WHITEPAPER

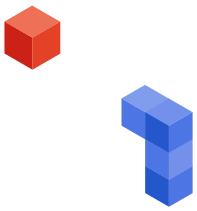
Best practices – using Incorta to modernize your Oracle BI environment

Introduction

Migrating to a new analytics environment can be a complex, time-consuming and resource-intensive undertaking. Significant investments have been sunk into existing analytic environments, and migrating to a new platform can involve months of effort. When organizations go to this level of effort and expense, ideally, they should achieve more than simply migrating the existing environment. A migration provides an excellent opportunity to look to the future, rethink the environment, and deliver new capabilities to the business that can improve efficiency and serve as a source of competitive advantage.

This paper will discuss some challenges Oracle Business Intelligence (BI) users face as they migrate from existing analytics environments. It will make a case for Incorta, a new type of unified data analytics platform. Readers will learn about the advantages that Incorta offers and some best practices that organizations can use to modernize their Oracle BI environment.

New choices for Oracle BI users



Organizations using Oracle Business Intelligence Enterprise Edition (OBIEE) have been aware of its end-of-support status for several years. Faced with the need to migrate, many customers are planning their next steps. Understanding end-of-support dates is a little complicated because OBIEE users need to consider OBIEE itself and the Oracle Fusion Middleware that underpins it. All Fusion Middleware versions 12.2.1.3 and older are now out of "Error Correction Support" as of December 2021. For OBIEE users, bug fixes and security patches will no longer be released.[1] For OBIEE 11g users, the end of error correction support has passed long ago. For OBIEE 12c users, all versions are now out of support except 12.2.1.4.

[1] **Oracle Business Intelligence Enterprise Edition (OBIEE) Users Must Migrate to Oracle Analytics Server Before December 2021**

Within the Oracle ecosystem, customers migrating from OBIEE have three broad choices:

- Oracle Analytics Cloud (OAC) service
- Oracle Analytics Server (OAS)
- Move to a non-Oracle analytics solution

OAC is a fully managed cloud-based BI and analytics platform from Oracle that offers many of the same features as OBIEE but comes with enhanced data visualization and data science features. OAS, by contrast, is customer installable and can be deployed on premises or in a customer's preferred cloud. OAC and OAS are similar, although the cloud-hosted version offers some features not available in OAS. These include natural language processing and generation (NLP/NLG), a data replication feature for Oracle-based SaaS apps, and Oracle Analytics Day by Day (a mobile app that displays data based on location and the current date to present more relevant information to users).[2]

Despite the availability of tools to facilitate migrations from OBIEE to OAC or OAS, migrations can be complicated in practice. Given the level of effort, planning and expense required for a migration, some organizations see the migration as a good time to investigate alternatives to OAC or OAS.

For migrations, the devil is in the details

Oracle offers tools to aid in migration from OBIEE to OAC or OAS. In the case of OBIEE 11g, users can download a migration tool that will export all content from their OBIEE into a .jar file that can then be loaded to the new environment. OBIEE 12c users can use the ***exportServicesInstance*** facility in OBIEE to create a BI Application Architecture (BAR) file, which can then be uploaded into OAC.[3]

[2] **What's Notable and Different in Oracle Analytics Server**

[3] **BI Connector Oracle Analytics Cloud (OAC): The Jumpstart Guide**

While this sounds easy enough, there are several challenges in practice. For example, automated upgrades are only feasible if directory paths already follow the Oracle recommended defaults. Customers migrating to OAS will need to upgrade Oracle Fusion Middleware.[4] Similarly, this upgrade strategy assumes that customers are happy with their OBIEE environment. If there are problems with the metadata model in OBIEE, these issues will carry forward to OAC following an automated migration. Importing an old environment is somewhat like "re-hosting a hairball." Finally, in-place upgrades essentially replace the existing OBIEE environment depending on how they are done, negating the opportunity to run in parallel.[5]

For these reasons, many customers prefer to follow what Oracle terms an "out of place" upgrade — essentially starting with a clean slate in the new environment and migrating gradually while operating in parallel with OBIEE. This helps reduce risk by executing a migration plan in phases, allowing organizations to prioritize different applications and groups based on their readiness and need.

As a practical matter, migrations are complicated enough that organizations often enlist the help of consultants to provide guidance and implementation assistance. While OAC and OAS are an improvement over OBIEE in several respects, even after spending considerable time and energy executing an upgrade, many challenges continue to exist post-upgrade.

Challenges with OBIEE, OAC and OAS

The basic ideas behind data modeling, warehousing and analytic environments have not changed for decades. Data in operational systems such as EBS, NetSuite or other business systems is typically stored in third normal form (3NF) optimized for transaction processing. In analytic environments such as OAC and OAS, data is drawn from an underlying database where data is stored using star or snowflake schemas with separate fact and dimensional tables.

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[4] **Migrating and Upgrading to Oracle Analytics Server**, Oracle Analytics Server Documentation

[5] **About In-Place versus Out-of-Place Upgrades**

Fact tables contain measures — columns that can be aggregated, such as revenue, cost and units. Dimension tables contain attributes that describe business entities — customer name, region and address are all attribute columns. In traditional data warehouses, it has long been a standard practice to extract, transform and load (ETL) data into analytics-friendly schemas. This approach allows data to be more readily queried and analyzed. OBIEE, OAS and OAC all adhere to this same basic design.

OAC and OAS still employ these fundamental mechanisms and require data to be reshaped, transformed and aggregated. Figure 1 illustrates this traditional approach to data modeling.

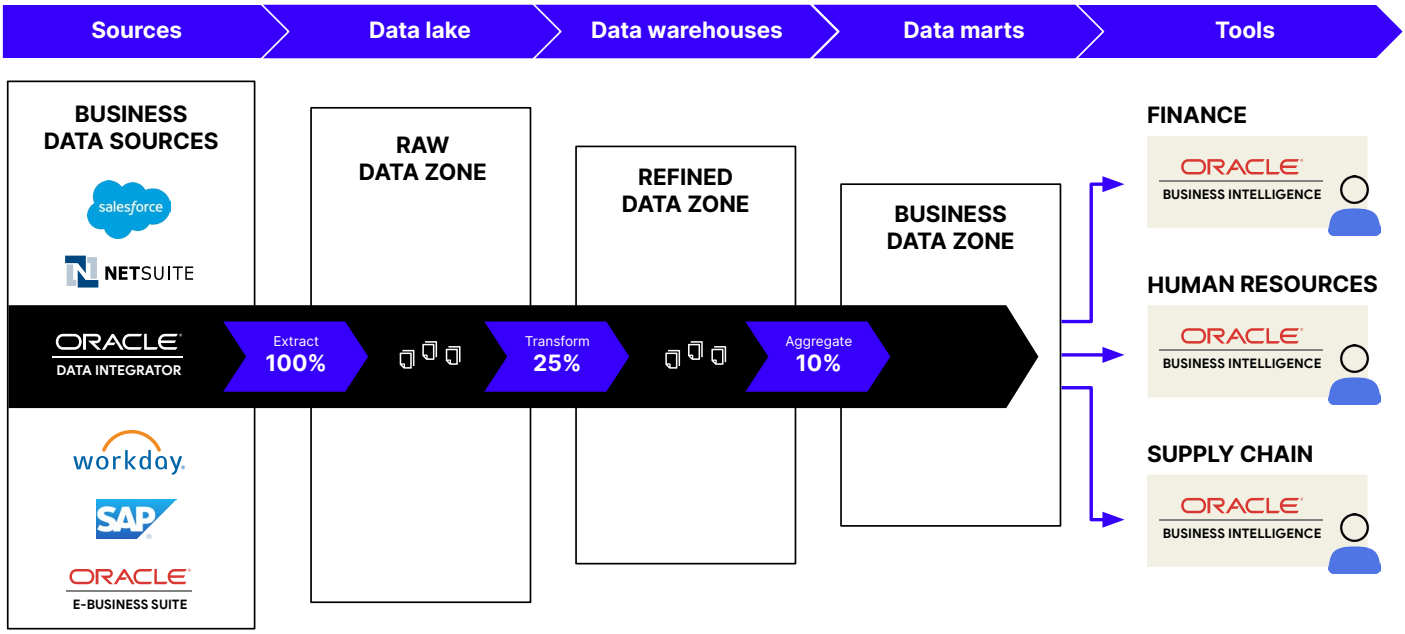


Figure 1 – Traditional approaches to data modeling

There are several challenges with this approach, however:

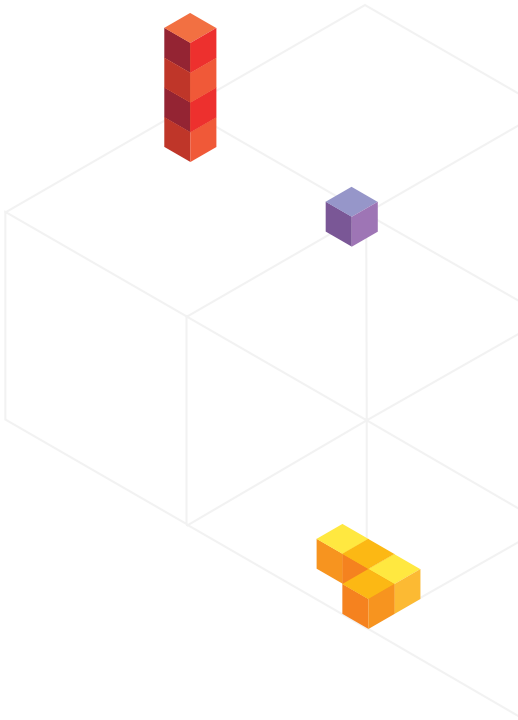
- **Difficulties achieving timely insights.** A star schema model requires ETL processing to refresh and transform data from upstream sources. These intermediate processing steps can result in loss of fidelity and limit data refresh frequency resulting in outdated data.

- **Challenges reconciling and maintaining data.** It can be time-consuming to reconcile data in OBIEE with source systems because data is typically massaged and modeled before being presented to end users. Incremental changes are also expensive. If users wish to add a new metric or dimension, this requires bringing these changes through ETL pipelines, a slow process in most organizations.

- **Challenges modeling data.** Users of the data modeler within OAC must derive different data views before they are accessible to end users. The Oracle Data Visualization (DV) facility in OAC makes handling complex models involving many data sources challenging.[6] These factors can inhibit customer self-serve data access and make adding data sources difficult and time-consuming.

- **Performance challenges.** Performance is critical to the success of any analytic project. Users don't want to wait 90 seconds for a dashboard refresh, and queries against raw ERP tables would be prohibitively slow and complex. To address performance challenges, data engineers typically create aggregations at different levels inhibiting maintainability and adding cost. This also results in a loss of data granularity and makes it more challenging to drill down to source data.

The challenges described above are not unique to OAS and OAC. They are typical of most analytic environments that employ data transformation and use dimensional models such as star schemas to facilitate analytic queries.



New approaches to analytics

Fortunately, several new technologies are transforming how customers approach analytics, enabling faster, self-service access to data while avoiding ETL and complex data modeling. Among these technologies are:

- Advances in data connectors, including parallel loaders and fast upsert functionality that keep analytic databases up to date and in sync with business systems[7]

- Open columnar data formats such as Apache Parquet to store analytic data on cloud storage efficiently and cost-effectively

- In-memory analytic techniques to improve the speed of analytic queries

- Advances such as Incorta's Direct Data Mapping® technology enable queries against source data, eliminating the need for data reshaping, ETL and aggregations

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[6] **Visualize Data (oracle.com – Oracle Analytics Cloud Documentation)**

[7] When ingesting data, an "upsert" refers to a conditional database operation that will update an existing row if a specified key value already exists, and insert a new row if it doesn't.

Incorta takes advantage of these and other innovations to help simplify Oracle BI and application environments and dramatically reduce time to insight.

Incorta – a unified data analytics platform

Incorta is a unified data and analytics platform designed to address modern data analytic challenges. It is an all-in-one solution that combines data acquisition, data processing, data curation, a semantic layer and data analysis, all accessible from a single web interface. Incorta is a feature-rich platform with too many components and capabilities to describe here. Readers interested in understanding Incorta in detail can review the Incorta Architecture Guide.[8]

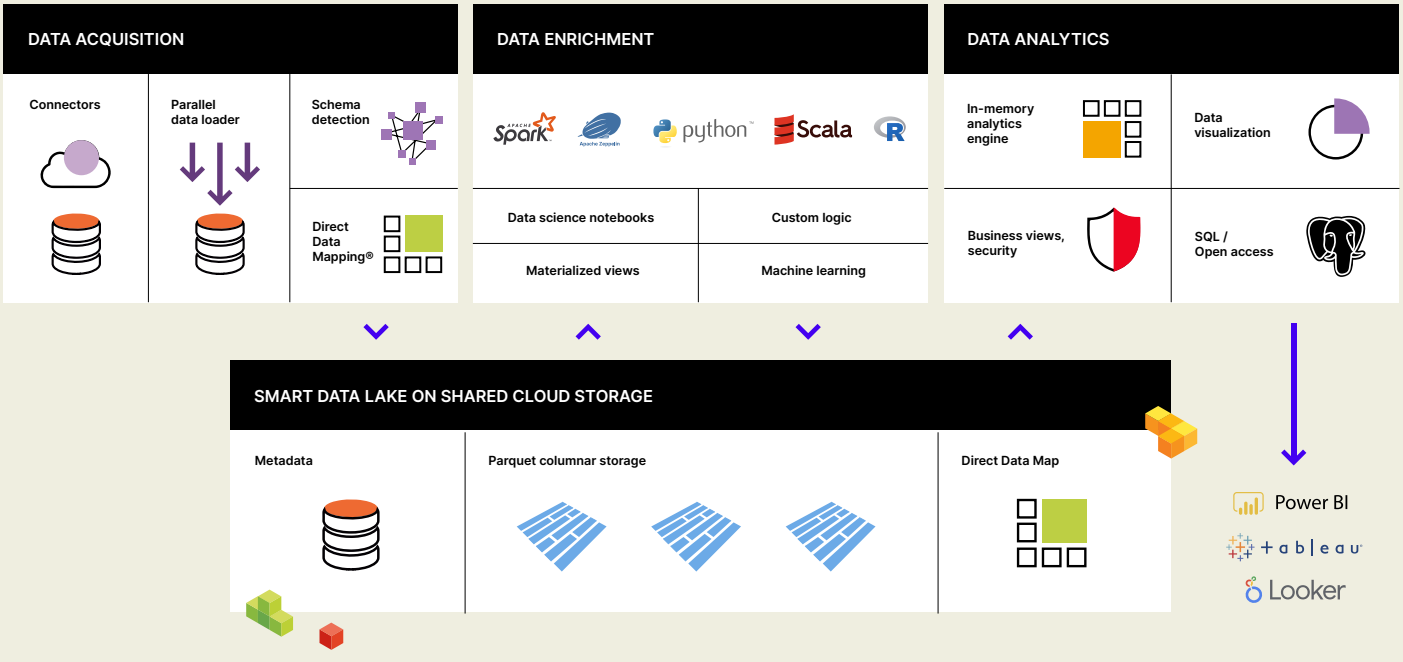


Figure 2 – Incorta unified data analytics platform high-level architecture

[8] **Download the Incorta Architecture Guide**

Incorta is comprised of several components, as illustrated in Figure 2. Major components include:

A Loader Service for data acquisition

This horizontally scalable service supports 240+ connectors to ingest data from virtually any source, including enterprise applications.[9]

An Analytics Service(s) for data analysis

Business users and analysts can collaborate using Incorta's intuitive interface to analyze data and build dashboards and visualizations.

Data enrichment facilities

An interface for creating enriched materialized views using SQL or data science-friendly languages with embedded notebook support.[10]

Apache Spark

Embedded within Incorta, a full-featured Spark environment enables analysts and data scientists to access rich programming interfaces to transform and analyze data.

Shared storage

Incorta maintains a private data lake/staging area implemented on cloud storage where ingested data resides in open Parquet format and direct data mapping files.

SQL interface (SQLi)

Incorta provides an open PostgreSQL interface that can be used by third-party query, BI, or data science tools to access data in Incorta.

What makes Incorta particularly powerful is its flexibility. Incorta provides open, standard interfaces enabling it to work with virtually any data management environment with minimal integration effort. Incorta can fit seamlessly with solutions such as Oracle's Autonomous Data Warehouse and other OCI databases. Depending on a customer's needs, Incorta can replace the data warehouse entirely.

[9] Incorta leverages prebuilt connectors from **CData Software**, a leading provider of data access solutions.

[10] Incorta embeds **Apache Zeppelin**, a full-featured notebook used for many purposes including creating materialized views.

Benefits for OBIEE/ OAC Users

As Figure 3 illustrates, Incorta enables organizations to sidestep the traditional challenges associated with data warehousing and analytic environments. Data is mapped directly to the source on ingest, avoiding the need for traditional data aggregation, reshaping and flattening. Incorta's unique technology enables fast analytic queries from full-resolution data ingested in third normal form.

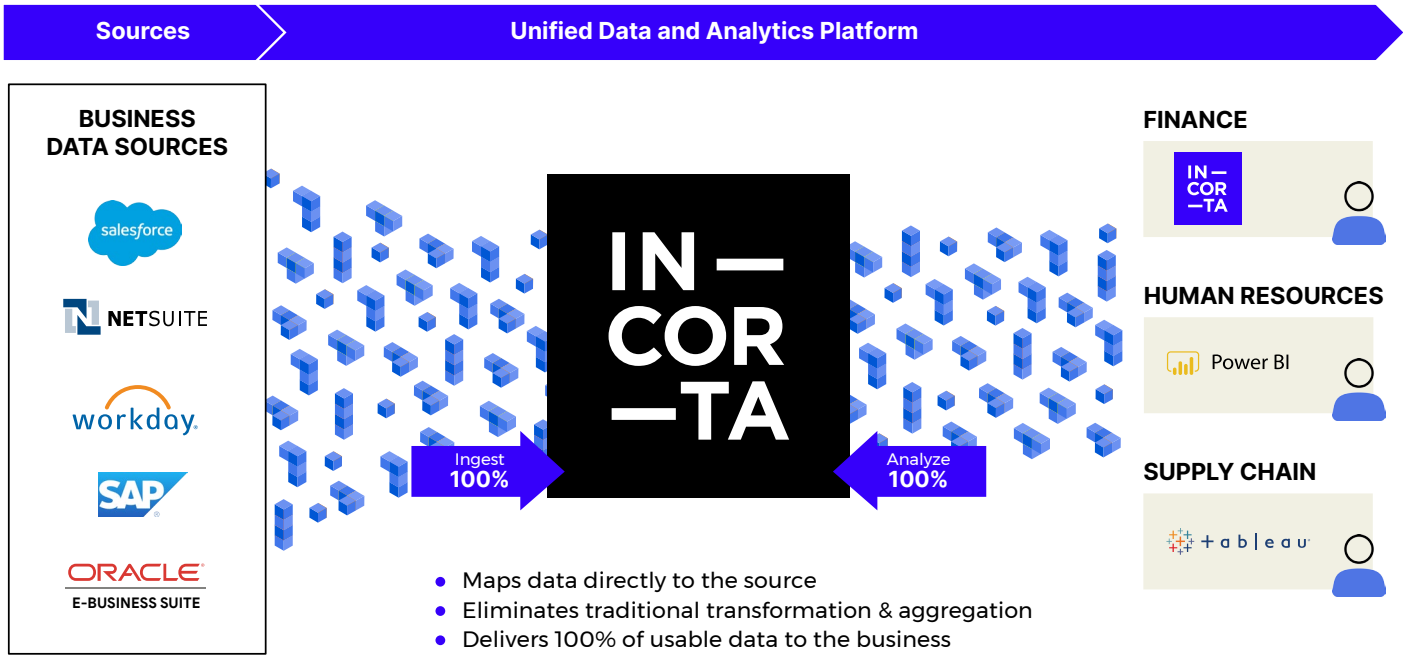


Figure 3 – Incorta eliminates traditional data transformation and aggregation

For users of OBIEE or OAC, adopting Incorta can provide multiple benefits:

Timely insights – Organizations can ingest the full volume of their enterprise data and refresh it more frequently, providing access to the most up-to-date data for analysis.

Easy to model data – With Incorta, data modeling is simplified dramatically. Incorta automatically detects columns that are measures and dimensions, applies joins, and stores data in a form where it can be readily queried.

Users can create business schemas in Incorta's semantic layer that update instantly as source data is updated.

High performance – Incorta's unique direct data mapping technology delivers dramatic performance improvements enabling new insights and boosting analyst productivity with custom dashboards featuring multiple types of interactive visuals.

Drill seamlessly – Users can quickly validate insights and determine the root cause of data anomalies by instantly drilling down from summary metrics to transaction line item detail across multiple data sources.

Data trust – Since analytic queries are run against source tables in Incorta, users can have high confidence that data presented in reports and dashboards are accurate and up to date.

Faster to value – Finally, as illustrated in Figure 4, Incorta can help organizations dramatically accelerate time to value by eliminating the complexities associated with traditional data warehouses.

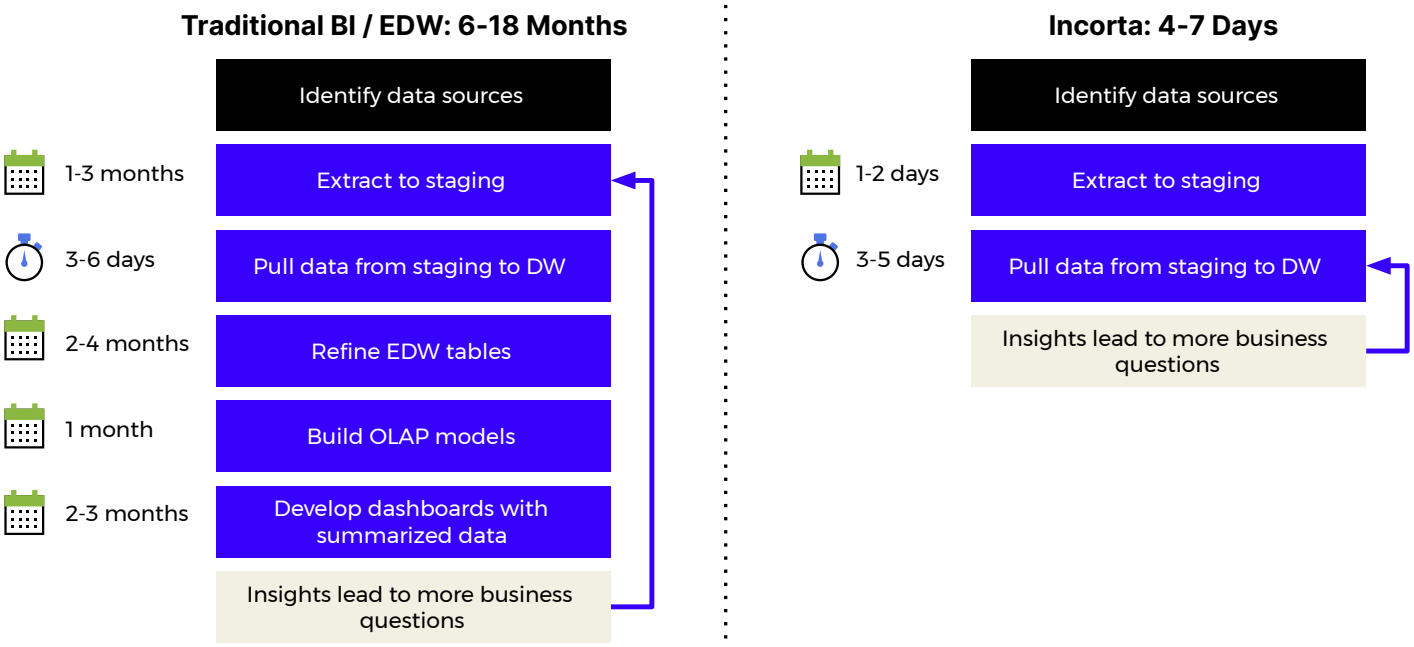
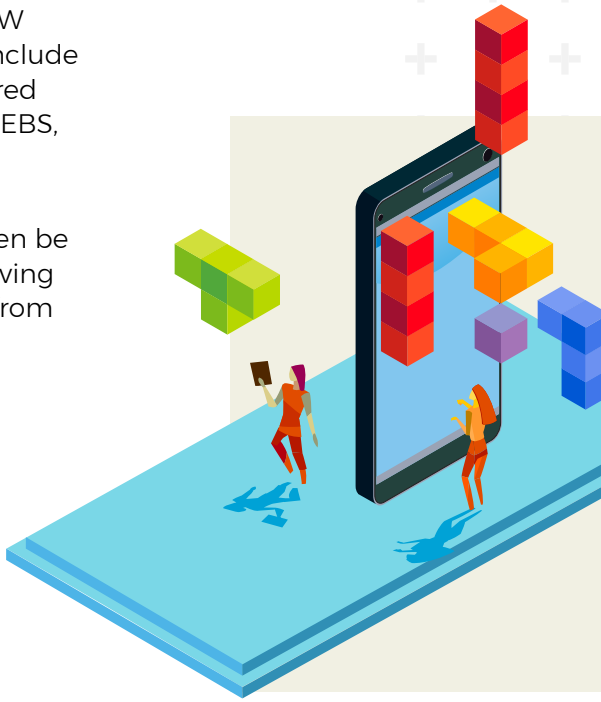


Figure 4 – Incorta dramatically accelerates time to value

Incorta fully automates or eliminates typically complex and time-consuming processes such as extracting data to staging areas, cleansing data and refining EDW table schemas to support analytic queries. Data is automatically extracted to Incorta's internal data lake as data sources are added. Because

data is stored in a query-ready format, there is no need to optimize EDW tables or build OLAP models. Incorta Data Apps (formerly Blueprints) include prebuilt reports, dashboards and business-friendly data views pre-tailored to popular Oracle and third-party business applications such as Oracle EBS, NetSuite and Oracle ERP.

Because of these and other innovations, implementation time can often be reduced from months to just weeks, reducing project costs and improving time to value.[11] Even customers who have already started a migration from OBIEE to OAC have found it worthwhile to revisit and re-evaluate prior decisions, given the potential savings in time and effort.[12]



Comparing Incorta and OAC

For readers familiar with OAC, before describing the differences with Incorta, it is helpful to explain what the two environments have in common. The same advantages OBIEE users would expect to realize when migrating to OAC also exist with Incorta. Both solutions:

- Are fully managed cloud-based offerings
- Provide an extensive set of data connectors
- Have integrated data analytics
- Offer integrated ML and predictive analytics capabilities

Table 1 describes some similarities and differences between OBIEE, OAC and Incorta. OBIEE and OAC users can access prebuilt reports but only with the addition of Oracle products such as Fusion Analytics Warehouse. Incorta by contrast, provides integrations with multiple applications.

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[11] While project times vary, see the webinar **5 Key Considerations for Upgrading OBIEE to a Modern BI Solution** for details. A large US-based electrical contractor was able to achieve results in a 7-week Incorta proof of value, comparable to what had been achieved with an EBS OAC replacement project that took approximately two years.

[12] For a list of customer success stories including implementations with Oracle EBS, Oracle ERP and NetSuite see Incorta Customers: **Customer Stories & Case Studies | Incorta.**

	OBIEE	OAC	INCORTA
Time to insight			
Build new insights from raw data in days (no re-modelling)	✗	✗	✓
Near real-time reporting at scale (billions of records) without a DW	✗	✗	✓
Pre-built reports for EBS and Oracle Cloud	✓ Limited to EBS	✓ Limited to Fusion	✓
Pre-built reports for non-Oracle enterprise apps (Salesforce, SAP, etc.)	✗	✗	✓
Self service analytics			
Drill Down capability (from summary level information to individual tansactions)	✓	✓	✓ Faster performance
Integrated search across dashboards	✗	✓	✓
Integrate new data sources quickly	✗	✓	✓
Unified technology platform			
Can do analytics at scale without a data warehouse	✗	✗	✓
Ease of maintenance (impacting TCO)	✗	✗	✓
Support for custom security needs	Limited to EBS	Limited to Fusion	✓
Augmented analytics			
Intelligent machine learning technology adds context for deeper analysis	✓	✓	✓ With Spark integration
Natural language generation automates reporting without third-party plugins	✗	✓	✗

Table 1 – Differences between OBIEE, OAC and Incorta

These include Oracle EBS, NetSuite, Oracle ERP, Oracle JD Edwards, Salesforce, SAP and others. Incorta also enables analytics at scale without needing a data warehouse, making the environment potentially more straightforward and less costly to operate.

Like OAC, Incorta provides augmented analytics capabilities leveraging machine learning (ML) for deep analysis. Incorta embeds a full-featured Apache Spark environment for data scientists and provides an integrated notebook environment. Data scientists can work with familiar languages and data science tools, including PySpark (for Python users), R, Scala, Spark SQL and PostgreSQL.

Best practices for Oracle BI users

There are many considerations for organizations running OBIEE, those planning a migration, or those who have already migrated. Below we suggest some best practices that Oracle BI users can keep in mind as they consider migrating to OAC, OAS or other environments.

Take the time to consider and pilot migration options

Given the time, effort and expense associated with migrating to a new analytics platform, it's worth taking the time to investigate options. This can be true even for organizations already partway into a migration. Analytic technologies are changing rapidly, and the benefits and cost savings associated with adopting a more modern environment can be significant.

Taking advantage of vendor boot camps or proofs of concept (POCs) is an excellent way to explore and pilot alternative analytic solutions. Organizations can understand what a full-scale implementation might look like with a minimal investment in time and resources. For many clients, Incorta has demonstrated value in a matter of days by helping organizations simplify their analytic environments, improve performance and address other challenges with their existing deployments. GC Services™ Limited Partnerships is an excellent example. They created a rigorous proof-of-concept environment with strict parameters around their requirements and gave three competing vendors just three weeks to deliver a functional solution. Incorta was the only vendor able to meet all their criteria.[13]

"It's amazing. I've never been that productive or that fast on any other analytics platform. Until Incorta, I never would've believed it was possible."

MARC PAIGE
AVP of IT Software Dev & Chief App Architect

GC Services™ Limited Partnership

Lay a foundation for future competitiveness

Winston Churchill famously said, "Never let a good crisis go to waste." While the need to migrate from OBIEE may be inconvenient, it also represents an opportunity to revisit the functionality of the analytics environment. Rather than simply replicating existing functionality on a new platform, organizations should aim to deliver new capabilities to enhance future competitiveness.

[13] **GC Taps into Unprecedented Insights**

For example, organizations can focus on improving self-service, flexibility and embracing new organizational approaches. Starting with a new system such as Incorta provides an opportunity to embrace new organizational approaches such as data mesh. Migration also provides an opportunity to build a more capable data management foundation to support new AI-based applications critical to future competitiveness.

Beware of the cost of ETL and aggregations

While ETL is foundational in most analytic environments, transforming and reshaping data is problematic. Data pipelines are not just expensive in a monetary sense — they add complexity, delays and maintenance to BI environments. They also introduce friction, making it difficult to react to changing business requirements quickly.

Data engineers often face a backlog of requests. It can take weeks or even months to modify and validate changes to data pipelines and add new data sources. The time required to execute ETL pipelines also affects the timeliness of information, meaning that decision-makers often act on data that is already outdated. Ideally, organizations should take advantage of an OBIEE migration to look for solutions that avoid the pitfalls associated with traditional approaches such as ETL aggregations.

Leverage data applications to accelerate implementation

Increasingly, organizations use commercial on-prem or cloud-based offerings for applications ranging from enterprise resource planning (ERP) to customer relationship management (CRM) to sales rorce automation (SFA). Organizations often run multiple such applications because of mergers and acquisitions or different business units making independent purchasing decisions.

Platforms like OBIEE and OAC can gain access to prebuilt reports using Fusion Analytics Warehouse, however, users are typically left on their own when developing business-friendly reports and dashboards for other applications. The same is true when combining data across application silos. Organizations can often spend months developing the reports, data views and associated pipelines required to provide users with baseline reports and visibility to KPIs.

Incorta data applications solves this problem by providing ready-to-use analytic templates for popular business applications. Data applications capture best practices, prebuilt analytics dashboard templates and content

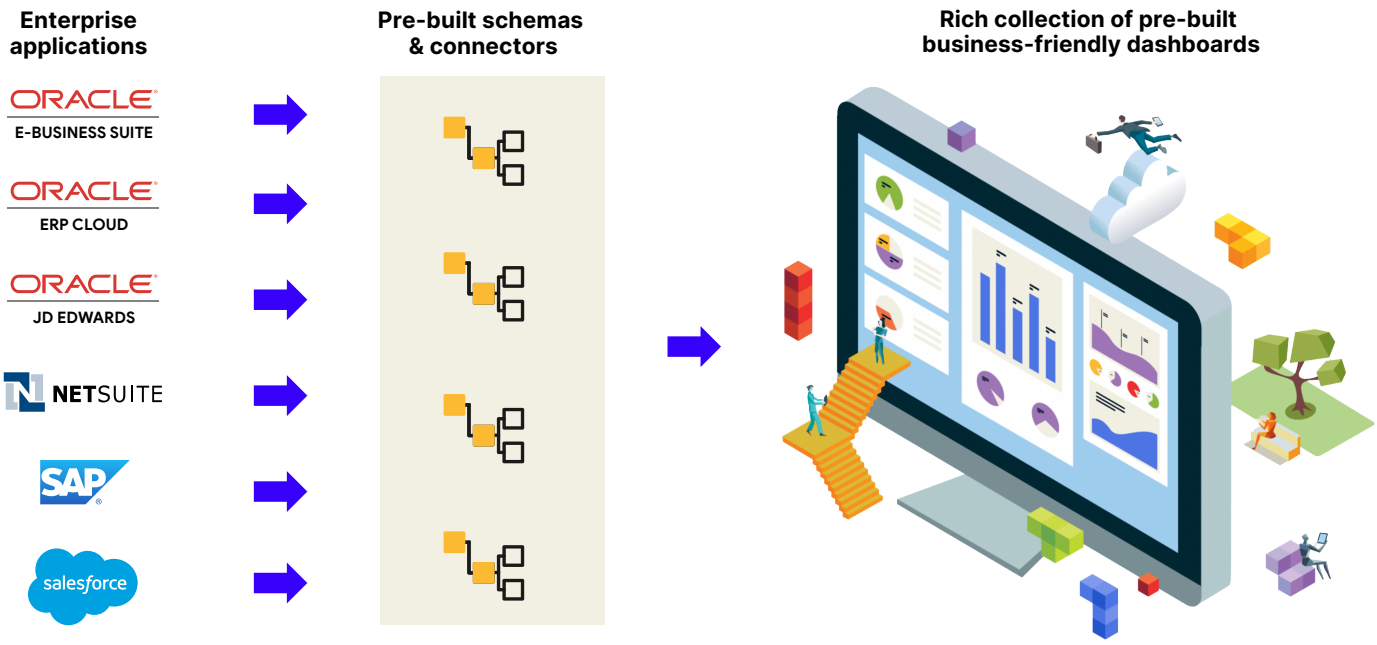

Figure 5 – Incorta data applications dramatically simplifies data analysis for leading enterprise applications

for accessing, organizing and presenting data from popular business solutions such as Oracle E-Business Suite, ERP Cloud, NetSuite, SAP, JD Edwards and Salesforce. They include schemas for multiple functional areas in each application and pull together key metrics, sample reports and visualizations. After installing a data application template in Incorta, only light customization is typically required to adjust for local preferences. The results can be dramatic, often reducing implementation times by several months.

Avoid BI silos

Increasingly, the operational systems described above are becoming coupled with analytic tools. For example, providers of business applications typically have analytic offerings as well. Salesforce encourages analytics using Tableau CRM, SAP offers its own Analytics Cloud. Of course, Oracle encourages using Oracle Analytics Cloud.

While these tailored offerings can be convenient for organizations running a single application, organizations can find themselves with multiple BI silos if they are not careful. This can make obtaining a single up-to-date view of their operations difficult.

Silos can occur even within a particular vendor's ecosystem. For example, organizations migrating to Oracle Cloud ERP may find themselves running alongside EBS and needing to combine data with both systems. They may have implemented their general ledger in ERP Cloud. However, they may need to drill down from their general ledger to a sub-ledger that resides in EBS. Incorta helps organizations avoid these silos across applications. Using the data applications described above, organizations can easily create dashboards with drill-down capability that combines data from multiple business applications.

An open environment for data science

The same issue exists in data science tools, with vendors offering platform-specific ML and AI-based services. Rather than employing data science tools tailored to a specific application, combining data from multiple operational systems and analyzing the data together is a better practice.

Incorta provides an open, data science-friendly environment that allows data scientists to use their preferred tools and frameworks. It embeds a familiar notebook interface where data scientists can rapidly write and execute code, visualize results and share code and insights with colleagues.

An Incorta Data API enables users to easily access their stored data in Incorta and save data from their preferred machine learning tools, including external notebooks such as Jupyter or Zeppelin. Data scientists familiar with Spark MLlib can optionally use an embedded Spark environment included with Incorta. These open interfaces and the "bring your own tools" approach helps make data scientists more productive.

An integrated machine learning library allows data scientists to set up time-series predictions, outlier detection and classification. Built-in job scheduling makes it easy to orchestrate model retraining and monitoring.

Incorta brings compelling benefits

For Oracle BI users, Incorta offers several benefits. Even for organizations already moving to OAC, Incorta may be worth looking at. This is especially true for organizations that need to analyze data across multiple enterprise applications. With Incorta, Oracle BI users can:

- Expedite their migration from OBIEE and drastically speed time to value for their Oracle analytics projects.
- Improve analyst productivity by providing self-serve access to the latest data from multiple enterprise applications.
- Directly map to Oracle and third-party data sources, eliminating traditional transformation and aggregation steps and delivering data to the business in record time.
- Achieve new insights with custom dashboards tailored to Oracle business applications featuring multiple types of interactive visuals.
- Validate insights by drilling down to the detail — from summary metrics across various data sources to transaction line details instantly.

With Incorta, organizations can avoid some challenges usually associated with OBIEE migrations. They can empower their business with a fast, efficient and more effective analytics infrastructure that can help enhance business competitiveness.

Learn more

Oracle BI users interested in discussing their requirements and learning more about Oracle BI migration options can request a no-obligation Incorta Proof of Concept (POC) at **https://go.incorta.com/proof-of-concept.**

To get started with a free Incorta Cloud trial and jump-start your analytics, visit **https://cloud.incorta.com/signup.**

You can also view a replay of our latest webinar, **4 Reasons You Should Rethink Your Oracle Analytics Cloud Migration.**

ABOUT INCORTA

Incorta provides a unified data and analytics platform that makes it quick and easy to unlock the full potential of data from multiple complex source systems by making it instantly ready for analysis. Backed by GV, Kleiner Perkins, M12, Prysm Capital, Telstra Ventures and Sorenson Capital, Incorta empowers the most forward-thinking companies to tackle their toughest data challenges, from innovators in the midmarket to Fortune 1000 category leaders such as Broadcom, Comcast and Shutterfly. For more information, visit www.incorta.com.