

From Data to Decisions: Enhancing Project Tracking with Power BI

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Speaker



Juliana Smith CITP MBCS — Reporting Lead —

- Background in Oceanography (Physics)
- 15+ years experience
- Power BI and UI Design Certified
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Agenda

- Why Tracking Schedule Matters
- Tracking Schedule: Integrating Power BI with Primavera P6
- Power BI Development Stages: Data Loading and Transformations, Data Modelling, Calculations and Visuals
- Case Studies
- Conclusions



Why Tracking Schedule Matters

Before Tools, It's About the Principles

Purpose

- To ensure projects stay on track by providing visibility into timelines.
- To support proactive decision-making through early identification of variances.
- To enable reporting and forecasting for stakeholders.

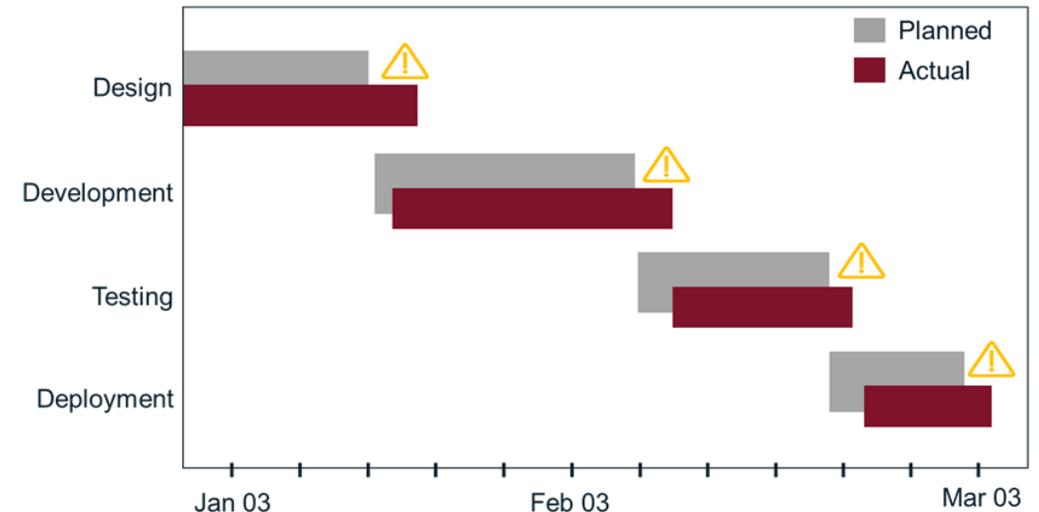
Key Characteristics

Integrated Timeline: Combines all tasks and dependencies into a coherent schedule.

Baseline vs. Actual: Allows comparison between planned and actual progress.

Resource & Cost Alignment: Links activities to resource allocation and budget.

Dynamic Updates: Adjusts for changes in scope, risks, or delays.



Tracking Schedule

Integrating Power BI with Primavera P6

- **Primavera P6:** a project management software used to plan, schedule, and manage complex projects.
- **Power BI:** collection of software services, apps, and connectors >> turn your unrelated sources >> logical and interactive insights.
- Integrating Power BI with P6 enhances project management by combining **advanced analytics** with **robust planning** tools.

Key benefits include

- **Enhanced Visualisation:** Enhanced visualisation ensures the information is presented in a way that's intuitive and easy to interpret.
- **In-Depth Analysis:** Dig deeper into data to uncover trends, patterns, and insights that might not be immediately obvious.
- **Data Integration:** possibilities to combine information from other critical datasets >> more comprehensive understanding of project/programme health.
- **Custom Reporting:** design reports that highlight the metrics and KPIs most relevant to your project goals >> meaningful info to different stakeholders.

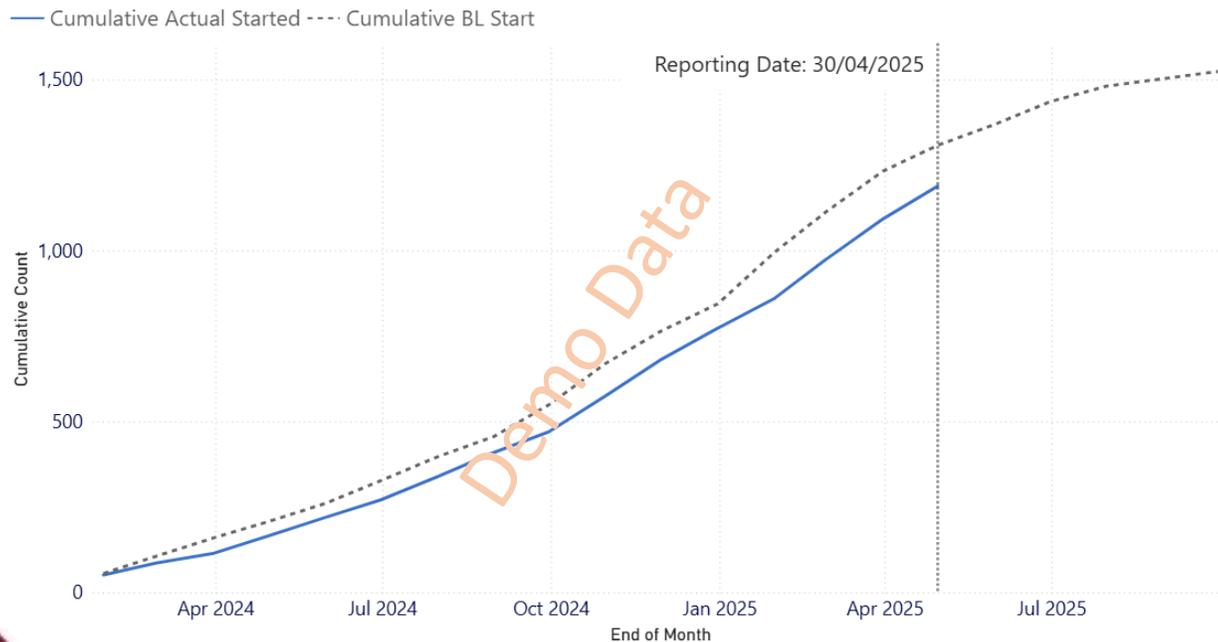


Tracking Schedule

Integrating Power BI with Primavera P6

Capability of building interactive S-Curves >> visual representation of **cumulative data** (like costs, hours, or progress) plotted against time >> current status vs planned >> They provide insights into progress, performance, and trends.

S-Curve for Activities Starts: Baseline vs Actual



- **Visual Progress Monitoring:** easy to spot deviations from the baseline schedule
- **Early Detection of Delays:** PMs can quickly identify slippage and take corrective actions before issues escalate.
- **Stakeholder Communication:** intuitive way to communicate status to stakeholders without overwhelming them with raw data
- **Integration of Cost and Schedule:** providing a holistic view of project performance (EVM)

Power BI Development Stages



Building S-Curves With Power BI

Development Stages

Pre-Development: Requirements, Data Gap Analysis, Data Standardisation (Planners)

Data Loading & Transformations

- Power Query

Data Modeling

- Dimensional Model
- Facts & Dim Tables

Calculations

- Explicit Measures: DAX
- Visual Calculations

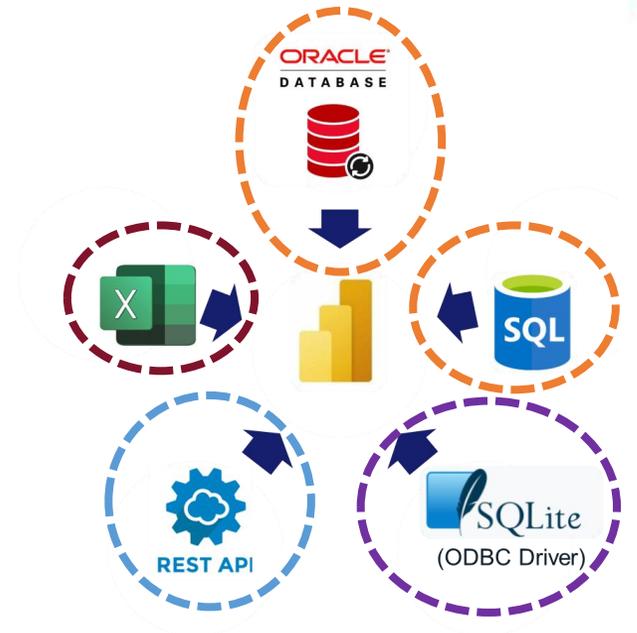
Data Visualisation

- Build visualisation using native visuals

Power BI Development Stage

Data Loading & Transformations

- Multiple ways to connect to Primavera P6, depending on the version in use and database.
- Important: Skills and IT capabilities
- Easier way: Excel



EPPM
Enterprise Project Portfolio Management

- **Database:** Oracle, SQL Database

PPM
Primavera P6 Professional Project Management

- **Database:** SQLite

OCP
Primavera Cloud

- **Database:** Oracle Cloud Infrastructure (OCI)

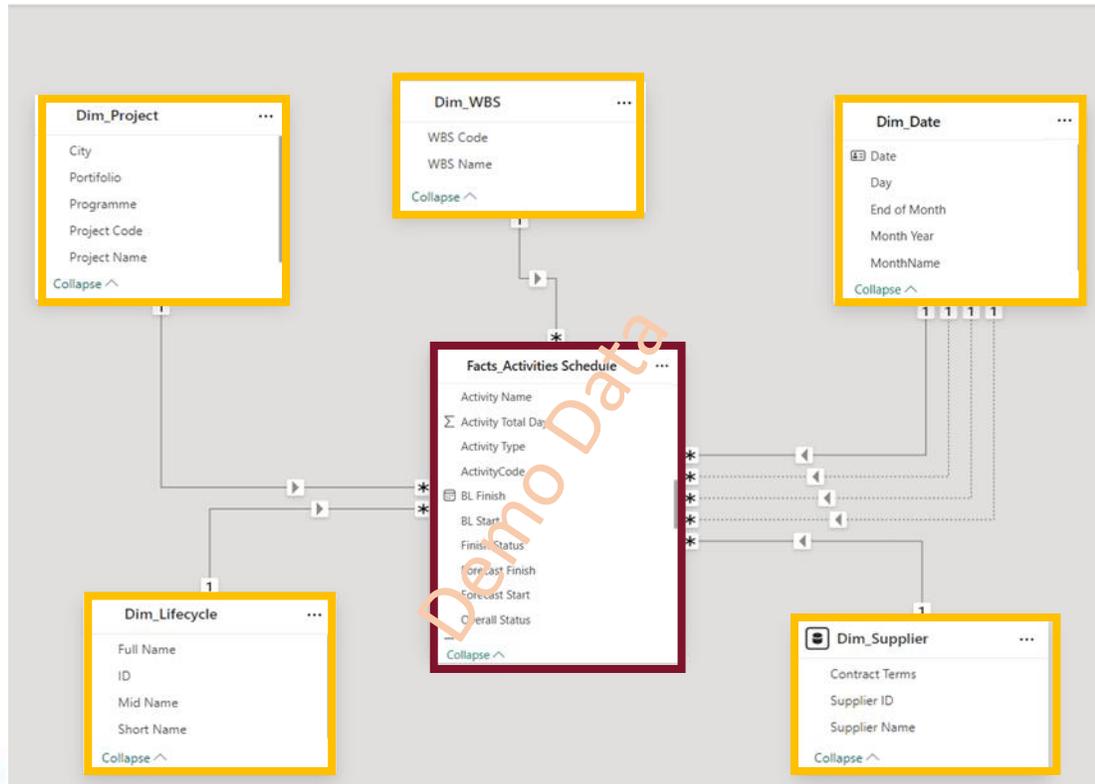
- Transform and clean data using Power Query



Power BI Development Stage

Data Modelling

Data modelling in Power BI is the process of creating relationship between common columns of multiple data sources (tables).



Dimensional modelling: structure data in a way that makes reports faster to build, easier to understand, and more reliable for tracking project performance over time.

Fact tables store events or observations.
Example: Project Schedule Data

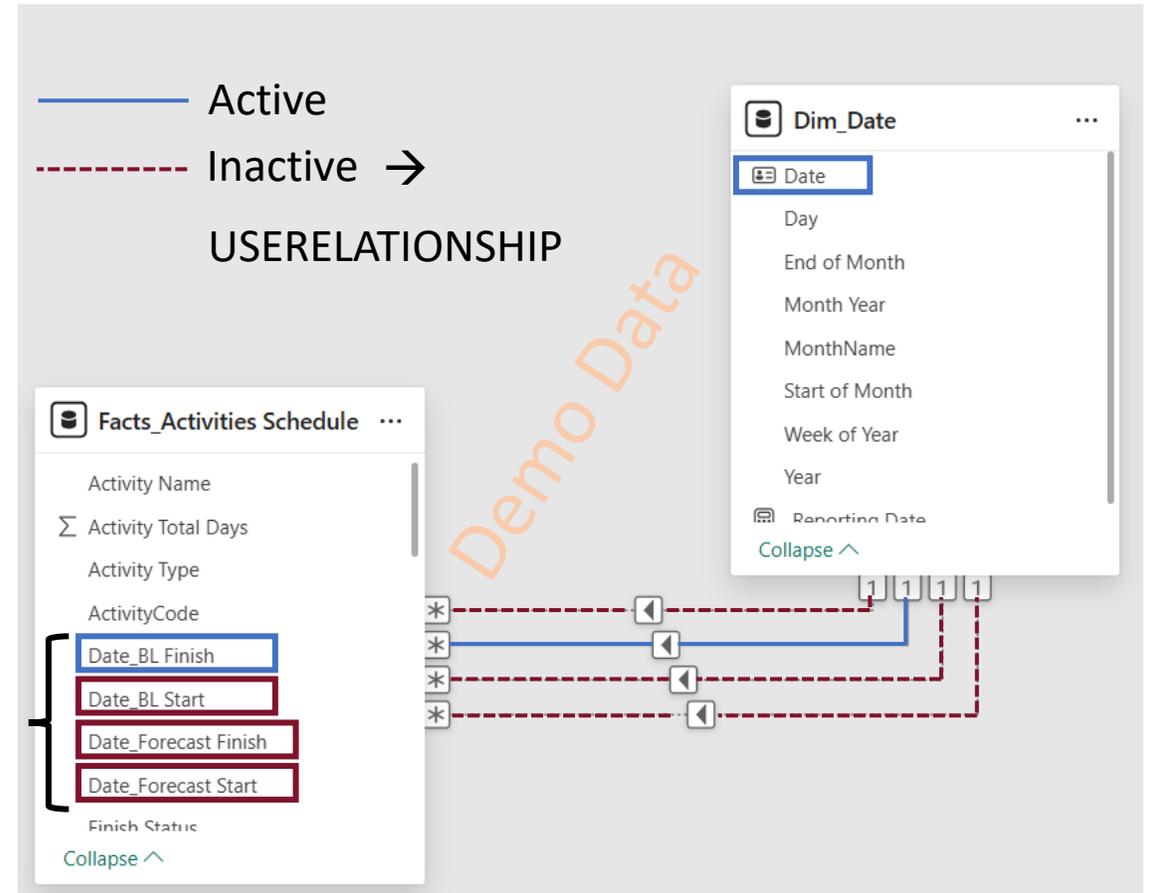
Dimension tables are descriptive. They hold descriptive information such as project and suppliers' details >> filter and understand project data more clearly in reports.

Power BI Development Stage

Data Modelling

Key Dimension Table: Date/Calendar

- Ensures uniform **date formats** and **consistent handling of date** values across the dataset.
- Supports the creation of time-based visualisations, such as **S-curves**, timelines, and MoM.



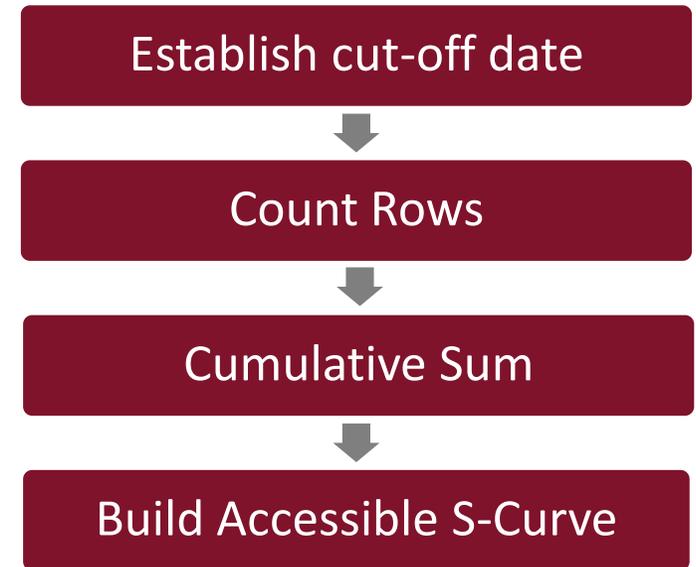
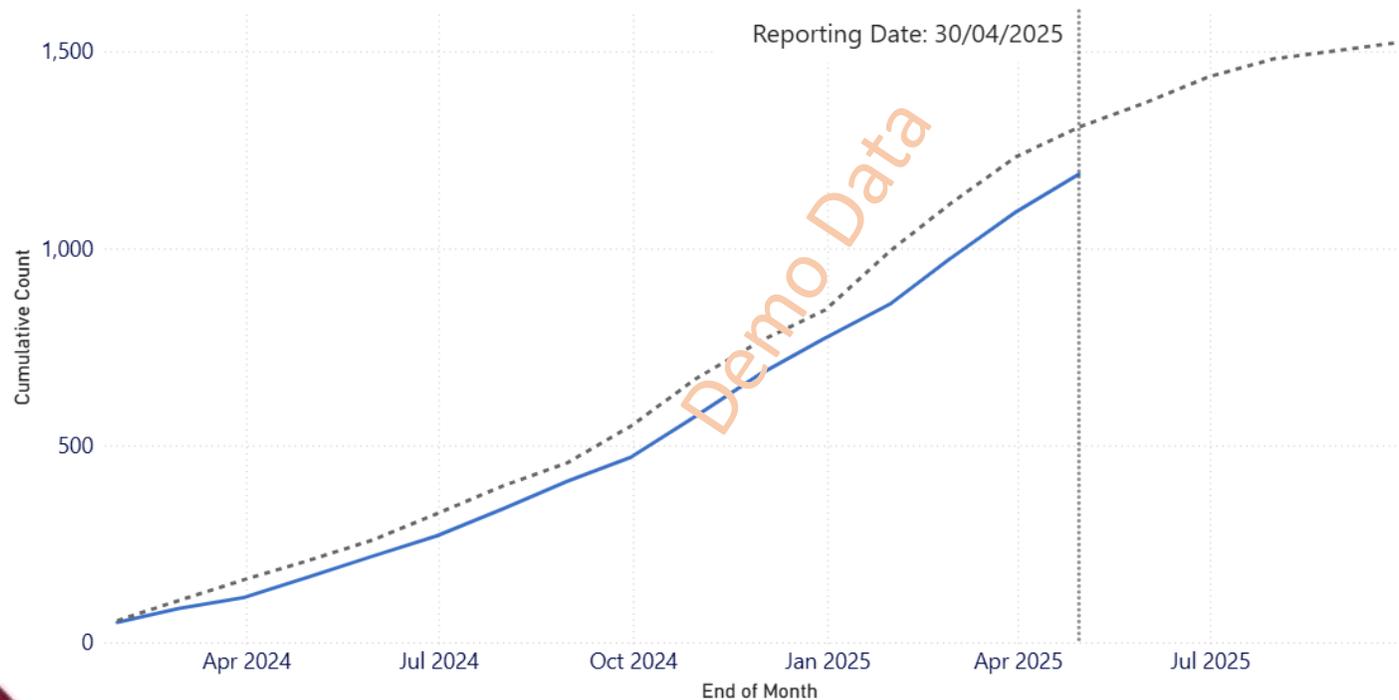
Power BI Development Stage

DAX Calculations

- Explicit measures are created using DAX (Data Analysis Expressions).

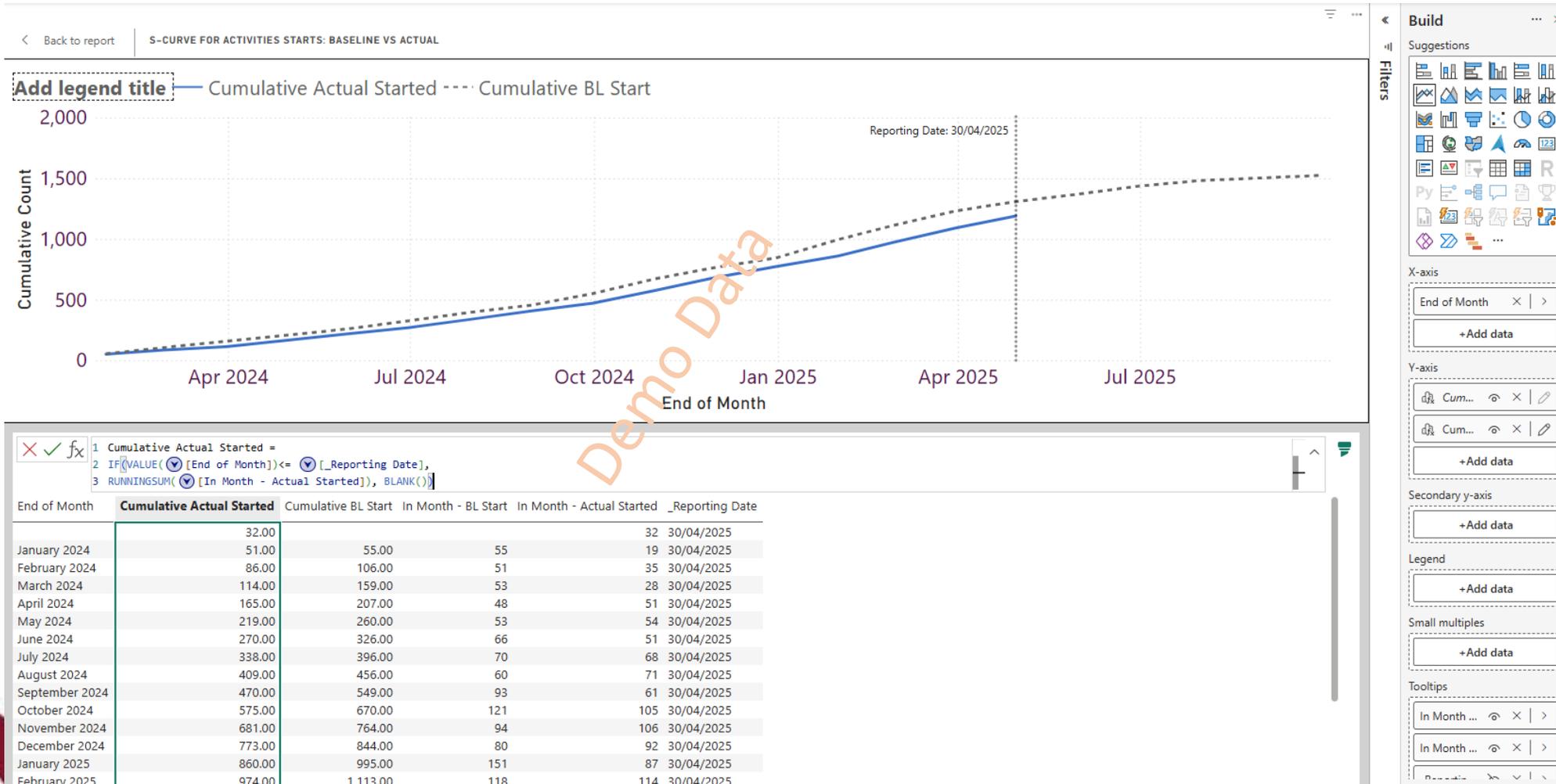
S-Curve for Activities Starts: Baseline vs Actual

— Cumulative Actual Started - - - Cumulative BL Start



Power BI Development Stage

Visual Calculations



Case Study – P6 Exports



Case Study – P6 Exports

Anglian Water Strategic Pipeline Alliance (SPA): Programme Management Office

Since 2021 to date, Costain has established and led the SPA PMO supporting Anglian Water and its delivery partners across a programme to construct 350km of new, large-scale pipelines across the Anglian Water region.



Image Credit - Anglian Water

Costain and its Alliance partners have had a successful track record working collaboratively >> including cutting water usage by 85% and reducing environmental impact through adopting a low water commissioning strategy.



Case Study – P6 Exports

Anglian Water Strategic Pipeline Alliance (SPA): Programme Management Office

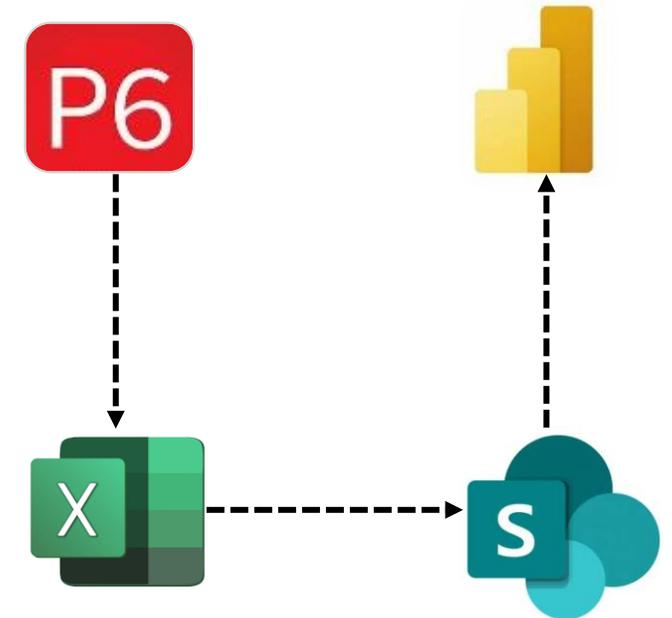
Primavera P6 System

Used to define, develop, implement, and maintain an integrated master schedule that drives delivery plans through the client's Primavera P6 scheduling toolset.

- Includes standardised milestones applied consistently across the programme's 21 projects and associated reporting dashboards.

Key Considerations

- Ensure Proper Date Formatting – Excel Pivot Year 1929 - 2030
- Consistent Naming Conventions
- Version Control
- Leverage Power Query



Case Study – P6 Rest API



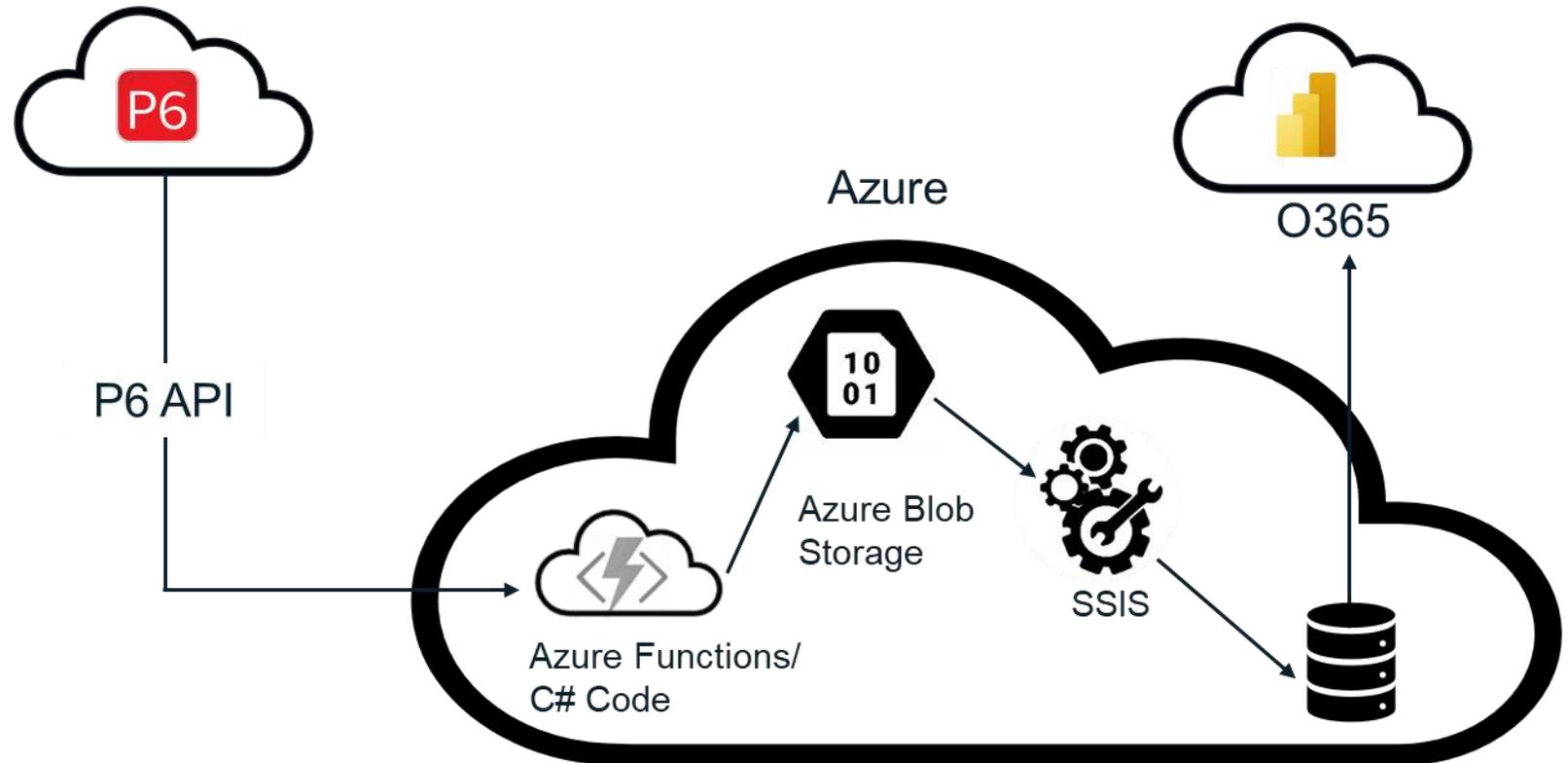
Case Study – P6 REST API

Client X : Deliverables Progress Reporting

Confidential client: performance reporting for deliverables per activity across project lifecycle. Combined data from Master Document Register and Activities Schedule from **Oracle Primavera Cloud** >> report in **Power BI**

Key Benefits

- Provides a unified, real-time view of deliverable performance across the entire project lifecycle
- Enables faster decision-making, improved transparency, and proactive risk management.



Conclusions

- By integrating schedule data directly into Power BI, we can build dynamic S-curves that not only visualise planned versus actual progress but also allow us to track trends over time with precision.
- This approach transforms static reports into interactive dashboards, making it easier for stakeholders to engage with the data and make informed decisions.
- We also benefit from automation, reducing manual effort and improving reporting accuracy
- At Costain, we have deep expertise in successfully delivering this kind of integration, whether it's leveraging simple Excel exports or implementing robust data warehouse solutions.



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