Cloud Data Warehouse Platform Selection  by, David Floyer

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Introduction

One of the foundation blocks for a digital business is a Cloud Data Warehouse platform that enables the lines of business (LoB) to work directly to define and mine the data that matters to them without needing direct help from IT experts. Ease-of-use and a broad choice of tools are the most critical attributes for democratizing access to data and developing a data-driven enterprise. The results of timely and efficiently processed data from all sources can then be distributed freely and securely across the business. The enterprise must also integrate this data in real-time or near-real-time with systems-of-record and inference systems.

Wikibon believes that the Oracle Autonomous Data Warehouse (OADW) platform is the best platform currently available to achieve these objectives.

IT Automation

The Cloud Data Warehouse platform provider must remove IT from day-to-day workflows. The platform provider is responsible for automating the installation, integration, patching, tuning, and optimization of software versions. The provider can integrate this automation more effectively than a single enterprise because they can learn and improve from their numerous cloud database customers. The OADW enables the IT database administrators (DBAs) and systems administrators to focus on higher-value work for the enterprise.

All databases require specialized hardware to optimize performance and elapsed time. The OADW provides the ability to automate the total stack of hardware and software using Exadata. All the components are designed, integrated, and delivered as a single stack, allowing end-to-end optimization of performance. This integrated stack is available in the Oracle Cloud or on-premises Oracle Exadata Cloud@Customer and Dedicated Region Cloud@Customer. The bottom-line benefits of this total stack are that work is completed faster and therefore needs fewer resources.

Ease-of-Use

Ease-of-use is the most important single factor for successfully democratizing access to data and developing a data-driven enterprise. The OADW integrated tools provide more intuitive point-and-click and drag-and-drop interfaces to make it easier for LoB data analysts to load, transform, and cleanse data. The tools can also automatically create business models for the analysts and automatically suggest patterns that might generate insights. These tools do not require the analyst to develop new skills or need help from data architects, DBAs, IT, or system administrators.

AutoML is an autonomous machine learning capability designed to assist more advanced data analysts and citizen data scientists in preparing data sets, building machine learning models, and deploying models. AutoML supports the ever-popular Python.

Self-service

Ease-of-use is a prerequisite for self-service. Self-service allows the LoB user to provision all the resources required to develop and execute data-driven advanced analytics. There is built-in loading from object storage in AWS, Google, and Microsoft Azure. Simultaneously, the OADW controls allow for automated access to sensitive data (e.g., GDPR personal data).

Multiple Data and Database Types

Database and data types have exploded in the last two decades, with many providers introducing different database types. Examples include Advanced Analytic, AI Inference, AI Learning, Blockchain, Document,
Graph, Key-value, Inference, In-memory, Log-file, NoSQL, Relational-operational, Spatial, and Time-series databases. Each of these databases deals with different data types and provides specialized structures to improve performance and reduce complexity.

**Single Converged Database Platform**

In previous research entitled “Cloud Database Platform Positioning,” Wikibon concluded that Oracle has the leading converged database implementation of all providers. All the data and database types identified in the previous section are included. For example, Autonomous JSON supports a native JSON binary data type, which increases Document Database performance and function. OADW now contains additional support for graph and spatial databases.

**Oracle Data Warehouse Ecosystem**

Oracle made an important strategic decision to provide users and developers with integrated access to an extensive range of third-party tools. Visualization tools include Tableau and Qlik.

**DeFi, NFT, and Web 3.0**

Web 1.0 brought universal access to all types of data across the Internet. For example, audio and picture files are everywhere with very little protection for the artists’ intellectual property. Web 2.0 brought streaming platforms as third parties, but most of the money goes to platform companies.

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**DeFi (Decentralized Finance) and NFT (Non-Fungible Tokens), together with cryptography, enable some significant advances by potentially eliminating financial and intellectual trusted third parties. Much more critical, new cryptographic platforms can offer dramatic new business models by attaching programmable DeFi permissions and conditions to NFTs. For example, buying an album might allow the first 500 purchasers permission to occupy free front-row seats to the artists’ concerts for a year. If an album is...**
resold, the artist can take 15% of the sale price. Photographers or photographer subjects can charge by the view, film artists can offer stunning shots and be rewarded when it is broadcast or included in a game. Engineers and journalists can protect and market their intellectual property. The complexity of creating agreements between buyers and sellers is automated and set up by the person(s) creating the intellectual property.

Just to be clear, Web 3.0 will need vendors to develop advanced cryptographic platforms to manage this data which scale with orders of magnitude reduction in cost per transaction. There are opportunities to develop new browsers and network protocols to interpret the permissions and conditions. These will take more than a few years before Web 3.0 is up and running.

**Oracle Immutable Blockchain Tables**

In the meantime, enterprises should start now to implement cryptographic database solutions. Oracle has introduced an end-to-end cryptographic database solution between two parties. Enterprises can use the immutable blockchain tables in the Oracle Database to protect all data types from change and identify if and when a change was attempted. The developers can publish cryptographic keys, which customers and business partners can use to ensure that nobody has tampered with the data.

This approach can implement 2-way agreements between enterprises without a trusted third party. This approach is better than moving the data into another database and managing the accuracy and provenance across two different databases. A single end-to-end solution is not as broad as the any-to-any Bitcoin and Ethereum platforms but much more responsive and easier to program. This approach is an early and low-cost way to start implementing new business ideas and models, as Blockchain Tables are a free feature in all Oracle Database editions. Wikibon believes this is a strategic imperative for all enterprises.

**Integration with OLTP & Systems-of-Record**

Business processes are usually a combination of mainly asynchronous processes and some synchronous processes. People deal with the discrepancies caused between the two. BPA (Business Process Automation) is the automation of business processes. RPA software such as UiPath can reduce the time for the asynchronous business processes, but it is tough to implement full BPA with RPA.

A better approach for many business processes is to combine the synchronous processes with advanced business analytics to provide the data and algorithms to automate the business process fully. For example, if creditworthiness fraud potential can be fully assessed by analytics during the system-of-record, BPA can be achieved.

A prerequisite for combining systems-of-record (OLTP) and advanced analytics is a converged database, where both components can access the same data in different ways. Oracle provides a neat solution to this BPA problem:

- A table can have row and column formats applied.
- Both are simultaneously active and transactionally consistent.
- OLTP uses the proven row format.
- Analytics & reporting use in-memory columnar format.

Synchronous applications combine systems-of-record and advanced analytics in real-time or near-real-time to enable complete automation of business processes. This type of automation is the most valuable in reducing costs and shortening business cycle-times.

The bottom line is converged databases with ODWA working together with Oracle Autonomous Transaction Processing(OATP) allows faster automation and simplification of business processes. This approach also
reduces the number of complex asynchronous business processes. The scale of this solution is unique in the IT industry.

**Alternative Strategies**

**AWS**

The 16 AWS databases were derived from open-source and modified to operate efficiently on the AWS PaaS. However, if data flows between the different databases, it has to be moved and transformed. This approach is slow and cumbersome, requiring processes to be created, monitored, and maintained by IT folk – the antithesis of democratization.

Wikibon concludes this strategy has worked well for projects that only need a single database. However, Wikibon believes that will fail as a way to automate business processes. The AWS PaaS is not designed to handle large-scale enterprise mission-critical database processing.

**Snowflake**

Snowflake offers a simple, easy-to-use data warehouse solution with a proven record of speed to implement. It runs on all the clouds, AWS, Google, and Microsoft Azure. However, it is a functionally simple analytics environment (e.g., complex joins are not supported) with very few other databases. There is no OLTP integration and there is also work to be done in the areas of operational automation.

**Conclusions**

Wikibon concludes that Oracle’s investment in Oracle Autonomous Data Warehouse is focused correctly on eliminating IT in most day-to-day management of the data warehouse. It is also focused on ease-of-use for the end-user in the LoB and concentrated on providing an ecosystem of tools that match end-user and developer communities’ needs.

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David Floyer spent more than 20 years at IBM, holding positions in research, sales, marketing, systems analysis and running IT operations for IBM France. He worked directly with IBM’s largest European customers, including BMW, Credit Suisse, Deutsche Bank and Lloyd’s Bank. Floyer was a Research Vice President at International Data Corporation (IDC) and is a recognized expert in IT strategy, economic value justification, systems architecture, performance, clustering and systems software.