Power BI World Tour 18

Eight Cities. Four Months. Thousands of Users.

PowerBIWorldTour.com

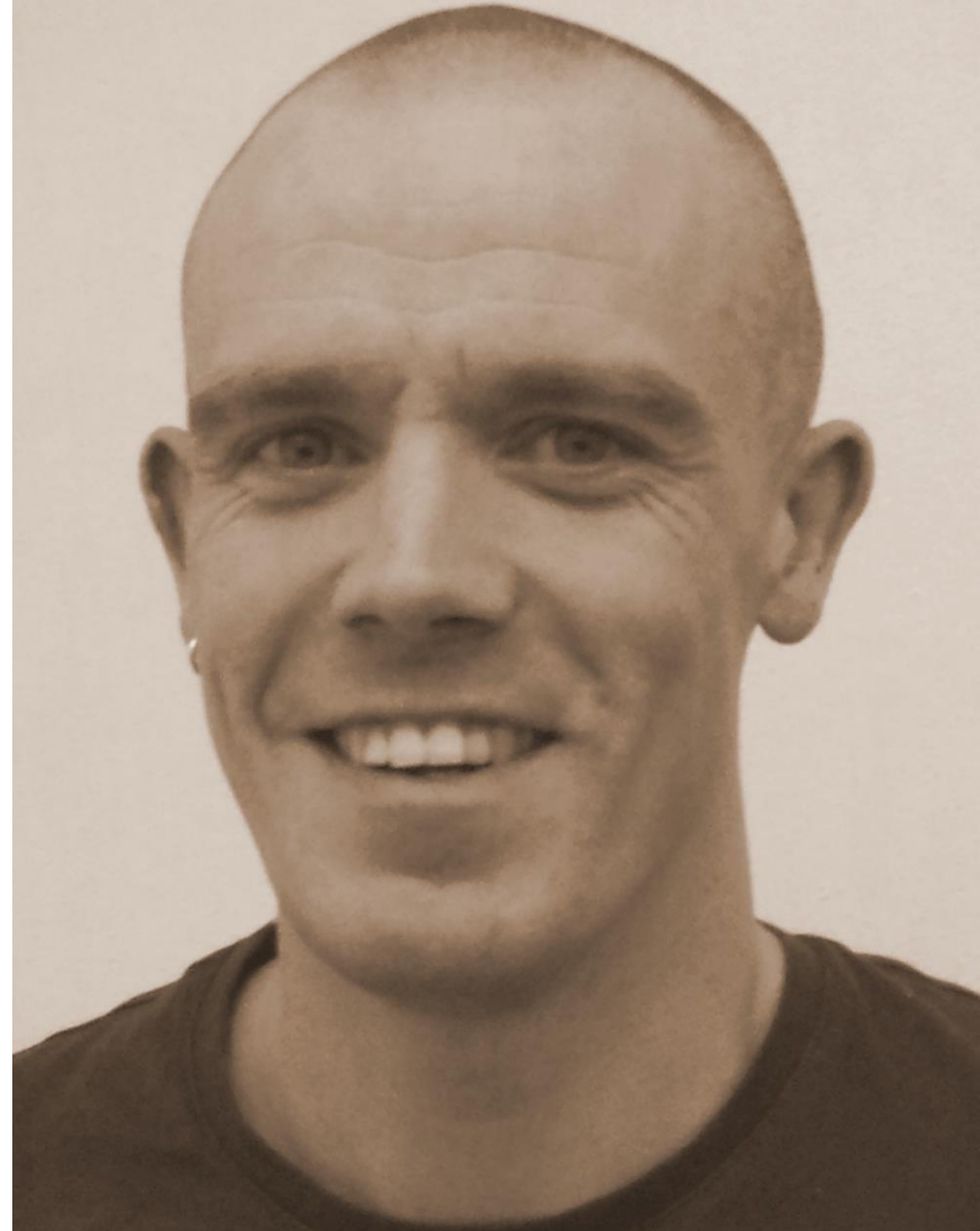#PBIWorldTour

Power BI Embedded

Just Thorning Blindbæk
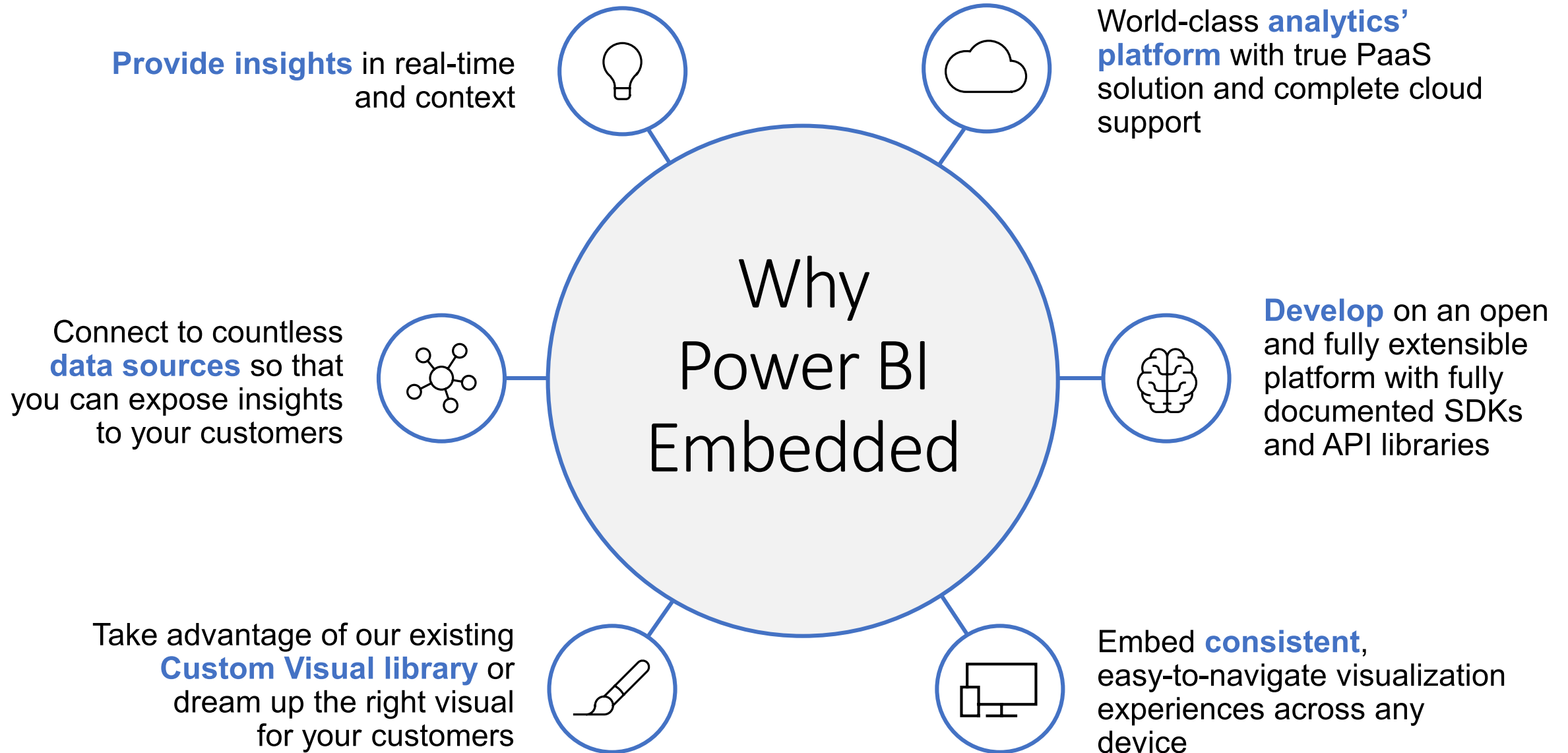
Power BI World Tour 18

Just Blindbæk

- Microsoft BI consultant at justB

- Trainer at Orange Man

- Founder of MsBIP.dk

- Worked with Microsoft BI in 11 years

- Strong focus on the front-end
  - Analysis Services
  - Reporting Services
  - PerformancePoint Services
  - Excel and Power Pivot
  - Power BI

Session objectives and takeaways

- Why embed

- Embedding options

- Get started

- Authorization and security

- Licensing

Provide insights in real-time and context

World-class analytics' platform with true PaaS solution and complete cloud support

Connect to countless data sources so that you can expose insights to your customers

Why Power BI Embedded

Develop on an open and fully extensible platform with fully documented SDKs and API libraries

Take advantage of our existing Custom Visual library or dream up the right visual for your customers

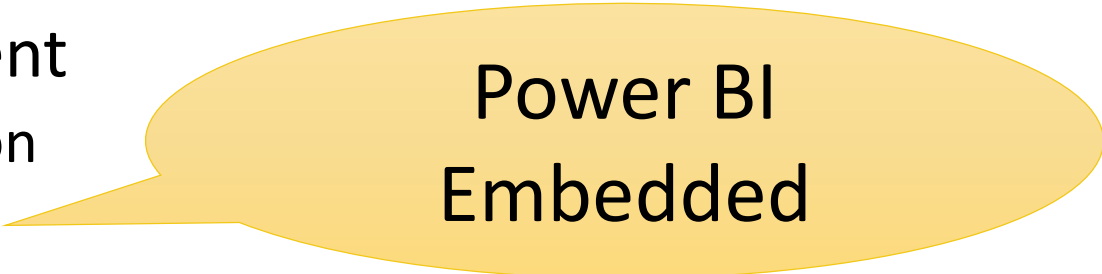Embed consistent, easy-to-navigate visualization experiences across any device

What can be embedded?

- Reports
  - View—edit or create
  - Fully interactive
- Report visuals
  - View
  - Fully interactive

- Dashboards
  - View—any interaction must be developed
  - Real-time dashboards
- Dashboard tiles
  - View—but no interaction
  - No support for real-time tiles
- Q&A experience
  - Can be interactive (like in service), or
  - Visual response only

Embedding options

- Publish to web

- SharePoint Online Web Part

- REST API / Custom development
  - Embedding for your organization
  - Embedding for your customers

Power BI Embedded

Embedding scenarios – Internal App

- Also known as
  - User owns data
  - Embedding for your organization
- Extend the Power BI service
  - Embed into a custom UX
- Supports single sign-on (SSO) and row-level security
- Capacity not required

Embedding scenarios – External App

- Also known as
  - App owns data
  - Embedding for your customers
- App authenticates users with its own identity store
- App users do not require a Power BI account or license
- Supports row-level security
- Suitable for external customers and business partners
- Capacity required for production

Demo: Microsoft Power BI Embedded Playground
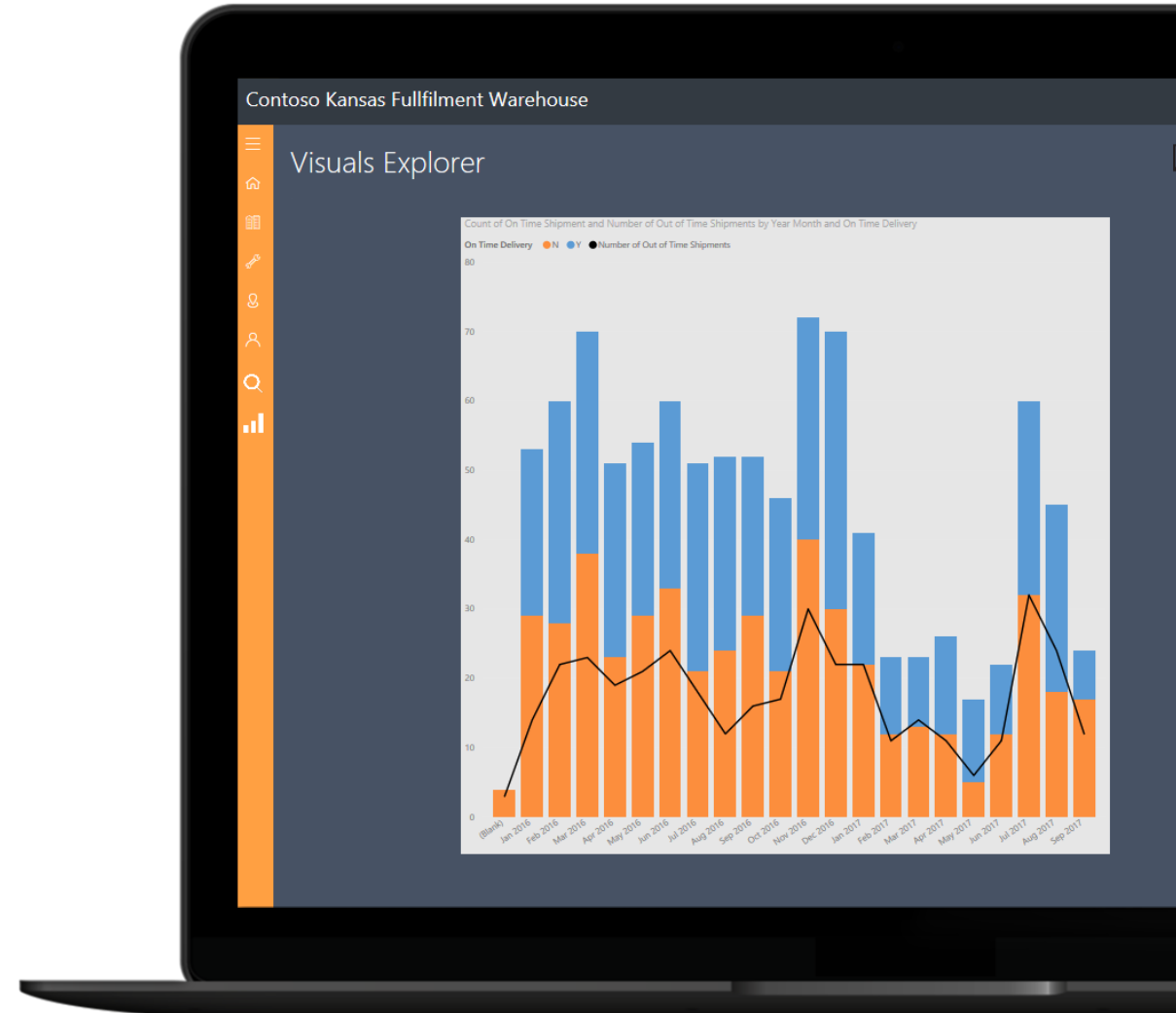
Latest JavaScript API capabilities

Visual embedding + custom layout

Scenario

ISV wants to embed visuals in his app, and have the ability to optimize size and location.

Enabled capabilities

> Show/ hide specific visuals in a page.

> Set their size and location in real-time.

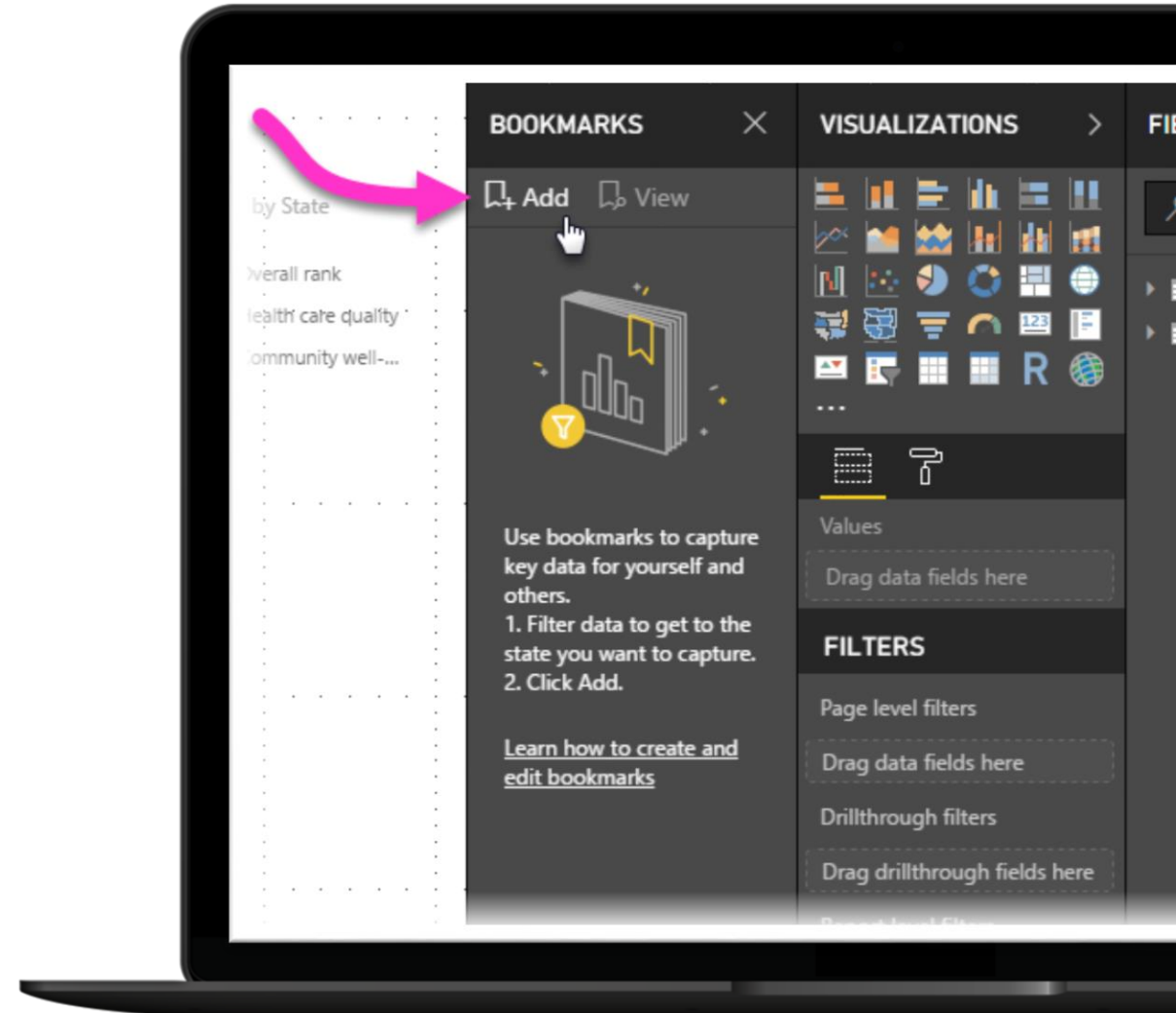> Update visibility and sizes during session.

> Visuals level API

Bookmarks API

Scenario

ISV wants to use bookmarks on his embedded reports.

Enabled capabilities

- Get bookmarks list
- Apply bookmarks – on load, during session
- Show/Hide/ Nav pane
- 'Bookmark applied' event
- Capture state as bookmark (Personalization)

Mobile support

Scenario

ISV wants to embed reports on his mobile app, and give his users a better experience when engaging with reports.

Enabled capabilities

- Embed report pages in mobile layout
- Support 'Swipe' & 'Zoom' events

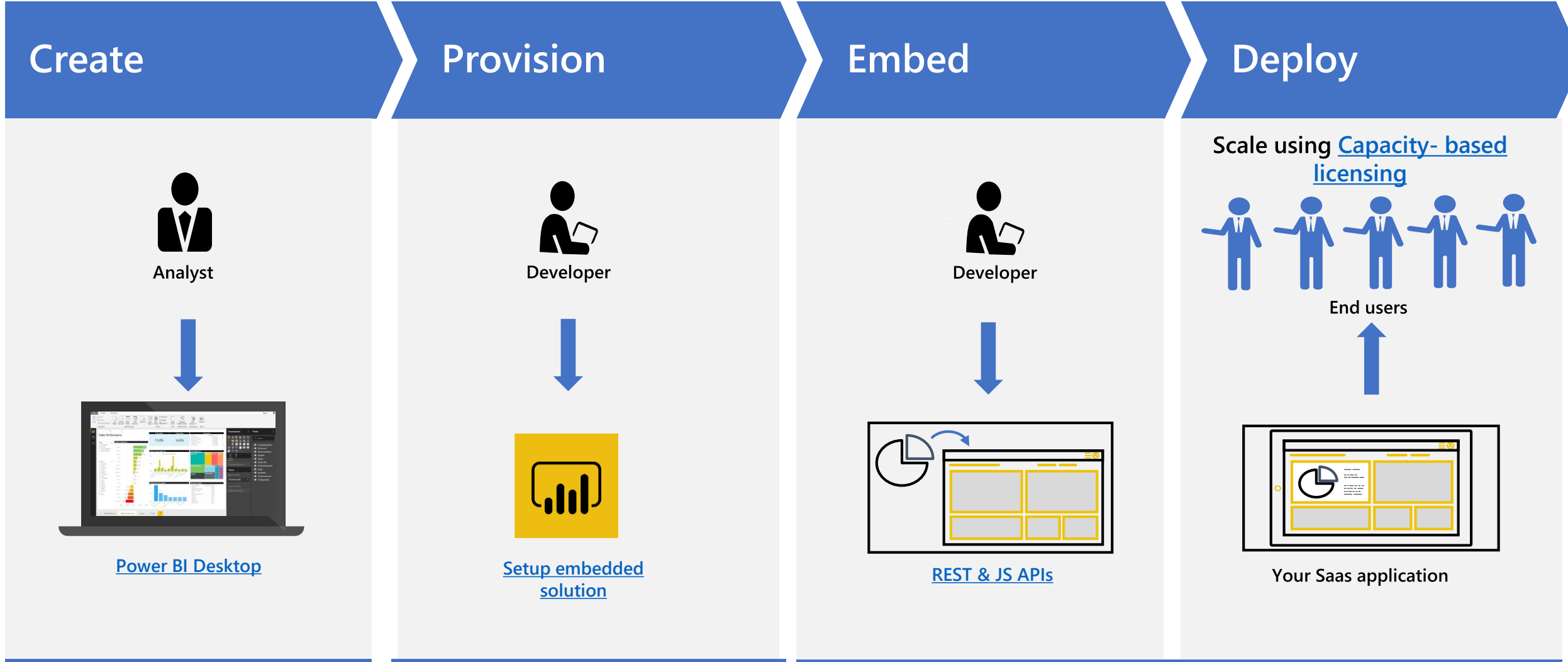# Demo: Microsoft Power BI Embedded Playground showcases

Power BI Embedded in Azure

- Management of your capacities (create, delete, update, pause, resume).

- Metrics

- Alerts

- Diagnostics

- Billing information

Demo: Power BI Embedded in Azure

How to start

How to start with Power BI Embedded?

Create	Provision	Embed	Deploy

Create

Analyst

[Power BI Desktop](#)

Provision

Developer

[Setup embedded solution](#)

Embed

Developer

[REST & JS APIs](#)

Deploy

Scale using [Capacity- based licensing](#)

End users

Your Saas application

Developing your app

1. Create app workspace

2. Add Power BI content

3. Register application in Azure AD

4. Import NuGet packages

5. Add app settings

6. Develop Web UX

7. Enhance Web UX

Developer

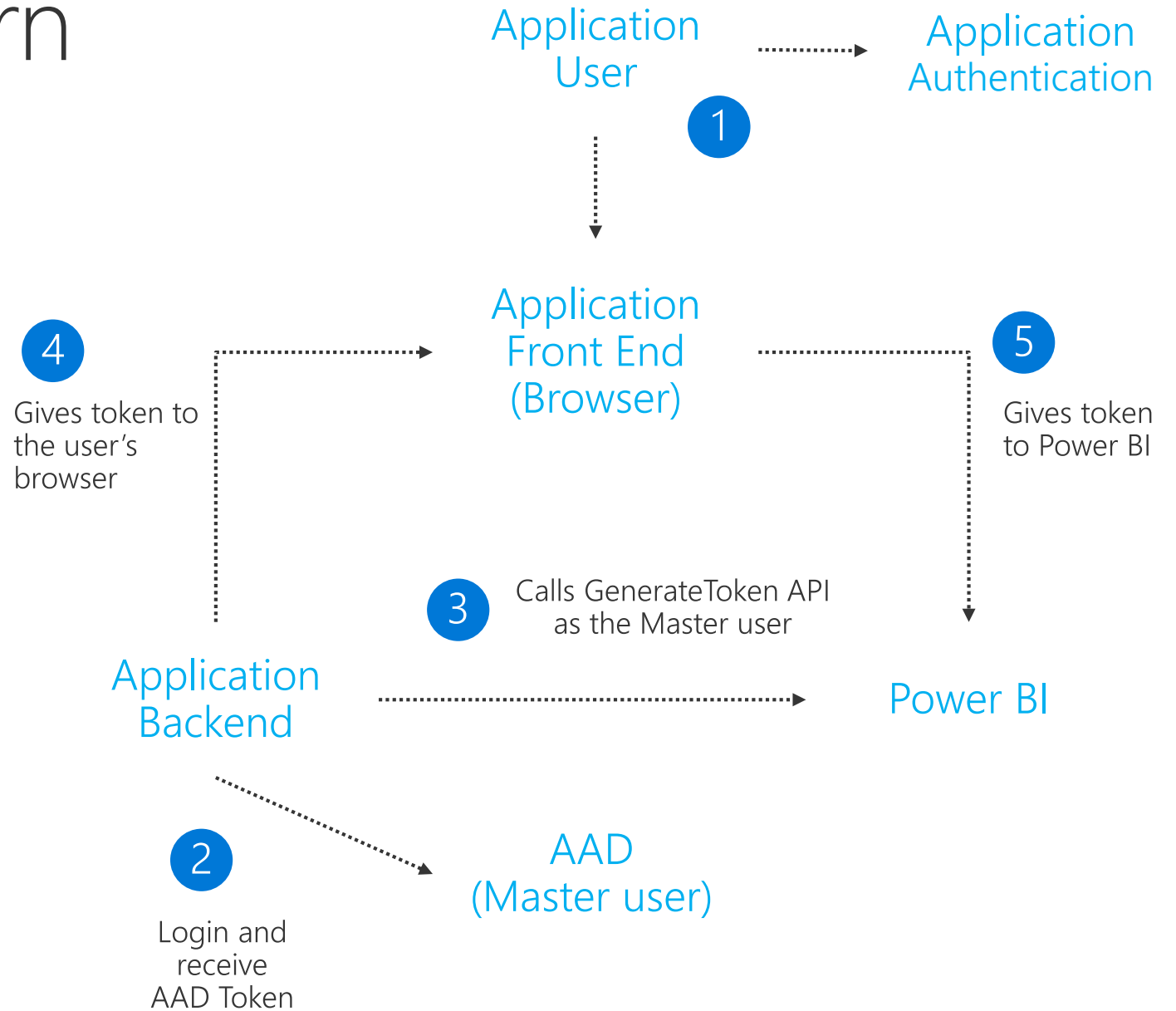Developer

Demo: New setup page

Authorization pattern

Access to Power BI is through a "Master Account"

- AAD Account **internal** to your application
- Has a **Power BI Pro** license
- **Owns** the App Workspace where content is stored

Application is responsible for Authenticating the user

- Can use any authentication method

Application authorizes access to Power BI using token created with the GenerateToken API

Application User

Application Authentication

1

Application Front End (Browser)

5

4
Gives token to the user's browser

Gives token to Power BI

Application Backend

3 Calls GenerateToken API as the Master user

Power BI

2
Login and receive AAD Token

AAD (Master user)

Tokens

Auth Token

Embed Token

Auth token

- Authenticating to the Azure Active Directory Tenant

- Account has to have a Power BI license

- Requires registered App

- Application ID (also called Client ID)

- Can be done with REST API (2-step process)

  - Request Authorization code
 - Request access token

Embed Token

- Power BI token

- Created with Auth Token

- GenerateToken() in Power BI REST API

- Token determines

  - Which resource can be accessed

  - Access level

  - How long it can be accessed

  - Identities information for Row-Level Security (RLS)

- Application can silently refresh embed token when it expires

One token per piece of content

Row - level security

Report	+	Token	=	Query + Predicate
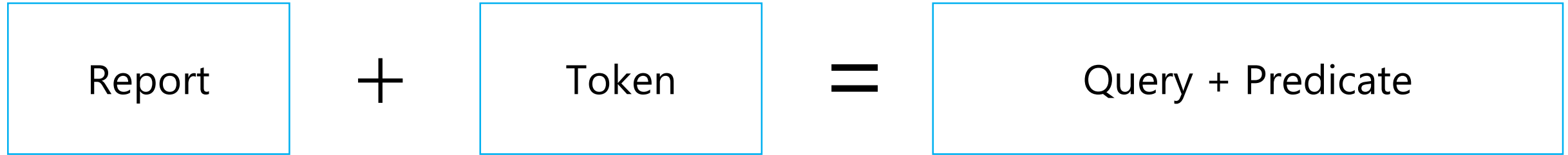
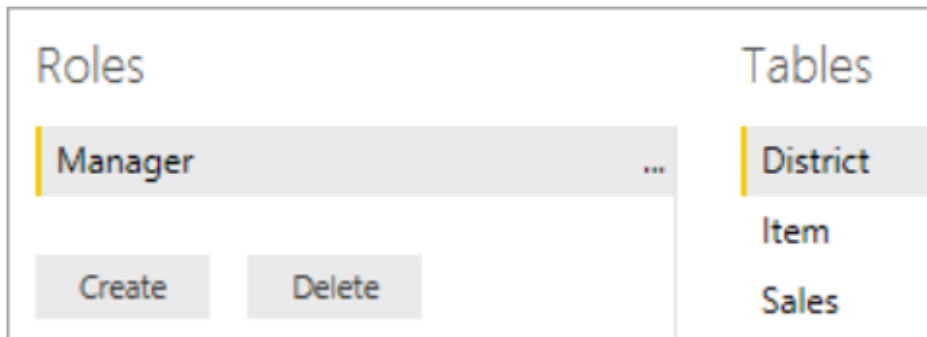|	Defines Roles Roles define predicates	Asserts Role Membership Asserts Identity	Query executes with correct scope
Ex.1	Role: Fabrikam Predicate: [Company] = "Fabrikam"	roles: "Fabrikam"	Select * FROM [Sales] WHERE [Company] = "Fabrikam"
Ex. 2 *	Role: Company Predicate: [Company] = USERNAME()	roles: "Company" username: "Fabrikam"	SELECT * FROM [Sales] WHERE [Company] = "Fabrikam"

Define roles on Power BI desktop

1. Go to 'Manage Roles'

2. Create a new 'Role' and define the rule

Demo: Customer case

Licensing

Capacity

	A SKU	EM SKU	P SKU
Product	Power BI Embedded	Power BI Premium	Power BI Premium
Purchase	Azure portal	Office 365	Office 365
Use cases	• Embed content in apps	• Embed content in apps • Share content with Power BI free users outside the Power BI portal • Embed in other SaaS apps (SharePoint, Teams)	• Same as EM SKU, plus: • Share content with Power BI free users through the Power BI portal
Billing	Hourly	Monthly	Monthly
Commitment	None	Yearly	Monthly/Yearly
Difference	Full elasticity: scale up, scale down, pause, resume. ARM API with PowerShell.	Can be used to embed content in SharePoint Online and Microsoft Teams	Combine embedding in apps, and use the Power BI Service in the same capacity. Power BI Report Server included.

Licensing – external app embedding

Name	Virtual Cores	Memory	Peak Renders per hour
Power BI Embedded A1	1	3 GB RAM	1–300
Power BI Embedded A2	2	5 GB RAM	301–600
Power BI Embedded A3	4	10 GB RAM	601–1,200
Power BI Embedded A4	8	25 GB RAM	1,201–2,400
Power BI Embedded A5	16	50 GB RAM	2,401–4,800
Power BI Embedded A6	32	100 GB RAM	4,801–9,600

Developer resources

Developer Center	https://powerbi.microsoft.com/en-us/developers/
App Samples	https://github.com/microsoft/powerbi-developer-samples
Playground	https://aka.ms/pbijs
Power BI REST API	https://docs.microsoft.com/en-us/rest/api/power-bi/
Power BI JavaScript	https://github.com/Microsoft/PowerBI-JavaScript/wiki
Setup embedding	https://app.powerbi.com/embedsetup
Developer blog	https://powerbi.microsoft.com/en-us/blog/category/developers/