Enhancing Retail Performance with Semantic Layer As an Enabler for Data and Analytics Teams

The Challenge

In the fast-paced retail sector, organizations need to be able to quickly view store performance analytics in order to make crucial decisions. A leading global retail chain faced significant delays of up to 5-6 weeks when attempting to retrieve essential store performance metrics and create reports for executive leadership. This bottleneck was largely due to a data landscape where the organization had no central repository to store analytics and reporting information, aided further by a lack of standardized metadata or a coherent taxonomy system. As such, employees could not locate crucial data metrics, find information to aid their understanding of existing metrics from previous data projects, or locate the creators/curators of said metrics or analytics. Consequently, the chain decided to make significant investments into a migration of their content and data into a data lake and data warehouses as part of a data analytics transformation and modernization effort. The company reached out to Enterprise Knowledge (EK) with a challenge in regard to their enterprise-wide data asset management and metadata standardization.

The organization's data and analytics teams employed Metrics Data Products that include dashboards, reports, and performance metrics that are used to evaluate business competencies and performance across their global stores. They are often reusable across projects and able to be modified to fit various reporting and analytics needs. In the client's current state, the organization could not locate the owners of existing data products,the methodologies/calculations, and the data used to create them. This was due in part to a lack of common metadata fields/tags, aligned business glossaries, and taxonomy structure and the data landscape being split between multiple sources and locations. As such, the organization's strategic direction focused on developing a data landscape that is powered by a semantic layer and ecosystem to provide standardized data products.

The Solution

To determine the data discovery processes that stakeholders undergo when searching for data metrics and process information, EK engaged stakeholders from various different levels of the organization to gather a wide range of insights on data handling challenges and to create a solution that worked for all organization users. EK created four distinct use case journey maps representing stakeholders at various organizational levels, mapping out the state of the organizational data landscape at the beginning of EK's engagement. These journey maps allowed for the documentation of current process opportunities and challenges. EK leveraged this process to help the organization prioritize and identify the most critical challenges/pain points to be addressed.

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Then, EK worked with the client to identify and standardize shared organizational metadata terms and develop an enterprise taxonomy and data labeling system in order to better organize data and ensure that data does not get lost outside of the taxonomy. This step was crucial for simplifying data discovery and ensuring that similar data products could be found using a standardized set of metadata tags.

Additionally, EK created sets of training materials for data product discovery and the creation/maintenance of proper taxonomy use, as well as a business metadata glossary containing multiple definitions so that users could easily tag and search for data products. Finally, EK created a foundational ontology model linking data elements to one another and data products to their corresponding metadata, which improved data product searchability and reduced the amount of lost data. Overall, this ontology served as a backbone schema (explicitly making relationships between data assets machine readable) for the data architecture, enhancing the coherence and usability of information.

The EK Difference

Our team worked closely with the chain and dedicated extensive time and effort towards understanding the user experience when searching for information. EK's semantic architects, metadata/taxonomy and ontology experts were able to then create a tailored solution to make the information search process easier and more accessible. By interviewing data product users on their search process and creating comprehensive user stories and journey maps, EK's experienced semantic ecosystem professionals readily identified issues that could subsequently be rectified with solutions that EK has implemented repeatedly and successfully for other companies.

Being at the forefront of the enterprise ontology field, EK's ontologists used their extensive expertise, including semantic web standards, advanced data modeling techniques, and ontology design to lay the foundations of a domain ontology that provided the chain with a future pathway towards a wholly integrated enterprise semantic search and data discovery platform. With the creation of eight separate enterprise taxonomies, a comprehensive business glossary tailored to organizational-specific needs, and training materials on taxonomy and metadata standardization to guide the chain's employees on the proper tagging and organization of data products, EK laid the groundwork for a well-organized foundational data landscape to facilitate scale and expansion to additional metrics and users.

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Finally, with EK being an industry leader in developing and implementing the Semantic Layer, the chain was able to implement multiple facets of the framework required to stand a Semantic Layer up, which include the domain ontology, taxonomies, and business glossary mentioned above. This laid the groundwork for further interconnectedness of the organization's data and knowledge assets, as well as the users that rely on this information as part of their essential job duties.

The Results

In the engagement with EK, the chain overall improved the searchability and reusability of their data products, as well as the ease with which key decision makers and data analysts can create, modify, and reuse data products. This approach significantly minimized the overlapping steps and the time it took for data teams to develop a report from 6 weeks to a number of days. The chain was also able to gain a better understanding of their users' data search behaviors, including how various personas in their organization search for knowledge and data, especially across multiple sources in their data landscape, giving the organization the flexibility to identify key store trends and act on them more swiftly. Employees were provided programmatic approaches to tag their knowledge and data more effectively with the creation of a standard set of metadata and tags and data cataloging processes, and were able to leverage training on proper data tagging for an easier search experience. Through this Semantic Layer, the chain acquired knowledge on the best practices for organizing and creating knowledge and data products for their data and analytics transformation efforts, so that less time and productivity was wasted by employees when searching for solutions in siloed locations. The result was a more efficient, better-informed, and highly responsive business environment, setting a new organizational data management standard.