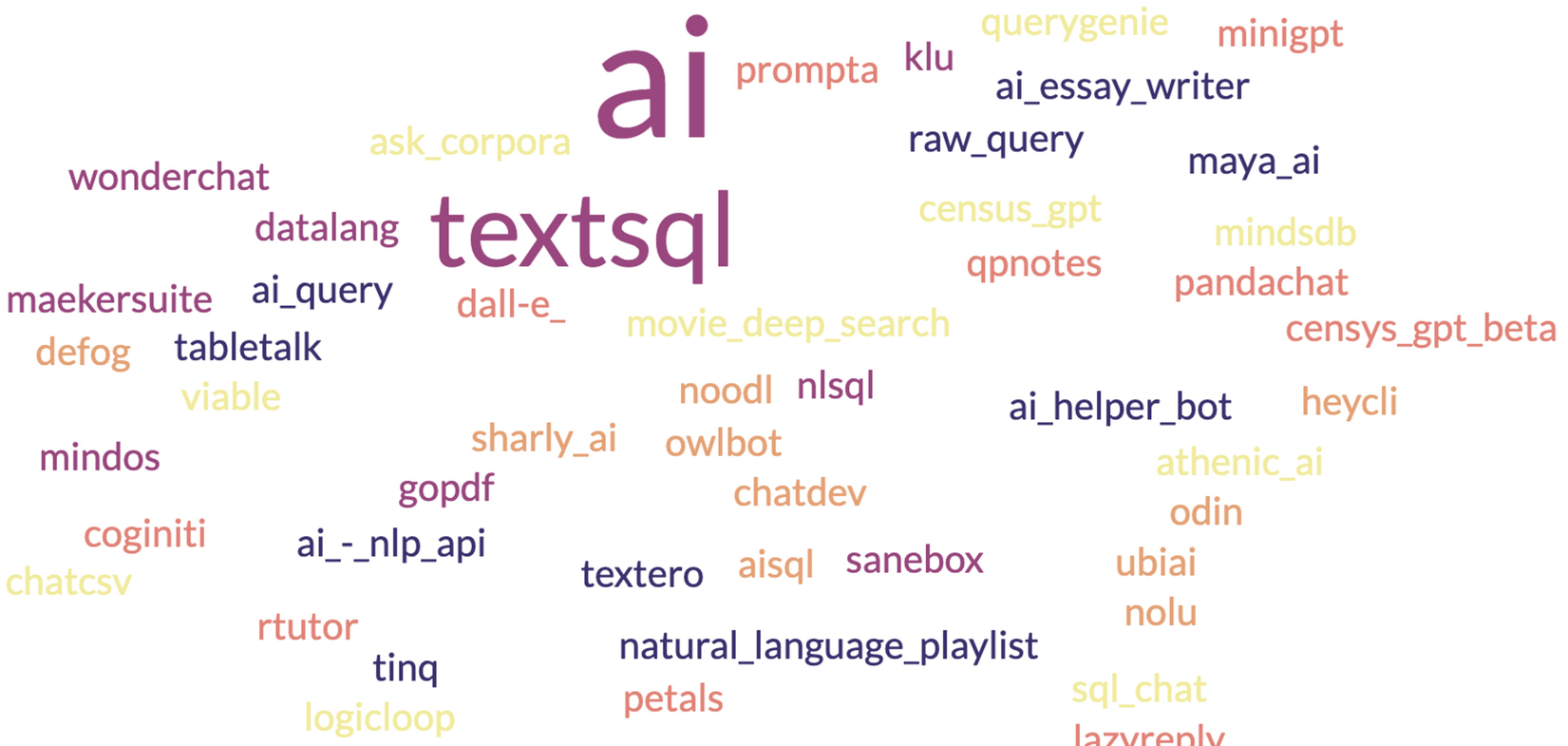
What are similar products in the market?



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How TalkToTaipy is different?

LOCAL MODEL HOSTING
- Commodity GPU

FULL CONTROL
- Further fine-tuning in need

PRIVACY AND DATA CONFIDENTIAL
- Data is asset and trade secret
- Transmitting data and data queries across the proprietary network could be risky.

TRANSPARENCY
- Generates Pandas and Python code for checking
- Fully explainable and trust-worthy

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Rethinking of GenAI in Data Analytics

- Restart from scratch rather than adding AI on top
- AI helps with 90% and human focuses on 10% that really matters
- Two meta-categories: automation and accessibility

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Some thoughts

- Garbage in - garbage out still holds true in the era of GenAI
- Go there and try, get a feeling
- Make your own judgement. No magic here
- AI is Co-pilot not Autopilot

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Thank you