

## Case Study



## In-Q-Tel

## Investor IQT Uses Neo4j to Help U.S. Intelligence Agencies Find the Best Cutting-Edge Technology

**INDUSTRY**

Government &amp; Intelligence

**USE CASE**

Knowledge Graph

**GOAL**

Source the best technology for U.S. intelligence agencies

**CHALLENGE**

Identify, fund and develop tech innovations from multiple sectors

**SOLUTION**

Neo4j database connects all IQT's data for search and analysis

**RESULTS**

- Better product evaluation and selection
- IQT generates new tech ideas for the US government faster and more easily

*IQT's mission is invest in and develop the innovative technology needed by US intelligence agencies. Installing a Neo4j-based system has enabled IQT to more efficiently identify tech innovations from multiple industries and combine them to develop entirely new solutions for the US government.*

**The Organization**

[In-Q-Tel](#) (IQT) is a non-profit venture capital firm and technology accelerator that helps America's intelligence agencies gain access to the most innovative technologies needed to keep the nation safe. IQT was founded in 1999 by the Central Intelligence Agency (CIA) when it became clear tech innovation was shifting away from government R&D and towards startups, who were developing new technologies more quickly and cheaply.

**The Challenge**

IQT bridges the gap between its government customers, the startup world and the venture capital (VC) community funding them. It uses its deep understanding of these diverse communities to identify and support the tech innovations that best match America's intelligence missions – the most enduring and difficult problems facing US security agencies.

IQT invests in approximately 50 companies a year. But to do so successfully, its staff must maintain a network of connections with VCs, startups, universities and technology centers. They must also evaluate tech innovations from a wide range of sectors – including biology, space systems, communications, cybersecurity, analytics, infrastructure, IoT, robotics, artificial intelligence, materials and energy.

IQT's ultimate aim is to break down (or “decompose”) these often very different product sets – anything from a drone to a 5G wireless communication system, for example – into their core complementary capabilities. It will then mix-and-match these features to create new custom technology “stacks” that solve its customers' complex problems.

But IQT faced a significant problem in achieving this mission.

“We had no way to automate these exercises,” explained Chief Architect Ravi Pappu. “Technology evaluation and decomposition was done manually in spreadsheets and presentation diagrams. Tech suppliers were matched manually, and the process of identifying new product combinations was slow and generated few ideas.”

**The Solution**

Pappu recognized that IQT had a series of [connected data](#) challenges: mapping the connections between intelligence agencies, their mission problems and startups; integrating

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– Ravi Pappu,  
CTO, In-Q-Tel

masses of information drawn from different suppliers and other sources; and quickly pinpointing significant links between the different tech products to create new solutions.

And from his experience of using Neo4j in a previous role, he recognized the best way to solve these issues was by a [graph database](#).

“Our tools didn’t reflect the connectedness of our data,” Pappu said. “That’s what we solved with [Neo4j](#).”

“The fundamental reason for us to choose a graph database over other systems is that there is enormous value in the relationships between different objects,” he explained. “Also, we have many different data silos in our organization, and we wanted to do a JOIN across all of them. Graph databases are the best way to do this – and we picked Neo4j because of its maturity, commercial support, my prior experience, and the willingness of the company to work with us on pricing.”

In January 2017, IQT began building a 100,000-node Neo4j database accessed by ARQ, a bespoke Neo4j-based front-end written in Go. This went live in mid-2017, with new releases every three months since. IQT is also in the process of integrating Elasticsearch to improve the relevance of search queries.

### The Result

Pappu compares IQT’s core mission to a genome project: The organization spots common tech capabilities (or “genes”) across multiple different products and enables engineers to combine these and create whole new solutions (“recombinant genes”) to feed to its tech-hungry customers.

Thanks to Neo4j, IQT’s technical staff are now able to develop these recombinant technology solutions by searching through its wealth of internally created data, along with information imported from sources such as the US Public Library of Science and IEEE, all integrated under one common taxonomy.

The project has produced multiple benefits, Pappu said, primarily better product innovations.

“Neo4j is making it easier and faster to generate new recombinant ideas to present to the government,” he said. “The ideas are more sophisticated as well, and the use of graphs is spreading through the company – hand-drawn PowerPoint drawings have dropped to zero!

“We are better at evaluating and decomposing technology, too, which both accelerates our vendor vetting process and improves the quality of the technology we add to our portfolio.

“IQT has a history of recognizing trends early – investing in Keyhole, the precursor to Google Earth, and staking early investments in Nirvana (acquired by Intel), Palantir, Kensho and Docker,” Pappu concluded. “With Neo4j, we now see even better into future technology trends.”

Neo4j, Inc. is the graph company behind the leading platform for connected data. The Neo4j graph platform helps organizations make sense of their data by revealing how people, processes and digital systems are interrelated. This connections-first approach powers intelligent applications tackling challenges such as artificial intelligence, fraud detection, real-time recommendations and master data.

More than 250 commercial customers, including global enterprises like Walmart, Comcast, Cisco, eBay and UBS use Neo4j to create a competitive advantage from connections in their data.

Questions about Neo4j?

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