# The Hidden Cost of Not Knowing

In today's AI-driven enterprise, data is no longer the problem — discoverability is. Enterprises operate in data-rich environments, yet struggle to extract consistent, reliable, and actionable insights.

**What is that costing you?**

- Estimated 25% of research efforts lost in duplicated research & redundant analysis
- Slower innovation cycles while competitors move faster
- Underutilized proprietary knowledge — your most valuable asset

# Introducing SemantX on mcube™

## The Semantic Intelligence Engine for Enterprise AI

SemantX, the semantic engine within mcube™, addresses this gap by embedding ontology-driven intelligence and knowledge graph capabilities at the core of enterprise data architecture. It transforms fragmented data into a connected, contextualized, and machine-interpretable knowledge layer, enabling organizations to scale analytics and AI with consistency and trust.

**SemantX combines semantic understanding, knowledge graphs, and GenAI into a single system that doesn't just retrieve scientific data, it connects, validates, and contextualizes it to accelerate real-world discovery."**

tcgdigital mcube by tcgdigital

TCG DIGITAL SOLUTIONS 265
Davidson Ave, Suite 220
Somerset, New Jersey 08873

contact@tcgdigital.com
www.tcgdigital.com
www.tcgdigital.com/tcg-mcube

## Core Capabilities

- **Semantics embedded from Day 1 :** SemantX powered by the mcube™ Semantic Lakehouse, embeds context and meaning directly into the data from the start, so that it is easily understood, discoverable, & AI-ready.
- **Context-Aware Scientific Intelligence :** Goes beyond mere keyword search. It comprehends relationships between molecules, pathways, assays, and outcomes, enabling reliable connected knowledge that aligns with true scientific reasoning.
- **Discovery of Hidden Scientific Connections :** Reveals non-obvious correlations across experiments, literature, and datasets to accelerate breakthrough insights.
- **The Knowledge Graph Agent, integrated with Gen AI :** Provides an easy conversational interface by generative AI with ontology-driven knowledge graphs.
- **Pre-Built Life Sciences Ontologies & Domain Models** : With 60+ ontologies and scientific frameworks to enable immediate, domain-specific intelligence, SemantX is equipped with pre-built models.
- **Specialized Scientific Search Capabilities :** Equipped with specialized scientific search capabilities such as chemical structure search, sequence analysis, patent intelligence, and semantic similarity for deep research workflows.
- **Unified Scientific Knowledge Layer :** Provides a connected, contextualized knowledge ecosystem, which houses all R&D, manufacturing, quality, and external data. Additionally, it integrates in-house proprietary and public sources in a secure environment.
- **Continuous Scientific Learning & Evolution :** Ensures the latest insights through dynamic updates synchronized with new research, publications, and experimental data.
- **Enterprise-Grade Data Security :** Advocates  governance to ensure all proprietary data remains within enterprise boundaries, enabling secure AI adoption without IP risk.
- **Native Integration with Lab Informatics Ecosystem :** Seamlessly integrates and interoperates with LIMS, ELN, and scientific data systems to create a continuous, end-to-end data flow across research and production environments.

### The Knowledge Graph Agent

Within SemantX, this is a natural language interface that transforms how scientists and business users interact with complex enterprise data by eliminating the need to navigate fragmented systems. Users can converse with it in natural language and receive governed, permission-aware answers, including structured, tabular outputs ready for immediate use. It goes beyond conventional conversational AIs. What differentiates it is its contextual intelligence, embedded in the knowledge graphs.

## Real-World Applications of SemantX in Life Sciences

| | |
|---|---|
| **Multi-Omics Driven Drug Discovery** | **Traverse complex biological relationships in seconds**<br>Allow researchers to move easily from gene to pathway to compound to clinical trial, which speeds up the process of coming up with new ideas and cuts down on the time it takes to make new discoveries by months. |
| **Intelligent Clinical Trial Matching** | **From patient data to trial eligibility in real time**<br>Unify genomic, EHR, and wearable data into a knowledge graph to instantly match patients to trial criteria, improving enrollment rates and reducing time-to-trial execution significantly. |
| **Connected R&D and Manufacturing Intelligence** | **Get rid of silos along the pharma value chain**<br>Connect experimental data, process parameters, and quality outcomes to speed up root cause analysis and make products more consistent. |

tcgdigital mcube by tcgdigital

TCG DIGITAL SOLUTIONS 265
Davidson Ave, Suite 220
Somerset, New Jersey 08873

contact@tcgdigital.com
www.tcgdigital.com
www.tcgdigital.com/tcg-mcube