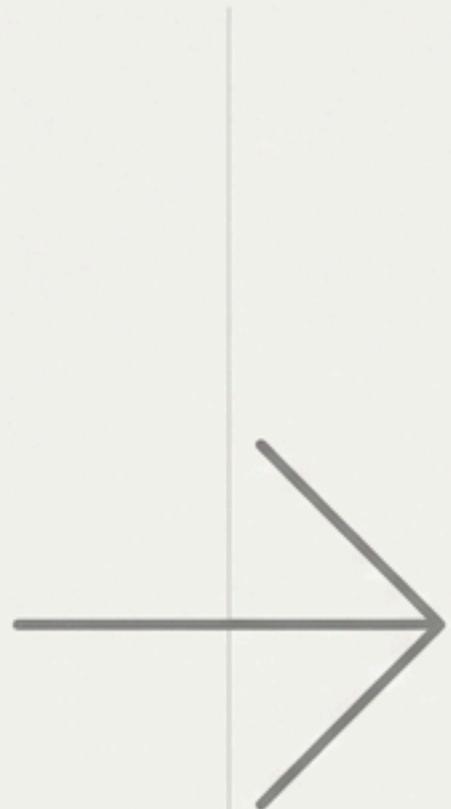
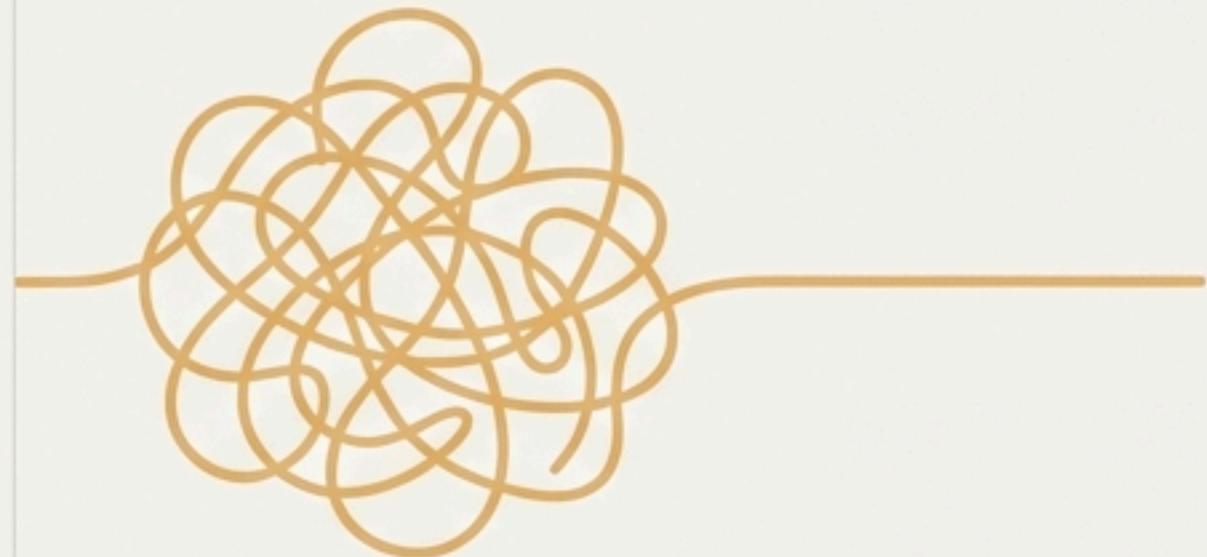


# **Business Co-pilot**

A Multi-Agent System for Strategic Idea Analysis

# From High Uncertainty to Strategic Insight



The Challenge

## **The Uncertainty of a New Venture**

Entrepreneurs must rapidly assess market context, competition, and potential risks. This process is complex and time-consuming.

The Vision

## **An Analytical Co-pilot**

Transform a single business idea, expressed in natural language, into a comprehensive feasibility analysis and risk assessment.

# The Technology Powering the Pipeline

## UI



Streamlit

## Orchestration



LangChain

## Local LLMs



Ollama

Gemma3:4b for extraction,  
Llama 3.2 for analysis

## Data & Search



ChromaDB



Sentence-  
Transformers



DuckDuckGo  
Search

## Visualization



Streamlit-Elements (Nivo)

# The Journey of an Idea: A 5-Agent Pipeline

A user's idea is processed sequentially through five specialized agents, each refining the analysis before passing it to the next.



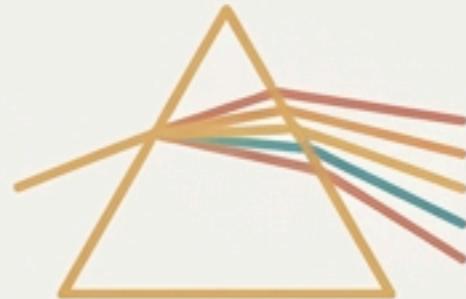
# Step 1: Deconstructing the Idea

Translates the user's natural language input into a structured, machine-readable JSON format.

## Natural Language Input

Source Serif Pro

*I want to open a gourmet  
pizzeria in Rome.*

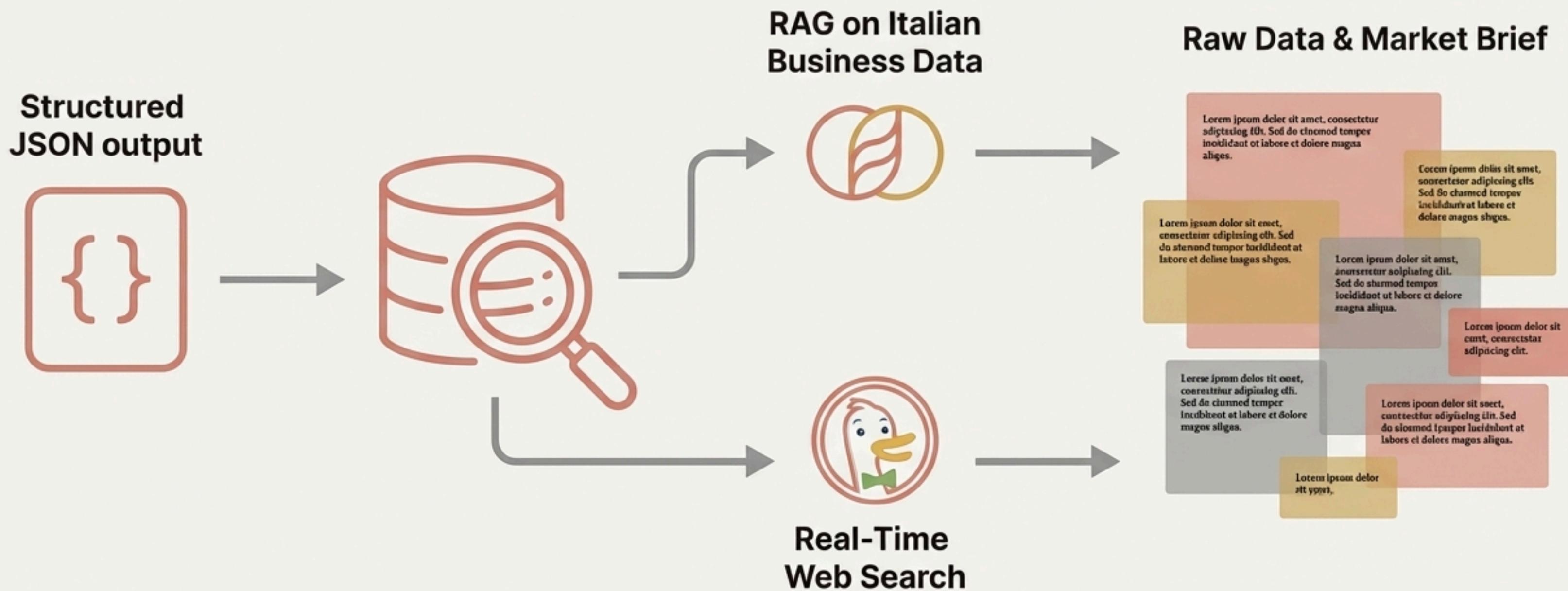


## Structured JSON

```
{  
  "settore": "ristorazione",  
  "tipo_business": "pizzeria gourmet",  
  "dimensione_geografica": "Roma",  
  ...  
}
```

# Step 2: Gathering Intelligence

Queries internal databases and the live web to gather raw market, competitor, and contextual data.



# Step 3: Structuring the Data for Visualization

Parses raw, unstructured text from the previous step into clean JSON lists, ready for charting.

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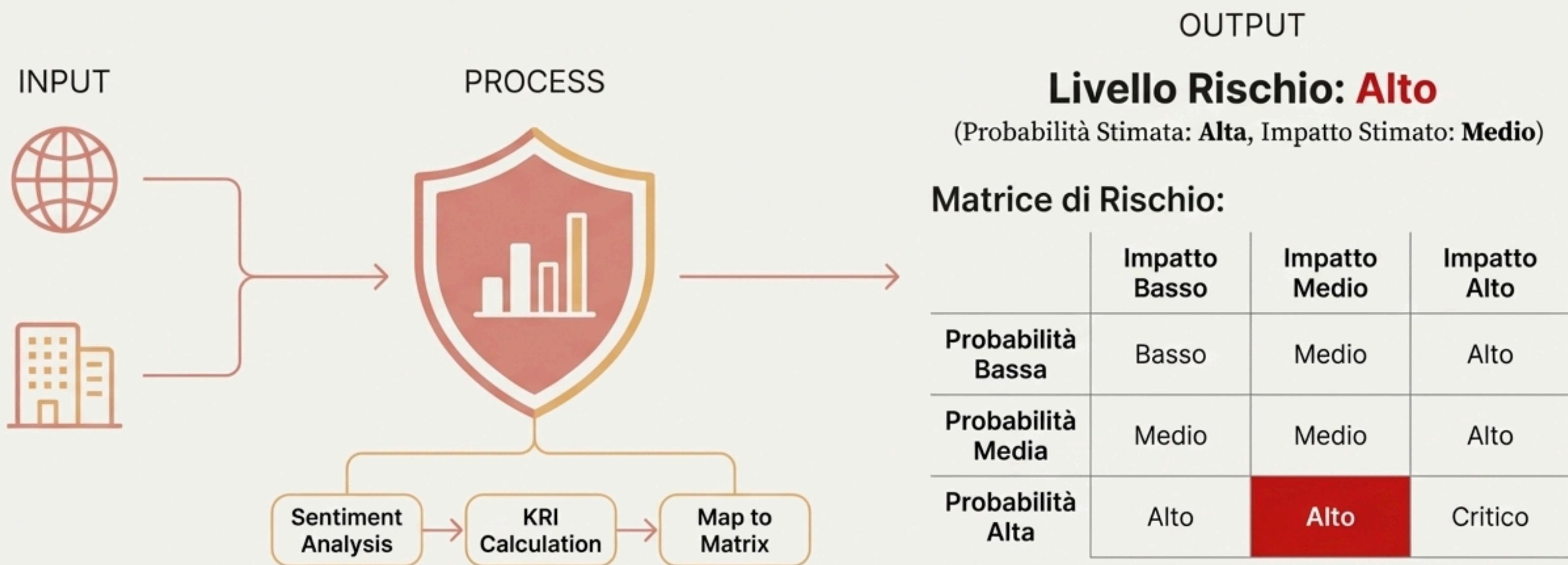
**Visualization-Ready JSON**



Includes fallback Regex  
parser for robustness

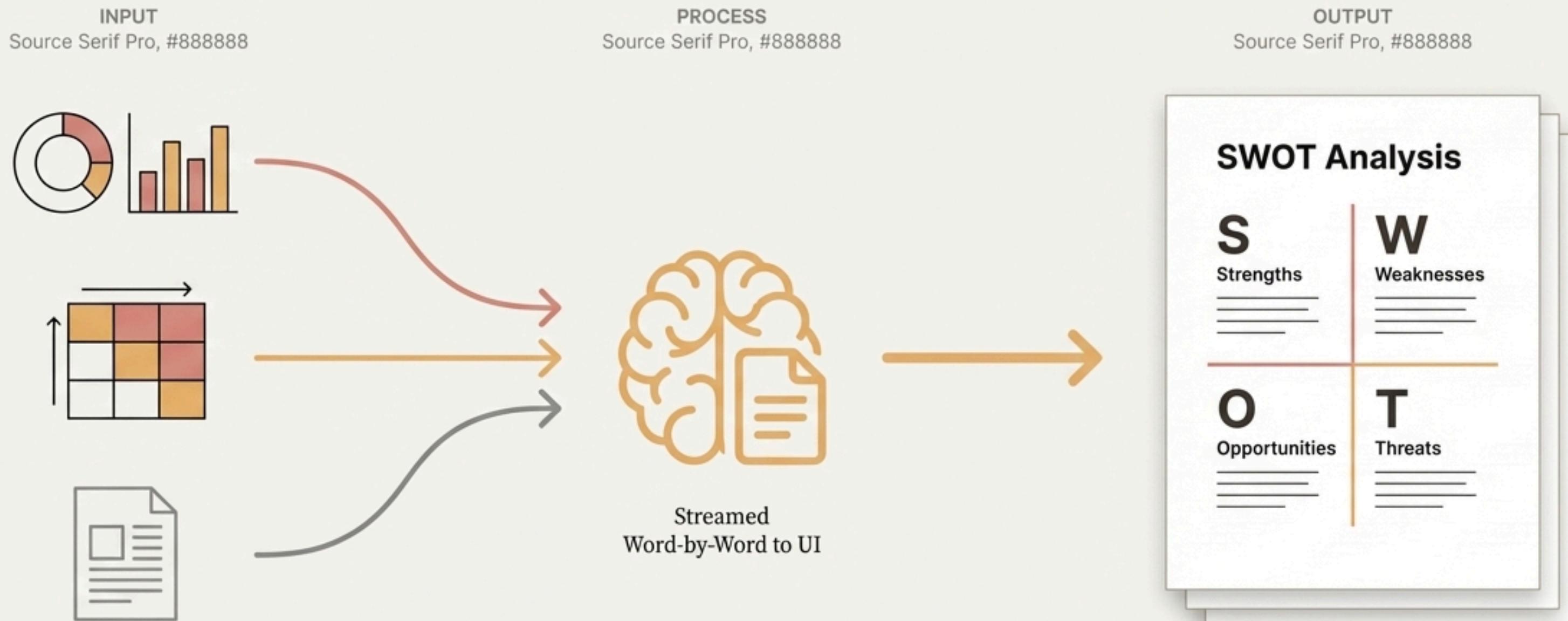
# Step 4: Quantifying the Risk

Performs sentiment analysis and uses a symbolic matrix to calculate a qualitative risk level based on probability and impact.



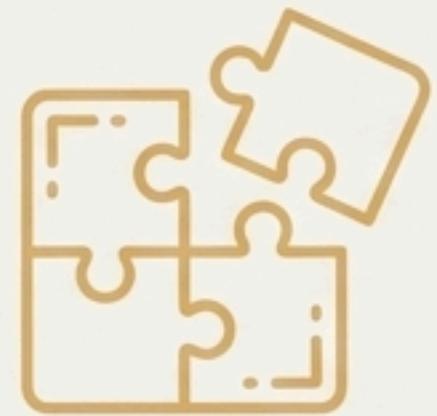
# Step 5: Generating the Final Strategic Report

Synthesizes all prior analysis—context, data, charts, and risk—into a final, comprehensive report including a SWOT analysis.



# Engineering a Resilient Pipeline

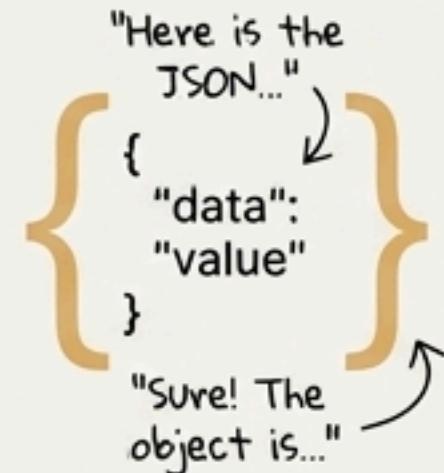
## CHALLENGE



### Semantic Mismatch

Inter SemiBold

User says 'pizzeria', but the database uses the official ATECO code 'Attività dei servizi di alloggio e di ristorazione'.



### LLM Unreliability

Inter SemiBold

Models add conversational text (e.g., "Here is the JSON...") that breaks standard parsers.

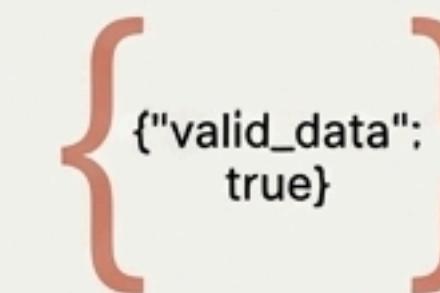
## SOLUTION



### Hybrid Search

Inter SemiBold

A function combines semantic search with keyword matching on the top results to ensure accurate ATECO code translation.



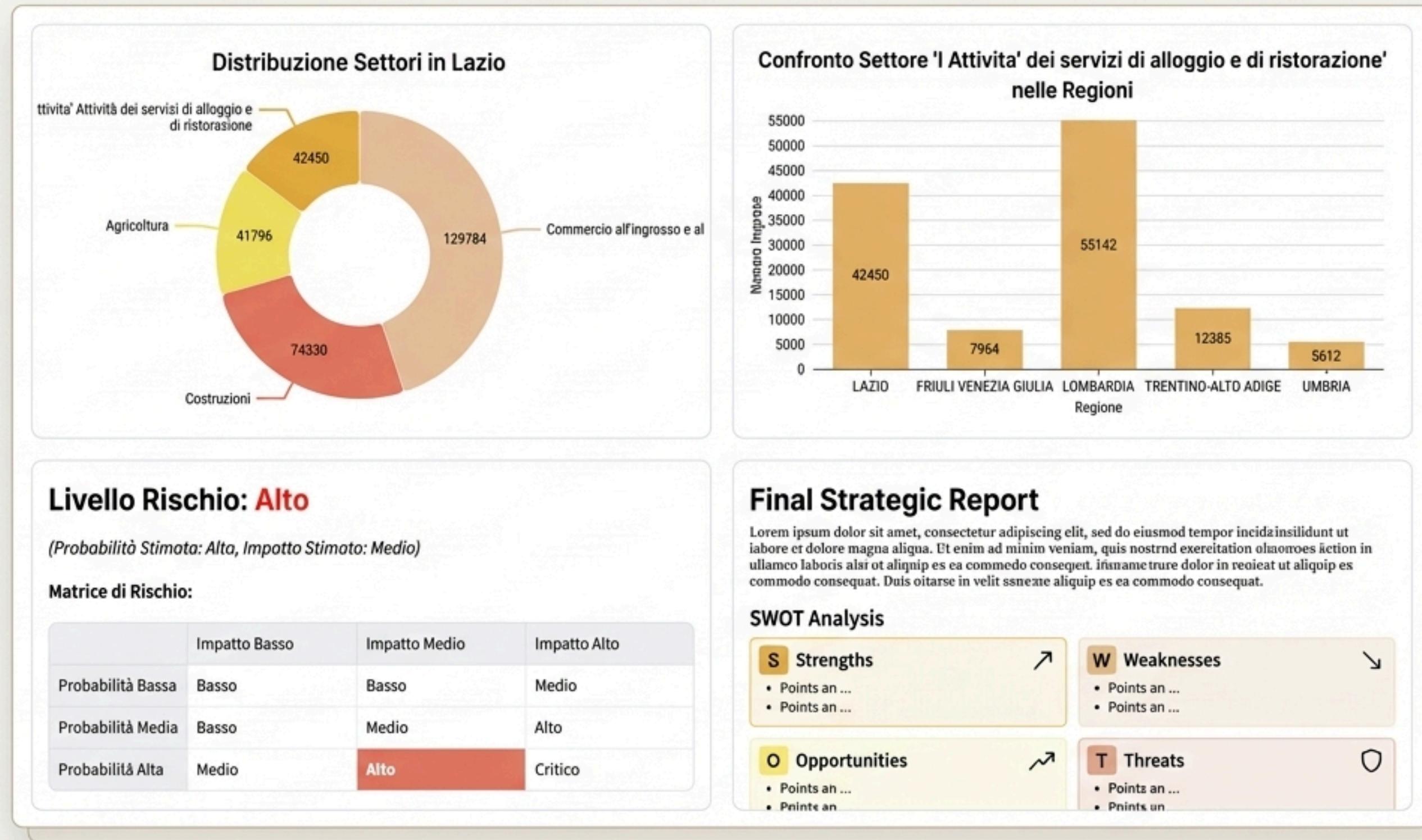
### Robust JSON Extraction

Inter SemiBold

A custom parser balances curly braces to extract only the first valid JSON object, ignoring all surrounding text.

# The Complete Picture: A Unified Analytical Dashboard

All generated analysis—from market distribution to risk level—is presented in a clear, interactive Streamlit interface.



# Key Takeaway: Architecture Enables Evolution

## Core Achievement

The project successfully evolved from a descriptive tool to a powerful analytical and evaluative assistant.

## Architectural Insight

The modular, multi-agent architecture provided the flexibility to solve complex problems, such as integrating the `RiskScoringAgent`, without re-engineering the entire system.

## Central Success

The system effectively bridges the gap between symbolic logic (structured databases, filters) and semantic understanding (LLMs, vector embeddings).

