

How to Quickly Prototype a Scalable Graph Architecture

KGC 2022

May 4, 2022

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Today's Objective:

Give you a practical toolkit to scope and execute a knowledge graph prototype successfully.

Topics to Achieve Our Objective:



Why Knowledge Graph Initiatives Fail



Scoping Your Prototype for Success



Streamlined Design and Development



Preparing for Scale

Project and Product Leads



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Why Do Graph Efforts Fail?

A rapid knowledge graph implementation through prototyping:

- **Untangles the business and technical complexities** of graph design and implementation.
- Offers a **clickable and valuable** prototype with a **practical, standards-based** path to scale.

Many KG implementations fail because...



The business does not understand the value and ROI



There is no clear product vision



Use case is not clearly defined or scoped to be achievable



Source data and systems are not accessible



The initiative is siloed from other enterprise initiatives

Prototype

- Alignment on vision and goals of KG
- Demoable, testable use case achieved
- Gaps and risks in data quality surfaced
- Standards-based foundation to scale

Minimum Viable Product (MVP)

- Integration with production environment
- Tested and validated with users
- Expansion to new use cases

Scale

- KG becomes business-critical
- Data quality and standards established
- Increased data governance
- Iterative expansion to new use cases, new data sources, and new systems

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Knowledge Graph Development: A Phased Approach

A man in a dark suit and tie is laughing heartily in a meeting. He is standing and gesturing with his hands. In the background, a whiteboard displays a complex network diagram with circular nodes and connecting lines. To the left, a woman is partially visible, looking towards the man. To the right, another woman is seated at a table with laptops, looking at the man. The overall scene is a professional meeting with a positive, collaborative atmosphere.

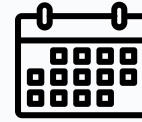
Scoping Your Prototype for Success

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Activities and Outcomes

The main outcomes of a prototype knowledge graph are to:

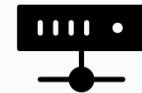
- **Discover** and **prioritize** an initial set of graph **use cases**
- **Create** a standard **knowledge model** that supports these use cases
- **Integrate** and **map** initial **datasets** to instantiate a prototype graph
- **Create** a lightweight **front-end** that **demonstrates value** to stakeholders



The engagement should take no longer than 8 weeks



Stakeholders and SMEs should be directly involved with workshops



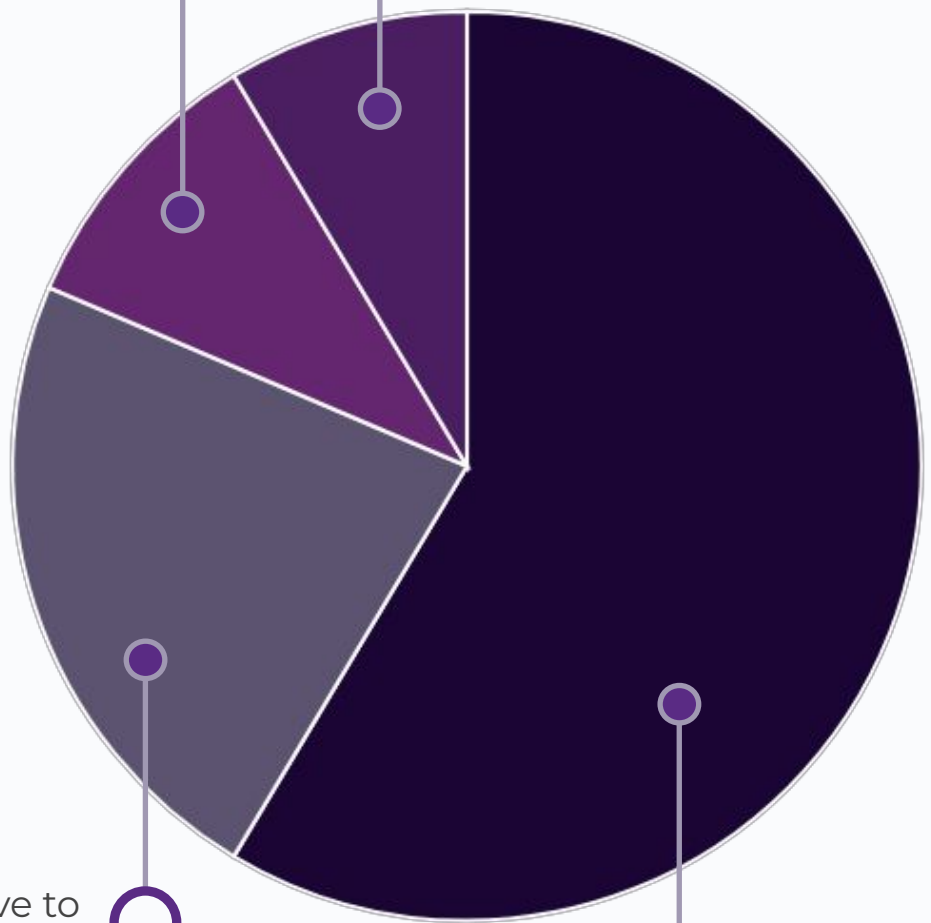
Architecture should be designed for scale, but can be lightweight for prototype



The prototype should clearly and quickly solve an existing business problem

Can Integrate with
Source Systems

Meets Security
Standards



Intuitive to
Customers

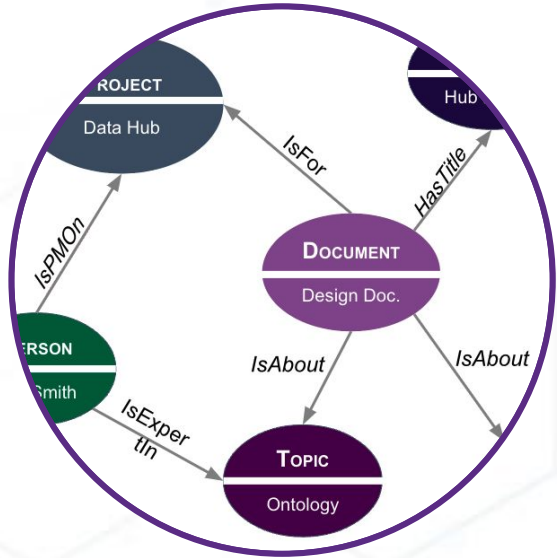
Enables Topic-Based
Recommendations

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What Are You Trying to Prove?

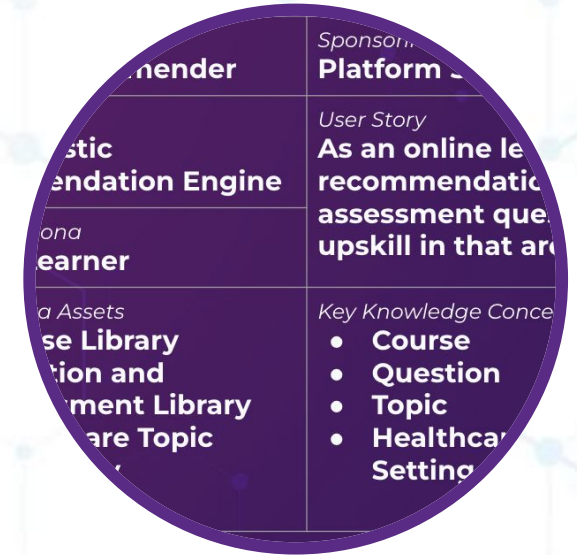
Your time, resources, and effort should focus on the critical outcomes of your prototype.

Design Components

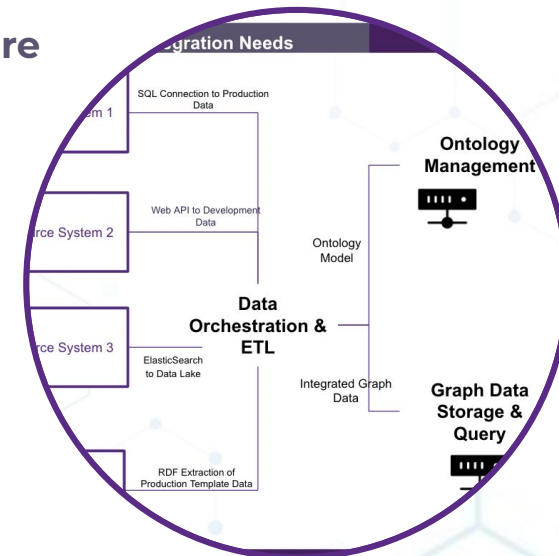


Ontology Model

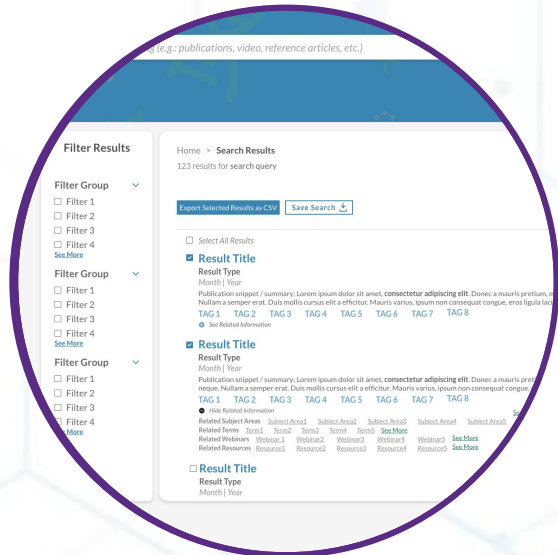
Use Case Definition and Target Persona



Solutions Architecture



Wireframe or Front End Visualization



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Success Factors for Your Prototype Use Cases

As an online learner, I want to see course recommendations when I get an assessment question incorrect, so that I can upskill in that area of weakness.



Identify specific end users



Address a foundational business problem



Garner high participant interest



Communicate specific outcomes



Result in a “clickable” product



Are not overly complex to implement



Have the required resources readily available



Provide a repeatable approach for subsequent implementations

Lightweight Knowledge Graph Implementation Process



Curate Source Data

Upload source data and create intermediary datasets as needed for mapping.



ETL Process

Map the source data to RDF triples based on the ontology model.



Construct the Graph

Materialize a physical graph store through a community graph database or RDF file.



Generate the front-end

Interact with the graph through a custom web-app, an analytics tool, or a ML pipeline.

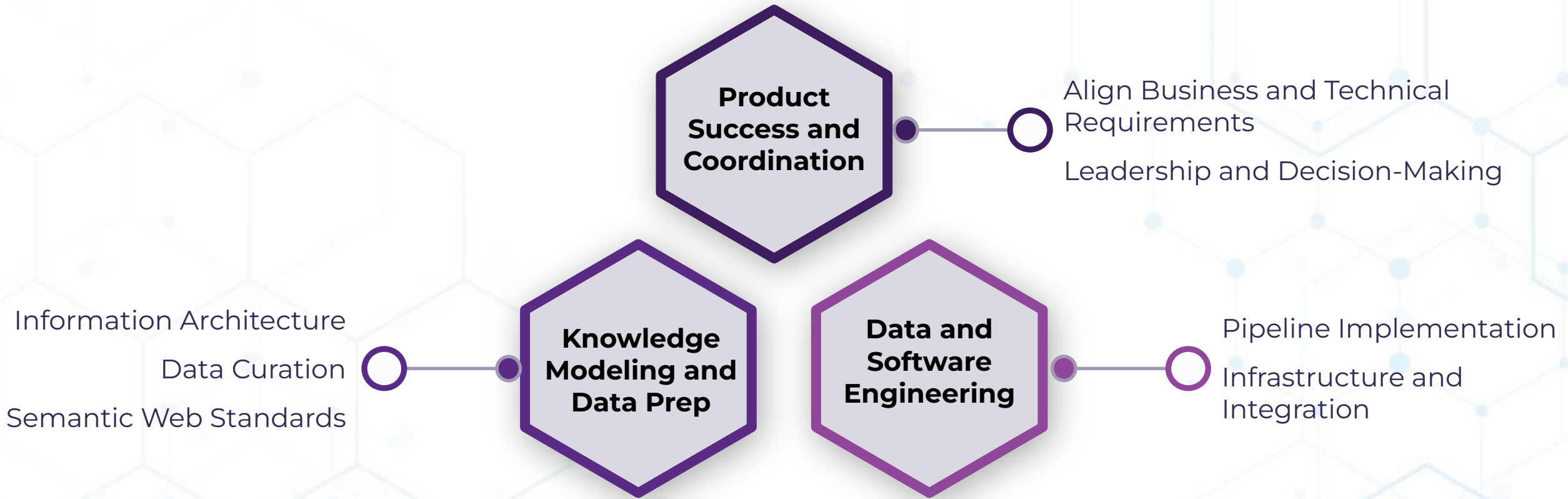


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Preparing for Scale



Who Should Be Involved in Your Team?



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Scaling Your Prototype

Minimum Viable
Product (MVP)

Prototype



Implementation Team

Collaboration with enterprise teams and end users



Quality Level

Higher validation and quality expectations



Development Environment

Production



Timeframe

6-7 months

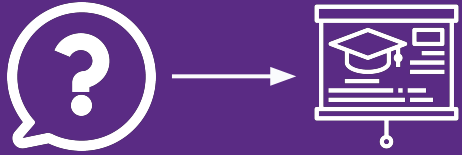


Solutions Architecture

- Integration with source systems
- Taxonomy/ontology management
- Graph database solution
- Integration with downstream application(s)

Success Stories: KG Prototypes in Less than 2 Months

Recommendation Engine



Automated recommendations where previously manually mapped

Improved learning experience for users

Automation

Expert Finder



Reduced information retrieval time from 3-4 weeks to 5-10 minutes

Provided a **single representation** of "Person"

Standardization

Process Analytics



Increased process comparison scale from 5 to 1,000

Reduced manual compilation process to 4 clicks

Insights

Data Accessibility



Eliminated waiting time to find information from project teams

Increased **reputability of data**

Findability

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Any Questions?

Thank you for listening.

We are happy to take any questions at this time.



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