Microsoft

Microsoft Build

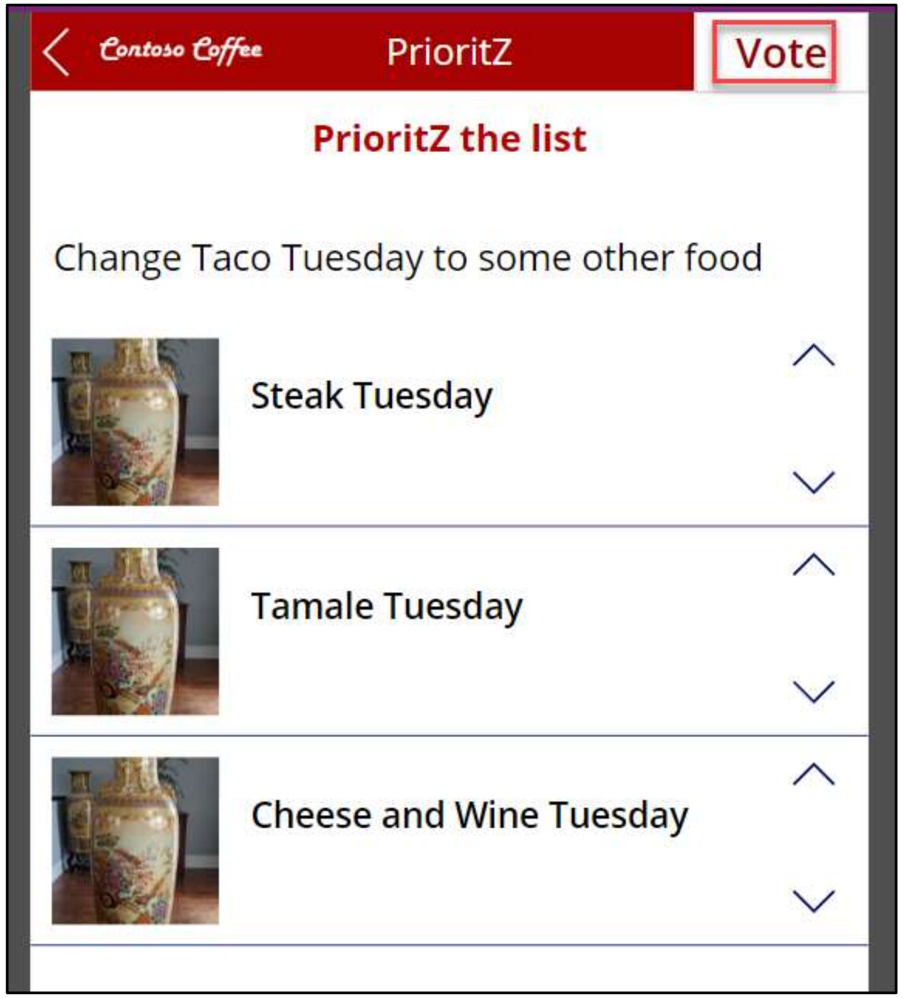
Microsoft

Power Up Low Code with Pro Code

April Dunnam, Principal Cloud Advocate, Microsoft
Greg Hurlman, Senior Software Developer, Microsoft

Workshop Material: aka.ms/BuildPRE07

What we'll be covering



PrioritZ the list

Change Taco Tuesday to some other food

Steak Tuesday

Tamale Tuesday

Cheese and Wine Tuesday

Demos

Set up and Power Platform Overview	ALM	Dev Tooling	Custom Connector	UI Components

Microsoft

Sign up for a demo environment

Aka.ms/PowerAppsDevPlan

Microsoft

Power Platform Overview

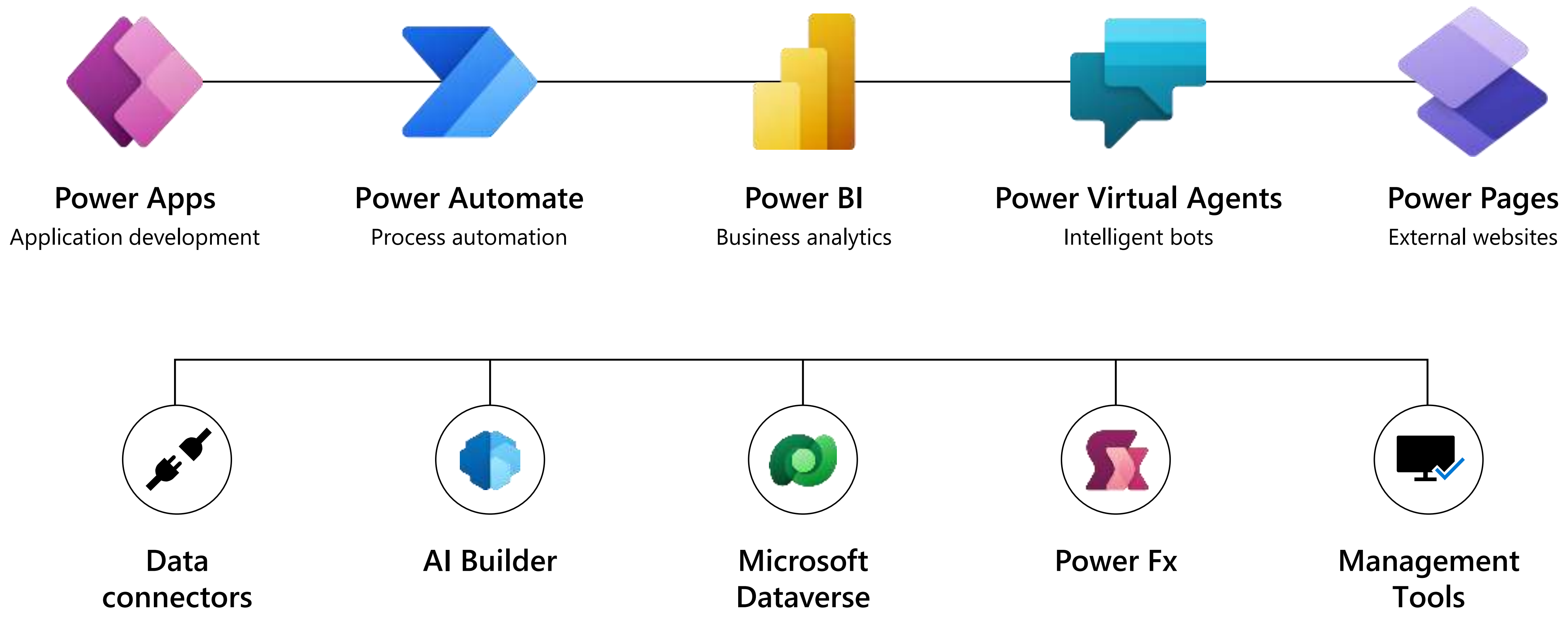
April Dunnam

Agenda

- Power Platform Overview
- Demo
- Environment Setup

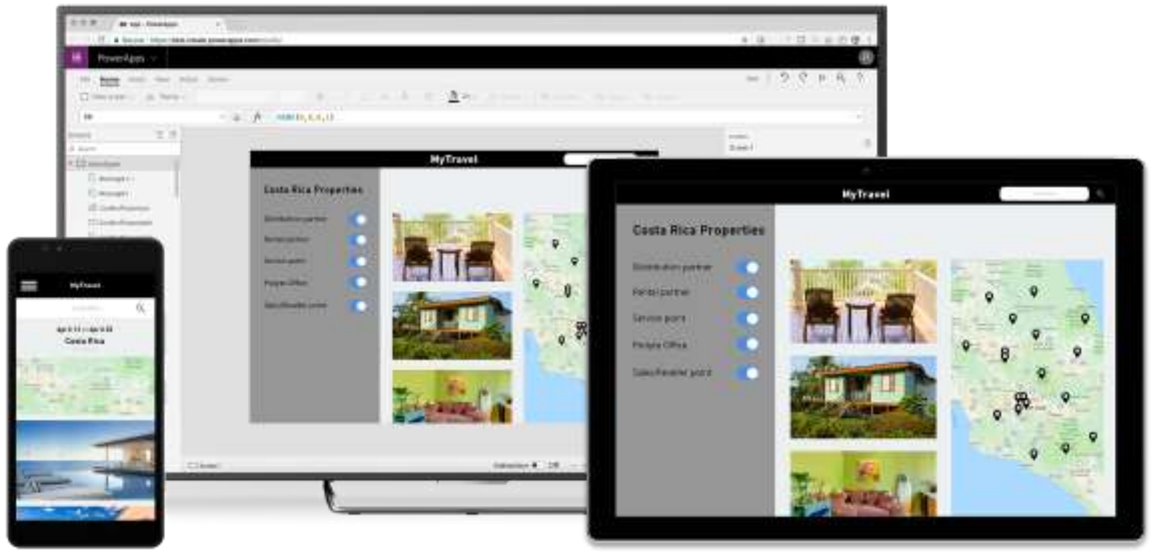
Microsoft Power Platform

The low-code platform that spans Office 365, Azure, Dynamics 365, and standalone applications



Build and consume solutions for web and mobile with PowerApps

- Build highly customized task- and role-based canvas apps with data from one or multiple sources
- Generate immersive model-driven apps, starting from your data model and business processes
- Consume fully accessible apps across web and mobile, embedded or standalone, on any device



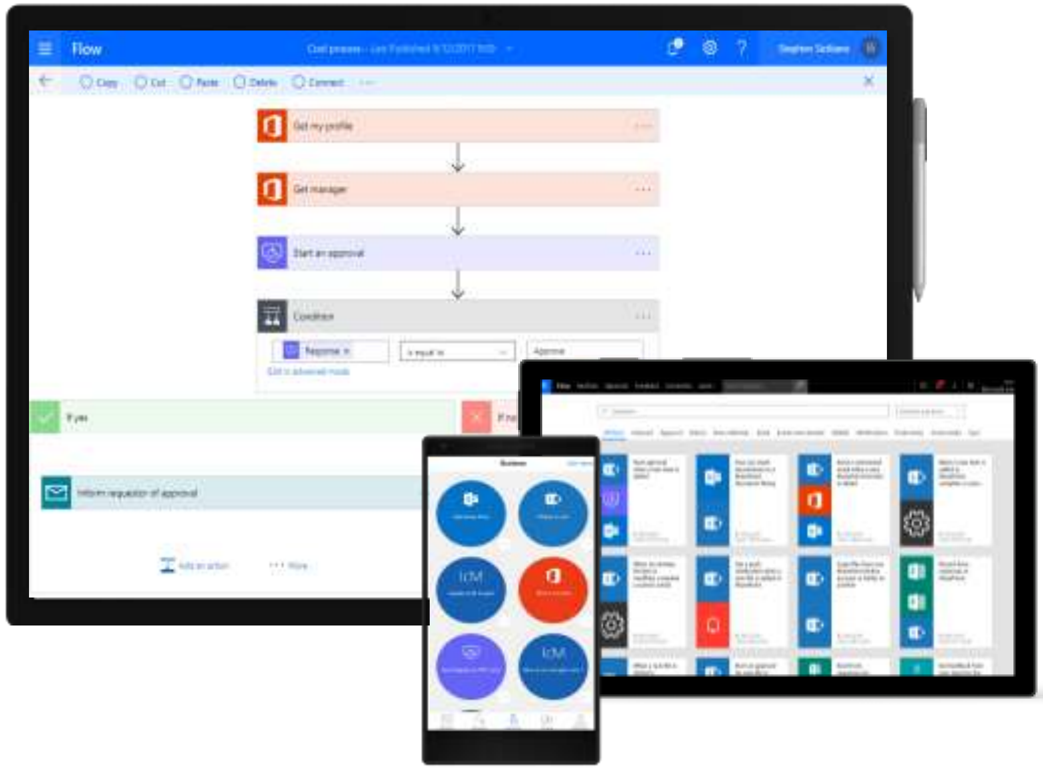
Enterprise-grade

Cloud and on-premises connectivity

Pro-developer extensibility

Automate and integrate business processes with Power Automate

- Automate and model business processes across your apps and services
- From simple automations to advanced scenarios with branches, loops, and more
- Trigger actions, grant approvals, and get notifications right where you work



Enterprise-grade

Cloud and on-premises connectivity

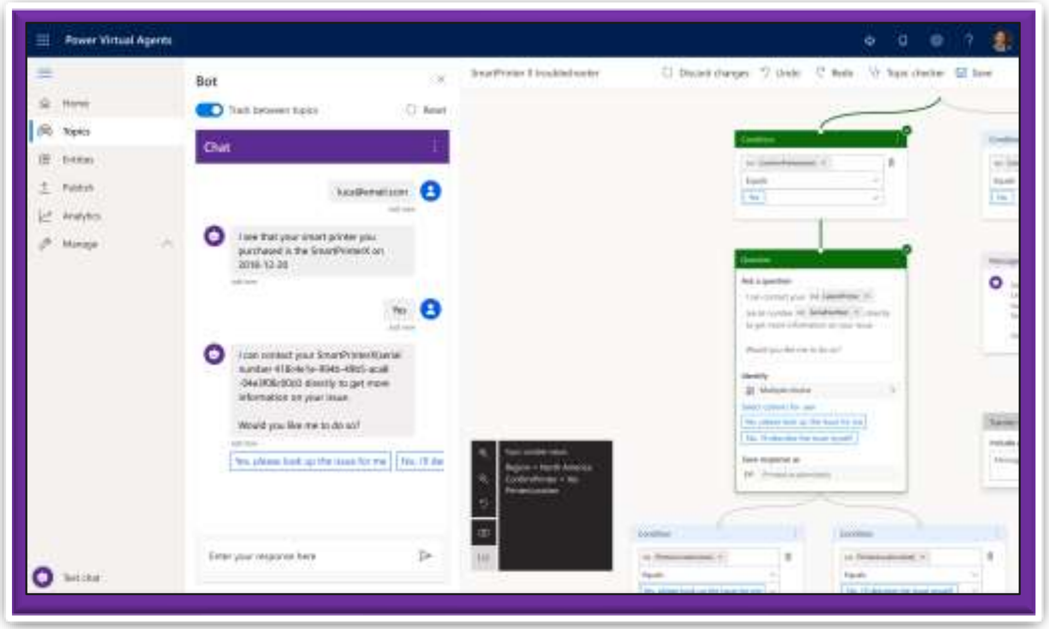
Pro-developer extensibility

Gain insights from your data regardless of where it lives with Power BI

- Connect to all your data and get a consolidated view across your business through a single pane of glass
- Create ad-hoc analysis, live dashboards and interactive reports that are easy to consume on the web and across mobile devices
- Build smart apps by infusing insights from your data and drive action with the power of the Power platform

Build powerful virtual agents with Power Virtual Agents

- Enable subject matter experts to easily create powerful virtual agents using a guided, no-code graphical interface—all without the need for data scientists or developers.
- Enable the virtual agent to take action on the customer’s behalf. Easily integrate your virtual agent with hundreds of services and systems out of the box or create custom workflows.
- Keep an eye on how your virtual agent is performing by using conversational metrics and dashboards. Get in-depth AI-driven insights to improve bot performance.



luca@email.com

I see that your smart printer you purchased is the SmartPrinterX on 2018-12-20

Yes

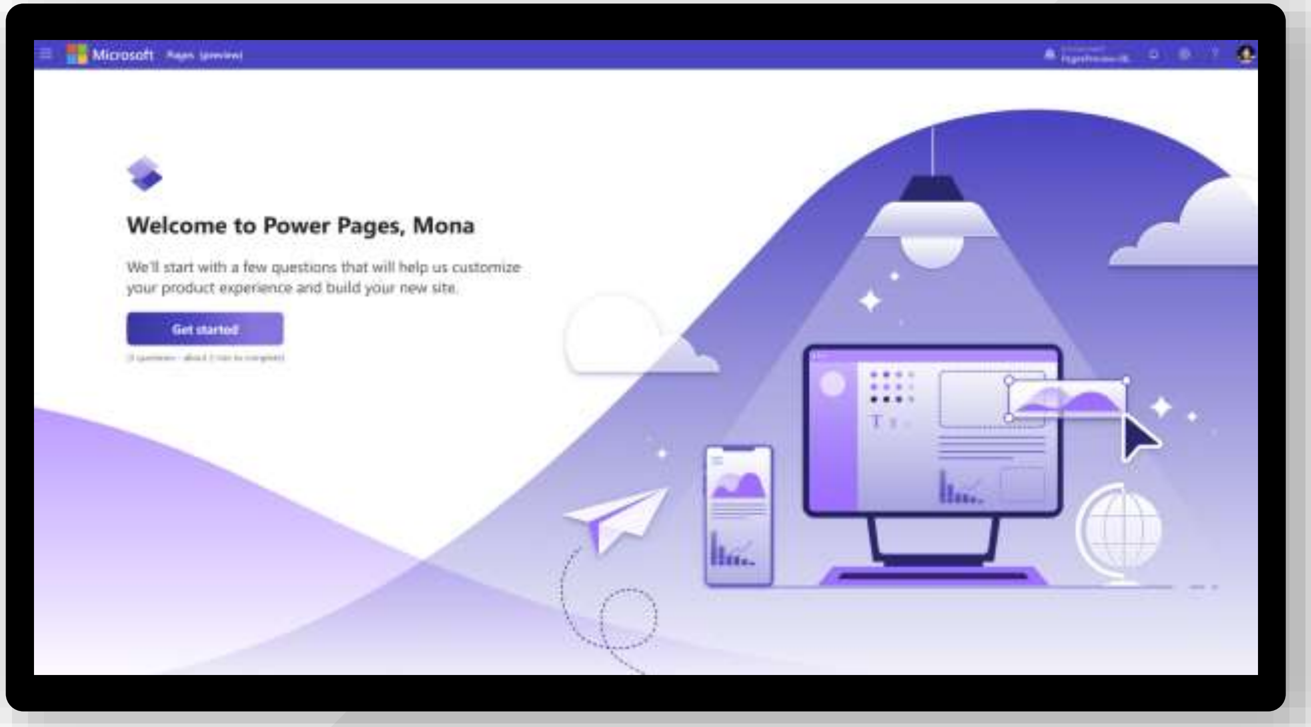
I can contact your SmartPrinterX (serial number 418c4e1a-8946-48d5-aca8-04e3f08c80d0) directly to get more information on your issue.

Would you like me to do so?

Yes, please look up the issue for me | No, I'll de

Power Pages

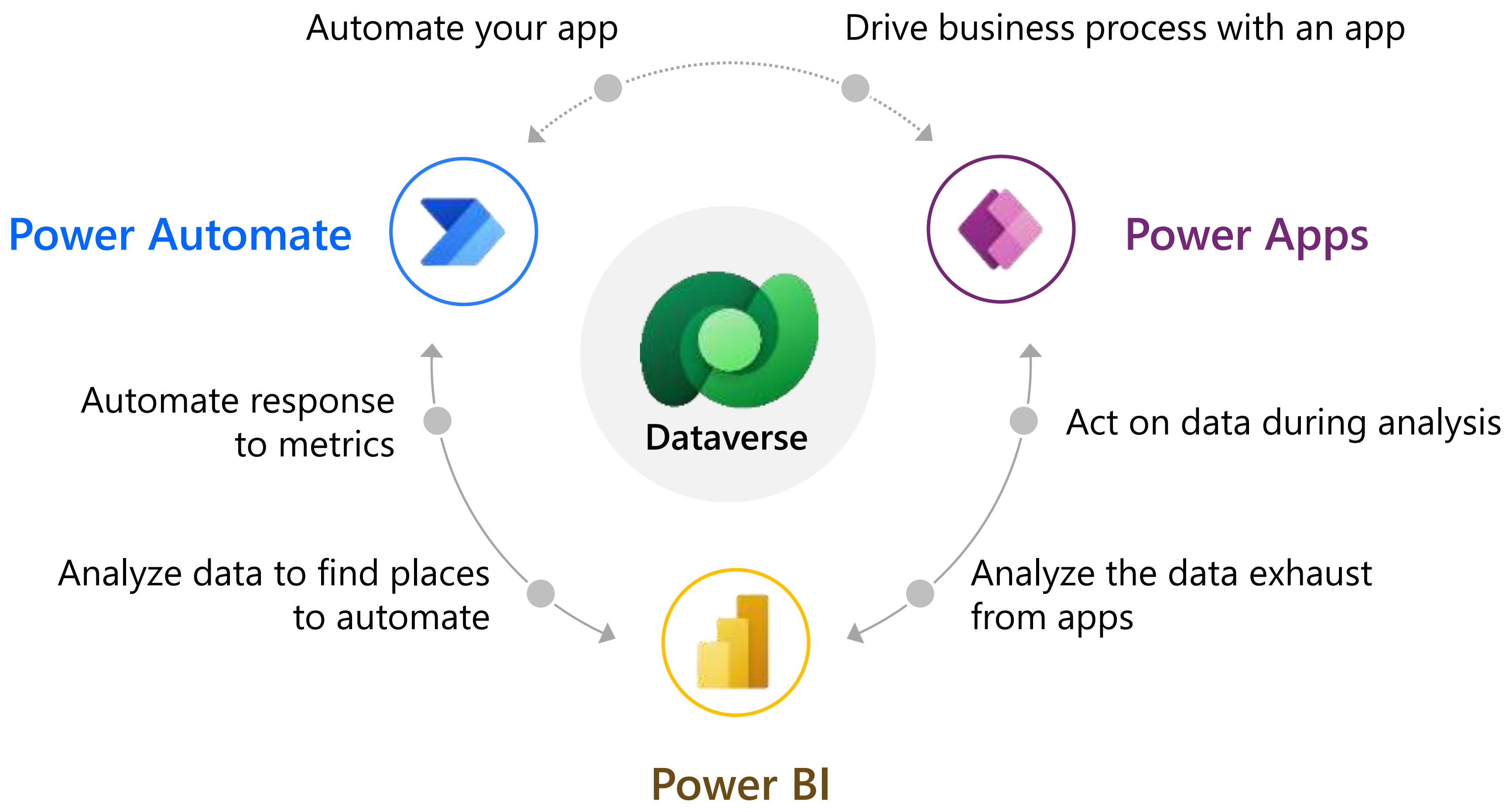
Create modern, secure, responsive business websites to rapidly engage your customers, partners, and communities



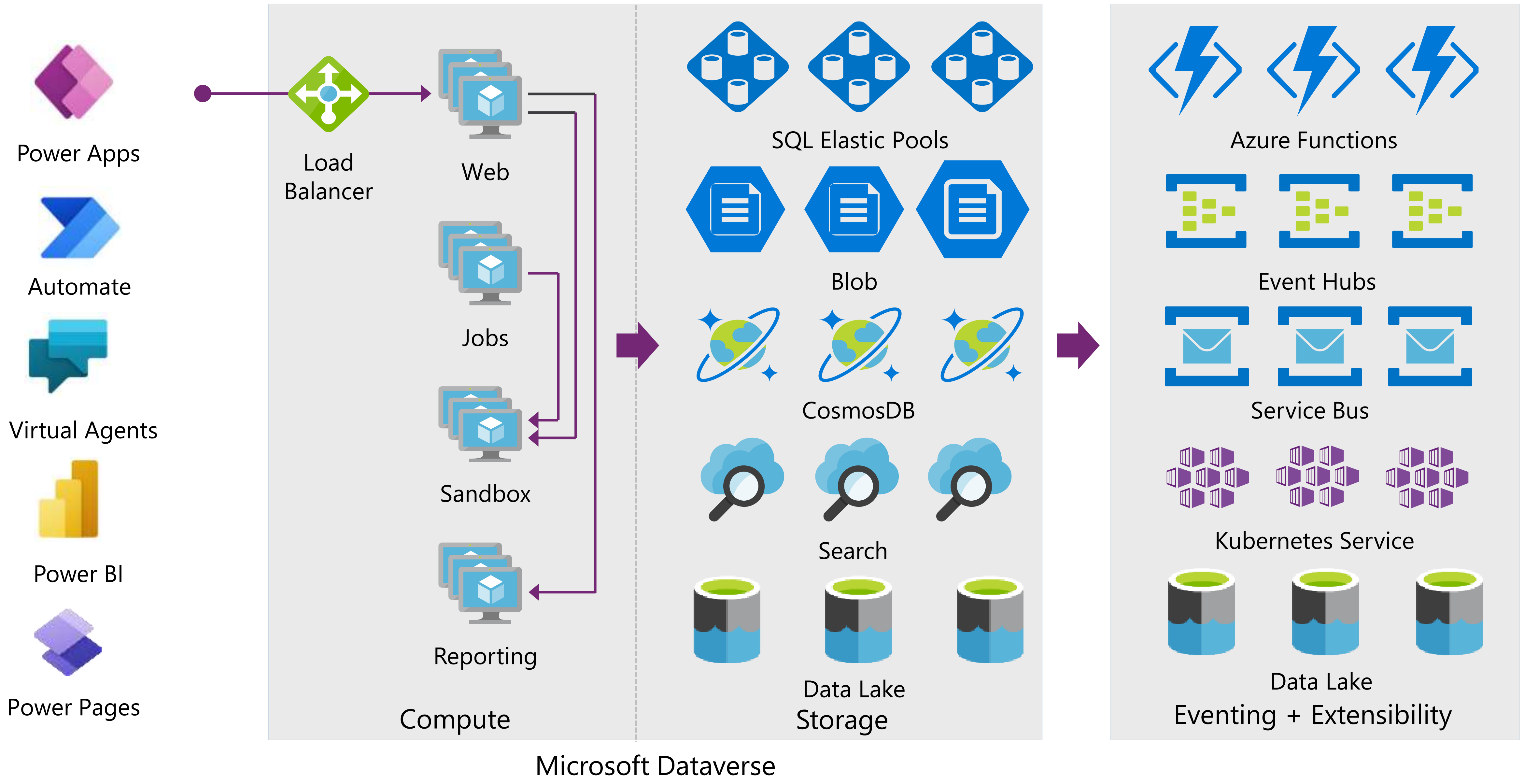
Welcome to Power Pages, Mona

We'll start with a few questions that will help us customize your product experience and build your new site.

Microsoft Dataverse is fully integrated into the Power Platform

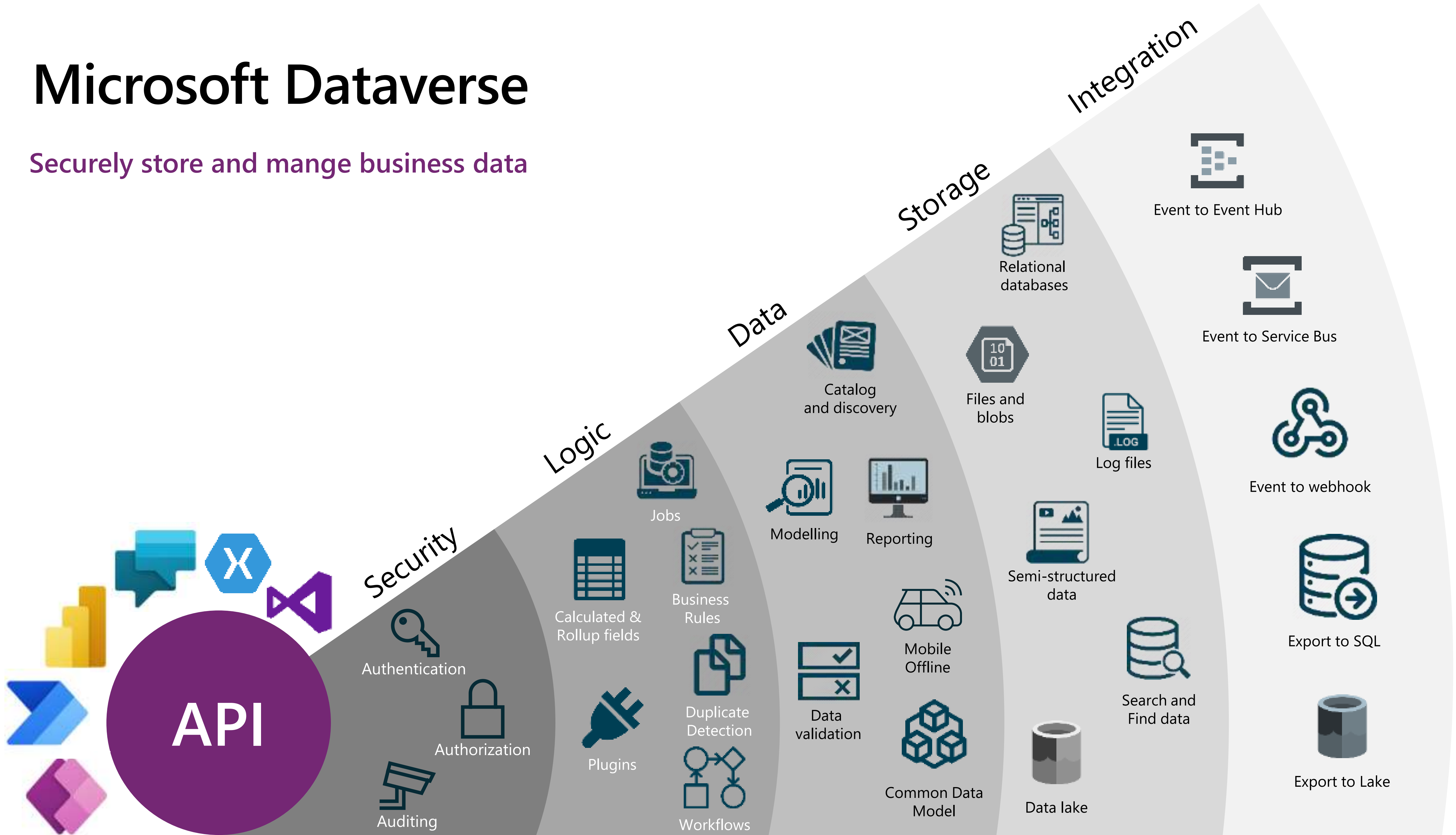

Automate your app
Drive business process with an app
Power Automate
Power Apps
Dataverse
Automate response to metrics
Act on data during analysis
Analyze data to find places to automate
Analyze the data exhaust from apps
Power BI

Microsoft Dataverse… Runs on Azure and Extends with Azure

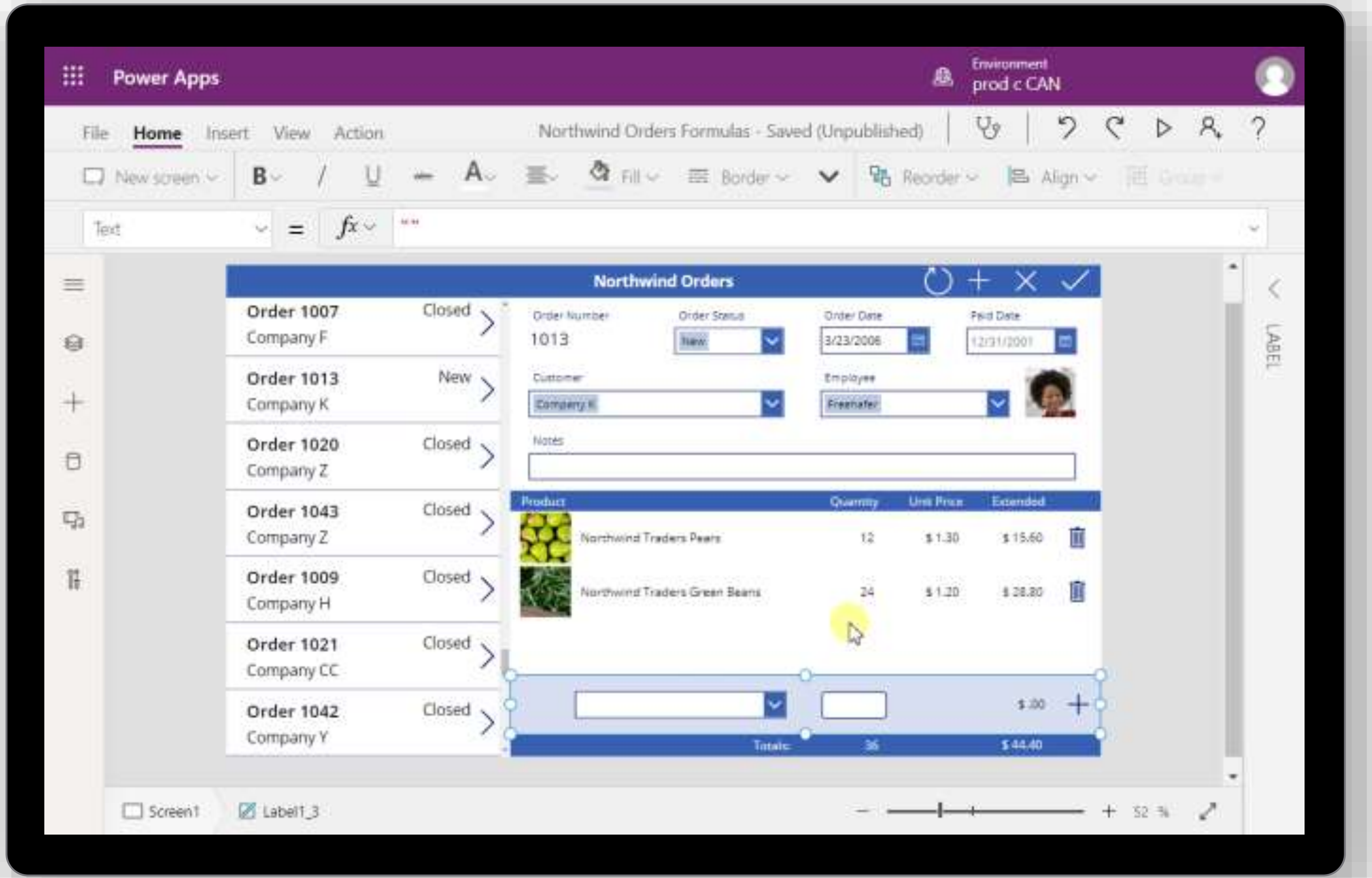


Microsoft Dataverse

Securely store and mange business data



Microsoft Power FX



Northwind Orders Formulas - Saved (Unpublished)

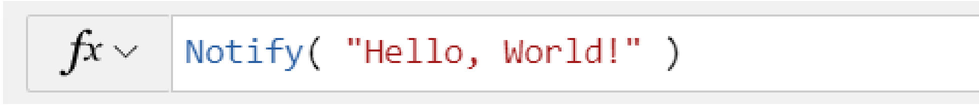
Text = fx ""

Northwind Orders

Order 1007 Company F	Closed
Order 1013 Company K	New
Order 1020 Company Z	Closed
Order 1043 Company Z	Closed
Order 1009 Company H	Closed
Order 1021 Company CC	Closed
Order 1042 Company Y	Closed

Order Number: 1013
Order Status: New
Order Date: 3/23/2006
Paid Date: 12/31/2001
Customer: Company K
Employee: Freehafer
Notes:

Product	Quantity	Unit Price	Extended
Northwind Traders Pears	12	$ 1.30	$ 15.60
Northwind Traders Green Beans	24	$ 1.20	$ 28.80
			$ .00
Totals:	36		$ 44.40



```
Notify( "Hello, World!" )
```

- An open-source language that will be **available for everyone to use and implement**.
- Expressed in text, it's a low code language that **makers can work with directly**.
- Reduce barriers for getting started with a language that **leverages the knowledge of excel users**
- **Accelerate with the simplicity of formulas** and add code where it matters using favorite developer tools.

https://powerapps.microsoft.com/en-us/blog/what-is-microsoft-power-fx/

AI Builder: intelligent apps and processes

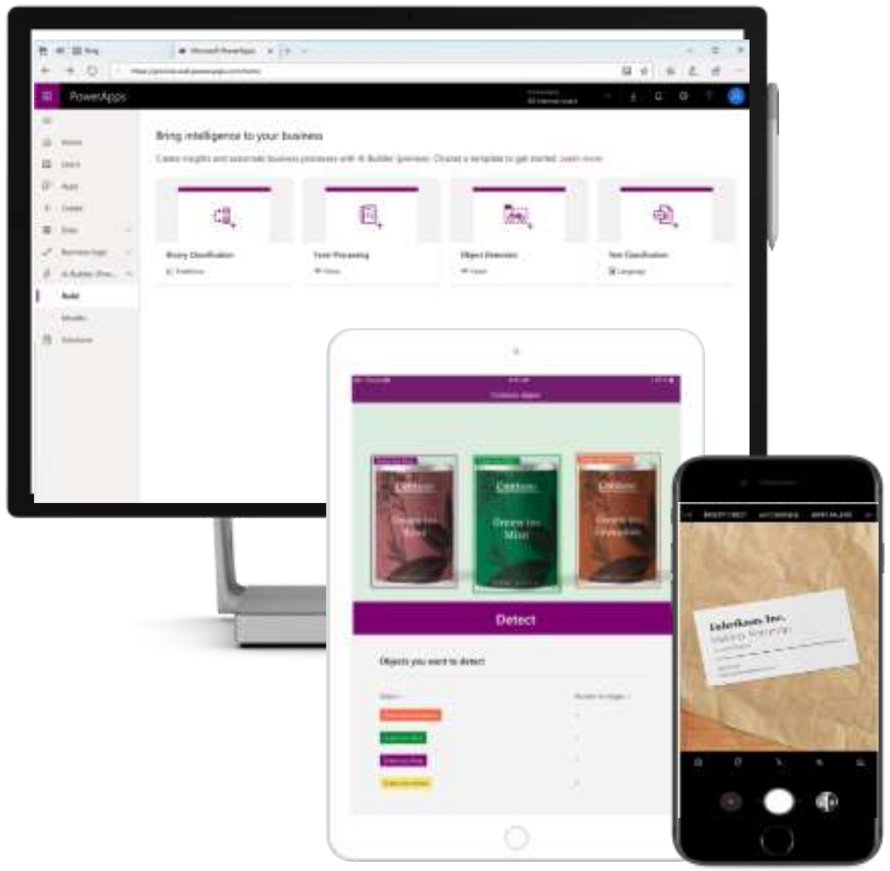
Low code AI solutions for Power Platform leveraging the power of Microsoft AI

Bring your data from CDS, ADLSv2 or 230+ pre-built connectors and custom connectors

Customize Dynamics 365 AI offerings to specific schema and processes with AI Builder

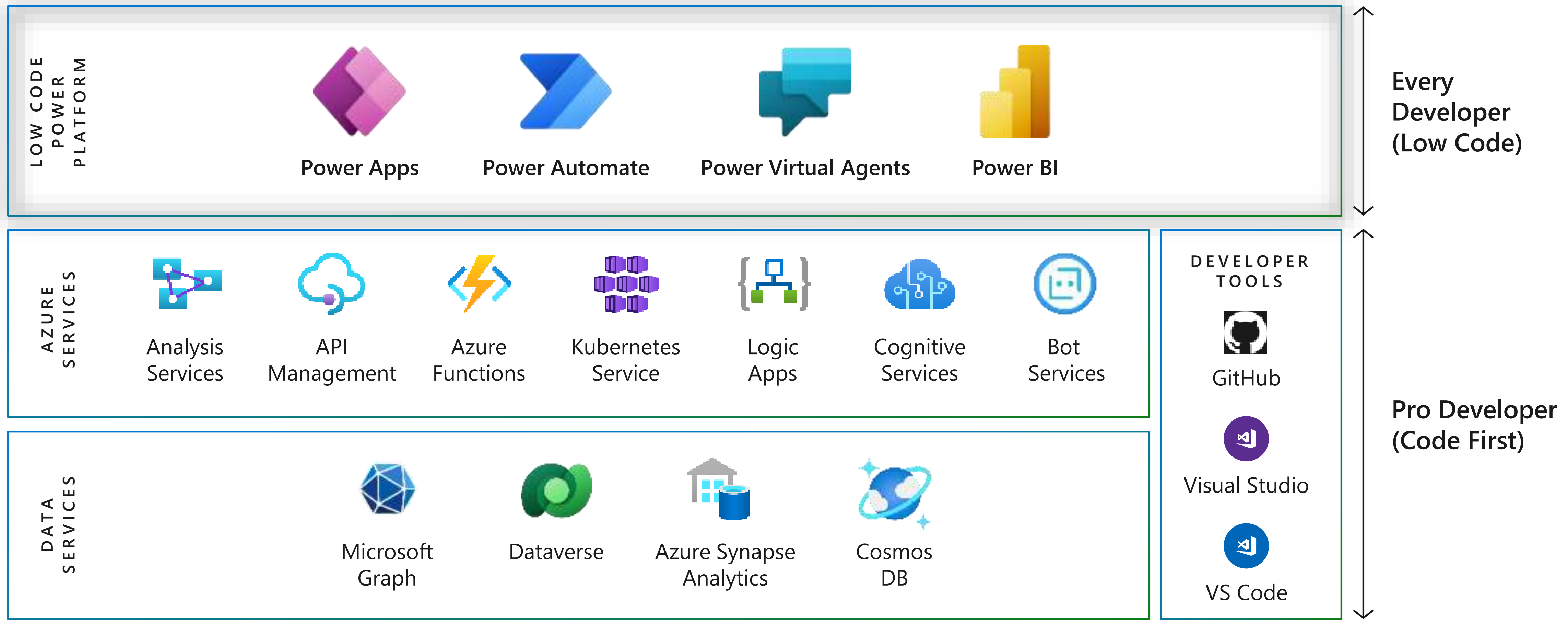
Predictions available in Common Data Service for Power Platform and Dynamics

Pro-Dev extensibility and governance


PowerApps
Bring intelligence to your business
Detect
Objects you want to detect

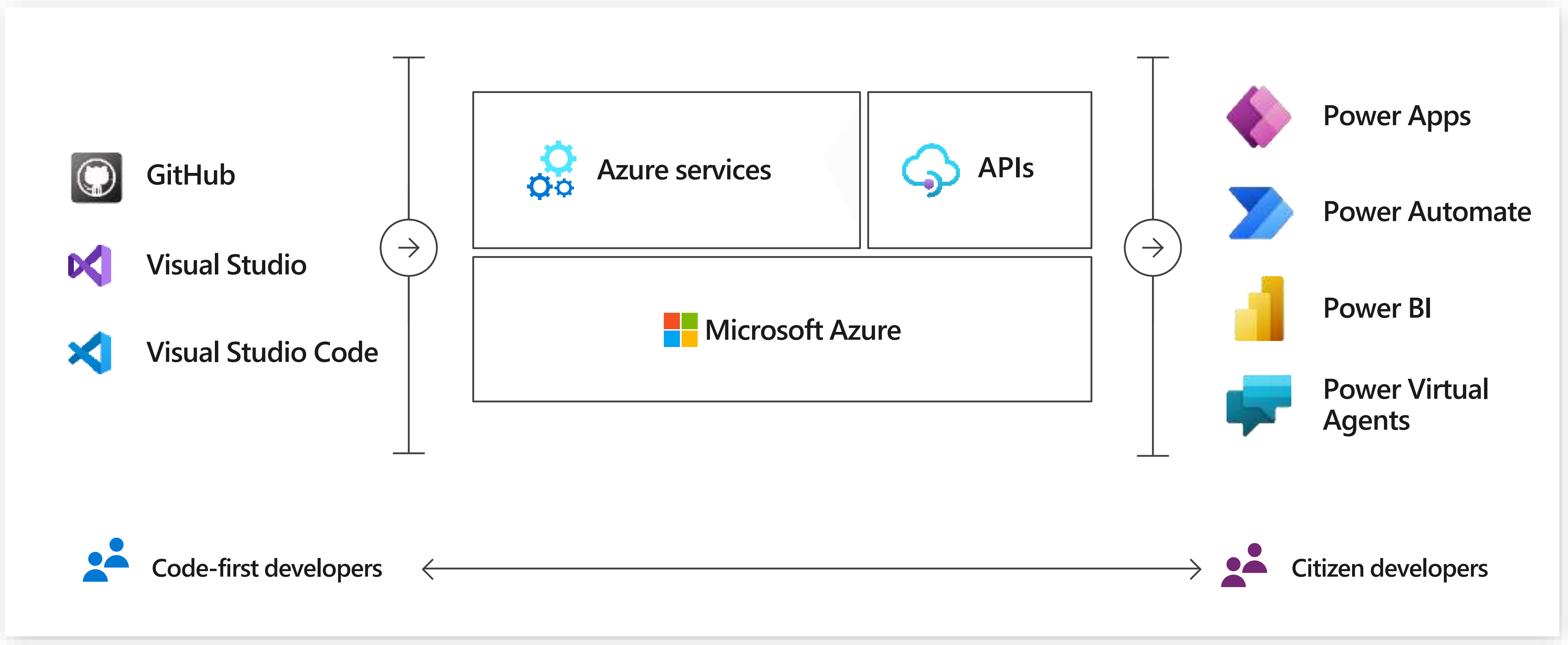
Fusion Dev Teams

Pro Developers + Power Platform = No Limits



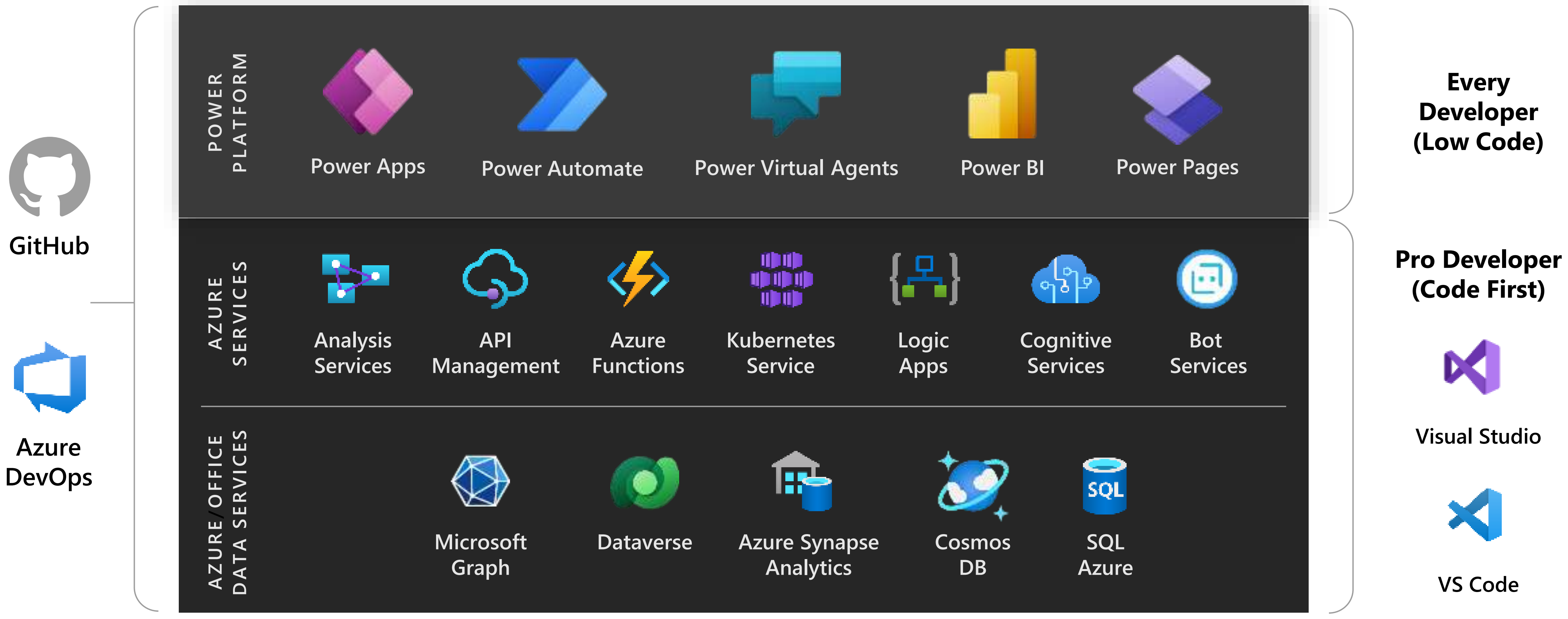
Fusion Team Development

Low-code and pro-dev application development extensibility with Power Apps + Azure



Extend the Power Platform with Azure Services

Integrate Azure services with pre-built and custom APIs



Demo: Exploring the Power Platform Tools

April Dunnam

Microsoft Power Platform

Questions?

Aka.MS/BuildPRE07

Microsoft

Power Platform Application Lifecycle Management

Greg Hurlman, Senior Software Developer, Microsoft

Workshop Material: aka.ms/BuildPRE07

Agenda

- Concepts Overview
- GitHub Integration
- Demo

Solution: Fundamental building block for ALM

SOLUTIONS ARE USED TO PACKAGE AND MAINTAIN COMPONENTS THAT MAKE UP ONE OR MORE POWER APPS

SOLUTIONS ARE CREATED AND AUTHORED BY A PUBLISHER

Solution

Data Model

- Tables
  - Attributes
  - Forms
  - Views
  - Charts
  - Relationships
- Global Option Sets

User Interface

- Model Apps
- Canvas Apps
- Web Resources
- PCF Controls
- Dashboards
- Sitemap

Process/Code

- Workflow Definitions
  - UI Flows (RPA)
  - Cloud Flows
  - Workflow
  - Business Process
  - Rules
- Assemblies
  - Custom Activities
  - Plug-ins

Other

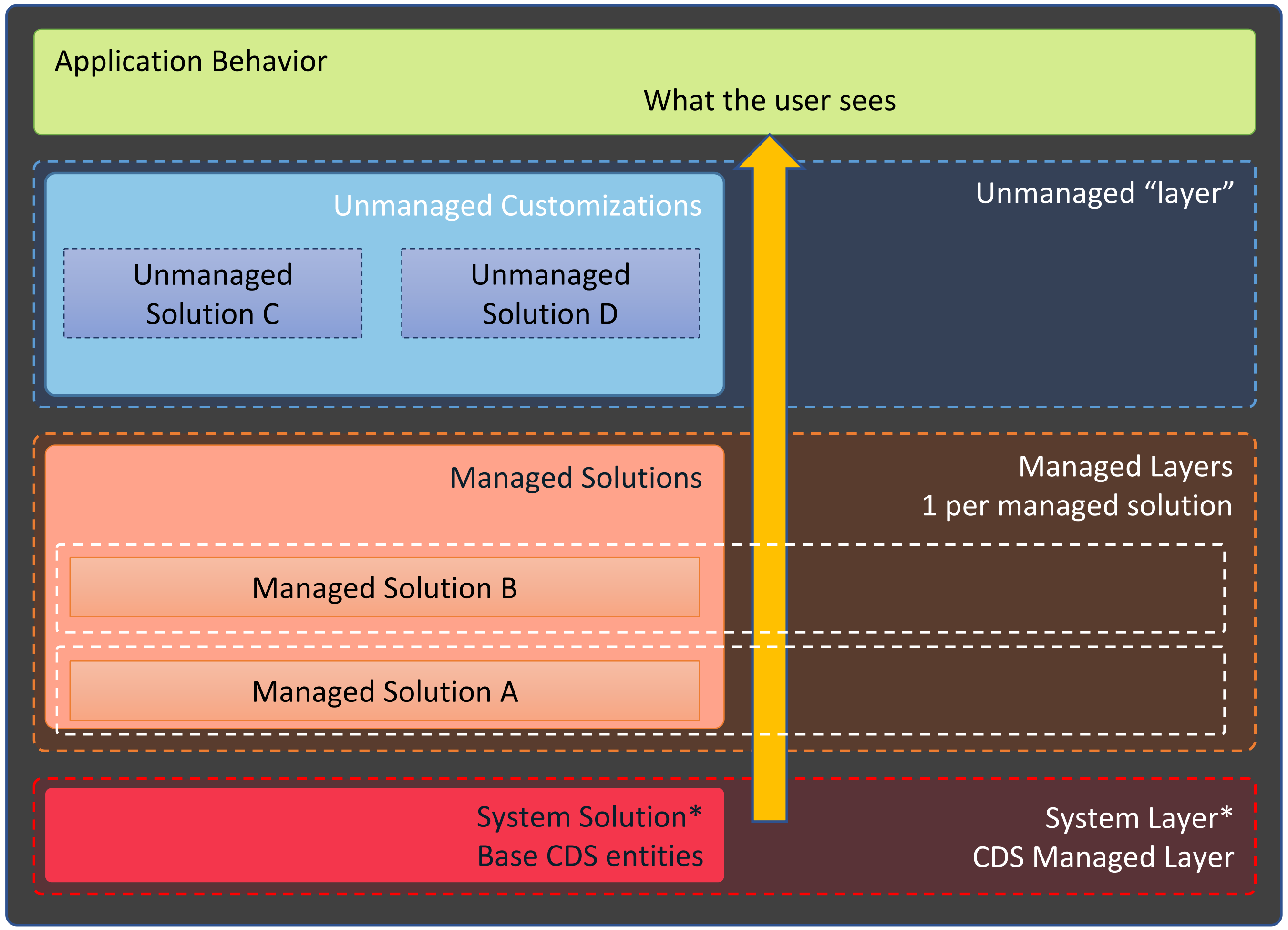
- Bots
- AI Models
- Env. Variables
- Templates
- Security Roles
- FLS Profiles
- Virtual Entities
- App Modules

Managed vs Unmanaged Solutions

Unmanaged Solutions are to be used in development environments while you are making configuration changes to your application. Solutions are exported as unmanaged and checked into your source control system. Unmanaged solutions should be considered your source.

Managed solutions are used to deploy to any environment outside of development. This includes test, UAT, SIT, and production environments. Managed solutions should be generated by a build server and considered as a build artifact. You cannot edit components within a Managed Solution, to edit the components you need to add them to an Unmanaged Solution

Solution Layering



Run time behavior

All imported unmanaged solutions and ad-hoc changes exist here

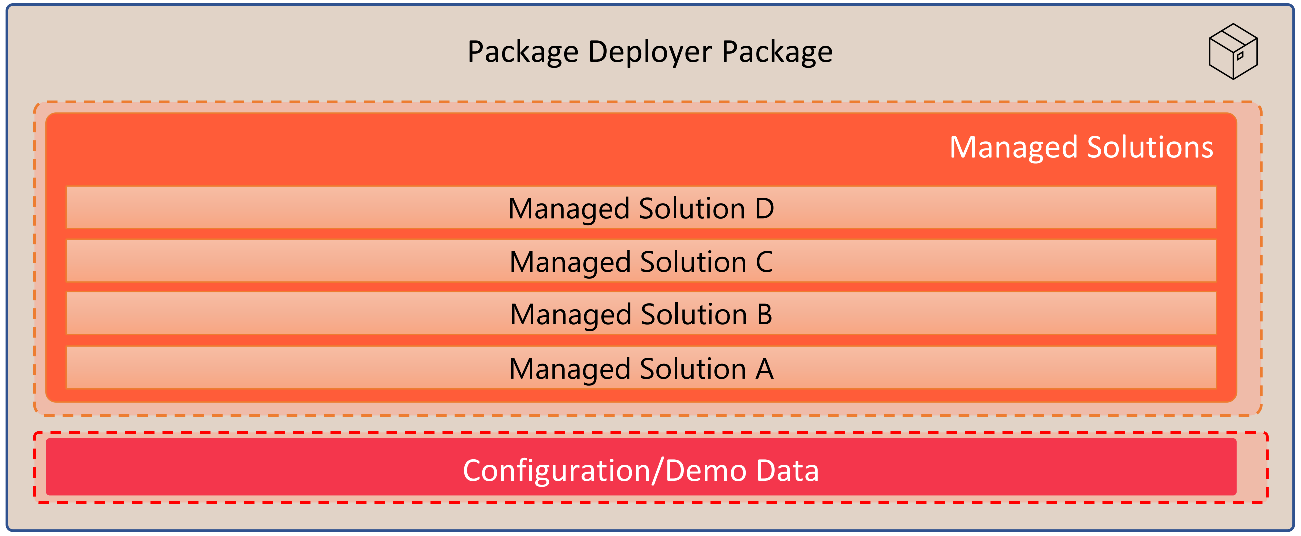
All imported managed solution exist here. When multiple solutions are installed, topmost solution's changes are in effect e.g., if solution B has made changes to fields, there were also referenced in solution A, then solution B's changes are enforced. If solution B is removed, then solution A's behavior come into effect

The system layer contains the entities and components are required for the platform to function

Packages: deployment units for the Power Platform

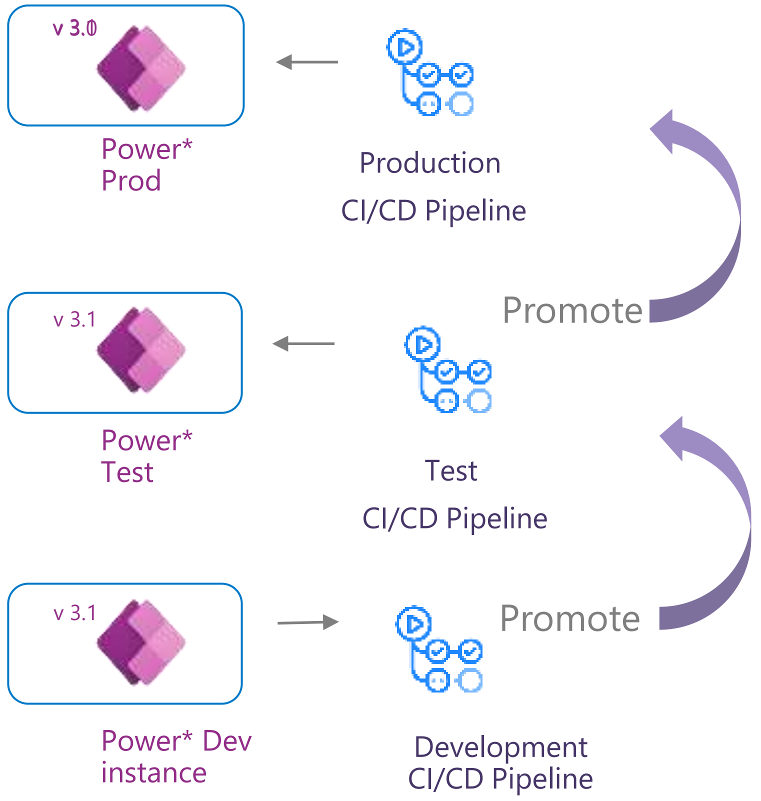
Contain the following:

- One or more solutions
- Flat files or exported configuration files (Configuration Migration tool)
- Custom Code (to run before or after a package is deployed)
- HTML content (to display before or after deployment)

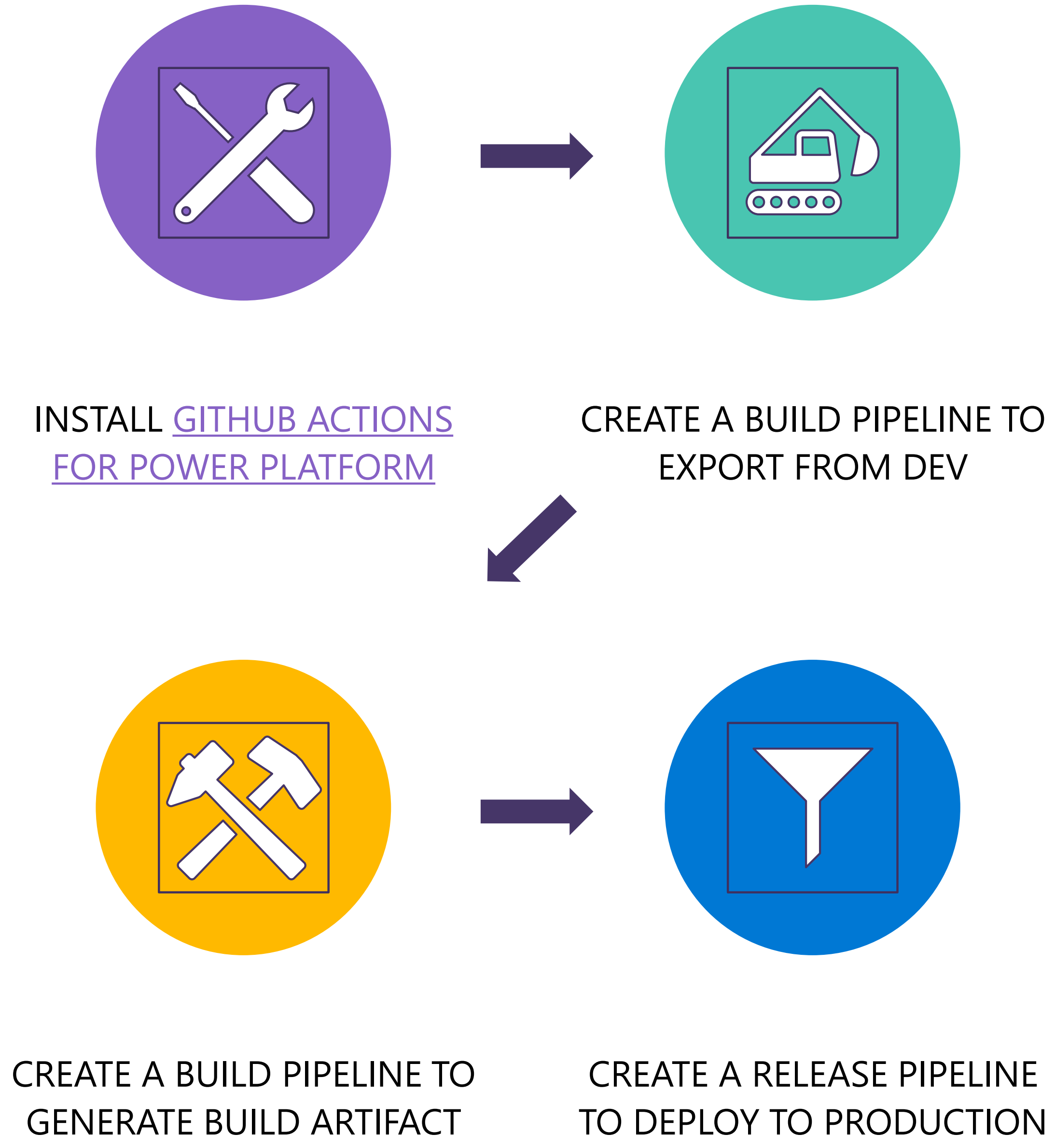


Low code in the enterprise requires DevOps

- Support for moving assets across environments using solutions.
- Full developer isolation with access to authoritative source management in GitHub and Azure DevOps.
- Agile process governance and team collaboration
- Full automation of repeatable processes for tests and workflows supporting continuous integration/continuous deployment (CI/CD)



From Environment Centric to Source Control Today


INSTALL GITHUB ACTIONS FOR POWER PLATFORM
CREATE A BUILD PIPELINE TO EXPORT FROM DEV
CREATE A BUILD PIPELINE TO GENERATE BUILD ARTIFACT
CREATE A RELEASE PIPELINE TO DEPLOY TO PRODUCTION

Power Platform + GitHub

Develop, test, and deliver applications with GitHub Actions for Power Platform

Seamlessly manage solutions and environments

Empower developers to work within the tool of their choice by creating their own systems development life cycle (SDLC) workflows or use pre-configured templates with GitHub actions for Power Platform.

Enable everyone to contribute to CI/CD

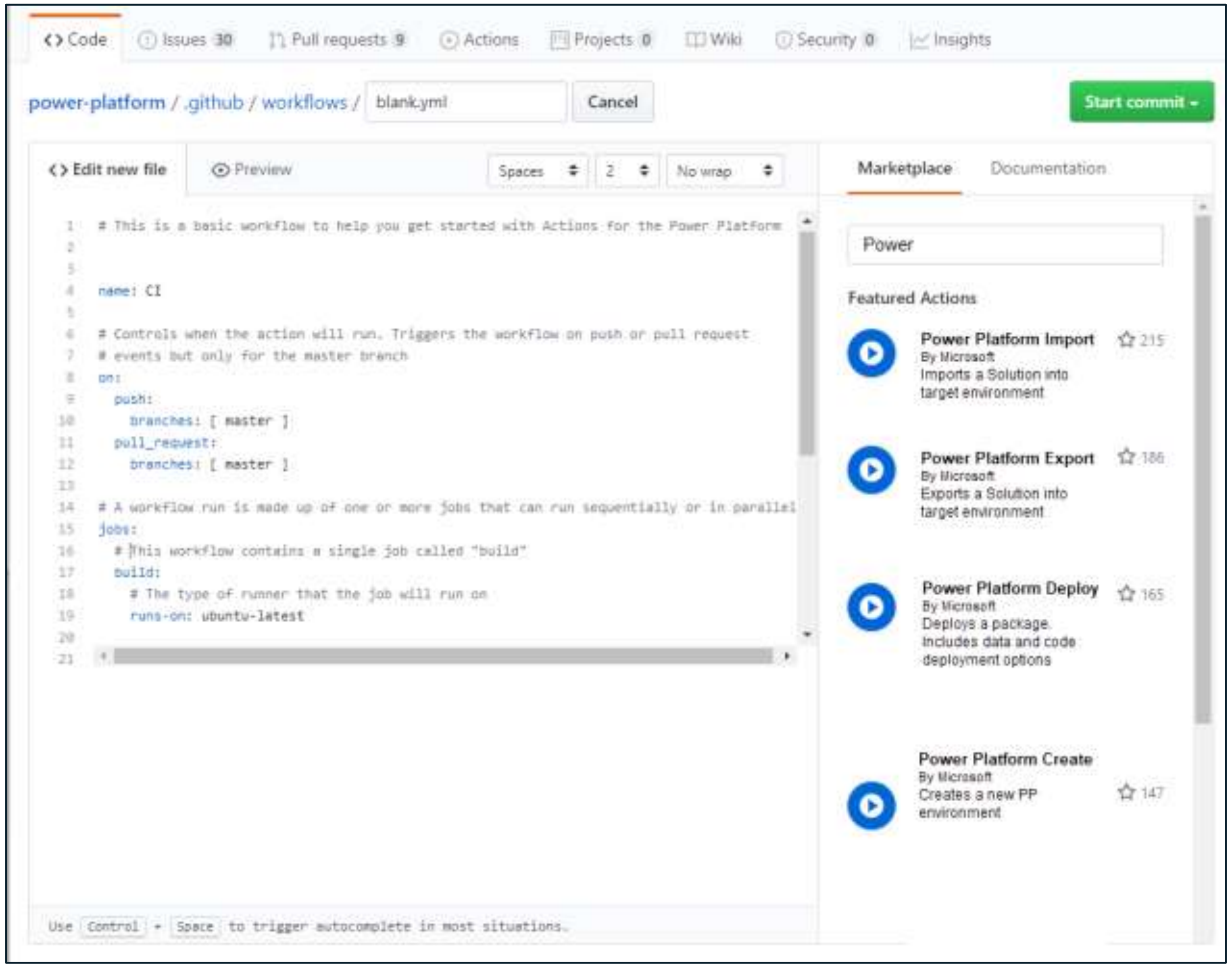
Empower citizen developers to perform self-service continuous integration/ continuous delivery (CI/CD) to free up time for DevOps engineers and IT admins. With a full line of sight for IT admins and professional developers, users no longer need to worry about audience disconnection for combined environments.

Seamless Fusion teams

Create seamless CoE team interactions by empowering citizen developers to trigger GitHub actions for Power Platform such as using Power Automate to construct CI/CD or build UX for self-service CI/CD using Power Apps.

GitHub actions for Power Platform

Developers can create their own SDLC workflows using **GitHub actions for Power Platform** available on GitHub marketplace



```
# This is a basic workflow to help you get started with Actions for the Power Platform


name: CI

# Controls when the action will run. Triggers the workflow on push or pull request
# events but only for the master branch
on:
  push:
    branches: [ master ]
  pull_request:
    branches: [ master ]

# A workflow run is made up of one or more jobs that can run sequentially or in parallel
jobs:
  # This workflow contains a single job called "build"
  build:
    # The type of runner that the job will run on
    runs-on: ubuntu-latest
```

Power Platform Import ☆ 215
By Microsoft
Imports a Solution into target environment

Power Platform Export ☆ 186
By Microsoft
Exports a Solution into target environment

Power Platform Deploy ☆ 165
By Microsoft
Deploys a package. Includes data and code deployment options

Power Platform Create ☆ 147
By Microsoft
Creates a new PP environment

Use Control + Space to trigger autocomplete in most situations.

Demo: Github Actions for the Power Platform

Microsoft Power Platform

Questions?

Microsoft Power Platform

Lunch Break – 30 Mins

Microsoft

Power Platform Development: Tools

Greg Hurlman, Senior Software Developer, Microsoft

Workshop Material: aka.ms/BuildPRE07

Agenda

1. Sometimes you feel like a command line
2. Sometimes you don’t
3. .NET (tools) to the rescue

The Power Platform CLI

Started initially as a project scaffolding tool for PCF

```
auth                Manage how you authenticate to various services
help                Show help for the Microsoft Power Platform CLI
pcf                 Commands for working with Power Apps component framework projects
solution            Commands for working with Dataverse solution projects
telemetry           Manage telemetry settings
```

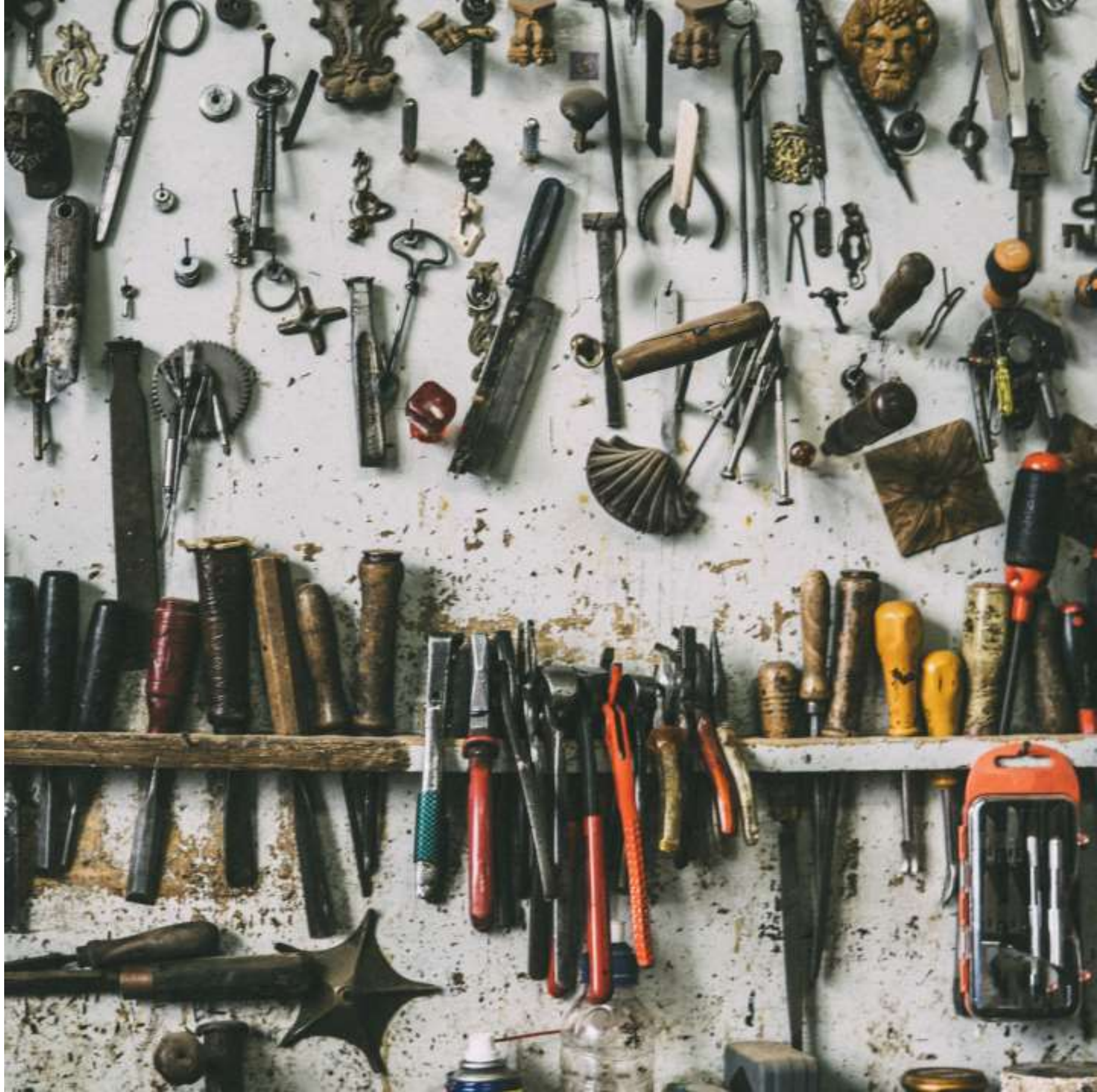
Since then, has added a ton of functionality:

```
admin               Work with your Power Platform Admin Account
application         Commands for listing and installing available Dataverse applications from AppSource
auth                Manage how you authenticate to various services
canvas              Operating with Power Apps .msapp files
catalog             (Preview) Commands for working with Catalog in Power Platform
connector           (Preview) Commands for working with Power Platform Connectors
help                Show help for the Microsoft Power Platform CLI
modelbuilder        Code Generator for Dataverse APIs and Tables
org                 Work with your Dataverse Organization
package             Commands for working with Dataverse package projects
paportal            Commands for working with Power Pages website
pcf                 Commands for working with Power Apps component framework projects
pipeline            Work with Pipelines
plugin              Commands for working with Dataverse plug-in class library
solution            Commands for working with Dataverse solution projects
telemetry           Manage telemetry settings
virtual-agent       Commands for working with Power Virtual Agent bots
```

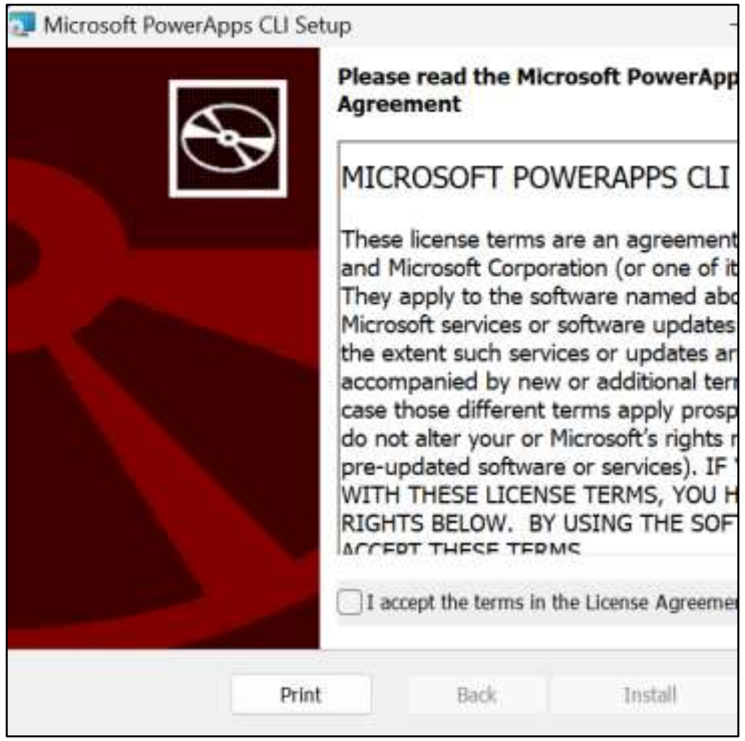
Anything tools can do, it can do ~~better~~ the same

The work for the CLI underlies many of the other tools as well:

- ✓ Power Platform Tools for Azure DevOps
- ✓ GitHub Actions for Power Platform
- ✓ Power Platform Tools for Visual Studio Code
- ✓ Other internal processes



CLI Installation ✨Options✨



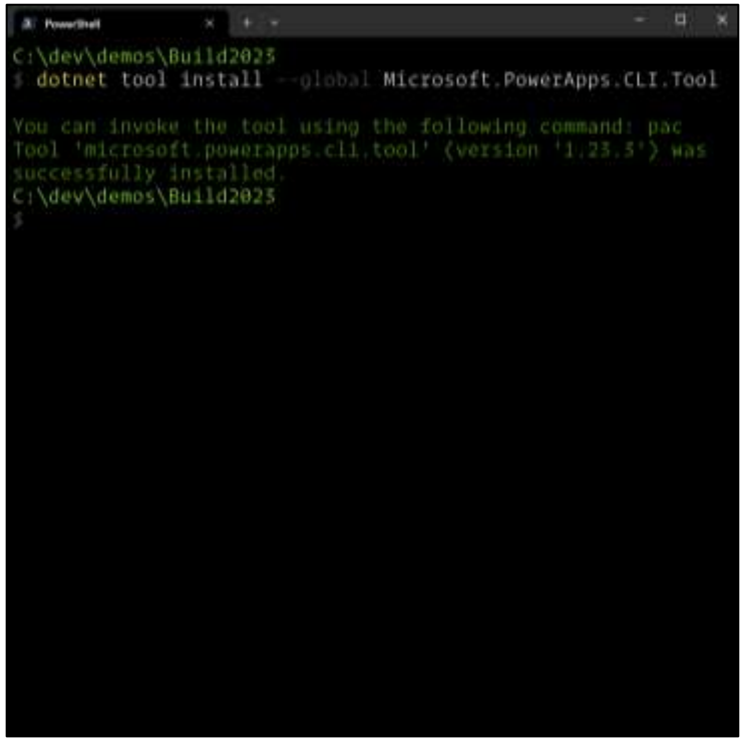
**Please read the Microsoft PowerApp
Agreement**

MICROSOFT POWERAPPS CLI

These license terms are an agreement
and Microsoft Corporation (or one of it
They apply to the software named abo
Microsoft services or software updates
the extent such services or updates ar
accompanied by new or additional ter
case those different terms apply prosp
do not alter your or Microsoft's rights r
pre-updated software or services). IF
WITH THESE LICENSE TERMS, YOU H
RIGHTS BELOW. BY USING THE SOF
ACCEPT THESE TERMS

☐ I accept the terms in the License Agreeme

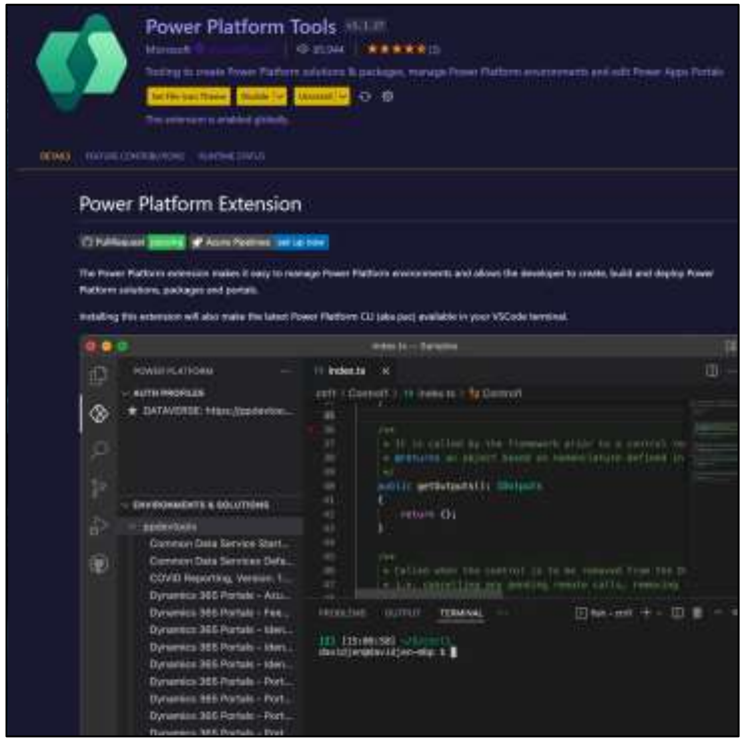
Option #1: Good ol' MSI



```
C:\dev\demos\Build2023
$ dotnet tool install --global Microsoft.PowerApps.CLI.Tool

You can invoke the tool using the following command: pac
Tool 'microsoft.powerapps.cli.tool' (version '1.23.5') was
successfully installed.
C:\dev\demos\Build2023
$
```

Option #2: dotnet CLI



Tooling to create Power Platform solutions & packages, manage Power Platform environments and edit Power Apps Portals

This extension is enabled globally.

Power Platform Extension

The Power Platform extension makes it easy to manage Power Platform environments and allows the developer to create, build and deploy Power Platform solutions, packages and portals.

Installing this extension will also make the latest Power Platform CLI (aka pac) available in your VSCode terminal.

Option #3: VSCode Extension

What about Visual Studio?

Power Platform: Now a Connected Service

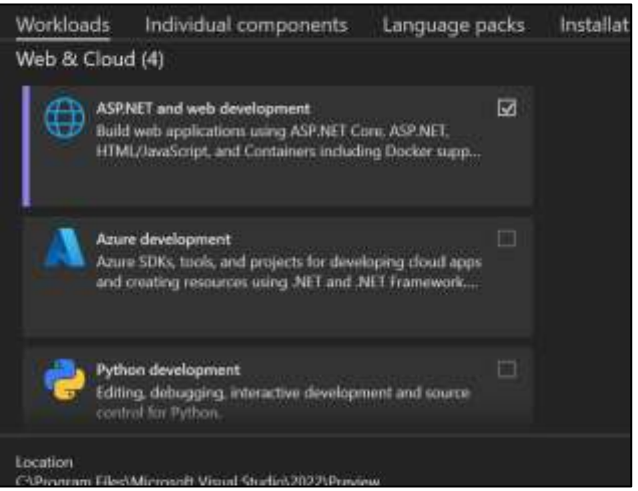
NEW

Connected Services is a collection of tools in Visual Studio that help you connect to different services

Support for the Power Platform was added for ASP.Net Web API projects to do the following:

- Connect to a Power Platform environment
- Automatically generate a custom connector
- Configure a dev tunnel to locally connect to your custom connector

Power Platform Connected Services: Prerequisites


Workloads | Individual components | Language packs | Installat

Web & Cloud (4)

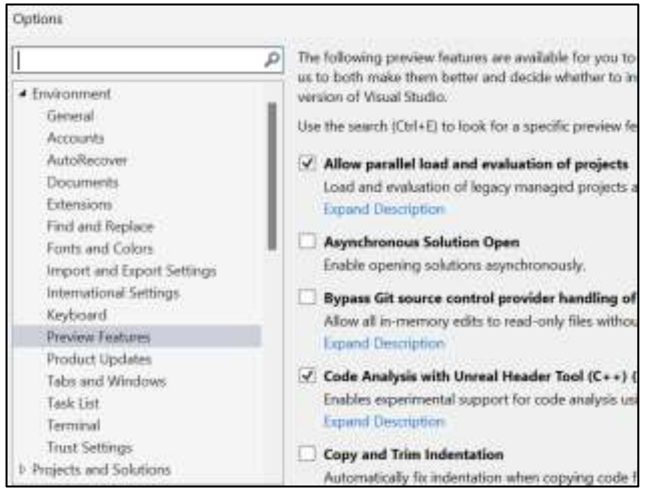
ASP.NET and web development ☑
Build web applications using ASP.NET Core, ASP.NET, HTML/JavaScript, and Containers including Docker supp...

Azure development ☐
Azure SDKs, tools, and projects for developing cloud apps and creating resources using .NET and .NET Framework....

Python development ☐
Editing, debugging, interactive development and source control for Python.

Location
C:\Program Files\Microsoft Visual Studio\2022\Preview

Visual Studio 2022 v17.6 Preview 2 with the "ASP.NET and web development" workload installed


Options

- Environment
  - General
  - Accounts
  - AutoRecover
  - Documents
  - Extensions
  - Find and Replace
  - Fonts and Colors
  - Import and Export Settings
  - International Settings
  - Keyboard
  - Preview Features
  - Product Updates
  - Tabs and Windows
  - Task List
  - Terminal
  - Trust Settings
- Projects and Solutions

The following preview features are available for you to
us to both make them better and decide whether to in
version of Visual Studio.

Use the search (Ctrl+E) to look for a specific preview fe

☑ **Allow parallel load and evaluation of projects**
Load and evaluation of legacy managed projects a
Expand Description

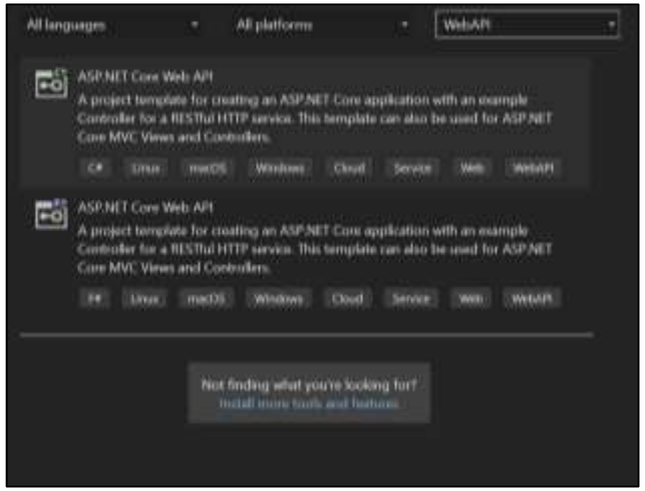
☐ **Asynchronous Solution Open**
Enable opening solutions asynchronously.

☐ **Bypass Git source control provider handling of**
Allow all in-memory edits to read-only files withou
Expand Description

☑ **Code Analysis with Unreal Header Tool (C++) (**
Enables experimental support for code analysis us
Expand Description

☐ **Copy and Trim Indentation**
Automatically fix indentation when copying code f

Dev Tunnels preview feature enabled

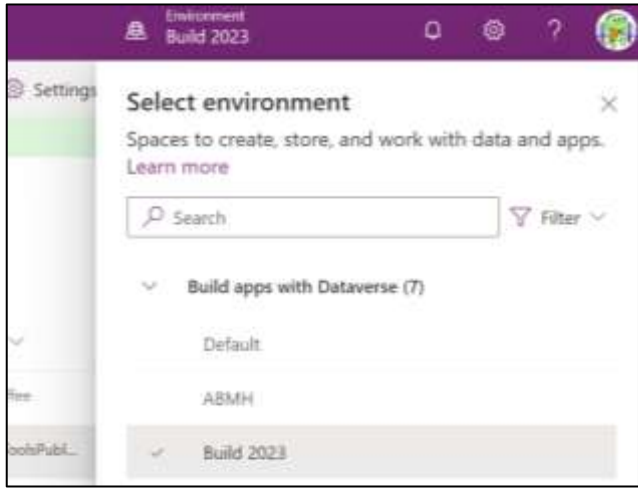

All languages | All platforms | WebAPI

ASP.NET Core Web API
A project template for creating an ASP.NET Core application with an example Controller for a RESTful HTTP service. This template can also be used for ASP.NET Core MVC Views and Controllers.
C# | Linux | macOS | Windows | Cloud | Service | Web | WebAPI

ASP.NET Core Web API
A project template for creating an ASP.NET Core application with an example Controller for a RESTful HTTP service. This template can also be used for ASP.NET Core MVC Views and Controllers.
F# | Linux | macOS | Windows | Cloud | Service | Web | WebAPI

Not finding what you're looking for?
Install more tools and features

An ASP.NET Core Web API Project


Environment
Build 2023

Settings

Select environment

Spaces to create, store, and work with data and apps.
Learn more

Search | Filter

Build apps with Dataverse (7)
- Default
- ABMH
- ✓ Build 2023

A Power Platform environment

Demo: Visual Studio Connected Services

Microsoft Power Platform

Questions?

Microsoft

Custom Connectors: Data & API Integration

April Dunnam, Principal Cloud Advocate

Agenda

1. Connectors overview
2. Custom Connectors

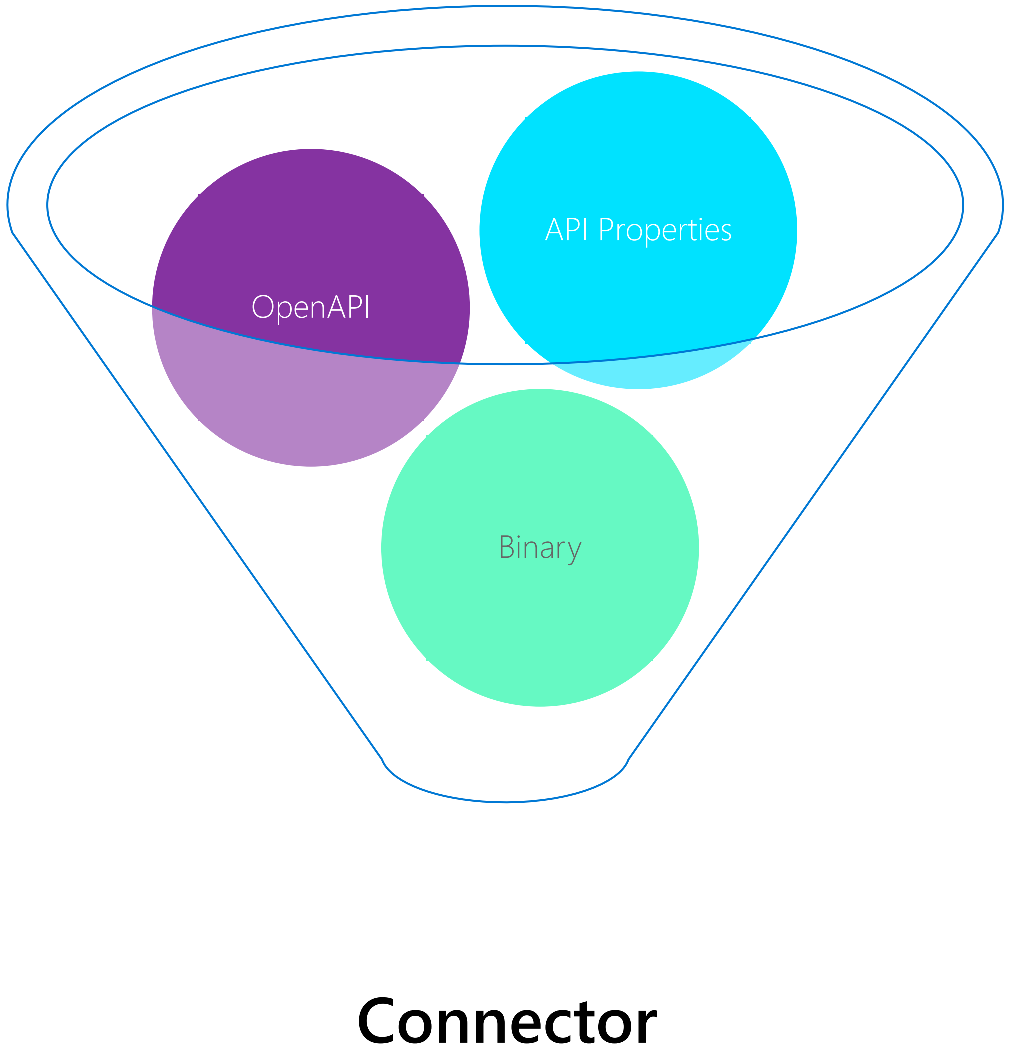
Data connections in the Power Platform

What is a connector?

A formal definition of a **REST API**

Allows the **REST service** to talk to Microsoft Power Apps, Power Automate, and Logic Apps

Currently **1000+** out-of-the-box connectors in the product

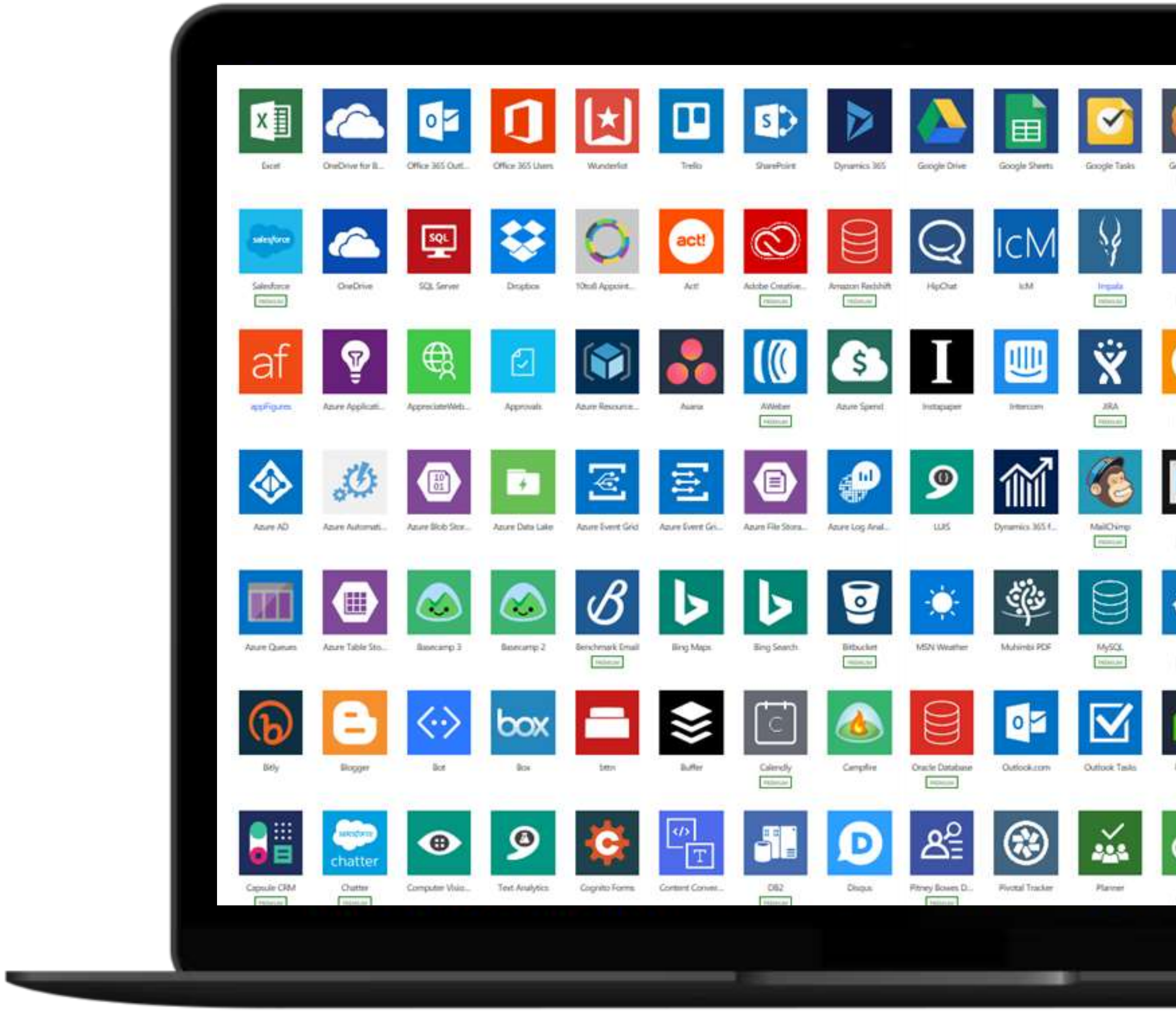


Data, data everywhere

Over 1000 connectors out of the box

Mix & match

Power BI data connectors are different

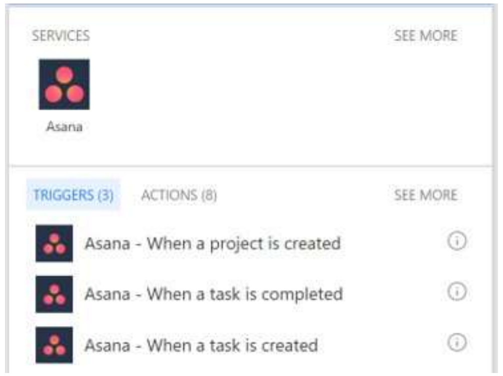


Connector: Definition of an API schema

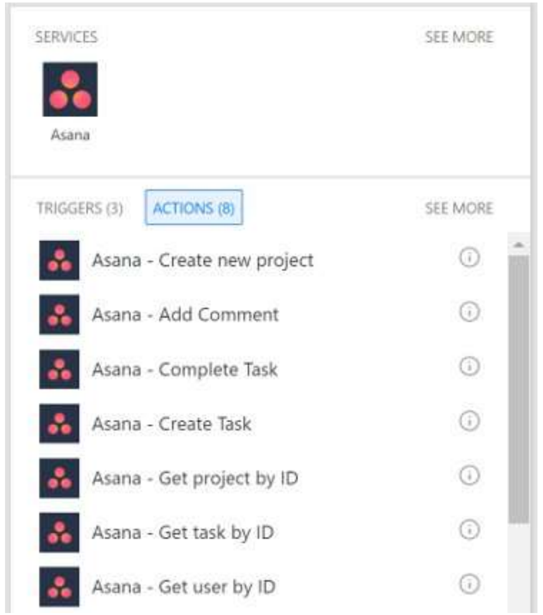
A connector is a formal definition of a REST API that allows the REST service to talk to the Power Platform

A connector consists of:

- Triggers: Allow power platform to kick off flows when "something" happens in the external system
- Actions: Things you can do with the service
- Security Protocol



Asana - When a project is created
Asana - When a task is completed
Asana - When a task is created



Asana - Create new project
Asana - Add Comment
Asana - Complete Task
Asana - Create Task
Asana - Get project by ID
Asana - Get task by ID
Asana - Get user by ID

Connection: How data flows in & out

An instance of a user using a connector by associating with specific “credentials” (or connection parameters)

Runtime API calls happen in the context of a connection

A connection has an access control list (ACL)

The owner is by default part of this access control list (ACL)

Some connections may be shared

OAuth connections cannot be shared

Custom Connectors

Why use custom connectors?

- Add services that are not currently supported
- Expand connectors that currently don't have the trigger/action you want
- Can be built using the wizard, a postman collection, or with your favourite IDE (for instance VS Code)
- Can be shared, packaged and certified via GitHub

Types of connectors

Connector Type	Custom Connector	Certified Connector	Independent Publisher Connector
API Availability	Public or private	Public	Public
Service Owner	Connector developer or someone else	Connector developer	Someone else
Audience	Internal	Everyone	Everyone

Good news, everyone

If you’ve done the work to be OpenAPI compliant, this’ll be easy

If you haven’t done that work (or can’t), we still have you covered

There’s no additional requirements on your code, your stack, or your deployment environment

Your current code won’t need any changes

Custom connectors

The definition of your API for the Power Platform

Create from scratch, from Azure APIM, even from Postman

Github integration

Cloud or on-premises APIs supported

Define the shape of the API, not the logic

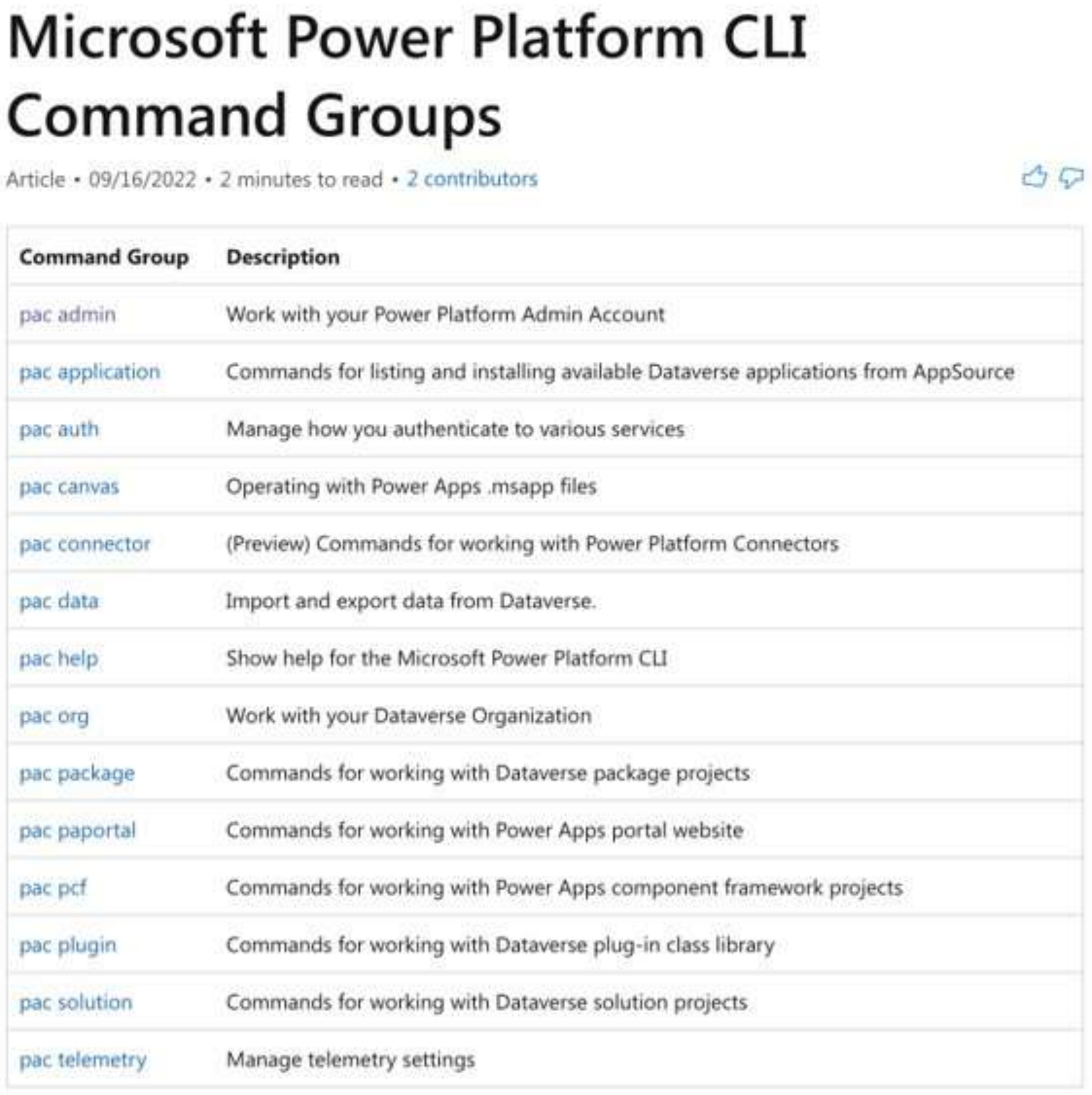
Open API v2.1 (even 3.0)

Step by Step: Building a Custom Connector

- Read the docs / know the API you want to build the connector for
- Start in one of the products (Power Apps, Power Automate or Logic Apps)
- Set up the authentication
- Define the operations (triggers / actions) for your connector
- Add code if needed (for now, C# code is supported)
- Save and test your connector

Tools for creating connectors

- Power Platform CLI (preview)
  - Helps with the ALM story of Custom Connectors
  - You can deploy, download and update your connectors with the CLI through the following commands:
    - pac connector list
    - pac connector init
    - pac connector create
    - pac connector download
    - pac connector update



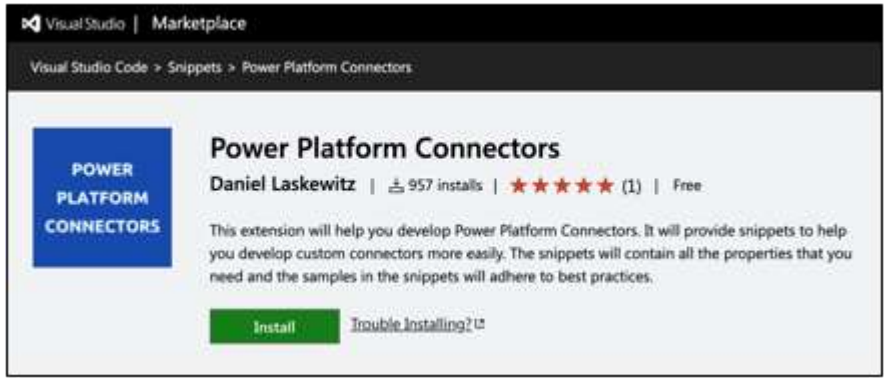
Microsoft Power Platform CLI Command Groups

Article • 09/16/2022 • 2 minutes to read • 2 contributors

Command Group	Description
pac admin	Work with your Power Platform Admin Account
pac application	Commands for listing and installing available Dataverse applications from AppSource
pac auth	Manage how you authenticate to various services
pac canvas	Operating with Power Apps .msapp files
pac connector	(Preview) Commands for working with Power Platform Connectors
pac data	Import and export data from Dataverse.
pac help	Show help for the Microsoft Power Platform CLI
pac org	Work with your Dataverse Organization
pac package	Commands for working with Dataverse package projects
pac paportal	Commands for working with Power Apps portal website
pac pcf	Commands for working with Power Apps component framework projects
pac plugin	Commands for working with Dataverse plug-in class library
pac solution	Commands for working with Dataverse solution projects
pac telemetry	Manage telemetry settings

Tools for creating connectors continued

- Power Platform CLI (preview)
  - ‘pac canvas create’ command generates a canvas app from a custom connector
  - This is great for pro code dev hand-off to citizen dev / makers
- Power Platform Connectors (VS Code Extension)
  - Helps you to easily add properties and other objects in Visual Studio Code by providing snippets


Visual Studio | Marketplace
Visual Studio Code > Snippets > Power Platform Connectors
POWER PLATFORM CONNECTORS
Install
Trouble Installing?

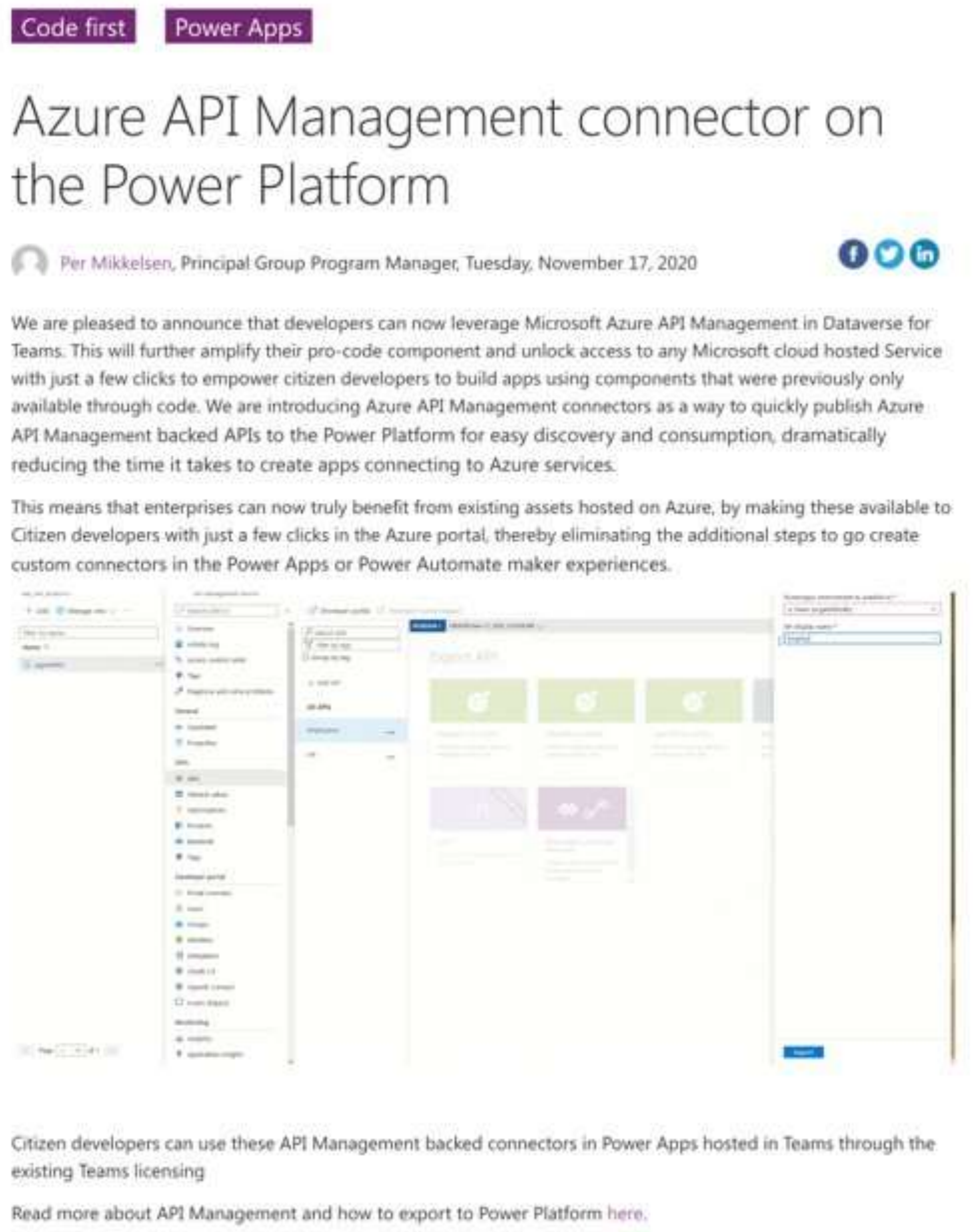
Power Platform Connectors

Daniel Laskewitz | 957 installs | ★★★★★ (1) | Free

This extension will help you develop Power Platform Connectors. It will provide snippets to help you develop custom connectors more easily. The snippets will contain all the properties that you need and the samples in the snippets will adhere to best practices.

API Management

- Azure service
- APIs can be:
  - Added to API Management
  - Exported from API Management to the Power Platform
- You have to pay for API Management (usage)
- But in a lot of cases it can be cheaper than per user licenses
- Free in Dataverse for Teams



Code first Power Apps

Azure API Management connector on the Power Platform

Per Mikkelsen, Principal Group Program Manager, Tuesday, November 17, 2020

We are pleased to announce that developers can now leverage Microsoft Azure API Management in Dataverse for Teams. This will further amplify their pro-code component and unlock access to any Microsoft cloud hosted Service with just a few clicks to empower citizen developers to build apps using components that were previously only available through code. We are introducing Azure API Management connectors as a way to quickly publish Azure API Management backed APIs to the Power Platform for easy discovery and consumption, dramatically reducing the time it takes to create apps connecting to Azure services.

This means that enterprises can now truly benefit from existing assets hosted on Azure, by making these available to Citizen developers with just a few clicks in the Azure portal, thereby eliminating the additional steps to go create custom connectors in the Power Apps or Power Automate maker experiences.

Citizen developers can use these API Management backed connectors in Power Apps hosted in Teams through the existing Teams licensing

Read more about API Management and how to export to Power Platform here.

Demo: Custom Connectors

April Dunnam

Connector Resources

- Docs (https://aka.ms/cc/learn)
- Get your connector certified (https://aka.ms/cc/certification)
- Power Platform Connectors GitHub repository (https://aka.ms/cc/github)
- Extend an OpenAPI Definition (https://aka.ms/cc/extend-openAPI)
- Custom code in custom connectors (https://aka.ms/cc/code)
- Create a connector from a Postman Collection (https://aka.ms/cc/postman)
- Custom Connectors Coding Standards (https://aka.ms/cc/coding-standards)
- Policy support in Custom Connectors (https://aka.ms/cc/policy-templates)
- Paconn CLI (https://aka.ms/cc/paconn)
- Power Platform Connectors VS Code Extension (https://aka.ms/ppc-vscode)
- Power Platform CLI (https://aka.ms/powerplatformcli)

Microsoft Power Platform

Questions?

Microsoft Power Platform

Break – 15 Mins

Microsoft

Building Custom UI Components with the Power Apps Component Framework

Greg Hurlman, Senior Software Engineer, Microsoft

Workshop Material: aka.ms/BuildPRE07

Agenda

- Framework Introduction
- Power Apps CLI
- Building a custom component
- Control demos

Empower every developer to do more

Citizen Developers

IT Developers

Pro Developers

Pre-Requisites

1. Visual Studio Code
2. Node.js
3. Microsoft Power Platform VS Code extension
4. .NET 5.x SDK
5. Dataverse Development Environment with Code Components Enabled

Some background

Once all part of Dynamics 365

First came the data layer, now Microsoft Dataverse

Next, the user interface ➡ PCF

PCF: How do we use it?

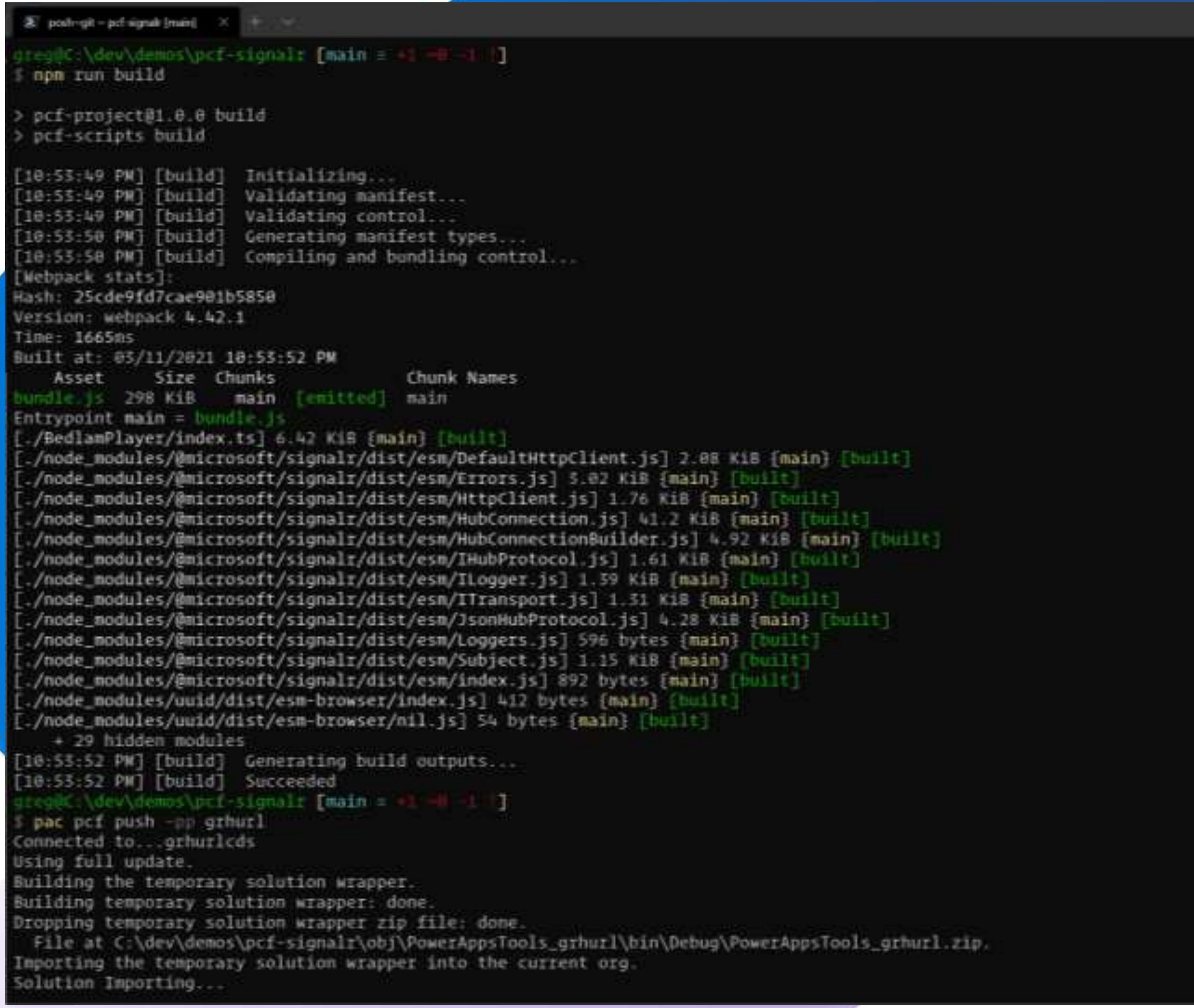
Simple to use CLI with control template (field and dataset) support

Built in validations to catch issues prior to deployment

Can be used headless as part of automated build processes

Local debug harness to render and test the control locally

Support for solution packaging

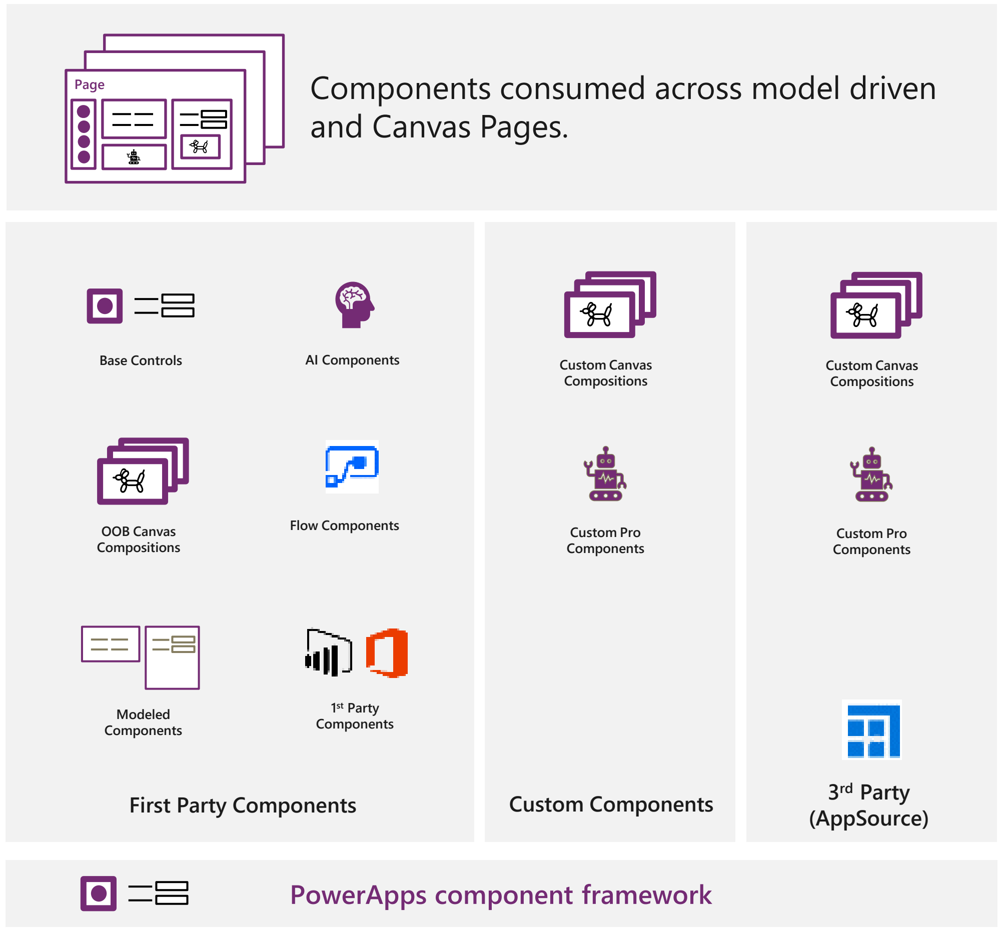


```
greg@C:\dev\demos\pcf-signalr [main ≡ +1 ~0 -1 !]
$ npm run build

> pcf-project@1.0.0 build
> pcf-scripts build

[10:53:49 PM] [build]  Initializing...
[10:53:49 PM] [build]  Validating manifest...
[10:53:49 PM] [build]  Validating control...
[10:53:50 PM] [build]  Generating manifest types...
[10:53:50 PM] [build]  Compiling and bundling control...
[Webpack stats]:
Hash: 25cde9fd7cae901b5850
Version: webpack 4.42.1
Time: 1665ms
Built at: 03/11/2021 10:53:52 PM
    Asset      Size  Chunks             Chunk Names
bundle.js  298 KiB    main  [emitted]  main
Entrypoint main = bundle.js
[./BedlamPlayer/index.ts] 6.42 KiB {main} [built]
[./node_modules/@microsoft/signalr/dist/esm/DefaultHttpClient.js] 2.08 KiB {main} [built]
[./node_modules/@microsoft/signalr/dist/esm/Errors.js] 5.02 KiB {main} [built]
[./node_modules/@microsoft/signalr/dist/esm/HttpClient.js] 1.76 KiB {main} [built]
[./node_modules/@microsoft/signalr/dist/esm/HubConnection.js] 41.2 KiB {main} [built]
[./node_modules/@microsoft/signalr/dist/esm/HubConnectionBuilder.js] 4.92 KiB {main} [built]
[./node_modules/@microsoft/signalr/dist/esm/IHubProtocol.js] 1.61 KiB {main} [built]
[./node_modules/@microsoft/signalr/dist/esm/ILogger.js] 1.39 KiB {main} [built]
[./node_modules/@microsoft/signalr/dist/esm/ITransport.js] 1.31 KiB {main} [built]
[./node_modules/@microsoft/signalr/dist/esm/JsonHubProtocol.js] 4.28 KiB {main} [built]
[./node_modules/@microsoft/signalr/dist/esm/Loggers.js] 596 bytes {main} [built]
[./node_modules/@microsoft/signalr/dist/esm/Subject.js] 1.15 KiB {main} [built]
[./node_modules/@microsoft/signalr/dist/esm/index.js] 892 bytes {main} [built]
[./node_modules/uuid/dist/esm-browser/index.js] 412 bytes {main} [built]
[./node_modules/uuid/dist/esm-browser/nil.js] 54 bytes {main} [built]
    + 29 hidden modules
[10:53:52 PM] [build]  Generating build outputs...
[10:53:52 PM] [build]  Succeeded
greg@C:\dev\demos\pcf-signalr [main ≡ +1 ~0 -1 !]
$ pac pcf push -pp grhurl
Connected to...grhurlcds
Using full update.
Building the temporary solution wrapper.
Building temporary solution wrapper: done.
Dropping temporary solution wrapper zip file: done.
  File at C:\dev\demos\pcf-signalr\obj\PowerAppsTools_grhurl\bin\Debug\PowerAppsTools_grhurl.zip.
Importing the temporary solution wrapper into the current org.
Solution Importing...
```

Components vs. Code Components



Components can be **used in both Canvas and model driven pages,** consumed in a consistent UI regardless of origin.

Rich, low-code compositions of components using expressions and connectors in canvas compositions.

The framework (Code) and compositions (Low code) are used both internally and externally for all components.

A single control framework, the **PowerApps component framework,** is used to develop **pro-dev leaf controls** and **programmatic compositions**.

What makes a framework component?

Manifest Input File

Control definition

- Name
- Version
- Properties
- Resource file references

Component Implementation

Code

- TypeScript or JavaScript
- User Interface
- Functionality

Resource Files

Static Resources

- CSS
- Localization
- Images, etc.

Why use TypeScript?

1. Type checking at compile time
2. Modular and object oriented
3. Better Developer Tooling support (e.g., refactoring)
4. ES6+ features (e.g., async) can be used before supported by browsers
5. As complexity grows – your code stay maintainable
6. PCF templates use TypeScript

Building, Testing and Debugging the control

Pre-defined build process that allows developers to focus purely on control development

Built project files are created in the output directory (including static files)

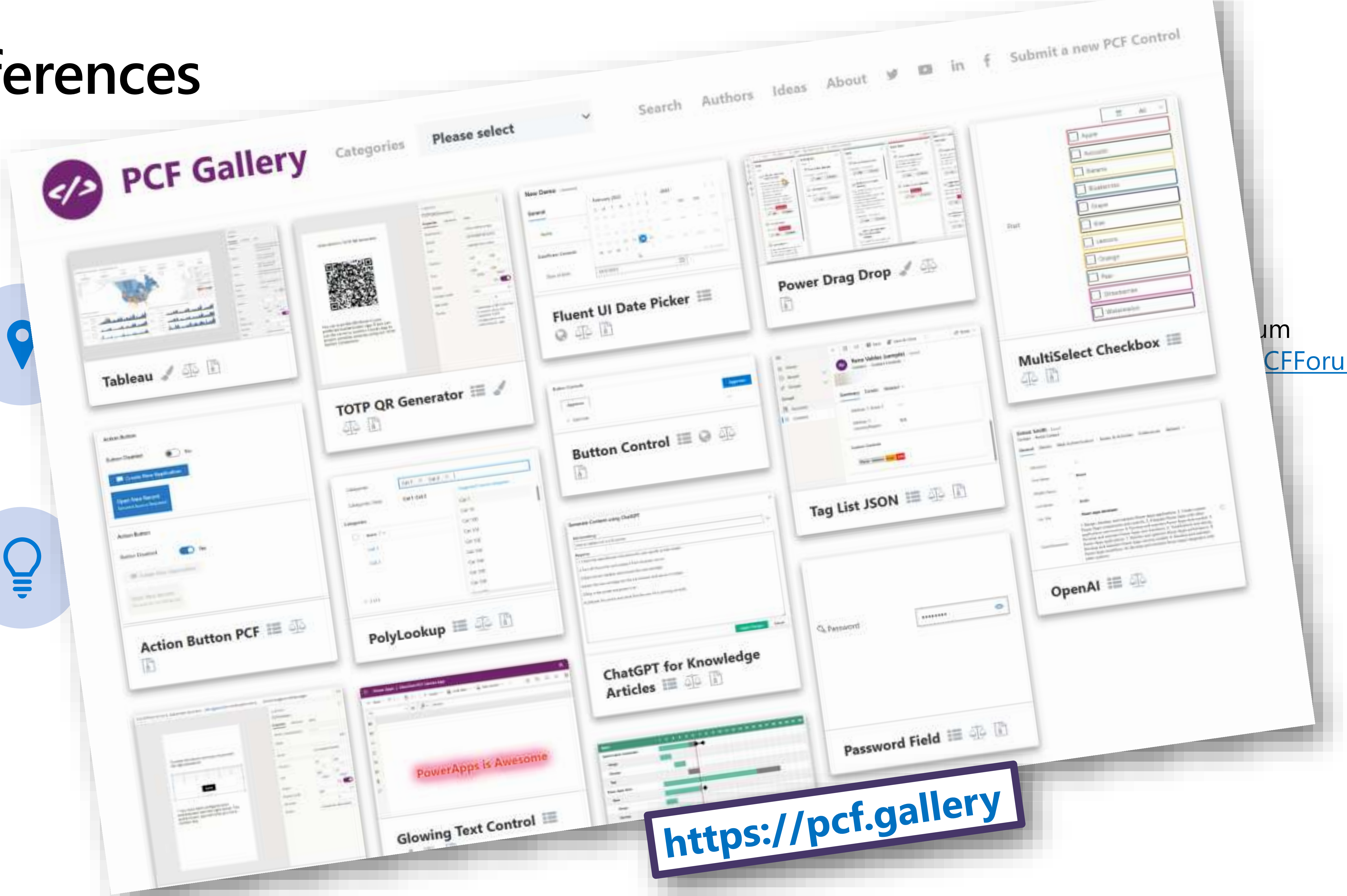
Quickly see your control **without having to upload** to your environment

Test your control on local machine browser in a provided host page

Inspect control layout and behavior before uploading to your org

Demo: Building a Code Component

References



https://pcf.gallery

um
CFForum

Microsoft Power Platform

Questions?

Continue your low-code learning at Microsoft Build

**Subject to change*

Low-code

■ Breakout Sessions

BRK270HFS
The future of app development with the Microsoft Power Platform

BRK271H
AI innovation in the Microsoft Power Platform

BRK272H
Accelerate development with Visual Studio and Microsoft Power Platform

BRK273H
Full stack scale with the Microsoft Power Platform

▲ Demos | In-person Only

DEM170A
Build web apps and connect to data faster using Microsoft Power Pages

DEM171A
Catalog in Microsoft Power Platform for pro developers

DEM171B
Power Fx and AI in Microsoft Dataverse

▲ Discussions

DIS170
Microsoft Power Platform governance and Application Lifecycle Management, Q&A

DIS173
Microsoft Power Platform and code-first development, Q&A

DIS271H
Data-driven app and web development with Microsoft Power Platform, Q&A

DIS272H
The future of AI and generative code, Q&A

DIS274H
Designing and implementing automation and conversational AI, Q&A

▲ Labs | In-person Only

LAB170
Skill up with Microsoft Power Platform and GitHub

LAB171
Build an end-to-end customer engagement app with Azure Communication

LAB172
Building your low-code hyperscale backend on Microsoft Dataverse

Low-code Expert Meet-up

Expert Meet-ups will be held in nine rooms on levels 3 and 4 of the SCC, organized by topic (.NET, AI, cloud development, data platform, developer tools, collaborative apps, DevSecOps and SRE, low-code, and Windows).

Joining an Expert Meet-up is easy. Simply find the room that relates to your question and join the conversation. The rooms will be broken into focus areas for easy navigation, but if you still are not sure where to go, stop by the concierge desk at the entrance of each room to find out which expert to connect with.

Focus areas

- Power Apps
- Power Automate
- Power Pages
- Power Virtual Agents
- Dataverse
- AI Builder
- Power FX
- Application Lifecycle Management
- Connectors/API's

Additional Resources

- Power Platform + Java Workshop: https://aka.ms/JavaPowerWorkshop
- Power Platform + Mixed Reality: https://aka.ms/pp/mr/workshop
- Power BI + Azure Synapse: https://aka.ms/PBISynapseWorkshop
- Power Platform Prompt Library: https://aka.ms/ppprompts
- Power Platform Samples: https://aka.ms/powerplatform-samples
- Power Platform Developer Blog: https://aka.ms/PowerPlatformDevBlog
- Power Platform Dev Blog Guest Blog Signup: https://aka.ms/PowerPlatformDevBlogGuest
- Power Platform Actions Labs: https://github.com/microsoft/powerplatform-actions-lab
- ALM Accelerator: https://aka.ms/almaccelerator

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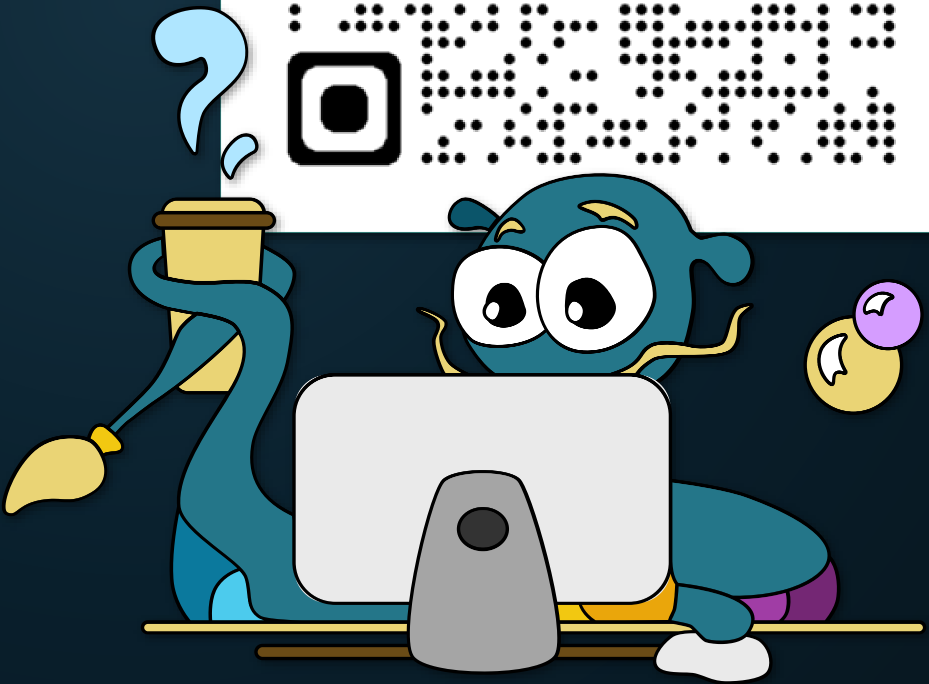

empower everyone Microsoft Power Platform CONFERENCE

Microsoft

Power Platform Q&A

Book a follow up with Greg:
https://aka.ms/greg/build-followup