

How Knowledge Graphs will Transform the Pharmaceutical Industry



Agenda

What is a knowledge graph?

PHUSE Project

Q&A



Speakers



Guy Vorster

Sr. Director of Solutions Consulting,
Stardog



Tim Williams

Knowledge Graph Project Lead,
PHUSE

Introducing Stardog: The Enterprise Knowledge Graph Company

Our Enterprise Knowledge Graph helps you make better decisions with data

We help our customers and partners:

- Build innovative new products
- Create efficient, data-driven operations
- Unlock access to data

Headquartered
Washington, DC

50+
Global Customers

Venture-backed
With \$20M in funding

Trusted by global leaders with their toughest data challenges



Morgan Stanley



D | DOW JONES



BNY MELLON



BOSCH

ELSEVIER



QIMR Berghofer
Medical Research Institute

SIEMENS



Boehringer
Ingelheim

NOKIA

SPRINGER NATURE

Schneider
Electric

“

Knowledge graphs represent contextual, highly-connected data that is organized in the form of graphs.

They are used to contextualize search and to turn data into knowledge.”

Gartner, Predicts 2020: Data and Analytics Strategies

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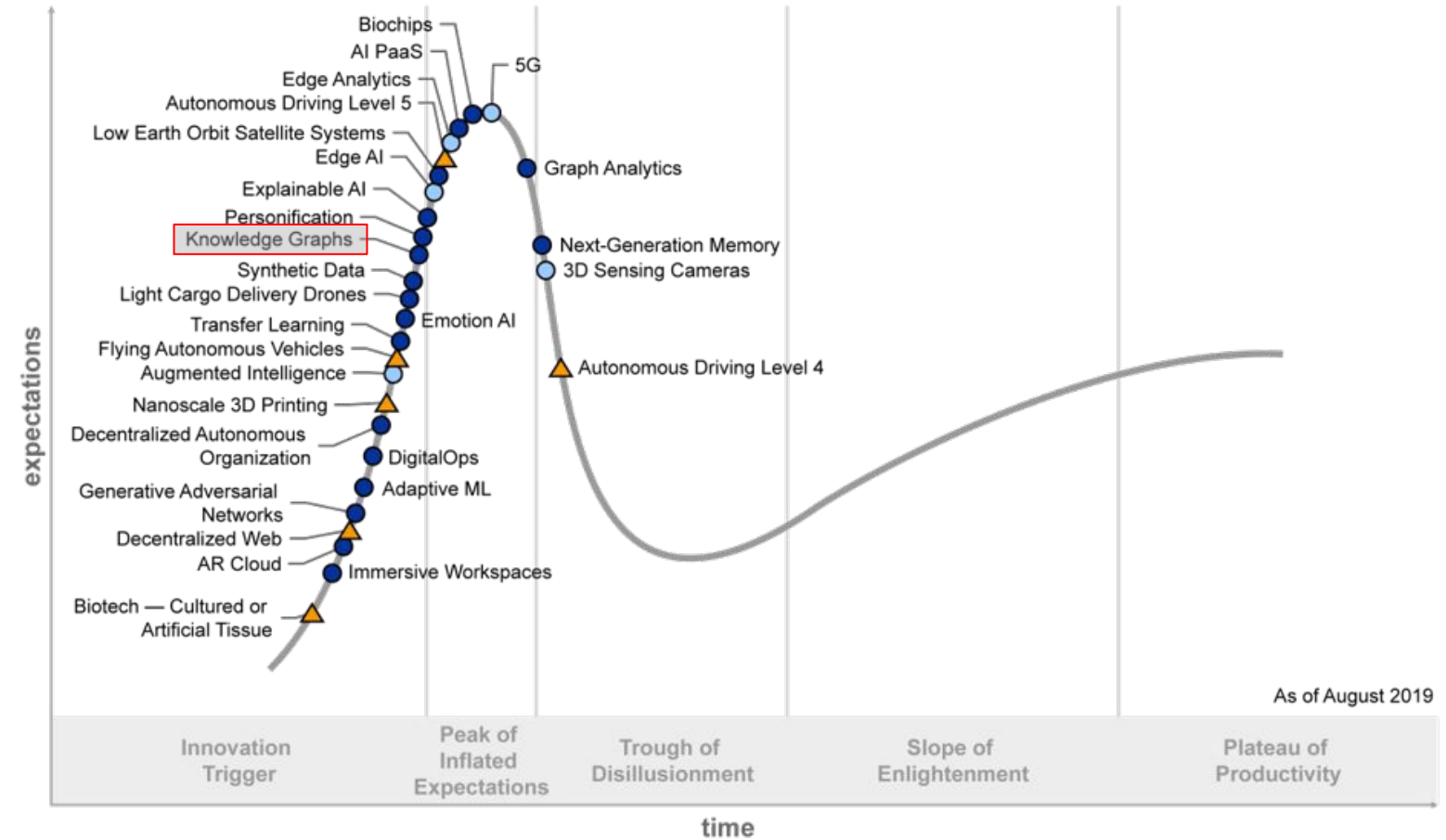
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Gartner, Predicts 2020: Data and Analytics Strategies

Knowledge graphs are on the rise

Stardog was the first to market with a Knowledge Graph platform, building on years of research by our co-founders

Hype Cycle for Emerging Technologies, 2019



As of August 2019

Plateau will be reached:
○ less than 2 years ● 2 to 5 years ● 5 to 10 years ▲ more than 10 years ⊗ obsolete before plateau

Source: Gartner
ID: 370466

Knowledge graphs power the products we use every day

The screenshot shows a Google search for "clinical trials". The search bar at the top contains the text "clinical trials" and a search icon. Below the search bar, there are navigation tabs for "All", "News", "Images", "Books", "Videos", and "More". The search results show "About 329,000,000 results (0.74 seconds)".

Below the search results, there are several advertisements:

- Ad · www.worldwide.com/clinical/research**
Worldwide Clinical Trials - Clinical Research Trials
See What Worldwide Clinical Trials Clinical Research Organization Services Can Do For You. Real World Evidence. Services: Clinical Development, Consulting, Real World Evidence, Clinical Trial Design, Drug Development Trials, Pain Studies.
Get In Touch
Thanks For Your Interest. Let Us Know How We Can Help.
Advanced Trial Mgmt Tech
See How Worldwide Can Support Your Trial with Integrated Technology
- Ad · www.gatewaycr.org/gateway/cancerresearch**
Clinical Cancer Trials | Help Fund Cancer Research
Help improve the well-being of patients. Donate today to fund transformational research. Telehealth Appointments. Innovative Treatments. Available 24/7. Clinical Trials. Personalized Treatment.
- Ad · pages.egnyte.com/clinical_trials/data_management**
Starting a clinical trial? | Manage clinical data easily | egnyte.com
Use Egnyte's GCP compliant environment to manage your clinical trial data. Watch Demo Now. Compliant. Easy-to-validate. Secure. Egnyte enables you to meet GCP requirements.

At the bottom left, there is a link for "clinicaltrials.gov" and "ClinicalTrials.gov: Home".

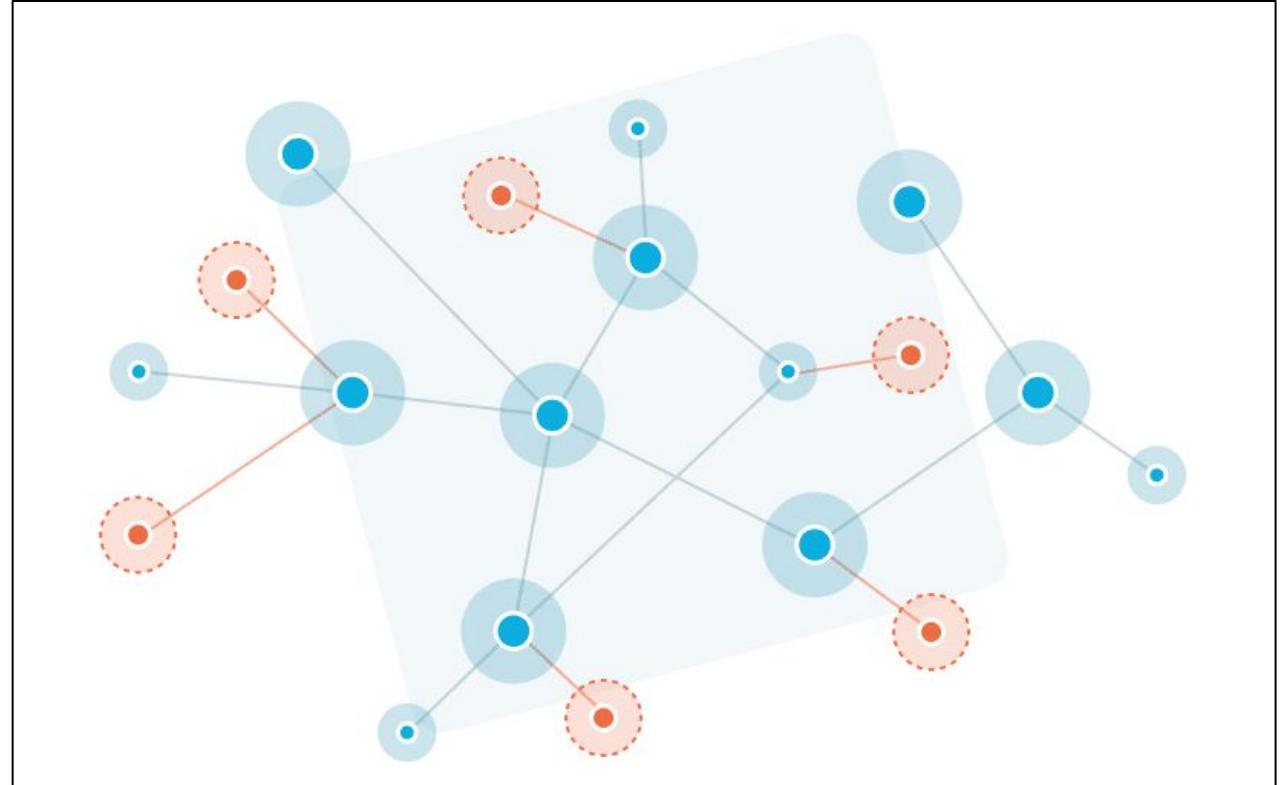
The Knowledge Panel for "Clinical trial" is highlighted with a red border. It features a diagram of a clinical trial process, a "Find a Clinical Trial" button, and a "More Images" button. Below the diagram, the text reads: "Clinical trials are experiments or observations done in clinical research. Such prospective biomedical or behavioral research studies on human participants are designed to answer specific questions ... Wikipedia". Below this, there is a section titled "People also search for" with a "View 15+ more" link. The items listed are: Sales, Clinical research, Research, Medicine, and Epidemiol... (Epidemiology).

Google Knowledge Panel:


- Introduced 2012
- Provides additional contextual information...
- Google moving away from “strings” to “things”

Stardog is used to solve business problems involving...


1. Highly connected datasets.
2. Heterogeneous data with diverse structures, scale, and types.
3. The need to **quickly** link and trace concepts across datasets without creating another silo.
4. The need to uncover and use hidden / indirect relationships.



Turn your data into knowledge



Our software is helping global pharma companies find the **protein** that will **cure a disease.**

A large orange and white rocket is positioned vertically on a launch pad. The launch pad is a complex metal structure with many levels and walkways. The rocket is the central focus, with its orange nose cone and white body. The background is a dramatic sky at sunset or sunrise, with the sun low on the horizon, creating a warm glow of orange and yellow light. The sky is filled with soft, wispy clouds. The overall scene is one of anticipation and technological achievement.

Our software is helping
NASA send humans
back to the **Moon...** and
to **Mars.**

With the Artemis program, NASA will land the first
woman and next man on the Moon by 2024...



STARDOG

With Stardog you can **THINK DIFFERENT** when solving complex business challenges involving disparate data.

Three things make Stardog special.

THINK DIFFERENT! - # 1 (Semantic Graph)

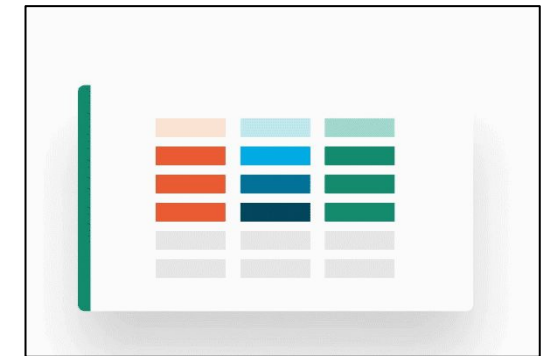
“The application of graph processing and graph DBMSs will grow at 100 percent annually through 2022” [Gartner]

The most flexible enterprise abstraction layer for data to solve today’s toughest business challenges:

- Relationships are first class citizens
- Infuse meaning into your data vs “structure first” relational thinking
- Link and trace concepts to unify data across silos
- Ask questions from any perspective
- Flexibility to continuously absorb evolving requirements



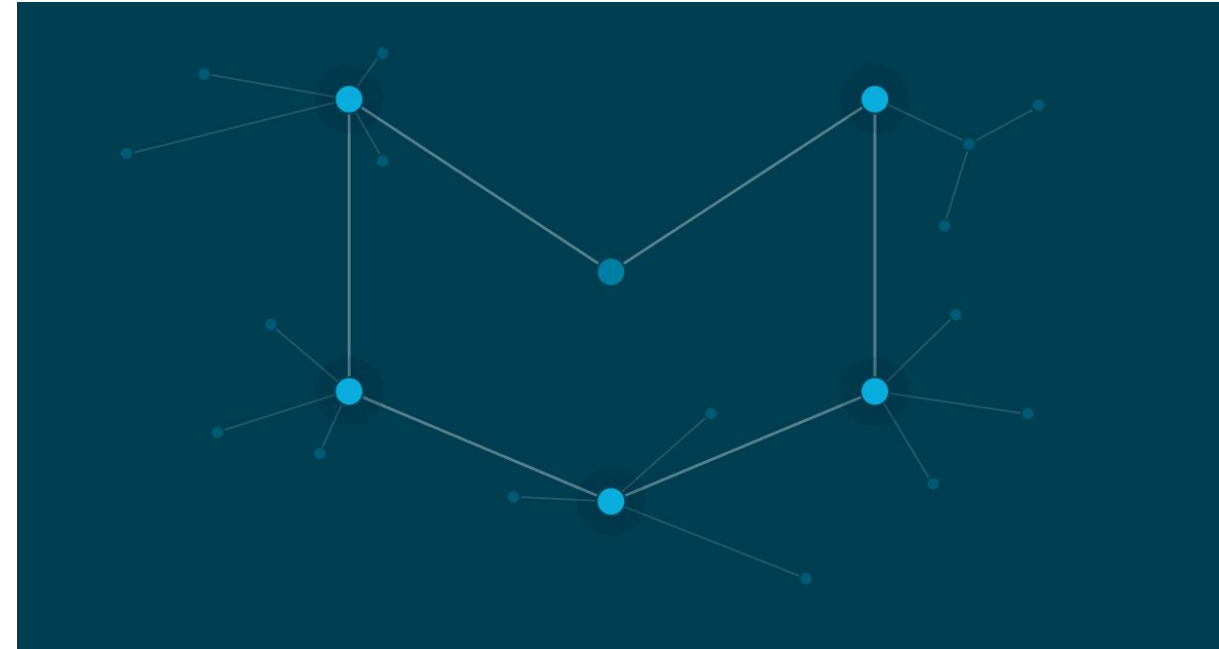
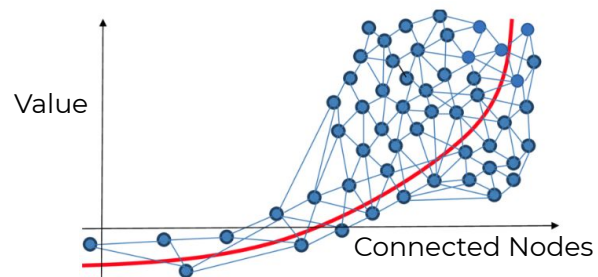
“things not strings”



THINK DIFFERENT! - # 2 (AI + Inferencing)

Generate more connections to further enhance the network effect of your data:

- Adds new nodes, relationships and context
- Declarative rules and machine learning algorithms to enrich your data
- Inferences appears at query time
- Supports multiple stakeholders with different perspectives



An HCP becomes an Investigator only when:

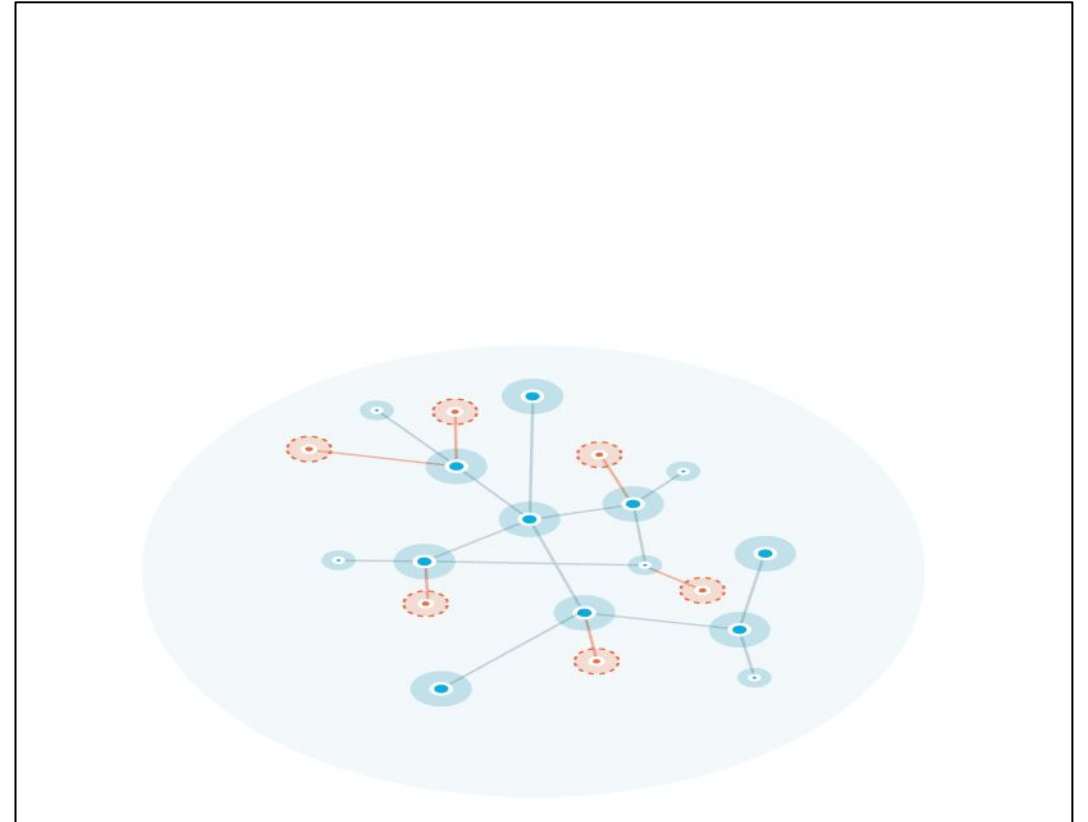
- an HCP is affiliated with a Site...
- A Site is conducting a Study...
- A Site has Subjects enrolled in a Study...

An HCP / Investigator is also a Person which is also a Party...

THINK DIFFERENT! - # 3 (Virtualization)

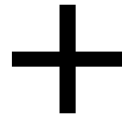
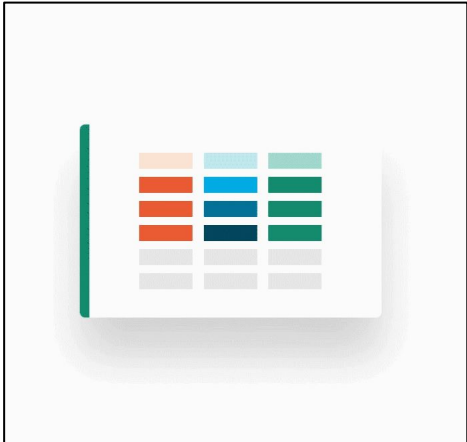
STOP copying data every time you have a new business challenge to solve!

- Connect directly to structured and semi-structured data sources
- Converts the relational structures into graph as questions are asked
- Iterate rapidly to add sources
- Guaranteed to be accessing the most up to date data
- Cache data to increase performance

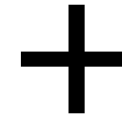
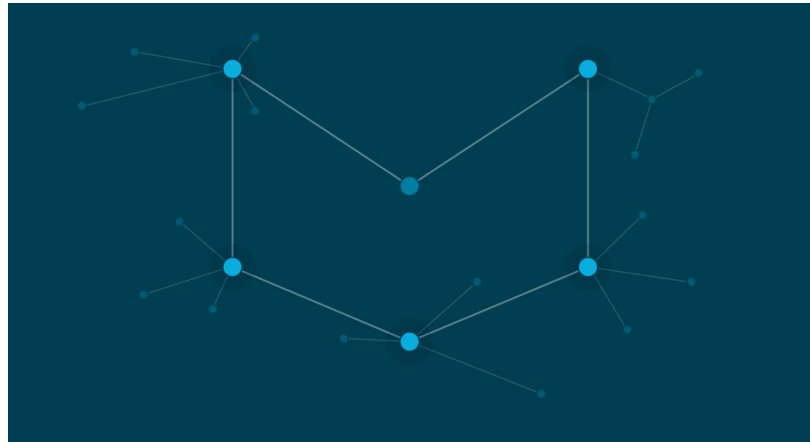


In Summary: What Makes Stardog Special!

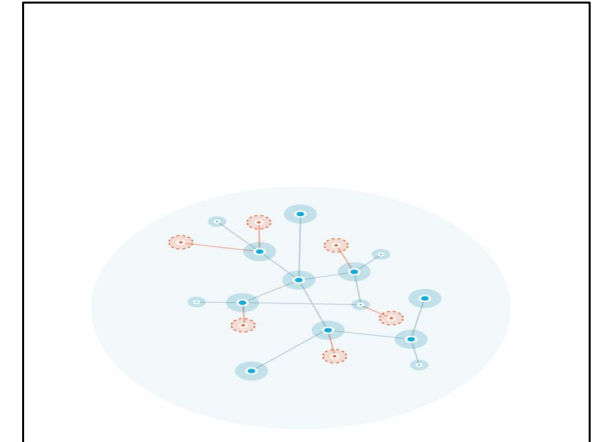
Semantic Graph



AI / Inferencing



Virtualization



Stardog is a data unification platform leveraging semantic graph, inferencing and virtualization to support context-driven decisions.