

## Governance Knowledge Graph Case Study

# Hume and Neo4j help a statutory authority govern itself better and stay compliant

### Company

A law enforcement agency

### Business

- Protecting people and country's interests
- Investigating crimes
- Providing airport security
- Community policing

### Challenge

Drastically reduce manual effort required to keep a large volume of complex governance documentation consistent and up to date.

### Solution

Governance knowledge graph powered by Hume and Neo4j

### Results

End-to-end, user friendly solution for traceability, impact analysis, duplication detection, gap identification, and recommendations for governance instruments

### See Hume in Action

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Committed to continuous improvement but overwhelmed by the volume and complexity of its governance instruments, a government agency uses knowledge graphs to stay aligned with changing legislation and evolving organisational structure.

GraphAware Hume and Neo4j have significantly reduced the amount of manual effort required to keep documentation consistent and mitigate compliance risk.



## The Challenges

GraphAware's client is a government agency dedicated to protecting the country by combating serious and organised crime. As a statutory authority, the organisation is governed by complex framework which dictates how the agency operates and conducts its business.

The governance framework consists of different types of governance instruments, ranging from publicly available legislation, commissioner's orders, and case law to internal directives, delegations, enterprise and employment agreements.

With nearly a thousand different instruments totalling tens of thousands of pages, any organisational or legislative change poses a significant challenge. It takes a large amount of human effort to make sure that the legal obligations placed on the organisation are implemented correctly and consistently at all times, and that it is always clear who is accountable and responsible for these obligations.

The organisation's commitment to continuous improvement only amplifies the need to keep the documentation up to date.

## The Solution

Lacey Barnes<sup>1</sup> is an Architect at the agency. Having previously implemented the knowledge graph approach for operational use cases, Lacey has already experienced the benefits of making hidden connections explicit.

By creating a single connected source of truth from siloed, disconnected, and heterogeneous data, she was able to empower teams of analysts and investigators to work more efficiently and effectively.

Sketching out the governance problem domain, Lacey quickly realised that the entities and relationships amongst them naturally form a graph. A majority of the documentation lives in the public domain and uses hyper-links to refer to pieces of legislation and other instruments.



Other kinds of structured data were available to further enrich the network of interlinked documents. Organizational units, position hierarchies, as well as the names of concrete individuals that are currently

and historically occupying the positions could easily be harvested from the agency's enterprise resource planning (ERP) system.

Having previously seen GraphAware Hume being used by non-technical users to analyse graph data, Lacey's team started building a governance knowledge graph from the structured data at hand with the intention to expose it, via Hume's powerful graph visualisation and search interface, to the end users.

## The Results

By implementing a governance knowledge graph using GraphAware Hume and exposing it to non-technical end users and domain experts, a law enforcement agency reduced the time it takes to analyse the impact of a legislation change from days to minutes.

Hume automatically identifies gaps and even recommends the best way to resolve outdated references to the organisational structure, inconsistencies, duplicated documentation, as well as missing obligation implementations, thereby significantly reducing the risk of the agency falling out of compliance.

Freeing up valuable time previously spent manually sifting through thousands of pages of documentation, the agency's staff is empowered to proactively execute on the agency's commitment to continuous improvement and better self-governance.

"The engagement with GraphAware has been first class. There's been excellent access to experts and expertise, incredible support and response times, and a high quality product that's on the mark." said Lacey Barnes, Architect at the agency. "Issues and challenges have been resolved in 24 hours consistently", she added.

*"If we can help the business easily explore connections between instruments, identify documents with a high degree of centrality or clusters of similar documents, it will already be a huge win"* said Lacey, hoping to alleviate parts of the manual process by automating change impact analysis, prioritising the review of densely connected documents, and helping detect potential duplicates.

Knowing that Hume possesses natural language processing (NLP) capabilities, Lacey asked the GraphAware team to help leverage these features to automatically detect mentions of other governance instruments, positions, keywords, obligations, as well as other entities and semantic relationships among them.

After two months of close collaboration between GraphAware and the agency's data science teams and domain experts, the machine learning models were trained and fine-tuned, ready to be plugged right into Orchestra, a data ingestion and enrichment workflow engine.

Orchestra is a part of Hume that has been specifically designed to take documents from a number of locations, perform optical character recognition (OCR) if needed, enrich the data using machine learning algorithms, perform necessary post-processing and de-duplication, convert the data into the right knowledge graph structure, and finally store it in Neo4j, the underlying graph database.

With a full governance knowledge graph in place, the teams created a set of preconfigured traversals through the network which allow end users to visually interact with the graph and ask insightful questions.

For example, they can search for a piece of legislation that has recently changed and learn, with a single click, which governance instruments may be impacted by this change and why. In a similar fashion, end users are able to find out which governance instruments refer to positions that no longer exist, in a matter of seconds.

As a result of the governance knowledge graph project going live, other teams within the agency realise the potential of Hume and Neo4j for their own use cases and, ultimately, for the organisation's mission to protect its country's people and country's interests.

**Are you interested in seeing what Hume can do for your business?**

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<sup>1</sup> Name has been changed for the purposes of this case study