



REDEFINING PHARMACEUTICAL BATCH GENEALOGY WITH KNOWLEDGE GRAPHS

In the pharmaceutical industry, being able to trace a batch from development to utilization is critical. Batch genealogy tracks information across the manufacturing process and empowers organizations to understand any batch's complete history – but this data is siloed, and accessing it requires cumbersome, inflexible systems with little interoperability. Knowledge graphs provide a transformative solution to integrate, view, access, and understand this data.

Let's explore how Altair® Graph Studio™ is solving batch genealogy challenges with interoperable, scalable, and highly visual capabilities that seamlessly integrates data for complete traceability.

The Challenge Manufacturers Face

Pharmaceutical companies face several interconnected issues that hinder batch genealogy:

1. **Siloed Data:** Different information about various batch components is stored in different files, formats, systems, etc. – with little to no integration. Answering seemingly simple questions about a batch – Where was it manufactured? Where was it shipped to? Did it require specific transportation requirements? – is often time-consuming and expertise-intensive.
2. **Outdated Systems:** These systems are slow and difficult to navigate because they're inflexible and lack interoperability with open-source standards. Unfortunately, data is often tied to unwieldy systems. Integrating the data becomes very difficult, and extracting the genealogy becomes almost impossible.
3. **Unscalable and Unsustainable:** These current systems lack resilience. Without the opportunity to scale current solutions, pharmaceutical manufacturers often create individual applications for individual problems, further siloing data and teams. What batch genealogy systems do exist are often unsustainable. Without open-source standards, they can't grow. All too often, these systems must be redone each time new regulations are introduced or changed, hindering data governance.

How Knowledge Graphs are Changing Batch Genealogy

Knowledge graphs solve fundamental data traceability issues. By integrating data from multiple sources, knowledge graphs break down data silos and harmonize it into a unified, accessible format that helps users identify new correlations and relationships. Using this technology, pharmaceutical manufacturers can institute strict data governance and data lineage to understand everything about the batch: where it comes from, where it's stored, how it functions within the graph itself, and more.



Knowledge graph technology makes industry-specific challenges – like impact analysis following manufacturing disruption, tracking polyfluoroalkyl substances (PFAS), and ISO Identification of Medicinal Products (IDMP) compliance – much more manageable. The insights Graph Studio provides extracted are integral to meeting regulatory standards and audit requirements. With it, users can grasp the manufacturing processes' nuances by removing the time-consuming detective work needed to track down every component of a batch.

Interconnected, Lateral Data

Graph Studio breaks down data siloes, gives users a single source of truth for batch genealogy. The data becomes highly visible, and with it, teams gain access to information with traceable histories. Batch genealogy benefits from all relevant data in a single accessible format.

Flexible, Interoperable Access

Instead of a tedious back and forth while data analysts answer a question over a lengthy period of time, Users access information easily with Graph Studio. The time Graph Studio saves users is immeasurable. Open-source standards offer pharmaceutical companies flexibility, interoperability, and growth. Knowledge graphs transform data to meet drug manufacturers' needs and provide a collaborative, multiuse solution to trace a batch from all angles.

Sustainable, Scalable Future

With knowledge graphs, batch genealogy is given a scalable transformation into a resilient, foundational tool. Users can add data sources at any time to comprehend all facets of the batch. Graph Studio is a sustainable solution that increases the genealogy's reach. Moreover, more teams can use the same structure for their own purposes because the foundation – the knowledge graph – is extendable. Teams are empowered to ask new, varied questions of the genealogy, tracing the full history of any given batch.

Transform pharmaceutical batch genealogy with Graph Studio.

Learn More: altair.com/altair-graph-studio