



**Power BI
Deployment
Pipelines**



Azure DevOps

Application Lifecycle Management for Power BI

Thank you, sponsors



K[◇]HERA

element
experience & expertise

 Microsoft

inetum.
realdolmen
Positive digital flow

bmatix
Act informed

LACO / KNOWLEDGE,
AND MORE.

lytix

 DataSense
Because your data makes sense!

MICROPOL

KPMG

delaware
we commit. we deliver.



 AKABI

 ADVANCING
ANALYTICS

u2u

de
Adapt
and
Enable

 cegeka
IN CLOSE COOPERATION

 Business & Decision

 MONIN
Database Managed Services

ORDINA
Ahead of change

9Δ nine
altitudes
REACH NEW HEIGHTS

 Tabular Editor



Marc Lelijveld

Data & Analytics consultant
Macaw Netherlands



Marc.Lelijveld@outlook.com



[@MarcLelijveld](https://twitter.com/MarcLelijveld)



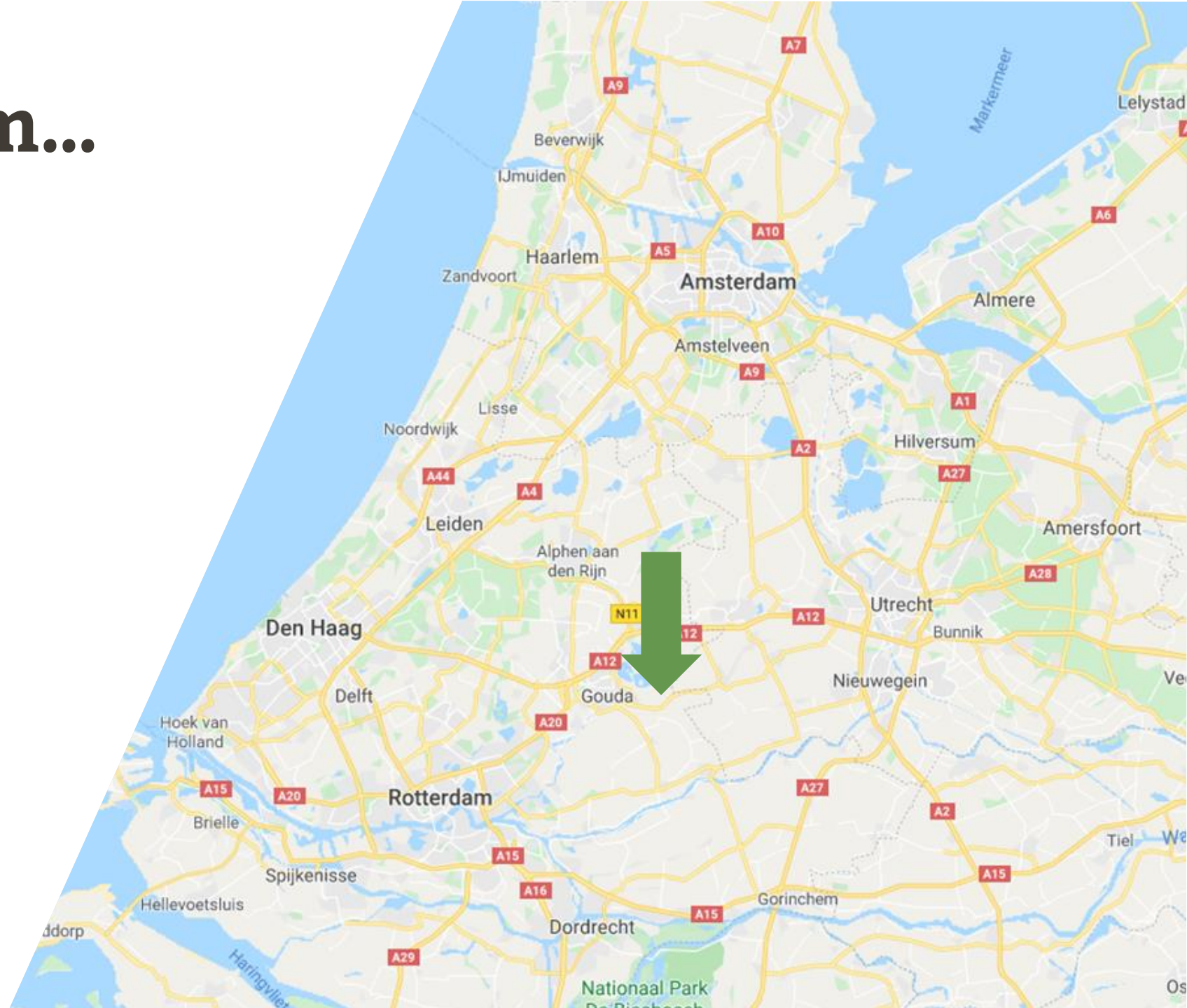
linkedin.com/in/MarcLelijveld



Data-Marc.com

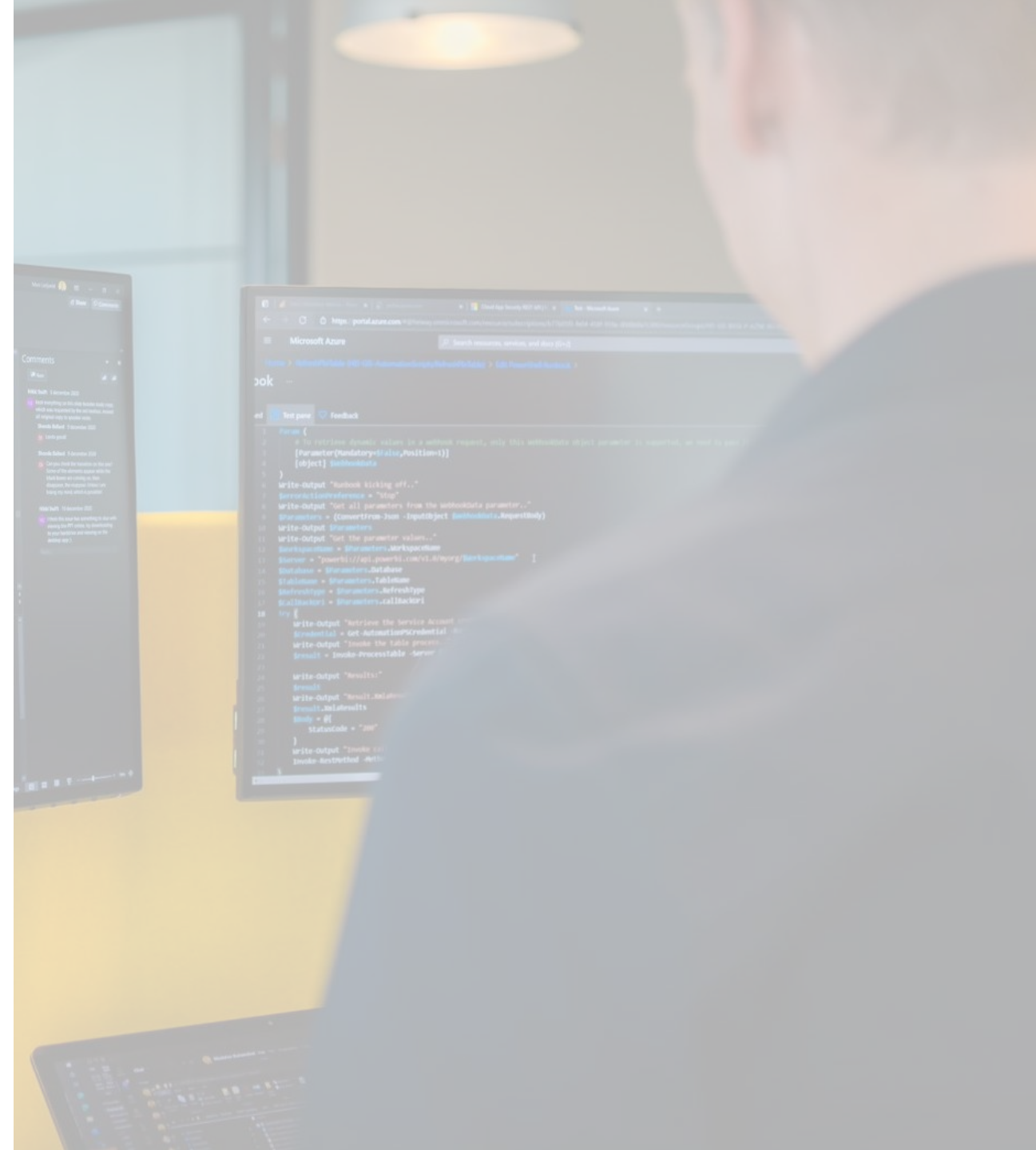


Where I'm from...



What we cover today

- The evolution of BI
- Deployment framework
- Native Deployment Pipelines
- Azure DevOps integration
- Wrap up



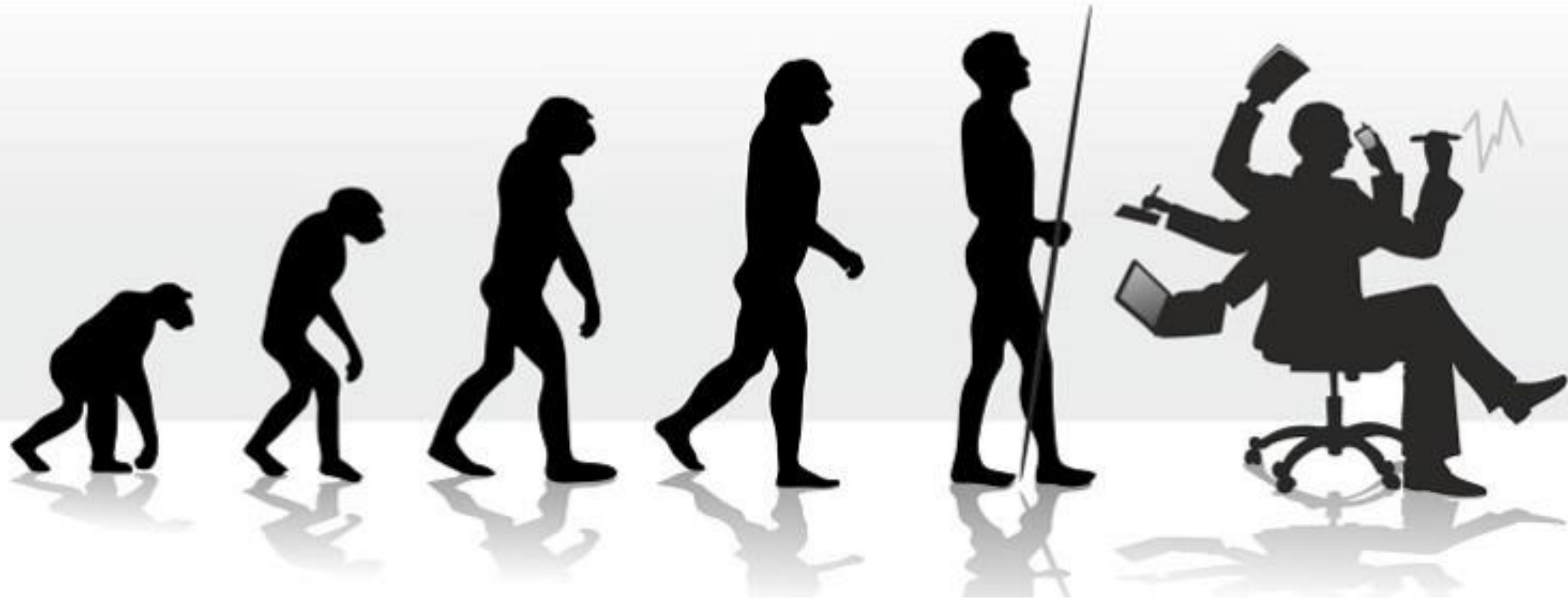
Who wants a shirt?!



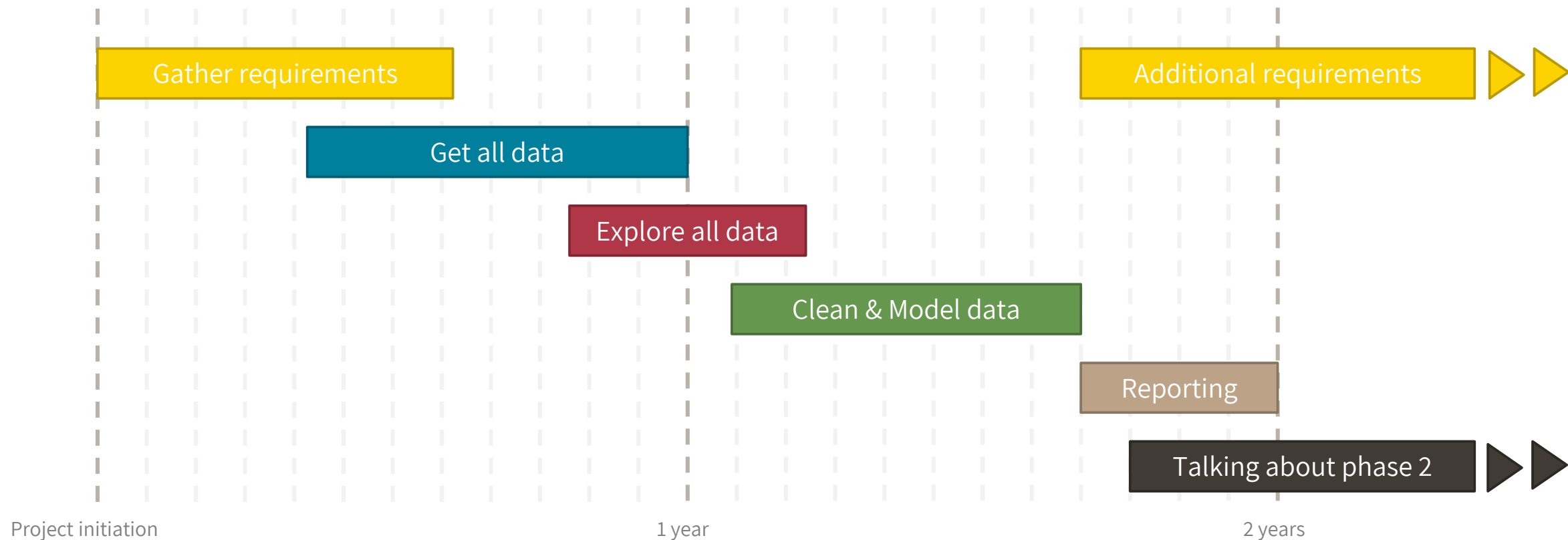
Our way of working



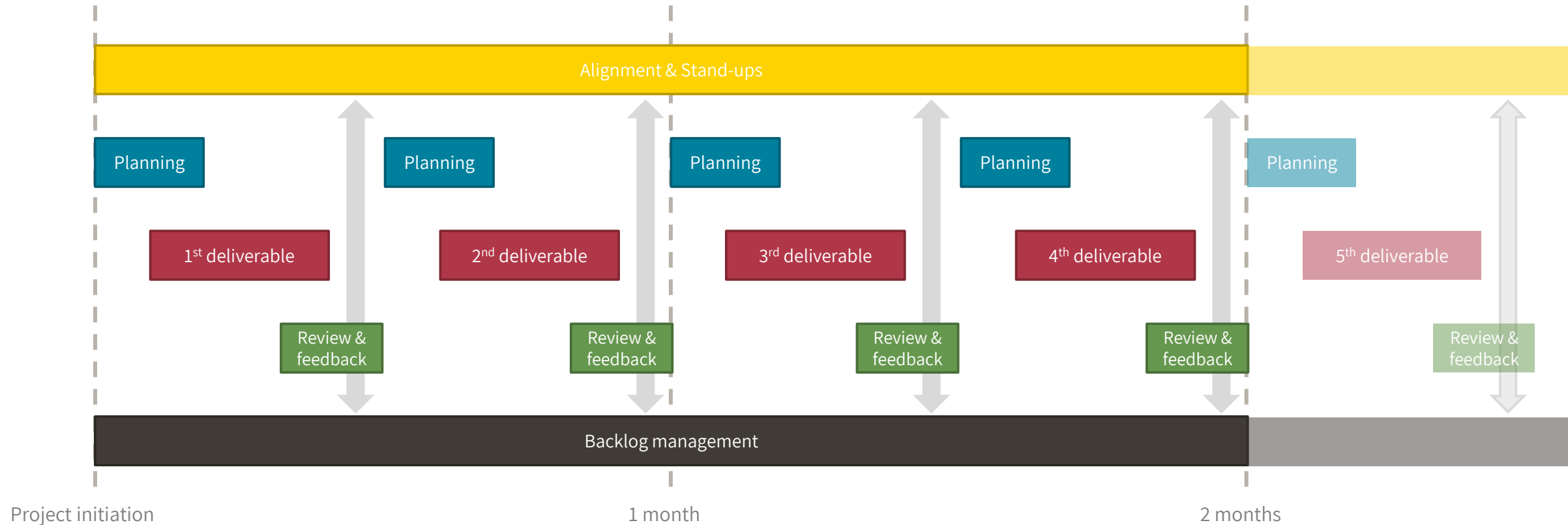
Busy era



Classic approach



Start working agile



The evolution of BI



The evolution of BI

1st wave
Corporate BI

2nd wave
Self-service BI

3rd wave
End user BI

IT to end user


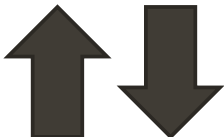

Analyst to end user

Everyone




Self-service vs End-user BI



Deployment scenarios

	Corporate BI	IT-Managed Self-Service BI	Business-Led Self-Service BI
Approach	 Top-Down	 Blended	 Bottom-Up
Data sources	Published by IT	Only governed sources	Any type of data source
Ownership	Fully supported by IT	IT for data model, Business for reports	Business supports all elements of the solution
Governed by	IT	IT for data, business for reports	Business
Usage scope of business	Only use of content	Creation of (custom) reports and dashboards	Data prep, modelling, reports and dashboards
Endorsement	Certified	Promoted	None

Deployment scenarios

	Corporate BI	IT-Managed Self-Service BI	Business-Led Self-Service BI
Approach	 Top-Down	 Blended	 Bottom-Up
Data sources	Published by IT	Only governed sources	Any type of data source
Ownership	Fully supported by IT 100%	IT for data modelling Business for support 50/50	Business supported by IT element of self-empowerment 100%
Governed by	IT IT-Driven	IT for data, business for reports	Business Business Driven
Usage scope of business	Only use of content	Creation of (custom) reports and dashboards	Data prep, modelling, reports and dashboards
Endorsement	Certified	Promoted	None

Today's challenges

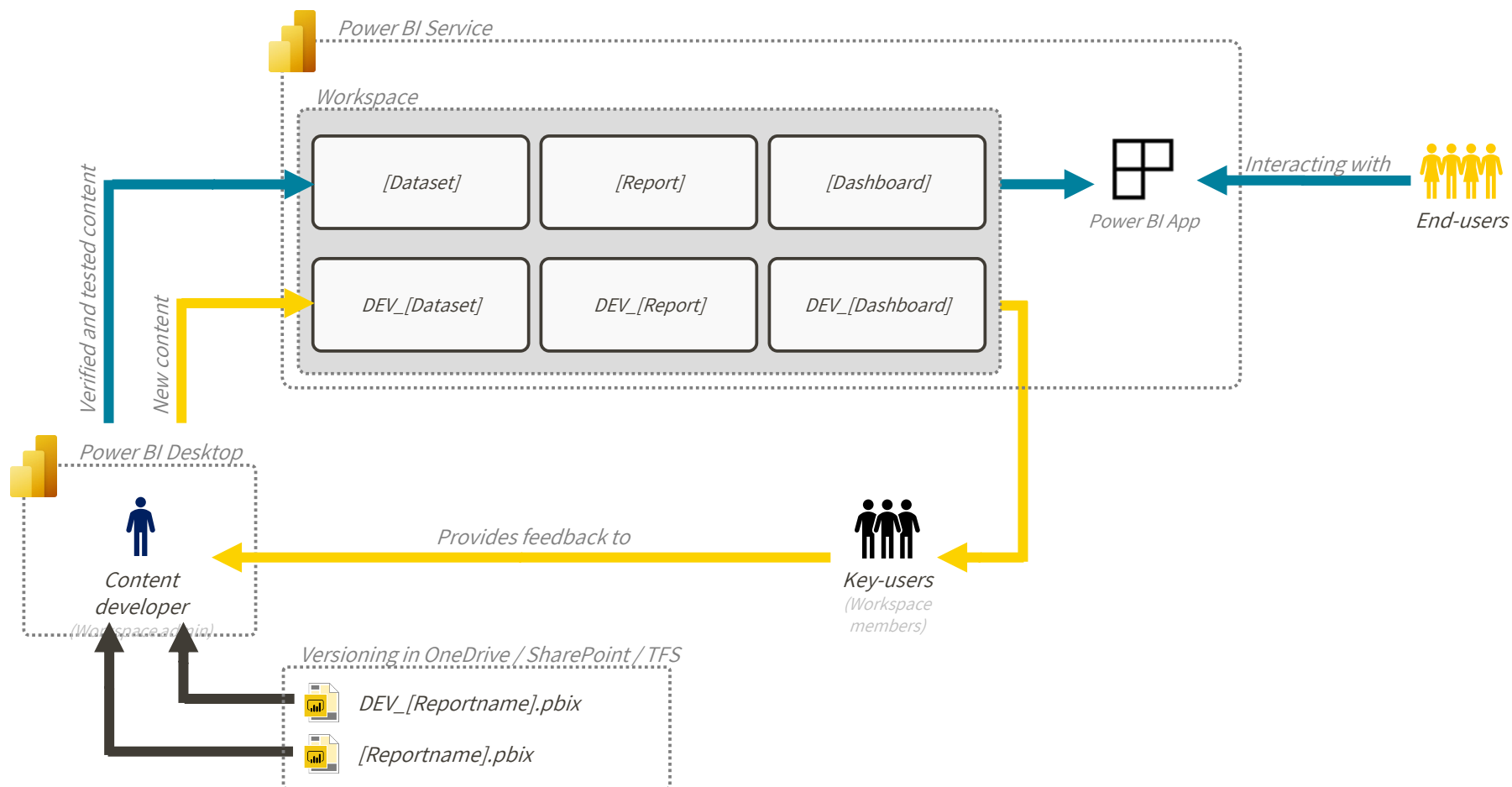
- Growing demand for BI
- Shorter time from ideation to delivery
- Faster development
- No room for mistakes
- More professional way to manage our content
- Structure and standardization



The background of the slide features a grayscale silhouette of two construction workers inside a building's steel framework. One worker on the left is standing and holding onto a horizontal beam with both hands. The other worker on the right is bent over, using a long tool, possibly a shovel or pry bar, on the floor. The steel beams create a complex geometric pattern of triangles and rectangles.

Deployment framework – self service

Deployment scenario (self service scale)



Deployment scenario (self service scale)

Parameters

New

ABC EnvironmentSwitch

Name

EnvironmentSwitch

Description

Switch between Development, Acceptance and Production environment.

☒ Required

Type

Text

Suggested Values

List of values

1	https://
2	https://
3	https://
*	

Default Value

https://

Current Value

https://

OK

Cancel

Settings for Parameterize Datasource

[Refresh history](#)

▶ Gateway connection

▶ Data source credentials

▶ Parameters

EnvironmentSwitch

Switch between Development, Acceptance and Production environment

https://SomeSite.sharepoint.com/sites/Site01/

SwitchFolderLocation

Switchs folders

C:\Users\MarcL\Documents\Study.xlsx

Apply

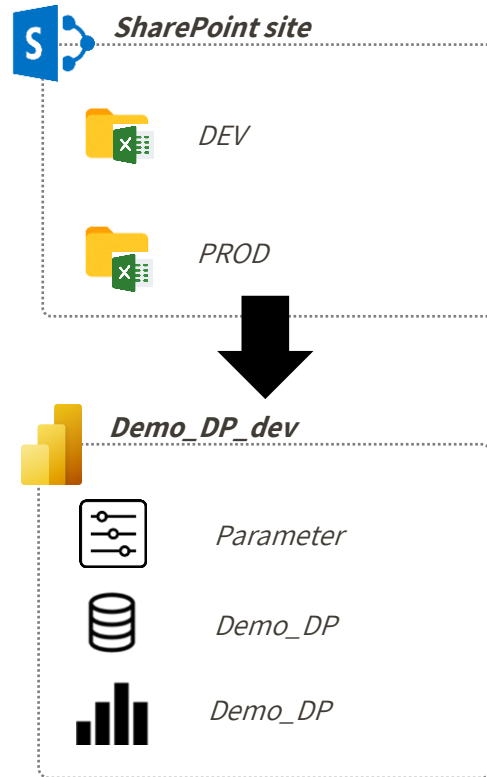
Discard

▶ Scheduled refresh

▶ Q&A and Cortana

▶ Featured Q&A questions

Demo context (self service scale)



Demo time!

Because life is boring without risks





Create a deployment pipeline

Use a pipeline to manage your workspace content through the deployment stages, continuously delivering the latest content to your users.

Deployment Pipelines

1 Create a pipeline

Start by creating the pipeline you'll use for managing and deploying the workspace content

2 Assign your workspace

Select your workspace and assign it to a deployment stage (development, test, or production).

3 Develop and test your content

Manage, preview, and compare your workspace content until its ready for releasing to users

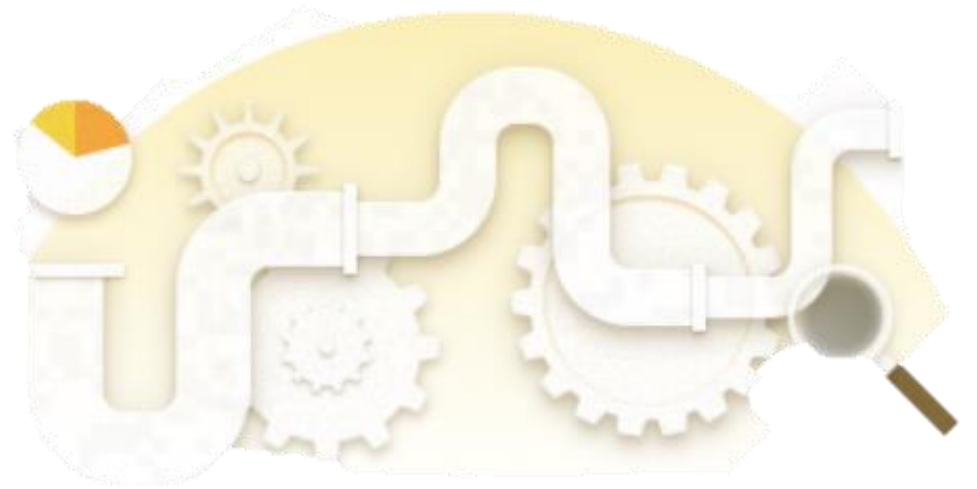
4 Share with your users

Deploy your content to production and share it with your organization

Create a pipeline

How it works

- Meta data deployment
- Incremental (selective) deployment
- Requires Premium!
- No versioning capabilities



Deployment pipeline overview



Pipeline Default Setup

Demo purposes

Deployment history Access Settings

Development [Learn more](#)

Design, review, and revise your content in a development workspace. When it's ready to test and preview, deploy the content to the test stage.

Test [Learn more](#)

Test and verify your content in a preproduction workspace. When it's ready to distribute, deploy the content to the production stage.

Production [Learn more](#)

Your content has been tested and is ready to distribute to your consumers as an app or by access to the production workspace.

ALM - DEV

0 Dataflows 0 Datamarts (Preview) 1 Datasets 1 Reports

Demo_Parameter

Demo_Parameter

Show less ^

[Publish app](#)

[Deploy to test](#)

ALM - Test Deployed: 10/10/2022, 10:56:18 AM

0 Dataflows 0 Datamarts (Preview) 1 Datasets 1 Reports

Demo_Parameter

Demo_Parameter

Show less ^

[Publish app](#)

[Deploy to production](#)

ALM - Prod


0 Dataflows 0 Datamarts (Preview) 0 Datasets 0 Reports


Show more v

[Publish app](#)


[Update app](#)

Deployment settings

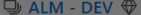
 **Pipeline Default Setup**
Demo purposes


 **Development** [Learn more](#)


Design, review, and revise your content in a development workspace. When it's ready to test and preview, deploy the content to the test stage.


 **Test** [Learn more](#)


Test and verify your content in a preproduction workspace. When it's ready distribute, deploy the content to the production stage.


 **ALM - DEV**


 0
Dataflows

 0
Datamarts
(Preview)

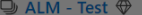
 1
Datasets


 1
Reports


 Demo_Parameter


 Demo_Parameter


Show less ^ [Publish app](#) [Deploy to test](#)


 **ALM - Test** Deployed: 10/10/2022, 10:56:18 AM


 0
Dataflows

 0
Datamarts
(Preview)

 1
Datasets

 1
Reports

 Demo_Parameter

 Demo_Parameter

Show less ^ [Publish app](#) [Deploy to production](#)

← Demo_Parameter

Create rules defining parameter values and data sources for this artifact. These rules will be applied when deploying to this stage. You can go to [artifact settings](#) to edit parameters directly. [Learn more](#)

▾ Data source rules

- ① There may be connections to other dataflows that aren't displayed here. During deployment we'll update these connections for you. You can see all the connections and impacted data sources in the lineage view.

[Open lineage view](#)

No rules were added yet

Define the data source that will be connected to this artifact.

[+ Add rule](#)

▾ Parameter rules

For this parameter

Apply this value

EnvironmentSwitch

/PROD/




















[+ Add rule](#)

- ① Rules will be applied when you deploy to this stage
To edit parameters and data sources directly, go to [artifact settings](#)

Deployment history

All Test Production

All

Deployed to	Date and time	Deployed by	Items	Note	ID	Status
Test	10/10/22, 10:56 AM	 Demo User	<div>+ 2</div>			
Test deployment 10/10/22, 10:56 AM Deployment preparing ALM for Power BI session at DataMinds						
Test	10/08/22, 4:44 PM	 P... (Service Principal)	<div>+ 4</div>			
Test	10/08/22, 4:27 PM	 P... (Service Principal)	<div>= 4</div>			
Test	09/09/22, 9:39 AM	 P... (Service Principal)	<div>= 4</div>			
Test	09/09/22, 9:22 AM	 P... (Service Principal)	<div>= 4</div>			
Test	08/25/22, 3:23 PM	 P... (Service Principal)	<div>+ 2</div> <div>= 2</div>			

Demo time!

Because life is boring without risks



Why you should care about Power BI Deployment Pipelines

ON [JULY 9, 2020](#) / BY [MARC](#) / IN [POWER BI PREMIUM](#), [POWER BI SERVICE](#) / [EDIT](#)

After a short holiday break, it is time for a new blog post! This time about one of the most exciting functionalities in Power BI that has been released in the past release wave, Power BI Deployment Pipelines!

In this blog I will elaborate on what Power BI Deployment Pipelines are, why it is an important part of your landscape and a comparison to other options you

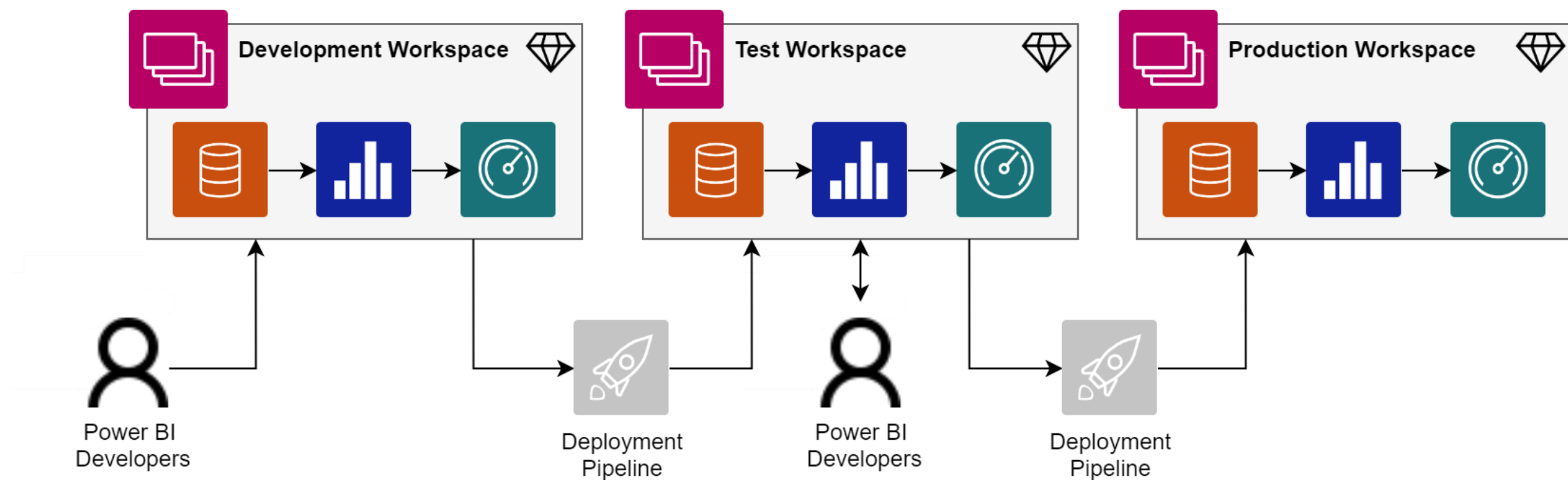
SEARCH



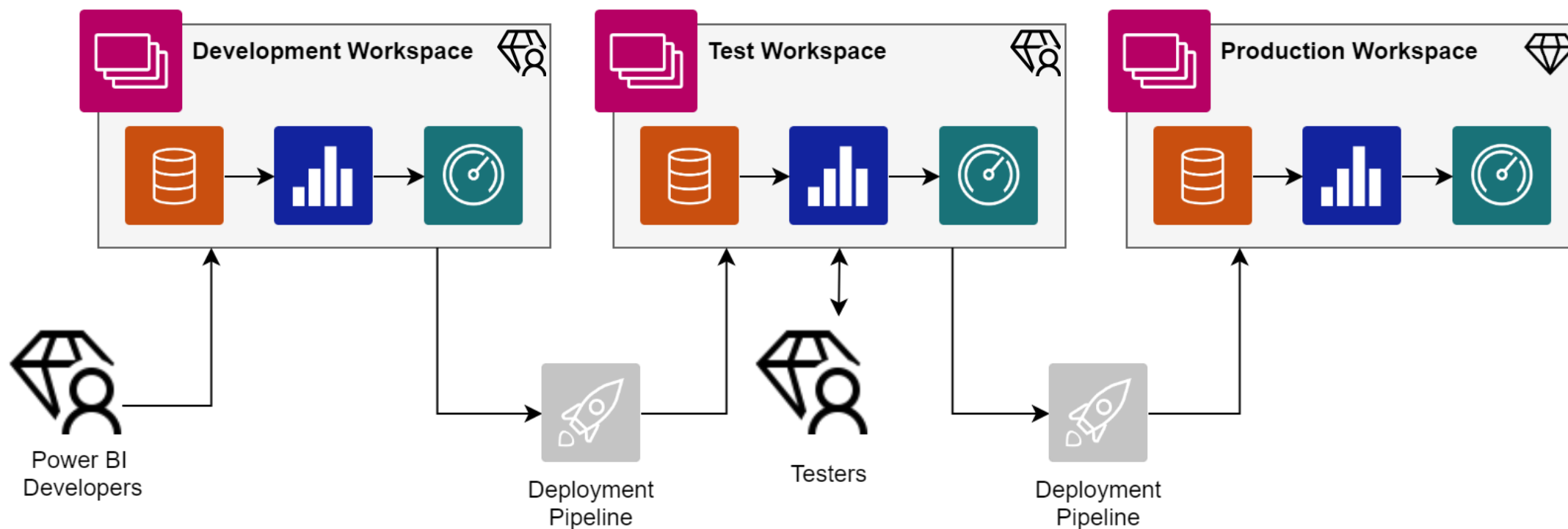
YOU ARE FOLLOWING THIS BLOG

Enter your email address to follow this blog and receive notifications of new posts by email.

Default setup



Possible option to lower capacity allocation



Data – Marc

Blogging about everything related to Data and AI based on Microsoft technology

[Home](#) / [About me](#) / [Shop Power Bler swag!](#) / [Speaking & Events ▼](#) / [Contact](#)

Leverage Power BI Deployment Pipelines with Premium per user licensing

ON [OCTOBER 5, 2020](#) / BY [MARC](#)

/ IN [DEVELOPING](#), [POWER BI PREMIUM](#), [POWER BI SERVICE](#)

At Microsoft Ignite, there were two really exciting announcements when it comes to enterprise features for Power BI. Both directly took my attention, as well as for many others. Obviously, the first one is Power BI Premium per user (PPU) licensing. Secondly, Deployment Pipelines reached General Availability!

Two super important features for enterprises and the maturity of Power BI! Let's have a look at both announcements and how these announcements together will have a massive impact!

SEARCH



YOU ARE FOLLOWING THIS BLOG

Enter your email address to follow this blog and receive notifications of new posts by email.

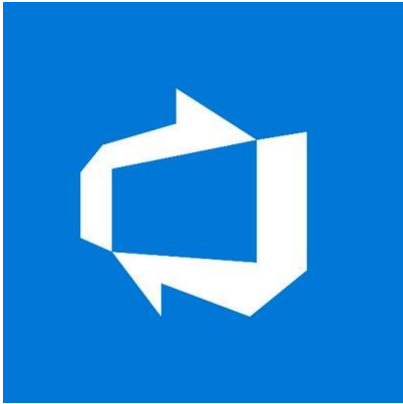
FOLLOW

Join 3,050 other followers

Integrate Power BI Deployment Pipelines with Azure DevOps



Deployment scenario (at enterprise scale)



Azure DevOps



Power BI Service

Azure DevOps



Azure Boards

Deliver value to your users faster using proven agile tools to plan, track, and discuss work across your teams.



Azure Test Plans

Test and ship with confidence using manual and exploratory testing tools.



Azure Pipelines

Build, test, and deploy with CI/CD that works with any language, platform, and cloud. Connect to GitHub or any other Git provider and deploy continuously.



Azure Artifacts

Create, host, and share packages with your team, and add artifacts to your CI/CD pipelines with a single click.



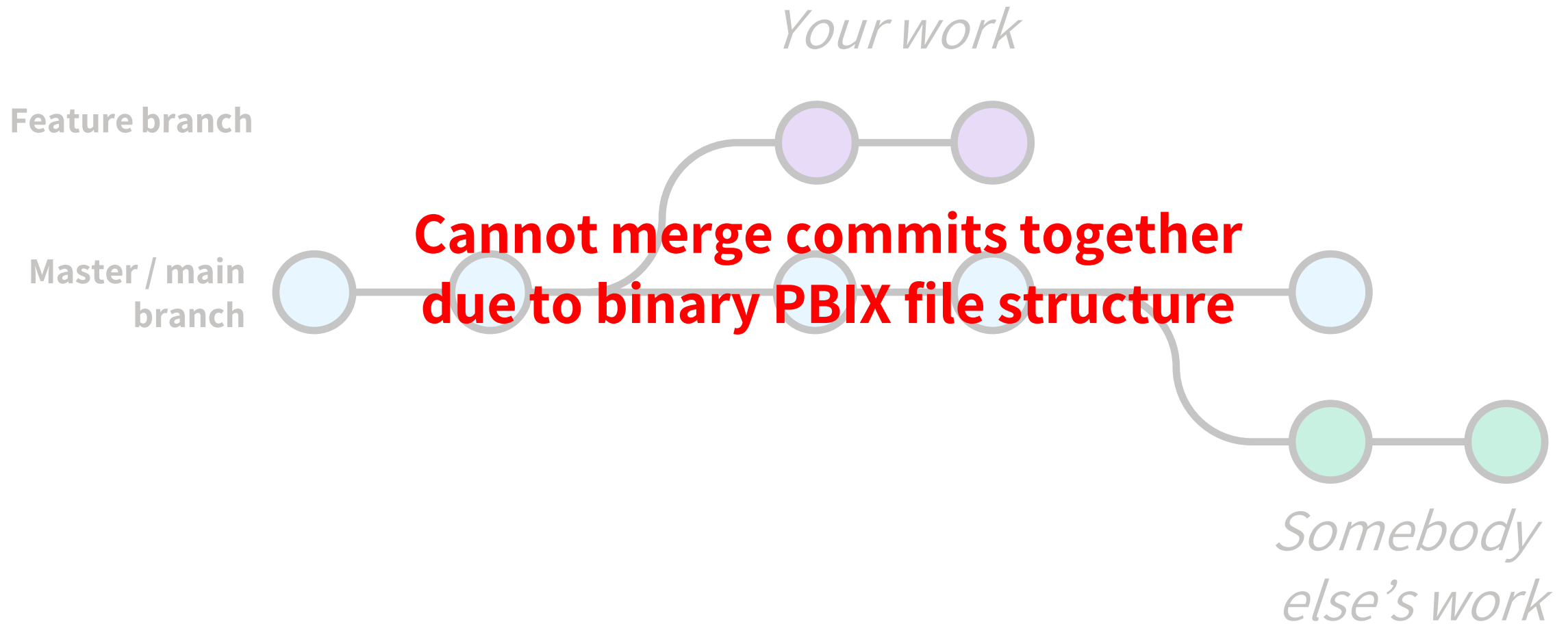
Azure Repos

Get unlimited, cloud-hosted private Git repos and collaborate to build better code with pull requests and advanced file management.

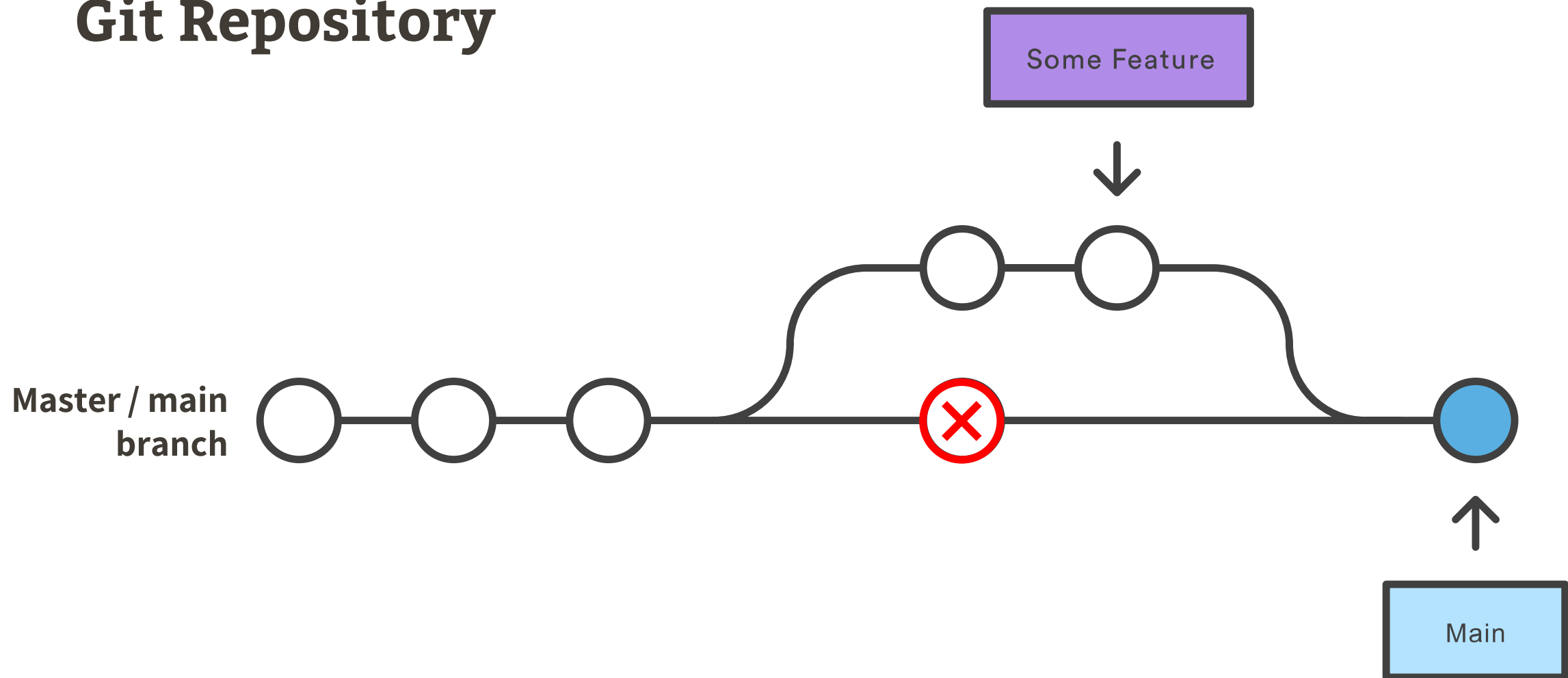
Extensions Marketplace

Access extensions from Slack to SonarCloud to 1,000 other apps and services—built by the community.

Git Repository



Git Repository



How to deal with Power BI files?



PBIX is binary – hard to track changes



PBIX can become extremely large – if it includes data



Don't want to store any secrets or passwords
(e.g. to data sources)

Azure DevOps



Repository

```
1 import React from 'react';  
2 import ReactDOM from 'react-dom';  
3 import App from './App';
```

CI/CD pipeline



Code

PackageFramework master

Pushed

5 min ago



Build

mobile-tests

Succeeded

1 min ago



Production

web-deploy

In Progress

1 min ago



Azure resources


<http://fabrkiamfiber.azurewebsites.net>



Azure Pipelines

Power BI REST API


HTTP

 Copy

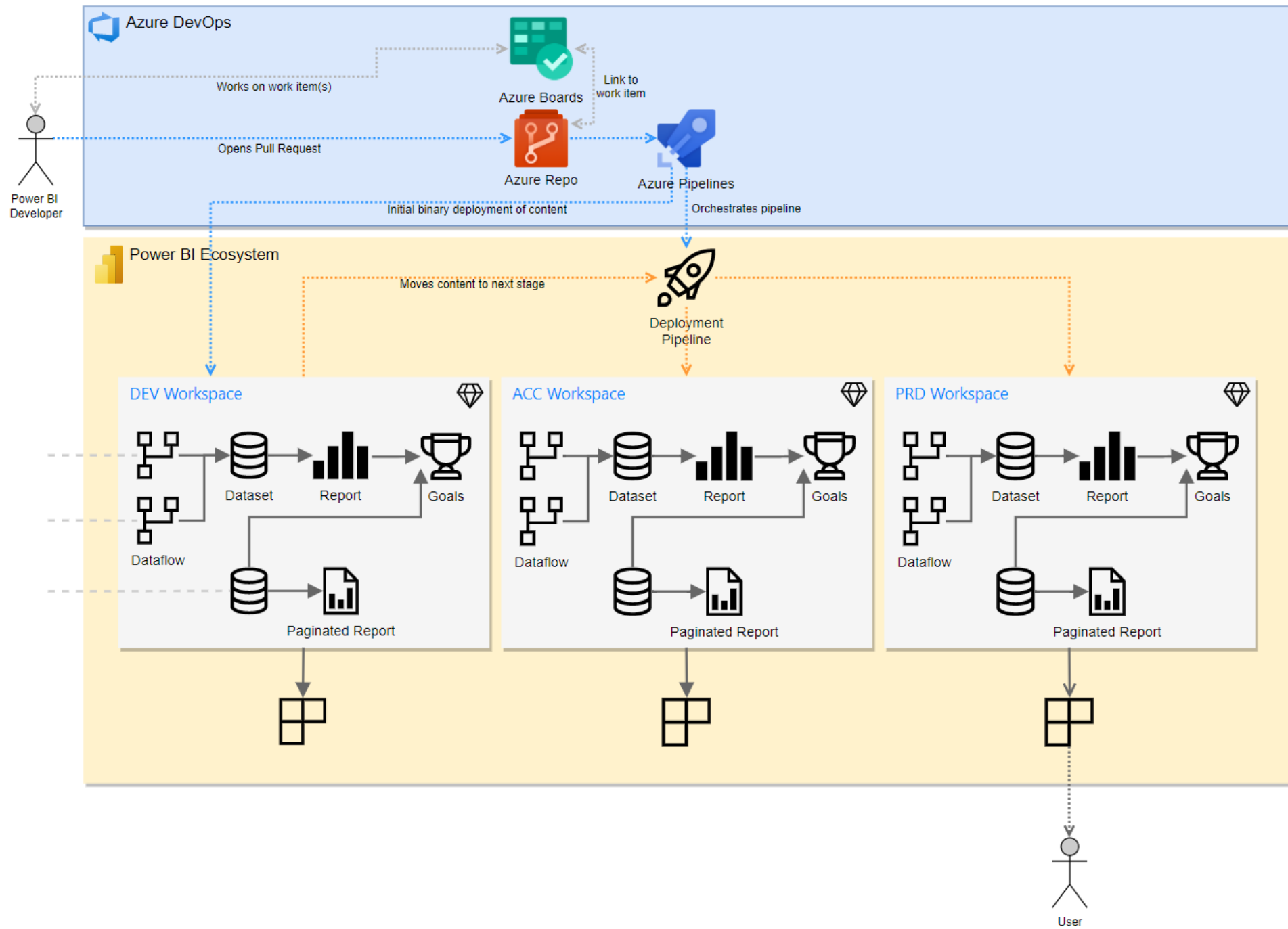
POST <https://api.powerbi.com/v1.0/myorg/pipelines/a5ded933-57b7-41f4-b072-ed4c1f9d5824/deployAll>

Request

JSON

 Copy

```
{
  "value": [
    {
      "id": "1065e6a3-a020-4c0c-ada7-92b5fe99eec5",
      "type": "Deploy",
      "status": "NotStarted",
      "lastUpdatedTime": "2020-12-13T09:26:43.153",
      "executionStartTime": "2020-12-13T09:25:43.153Z",
      "executionEndTime": "2020-12-13T09:26:43.153Z",
      "sourceStageOrder": 0,
      "targetStageOrder": 1
    }
  ]
}
```



How to get the files in the repo?

Command line

```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.19044.2006]
(c) Microsoft Corporation. All rights reserved.

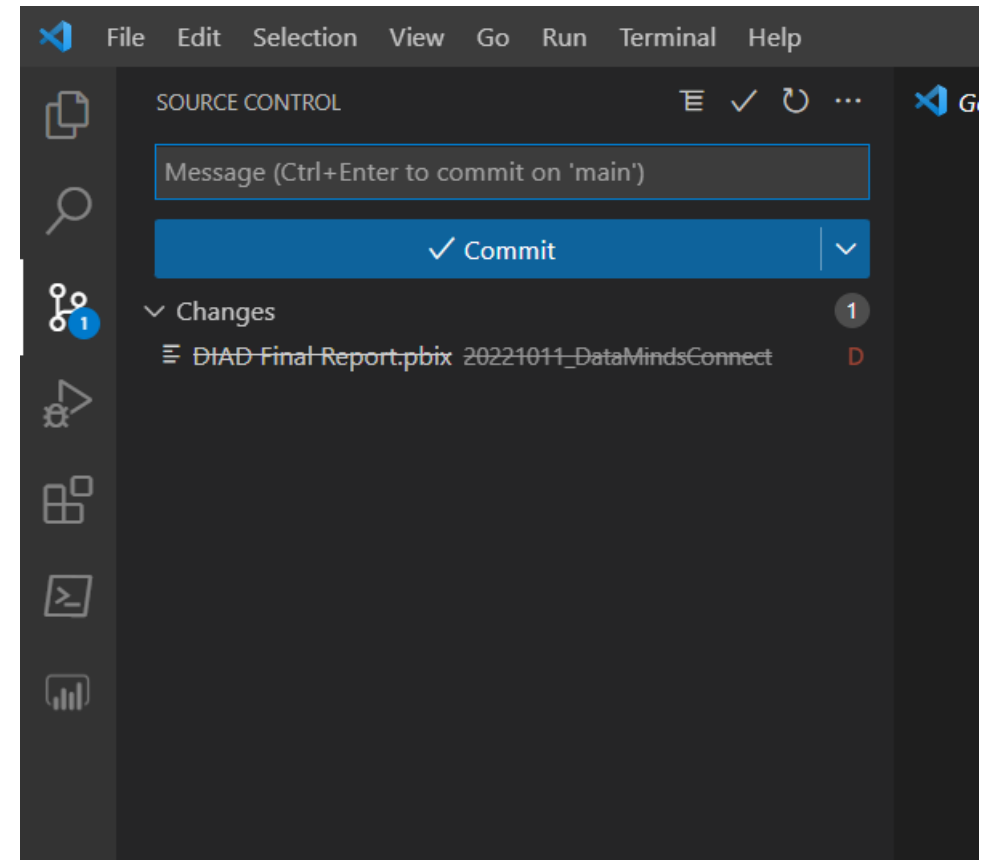
C:\Git\PBI%20Deployment%20Pipeline>git status
On branch main
Your branch is up to date with 'origin/main'.

Changes not staged for commit:
  (use "git add/rm <file>..." to update what will be committed)
  (use "git restore <file>..." to discard changes in working directory)
        deleted:    20221011_DataMindsConnect/DIAD Final Report.pbix

no changes added to commit (use "git add" and/or "git commit -a")

C:\Git\PBI%20Deployment%20Pipeline>git add .
```

Visual Studio Code



Demo time!

Because life is boring without risks



Things to keep in mind

Make sure permissions are set correctly!

- Add the Service principal to each stage workspace and the deployment pipeline itself
- Grant delegated API permissions to the service principal in AAD (Pipelines & workspace permissions)

Get the DevOps extension

- Macaw extension for binary file upload for dev + pipeline tasks
- Microsoft extension if you prefer MSFT managed task, but does not support binary file upload



Macaw Power BI Extensions

Macaw | 📦 969 installs | ★★★★★ (1) | Free

Power BI release manager tasks for VSTS.

Get it free

Overview | Q & A | Rating & Review

Macaw Power BI Extensions is a Build and Release Task for Azure Pipelines. With this tasks you can control your Power BI deployment in Azure DevOps

Actions that can be performed with this extension are:

- Group tasks
 - Create or Update Power BI workspace
 - Delete Power BI workspace
 - Write all workspace info to JSON logfile
- Report tasks
 - Create or Update Power BI Report
 - Delete Power BI Report
 - Delete Power BI DataSet
 - Update the datasources of the specified dataset
 - Update the parameters values for the specified dataset

For the custom task to work as it should, you need to configure the following parameters:

- ClientId: The client id of the native Azure Active Directory application. This application should have the appropriate rights in order to use the Power BI Api. To register an application, check the following URL: [Register an Azure AD app to embed Power BI content](#)
- Username: The username of the user that will perform the actions. Make sure the account does not have Multi

Agent phase

Run on agent



Power BI Group Tasks: CreateWorkspace

Power BI: Group Tasks



Power BI Report Task: CreateReport

Power BI: Report Tasks



Power BI Report Task: UpdateParameter

Power BI: Report Tasks

Categories

Azure Pipelines

Works with

Azure DevOps Services

Azure DevOps Server

Resources

[License](#)



Power BI automation tools

Microsoft | 📦 2,334 installs | ★★★★★ (0) | Free

Automate release management tasks related to Power BI deployment pipelines

Get it free

Overview

Q & A

Rating & Review

The Power BI [deployment pipelines](#) tool enables BI teams to build an efficient and reusable release process for their Power BI content. You can leverage the tasks in this Azure DevOps extension to integrate Power BI into your organization's automation process. Here are a few examples of what can be done using the extension:

- Manage Power BI pipelines from start to finish, including creating a pipeline, assigning a workspace to any stage, deploying and deleting the pipeline.
- Assign users to a pipeline.
- Assign users to a workspace.
- Deploy all/selected items in a Power BI pipeline to the next stage.

Learn more about using these tasks [here](#).

To get started with deployment pipelines, learn more [here](#).

Release Notes

Version	Remarks
1.0.2	Public preview release.

Add tasks

🔄 Refresh



Delete a deployment p

Delete a Power BI deployment

Categories

Azure Pipelines

Tags

dataset

Deployment Pipelines

PBIX

Power BI

release

Utility task

Works with

Azure DevOps Services

Data – Marc

Blogging about everything related to Data and AI based on Microsoft technology



Integrate Power BI Deployment Pipelines with Azure DevOps

ON [JUNE 4, 2021](#) / BY [MARC](#)

/ IN [AZURE](#), [DEVELOPING](#), [POWER BI REST API](#), [POWER BI SERVICE](#), [POWERSHELL](#),
[XMLA ENDPOINTS](#)

Back in 2019, [Ton Swart](#) and I wrote a blog post on [Versioning and CI/CD for Power BI with Azure DevOps](#). Back then, there were not many options available for versioning and professionalizing your ALM story for Power BI. Till today, this blog post is still my most read blog on Data-Marc.com which makes us proud.

SEARCH



YOU ARE FOLLOWING THIS BLOG

Enter your email address to follow this blog and receive notifications of new posts by email.

Comparison

Functionality	Azure DevOps	Deployment Pipelines	Combined
Working with multiple users	Yes	Yes	Yes
Incremental deployment	No	Yes	Yes
Meta data deployment	No	Yes	Yes
Requires Power BI Premium	No	Yes	It depends
Versioning	Yes	No	Yes
Dataflow support	Yes	Yes	Yes
Integration with other processes	Yes	No	Yes
Customization	Yes	No	Yes

Wrap up

Professionalize your deployment process

Easy **roll-back** within pipelines

Versioning can be achieved with Git

Deployment pipelines is cool! But integration with **DevOps** is even more powerful

Combine them, as they are **better together!**

LET'S
RECAP...

Thanks for attending!

<https://data-marc.com/?s=Deployment>



Marc Lelijveld

Data & Analytics consultant
Macaw Netherlands



✉ Marc.Lelijveld@outlook.com

🐦 [@MarcLelijveld](https://twitter.com/MarcLelijveld)

in linkedin.com/in/MarcLelijveld

🌐 Data-Marc.com

Session Feedback



https://bit.ly/dMC2022_SessionFeedback