Women's Health Foundation
–
Semantic Classification POC

The Challenge

A humanitarian foundation focusing on women's health faced a complex problem: determining the highest impact decision points in contraception adoption for specific markets and demographics. Two strategic objectives drove the initiative—first, understanding the multifaceted factors (from product attributes to social influences) that guide women's contraceptive choices, and second, identifying actionable insights from disparate data sources. The key challenge was integrating internal survey response data with internal investment documents to answer nuanced competency questions such as, "What are the most frequently cited factors when considering a contraceptive method?" and "Which factors most strongly influence adoption or rejection?" This required a system that could not only ingest and organize heterogeneous data but also enable executives to visualize and act upon insights derived from complex cross-document analyses.

The Solution

To address these challenges, the project team developed a proof-of-concept (POC) that leveraged advanced graph technology combined with AI-augmented classification techniques.

The solution was implemented across several workstreams:

Defining System Functionality
The initial phase involved clearly articulating the use case. By mapping out the decision landscape—from strategic objectives (improving modern contraceptive prevalence rates) to granular insights from user research—the team designed a tailored taxonomy and ontology for the women's health domain. This semantic framework was engineered to capture cultural nuances, local linguistic variations, and the diverse attributes influencing contraceptive choices.

Processing Existing Data
With the functionality defined, the next phase involved transforming internal survey responses and investment documents into a unified, structured format. An AI-augmented classification workflow was deployed to extract tacit knowledge from survey responses. This process was supported by a stakeholder-validated taxonomy and ontology, allowing raw responses to be mapped into clearly defined data classes. This robust data processing pipeline ensured that quantitative measures (like frequency of citation) and qualitative insights were captured in a cohesive base graph.

Women's Health Foundation – Semantic Classification POC

Building the Analysis Model
The core of the solution was the creation of a Product Adoption Survey Base Graph. Processed data was converted into RDF triples using a rigorous ontology model, forming the base graph designed to answer competency questions via SPARQL queries. While this model laid the foundation for revealing correlations and decision factors, the full production of the advanced analysis graph—designed to incorporate deeper inference and reasoning—remained as a future enhancement.

Handoff of Analysis Graph Production and Frontend Implementation
Due to time constraints, the production of the comprehensive analysis graph and the implementation of the interactive front end were transitioned to the client. Our team delivered the base graph and all necessary supporting documentation, providing the client with a solid foundation and a detailed roadmap for further development. This handoff ensures that the client's in-house teams can continue productionalizing the analysis graph and integrate it with their BI dashboard for end-user access.

Provide a Roadmap for Further Development
Beyond the initial POC, a clear roadmap was established. The next steps include refining the AI classification workflow, fully instantiating the analysis graph with enhanced reasoning capabilities, and developing the front end to expose these insights via a business intelligence (BI) dashboard. These tasks have been handed off to the client, along with guidance on leveraging enterprise graph database licenses and integrating the solution within existing knowledge management frameworks.

The EK Difference

A standout feature of this project is its novel, generalizable technical architecture:

Ontology and Taxonomy Design:
A custom ontology was developed to model the women's health domain—incorporating key decision factors, cultural influences, and local linguistic variations. This semantic backbone ensures that structured investment data and unstructured survey responses are harmonized under a common framework.

AI-Augmented Classification Pipeline:
The solution leverages state-of-the-art language models to perform the initial classification of survey responses. Supported by a validated taxonomy, this pipeline automatically extracts and tags critical data points from large volumes of survey content, laying the groundwork for subsequent graph instantiation, inference, and analysis.

Women's Health Foundation – Semantic Classification POC

Graph Instantiation and Querying:
Processed data is transformed into RDF triples and instantiated within a dedicated Product Adoption Survey Base Graph. This graph, queried via SPARQL through a GraphDB workbench, offers a robust mechanism for cross-document analysis. Although the full analysis graph is pending, the base graph effectively supports the core competency questions.

Guidance for BI Integration:
The architecture includes a flexible API layer and clear documentation that maps graph data into SQL tables. This design is intended to support future integration with BI platforms, enabling real-time visualization and executive-level decision-making.

The Results

The POC delivered compelling outcomes despite time constraints:

- **Actionable Insights:** The system generated new insights by identifying frequently cited and impactful decision factors for contraceptive adoption, directly addressing the competency questions set by the Women's Health teams.
- **Improved Data Transparency:** By structuring tribal knowledge and unstructured survey data into a unified graph, the solution provided an explainable view of the decision landscape. Stakeholders gained visibility into how each insight was derived, enhancing trust in the system's outputs.
- **Scalability and Generalizability:** The technical architecture is robust and adaptable, offering a scalable model for analyzing similar survey data across other health domains. This approach demonstrates how enterprise knowledge graphs can drive down the total cost of ownership while enhancing integration within existing data management frameworks.
- **Strategic Handoff:** Recognizing time constraints, our team successfully handed off the production of the comprehensive analysis graph and the implementation of the front end to the client. This strategic decision ensured continuity and allowed the client to tailor further development to their unique operational needs.

info@enterprise-knowledge.com | 571-403-1109 | @EKConsulting