Case Study

Lockheed Martin Space Systems

From Scientists to Satellites: LMSS Tackles Disparate Life Cycle Data with a Neo4j Product 360 System

INDUSTRY
Government & Aerospace

USE CASE
Bill of Materials / Product Data Management

GOAL
Create project efficiencies by connecting data in different ways, instead of relying on tribal knowledge

CHALLENGE
No way to integrate data, and building out an internally developed system was costly and not scalable

SOLUTION
Neo4j helps connect all data silos – like a product nervous system

RESULTS
– Reduced costs and greater efficiencies to meet business objectives
– Greater insights into where to focus on process improvements

With years-long product life cycles to build intricate space equipment, Lockheed Martin Space Systems was producing galactic amounts of data that was siloed and disconnected. With Neo4j, they created a product 360 solution to easily access once-tribal information and reveal unseen data relationships critical for meeting project deadlines and business objectives.

The Company

Lockheed Martin Space Systems (LMSS) is a division of Lockheed Martin Corporation that builds satellites to explore the solar system as well as space vehicles that drive around planet Mars. They also manufacture equipment to conduct other explorations that aid in predicting the weather, delivering precise GPS, detecting and defeating missile launches and more. As the premier government contractor, LMSS has built more interplanetary spacecraft than all U.S. companies combined.

The Challenge

LMSS was in dire need of a solution to support digitizing and integrating all of their processes and data across the entire lifecycle of products. With a wide expanse of disparate data they had no flow across multiple systems.

Ann Grubbs, Chief Data Engineer for LMSS, said they'd built a few interfaces to connect data, but that "it cost us a kazillion dollars to build the interface between our data storage systems, and it's not very scalable if you want to look at the entire life cycle of a product."

Most equipment LMSS builds has a very long development life cycle. From engineering to launch, every facet of the manufacturing life cycle correlates with and affects each other. Redesigns done today could have a big impact on something that's being put together years later.

As technology moved forward, LMSS amassed far more data than a human could ever understand or manage.

"All I can tell you is there are hundreds, maybe thousands of data systems, and tens of thousands of datasets," Grubbs said. "We create a lot of data around here."

Though a lot of information was residing in the heads of very smart people, tribal knowledge was too unreliable. Instead of a customer 360 solution – because they only have one customer, the government – they needed a product 360 solution.

Case Study

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– Ann Grubbs
Chief Data Engineer,
Lockheed Martin Space Systems

The Solution

"We looked at the problem and had a diagram that had circles coming off from lines, and it was a representation of our graph omen," Grubbs said.

Her team went searching for graph databases and found Neo4j. With Neo4j, LMSS stored their datasets in a graph of connected data. With reporting and analytics capabilities, they're able to easily see how their data fits together across a product life cycle.

Before using graph technology, it could take weeks to query all of the disparate systems to find an answer to an analyst or manager's question. The common methodology was to assign someone to manually connect the dots. By using a graph database to query data connections, however, the finding an answer to a question became much more efficient.

"Neo4j's graph database created a map of our products," added Grubbs. "'The DNA of our products' is what we like to say."

The LMSS team has a polyglot mantra, and that's been a huge part of Neo4j's successful implementation. Neo4j guides the application to the appropriate legacy system to drill down, bit by bit, and connect all data silos – like a nervous system. Because the massive architecture of their information "map" is built around Neo4j, they're set to scale.

LMSS understood early on they could use the graph for numerous things in a practical and valuable way. All the way up to the CEO, different departments want data connections that make sense for their objectives.

"We're rewriting our whole framework so we can blend this broad data with our deep data," Grubbs said. "We have all kinds of business cases lined up and ready to go."

The Result

The team was focused on efficiencies that would translate into benefits they could deliver to the business. With Neo4j as their method to map data, LMSS was able to reduce costs, meet schedules and improve predictability across the entire operation.

"We had a big problem managing scheduling across all the different groups of people, and with this system in place we can say, 'Hey, in engineering, if you don't get this done at this time, here's the impact to the schedule downstream,'" said Grubbs.

Using graph technology also gives LMSS the capability to determine where to focus on improving processes. For example, if they spend more money on making designs more complex, they need to know if it's really going to help later.

These insights allow them to understand how they should really be spending their budget to be overall more efficient and effective. With Neo4j as the guide along their map of data, they make these assessments in seconds as opposed to weeks or months.

Questions about Neo4j?

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