AI-Assisted Data Querying with Dynamic Data Dictionary

Description of the Invention:

This invention relates to an AI-assisted data querying system that integrates a dynamic data dictionary to enable seamless interaction with a company's data using natural language inputs. The system leverages AI to automatically generate accurate and structured queries based on the specific data architecture of each company, which is captured and organized during the onboarding process. This approach allows non-technical users to interact with complex datasets without needing expertise in query languages such as SQL or programming languages like Python.

The core innovation of the invention is the integration of the AI engine with the dynamic data dictionary. During onboarding, the data dictionary is populated with essential metadata about the company's databases, such as table structures, columns, data types, relationships (e.g., primary and foreign keys), and custom business rules. This information enables the AI to interpret user queries in the context of the company's unique data architecture, dynamically translating natural language inputs into structured data queries.

The AI system also offers advanced capabilities by generating Python code for complex data manipulation tasks. Based on the company's specific data model, the AI can create custom Python scripts in response to user requests, allowing for flexible data analysis and automation.

AI Architecture and Data Privacy:

The AI is deployed in a cloud-based environment, but each company is provided with an isolated AI instance to ensure strict data privacy. These AI instances operate independently within each company's data ecosystem, meaning that the AI only interacts

with the company’s data and never shares information or insights between organizations. This design provides the scalability of a cloud-based solution while maintaining complete data security and isolation.

Key Features:

Dynamic Data Dictionary: The system's AI leverages the dynamic data dictionary to interpret natural language queries by referencing metadata about the company’s specific data architecture. The dictionary is continuously updated as the company’s data evolves, ensuring that the AI always generates accurate and context-specific queries.

Natural Language Querying and Code Generation: The AI interprets user inputs in natural language and automatically generates structured data queries (e.g., SQL) or custom Python scripts for more advanced data processing. This allows both non-technical and technical users to interact with and manipulate data seamlessly.

Isolated Cloud-Based AI Instances: Each company operates its own dedicated AI instance in the cloud, ensuring that the AI learns only from the company’s data and that no data is shared across companies. This guarantees data privacy and prevents the transfer of insights between organizations.

Automation of Data Queries and Reports: The AI can automate the execution of frequently run queries or generate scheduled reports and scripts based on predefined conditions. This feature reduces manual intervention and provides regular insights to users.

Advantages of the Invention:

Customizable and Secure AI: The isolated AI instances ensure that data privacy is strictly maintained while enabling companies to harness the power of AI for querying and data manipulation.

Adaptive Query Generation: The integration of the dynamic data dictionary allows the AI to adapt to changes in the company's data architecture, ensuring that queries are always accurate and aligned with the latest data structures.

User-Friendly Interface: The system enables non-technical users to interact with data using natural language, while technical users can leverage the AI to generate Python scripts for advanced tasks, making it accessible to a broad range of users within the organization.

Conclusion:

This invention provides an advanced AI-driven solution for querying and manipulating data by combining a dynamic data dictionary with natural language processing and automated query generation. The system's ability to deploy isolated AI instances ensures that each company can interact with its data securely, without concerns about data privacy or cross-company data sharing. This makes the system a powerful tool for both non-technical and technical users, offering flexibility, security, and automation for modern business needs.