

ORACLE  
DatabaseWorld  
at CloudWorld

# Oracle Innovations in Modern Data Platforms

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# Safe harbor statement

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# Today's Agenda



Oracle Data Platform  
**Vision & Strategy**



What's new from  
Oracle Data Management



What's next from  
Oracle Data Management

# Oracle Modern Data Platform

Oracle Applications  
Oracle Databases

Any Apps  
Other Databases

IoT, APIs, files, social  
Any SaaS, any cloud

App and Data Integration

Data Streaming



App Dev



Analytics & Visualization



AI & ML



Generative AI

Generate continuous business outcomes with your data



## Integrated Data Access

With security, performance, and governance



### Transaction processing

Rapid updates with real-time data



### Data Warehousing

Analytical queries on structured data



### Data Lake

Complex queries on mostly unstructured data



Growth with new revenue streams



Better real-time forecasts and automated processes



Reduce operational cost with automation and preventive maintenance



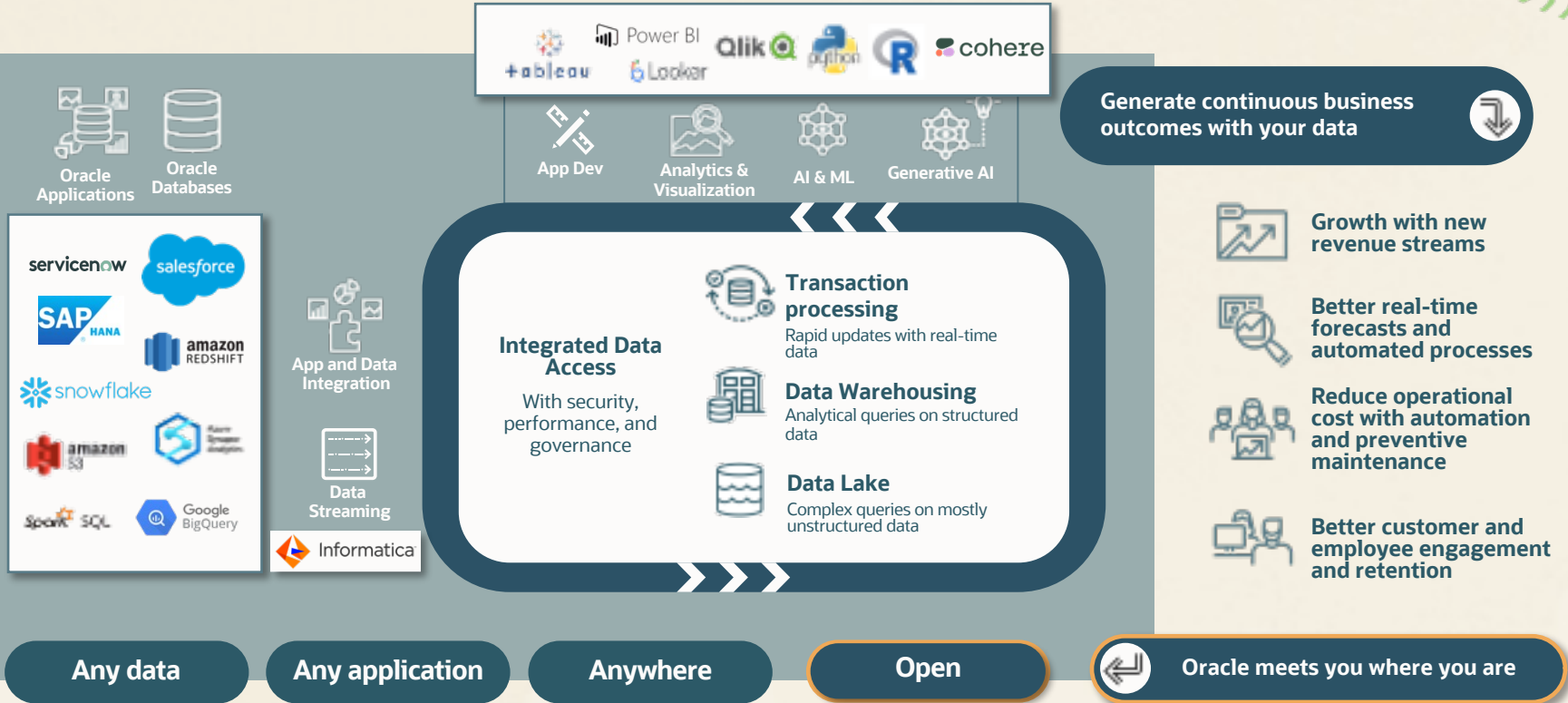
Better customer and employee engagement and retention

Any data

Any application

Anywhere

# Oracle Modern Data Platform



# Oracle's Database *Vision*

Make it easy to **develop** and **run** modern apps and analytics for **all use cases** at **any scale**



## Converged Oracle Database

**Complete** support for all modern data types, workloads, development styles



## Oracle Autonomous Database

**Simplest** cloud database for developing and running any app at any scale or criticality

# Today's Agenda



Oracle Data Platform  
**Vision & Strategy**



**What's new** from  
Oracle Data Management



**What's next** from  
Oracle Data Management

# *New* from Oracle Data Management



Oracle  
Database 23c



Oracle  
Exadata X10M



OCI & MultiCloud  
Developments



Autonomous  
Database Innovations



# Oracle Database 23c

300+ New Features

Emphasis on *Developers and AI*

Plus enhances Oracle's lead in scalability, availability, security, analytics, etc.

A laptop screen is shown on the right side of the slide. The screen displays the text '23c' in a large, bold, black font, with 'App Simple' in a smaller, black font below it. The laptop is silver and is positioned against a green background with a blue circular graphic in the top right corner.

23c  
App Simple

# Oracle Database 23c *Free* (23.3)

Develop, Learn,  
and Run for Free



## Early and easy access to 23c AppDev features

Developers get a head-start on building apps with innovative 23c features  
Simplifies development of modern data-driven apps

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## Oracle Database 23c Free Released via:

Docker image, VirtualBox VM, Linux RPM file  
Windows coming soon

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## Available under the Free Use Terms & Conditions license

Download straight from the web - no user account or login required  
Capped database resources for 12GB storage, 2GB memory, and 2 CPU cores

# Oracle Database 23c

*Sample of Marquee Features for DBAs, Analysts, & Developers*

Now **GA** on OCI  
Base Database  
Service

NEW IN  
23c

**DBA**



Real-time SQL Plan Management  
SQL Firewall  
True Cache

**ANALYST**



Automatic Materialized Views  
Analytics Views  
Improved ML Algorithms

**DEVELOPER**



JSON Duality Views  
Property Graph Views  
JavaScript Stored Procedures  
AI Vector Search

# JSON-Relational Duality *Views*

A *simple* way to enable databases to generate JSON format and APIs from relational tables

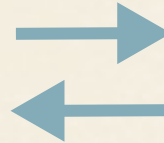



STUDENT			
STUD	ENAME	MAJOR	YEAR
S3245	Jill	Math	First
...	...	...	...

COURSE				
CID	CLASS	ROOM	TIME	TEACH
C01	MATH101	A101	14:00	Tom
C02	SCIENCE102	B405	16:00	Anita
...	...	...	...	...

STUDENT COURSES	
STUD	CID
S3245	C01
S3245	C02
...	...

TEACHER		
TEACH	TEACHER	TIME
C01	Adam	14:00
C02	Anita	16:00
...	...	...



```
SCHEDULE FOR: JILL 
```

```
{
  "student"      : "S3245",
  "name"         : "Jill",
  "major"        : "Math",
  "schedule"     : [
    {
      "time"      : "14:00",
      "course"    : "Math 201",
      "room"      : "A102",
      "teacher"   : "Adam"
    },
    {
      "time"      : "16:00",
      "course"    : "Science 102",
      "room"      : "B405",
      "teacher"   : "Anita"
    }
  ]
}
```

# Property Graph *Views*

- A *powerful* way to query connections between data using standard SQL
- First commercial DB to implement SQL/PGQ standard

Property Graphs are effectively a ‘view’ on top of relational data tables

All inserts, updates, and deletes to source tables are automatically reflected

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New GRAPH\_TABLE function and MATCH clause of the SQL:2023 standard

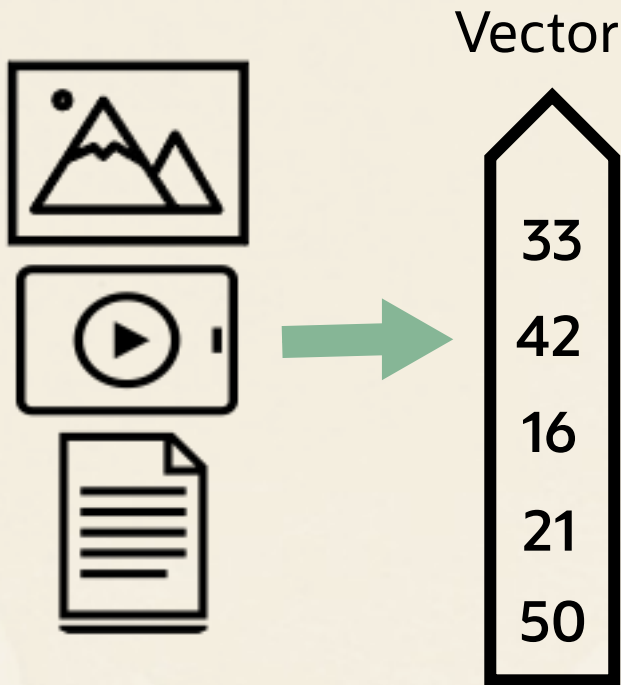
Enables writing simple SQL queries to follow connections in data

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Suitable for a variety of application use cases, including:

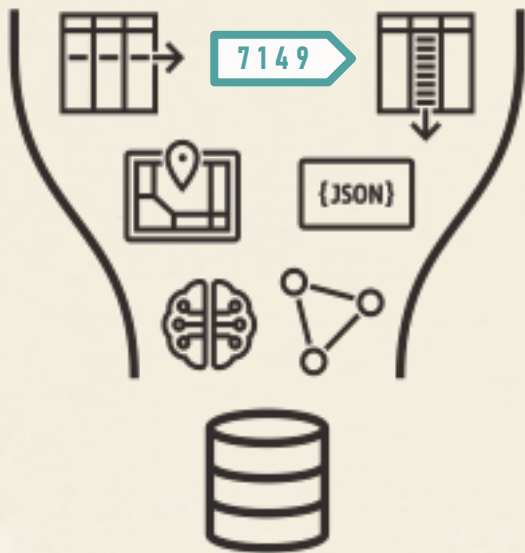
Money-laundering detection, next likely purchase models, workflow dependencies, etc.

# Vectors in AI/ML



- A vector is a **sequence of numbers**, called dimensions, used to capture the important "features" of the data
- **Vectors** represent the **semantic content** of data, not the underlying words or pixels
- Vectors are generated using deep learning embedding models

# Introducing *Oracle AI Vector Search*



- New VECTOR data type for storing vector values
- New SQL syntax and functions expresses similarity search with ease
- New Approximate search indexes packaged and tuned for high performance and quality
- Perform vector search in queries alongside business data about customers and products
- Handle vector and other workloads in same database

*Sign up for Preview Now*



# With Oracle Database 23c...

One part of an app can treat the data as *relational*, while other parts treat the *same* data as a *document*, and others treat it as a *graph*



You get the *best* of all these worlds, at the *same time*.

Another huge benefit for app dev



# Oracle *Exadata*

Extreme performance and availability for all data workloads



## Ideal Database Hardware

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## Database-Aware System Software

Unique algorithms vastly improve the performance of modern operational and analytic apps for all use cases at any scale

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## Automated Management

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## Deployable Everywhere

Oracle Database on Exadata runs on-premises, Oracle Cloud@Customer, Oracle Cloud, and @Azure

# Oracle Exadata *X10M*

World's Most  
*Cost-Effective*  
Database Machine  
for all Workloads

## Up to 2,880 CPU cores per rack

The latest 96-core AMD EPYC™ CPUs

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## Up to 33 TB memory

2.5x faster and 1.5x higher memory capacity

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## Up to 2 PB of raw all-flash storage

New 30.72 TB capacity-optimized flash drives

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## Up to 4.2 PB of raw data storage

22 TB Disks replace 18 TB

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## Key Benefits

Ultra-fast <17 microsecond OLTP IO latency

Uncompressed I/O bandwidth of up to 1 TB/sec per rack from SQL

25.2 million 8k read I/Os per second per rack

# Oracle Cloud Infrastructure *Global Footprint*



September 2023

45 Regions

7 planned

12 Azure Interconnect Regions

- 35 Commercial
- 7 Commercial Planned
- 2 Sovereign
- 8 Government
- 12 Microsoft Azure Interconnect



100% Renewable Energy by 2025



# *New* Multicloud - Oracle Database@Azure

## OCI Azure Interconnect

Integrated network

2ms latency

No egress fees

## Oracle Database Services for Azure

### Adds:

Integrated identity

Service metrics, events,  
logging shipped to Azure

## Oracle Database@Azure

### Adds:

Exadata systems in Azure regions

10x lower latency

Purchase and bill using Azure  
Consumption Commitment

Available Oracle Support Rewards

# Autonomous Data Warehouse *Innovations*



## Multicloud Data Warehouse

Native integration across public clouds

No coding or extra services needed



## Rethink the Data Lake

Database storage at the cost of object storage

Choice of data lake architectures



## Open Data Sharing

Delta Sharing standard

Data sharing in any cloud



## Data Studio

Comprehensive, built-in low-code analytics tool suite

More productivity at no extra cost

# Today's Agenda



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**Vision & Strategy**



What's *new* from the  
Oracle Data Management



**What's next** from  
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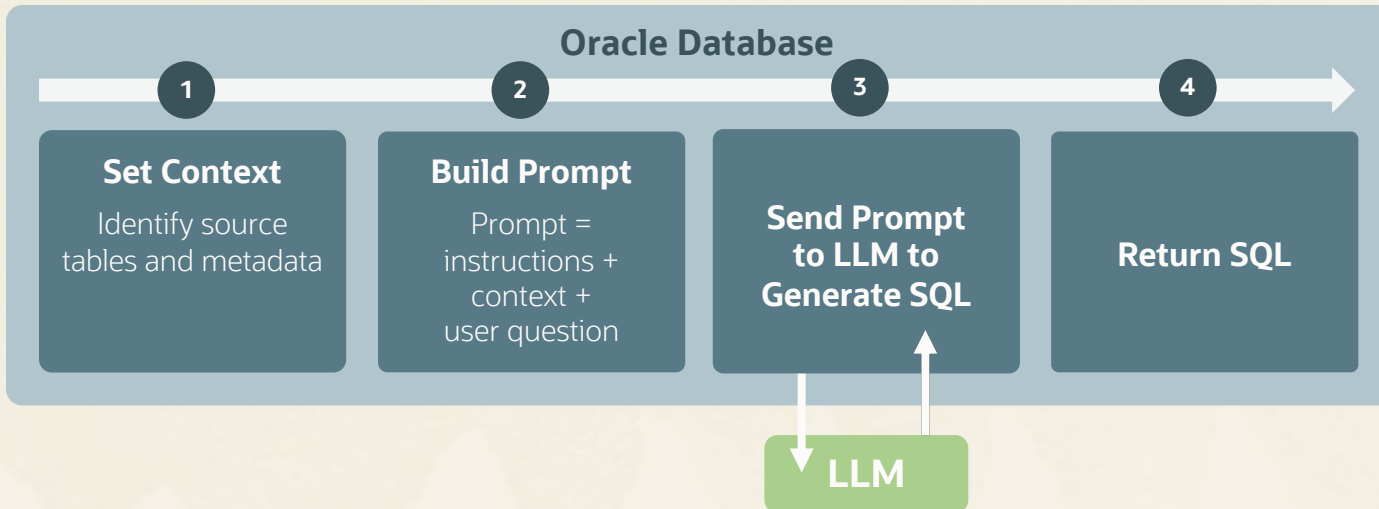
# Oracle Database Vision

With Generative AI (LLM)

Make it easy to  
**generate** and run  
modern apps and  
analytics for all use  
cases at any scale

# SQL Generation from Natural Language *using LLM*

“Give me the average salary of employees in each department”





# Autonomous Database speaks “human”

**Select AI** is a new Autonomous Database capability that is included with the service and allows you to **use natural language** to query data.

<https://blogs.oracle.com/datawarehousing/post/autonomous-database-speaks-human>

The screenshot displays the Oracle Autonomous Database interface. At the top, a header reads "How many customers in San Francisco are married". Below this, the interface is split into two panels. The left panel, titled "%sql", shows a natural language query: "SELECT AI how many customers in San Francisco are married". Below the query are icons for copy, refresh, and download. The result is displayed as a table with one row: "TOTAL\_CUSTOMERS\_MARRIED" and the value "18". The right panel, titled "Show SQL for 'how many customers in San Francisco are married'", shows the generated SQL query: "SELECT AI showsql how many customers in San Francisco are married". Below this are the same icons. The response is shown as a SQL query: "RESPONSE SELECT COUNT(\*) AS total\_married\_customers FROM SH.CUSTOMERS c WHERE c.CUST\_CITY = 'San Francisco' AND c.CUST\_MARITAL\_STATUS = 'Married'".

```
%sql
SELECT AI how many customers in San Francisco are married

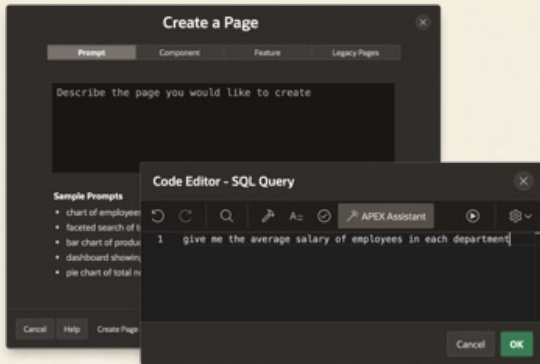
TOTAL_CUSTOMERS_MARRIED
18
```

```
Show SQL for "how many customers in San Francisco are married"

%script
SELECT AI showsql how many customers in San Francisco are married

RESPONSE
SELECT COUNT(*) AS total_married_customers
FROM SH.CUSTOMERS c
WHERE c.CUST_CITY = 'San Francisco'
AND c.CUST_MARITAL_STATUS = 'Married'
```

# Low-code Platforms *Generate Apps*



By **declaring the intent** of the **app** using visual tools and metadata

Low-code is far more productive than coding

Today, low-code is great for generating simple apps

The challenge for low-code is generating enterprise-grade apps

Oracle APEX is the leader in addressing this challenge

<https://apex.oracle.com/en/platform/ai/>

# *Summary:* Oracle Data Management

Focused on increasing  
*productivity* for DBAs,  
Developers and Analysts

## **Converged Oracle Database**

Complete support for all modern data types, workloads, development styles

Simplifies development of operational and analytical applications today, and for tomorrow

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## **Oracle Autonomous Database**

All the benefits of converged Oracle Database on Exadata, and run apps at any scale or criticality

Deploy in the cloud, on-premises and multicloud configurations

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## **Generative AI**

Make it easy to generate and run modern apps and analytics for all use cases at any scale



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Thank you