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# 1. Background

## 1.1 Purpose

This document details about fully automated integration solution between Microsoft Power BI and Oracle EPM Cloud applications.

## 1.2 Background

Oracle Fusion Cloud Enterprise Performance Management (EPM) applications are SaaS solutions from Oracle, that helps an organization to model and plan across finance, HR, supply chain, and sales, streamline the financial close process, and drive better decisions.

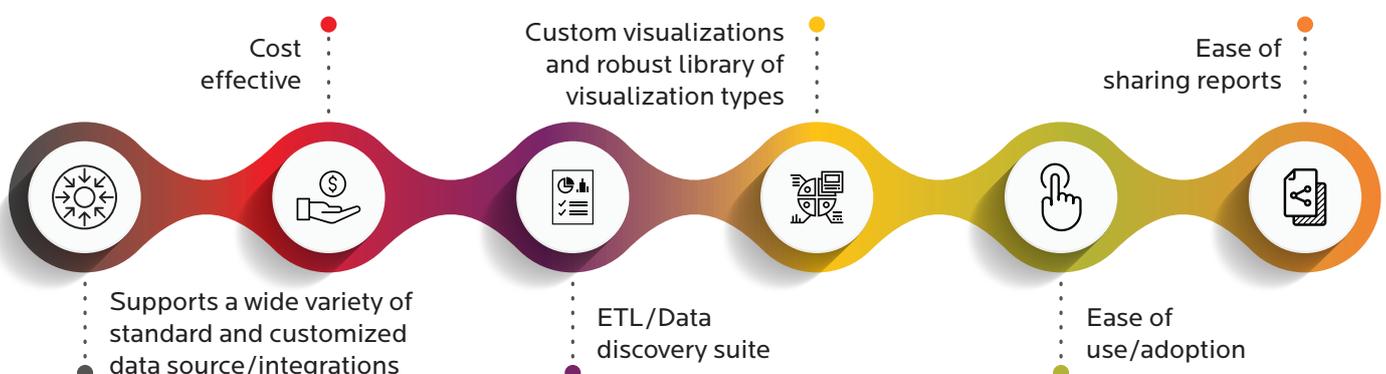
It comes with out-of-the-box robust reporting and dashboard capabilities used for various financial reports but with few limitations. However, with increased adoption of Microsoft Power BI solution to create custom visualization, allowing business user to explore and display the data in captivating ways, it becomes imperative to have an automated integration solution available for Oracle EPM Cloud users.

Typically the use cases would be to send financial budget vs actuals, forecast vs actuals, profitability by customer/product etc. to Microsoft Power BI, for creating integrated visualizations and dashboards along with data from other applicable sources.

## 1.3 Limitations Connecting Microsoft Power BI & Oracle EPM Cloud Apps

- Currently there are no direct integration options available in Microsoft Power BI so that a direct connection can be established with Oracle EPM Cloud apps for seamless integration.
- There is a capability in Oracle Cloud apps where we can send data to any target system using EPM Automate or REST APIs, however there must be a staging layer in between, in the form of a server or database, to store the information.
- Many customers are relying on manual data/metadata exports from Oracle EPM Cloud to transfer information to Power BI for integrated reporting requirements.

## 1.4 Advantages of using Power BI for integrated reporting needs



## 2. Integration Solution – Python + REST API Based

### 2.1 Power BI and Oracle EPM Cloud Integration

- Microsoft Power BI supports Python Script as a data source for any kind of custom integration written in python.

The image shows two overlapping dialog boxes in Power BI. The 'Get Data' dialog on the left has 'Other' selected in the left-hand menu, and 'Python script' is highlighted in the 'Other' list. A tooltip at the bottom says 'Run a Python script on a local Python installation to import data frames.' The 'Python script' dialog on the right contains a Python script for reading a CSV file and converting it to a DataFrame. The script is as follows:

```
with open(file, mode='wb') as op:
    op.write(r2.content)

headers = '''Currency","Channel","ManagementUnit","Entity","Customer","Product","Version","Yr
headers = headers.replace("'", '')
headers = headers.split(',')

PBCS_Data = read_csv(file, sep=',', header=None, names=headers, low_memory=False, skiprows=2)
for col in headers[11:]:
    PBCS_Data[col] = PBCS_Data[col].astype('float64')
print(PBCS_Data)
```

Below the script, it states: 'The script will run with the following Python installation C:\Program Files\Python37. To configure your settings and change which Python installation you want to run, go to Options and settings.' There are 'OK' and 'Cancel' buttons at the bottom right.

- Python has a capability to create data in the form of “Data Frames” using “Pandas” library and Power BI can consume the data frames to load data into its staging layer.

\*\*\* Oracle EPM Cloud - PBCS Data transformed to Data Frame and displayed in Power BI:

The image shows the Power BI Navigator interface. On the left, under 'Python [1]', the 'PBCS\_Data' data source is selected. The main area displays a preview of the data frame. The preview is titled 'PBCS\_Data' and 'Preview downloaded on Friday, September 4, 2020'. Below the title is a table with the following data:

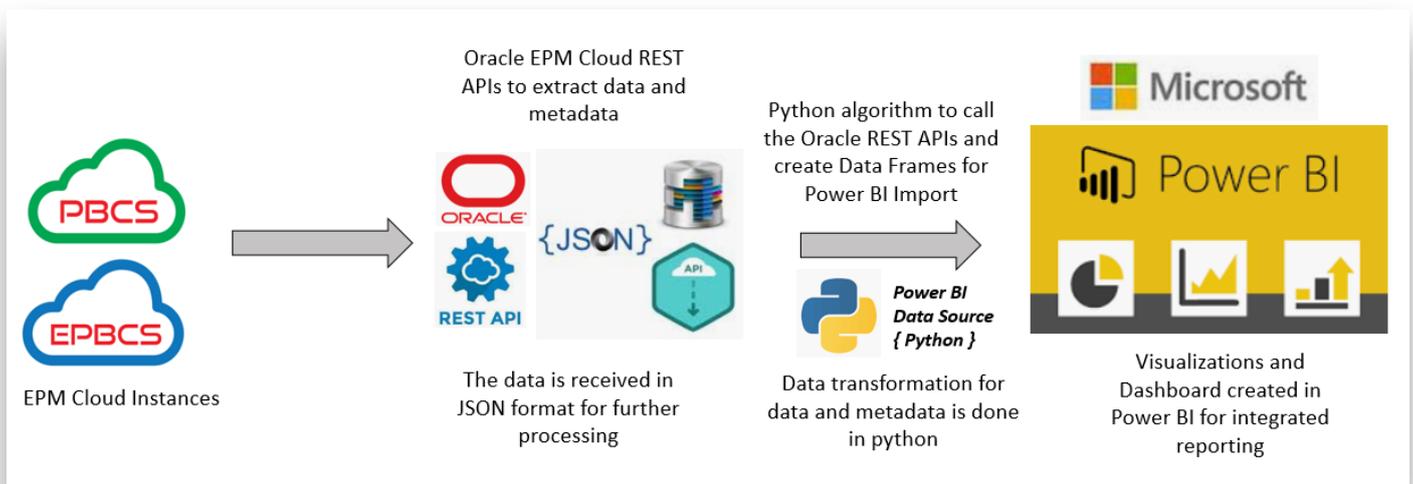
Currency	Channel	ManagementUnit	Entity	Customer
Local_Currency	U002	U10	673	FS DT Not Assigned
Local_Currency	U002	U10	673	FS DT Not Assigned
Local_Currency	U002	U10	673	FS DT Not Assigned

Below the table, there is an information icon and the text: 'The data in the preview has been truncated due to size limits.'

- Python script calls the Oracle EPM Cloud REST APIs to extract data and metadata on a real-time basis from EPM cloud apps and converts them to multiple data frames for loading into Power BI staging layer.
- Any kind of data or metadata transformations can be achieved within robust python algorithm so that data can be brought in Power BI acceptable formats and reporting needs. This gives us an advantage to use the excellent python capabilities for even complex data transformations.
- The python data source can be saved as a connection and hosted in Power BI for creating a sharable report.
- Once the report is published, the Power BI report pulls the data and metadata in real time from Oracle EPM cloud applications and displays in the Power BI dashboards for further visualizations and analysis.

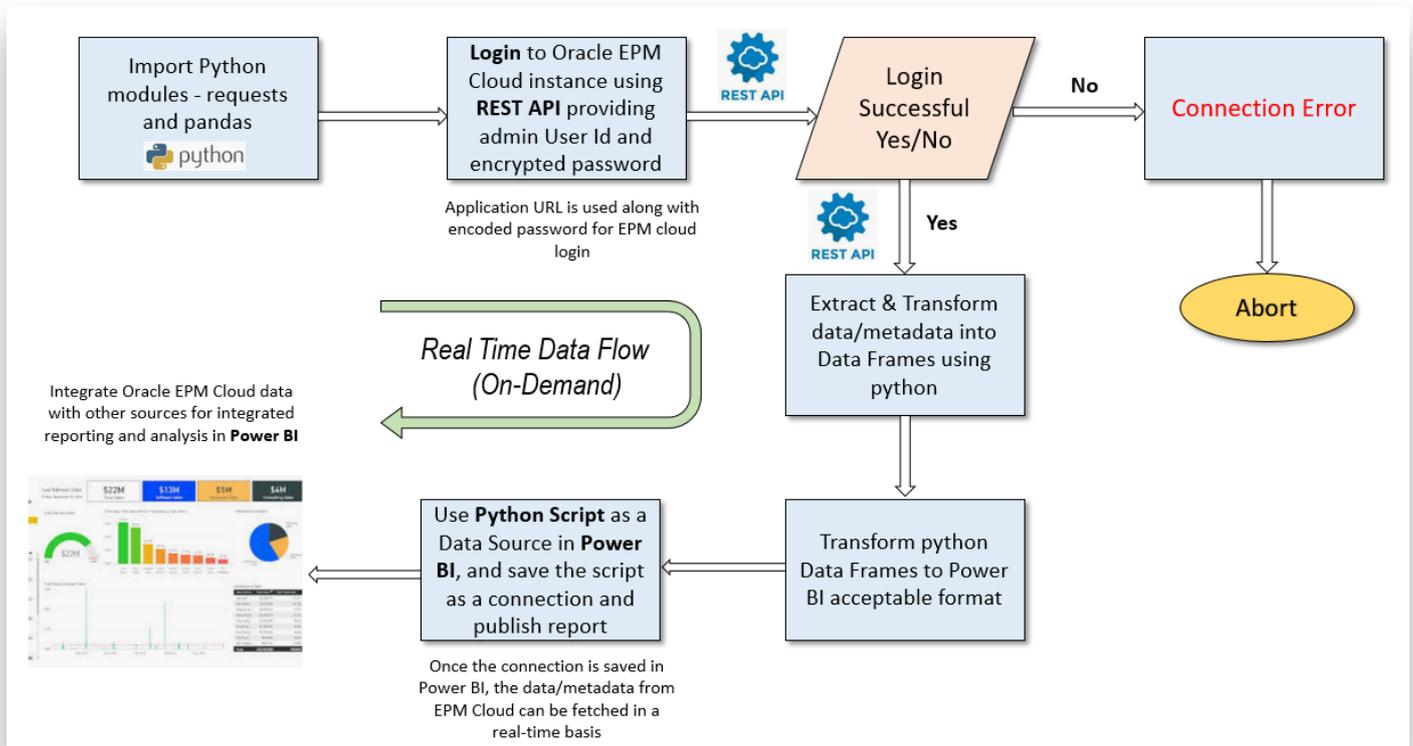
\*\*\* As a pre-requisite, Python and its related libraries, must be installed on the machine/server where the Power BI reports are configured.

## 2.2 Solution Diagram



## 2.3 Python Algorithm for Power BI and EPM Cloud Integration

- Python needs “Requests” library for configuring Oracle EPM Cloud REST APIs and “Pandas” library for creating data/metadata in the form of Data Frames for loading into Power BI staging.



## 2.4 What does it take to implement?

If a customer wishes to implement a fully automated integration solution between Oracle EPM Cloud and Microsoft Power BI, then below would be required:

- A python developer who can write basic python script for integration. Since this is a pretty simple integration approach, any python developer can easily implement this.
- A typical integration can be established in a week's time with easy to medium complexity.
- Knowledge of Oracle EPM REST APIs. Oracle has provided a detailed admin guide for reference along with sample codes which can be re-used.
- A server to host the Power BI reporting tool and python scripts.

## 3. Benefits

### 3.1 Benefits of using this custom integration solution



#### Low Cost

- With increasing adoption of REST APIs and Python programming, this integration setup can be achieved in less time and once configured, can be used in a hassle free manner.



#### Extract Real Time Data and Metadata from Oracle EPM Cloud

- This fully automated integration approach allows business users to access real time data from Oracle EPM cloud apps in Microsoft Power BI.
- This solution was implemented and used in large scale by one of our leading Global FMCG customer and was well appreciated by the business.



#### FTE Savings

- Any manual extraction of data/metadata creates dependency on technical team/support team and hence delays the entire process of reporting.
- This fully automated integration approach can help business to eliminate any dependency on technical resources, hence bringing in savings in terms of cost and time.



#### Easy of Managing

- Since this integration approach uses Oracle provided REST APIs and robust python algorithms, any future changes can be implemented quickly depending on the business needs.

## 4. References

- Oracle REST APIs reference (<https://docs.oracle.com/en/cloud/saas/enterprise-performance-management-common/prest/toc.htm>)
- Power BI Data Sources (<https://docs.microsoft.com/en-us/power-bi/connect-data/desktop-data-sources>)
- Python Library references (<https://pypi.org/project/requests/> , <https://pypi.org/project/pandas/>)



RESOURCES

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