

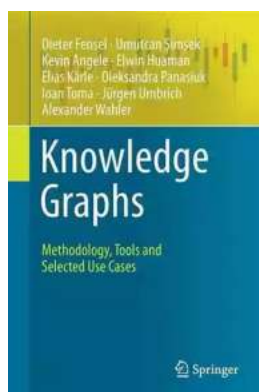
Knowledge Graphs Methodology Tools And Selected Use Cases

Knowledge graphs have emerged as a powerful tool for organizing and representing complex information. In this article, we will explore the methodology, tools, and various use cases of knowledge graphs.

to Knowledge Graphs

Knowledge graphs are structured representations of knowledge that provide a way to organize and connect information in a semantic manner. They consist of data nodes (entities) and edges (relationships) that link those entities together. This interconnectedness allows for rich and meaningful associations between various data points.

Knowledge graphs are often built using a combination of linked data, graph databases, and ontologies. Linked data refers to the principles and best practices for publishing and connecting structured data on the web. Graph databases provide the infrastructure to store, traverse, and query knowledge graph data efficiently. Ontologies define the vocabulary and rules for describing the entities and relationships within the knowledge graph.



Knowledge Graphs: Methodology, Tools and Selected Use Cases

by Victoria Taylor(1st ed. 2020 Edition, Kindle Edition)

★★★★☆ 4 out of 5

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Screen Reader : Supported

Print length : 164 pages



Methodology for Building Knowledge Graphs

Building a knowledge graph involves several steps, including data extraction, data modeling, and knowledge inference.

Data Extraction

The first step in building a knowledge graph is to extract relevant data from different sources, such as databases, APIs, and web pages. This can be done through web scraping, data integration, or other extraction techniques. It is crucial to ensure data quality and accuracy during this process.

Data Modeling

Once the data is extracted, it needs to be transformed into a suitable format for building the knowledge graph. This involves identifying the entities, relationships, and attributes within the data and creating a conceptual schema. Ontologies play a significant role in defining the structure of the knowledge graph and facilitating data modeling.

Knowledge Inference

Knowledge inference refers to the process of deriving new knowledge from existing information within the knowledge graph. This can be achieved through various techniques, such as rule-based reasoning, machine learning, or natural language processing. The goal is to uncover implicit connections and insights that may not be explicitly present in the original data.

Tools for Building Knowledge Graphs

There are several tools available for building and managing knowledge graphs. Some popular ones include:

- **Neo4j:** Neo4j is a widely used graph database that provides a flexible and scalable platform for building knowledge graphs. It offers a powerful query language (Cypher) and a rich set of APIs for data integration and manipulation.
- **Apache Jena:** Apache Jena is a Java-based framework for building semantic web and linked data applications. It provides support for RDF (Resource Description Framework) and SPARQL (SPARQL Protocol and RDF Query Language) standards.
- **OpenRefine:** OpenRefine is a tool for cleaning and transforming messy data. It can be used to preprocess data before building a knowledge graph, ensuring data quality and consistency.
- **Protege:** Protege is an ontology editor and knowledge management system. It allows users to create and modify ontologies, define classes and properties, and perform reasoning tasks.

Selected Use Cases of Knowledge Graphs

Knowledge graphs have been applied in various domains, showcasing their versatility and potential. Here are a few examples of selected use cases:

Healthcare and Life Sciences

In healthcare and life sciences, knowledge graphs are being used to connect patient records, medical literature, and genetic data. This enables researchers to gain holistic insights into diseases, drug interactions, and personalized medicine.

E-commerce and Recommendation Systems

Knowledge graphs are employed in e-commerce platforms to enhance recommendation systems. By understanding the relationships between products, customers, and preferences, personalized recommendations can be generated, improving customer satisfaction and sales.

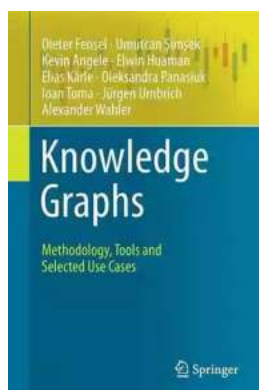
Financial Services

In the financial domain, knowledge graphs are utilized to detect fraudulent activities, identify patterns in transactions, and assess risk. By combining data from diverse sources, financial institutions can make more informed decisions and mitigate risks effectively.

Semantic Search and Information Retrieval

Knowledge graphs play a crucial role in semantic search and information retrieval. By deepening the understanding of user queries and the context of information, search engines can deliver more relevant and accurate results.

Knowledge graphs offer a powerful approach to organizing and representing complex information in a structured and interconnected manner. They provide a flexible and scalable solution for various domains, enabling new insights and applications. By leveraging the right methodology and tools, organizations can unlock the full potential of knowledge graphs and drive innovation in their fields.



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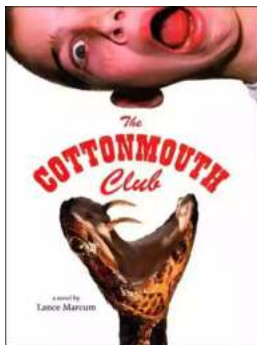
This book describes methods and tools that empower information providers to build and maintain knowledge graphs, including those for manual, semi-automatic, and automatic construction; implementation; and validation and verification of semantic annotations and their integration into knowledge graphs. It also presents lifecycle-based approaches for semi-automatic and automatic curation of these graphs, such as approaches for assessment, error correction, and enrichment of knowledge graphs with other static and dynamic resources. Chapter 1 defines knowledge graphs, focusing on the impact of various approaches rather than mathematical precision. Chapter 2 details how knowledge graphs are built, implemented, maintained, and deployed. Chapter 3 then introduces relevant application layers that can be built on top of such knowledge graphs, and explains how inference can be used to define views on such graphs, making it a useful resource for open and service-oriented dialog systems. Chapter 4 discusses applications of knowledge graph technologies for e-tourism and use cases for other verticals. Lastly, Chapter 5 provides a summary and sketches directions for future work. The additional appendix introduces an abstract syntax and semantics for domain specifications that are used to adapt schema.org to specific domains and tasks.

To illustrate the practical use of the approaches presented, the book discusses several pilots with a focus on conversational interfaces, describing how to exploit knowledge graphs for e-marketing and e-commerce. It is intended for advanced professionals and researchers requiring a brief to knowledge graphs and their implementation.



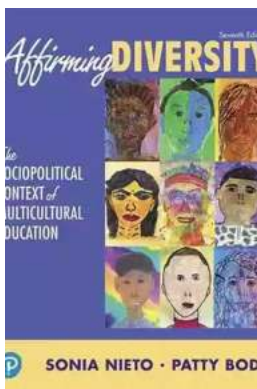
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