Oracle Solutions for the Research Enterprise: Capture, Organize and Analyze Big Data

"We were spending a lot of time dealing with disparate hardware and seemingly random operating system choices. We wanted to standardize as much as possible to focus on what scientists need and the business applications that need to be supported."

David Salbego, Department Head, Infrastructure and Operations, Argonne National Laboratory Department, CINES
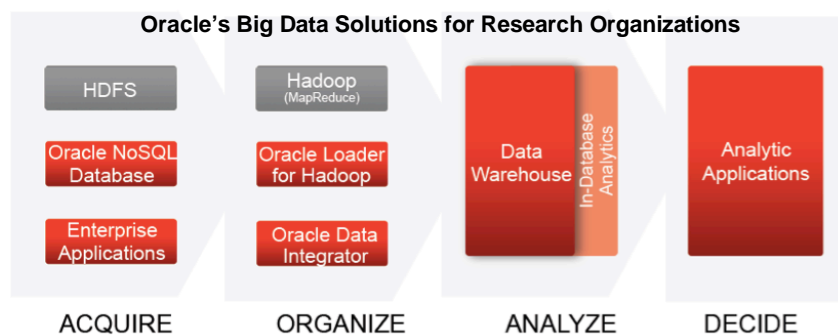
Today the term 'big data' draws a lot of attention, but behind the hype—especially for research organizations—there's a simple story. For decades, traditional research organizations have been collecting and working with data on a daily basis. As computing technology has evolved, so has the ability to gather, aggregate, analyze, and store increasing volumes of data. But even many of the most forward-thinking research technologists underestimated how fast these volumes of data would grow.

In large part, the data deluge—or big data phenomenon— in research has been fueled by the proliferation of unstructured, non-traditional data generated through collaboration tools and social networking sources as well as the global sharing among researchers of observational data, simulation models, and experimental data. In addition, libraries have continued to digitize huge volumes of archived bodies of research that once were available only to a handful of researchers—or not at all.

In addition, the cost of storage, compute power, and capacity has decreased, making it more affordable to aggregate, share, and analyze data in ways that may not have been feasible for many research organizations just a few years ago. And the proliferation of smart phones, GPS and other mobile devices have supported the immediacy of capturing observation and location research data—including large multi-media files.

Oracle Solutions for Big Data Research

Oracle offers the broadest and most integrated portfolio of products to help research organizations acquire, aggregate, organize and analyze data from diverse sources. And Oracle is the first vendor to address the full spectrum of research enterprise big data requirements and is uniquely qualified to combine everything needed to meet your big data challenges—including software and hardware—into one engineered system.

Oracle's Big Data Solutions for Research Organizations

ACQUIRE	ORGANIZE	ANALYZE	DECIDE
HDFS	Hadoop (MapReduce)	Data Warehouse / In-Database Analytics	Analytic Applications
Oracle NoSQL Database	Oracle Loader for Hadoop		
Enterprise Applications	Oracle Data Integrator		

"Oracle Database and Oracle Application Express are critical to our mission of identifying the biomarkers related to breast cancer. The solution gives our researchers the tools they need to successfully filter and reduce data, as well as generate hypotheses, without being slowed by weeks or months of software obstacles. In addition, the tool's collaborative services make us more competitive for future research opportunities."

Dr. John Springer,
Assistant Professor,
Department of Computer
and Information
Technology, Purdue
University

Key Components of the Research Infrastructure to Support Big Data

The requirements in a big data infrastructure span data acquisition, data organization and data analysis. Oracle's solutions to support these areas are outlined below. For more details, download Oracle's whitepaper on *Big Data for the Enterprise* or visit the Big Data product pages on Oracle.com.

Acquire: Making the most of big data means quickly capturing high volumes of data generated in many different formats. Oracle offers a range of products including Oracle NoSQL Database and Oracle Database 11g. As the leader in database technologies, Oracle is developed to handle very high transaction volumes in a distributed environment and support the research community's need for flexible, dynamic data structures.

Organize: A big data research platform needs to process massive quantities of data—filtering, transforming and sorting it before loading it into a data warehouse. Oracle offers a choice of products for organizing data. In addition, Oracle enables end-to-end control of structured and unstructured content, allowing you to manage all your data from application-to-archive efficiently, securely, and cost effectively with the Oracle content management and tiered storage solution designed specifically for research organizations.

Analyze: The infrastructure required for analyzing big data must be able to support deeper analytics such as statistical analysis and data mining on a wider variety of data types stored in diverse systems; scale to extreme data volumes; deliver faster response times; and automate decisions based on analytical models. Oracle offers a portfolio of tools for statistical and advanced analysis. These solutions include the Oracle Exadata and Data Warehousing as well as developer tools for the application layer such as Oracle Application Express, which allows your researchers to more easily access and analyze data from within their applications.

Summary

No matter what type of data your researchers need to capture, access, and analyze; Oracle's industry-leading solutions deliver the capacity, security, and processing speed researchers want. Only Oracle has all the infrastructure components needed to support big data sharing and interoperability for global, heterogeneous, and increasingly multidisciplinary research environments and ecosystems.

CONTACT US

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