

Cloud Essentials

Oracle Data and Analytics Platform

Featuring: Oracle Autonomous Data Warehouse,
Oracle Analytics, and Oracle Big Data Service.

ORACLE
Cloud





Transforming Analytics for the Enterprise

Businesses in nearly every industry depend on data to streamline operational processes, and vault ahead of competitors. Yet many organizations are held back by legacy data warehouses, business-intelligence tools, and data-management procedures that inhibit innovation. According to research firm IDC, traditional IT shops spend up to 75 percent of their budgets merely “keeping the lights on”—that is, maintaining their existing information systems.¹ It’s an untenable state of affairs at a time when data-driven business models are winning the day.

What if business and IT could work together to establish a versatile data-management cloud that eliminates routine administrative tasks, and brings analytic capabilities to workers throughout the enterprise? What if these information systems could run autonomously, with little or no human intervention, empowering business users to collaborate with technology professionals to disrupt their industries and leapfrog competitors?

This transformation has arrived as Oracle launches a new era of data-management efficiency based on Oracle Autonomous Database. Oracle uses machine-learning (ML) technology to automate fundamental processes such as storing, processing, and visualizing data. Routine management tasks are automated, and customers are never locked into a rigid cloud strategy. Oracle Cloud technology has been designed for ready compatibility with on-premise deployments, facilitating a smooth transition of your Oracle technology assets to the cloud and maximizing options for the future. You can migrate data and analytic functions in a gradual fashion or all at once, and leverage existing skills, resources, and tools to take advantage of a wide range of cloud services for data transformation, data warehousing, data visualization, big data, and many other functions.

¹ Carl W. Olofson and David Schubmehl, “Oracle’s Autonomous Database: AI-Based Automation for Database Management and Operations,” IDC report, February 18, 2018, [oracle.com/us/products/database/idc-oracles-autonomous-database-4497146.pdf](https://www.oracle.com/us/products/database/idc-oracles-autonomous-database-4497146.pdf).



Synergistic cloud services reduce IT complexity.

With Oracle Autonomous Database you don't need to think about configuring, managing, tuning, scaling, or backing up databases—or any of the associated server and storage resources. Nor do you have to build a data warehouse; you simply stipulate how many CPUs and terabytes of data you would like to use and then instantly load your data. You can also tap into Oracle Analytics to visualize your data, obtain new insights, and make knowledgeable decisions. If you want to analyze unstructured data, you can provision a data lake in Oracle Big Data Service—and easily move data between your cloud-based data lakes and data warehouses as needed.

All cloud services within Oracle Data Management Platform work together to simplify maintenance and maximize productivity. If you need more storage or compute power, you can scale up, with zero downtime. If you need



Essential technologies within Oracle Data Management Cloud

less, you can scale down—or shut down these cloud services altogether to save money, and then restart them on demand when necessary.

Gone are the tedious aspects of implementing data warehouses, establishing object stores for new data lakes, and developing analytic apps to visualize your data. Oracle helps you put the world's leading analytics and data-management functionality into production, fast—with no code changes, identical software, and a common architecture for all Oracle-based data-management activities—on premise [sic] and in the cloud.

Advantage: Oracle.

- In-depth security at all layers of the stack
- Support for high-performance workloads on Oracle Engineered Systems
- No need to bother with configuring servers, storage resources, data warehouses, data lakes, and analytic apps for visualizing data—along with all the associated administrative concerns

“Cloud computing is changing the mission and purpose of data management. Within a few years, most data-management functions will be in the cloud.”

Unisphere Research





Unleash the potential of your data.

Keeping up with a rising deluge of data has become progressively more difficult as the scale and velocity of incoming data places crushing demands on enterprise data marts, data warehouses, big-data initiatives, data lakes, and analytic systems—making many of these software assets obsolete. The ground rules have changed. Until recently, queries against a relational database typically returned a structured dataset that fit neatly into tabular reports. But today's businesses need more latitude to extract, transform, store, visualize, and experiment with a range of data types to support new business processes, discover trends, and make predictions. And they often need results fast to respond to pressing market opportunities. Modern analytic systems must be able to store data from many different sources and in many different formats, including web pages, social-media feeds, search indexes, and equipment sensors. Business users need tools to present complex datasets in

an actionable form so that executives and line-of-business users can make smarter business decisions.

Oracle's advanced, cloud-based information systems eliminate complexity, minimize human error, and simplify routine administrative tasks, enabling customers to deliver high-value analytics throughout their businesses. Autonomous operations require almost no manual human labor; these systems essentially run on their own.

Popular use cases for Oracle Data Management Platform include:

- **Analytical data marts and data warehouses**

These complement and extend existing enterprise data warehouses, and enable business teams to answer questions, quickly. ML technology automatically tunes, optimizes, and patches the database.

- **Analytical sandboxes**

Sandboxes allow business users and data scientists to spend time creating new data products rather than transforming data and cobbling together infrastructure. Embedded ML technology helps users make the best possible decisions based on the available data.

- **Data-visualization applications**

These provide self-service access to dynamic, mobile-ready graphs, charts, and reports. Built-in data-enrichment technology, powered by ML, recommends new data sources, columns, fields, and other relevant data elements.

- **Data lakes**

These make a broad range of data available to analysts via versatile and powerful cloud-based object stores. An embedded ML platform assists with pattern matching, data discovery, and other essential analytic functions.

“Computing hardware used to be a capital asset, while data wasn't thought of as an asset in the same way. Now, hardware is becoming a service people buy in real time and the lasting asset is the data.”

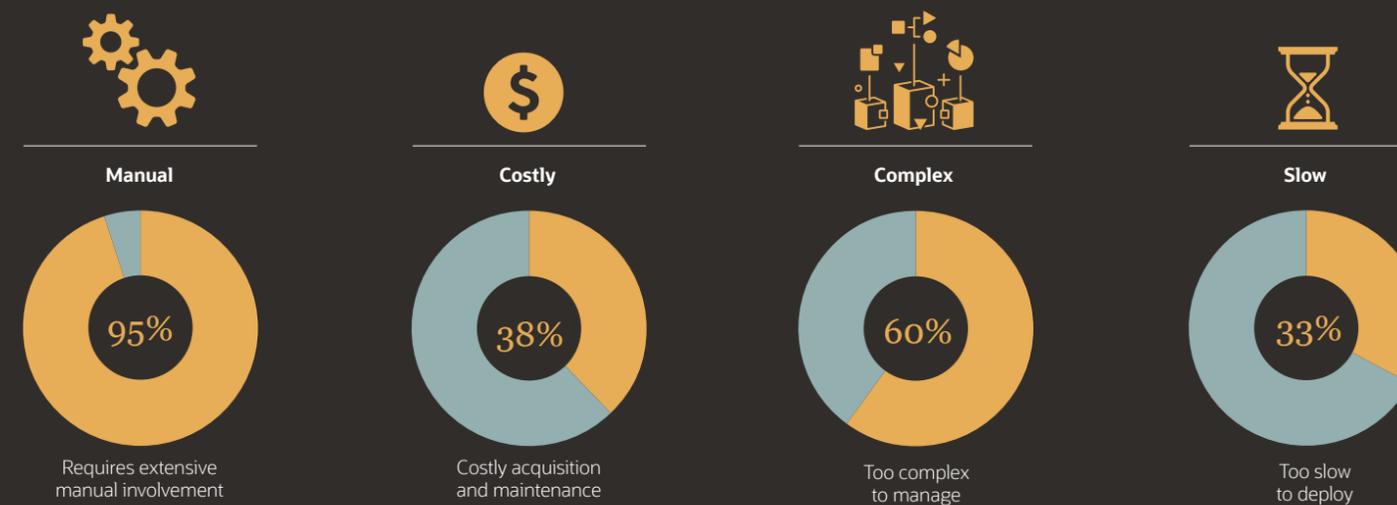


Part 1: Build a Better Data Warehouse

According to a recent CIO Research report, which surveyed IT professionals about corporate data-warehouse maintenance and use, 95 percent of the respondents admitted that their legacy data warehouses required extensive manual involvement. 60 percent complained about overall management complexity, 38 percent said their warehouses were too costly to acquire and maintain, and 33 percent reported that they were too slow to deploy.²

Data-warehouse solution or roadblock?

Common data-warehouse challenges



Like all businesses, these organizations want data-warehouse solutions that are **easy** to deploy, **fast** to operate, and that scale in an **elastic** fashion to maximize versatility. Oracle delivers, with autonomous data-warehouse solutions that uphold a long-standing objective: to help business stakeholders make data-driven decisions in a timely manner. Line-of-business managers want to focus on growing their operations rather than on managing technology.

It's a vision that Oracle has taken to heart. Oracle Autonomous Data Warehouse enables businesses to integrate virtually any type of data, of any size, from anywhere—with unlimited capacity to run high-performance analytical workloads. It supports structured data in Oracle Database as well as many new types of unstructured data, with all data compressed and encrypted automatically. It includes ML technology to automatically tune, optimize, and patch the database—bolstering security, improving reliability, and enhancing performance. It is easy to use, scales elastically, and delivers incredible query performance—without requiring IT pros to perform routine administrative tasks such as provisioning, patching, scaling, tuning, and optimizing database-management systems.

²"Biggest Challenges of Data Warehousing Solutions" (CIO Research)



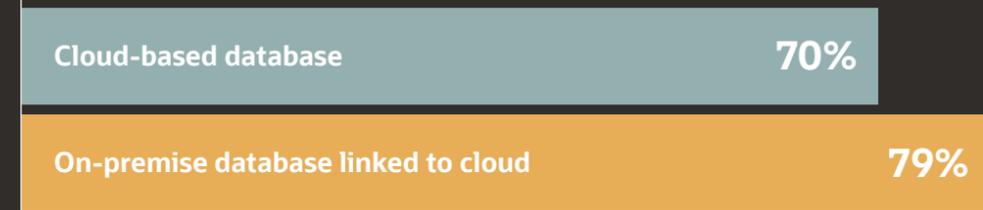
Mass migration.

In December 2017, Unisphere Research conducted a study among the members of the Independent Oracle Users Group (IOUG) to examine the key challenges, priorities, and solutions associated with cloud computing. 79 percent of these IT professionals reported that they expect on-premise databases to be linked to the cloud within the next two years, while another 70 percent foresee using cloud-based databases.

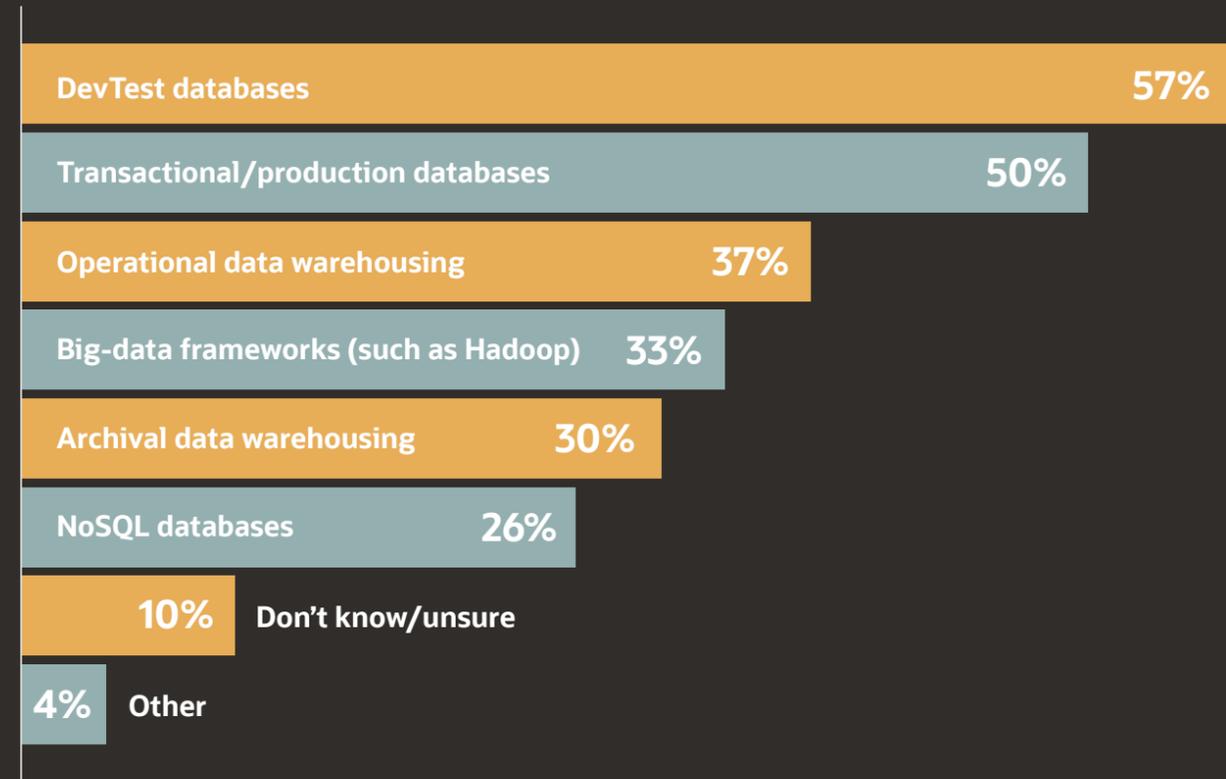
What do these data managers find most appealing about public-cloud deployments? According to Unisphere Research, it's the ability to grow their datasets—and their businesses—and almost instantly be able to provision all the processing power and storage space they need.

Why move data warehouse workloads to Oracle Cloud?

- Easily migrate on-premise databases to a fully managed cloud
- Benefit from elastic compute and storage resources
- Get automatic backup of mission-critical data
- Profit from on-demand analytics for the business community
- Rapidly provision analytic capabilities for both business users and data scientists



Data-manager expectations for cloud-based databases over the next two years (source: Unisphere Research).



Types of workloads moving to the cloud, versus staying on premise

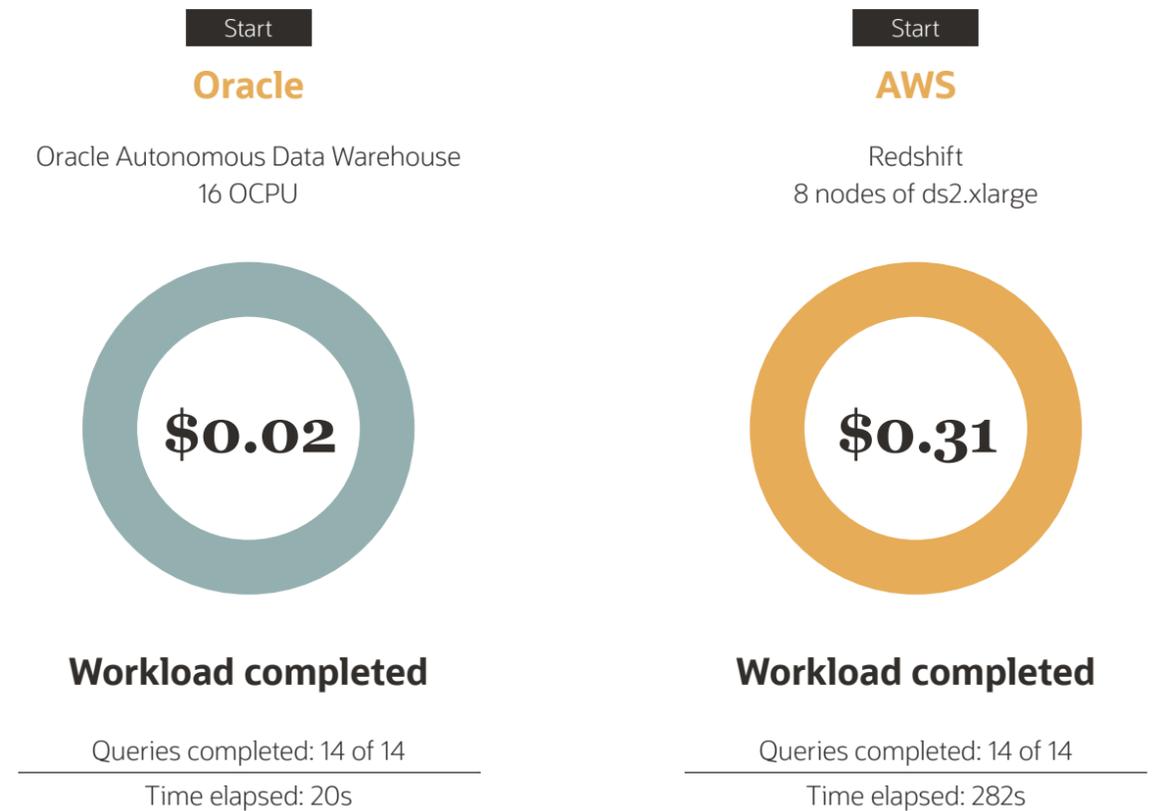
Store and process data with a few clicks.

With Oracle Autonomous Data Warehouse you can set up a data warehouse in seconds. With a few clicks, you can create a new database; all you have to do is name it, request how many CPUs you need, and specify how many terabytes of data you expect to use. Behind the scenes, Oracle Autonomous Data Warehouse provisions and maintains the infrastructure. This means your database administrators don't have to spend time manually tuning, indexing, and managing database resources. It's easy to scale as your need for more data storage or processing power increases. Storage resources can be scaled separately from computing resources, maximizing flexibility for any workload. You only pay for what you use, when you use it.

Better performance for less.

While other cloud vendors offer data-warehouse cloud services, only Oracle offers a complete PaaS environment that allows integrated control of both hardware and software. As Oracle CTO and Executive Chairman Larry Ellison demonstrated during his introduction of Oracle Autonomous Data Warehouse,³ Oracle's unique cloud service processes data faster than Amazon Web Services (AWS) Redshift, and it costs significantly less. In fact, Oracle guarantees that the cost of running your database workloads will be at least 50 percent lower in Oracle Cloud than in AWS.

Retail analysis workload



“Oracle Autonomous Data Warehouse is very easy to use, very easy to load data [onto], and the performance has been amazing.”

Miles Oustad, Data Integration Team Manager, Minnesota State

³ Oracle, “Larry Ellison: Introducing Oracle Autonomous Database Cloud,” YouTube, published March 28, 2018, [youtube.com/watch?v=QwkKVEDZU1Q](https://www.youtube.com/watch?v=QwkKVEDZU1Q).



Oracle Autonomous Data Warehouse has the flexibility to run all types of workloads, tailored to the exact levels of performance and availability needed for the task at hand.

Businesses are gravitating to this new solution because it's:

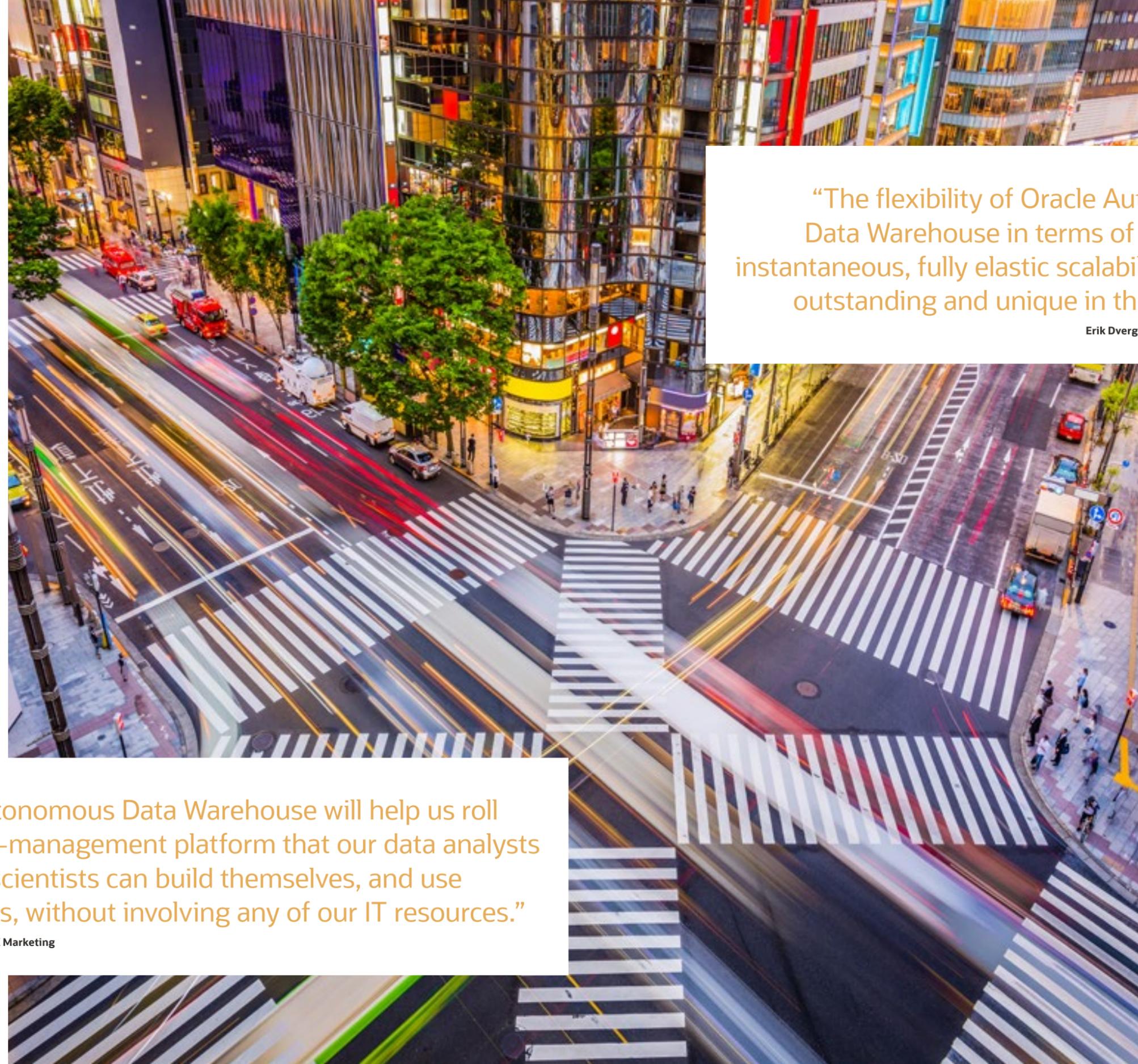
- **Easy**
Instantly set up a data warehouse to experiment with your data
- **Fast**
Quickly submit queries and gain insights
- **Elastic**
Explore any type of data, and scale your analytic activities on demand

“The flexibility of Oracle Autonomous Data Warehouse in terms of delivering instantaneous, fully elastic scalability is truly outstanding and unique in the market.”

Erik Dvergsnes, Architect, Aker BP

“Oracle Autonomous Data Warehouse will help us roll out a data-management platform that our data analysts and data scientists can build themselves, and use themselves, without involving any of our IT resources.”

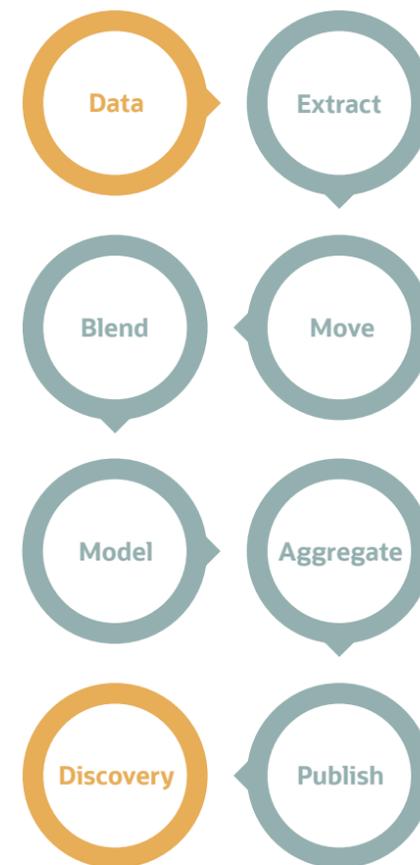
Jerry Gearding, CTO, DX Marketing





Part 2: Put Analytics on Autopilot

Business users need to be able to answer complex questions, fast, and often in the context of day-to-day activities. Unfortunately, the data-discovery process at most companies is laborious and tedious, which drives up complexity and costs. The typical progression looks something like this:

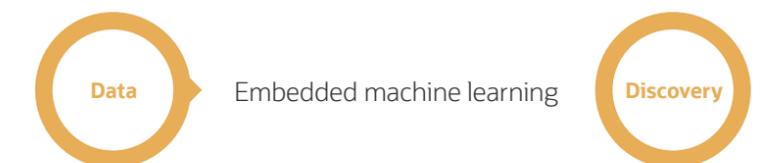


The data-discovery cycle typically involves data extraction using one tool, blending and enrichment with another tool, and multiple other tools to process and visualize the results. If anything is wrong, the process is repeated until the stakeholders have some confidence in the numbers—not an ideal scenario when you are looking for quick time-to-value. Plus, it’s expensive and complicated: Relying on multiple tools requires multiple skill sets, multiple software licenses, and multiple support contracts.

Oracle Analytics simplifies this multifaceted discovery process, so you can glean the insights you need to take immediate action and make more-informed decisions. Embedded ML technology helps users arrive at the answers more quickly. For example, Oracle’s intelligent-analytics cloud service can recommend new data sources, columns, fields, and other elements to enrich your dataset. If you are reviewing a report that includes fields for first name, last name and city, the tool might recommend that you also

add a field for state, country, or zip/postal code. It also automates self-service analysis to ensure that you are not only analyzing the best data available, but making the best possible decisions and recommendations. Gartner calls it “augmented analytics”—and it’s an area in which Oracle excels.

Oracle Analytics gets you closer to what you really want to do with your data: discover patterns, understand hidden correlations, and identify potential anomalies. Standard connections to lots of different data sources make it easy to enrich your data—including connections to on-premise sources as well as Oracle SaaS and third-party applications. It gives you one comprehensive package, one unified analytics service, one enterprise cloud.



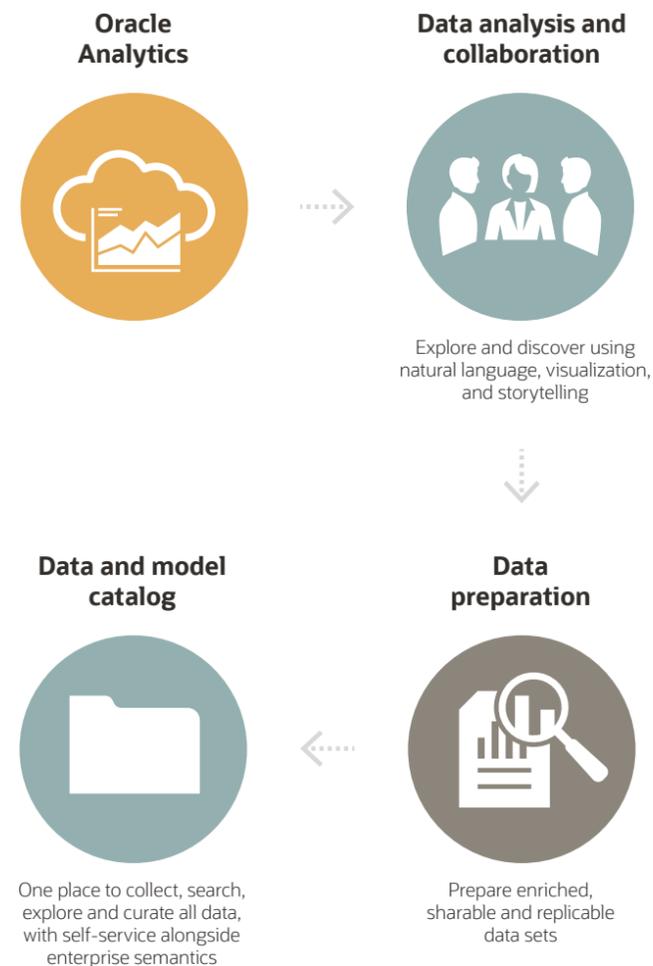
From insight to action.

Business outcomes become more relevant when you can embed analytics directly into your business processes and business flows, such as hire-to-retain, record-to-report, and procure-to-pay. Oracle's autonomous analytics platform integrates directly with your existing applications—a breakthrough known as transactional-business intelligence.

Not only is Oracle's analytic output visually appealing, it's presented in a way that encourages immediate action. Oracle Analytics allows you to build narrative stories, share them with your peers, and collaborate with your colleagues. The scale is almost limitless, so you can effortlessly expand from one user to hundreds of thousands—without ever having to build a technology stack, or provision onsite infrastructure.

With extraordinary performance.

Oracle's self-service analytics capabilities allow business users to blend personal and external data sources as well as create data visualizations that reveal a complete view of business activities.



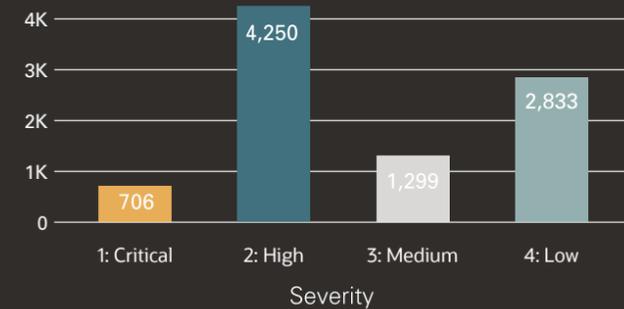
Mobile analytics optimized for any device.

Oracle Analytics includes a mobile application called Day by Day that can infuse data-driven insights into your daily activities. Personalized to each user, this digital assistant can anticipate your questions through a self-learning module, as well as proactively deliver new insights based on the context (time, location, caller, and other variables). You can use your mobile device's voice capabilities to interact with analytic apps via natural-language processing, with answers ranked based on self-learning technology and an innate understanding of relevant terms. It's easy to collaborate with other team members via one-click sharing of data and insights.

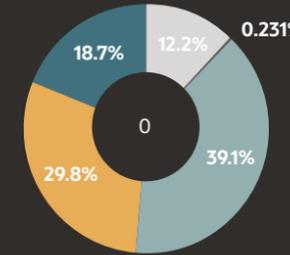
Team performance review project

Year	Quarter	Week	Assigned to employee	Severity	Escalation flag	SLA name
All	Q1 to Q2, 2016	All	All	All	All	All

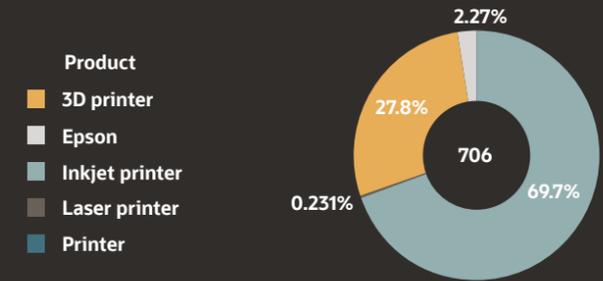
What is the severity level of the incidents?



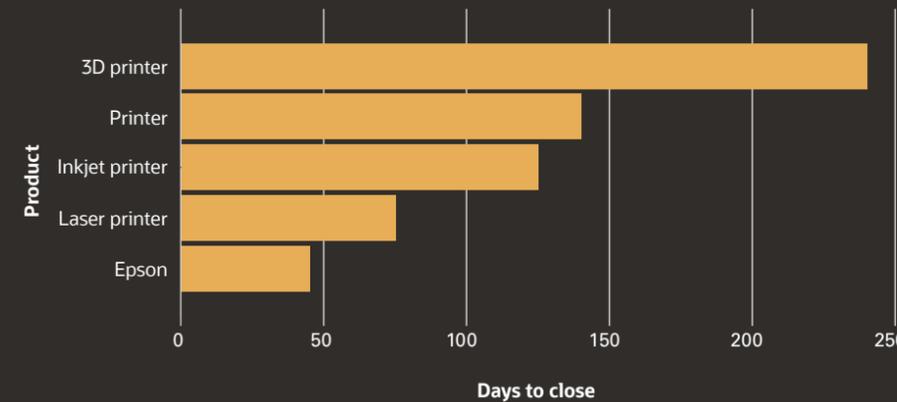
Which products have most incidents?



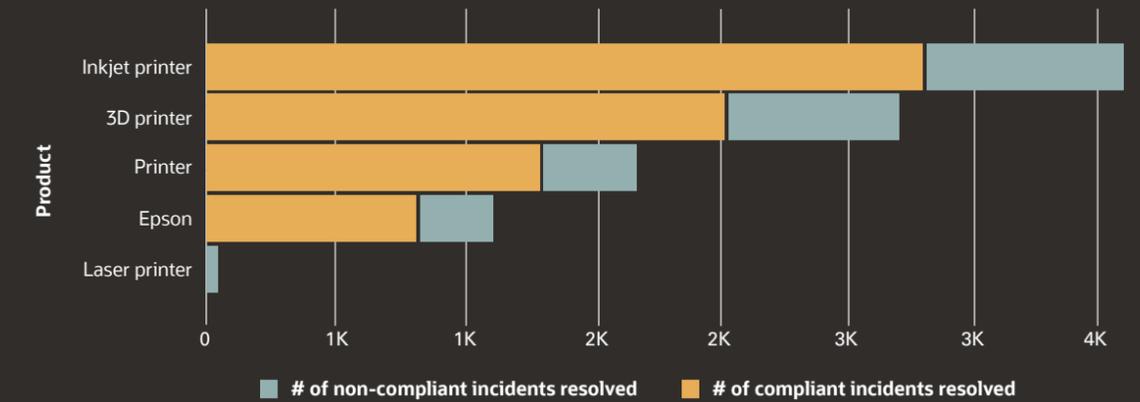
Which products have most critical incidents?



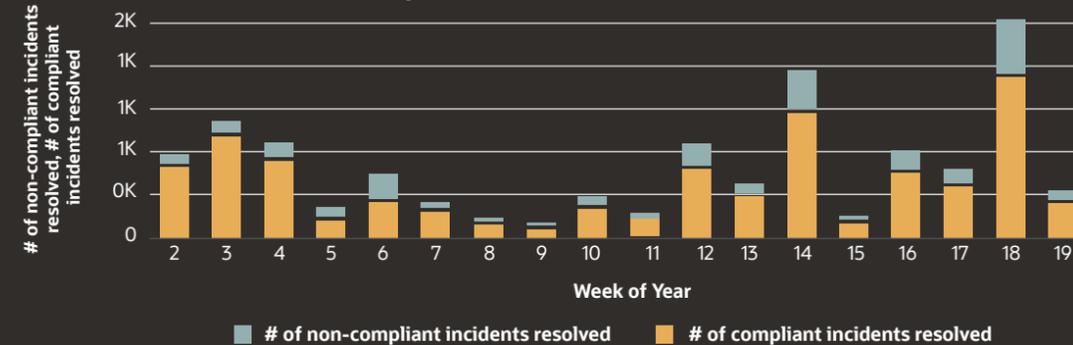
Which products are taking more time to close?



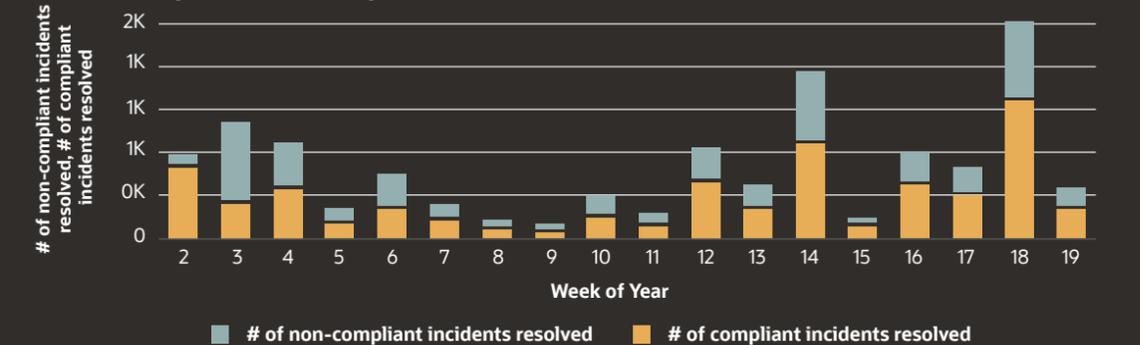
Which products are frequently going over SLA?



How is the resolution SLA compliance trend?



How is the response SLA compliance trend?



A visualization that reveals team performance for a customer-support organization.



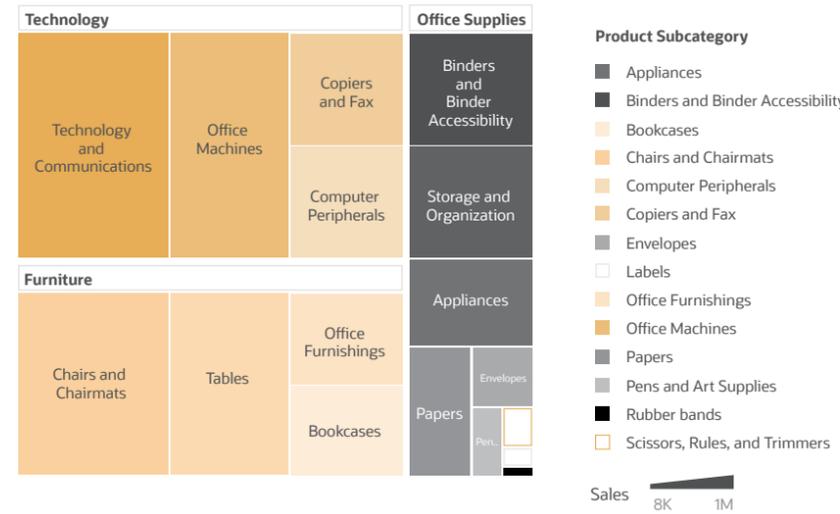
Improve analytic agility.

- Stunning visualizations and interactive presentations
- Automatic recommendations and chart creation
- Single-click trending and forecasting, with drag-and-drop clustering and outliers
- Easy access to popular third-party plugins

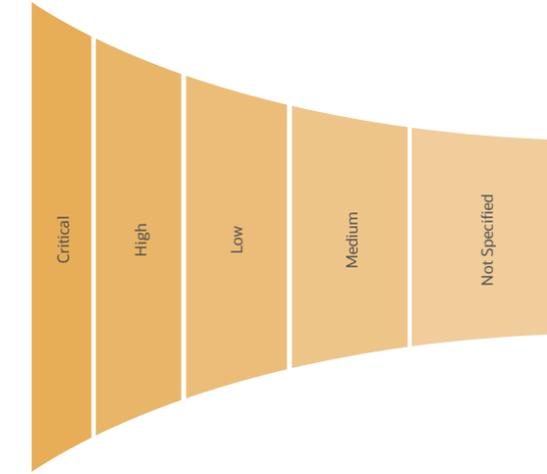
Discover patterns in your data.

- Automatically see what drives your results
- Easily identify and analyze key segments of behavior
- Discover anomalies where data is not aligned with expected patterns
- Interact with the results and collaborate with others

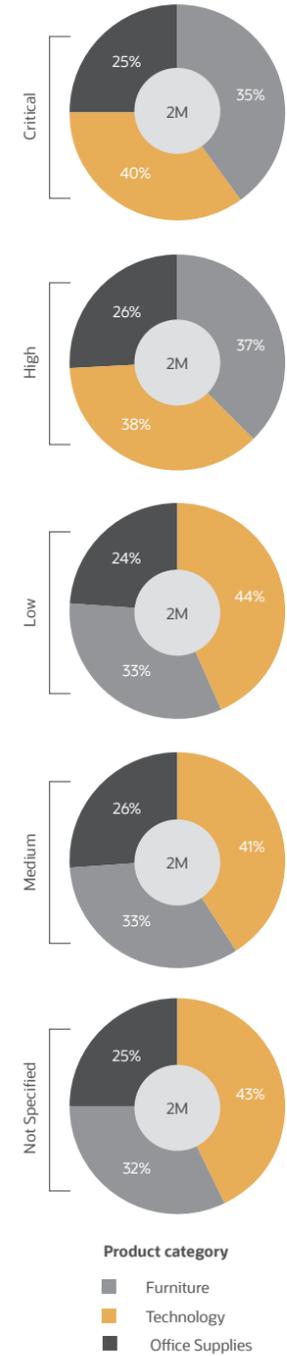
Sales by product category, product subcategory



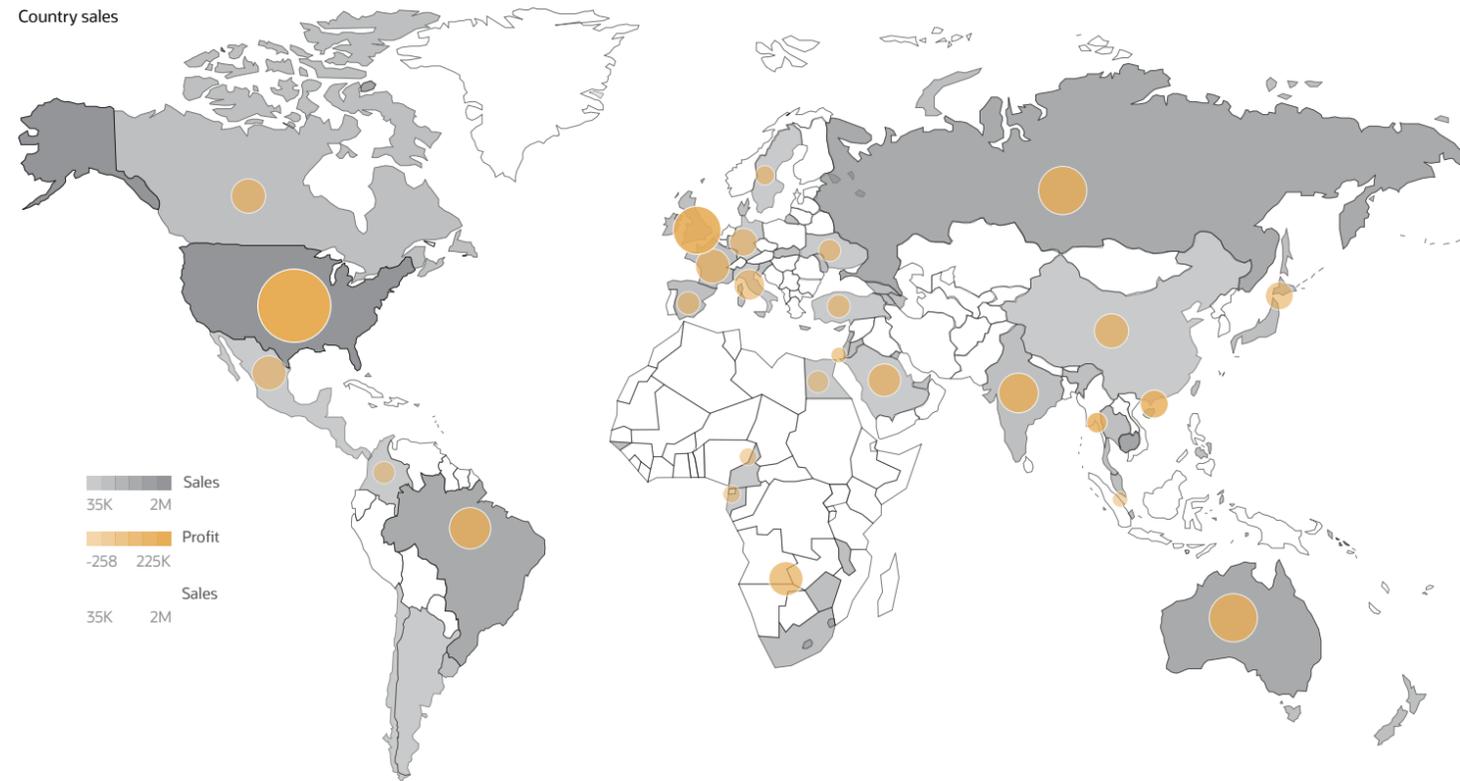
Funnel Chart: Sales by Order Priority



Sales by product category



Country sales



A visualization of a sales funnel that shows sales by priority, product category, geography, and other metrics.

Present insights through stories.

- Create interactive stories directly from your analyses
- Present free-form text and images
- Access visual content on your phone, tablet, desktop, or browser

Automate discovery with embedded machine learning.

- Accelerate data discovery and preparation
- Enable predictive analytics
- Benefit from single-click forecasting, trending, and clustering

“We use data visualization in Oracle Analytics to analyze usage trends to advance the Ha:mo next-generation transportation system, and verify its effectiveness as a sharing service to meet all kinds of needs.”

Makoto Tamura, General Manager, Ha:mo Business Planning Department, Toyota

“We wanted to balance deep analytic expertise with broad operational insights. Oracle Analytics helps us create an enterprise view of talent. Our people can use the self-service tool to put together their own stories—use the filters, search by topic, and create visuals—without having to know the technical details about how it all comes together.”

Joe Knytych, Staff VP of Talent Insights, Anthem



Part 3: Create New Business Models with Big Data

Big data plays a progressively more important role in every industry. Wikibon's Big Data Forecast projects a 17 percent compound annual growth rate for big-data software over the next 10 years. IDC reports that big-data cloud implementations are growing 4.5 times faster than on-premise big-data implementations.

As big data grows in importance, and as more and more kinds of data became potentially useful, companies need a place to store it, visualize it, and mine it for insights. To create a repository for both structured and unstructured data, more and more organizations are creating data lakes. These versatile data-management environments can capture and ingest a wide range of data for exploration and analysis. They not only process streaming data from weblogs, click streams, and sensors, but also integrate existing datasets and systems of record—relational and otherwise. They can be used to consolidate new and traditional data sources that don't necessarily belong in your data warehouse—yet are still potentially important to your organization.

Store, manage, transform, and analyze all types of data.

Oracle Big Data Service provides a framework for all aspects of big-data analytics. It uses object storage to store the data, which can then be processed using a modern software framework such as Apache Spark. Data scientists can subscribe to an embedded ML platform to build predictive models that assist with pattern matching, data discovery, and other analytic functions. AI/ML programs built with Caffe, Keras, and TensorFlow can run on top of Apache Spark to execute complex deep-learning workloads. For example, streaming data can be fed through Kafka pipes to populate object storage. This data can also be analyzed while in motion, to detect potentially fraudulent transactions, for example. Oracle also supports alternative storage systems for specialized requirements such as relational databases for data warehousing, NoSQL stores for event-stream data, and time-series data.

- Offload ETL processes to simplify data transformation
- Enable data science projects to build, train, and execute ML models
- Consolidate analytic data into a data lake for management and processing
- Run ML models to automatically deliver results to business applications



Catalog



Data science tools



Analytics



Data integration



Data lake



Data warehouse

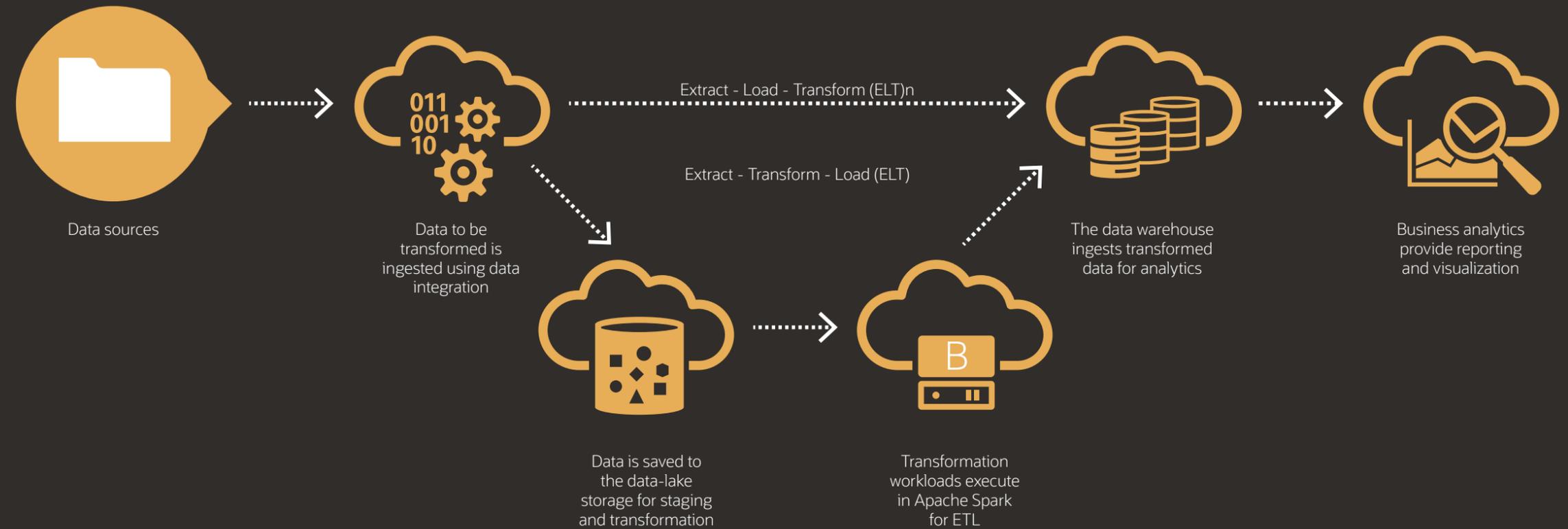
Infrastructure

Run ETL processes in Oracle Big Data Service.

Some customers use Oracle Big Data Service as a data-integration engine to transform data and load it into the data warehouse for analysis. Using Oracle Big Data Service for these processes can be faster and more economical than loading it into a data warehouse and transforming it there.

- Move data efficiently from various sources into a data warehouse
- Give business users faster access to analytics
- Access new types of data, in real-time and batch mode

ETL offload

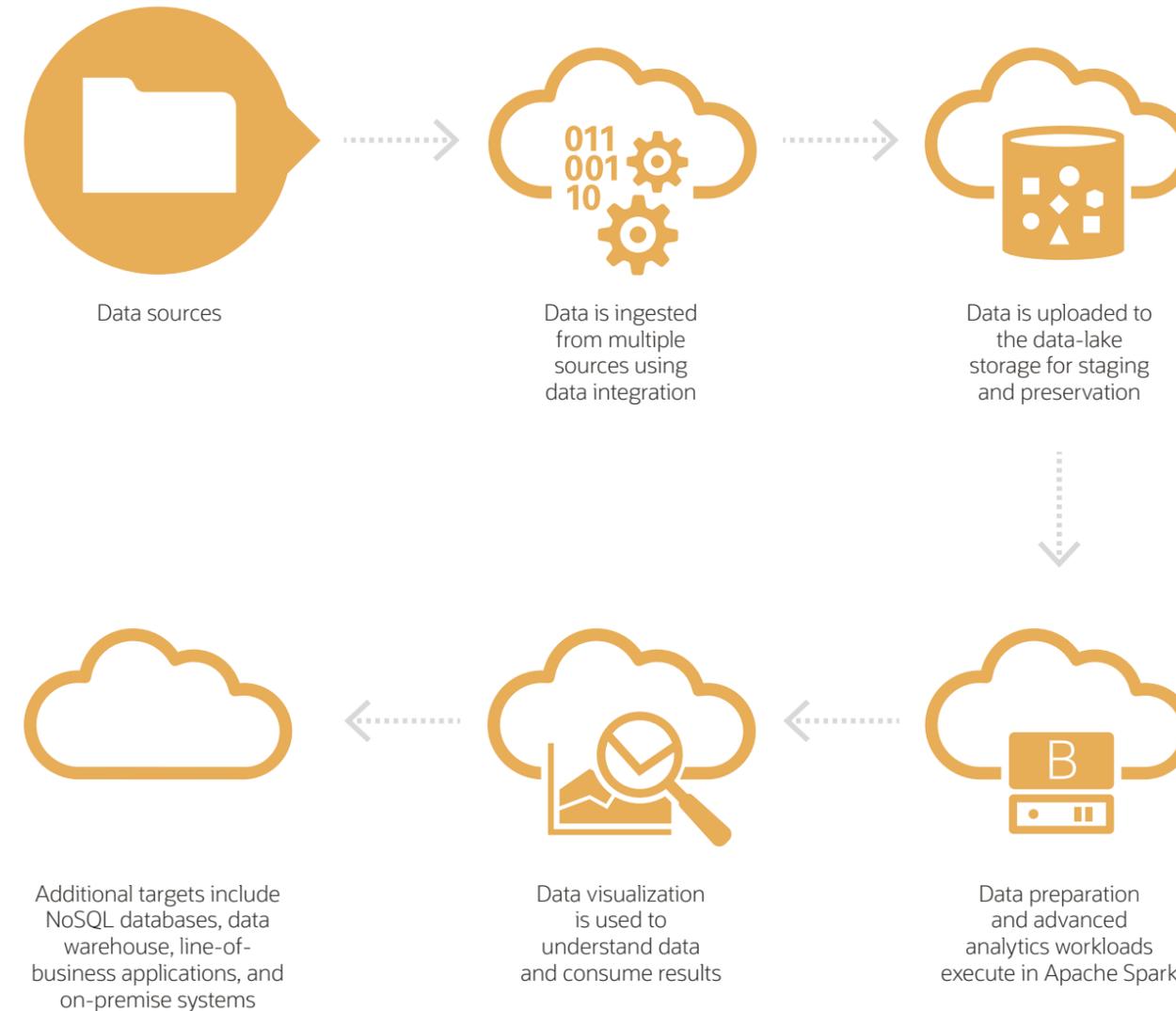


Create advanced analytics for data-science products.

Data scientists rely on Oracle's cloud-based data lake to make predictions, discover patterns, and detect anomalies. You can use Oracle Big Data Service to load results into a data warehouse, while the source data remains in the data lake.

- Get fast, easy access to any data, anytime, anywhere, at any scale
- Benefit from a unified, integrated platform for data management
- Experience advanced analytics, artificial intelligence, and machine learning

Big-data advanced analytics



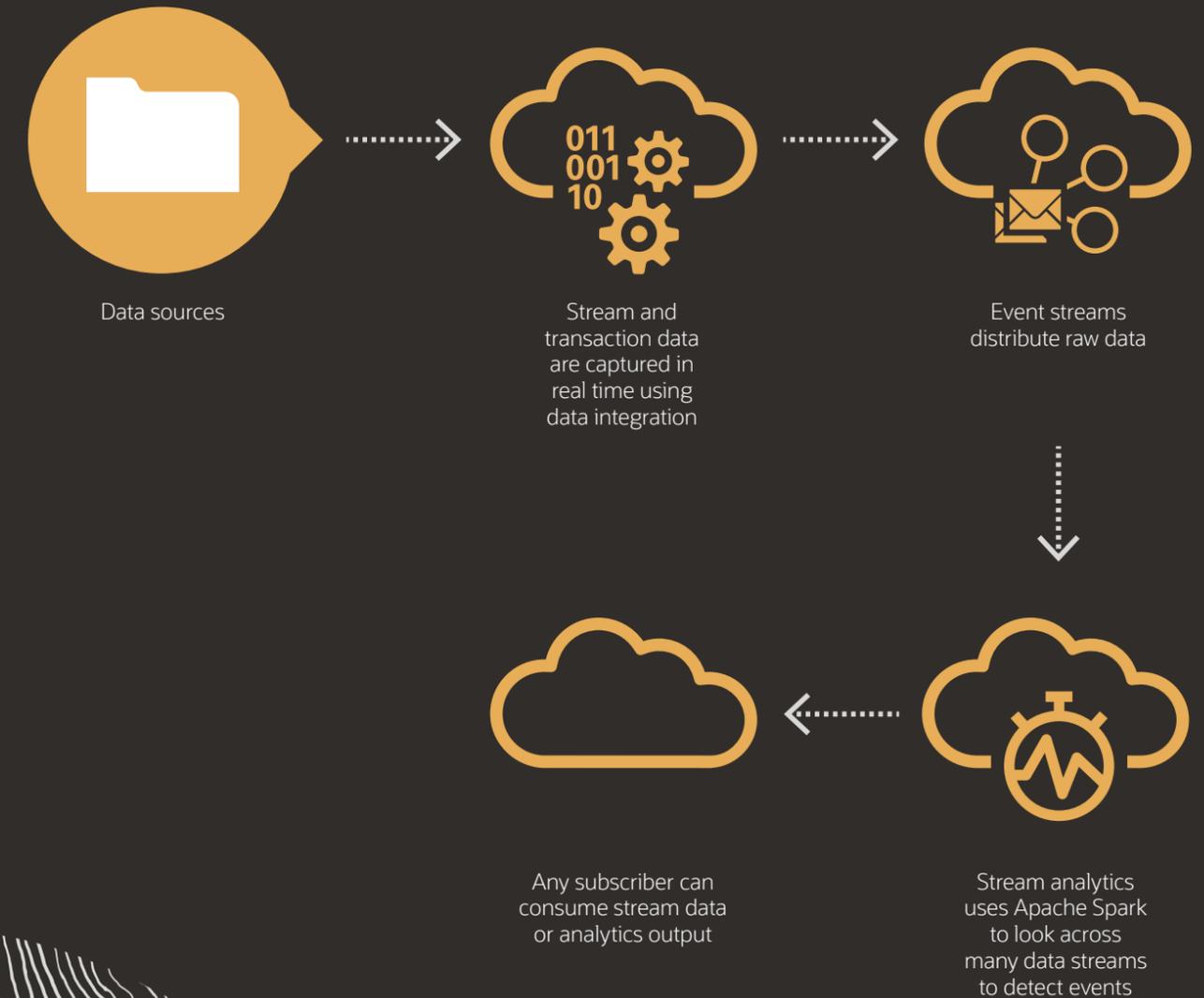
Make use of stream analytics for real-time event processing.

Big data can include data streams from IoT sensors, transactions from an OLTP system, or any other real-time data stream. Oracle's robust data-management platform can capture, process, and store these event streams; capture, load and transform data from any source; as well as apply spatial, time-series, and ML-based analytics on streaming data.

- Capture streaming and transactional data for real-time processing
- Store data in a data lake for historical analysis
- Deliver results to downstream applications

With Oracle's ready-to-go big-data analytics service, you can sign up for an account, load your data into a data lake, and start analyzing it right away. It's easy to add server resources as workloads scale up, and there's no system-integration work or administrative tasks to worry about. Oracle hosts the big-data environment and you gain the benefits of using a big-data system without buying and maintaining hardware, and without having to orchestrate complex data-management tasks. With an on-premise data warehouse or data lake, by contrast, it's up to you to provision the hardware and software, as well as patch it, upgrade it, scale it, and keep it going. These tasks divert valuable resources away from your core big-data charter: to get value out of the data.

Stream analytics



Think autonomous.

Cloud-computing models are changing how businesses operate and how people interact. The cloud is redefining our relationship with the devices we use and the information we depend on. Oracle offers the industry's only data-management platform with autonomous database capabilities, empowering customers to create new data warehouses, data lakes, and analytics capabilities, then scale them to meet expanding business requirements.

If you need a flexible technology environment that caters to business users, data scientists, developers, and many other constituents, and that includes data warehousing, big data, and analytics, then consider Oracle Data Management Platform. You can subscribe with a few clicks, eliminating the need to provision, build, and manage in-house infrastructure, applications, databases, and storage systems.

Lower your costs.

- Autonomous database management, monitoring, and tuning eliminate costly manual management
- Independent scaling of compute and storage resources minimizes cloud usage costs

Reduce risk.

- Automated updates for all security patches
- Industry-leading internal- and external-attack protection
- Unified, end-to-end data-management platform to eliminate complex operational processes and dependence on multiple vendors, licenses, and tools

Accelerate innovation.

- Deploy database workloads faster
- Unleash data-monetization opportunities with unlimited cloud flexibility

Take these next steps.

Sign up for a free trial of Oracle Autonomous Analytics.

Build and populate a data lake.

Try other Oracle Cloud services, including Oracle Autonomous Database.



Cloud Essentials

Learn more at

oracle.com/analytics

oracle.com/big-data

oracle.com/database/autonomous-database.html

Try Oracle Cloud today.

Go to oracle.com/cloud/free.

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