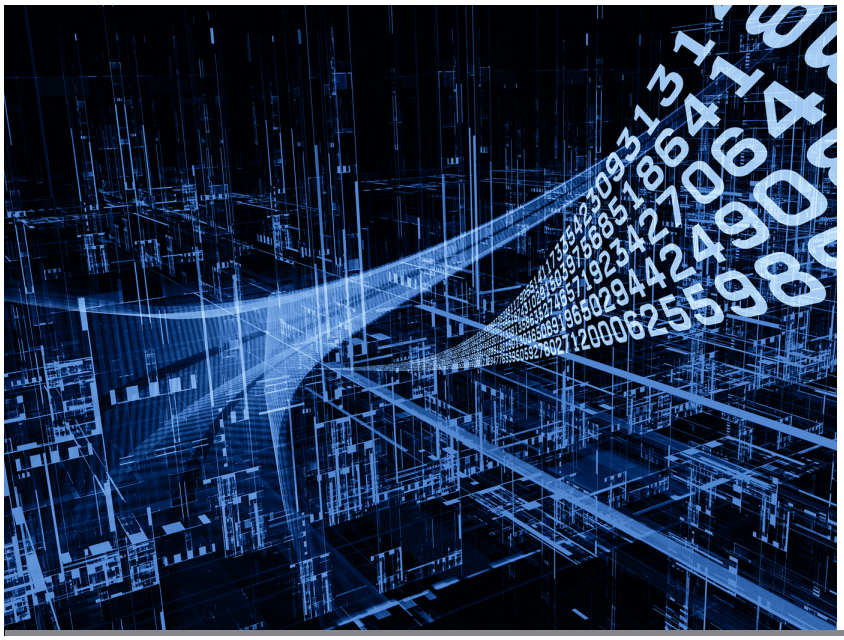


National Aeronautics and Space Administration

NASA

TECHNOLOGY SOLUTION

Information Technology and Software

Centralized Data Management Platform

A method and a system for managing complex interconnection of data and its derivatives

Many organizations have data stored in differing formats and various locations throughout the organization and often outside the organization. It is often difficult to access such data and to determine and access interconnected data and data derivatives. Developed at NASA Ames Research Center is a novel data management platform for managing interconnected data and its derivatives. The data management platform is able to receive miscellaneous data assets, analyze and reformat the assets using corresponding data models, link data assets by identifying interconnections between the data, and store the miscellaneous data assets in a database management system. This advance data management and analysis platform that allows the integration of heterogeneous data sets, employs machine learning to effect real-time data discovery, and dynamically associates data assets based on their content to generate data relationships.

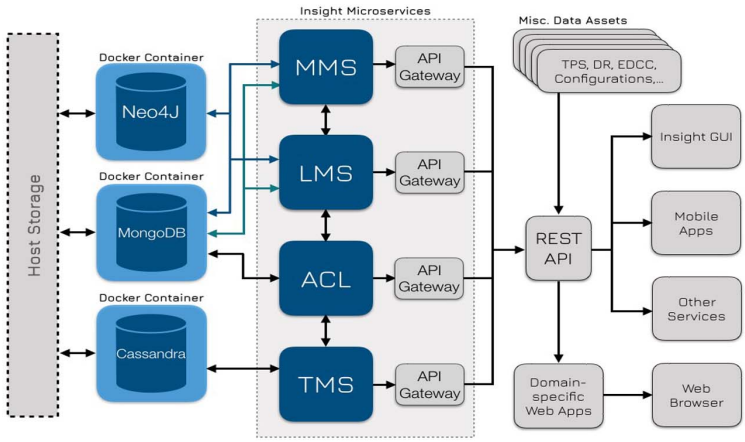
BENEFITS

- Adaptive data management services
- Data tagging services for efficient organization of disparate data from multiple heterogenous data systems
- Data ownership services for data security authorizations management across multiple microservices
- Data relationships services for data assets association based on content
- Data cataloging services for organizing metadata
- Data discovery services for searching data across domains ingested from various data sources
- Data lifecycle services to facilitate data lifecycle management including data collection, data maintenance, and data synthesis
- Data lineage and provenance tracking service to facilitate error detection and origin and promote interoperability

THE TECHNOLOGY

The technology is an adaptive data management and integration platform designed for disparate data sources. It is built to support multitenancy, manage data governance, handle heterogeneous data formats and advance data democratization using a suite of connected, independent microservices. Each service can be used within an integrated environment, or as a standalone product, with a dedicated set of functionalities, such as metadata management, data versioning, access control, data tagging, link management, and analytics, among others.

The platform includes APIs to query, navigate and analyze complex interconnections between data assets. The invention provides the capability to capture and manage domain knowledge as a graph schema. The microservices architecture provides services for data tagging, managing data ownership, managing data relationships by dynamically associating data assets based on their content, metadata cataloging and handling, data discovery by searching data across domains ingested from various data sources, while tracking the data's lineage and provenance, and product lifecycle that data assets belong to. Such data management can integrate heterogeneous datasets, facilitating cross-domain Metadata Management Services (MMS), identifying and limiting unconnected data sources and other fragmented data, as well as reducing redundant data sources.



Data Management and Integration System (Data Management Platform)

APPLICATIONS

The technology has several potential applications:

- Data management and Analysis
- Manage Product Lifecycle Data
- Internet of Management Things (IMT)

PUBLICATIONS

Patent No: 11,556,398

technology.nasa.gov

NASA's Technology Transfer Program pursues the widest possible applications of agency technology to benefit US citizens. Through partnerships and licensing agreements with industry, the program ensures that NASA's investments in pioneering research find secondary uses that benefit the economy, create jobs, and improve quality of life.

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More Information

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