Safe Harbor and Forward-looking Statements

This presentation is intended to outline our general product direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions. The development, release, timing, and pricing of any features or functionality described for Oracle’s products may change and remains at the sole discretion of Oracle Corporation.

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Generative AI Changes Everything
Infrastructure & Applications
About One Year Ago: ChatGPT 3.5 was Born ... the Baby Talks

- Developed by OpenAI: A Company Founded by Elon Musk 10 Years Ago
- Huge Artificial Neural Network: Multi-Billion Parameter Large Language Model (LLM)
- Trained on Language: Trillions of Data Elements ... Wikipedia + Public Internet
- ChatGPT 3.5 Talks: Generates Answers to Questions ... Engages in Conversations

A Big Surprise
ChatGPT's Scale Enabled it to Understand and Generate Language
ChatGPT: A Rare Event that Captured Worldwide Attention

• ChatGPT 3.5 Surprised OpenAI’s Research Team
• Raised Concerns of Governments and AI Experts
• Writers Strike in Hollywood partially based on the Fear of AI
• Everyone wants to Know … What Comes Next?

A Race...to Build what Comes Next: Better AI...Better Future...Risks
Generative Artificial Intelligence – Question?

Is Generative AI the Most Important New Computer Technology Ever? Probably!

- Countless Billions $$$: Being Invested in Generative AI and Large Language Models
- Last Year: ChatGPT 4.0, Cohere, other LLMs Generated Images, Music, Computer Code …
- Coming Soon: Self-Driving Cars, Antiviral Drug Design, Clinical Voice Digital Assistant …

More Big Surprises !!
Oracle Cloud: Best Cloud for Training Generative AI Models

- RDMA Network: Connects NVIDIA GPUs into Huge Superclusters
- Efficiently Train Generative AI Models: Twice the Speed and Less than Half the Cost
- AI Customers: NVIDIA, Cohere, xAI … Plus Dozens More

Technology Leaders & Startups Train AI Models in Oracle’s Cloud
Oracle Cloud: NVIDIA Superclusters — World’s Largest Computer

- Supercluster: NVIDIA H100 GPUs + Oracle Cloud RDMA Network
- Supercluster Scale: 512 GPU Cluster to 16,000 GPU Cluster
- Node Bandwidth: Each GPU has a 200Gb/s RDMA connection
- Node Latency: Few Microseconds between Nodes
- Supercluster Bandwidth: 102,400 Gb/s to 3,200,000 Gb/s

RDMA Network Moves AI Training Data to GPUs Many Times Faster
Oracle Cloud has been using AI for Years ...

Generative AI is Transformational
Generative AI — Transforming Oracle Cloud Technologies

- Improved APEX Application Generator: No Code – not – Low Code
- Improved Autonomous Elastic Database: No Human Labor – No Human Error
- New Object Relational Database: Generate Relational Schema from JSON Documents
- New Oracle Vector Database: Specializes Generative LLMs for Medicine, Law …
- New Cloud Data Intelligence Platform: Population Scale Data Trains Medical AI Models

Productivity – Performance & Cost – Security
APEX Cloud Application Generator – Most New Applications

• APEX: Generate Applications – No Code
  • From Java Programming to APEX Application Generation
  • Most New Oracle Applications Generated by APEX
  • Cerner New Millennium, Fusion Marketing, Banking, Retail, Hospitality …

• APEX Application Development Methodology – Smaller Teams & Less Time
  • Smaller Development Teams: 50 becomes 10
  • Faster Development Methodology: Prototype Features and Iterate
  • More Secure: Does Not Generate Security Bugs
  • More Reliable: Generates Stateless Applications with Automatic Failover

10x Development Productivity Gain
Autonomous & Elastic Cloud Database – All Cloud Applications

• Autonomous Database – No Human Labor & No Human Error
  • 100% Self Driving: Automatic Installation, Configuration, Updates, Patching, Tuning …
  • All New Oracle Applications Built on the Autonomous Elastic Database
  • New Cerner HealtheIntent, Fusion Marketing, Banking, Retail, Hospitality …
  • Fusion & NetSuite moving to Autonomous Elastic Database

• Elastic Database – Higher Performance & Lower Costs
  • Automatically Allocates and Releases Processors & Memory based on Workload
  • 10x Faster on Large Workloads while Costing Less Overall
  • Serverless when Idle – Do Not Pay for what you Do Not Use

Higher Performance – Lower Cost – More Secure
Object Database & Relational Database — Best of Both Worlds

- Seamlessly Combines Easy-to-Use JSON Documents with the Power of SQL
- Programmers Use Mongo Compatible Get and Put on Standard JSON Documents
- Database Automatically Generates Relational Tables from JSON Documents
- Use Powerful SQL Language to Query Database

Easy-to-Use Document Database – Powerful Relational Database
Oracle Cloud Enables Customers
To Use Their Own Data to Train Generative AI Models
Oracle Vector Database: Easily Specialize AI Models & Build AI Apps

- Designing & Training Foundational AI Models: Complex and Expensive
  - Design Multi-Billion Parameter Artificial Neural Network: OpenAI, Cohere, xAI ...
  - Ingest Trillions of Training Data Elements: Wikipedia + Everything on the Internet
  - Oracle Cloud: 16,000 Node H100 NVIDIA Supercluster with RDMA Interconnect
- Specializing AI Models: Pretrained Foundational Model + Supplementary Training Data
  - Oracle Vector Database: Stores Vectorized Supplementary Training Data
  - Specialized AI Model with EHR Data: Generate Doctors’ Orders – Cerner New Millennium
  - Specialized AI Model with Diagnostic Image Data: Rapid Cancer Detection – Imagene

Most Customers will Train Specialized AI Models for Specific Applications
Customers Maintain Data Privacy while Training Specialized AI Models

- Imagene: Biopsy Slide Images for Early Cancer Detection
- Ronin: EHR Data for Managing Cancer Care and Therapy
- Investment Banker: Financial Trading Data for Predictive Modeling
- Software Company: Service Request Data for Customer Support System

Oracle Cloud Vector Database – Private Training Data Remains Private
Oracle Analytics + Generative AI

New Oracle Cloud Data Intelligence Platform
New Oracle Public Health Data Intelligence Platform

- All New Cerner HealtheIntent: Oracle Public Health Data Intelligence System
  - Unified National Population Scale Health Data: Oracle Cloud & Autonomous Database
  - Unified Patient Treatment & Outcome Data from Multiple EHRs: Cerner, Epic, DHIS2 ...
  - Unified Patient Claims & Cost Data: Providers and Payers

Unified Population Health Data: 1,000x More Data to Train Medical AI Models
New Oracle Public Health Data Intelligence Platform

• National Population Scale Public Health Data: 1,000x More Training Data
  • Enables Personalized Medicine: Which Statin works for Patients with your Genome
  • Enables Value Based Care: Better Treatment, Better Outcomes, Lower Cost
  • Machine Learning on Diagnostic Images Accelerate Cancer Treatment: Imagene
  • AI on Patient Monitoring Data Reduces Hospitalization after Chemotherapy: Ronin

Personalized Treatment with Better Outcomes for Millions of Patients
New Oracle Cloud IoT Automated Data Capture

Sensors & Robots
Automatically Capture Patient Data with Cloud IoT Devices

- Patient Monitoring: New Cerner CareAware in Hospitals, Clinics and at Home
- Patient Diagnostic Image Capture and Storage: MRI Images, Sonograms, X-Rays ...
- Laboratory Test Results: Blood Tests, Respiratory Infection Panel ...
- Home Devices and Wearables: Blood Pressure, Pulse/Oximeter, Smart Watch ...

Diagnostic, Lab and Monitoring Data Stored in EHR + Public Health Data Platform
Automated Cloud IoT Data Capture Platform: Other Medical Data

• Automatically Collect Hospital & Clinic Inventory & Supply Chain Data
• Fusion Supply Chain: Medical Supply Inventory RFID Tags with Automatic Reordering
• Laboratory Robotic Automation: Cerner Lab Robotics + Oracle IoT Data Capture
• Medical Device Robotic Manufacturing: Building Microfluidics Disks for Fast PCR

Automated Data Capture & Robotics Improves Data Accuracy, Lowers Costs
IoT Sensors: Collect Huge Amounts of AI Training Data

- **Healthcare Training Data:** Some Data Not Saved
  - Patient Monitoring: Blood Pressure, Pulse Oximeter, Smart Watch
  - Diagnostic Images: X-Rays, MRI Scans, Biopsy Slides …
  - Genomics: Gene Sequences, Variations and Mutations

- **Diagnostic Image Storage Cost Problem**
  - Diagnostic Images & Genomics: Not Saved Due to Cloud Storage Costs
  - **Oracle Cloud:** Provides an Economic Solution to this Problem
Generative AI & Sensors & Robots
Can Transform Other Industries
Transformative Technologies: Applied to other Industries

- Generative Artificial Intelligence
  - APEX No Code Application Generation System
  - Autonomous Database Stores Vast Amounts AI Training Data

- Internet of Things: Sensors & Robots
  - Sensors Collect Vast Amounts of Training Data
  - Robots Lower Costs and Improve Product Quality & Job Quality
21st Century Agriculture

Growing Indoors: Applied Inventions Project
Advantages Growing Indoors: Robotic Greenhouses

• Grow using 98% Less Water: Adapt to Changing Climate ... Droughts in Ethiopia, Somalia ...
• Grow using 90% Less Land: Preserve Amazon Rainforest and African Animal Habitat
• Grow Near Population Centers: Lower Food Transportation Costs and CO₂ Emissions
• Daily Harvest with Same Day Delivery: Less Expensive, Fresher more Nutritious Food
• Better Job Security and Job Quality: Hand Harvest Inside in Climate Controlled Building

Agriculture Accounts for Over 30% of Global Greenhouse Gas Emissions
Challenges Growing Indoors: Robotic Greenhouse

- Operate Cost Efficiently in Any Climate Anywhere in the World: Local Solar Power
- Inexpensive To Build: Robotic Factory Builds Greenhouse Modules
- Inexpensive to Ship: All Greenhouse Modules Fit in Standard Shipping Containers
- Inexpensive to Install: Robot Digs Foundation … Greenhouse Quickly Assembled
- Inexpensive and Easy to Operate: Sensors, Robots … Always Satellite Connected to Cloud
- Same Greenhouse Grows Multiple Crops: Leafy Greens, Berries, Rice …
Sensors Collect Lots of AI Training Data

- Robotic Hydroponic Greenhouse
  - Environmental: Sunlight, Temperature ...
  - Nutrition: Water, Nitrogen ...
  - Plant Images: Size, Health, Ready to Transplant or Harvest ...
  - Plant Genomics: Different Varieties of Foods for Different Climates and Cultures
Robots do the Heavy Lifting: Improved Job Quality

- Hydroponic Greenhouse
  - Robot Moves Rows of Plants from Growing Area to Harvesting Area …
  - People Do not Go Into Growing Area to Reduce Contamination and Infestation
  - Largely Eliminates the use of Pesticides
Applied Inventions Robotic Greenhouse Oracle Technology

- Oracle Cloud
- Autonomous Database
- NetSuite to Manage Growing Business
- Collaborating with Oracle on AI, IoT, Robotics, Analytics, Satellite Network …
New Oracle First Responder System

Satellite + Terrestrial Fail-Safe Mobile Network
Always-on Audio/Video IoT Network Connects First Responders

- First Responder Fail-Safe IoT Mobile Network: 5G + Satellite Connection
  - EMTs, Fire Fighters, Police Officers: Wearable Computer with Audio/Video Connection
  - Ambulances, Fire Trucks, Police Cars Always Connected with Cameras & Microphones
- Dispatch & Command Center: Assists First Responders in the Field
  - Police/Fire Command Center: Real-Time Monitor & Manage Any Incident Anywhere
  - Hospital Emergency Command Center: ER Doctors Assist EMTs with Patients in Transit

Never Lose Communications – Continuous Assistance & Supervision
 Autonomous Robot Drones Support First Responders

- Continuous Monitoring for Early Detection of Brush Fires in Dry Season
- Replace Conventional Aircraft for Routine Traffic Monitoring
- Arrive Early for Improved Situational Awareness

Dramatically Lower Cost than Conventional Piloted Aircraft
MultiCloud: Microsoft & NRI
Most Customers use Multiple Clouds

• Infrastructure: AWS, Azure, Google, Oracle ...  
• Applications: Oracle, Salesforce, ServiceNow, Workday ...

All Clouds Should be Open and Connected

Easy for Customers to Combine Different Services from Different Clouds
MultiCloud Announcement: Microsoft Cloud & Oracle Cloud

Microsoft Cloud & Oracle Cloud are Open — Not Walled Gardens

• 2019: Microsoft Oracle Cloud High-Speed Interconnect – 470+ Customers Today
• 2023: Oracle Cloud Hardware & Software to be Installed in Azure Datacenters
• Fastest Database: Oracle Databases on Exadata Hardware
• Fastest Network: Microsecond Connection from Oracle Database to Azure Services
• Easy to Use: Provision Oracle Database Services from Azure Portal
• Low Cost: No Data Egress Fees on Your Data
MultiCloud: Microsoft Cloud & Oracle Cloud

Is it a complete Oracle Cloud inside the Azure Datacenters? Yes!

- All Oracle Cloud Datacenters have the identical Hardware and Software: Vary by Scale
- Because the Datacenters are Identical it’s possible for them to be Fully Automated
- Automation makes Cloud Datacenters More Secure, More Reliable, Much Lower Cost
- Oracle Cloud Datacenters Economical for Small Countries and Medium Sized Customers
More Cloud Regions than any Hyperscaler
64 Customer-Facing Regions Live

44 Public & Government regions live and 5 planned
3 Alloy Planned
9 Dedicated Regions (DRCC) live and 11 planned
+ EU Sovereign and National Security Regions (Gov)
Nomura Research Institute (NRI)

- Largest Economic Research and Consulting Firm in Japan
- Installed 2 Oracle Dedicated Cloud Regions in Japan: Adding 2 More
- Resells Oracle Cloud Services with NRI Services
- Major Financial Services Customers in Japan
- Runs Tokyo Stock Exchange on NRI Oracle Cloud
- Uses APEX to Reduce Application Development Costs by 65%

Dedicated Region Cloud@Customer (DRCC)
Runs All Oracle Cloud Services in Customer Datacenter
Oracle Dedicated Region Cloud@Customer (DRCC)

Runs All Oracle Cloud Services in Your Datacenter

Only Pay for What You Use — $2 Million per Year Minimum

Connects to Other Clouds
Thank You ...
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