Development of a semantic and intelligent knowledge graph for well-being energy

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Background & Motivation

Drinkizz is a wellness energy drink brand that promotes health through natural ingredients. However, its valuable product knowledge was stored in a static PDF Handbook. This format made it difficult for staff to quickly retrieve information and prevented customers from easily exploring ingredient functions and health benefits. To solve this challenge, our team set out to transform unstructured data into a smart, machine-readable system.

Objectives

Our goal was to design and deploy a semantic knowledge graph and an AI-powered chatbot for Drinkizz. This system would provide structured, explainable, and interactive access to product knowledge. It aims to improve transparency, support better internal decision-making, and enhance customer engagement with clear, verifiable answers

Architecture & Workflow

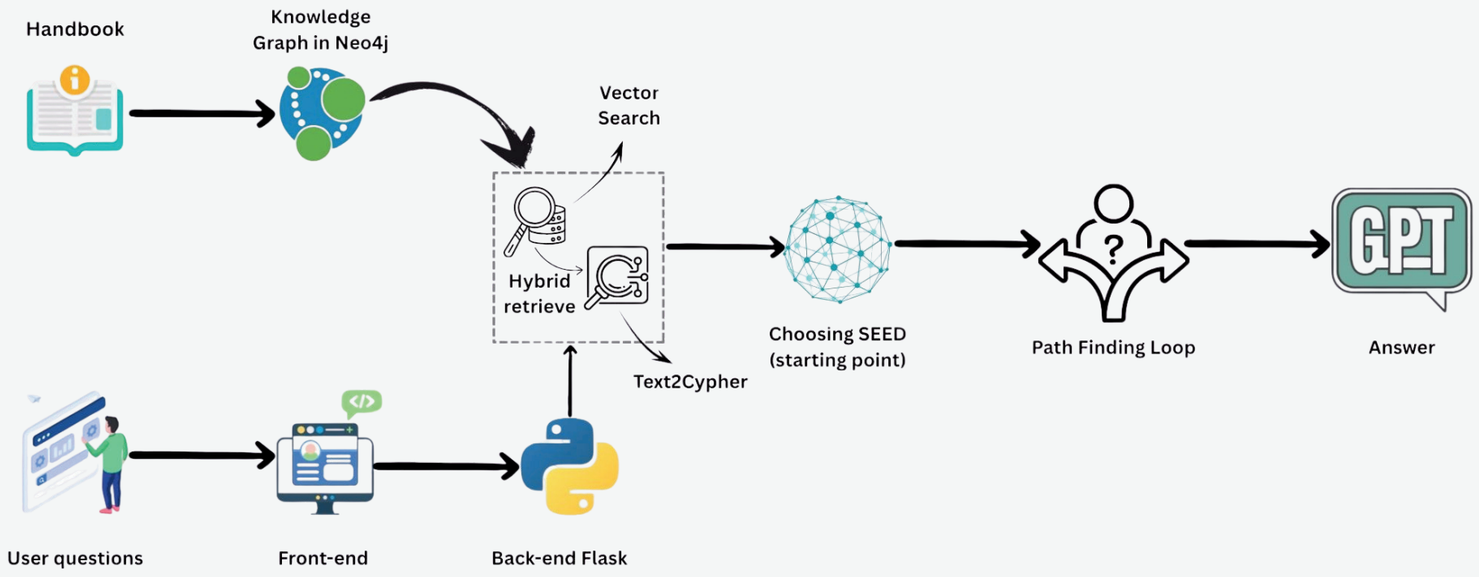

Figure 1: From Handbook to Answers: System Workflow

Methodology

The development process of the AI Chatbot involves several key steps:

- Extract glossary terms, definitions, and relationships from the Handbook.
- Model the ontology using OWL and validate with Protégé.
- Deploy on Neo4j with Neosemantics for semantic querying.
- Integrate LangChain Graph-RAG with GPT-4 to power conversational AI

Conclusion & Findings

Our solution demonstrates how semantic AI can make complex product knowledge transparent and interactive. The chatbot improves internal efficiency, enhances customer trust, and offers a reusable model for wellness and other regulated industries

Experiments & Results

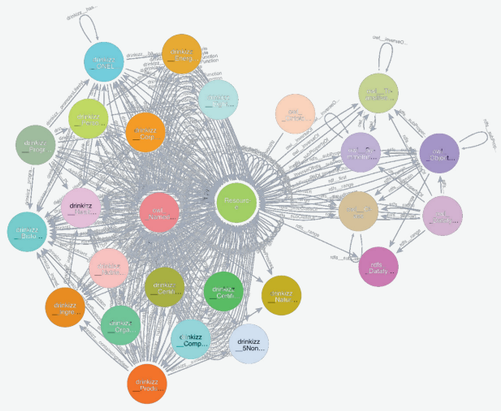

Figure 2: Database Schema Visualization

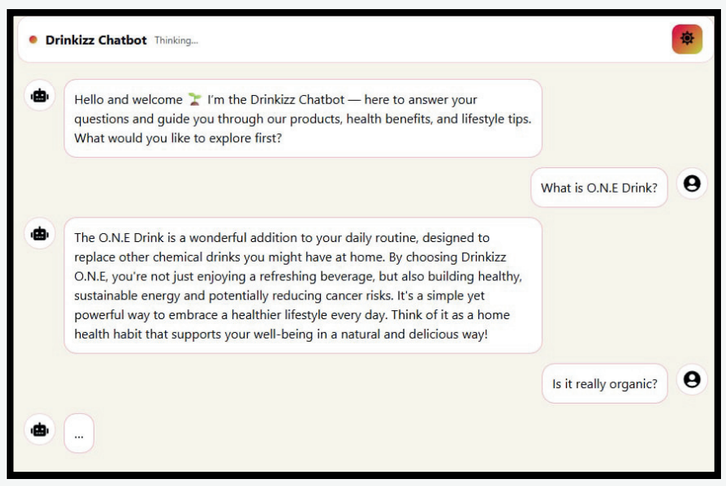

Figure 3: Sample Conversations

Figure 4: Chatbot in Dark Mode

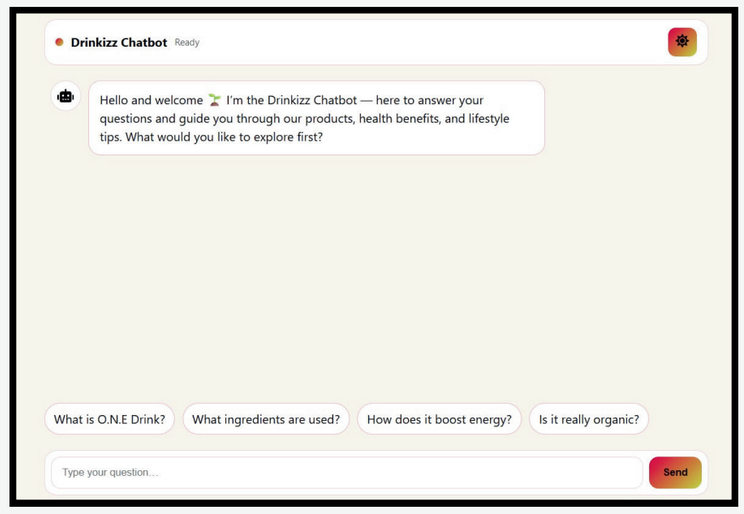

Figure 5: Chatbot in Light Mode

Ontology Generation

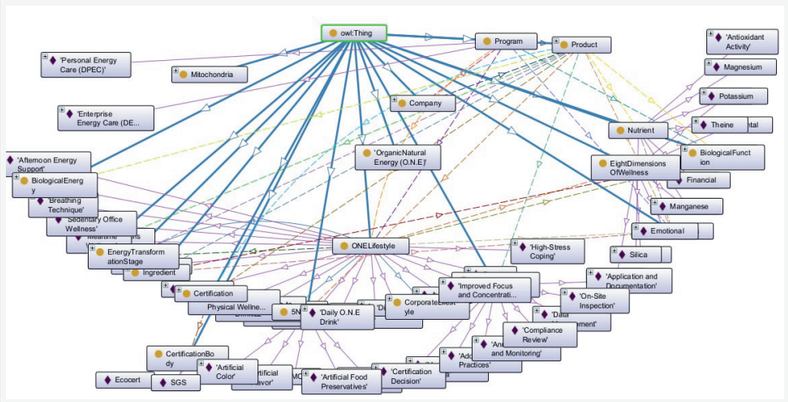

Figure 6: Ontology Visualization