

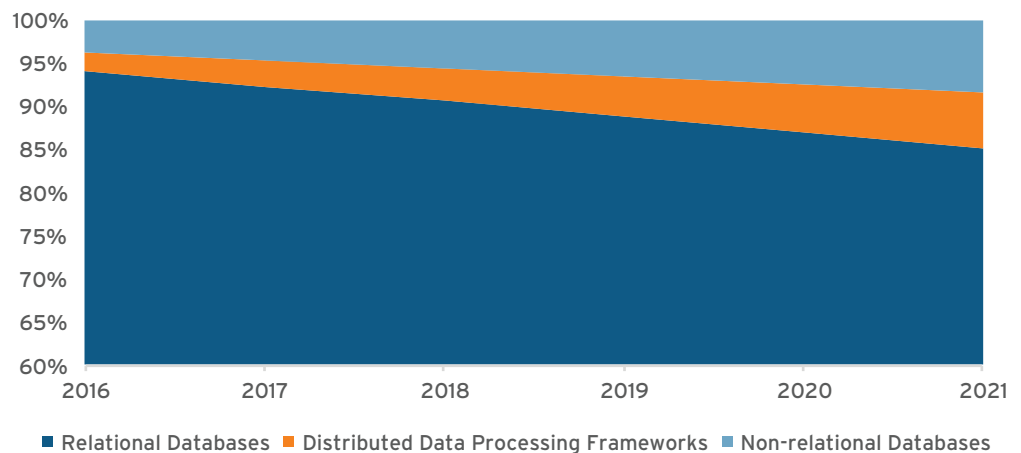
The rise of the knowledge graph for agile enterprise-wide data management

The 451 Take

Data silos have long been an impediment to business agility, despite numerous attempts by enterprises to eliminate them. While the relational database model has dominated for decades, enterprises still face challenges when trying to create a single view of data in multiple relational databases. Integrating data in a central location and normalizing it into a standard format is complicated and costly work.

The rise of newer data platforms – NoSQL, Hadoop and cloud storage – has only exacerbated the complexity of managing data by creating even more data silos, and this trend is set to continue. 451 Research estimates that 93.97% of data platform revenue in 2016 was generated by relational databases, but this figure is set to decline to 85% by 2021, as non-relational databases (especially NoSQL) and distributed data processing platforms (Hadoop, Spark) are increasingly used to store and process enterprise data.

The relational database is no longer the default enterprise data platform



Source: 451 Research, Total Data Market Monitor

The emerging concept of the data lake is a step in the right direction, enabling multiple use cases based on multiple data sources. But this involves moving all data into one environment, which isn't realistic or practical given the complexity of the modern IT landscape.

Enter the knowledge graph, which maps to data in place and pulls it dynamically from its canonical location. Companies like Facebook, Google and LinkedIn have taken approaches based on the concept of the knowledge graph – a graph-based map of all available information across the organization, and the relationships between that information, that can be used to combine data in an agile manner to support a wide range of use cases.

Enterprise knowledge graphs, based on a graph data layer that abstracts underlying data stores from business use cases and applications, provide a potential solution to the problem of data silos. Creating a knowledge graph means overcoming assumptions about data ownership, but it does not mean putting all enterprise data in a single graph database and scrapping existing database investments. By providing an abstraction layer to separate the use cases from the data sources, enterprise knowledge graphs enable users to leave data where it is while treating the unified data set as a single resource to drive various use cases. In doing so, the knowledge graph can support greater business agility and versatility.

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Business Impact Brief

Business Impact

GREATER BUSINESS AGILITY. Overcoming the assumption that use cases need to be tied to specific data silos enables enterprises to more easily share data beyond existing departmental or geographic 'boundaries.' By doing so, companies are able to make greater use of available data, develop new applications and use cases, and respond more quickly to changing business conditions.

IMPROVED VERSATILITY. By implementing the technology to create a companywide knowledge graph, organizations can then expand and evolve the data incorporated into that knowledge graph over time to address multiple use cases. Rather than critical business use cases being delayed by costly and complex data integration and standardization efforts, enterprise knowledge graphs enable data unification that is adaptable to evolving business requirements.

MORE EFFICIENT USE OF EXISTING INVESTMENTS. By providing an abstraction layer between an organization's apps, analytics, reporting, business logic and the underlying data sources, an enterprise knowledge graph does not necessitate replacing existing database/data-processing assets (although the organization may choose to do so in the longer term). Knowledge graph offerings make use of data abstraction and data virtualization capabilities, meaning that the knowledge graph can represent and pull data from potentially any data source.

ENABLE DIGITAL TRANSFORMATION EFFORTS. The abstraction of the application from the underlying data source means that enterprises can take advantage of greater versatility in terms of not only data processing and storage technologies, but also the associated infrastructure. Underlying data sources could include cloud services as well as on-premises deployments, and the abstraction layer has the potential to enable infrastructure versatility and help provide stability amid larger transformation efforts.

Looking Ahead

The emergence of data silos was the inevitable consequence of departmental and regional segmentation within enterprises, as well as technological advancement. It's perfectly normal that an organization has multiple departments, business units and geographic entities, and each of those has its own associated data. What companies like Facebook, Google and LinkedIn have shown is that the graph concept is a means to providing agile access to enterprise data assets and the relationships between them.

While adoption of knowledge graphs for enterprise-wide data management is still in its infancy, there is a growing recognition that doing so can deliver business agility without having to move all enterprise data into a single repository. As such, we expect adoption of knowledge graph-enabling technology to increase rapidly in the coming years as part of the larger industry drive toward treating data as an asset, as well as cultural and organizational shifts toward being more data-driven.

The fact that the knowledge graph is able to evolve and expand as more data sources and use cases are added means that enterprises can start small, with focused use cases and data sets, before expanding to address wider business goals. Organizations that embrace the potential to create new applications driven by the abstraction of business use cases from the underlying data sources and the unification of data across organizational and geographic boundaries are likely to be the most successful.



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