

DANTI: AN AI-NATIVE KNOWLEDGE ENGINE FOR NEXT-GENERATION SDI

Overview & Context

Danti is an AI-native knowledge engine purpose-built for rapid, context-rich discovery of spatial data across silos. In an era defined by data abundance but limited discoverability, Danti enables users to semantically search, visualize, and interact with geospatially-referenced information without needing to move or replicate datasets.

Designed for enterprise, government, and mission-critical environments, Danti streamlines SDI access by transforming unstructured data into structured, map-ready insights while preserving data sovereignty and security.

Technical Details

Danti is built as a cloud-native, modular platform designed specifically for the modern data ecosystem, where spatial information is increasingly decentralized, dynamic, and varied in structure. At its core, Danti is a zero-copy knowledge engine, meaning it does not ingest, duplicate, or relocate data. Instead, it connects directly to existing data repositories, whether cloud-based, on-premises, or edge-deployed, and enables real-time querying without disrupting source systems or introducing unnecessary latency. This architectural choice is foundational to its scalability, data governance compatibility, and ease of adoption.

Rather than requiring users to conform to rigid schemas or ETL pipelines, Danti uses advanced semantic indexing powered by natural language processing (NLP) to automatically classify and contextualize structured and unstructured data. Metadata, spatial relationships, and temporal cues are extracted and encoded into a searchable index that supports high-performance, multimodal retrieval. As a result, a user might type a plain-language query (e.g., “recent permits for residential construction in flood zones”) and receive precise, spatially-aware results from multiple federated sources, including PDFs, spreadsheets, web services, or geospatial databases.

Danti's design philosophy embraces interoperability and extensibility. It natively supports OGC-compliant data services such as WMS, WFS, GeoJSON, and integrates easily with CSW-based catalogs and STAC indexes. Additionally, its API layer is compatible with both REST and GraphQL patterns, allowing third-party tools to build upon or embed Danti capabilities without friction.

In terms of technical extensibility, Danti offers a microservices-based plugin framework. This allows for rapid deployment of domain-specific models or functions such as automated feature extraction from imagery using computer vision, generation of vector tiles for dynamic map rendering, or enrichment of attribute data using external knowledge graphs. These services operate on demand and in parallel, ensuring low-latency responsiveness even at scale.

Security and access control are integral to the platform. Danti implements a zero-trust model that supports fine-grained access permissions, including role-based access control (RBAC) and attribute-based policies. It integrates with enterprise identity providers using standards such as OpenID Connect and SAML, ensuring secure federation across organizational boundaries. This

is particularly critical for use cases involving multi-agency data collaboration or compartmentalized data environments.

Altogether, Danti's technical architecture is aligned with the OGC vision for next-generation SDIs for resilient, interoperable, AI-enabled, and user-centric. It not only enables smarter access to spatial data but also empowers users across the enterprise, from GIS professionals to operational decision-makers, with tools to discover, analyze, and act on complex spatial information in context.

Benefits & Impact

Danti fundamentally improves how organizations discover, access, and act on spatial data by reducing complexity and accelerating decision-making. In traditional SDI environments, users must navigate disparate systems, incompatible formats, and siloed data often requiring days or weeks to locate and understand the information they need. Danti shortens that timeline to seconds through intuitive, AI-driven search and automated data contextualization.

By eliminating the need for centralized ingestion or manual ETL processes, Danti reduces infrastructure burden and operational overhead while preserving data ownership and access controls at the source. This enables organizations to modernize their spatial data infrastructure without disrupting existing workflows or duplicating datasets, delivering both technical and economic efficiency.

Danti also democratizes geospatial intelligence. Its natural language interface and rich visualizations empower a broader set of users including planners, emergency managers, analysts, and non-GIS professionals to ask questions and receive geospatially-anchored insights without requiring specialized tooling or training. This inclusive design not only increases the utility of SDI investments but also strengthens cross-functional collaboration and decision quality.

In environments where security, speed, and scale are paramount, Danti has proven to reduce latency in mission workflows, improve data accuracy, and unlock untapped value from underutilized datasets. Whether supporting urban planning, public safety, or environmental monitoring, the platform transforms spatial data from static layers into operational intelligence.

Demonstration URL

<https://www.loom.com/share/f8682c8ba42a426f861aa343b4941d69?sid=d20a1642-22dd-484e-93b5-f1991989e063>

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