



DATA, INTEGRATION, DISCOVERY

AI Engine



DeciSym AI Engine

Eliminate data preprocessing steps and enable Analysts to focus on analysis.

Creating Decision Advantage¹

Effective data for decision-making exhibits the following characteristics:

VAULTIS Framework Attribute	DeciSym AI Engine Solution
Visible: Consumers can locate the needed data.	Meta-data and inference enable the discovery of relevant data even if users do not think to perform a search.
Accessible: Consumers can retrieve the data.	Custom Data Fabrics can be established to retrieve distributed data across organizational data owner authorities.
Understandable: Consumers can find descriptions of data to recognize the content, context, and applicability.	Meta-data is enabled throughout the architecture. Descriptions and context can annotate any datum.
Linked: Consumers can exploit complementary data elements through innate relationships.	W3C Linked Data standards are the fundamental building blocks.
Trustworthy: Consumers can be confident in all aspects of their use of the data for decisionmaking.	All data is signed and encrypted. Meta-data captures provenance.
Interoperable: Consumers and producers have a common representation and comprehension of data.	Ontologies encode explicit relationships across heterogeneous data sources.
Secure: Consumers understand data safeguarding responsibilities, follow classification management procedures, and know that data is protected from unauthorized use and manipulation.	Need-to-Know (NTK) is enforceable by logic over meta-data. Key Management Systems (KMS) enforce explicit authorization before access is possible.

Analyst Workflow and Cost Savings

Analysts frequently expend time and effort identifying data sources, collecting them for analysis, bulk loading them into an analysis database or tool, normalizing/transforming them into a canonical or interoperable format, and indexing the contents. Data freshness characteristics may require the entire pipeline to be redone for subsequent analysis. The pipeline is typically appropriate only for one group or class of analysis and cannot be reused organization-wide. DeciSym Data Packaging Service enables organizations to shift the effort of data source collection, normalization, and indexing away from internal staff to a service provider. DeciSym AI Engine is a triple-store database that enables Analysts to immediately query Data Packages, skipping the cost and effort of pre-processing.

¹ VAULTIS Framework as described in: Department of Defense. (2023). *Department of Defense Data, Analytics, and Artificial Intelligence Adoption Strategy Accelerating Decision Advantage*. Department of Defense. https://media.defense.gov/2023/Nov/02/2003333300/-1/-1/1/DOD_DATA_ANALYTICS_AI_ADOPTION_STRATEGY.PDF

Data Fabric

Custom interoperable Data Fabrics can be created at any organizational level, from air-gapped enclaves to globally distributed and networked sites. The DeciSym AI Engine can perform queries that can cross local storage, the collection of copies from hosted storage lacking compute (e.g., AWS S3, SCP, etc.), and remotely hosted instances having both storage and remote compute (e.g., dedicated servers, VMs, etc.).

Integration

Ontologies provide the mechanism for systematic, distributed data integration. Traditional Relational Database Management Systems (RDBMS) require data structures to be predefined before data can be included in centralized data warehouses or data lakes. Ontologies embrace distributed data with heterogeneity, allowing different communities of practice to use their own vocabulary while still integrating with data from other communities.

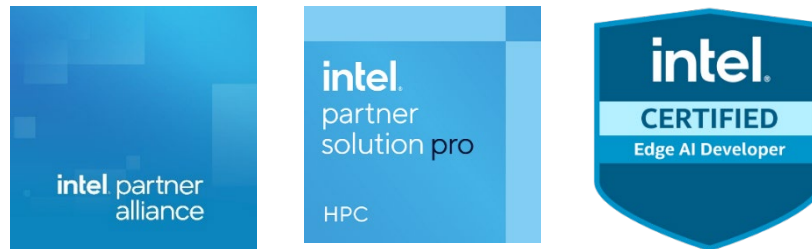
Architectural Overview

The DeciSym AI Engine is implemented in Rust on top of foundational open-source, standards-compliant triple stores and RDF processing libraries. It leverages our partner Sylabs' advanced encryption, access control, and compression technology, ensuring data security at all processing stages. The Engine is deployed as a simple CLI with customization points, such as feeding organization-specific dashboards.

About DeciSym

DeciSym.AI provides software tools and data services for maximizing operational efficiencies in AI/ML workflows, data sharing, and local/distributed analytics. DeciSym.AI's approach is to leverage open-source technologies whenever possible. DeciSym.AI data packages shift the collection and pre-processing of Publicly Available Information (PAI) from analysts to data service providers. Ontology alignment provides a mechanism for integrating PAI with secret or proprietary data in secure enclaves. DeciSym.AI engine can process integrated data in air-gapped computing environments. These tools and services lead to shorter, more accurate AI/ML workflows, resulting in increased operational effectiveness.

DeciSym.AI was founded in April 2022 by Don Pellegrino, PhD., to solve challenges encountered while developing cyber security systems for the United States Department of Defense and performing data integration for scientific R&D in the Chemical Industry. DeciSym.AI solutions are tuned for the operational environment of secure data management while ensuring analysis results meet requirements for high performance and trust.



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