CASE STUDY

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Cisco's Semantic Knowledge Mapping & Analytics Platform

Since its founding in 1984, Cisco has been shaping the future of the Internet as the worldwide leader in networking - transforming how people connect, communicate, learn, work, play and collaborate. A key tenet of Cisco's value proposition is helping companies and partners build smarter solutions, more agile teams, continuously learning, innovating and enabling productive organizations for today and tomorrow -- which is where Cisco Learning, knowledge sharing, semantic knowledge mapping & analytics platform fits.

Cisco Knowledge Mapping capabilities is at the heart of this mission, enabling knowledge-intensive organizations create, share and discover contextually relevant knowledge used in up skilling & learning solution.

Cisco Knowledge Mapping practice helps us re-imagine the future of access to knowledge relevant to issue at hand, collaboration with experts, design, work, learn, sharing our diverse ideas, co-creating theorems & proofs, accelerate innovation that enhances our customers, partners and consumers experiences.
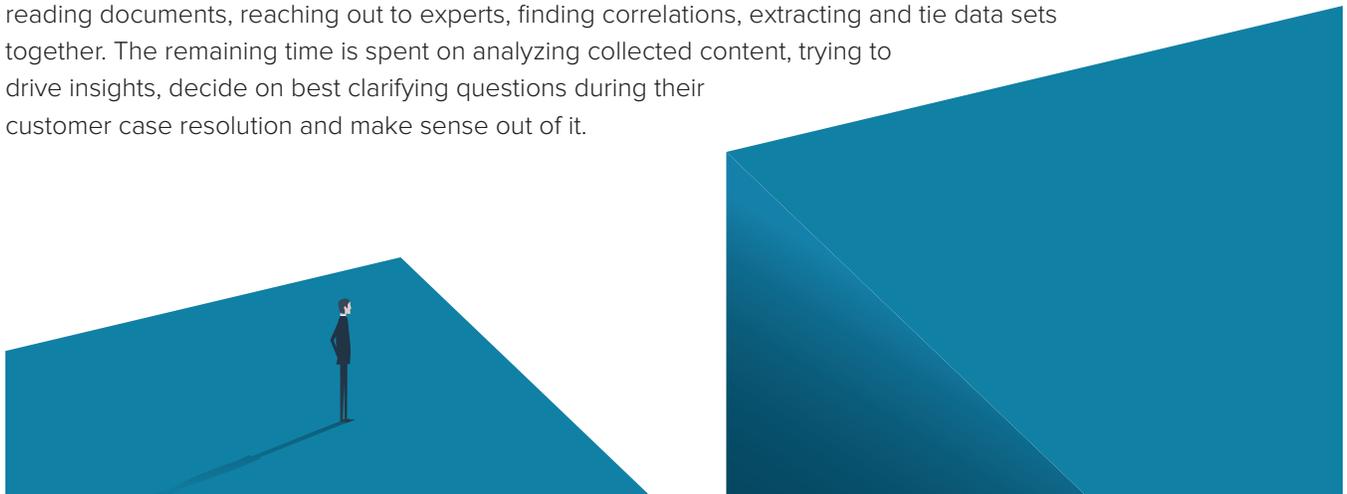
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The Challenge

As Cisco has matured from inception, to 80,000+ global employees, maintaining and supporting the exponential growth of corresponding expert knowledge and product and technology related content documentation posed a huge challenge.

Cisco relies heavily on revenue stemming from partners and resellers across a huge, acquisition-saddled product catalog. As a result, it's mission-critical to provide a polished and cohesive experience for over 150,000 consumers of education, training and certification resources in the support of this global channel ecosystem.

There is a growing demand for entitled access to consistent view of Cisco products definition and relevant metadata structures from technology groups all the way to related technologies, systems, components, product features, configuration information, related support cases, suppliers, related skills, learning resources and experts.

Internally, people are spending most of their time keyword searching in various portals, researching topics, reading documents, reaching out to experts, finding correlations, extracting and tie data sets together. The remaining time is spent on analyzing collected content, trying to drive insights, decide on best clarifying questions during their customer case resolution and make sense out of it.

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The Solution

Learning@Cisco Platform & Technology group sought to create an deep knowledge analytics environment to enable and enhance this knowledge mining and discovery experience. Depending on the user profile, past learning history, search intents and knowledge sharing activities, topics and documents are processed using AI techniques such as Semantic modeling, NLP & Machine Learning, auto classified and linked in real time, contextual relativity measured, scored, and indexed enabling visual representation and exploration.

Back in 2000, the first-ever Cisco ontology server was developed, and Cisco products and technology metadata services enriched numerous Cisco internal applications and external websites. In 2014, a small team in Learning@ Cisco, Visual Knowledge Map (VKM) envisioned a much more performant, capable, linked, machine-readable and feature-complete Knowledge Graph platform to serve as the foundational backbone -- that's where Stardog came in. The result of which is the Cisco Collaborative Knowledge platform, and more specifically the Visual Knowledge Mapping and Analytics service.

As of May 2018, the VKM team have reached a major milestone by completing a deep dive validation, by Cisco internal AI Steering committee (Cognitive Architecture Review Board). The team developed specifications, scalable methods and tools for defining & linking Cisco Knowledge Graphs, using a finite yet continuously growing set of product models, based on universally and internationally unique identifiers (in compliance with IRI standards defined by W3C and IETF), core- and domain-specific ontologies to provide enterprise-wide interoperability, programmability, reuse and usability of Cisco Knowledge services.

The result is a cohesive machine-readable and consistent representation of our understanding (specification of meaning & contextual correlation) of Cisco's technical topics, skills, product, technology, systems and features with well authored related contents, people, agents, events and activities generated via various business processes, applications, platforms for internal or external audience.

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The Solution (cont.)

Through use of developed methodology:

- **Achieved**: more service-oriented, collaborative, accurate, entitled and easy to use Knowledge through the use of Knowledge Mapping services and AI knowledge mining tools. Expert engagement is optimized using semantic technology stack, RDF store, NLP and ML, knowledge discovery, automatic classification and reasoning.

- **Overcame**: the problem of disconnected silos and inconsistent data sets and context-poor data replications.
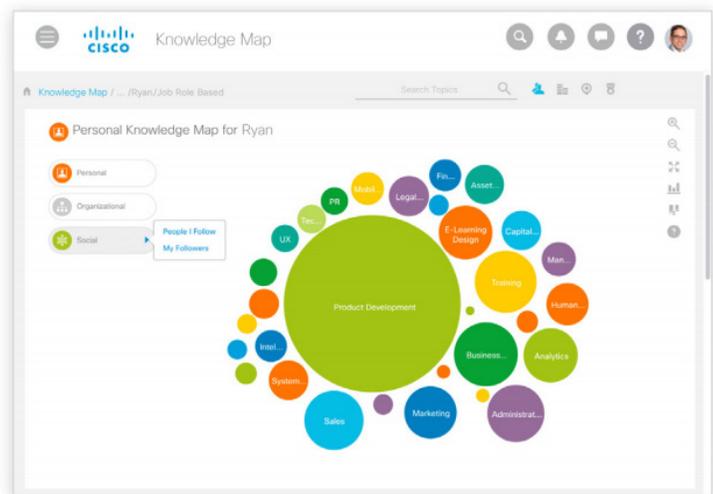
This integrated solution unites structured vocabulary, concept mapping with semantics graphing, aggregated data, expert crowdsourcing to assess knowledge structures and learning in real time. Once a topic is selected, a snapshot of endorsements and knowledge strengths can be viewed across jobs, departments, business units and/or the company. These snapshots can be used to support capabilities development, career planning, and succession planning.

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The Solution (cont.)

Under the hood, the Visual Knowledge Mapping and Analytics is powered by the Stardog Knowledge Graph platform, which provides a host of benefits:

- Integrates nearly 40 disparate sources of training and certification data at the individual user level

- Acts as the system of intelligence for linking and classifying the scheme, resources, annotations, and topics in the Cisco Knowledge domain itself

- Supports unstructured text data, which makes it possible to fully index the content of these resources in a searchable interface

- Provides next-generation guidance and curriculum feedback to consumers, ensuring they use CK resources in the most efficient manner to new attain training levels and certifications

With integrated standard, core and Cisco domain ontology models to represent the solution, Cisco Knowledge Graph is loyal not only to the existing standards but to the future, as well. Future iterations will include use cases such as assisting with automatically classifying and routing customer issues, as well as identifying resolutions and learning resources related to certain product features.

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📊 The Results

Deploying the Visual Knowledge Mapping & Analytics services have been a significant progress toward realizing the vision of data-driven analytics, breaking through the silos, personalization, curated discovery and recommendation services based on Cisco's collective & deep understanding of its products and technology knowledge.

- **Productivity of the Knowledge Worker**
  Reducing ambiguity and not having to go to various portals to search for relevant keywords, hoping to find the right documentation.

- **Trust & Reliance on the Service**
  Cisco Knowledge has solidified the foundation of collaboration and innovation -- the end-user is being served by a sophisticated knowledge service. It's like a "well-stocked library with great, great librarians -- why would you ever leave?!"

- **Reduction of ETLs, and Cost in Knowledge Acquisition and Distributing Learning**
  Greatly reduced the costs associated with creating, packaging, and disseminating knowledge, which empowers the knowledge workers in the organization

Want to get started with Stardog? Sign up for a free trial today.