ADVANCING ANALYTICS AT ROSENDIN

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FUTURE & PAST TECHCASTS:

July 27th

Data Science Review 2023

Presented by Karl Rexer & Tim Vlamis

August 10th

Our Favorite Features in OAC

Presented by Wayne Van Sluys and Dan Vlamis

TechCast Archive

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2023 | 2022 | 2021 | 2020 | 2019

Date	Title	Presenter(s)	Replay	Download(s)
Jun 29	Financial Crime and Compliance—Transforming Text Documents to Graphs	Doga Tekin	Video	Slides
Jun 27	Live! from Kscope	Roger Cressey	Video	No slides
Jun 15	McGraw Hill modernizes their ETL strategy as they migrate to the Oracle Cloud with Informatica	Lee Rosenfeld	Video	Slides
Jun 1	What's New in OAC, Our Favorite Features	Dan Vlamis & Wayne VanSluys	Video	Slides
May 18	Thinking Visually with Oracle Analytics	Dan Vlamis & Tim Vlamis	Video	Slides
May 4	Oracle APEX: A Swiss Army Knife Story for Your Analytics	Lucas Hirschegger & Simon Collins	Video	Slides
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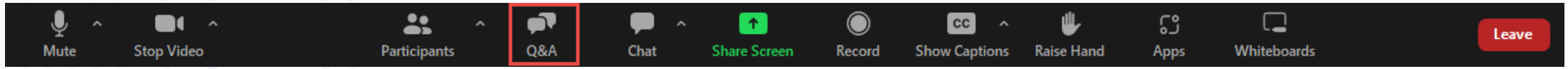
QUESTIONS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Analytics and Data Summit 2024

Call for Speakers now open!

March 19-21, 2024
Oracle Conference Center
Redwood Shores, California

www.andouc.org/andsummit2024

AGENDA

- About Rosendin
- Background
- Where We are Today
- Benefits
- Demo
- Lessons Learned
- Preview of Oracle Database 23c Free – Release
- Questions

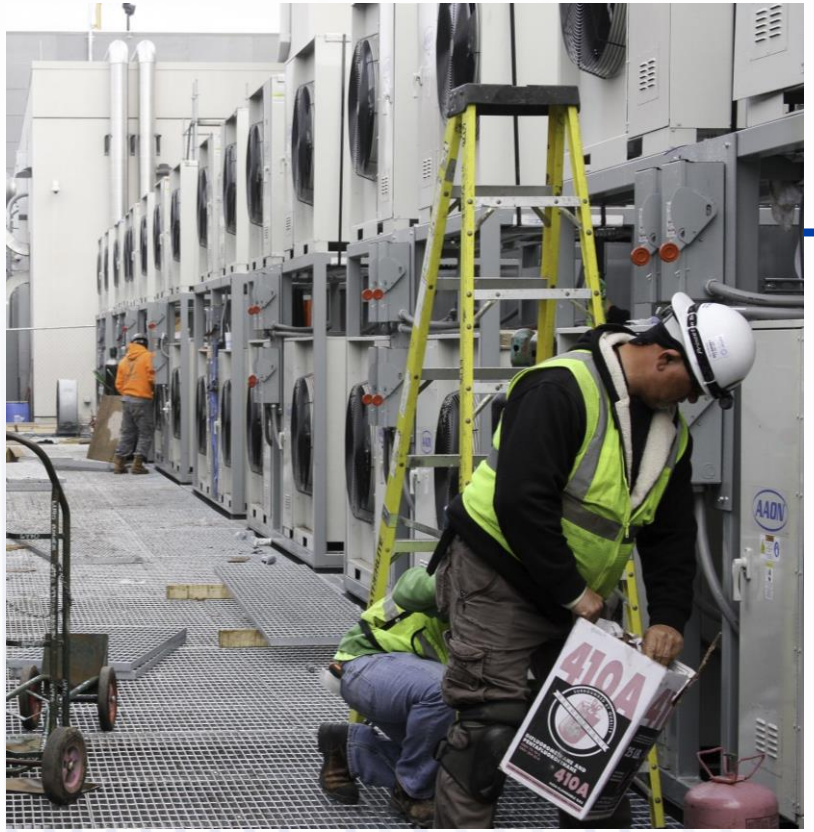
ABOUT ROSENDIN

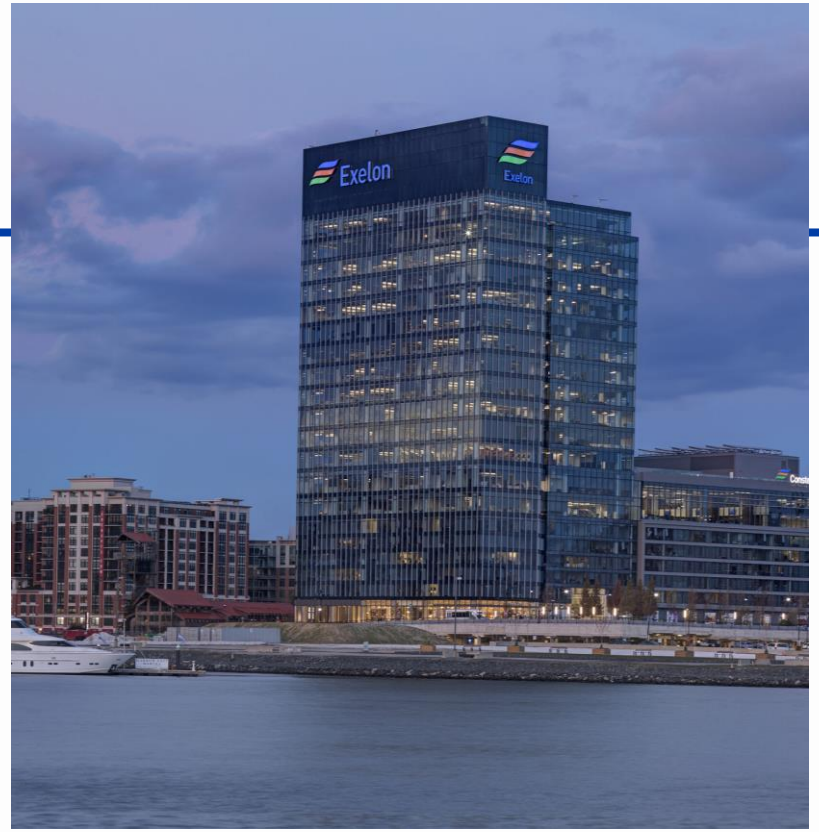
Established in 1919, Rosendin remains proud of our **more than 100 years** of building quality **electrical and communications installations and value** for our clients but, most importantly, for **building people** within our company and our communities.

Our customers lead some of the most complex construction projects in history and rely on us for our knowledge, ability to scale, and dedication to quality.

At Rosendin, we work to ensure that **everyone has the opportunity** to reach their full potential by building a culture that is **diverse, safe, welcoming, and inclusive**.

- Over 7,500 Employees
- Annual Revenue $3B+
- Offices Nationwide
- Employee-Owned





WHAT WE BUILD

ROSENDIN

COMMITTED.
CONNECTED.
ENGAGED.

OUR MISSION

Building Quality. | Building Value. | Building People.®

Our customers lead some of the most complex construction projects in history and rely on us for knowledge, scalability, and quality. They value our partnership because they deserve a team as committed, connected, and engaged as they are. As the largest employee-owned company in our industry, we do what is needed for a successful job.

OUR VISION

Lead. Inspire. Build.

We believe the work we do should build our industry, empower our employees and inspire innovation.

OUR CORE VALUES

- **We Care.** We are an organization built on integrity. We create an environment that empowers people to work safely, be at their best, and respect one another.
- **We Listen.** Our success is based on hearing and understanding the objectives of our customers. We build relationships.
- **We Share.** We collaborate, inspire, and challenge one another.
- **We Innovate.** People will remember us for the solutions we provide. Entrepreneurial ideas are encouraged to continuously raise industry standards.
- **We Excel.** The quality of our work will represent us for years to come. We take pride in what we build. It is our legacy.

ROSENDIN

BACKGROUND

- Large legacy OBIEE system
- Had “Dashboards”
- Migrated OBIEE 11.1.1.7 to OAC
- Tried rebuilding data structure to increase load performance etc.
- Brought in revolving door of people who said they knew OAC, but only knew OBIEE
- Realized needed help, especially with integrating visuals and reorganizing/optimizing our data structure.

MOTIVATIONS

- Retire outdated technology
  - physical servers reaching end of life
- Improved overall performance of the system
  - dimension tables
  - remodeling of subject areas
- Redesigned dashboards to make more useful and interactive
- Used ad hoc DV capabilities of OAC
  - explore business data
  - develop new analytic insights
- Working to remove manual reporting process to automated DV processes.

CURRENT TECHNOLOGY– CLOUD FIRST APPROACH

- We are on cloud-based technology
- ADW
  - Faster
  - Less maintenance
  - Retire old hardware
  - Modified data model at same time
  - Now on cloud
- ODI
  - started using ODI instead of Informatica
- OAC
  - Access to DV front end for new business cases
  - Better visualizations
- Not 100% autonomous – needs some looking after
- Dedicated resource that knows ADW is still helpful

ROSENDIN NEEDS IN OCTOBER 2020

- We wanted to modernize analytics
- Get business to use the data regularly (be more modern)
- End users had lost confidence in data integrity, frustrated with load times, stakeholders irritated with long development times

- Asked Oracle sales rep for suggestion

"*Find me someone that can do what you promised, or we are done*."

Matt Lamb, Rosendin CIO

WORKING WITH CONTRACTORS

- Started with support contract to help Rosendin with OAC
  - Punch list items – 7 quick-hit items to get going
- Rebuilt Billings Dashboard in OAC classic using OBIEE dashboards as a prototype
- Install Rate dashboard built in DV according to users' needs
  - Identified issue with monthly vs weekly data
- Assessment

FINDINGS FROM OAC ASSESSMENT

- Redesign Executive KPI and other dashboards
  - Several UI suggestions
  - New comparison measurements
  - Additional graphs for specific analyses
- Move calculations into RPD, not in report logic
- Organize column names to make more useable
- Performance needs to be improved

WHERE WE ARE TODAY

- Migrated to OAC
- ETL is now in ODI
- New ADW model
- Dashboards updated
- Starting to work with OAC DV

Turned off OBIEE 3/10/2023

Repurposed Servers June 2023

POST GO-LIVE – ROLLOUT INSTALL RATE DASHBOARD

Project Week End Date
Between
04/09/2023
-
07/02/2023

Task Number Suffix
0100

Construction Type
--Select Value--

Division Name
--Select Value--

Superintendent
--Select Value--

General Foreman
--Select Value--

Project Manager
--Select Value--

Project Number
--Select Value--

Apply Reset

UOM
Hours/100

Install Rate
99.99

Install Rate Trend

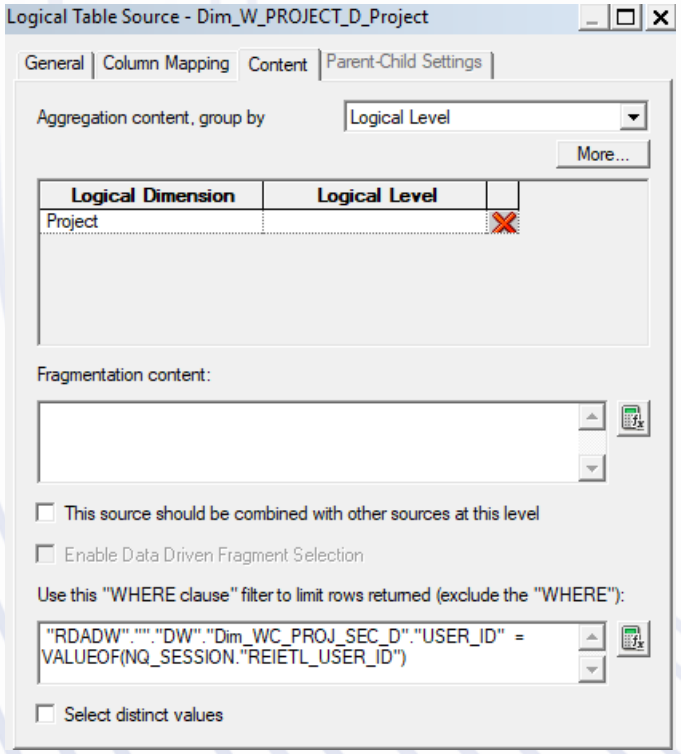
Install Rate by Construction Type

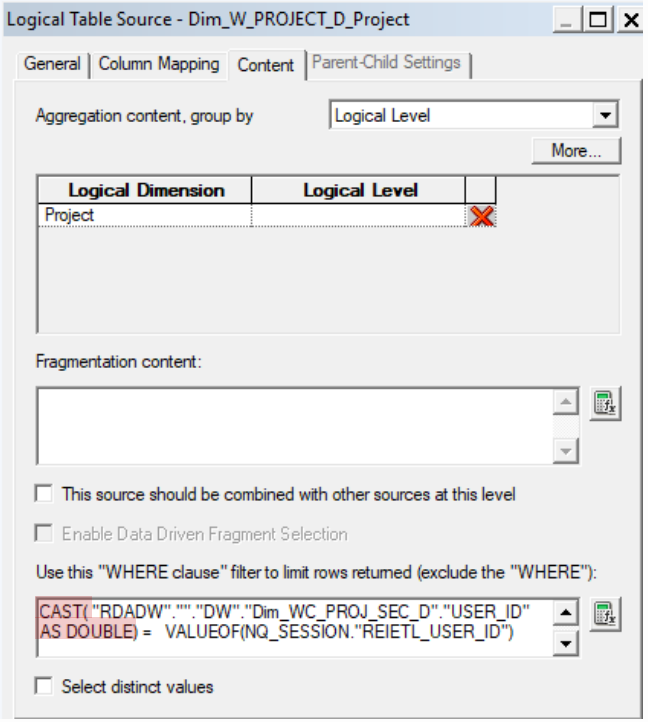
Project Week End Date	Install Rate - Weekly	Labor Hours - Weekly	Install Quantity - Weekly
07/02/2023	99.99	9,999	99,999
06/25/2023	99.99	9,999	99,999
06/18/2023	99.99	9,999	99,999
06/11/2023	99.99	9,999	99,999
06/04/2023	99.99	9,999	99,999
05/28/2023	99.99	9,999	99,999
05/21/2023	99.99	9,999	99,999
05/14/2023	99.99	9,999	99,999
05/07/2023	99.99	9,999	99,999
04/30/2023	99.99	9,999	99,999
04/23/2023	99.99	9,999	99,999
04/16/2023	99.99	9,999	99,999
04/09/2023	99.99	9,999	99,999
Grand Total	99.99	9,999	99,999

Project Week End Date	Industry	Division Name	Project Manager	Superintendent	General Foreman	Project Number	Labor Hours - Weekly	Install Quantity - Weekly	Install Rate - Weekly
07/02/2023	BIOTECH/PHARMACEUTICAL	Division 24 Texas	Ruder, Vitali	Wallace, Rogelio Alberto	Suchomel, Lance Alton	440231	9,999	99,999	99.99
07/02/2023	BIOTECH/PHARMACEUTICAL	Division 7 Sacramento	Clark, Robert Joseph (Rob)	Thiessen, John N	Roberts, Scott K	270146	9,999	99,999	99.99
07/02/2023	BIOTECH/PHARMACEUTICAL	Division 2 San Francisco	Gardner, Frederick Nick (Fred)	Muther, Eric Stephen	Hawthorne, Kenneth R	220289	9,999	99,999	99.99
07/02/2023	BIOTECH/PHARMACEUTICAL	Division 10 East Bay	Shortlidge, Mitchel A	Houser, Justin R	Thom, Aaron P	300138	9,999	99,999	99.99
07/02/2023	BIOTECH/PHARMACEUTICAL	Division 10 East Bay	Shortlidge, Mitchel A	Houser, Justin R	Salcido, Tousant	300141	9,999	99,999	99.99
07/02/2023	BIOTECH/PHARMACEUTICAL	Division 10 East Bay	Townsend, Mr. Richard James (Rich)	Houser, Justin R	Warn, Michael James	300130	9,999	99,999	99.99
07/02/2023	BIOTECH/PHARMACEUTICAL	Division 24 Texas	Bradley, Stephen E	Wallace, Rogelio Alberto	Suchomel, Lance Alton	470409			0.00

POST GO-LIVE - PERFORMANCE

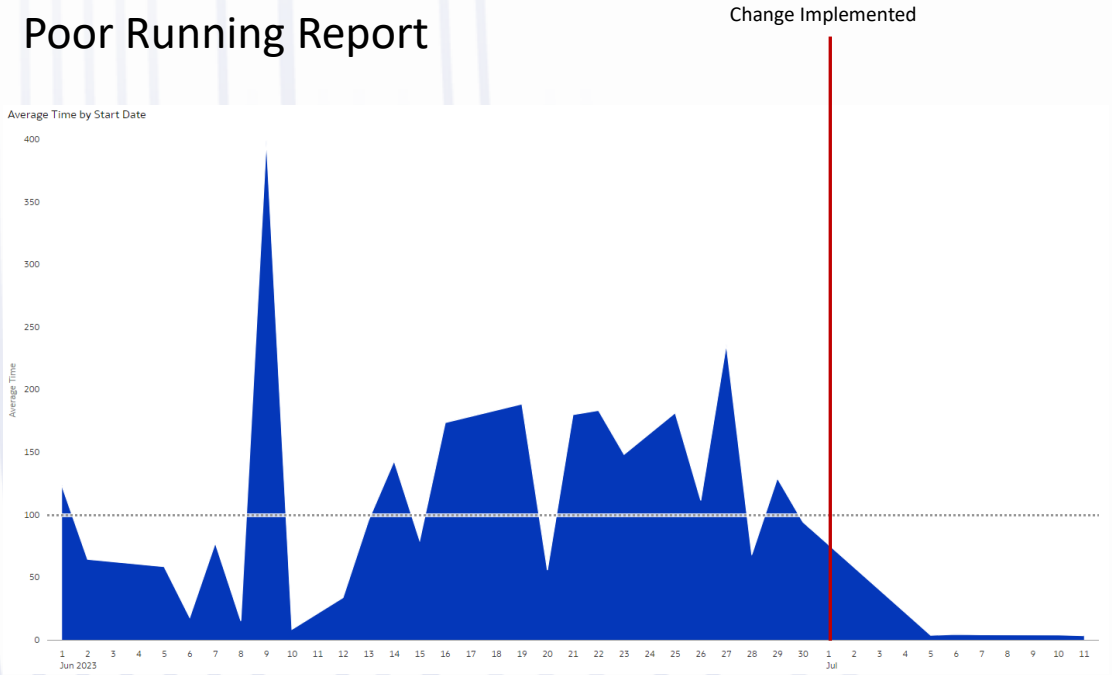
- Started working on Performance
  - Identified Candidates for Performance Improvements
  - Made Significant Performance Boost – CAST



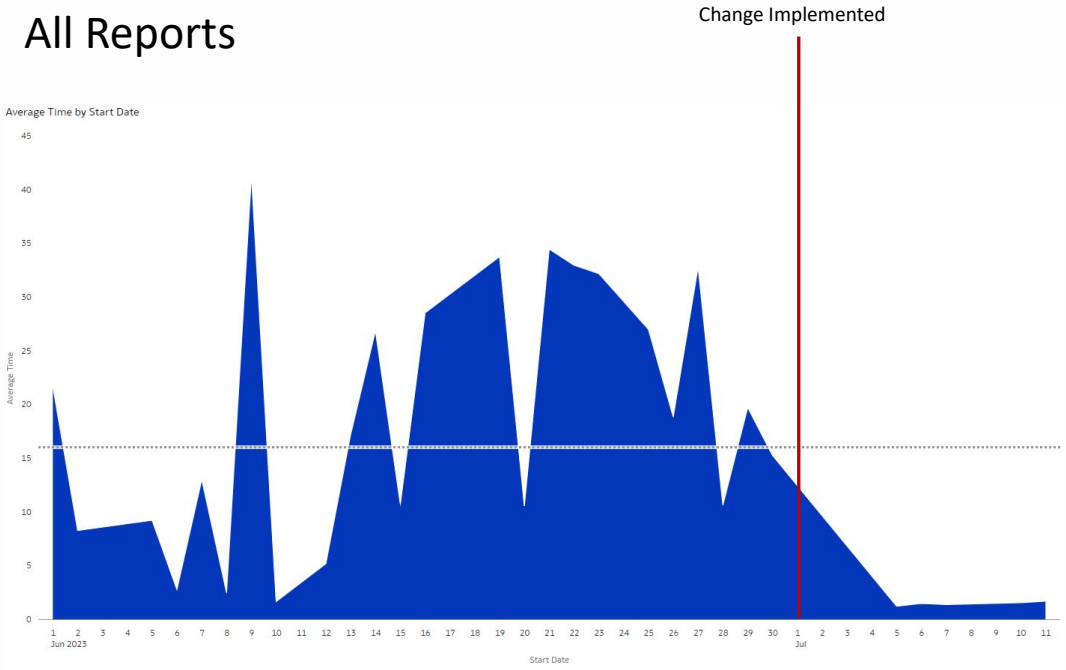


POST GO-LIVE – PERFORMANCE RESULTS

Poor Running Report

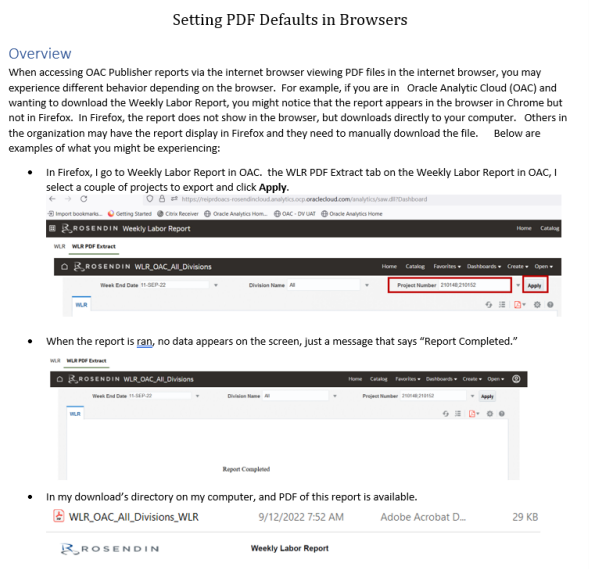


All Reports



POST GO-LIVE INITIATIVES (INCREASE ADOPTION)

- Increase adoption of Oracle Analytics
  - Provide support for user community
    - Tips and Tricks
    - Training
  - Quickly address questions and concerns



Setting PDF Defaults in Browsers

Overview

When accessing OAC Publisher reports via the internet browser viewing PDF files in the internet browser, you may experience different behavior depending on the browser. For example, if you are in Oracle Analytic Cloud (OAC) and wanting to download the Weekly Labor Report, you might notice that the report appears in the browser in Chrome but not in Firefox. In Firefox, the report does not show in the browser, but downloads directly to your computer. Others in the organization may have the report display in Firefox and they need to manually download the file. Below are examples of what you might be experiencing:

- In Firefox, I go to Weekly Labor Report in OAC. the WLR PDF Extract tab on the Weekly Labor Report in OAC, I select a couple of projects to export and click **Apply**.
- When the report is ran, no data appears on the screen, just a message that says "Report Completed."
- In my download's directory on my computer, and PDF of this report is available.

WLR_OAC_All_Divisions_WLR 9/12/2022 7:52 AM Adobe Acrobat D... 29 KB

ROSENDIN Weekly Labor Report

"I just ran my report and was able to pull about 40 jobs in about 12 seconds!"

Suzanne Dunn

POST GO-LIVE – EXPANDING USE OF OAC DV

- Worked with field on Labor Efficiency analysis
  - Built DV analytics to show inefficiency in labor
    - Team members working multiple locations in a single day
    - Team members working on multiple tasks in day
    - Team members remaining on project to keep consistency
  - Normally, pay $25 – $50K for outside firm for labor inefficiency analysis. This took 5 hours to complete.

POST GO-LIVE – POWER BI CONNECTOR

- Installed and tested Power BI Connector and worked with the analysts to build analyses in OAC and have them load and update Power BI model, cutting down the need for export/import.
- Things to know:
  - Only works with Power BI Desktop only (Not Premium or Pro)
    - The model is stored in BI Desktop
    - After built the user should be able to migrate to Premium or Pro
  - Connection to the OAC subject area (presentation layer of the RPD). Can access data via:
    - Tables in subject area (BIContentAuthor Role)
    - Analyses built in OAC (BI Consumer Role)
    - Logical SQL from advance table of analysis (??? Role)
  - Must have Oracle Analytics client tools installed on the desktop
  - May need to increase the "Access Token Timeout"

BENEFITS

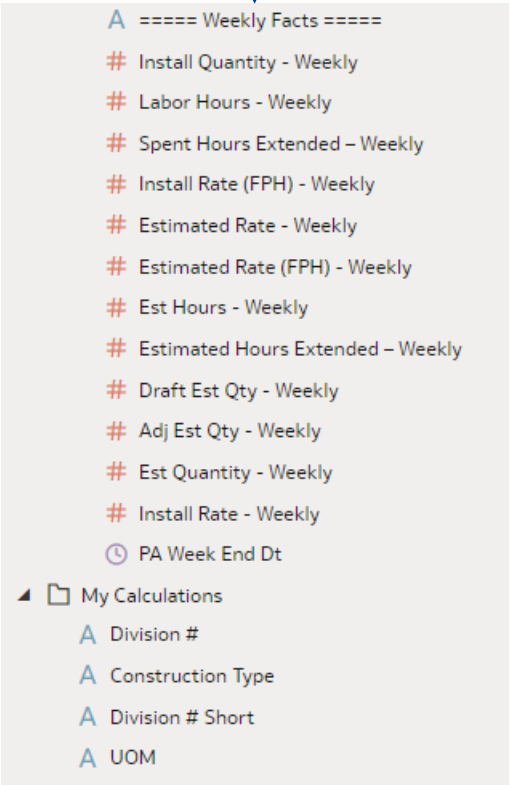
- Provided supervisors and managers access to on-demand weekly-level data
  - Enables them to properly staff their projects
- Business Improvements
  - Helped internal group be more confident about the data
  - Super users now able to use in ad-hoc manner
  - End users noticing improvement vs OBIEE – speed and usability
  - Have more confidence that IT can deliver results

DEMO

LESSONS LEARNED

- Not 100% autonomous – needs some looking after
  - Dedicated resource that knows ADW is still helpful
- Find good reasonable ODI resources
- Average user has trouble creating ad-hoc reports
  - Rosendin has complicated data model that's grown over the years
  - Users have preference to other analytic tools
- Meet early and often with key users
- Hire employees and contractors that fit with your culture
- Validate skill sets claimed
- Take advantage of the resources available to you
  - Global Leaders
  - Customer Advisory Board
  - Trusted Oracle Partners

40+ Measures



DATABASE 23C FREE

ORACLE DATABASE 23C - FREE

Overview

Oracle released Oracle 23c Free – Developers Release which is the first release of the next generation of the Oracle Database. Developers can download and start using the Oracle 23c Free release to get a head start on new features of the Oracle database. Oracle provides a VirtualBox download that includes:

- Oracle Linux 8.7
- Oracle Database 23.2 Free - Developer Release for Linux x86-64
  - Sample Schema and Tables
- Oracle REST Data Services 23.1
- Oracle SQLcl 23.1
- Oracle APEX 22.2

Limitations

- 12 GB of User Data storage
- Maximum RAM is 2 GB

Steps:

- Download Image - https://www.oracle.com/database/free/download/
- Install Virtual Box - https://www.virtualbox.org/
- Follow the instructions and you should be ready to go in less than an hour.

KEY FEATURES - DEVELOPERS

- SQL/PGQL
- 4096 Columns
- SQL*Plus ARGUMENT Command
- Aggregation over INTERVAL Datatypes
- Boolean Data Type
- Annotation
- IF [NOT] EXISTS Syntax Support
- Domains
- GROUP BY & HAVING with Column Aliases
- GROUP BY with Column Position
- SELECT Without FROM Clause
- Direct Joins for UPDATE and DELETE Statements
- DEFAULT ON NULL for UPDATE or Insert Statements

4096 COLUMNS & SQL*PLUS ARG

- 4096 Columns - Oracle increased the number of columns in a table from 1000 to 4096 columns. Quote below makes me a little apprehensive:

  "There is a new feature in Oracle Database 23c allowing for up to 4096 columns in a table or view. However, only 23c clients can be used to access tables or views that take advantage of this new feature."

- SQL*Plus ARGUMENT Command - A new ARGUMENT command lets users of batch scripts control how SQL*Plus treats script argument variables for which the users have not explicitly set values. With this command, users are now able to control when to prompt for input or use a default value for each unset script argument.

AGG OVER INTERVAL & BOOLEAN

- Aggregation over INTERVAL Datatypes - You can pass INTERVAL datatypes to the SUM and AVG aggregate and analytic functions. This enhancement makes it easier for developers to calculate totals and averages over INTERVAL values.

- Boolean Data Type – While Boolean data types have been in PS/SQL for year, Oracle 23c introduces the Boolean data type in SQL:
  - Define a boolean data type using the BOOLEAN or BOOL keywords
  - Assign a value to a Boolean type in several ways

    (insert into boolean_test (active, archived) values (true, false)
    - true/false, TRUE/FALSE, t/f, T/F
    - yes/no, YES/NO, y/n, Y/N
    - on/off, ON/OFF
    - 1/0, '1'/'0'

ANNOTATION AND IF [NOT] EXISTS

- Annotation - Annotations allow us to add a description or purpose to a table. Used for documentation. Populates the user_annaotation_usage table.

- IF [NOT] EXISTS Syntax Support - DDL object creation, modification, and deletion now support the IF EXISTS and IF NOT EXISTS syntax modifiers. This enables you to control whether an error should be raised if a given object exists or does not exist.

  The IF [NOT] EXISTS syntax can simplify error handling in scripts and by applications.

DOMAINS

- Domains– Domains will let us have a Single Point of Definition (SPOD) for columns. This will allow consistency through the application. Below is an example in the documentation using email address:

```
Creating Domain

create domain email_dom as varchar2(100)
constraint email_chk check (regexp_like (email_dom, '^(\S+)\@(\S+)\.(\S+)$'))
display lower(email_dom)
order   lower(email_dom)
annotations (Description 'Domain for Emails');

Referencing Domain

create table t1 (
  id     number,
  email  email_dom
);
```

GROUP BY & HAVING WITH COLUMN ALIASES

- GROUP BY and HAVING clause can now use column aliases.

```
Select
a.DEPARTMENT_ID || ' - ' || b.DEPARTMENT_NAME as DEPT,
count(a.EMPLOYEE_ID) as EMP_COUNT
from EMPLOYEES a,
     DEPARTMENTS b
where a.DEPARTMENT_ID = B.DEPARTMENT_ID
group by DEPT;
```

Query Result | Script Output | DBMS Output | Explain Plan

Download ▾ Execution time: 0.006 seconds

	DEPT	EMP_COUNT
1	10 - Administration	1
2	20 - Marketing	2
3	30 - Purchasing	6
4	40 - Human Resour	1
5	50 - Shipping	45
6	60 - IT	5
7	70 - Public Relatior	1
8	80 - Sales	34
9	90 - Executive	3
10	100 - Finance	6
11	110 - Accounting	2

```
Select
a.DEPARTMENT_ID || ' - ' || b.DEPARTMENT_NAME as DEPT,
count(a.EMPLOYEE_ID) as EMP_COUNT
from EMPLOYEES a,
     DEPARTMENTS b
where a.DEPARTMENT_ID = B.DEPARTMENT_ID
group by DEPT
having EMP_COUNT > 5;
```

Query Result | Script Output | DBMS Output | Explain Plan

Download ▾ Execution time: 0.021 seconds

	DEPT	EMP_COUNT
1	30 - Purchasing	6
2	50 - Shipping	45
3	80 - Sales	34
4	100 - Finance	6

GROUP BY WITH COLUMN POSITION - FAILED

- GROUP BY clause can now use column aliases.

```
Select
a.DEPARTMENT_ID || ' - ' || b.DEPARTMENT_NAME as DEPT,
count(a.EMPLOYEE_ID) as EMP_COUNT
from EMPLOYEES a,
     DEPARTMENTS b
where a.DEPARTMENT_ID = B.DEPARTMENT_ID
group by 1
having EMP_COUNT > 5;
```

Query Result | Script Output | DBMS Output | Explain Plan

Download

00979. 00000 - "not a GROUP BY expression"

*Cause:

*Action:

Error at Line: 2 Column: 0

But Oracle said it works????

In this example, rather than repeating the "initcap(d.dname)" reference in the GROUP BY clause, we use the column position of "1". We are not able to use the column position in the HAVING clause for obvious reasons, as the database wouldn't know what was a column position and what was a number literal.

```
select initcap(d.dname) as department, count(*) as amount
from   dept d
join   emp e on d.deptno = e.deptno
group by 1
having amount > 3;

DEPARTMENT         AMOUNT
-------------- ----------
Research                5
Sales                   6
```

GROUP BY WITH COLUMN POSITION - SUCCESS

The Solution : Column Position

From Oracle 23c onward we can make use of the column position in the `GROUP BY` clause. This functionality is not enabled by default, so it must be enabled at the session or system level. Here we enable it for our session.

```
alter session set group_by_position_enabled=true;
```

```
alter session set group_by_position_enabled=true;
Select
a.DEPARTMENT_ID || ' - ' || b.DEPARTMENT_NAME as DEPT,
count(a.EMPLOYEE_ID) as EMP_COUNT
from EMPLOYEES a,
     DEPARTMENTS b
where a.DEPARTMENT_ID = B.DEPARTMENT_ID
group by 1
having EMP_COUNT > 5;
```

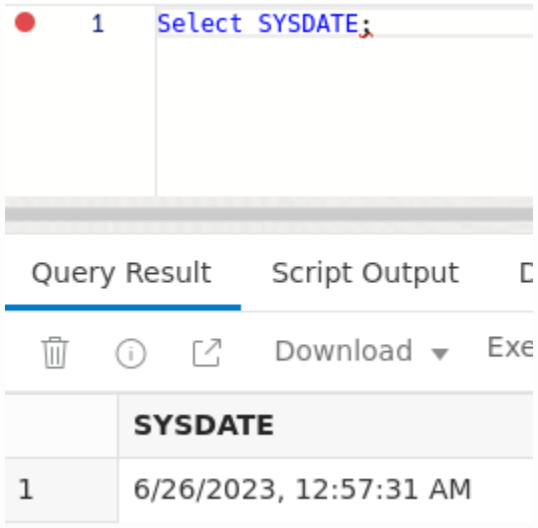
Query Result | Script Output | DBMS Output | Explain Plan

Download ▾ Execution time: 0.027 seconds

	DEPT	EMP_COUNT
1	30 - Purchasin	6
2	50 - Shipping	45
3	80 - Sales	34
4	100 - Finance	6

SELECT WITHOUT FROM CLAUSE

- SELECT Without FROM Clause - You can now run SELECT expression-only queries without a FROM clause



If I put ";" at the end, I got the red dot and squiggly line indicating incorrect code, but it ran fine.

DIRECT JOINS FOR UPDATE AND DELETE STATEMENTS

- Direct Joins for UPDATE and DELETE Statements - Join the target table in UPDATE and DELETE statements to other tables using the FROM clause. These other tables can limit the rows changed or be the source of new values.

EMPLOYEES Table

```
Select
EMPLOYEE_ID,
FIRST_NAME,
LAST_NAME,
DEPARTMENT_ID,
DEPARTMENT_NAME
from EMPLOYEES;
```

Query Result | Script Output | DBMS Output | Explain Plan | Autotrace | SQL History

Download ▾ Execution time: 0.03 seconds

	EMPLOYEE_ID	FIRST_NAME	LAST_NAME	DEPARTMENT_ID	DEPARTMENT_NA
1	100	Steven	King	90	(null)
2	101	Neena	Kochhar	90	(null)
3	102	Lex	De Haan	90	(null)
4	103	Alexander	Hunold	60	(null)
5	104	Bruce	Ernst	60	(null)
6	105	David	Austin	60	(null)
7	106	Valli	Pataballa	60	(null)
8	107	Diana	Lorentz	60	(null)
9	108	Nancy	Greenberg	100	(null)

DEPARTMENTS Table

```
Select *
from DEPARTMENTS;
```

Query Result | Script Output | DBMS Output | Explain Plan | Autotrace | SQ

Download ▾ Execution time: 0.043 seconds

	DEPARTMENT_ID	DEPARTMENT_NA	MANAGER_ID	LOCATION_ID
1	10	Administration	200	1700
2	20	Marketing	201	1800
3	30	Purchasing	114	1700
4	40	Human Resources	203	2400
5	50	Shipping	121	1500
6	60	IT	103	1400
7	70	Public Relations	204	2700
8	80	Sales	145	2500
9	90	Executive	100	1700

DIRECT JOINS FOR UPDATE AND DELETE STATEMENTS

```
1   update EMPLOYEES a
2   set    a.department_name =  b.department_name
3   from   DEPARTMENTS b
4   where  a.department_id = b.department_id;
5
6   Select
7   EMPLOYEE_ID,
8   FIRST_NAME,
9   LAST_NAME,
10  DEPARTMENT_ID,
11  DEPARTMENT_NAME
12  from EMPLOYEES;
```

Query Result | Script Output | DBMS Output | Explain Plan | Autotrace | SQL History

Download ▾ Execution time: 0.016 seconds

	EMPLOYEE_ID	FIRST_NAME	LAST_NAME	DEPARTMENT_ID	DEPARTMENT_NA
1	100	Steven	King	90	Executive
2	101	Neena	Kochhar	90	Executive
3	102	Lex	De Haan	90	Executive
4	103	Alexander	Hunold	60	IT
5	104	Bruce	Ernst	60	IT
6	105	David	Austin	60	IT
7	106	Valli	Pataballa	60	IT
8	107	Diana	Lorentz	60	IT
9	108	Nancy	Greenberg	100	Finance
10	109	Daniel	Faviet	100	Finance

```
update EMPLOYEES a
set    a.department_name =  b.department_name
from   DEPARTMENTS b
where  a.department_id = b.department_id;
```

ANNOTATIONS

```sql
alter table Employees
annotations (UI_Display 'List of Employees');

select object_name,
       object_type,
       column_name,
       domain_name,
       domain_owner,
       annotation_name,
       annotation_value
from   user_annotations_usage
order by annotation_name, annotation_value;
```

Query Result | Script Output | DBMS Output | Explain Plan | Autotrace | SQL History

Download ▾ Execution time: 0.321 seconds

	OBJECT_NAME	OBJECT_TYPE	COLUMN_NAME	DOMAIN_NAME	DOMAIN_OWNER	ANNOTATION_NAME	ANNOTATION_VALUE
1	EMPLOYEES	TABLE	(null)	(null)	(null)	UI_DISPLAY	List of Employees

Used to help with documentation.

KEY FEATURES - DBA

- Better RETURN Clauses
- SQL Transpiler
- Oracle Call Interface (OCI) Session Pool Statistics
- Temporary Access/Privileges
- Schema Privileges
- Developer Role –(db_developer_role)
- Efficient Table DDL Change Notification
- SQL Firewall
- JDBC Drivers

QUESTIONS

HELPFUL LINKS –

ORACLE ANALYTICS VIDEOS:
https://www.youtube.com/@OracleAnalytics/videos

OAC JULY 2023 NEW FEATURES VIDEOS BY ORACLE:
bit.ly/OACJuly23Features

ORACLE ANALYTICS COMMUNITY:
https://community.oracle.com/products/oracleanalytics

ORACLE ANALYTICS LIVE DEMOS:
https://www.oracle.com/business-analytics/data-visualization/demos/

POWER BI INFORMATION:
https://docs.oracle.com/en/cloud/paas/analytics-cloud/acsds/connect-oracle-analytics-cloud-microsoft-powerbi.html#GUID-A69C7A4E-3968-4DCE-A7F8-0AB01D268CE5

ORACLE DATABASE 23C FREE INFORMATION AND DOWNLOAD:
https://www.oracle.com/database/free/

CONTACT INFORMATION

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Thank you!