

# Leveraging Power BI to Boost Productivity in Project Controls Teams

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# About the speaker

- Civil Engineer and Project Controls Professional with over 10 years of work experience in Project and Portfolio Management.
- Certified Cost Professional by the AACE International and Australian Chartered Professional Engineer.
- Exposed to projects within the Infrastructure, Mining, and Oil and Gas industries. Frank specialises in Project Controls functions, including Cost Control, Project Planning and Scheduling, Portfolio Management, and Reporting. F
- Involved in projects in Australia, Argentina, Indonesia, and Peru.

# Agenda

- Introduction
- Objectives
- Understanding Power BI in Project Controls
- Use and implementation cases
- Lessons learned and best practices
- Limitations & Opportunities
- Q&A

# Introduction

- Efficient project controls reporting is crucial for informed decision-making and successful project outcomes. However, traditional manual reporting processes often prove **time-consuming, error-prone,** and lack effective data visualisation capabilities.
- Organisations are turning to automation and advanced data visualisation tools like Microsoft Power BI to overcome these challenges.



Raw data



Processing (Excel)



One-off Report

# Objectives

- *To demonstrate the various applications of Power BI in project controls processes*
- *To demonstrate the benefits of introducing Power BI to Project Controls to better efficiency*

# Understanding Power BI in Project Controls

- Business intelligence and data visualisation tool provided by Microsoft.
- It offers project management and project controls professionals the ability to transform raw project data into interactive reports, dashboards, and visualisations.

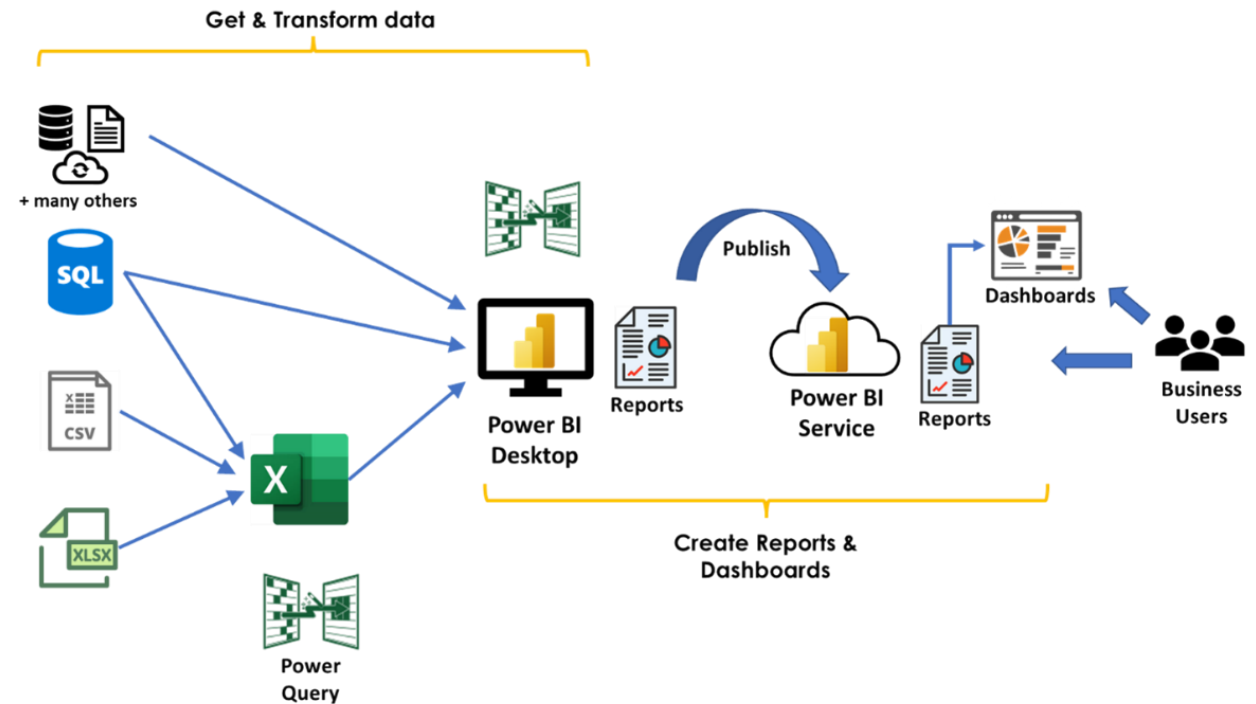


Figure 1 Power BI Architecture (Åkesson, 2022)

# Understanding Power BI in Project Controls

## In the project Controls Space:

- Schedule related reports
- Cost Reports
- Change Management
- Contract & Proc
- Auditing PC Data

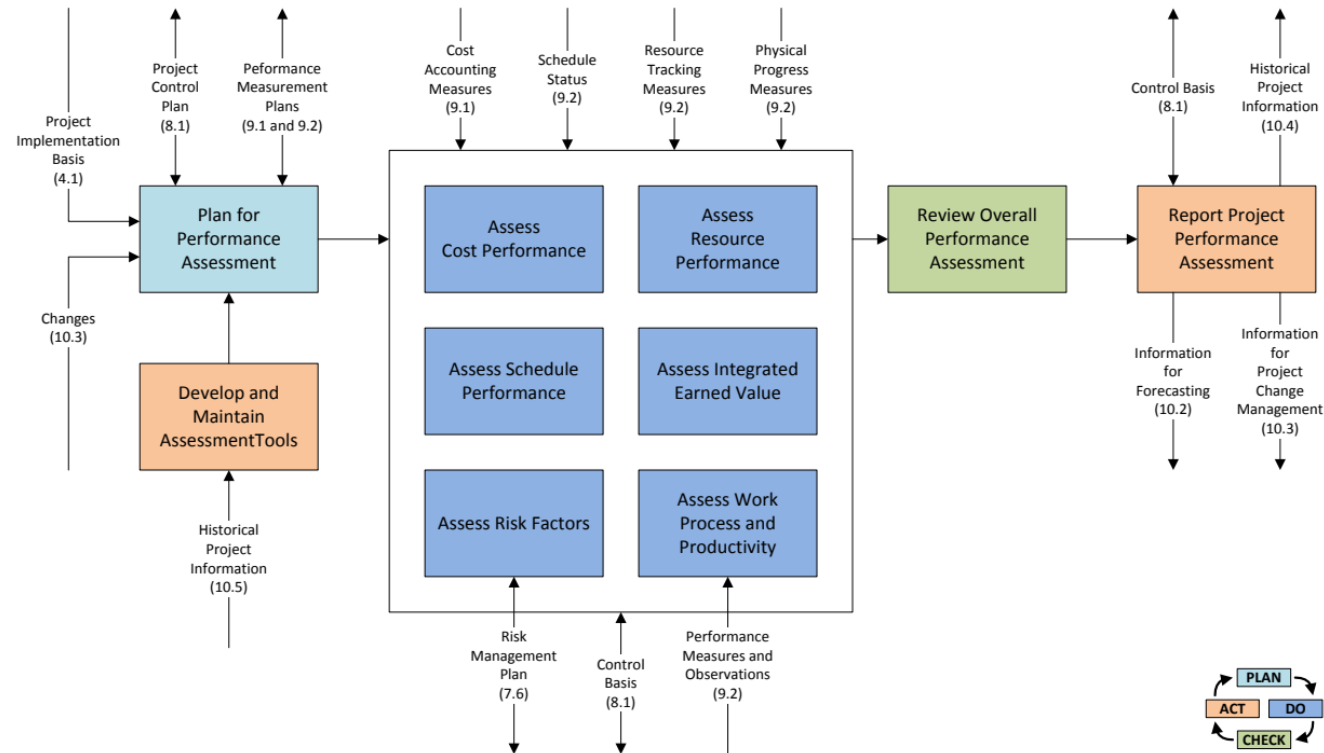


Figure 10.1-1 Process Map for Project Performance Assessment



# Understanding Power BI in Project Controls

## Typical Data Sources in projects

- SharePoint (Libraries, Lists, MS Project)
- Oracle
- SAP ERP
- Aconex
- Contruent (formerly PRISM)
- InEight
- Ecosys
- Excel tables
- Other In-house system

ORACLE  
Aconex



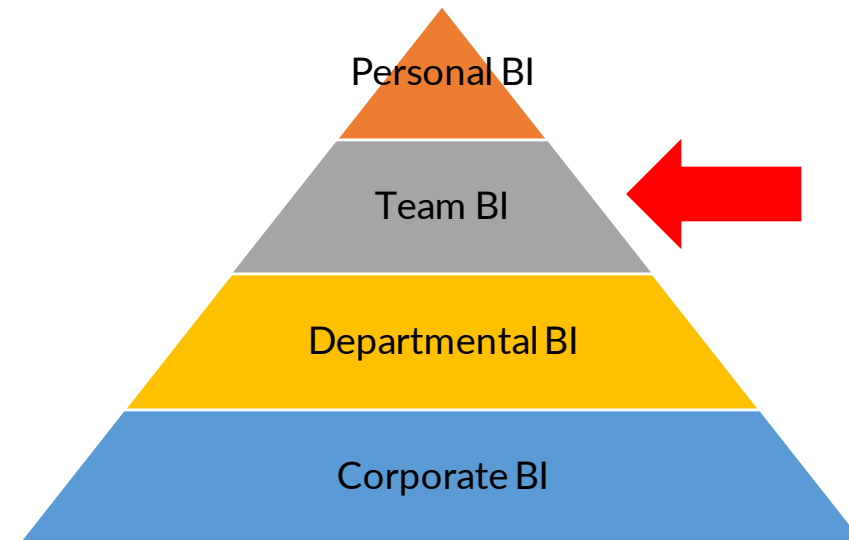
Contruent



# Understanding Power BI in Project Controls

## Levels in the use of Power BI:

- Personal BI: Role and Task focus, Drives Agility.
- Team BI: Process Focus, Drives Collaboration.
- Departmental BI: Delivers content to a large number of consumers. Drives Alignment.
- Enterprise BI: Delivers content broadly across organisational boundaries to the largest number of target consumers.



*Figure 2 Scope of Contents - Power BI*

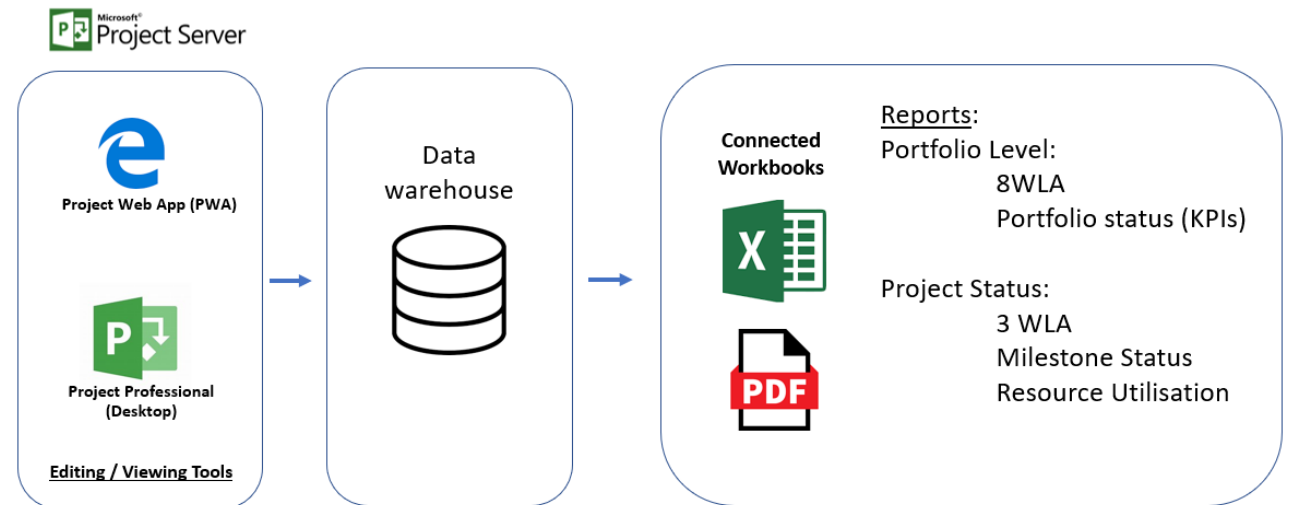
# Power BI Use and implementation cases



# Use case 1 – Portfolio in a Mine Operation

## Context:

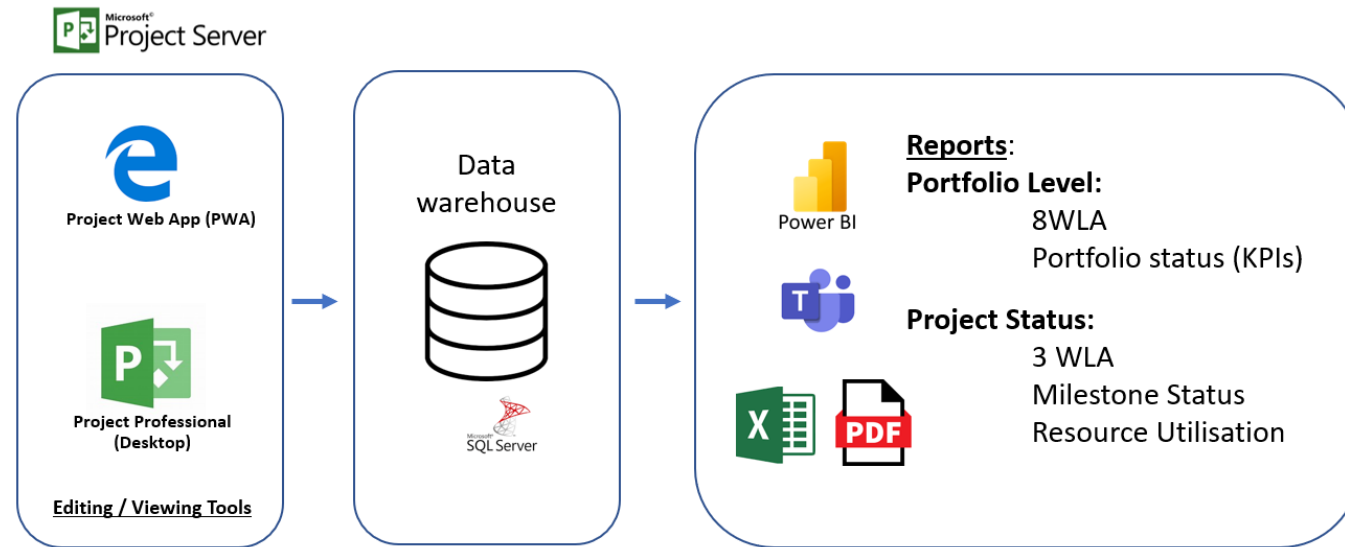
- Mine Operation
- The organisation has implemented Microsoft Project Web App
- Schedules loaded with resources (man-labour hours)
- SQL Server deployed
- Weekly updates on schedules
- Relatively small projects (\$1M to \$5M ).



# Use case 1 – Portfolio in a Mine Operation

## Implementation:

- Power BI was already used in the organisation. A Pro License was provided to the Planner.
- Microsoft Teams to host Power BI Reports.
- The connector to Power BI was a SQL Server



# Use case 1 – Portfolio in a Mine Operation

## Outcome:

- Planner skips the step of exporting the data from the system for each PM (~2hrs saved weekly)
- PMs access real-time reports with interactive features
- Increase engagement

[Go to report](#)

# Use case 2 – PMO Rail Infrastructure

## Context:

- PMO, Rail industry, projects from \$4 to \$40M.
- Different levels of reporting required: Portfolio, Project, and Contractors.
- Primavera P6 as a scheduling tool (EPPM) – Monthly updates.
- SAP ERP
- SharePoint Lists

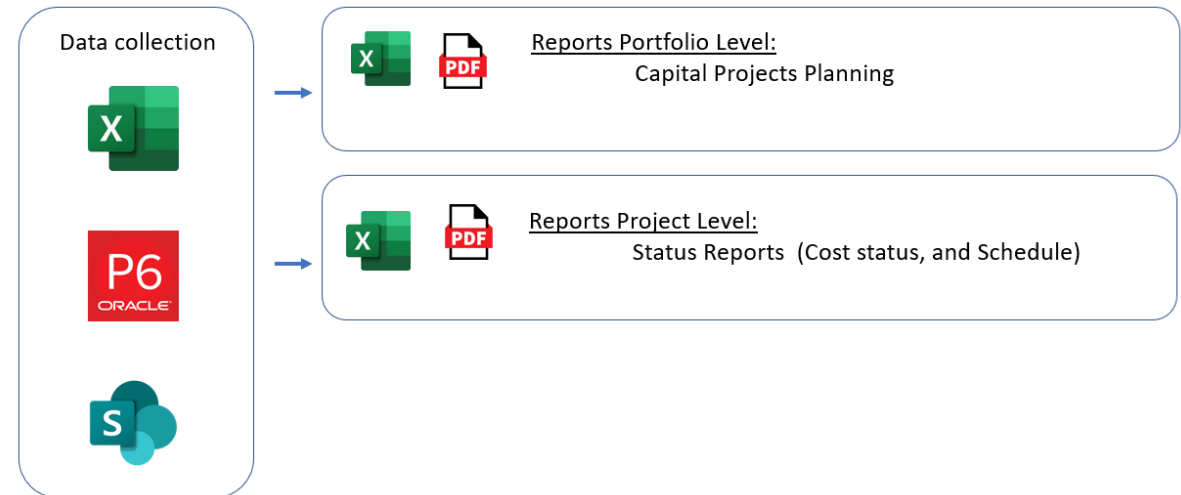
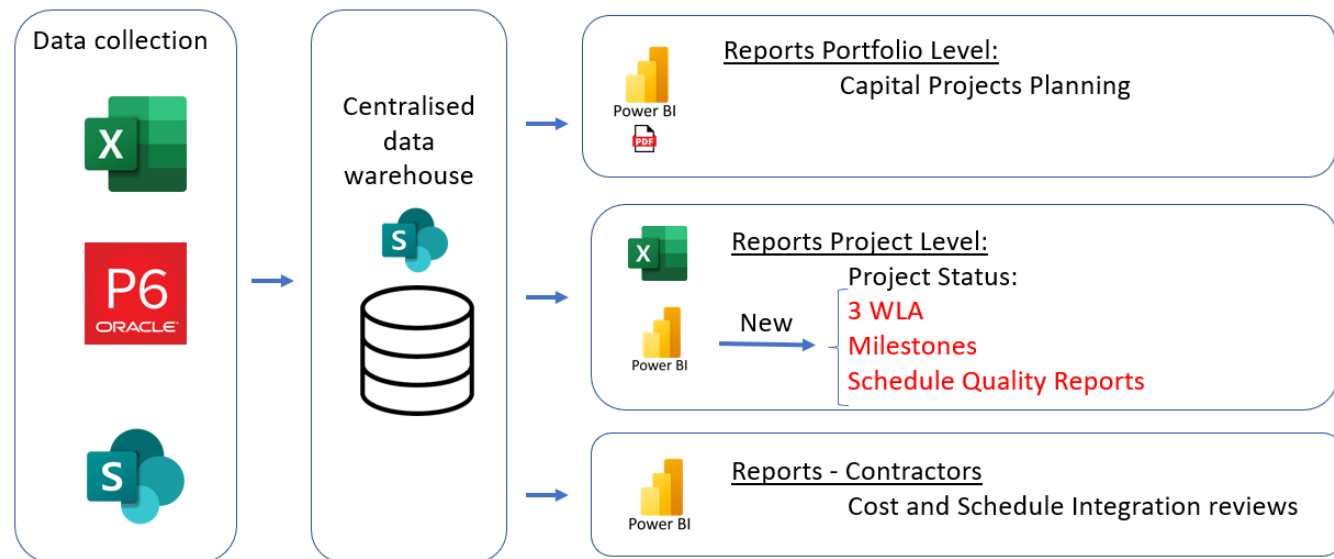


Figure 6 Business-as-usual reporting architecture – Case Study 2

# Use case 2 – PMO Rail Infrastructure

## Implementation:

- Power BI to replace the existing Pipeline Report mechanism (for high-level time phasing)
- A portfolio three-week look ahead report was implemented.
- SharePoint was used as a repository (dataset to host XER files from Primavera P6 and other Excel spreadsheets).
- From SharePoint, access to different levels of reporting was provided.





# Use case 2 – PMO Rail Infrastructure

Example optimisation:

BAU →



PBI →



*Iterate if change is needed*

## Use case 2 – PMO Rail Infrastructure

### Outcome:

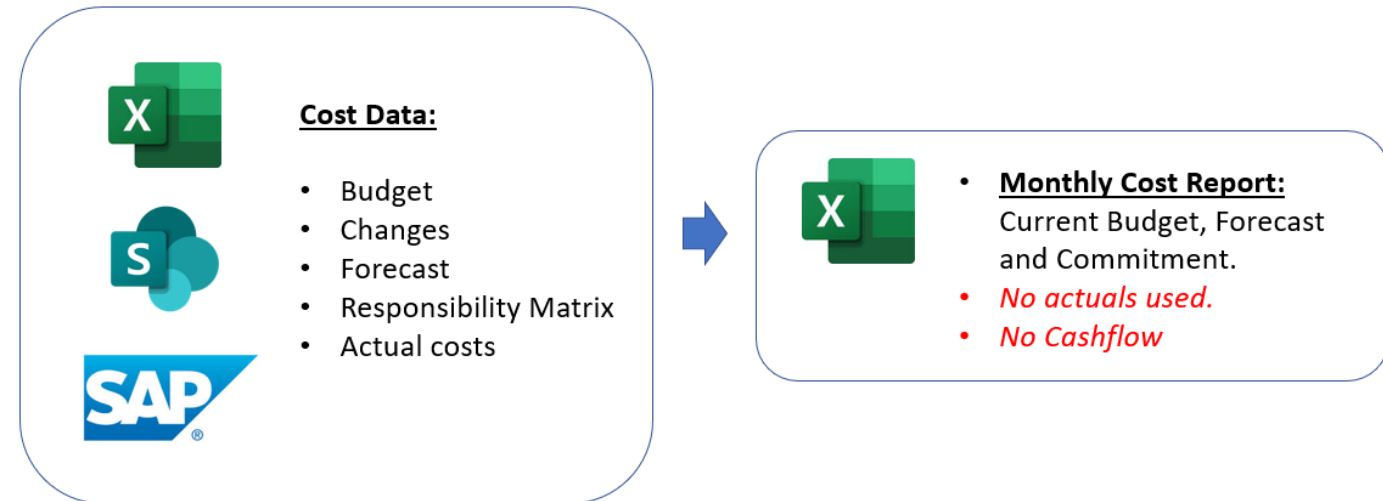
- The time for preparing the Pipeline Report was reduced significantly (~2hr per iteration, ~3-4 days)
- Effective and efficient Contractor's Reports (Cost and Schedule).
- Higher quality of Schedules

[Go to the Reporting Portal](#)

# Use case 3 - Multibillion Mine Expansion Project

## Context:

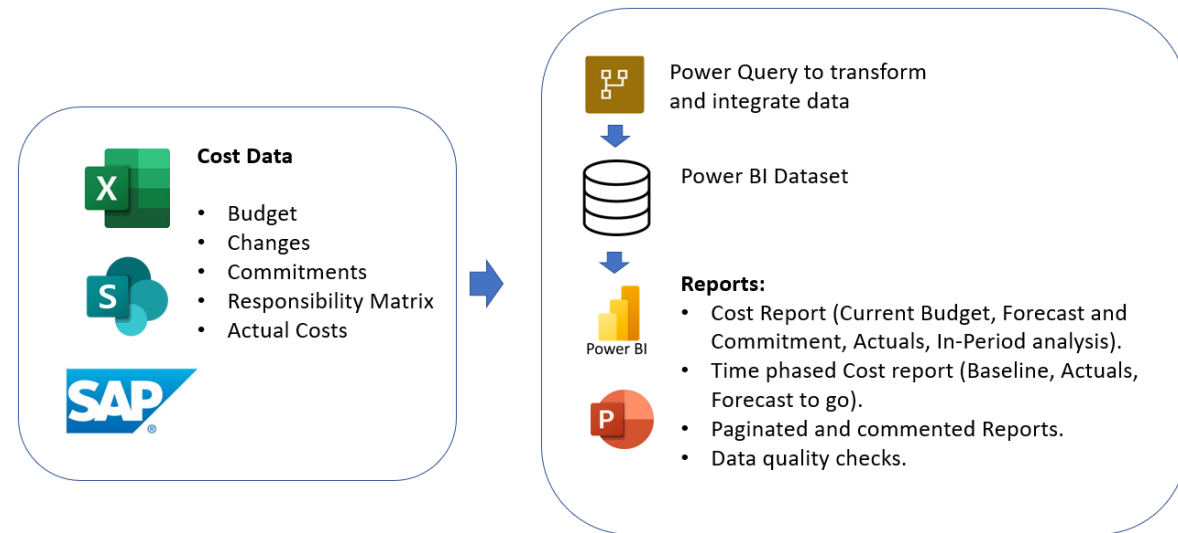
- Mine expansion project. Valued in USD 1.58 bn dollars ~170 work packages.
- No cost control system.
- No reporting system. Monthly reports difficult to produce.
- Small Project Controls Team. 01 Cost Engineer, 01 Change & Cost Engineer and a 01 Cost Lead.



# Use case 3 - Multibillion Mine Expansion Project

## Implementation

- Power BI Implemented in other departments.
- Power BI was used to transform and streamline the data to produce a cost report.



## Use case 3

### Outcome:

- Report produced faster. (30 min compared with 2-3 hours on the original set-up).
- The monthly report was a snapshot of the current cost status as real-time reporting.
- Cost Data quality checks in Power BI allowed higher quality cost reports.
- Integrating BI Reports in PowerPoint enhanced visibility of the cost status for those unfamiliar with navigating through Power BI.
- Increased collaboration within the team, as everyone was working on a single spreadsheet to work on, avoiding silos within the team.

[Go to Report](#)

# Limitations/Challenges

## Lessons learned &



# Limitations and Challenges

- Resistance to change.
- Maintaining PBI Reports. More troubleshooting when Excel is used as a data source.
- Data sources requiring lots of cleansing and transformation
- Low understanding of data management on project controllers. Data modelling is a key concept.
- The lack of alignment between cost, schedule, and others is still a challenge. Integration with Power BI is easier when an alignment in coding is established (WBS, Work Packages, Control Accounts, Cost Accounts)
- Software in Project Management is not integrable with other standard tools (e.g. SharePoint).



# Lessons learned

1. Power BI not only a visualisation tool, also a transformation. Supports the individual tasks and organisational processes.
2. Assess requirements and objectives in accordance with the report audience.
3. Plan the reporting architecture based on the project and organisation needs.
  - a) Data sources (how much data modelling is required),
  - b) Access to reports,
  - c) Refresh frequency,
  - d) User interface for report consumption (Server, SharePoint, PowerPoint, Microsoft Teams, Apps)
4. Plan data history and auditing (data evolution).

# Lessons learned

5. Have and foster a data-driven approach. Small actions count. (Use tables, lists, identifiers, coding)
6. Report must be user-friendly. User training is essential.
7. Power BI – Data transformation for data quality check.
8. Documentation and Governance in accordance with the implementation levels.
9. Data size can be a problem (performance). Use DAX whenever possible for data transformation
10. A project controls software is not always the only solution.



**THANK YOU**