

# **Unlocking Low-Code Development with SAP BTP & Azure**

**Accelerating Innovation at CenterPoint Energy**



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# Bowdark At a Glance

Bowdark specializes in the design and development of custom software solutions using SAP, Microsoft, and cloud-based technologies. We're based in Flower Mound, TX and have been developing best-in-class solutions for customers since 2006.

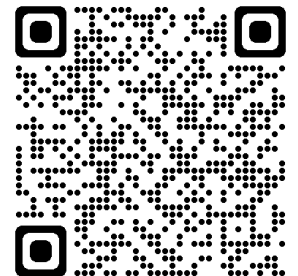


## Expert Knowledge

- ❑ 2 SAP Mentors
- ❑ A member of the SAP Developer Advisory Board
- ❑ An SAP HANA Distinguished Engineer
- ❑ Authors of 16 books on SAP & related topics



Gold Application Integration  
Gold Application Development





CenterPoint Energy provides a variety of energy services to customers across 6 states. By the numbers:

- CNP operates electric & natural gas utility businesses in Texas, Louisiana, Mississippi, Indiana, Ohio, and Minnesota
- Serves over 7 million metered customers
- Assets totaling approximately \$35 billion
- Approximately 8,900 employees



CenterPoint Energy...Always There®

- Electric Transmission & Distribution
- Power Generation
- Home / Residential Services
- Natural Gas
- Mobile Energy Solutions
- Commercial Services
- Pole Attachments
- Surveying & Right-of-Way
- Telecommunications Delivery

# What We'll Cover

- Setting the Stage: How Did We Get Here?
- Introduction to Low-Code Development
- Building a Foundation for Low-Code Development
- Applied Business Cases
- Next Steps
- Wrap-Up

# **Setting the Stage: How Did We Get Here?**

Understanding Previous Barriers to Innovation

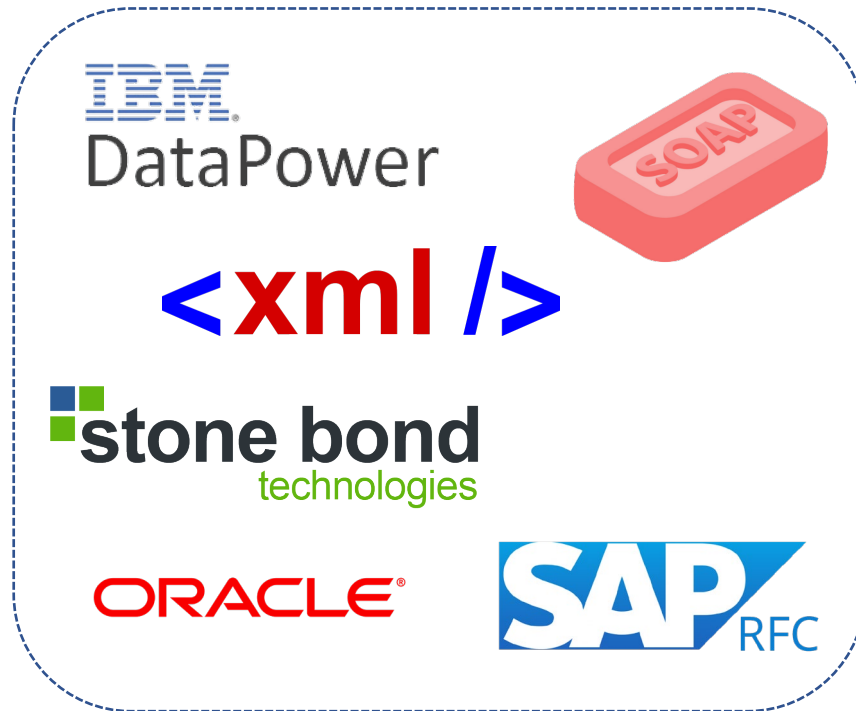
# Before: Common Challenges

- The needs of the business outweigh the capacity of IT
- Custom SAP solutions (e.g., Fiori apps) are expensive to build (and maintain)
- There are limitations to what can be built using ABAP & NetWeaver technologies
- SAP change management is slow and complex
- Apps only address *part* of a process problem

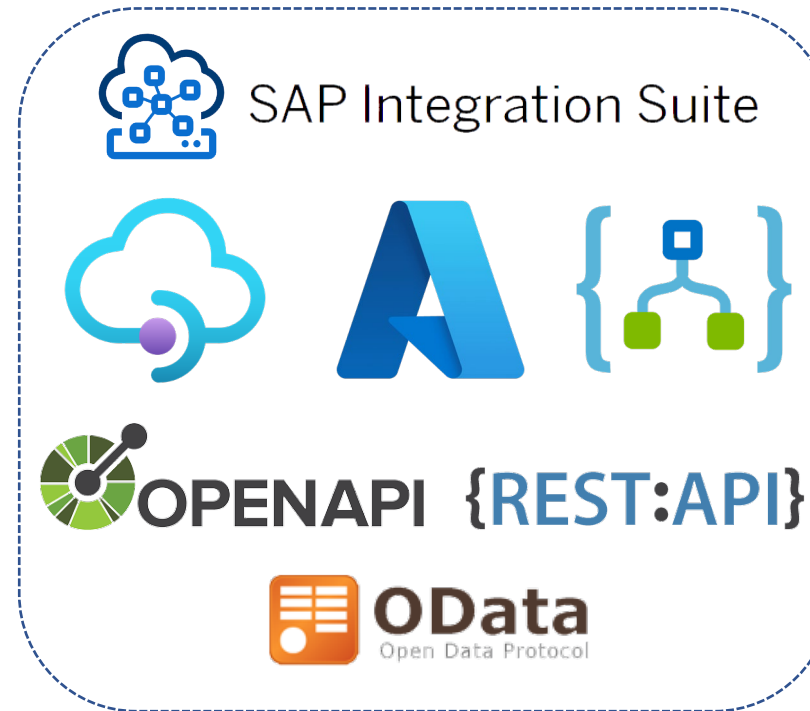
# Desired Outcomes

- Rapid app / solution rollout
- Improved customer service
- Reduced operating costs
- Open up SAP to a broader developer ecosystem
- Simplified architecture & security
- Alignment with long-term enterprise IT strategy

# Before & After: API Enablement



Complex A2A-Style  
Integration



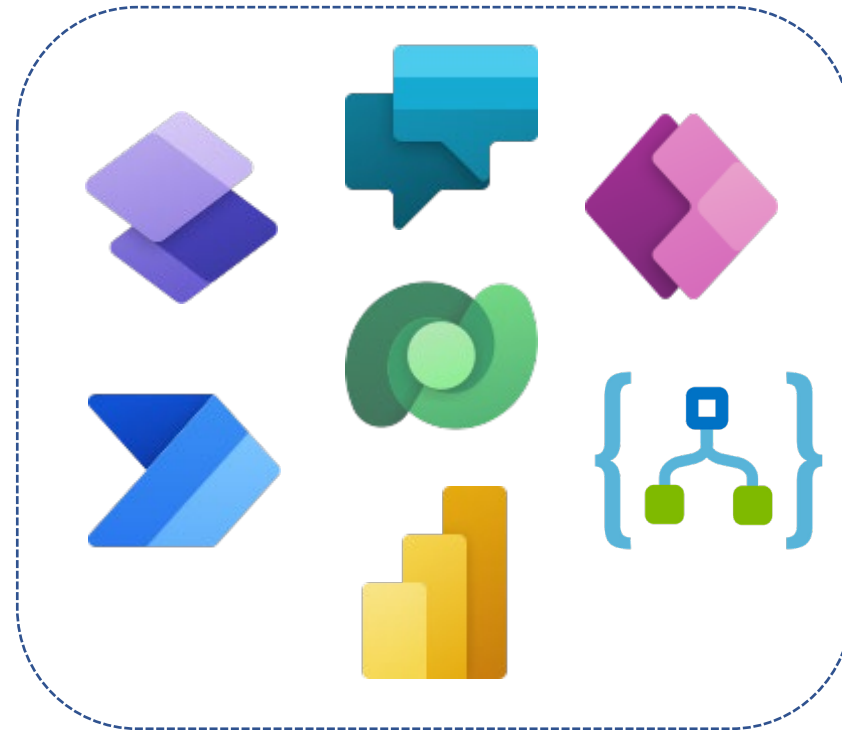
Simplified A2X-Style  
Integration



# Before & After: Dev Approach

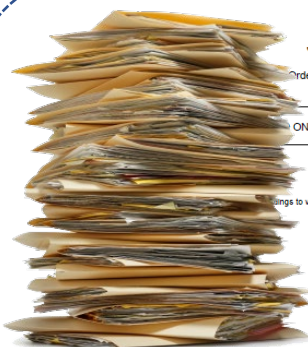


Pro-Code  
Development



Low-Code  
Development

# Before & After: User Experience



**JOB SAFETY BRIEFING**

Order Number 222162-1 Clearance Number \_\_\_\_\_

ON THIS JOB: \_\_\_\_\_

Check Applicable Safety Items Below

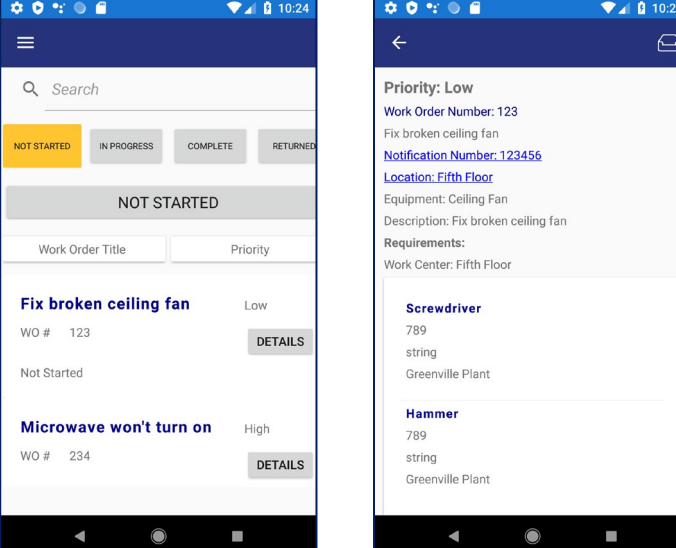
Things to verify the topic was considered even if there were no hazards associated with the job activity.

<input type="checkbox"/> <b>WORK PROCEDURES</b>	<input type="checkbox"/> <b>SPECIAL PRECAUTIONS</b>
<input type="checkbox"/> Scaffolding Use	<input type="checkbox"/> Gas/Atmosphere Monitors
<input type="checkbox"/> Work Zone - Signs, Barricades	<input type="checkbox"/> Emergency Information
<input type="checkbox"/> Lockout / Tagout (Clearance)	<input type="checkbox"/> Housekeeping
<input type="checkbox"/> Crane / Forklift Use	<input type="checkbox"/> Fire Watch
<input type="checkbox"/> Confined Space/Atmospheric Check	<input type="checkbox"/> Proper Rigging
<input type="checkbox"/> Mobile Equipment - Scissor / JLG	<input type="checkbox"/> Pinch Points
<input type="checkbox"/> Elevated Work	<input type="checkbox"/> Safety Shower
<input type="checkbox"/> Equipment Stabilized - Outriggers	<input type="checkbox"/> Heat or Cold Stress
<input type="checkbox"/> Fall Protection	<input type="checkbox"/> Permits in Place
<input type="checkbox"/> Grounding, GFCI Use	<input type="checkbox"/> Lifting Equipment - Load Limits
<input type="checkbox"/> Ventilation	<input type="checkbox"/> Working on or Near Water
<input type="checkbox"/> Welding Precautions	

<input type="checkbox"/> <b>PPE</b>	<input type="checkbox"/> <b>PPE (Continued)</b>	<input type="checkbox"/> <b>ENERGY SOURCE CONTROLS</b>
<input type="checkbox"/> Hardhat	<input type="checkbox"/> Work Gloves	<input type="checkbox"/> Electric
<input type="checkbox"/> Safety Glasses	<input type="checkbox"/> Goggles/Face shield	<input type="checkbox"/> Hydraulic
<input type="checkbox"/> Flash Suit/FR Clothing	<input type="checkbox"/> Hearing Protection - Plugs, Muffs	<input type="checkbox"/> Pneumatic
<input type="checkbox"/> Respirator/SCBA	<input type="checkbox"/> Disposable Cover-all	<input type="checkbox"/> Gravity
<input type="checkbox"/> Rubber Gloves/Cover-up	<input type="checkbox"/> Chemical Resistant Clothing	<input type="checkbox"/> Stored
<input type="checkbox"/> Harness & Lanyard	<input type="checkbox"/> Rubber / Di-electric Boots	<input type="checkbox"/> Other _____

ADDITIONAL JOB HAZARD CONSIDERATIONS: \_\_\_\_\_

Manual Paper-Based  
Processing



The left screen shows a search bar, status filters (NOT STARTED, IN PROGRESS, COMPLETE, RETURNED), and a list of work orders. The first work order is 'Fix broken ceiling fan' with a priority of 'Low'. The second is 'Microwave won't turn on' with a priority of 'High'. Each entry has a 'DETAILS' button.

The right screen shows the details for the 'Fix broken ceiling fan' work order. It includes the priority (Low), work order number (123), description (Fix broken ceiling fan), notification number (123456), location (Fifth Floor), equipment (Ceiling Fan), and requirements (Screwdriver, Hammer). It also lists the work center as 'Fifth Floor' and the location as 'Greenville Plant'.

Digital End-to-End  
Processing

# **Introduction to Low-Code Development**

Getting Started with Low-Code Development Platforms

# A New Abstraction Model

- Low-code development platforms (LCDP) have introduced a new style of development focused on:
  - [Model-driven](#) or declarative design
  - Reusable components and templates (think Lego™)
  - Visual programming using graphical WYSIWYG editor tools
  - Automatic code generation
  - Simplified logic (think Excel formulas)



# Why Low-Code Tools Matter

1. LCDPs significantly lower the barrier to development, unlocking the door for [citizen developers](#)
2. They also make developers much more efficient
  - Developer productivity here at Bowdark is up **over 60%** with low-code tools
3. They offer unprecedented agility (e.g., DevOps, ALM)
4. They unlock many new app scenarios
5. They significantly reduce the TCO for custom solutions



# WYSIWYG Designer Tools



Power Apps | Form

Search

Environment: D365 PO Test

James Wood

Back | Form field | Component | Form settings | Switch to classic | Save | Publish

### Table columns

Search

+ New table column

☒ Show only unused table columns

- Created By
- Created By (Delegate)
- Created On
- Currency
- 0.0 Exchange Rate
- Modified By
- Modified By (Delegate)
- Modified On
- Owning Business Unit
- Purchase Price (Base)
- Status
- Status Reason

### New Equipment

Equipment

General

Name	---
Category	---
Description	---
Vendor	---

Manufacturing Information

Manufacturer	---
Model Number	---
Serial Number	---
Order Number	---

Price and Assignment

Purchase Date	---	Purchase Price	---
Assigned To	---	Assigned On	---

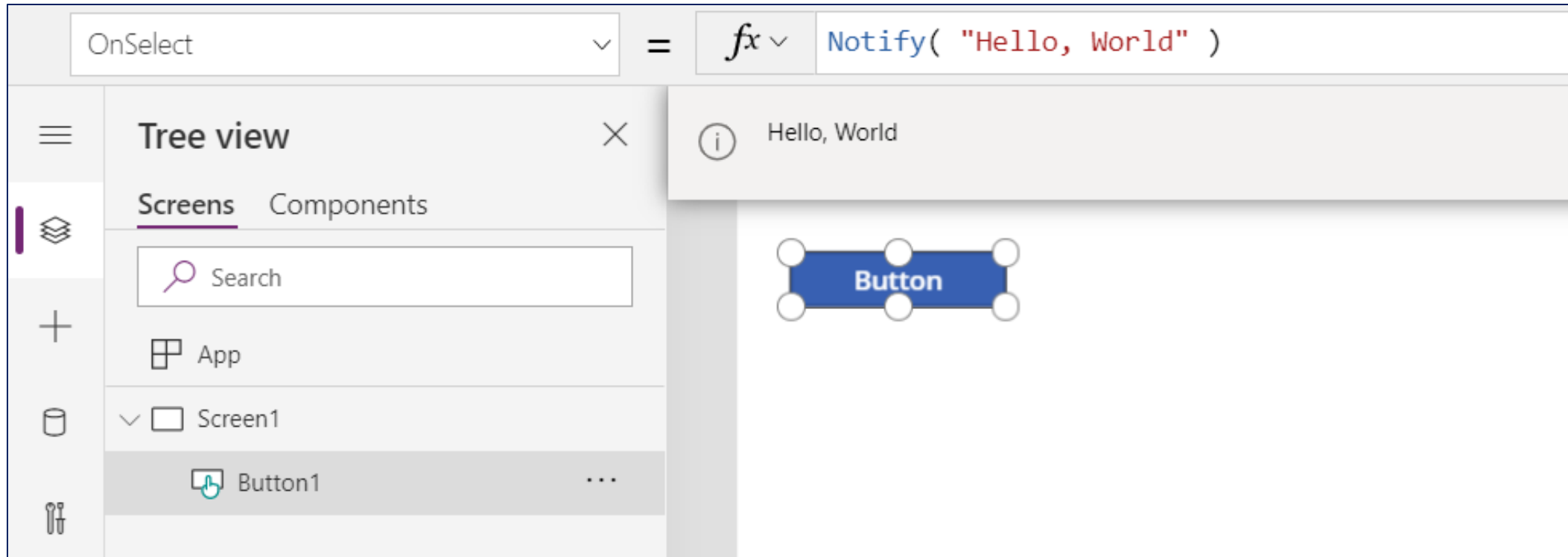
Customer Information

Customer Asset	No	Customer	---
----------------	----	----------	-----

Equipment main form

Desktop (1920 x 1080) | Show Hidden: Off | 64%

# Simplified App Logic



# Just Add ~~Water~~ APIs

- REST (OData) APIs are the lifeblood of LCDPs
- When defined *properly*, APIs can be:
  - Used to create new user experiences
  - Mixed-and-matched to create app mash-ups (ex: SAP + Salesforce)
  - Leveraged by a wider audience of developers
  - Shared across the enterprise



# From APIs to Connectors



Office 365



Outlook



SharePoint



OneDrive



MS Teams



Slack



Notifications



SAP



Salesforce



Dynamics 365



Workday



Adobe Sign



DocuSign



Stripe



SQL Server



Oracle



Mainframes



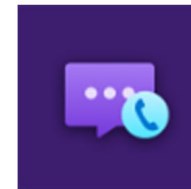
AWS



FTP / Files



ArcGIS



Azure  
Communication  
Services

# More Than Just Apps

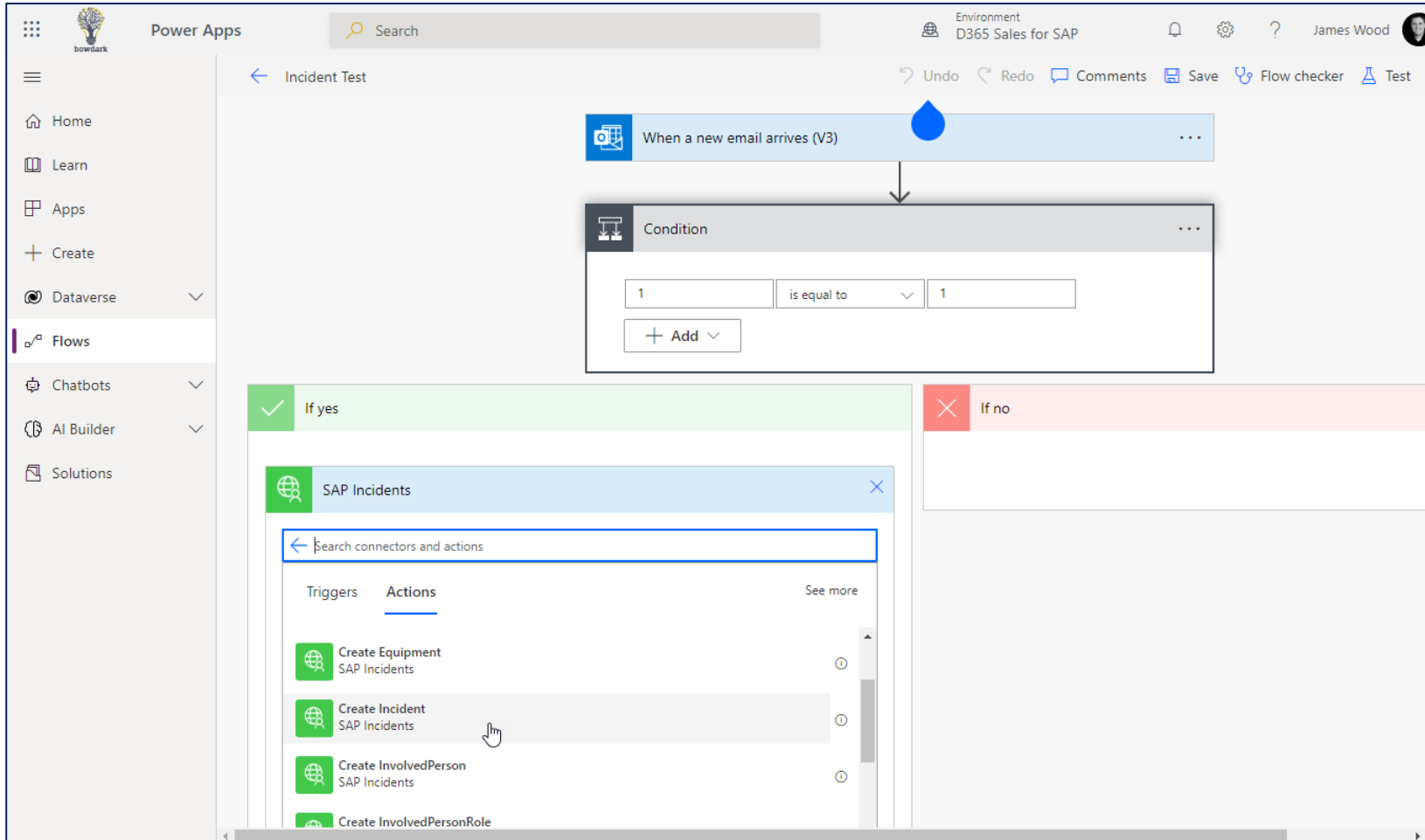
- Besides web and mobile apps, LCDPs can also be used to (rapidly) develop:
  - Self-service portals
  - Spreadsheet replacements (Excel + Access)
  - Interfaces
    - Ex: Microsoft provides over 800 connectors OOTB to easily connect SAP with various cloud and on-premises business systems
  - Workflows
  - Automations (RPAs)
  - AI & machine learning-based solutions
  - Reports & dashboards
  - Chatbots

“

*“The best app is no app”*

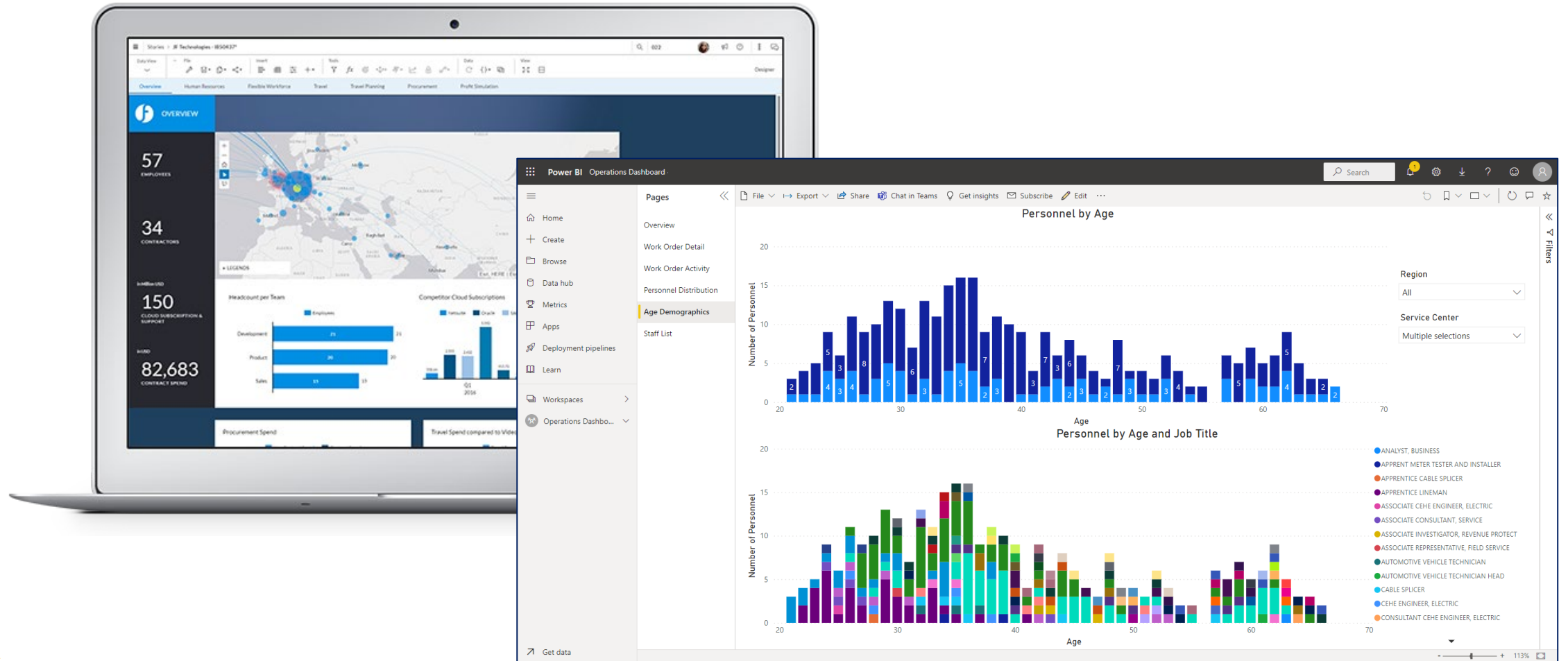
- Eleanor Roosevelt (Probably)

# Workflows & Automations



The screenshot displays the Microsoft Power Apps interface for editing a workflow named "Incident Test". The top navigation bar includes the "Power Apps" title, a search bar, and the environment "D365 Sales for SAP". The left sidebar shows the navigation menu with options like Home, Learn, Apps, Create, Datasource, Flows (selected), Chatbots, AI Builder, and Solutions. The main workspace shows the workflow steps: a trigger "When a new email arrives (V3)" followed by a "Condition" step. The condition is configured with the value "1" compared "is equal to" "1". Below the condition, there are two conditional paths: "If yes" (green) and "If no" (red). The "If yes" path is currently active, and a search pane is open, showing "SAP Incidents" as the selected connector. Under the "Actions" tab, the "Create Incident SAP Incidents" action is highlighted.

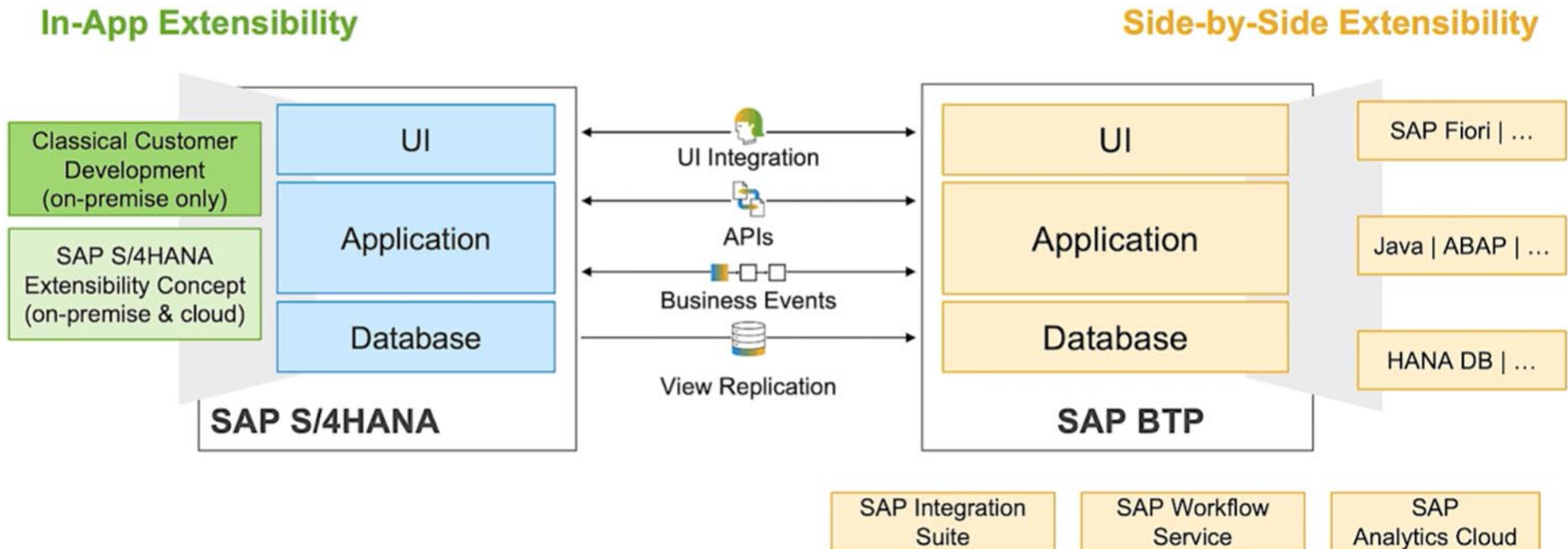
# Self-Service Analytics



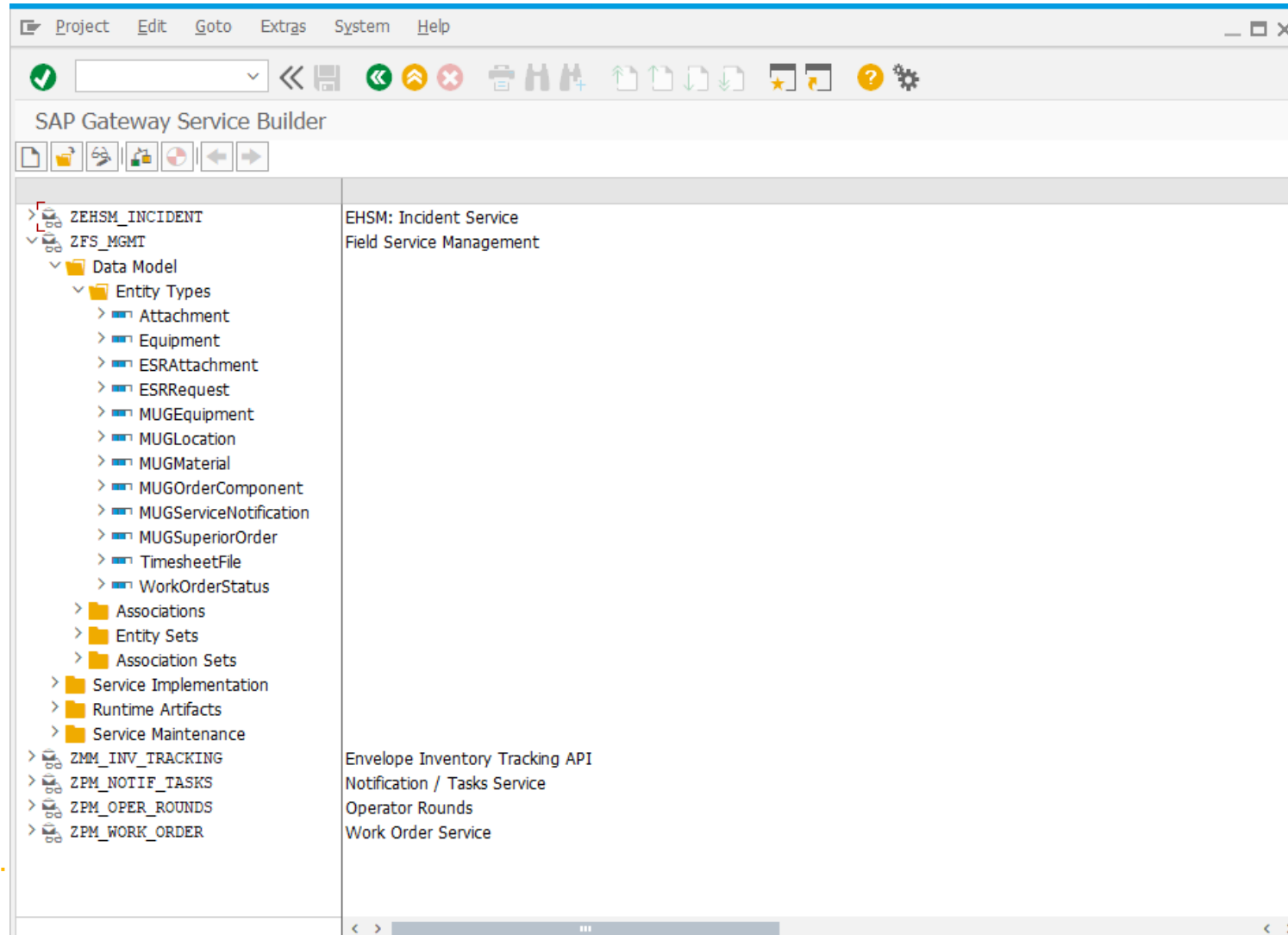
# **Laying the Foundation**

**Building an Architecture to Support Low-Code Development**

# Conceptual Approach: Side-by-Side Extensions



# Building APIs in SAP Gateway





# Publishing SAP APIs to APIM



The screenshot displays the SAP API Portal interface. The top navigation bar includes the SAP logo, 'API Portal' text, and icons for a grid, notifications (11), and a user profile. A left sidebar contains icons for home, search, edit, view, and settings.

**Activity Section:**

- Recent APIs:** A list of three APIs, all with status 'Deployed':
  - WorkOrder ODATA | S0015349096
  - OperatorRounds ODATA | S0015349096
  - OperatorRoundsPowerApps ODATA | S0015349096
- Quick Actions:** A section titled 'Create Artifacts' with four options: API, API Provider, Product, and Rate Plan.

**Monitoring Section:**

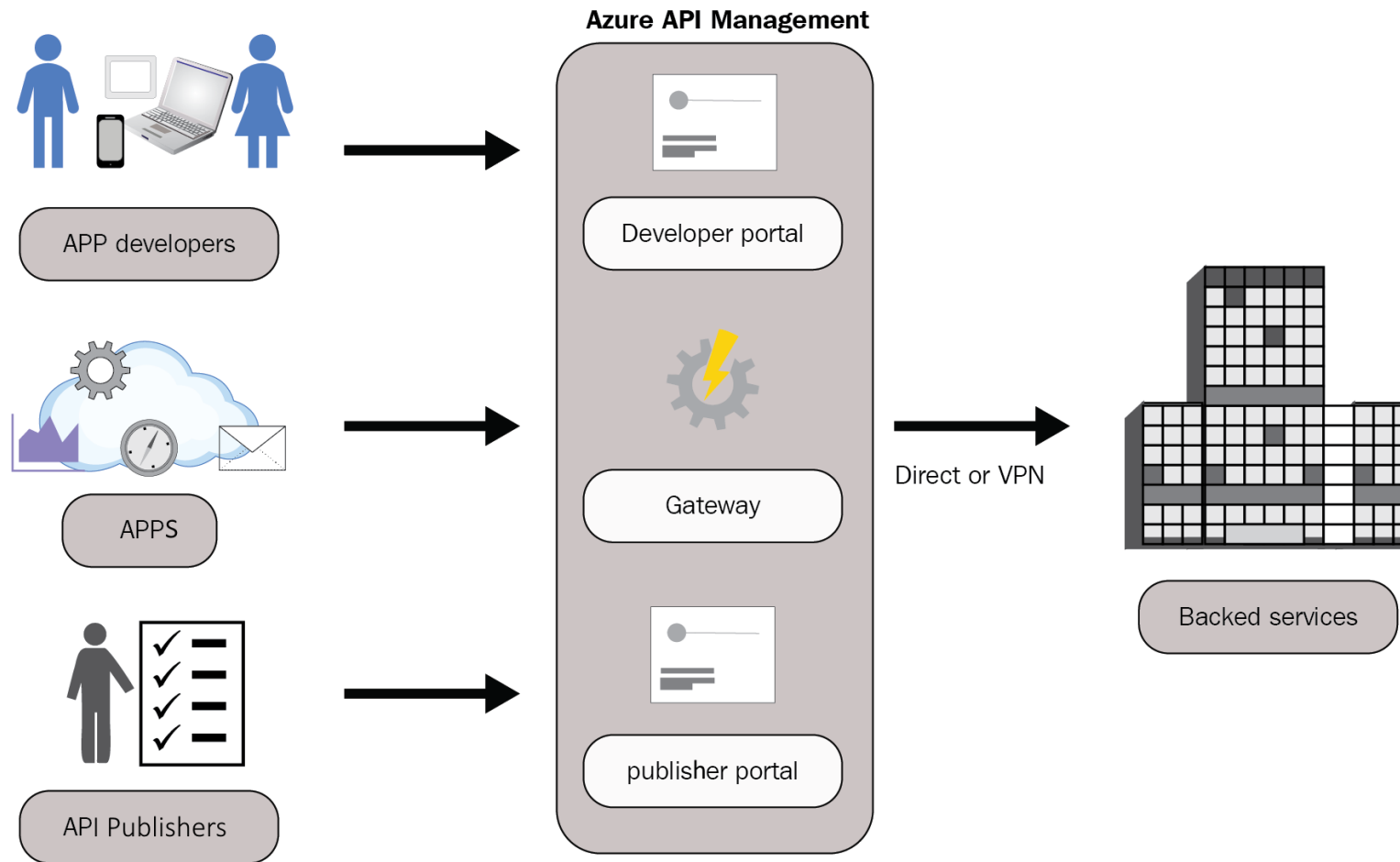
Create and explore SAP APIs and view high level analytics

Time filters: Last 6 Months, Month, Week, **Day**, Hour

Four monitoring cards are shown, each with a large '0' value:

- API Errors:** Based on number of failure. Error causing APIs: 0. Total API Errors.
- API Performance:** Based on Response Time. Average Response Time(ms).
- Applications:** Based on API Calls. In Use Applications: 0. Total Applications.
- Products:** Based on Applications usage. Published Products: 0. Total Products.

# API Publication Process

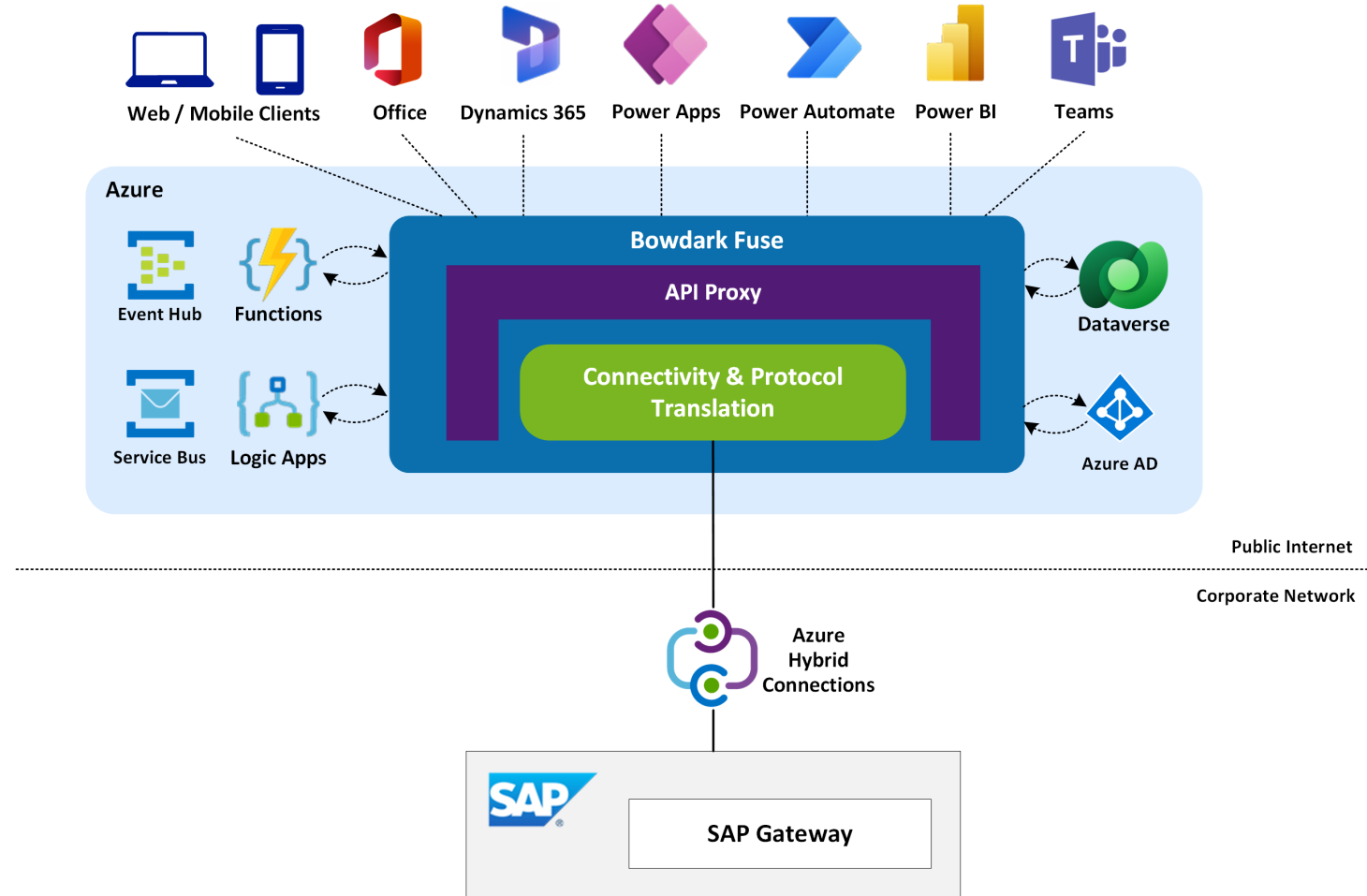


# Empowering Devs with Fuse

- Bowdark Fuse is a middleware solution which simplifies consumption of SAP APIs from low-code consumer types
- In a nutshell, Fuse unlocks:
  - Secure API access to SAP backend systems with principal propagation
  - Integration with a wide variety of tools and programming environments (notably Microsoft Power Platform)
  - Deep integration of SAP with Microsoft Dataverse



# Fuse Architectural Overview



# API Access with Fuse (1)



**Fuse** Bowdark Fuse Connector for SAP

Connected SAP Systems (1)

Delete System

Edit System

Add System

System	Client	Host	Port	Description
S4H	001	https://s4dev.bowdark.com	443	Bowdark S4H

Published Services (2)

Refresh Metadata Cache

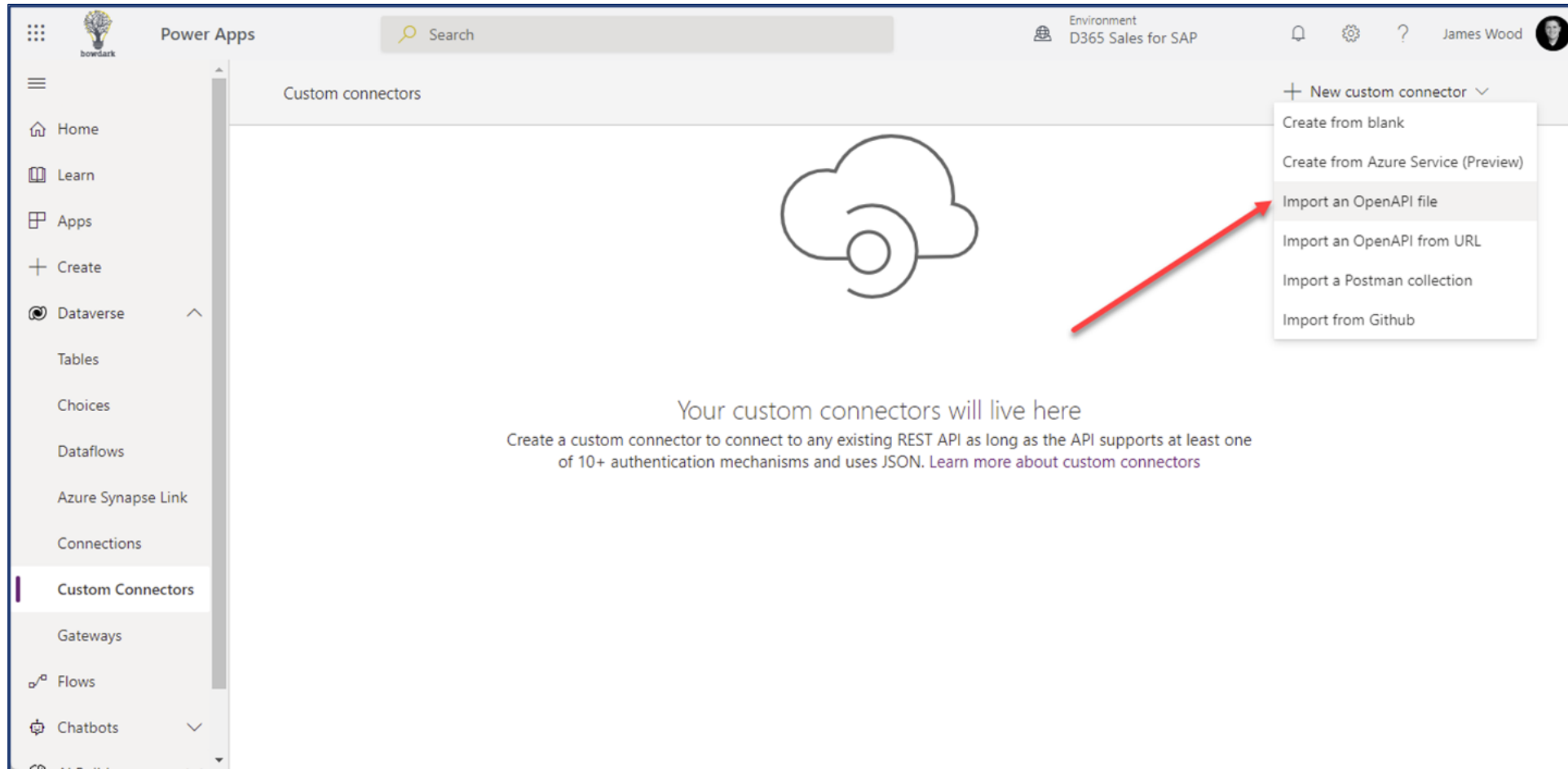
Delete Service

Edit Service

Add Service

Service	Path	Service Document	Metadata Document	Open API Spec
IncidentService	/sap/opu/odata/sap/ZEHS_INCIDENT_SRV/	<a href="#">↓</a>	<a href="#">↓</a>	<div><a href="#">↓</a></div>
CATALOGSERVICE	/sap/opu/odata/iwfnd/CATALOGSERVICE;v=0002/	<a href="#">↓</a>	<a href="#">↓</a>	<div><a href="#">↓</a> Download</div>

# API Access with Fuse (2)

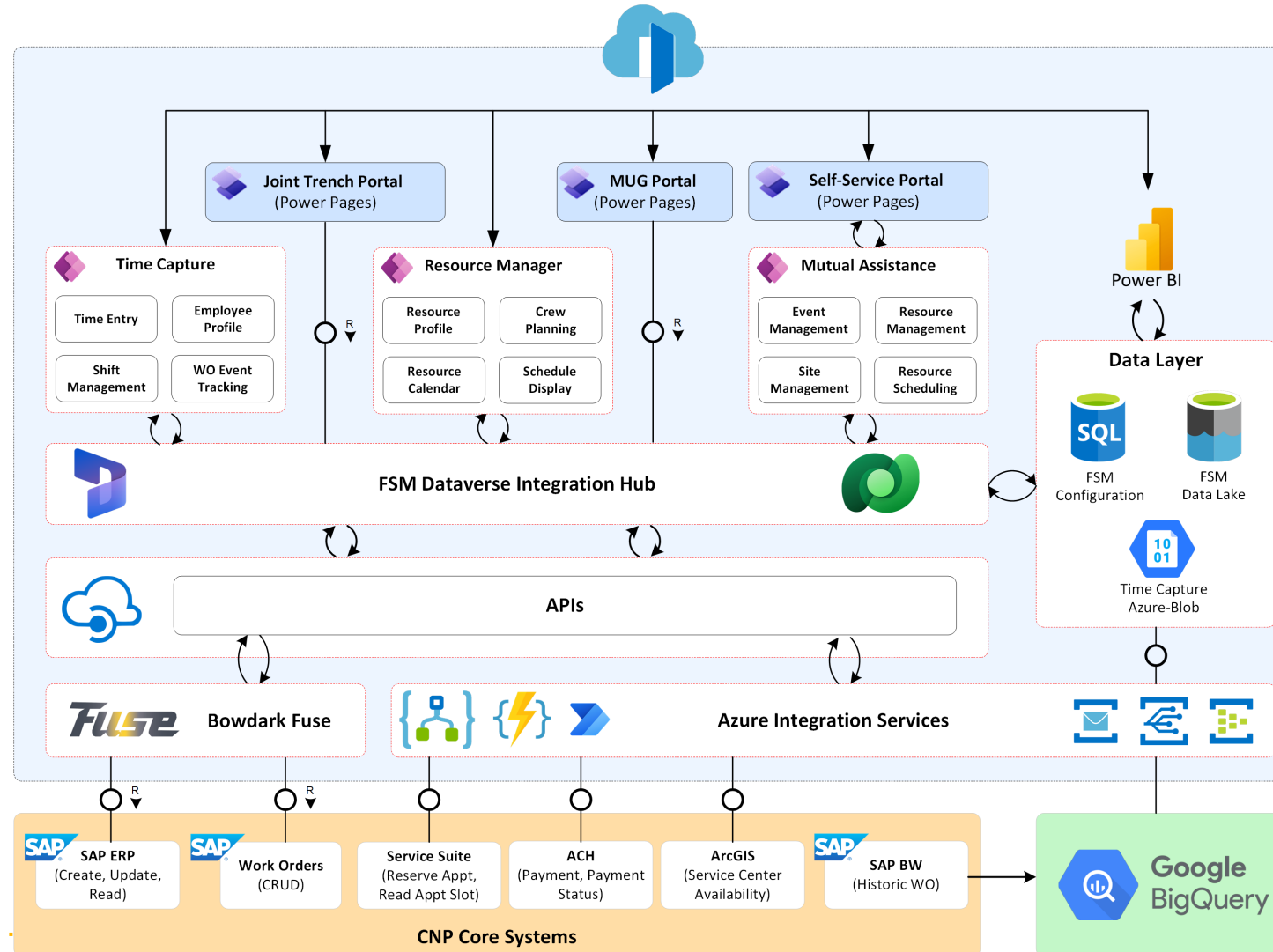


# API Access with Fuse (3)



The screenshot displays the Microsoft Power Apps environment. The top navigation bar includes the 'Power Apps' title, a search bar, and the user's name 'James Wood'. The left sidebar shows the navigation menu with options like Home, Learn, Apps, Create, Dataverse, Flows, Chatbots, AI Builder, and Solutions. The main workspace shows a flow named 'Incident Test'. The flow starts with a trigger 'When a new email arrives (V3)', followed by a 'Condition' step with the logic '1 is equal to 1'. Below the condition, there are two paths: 'If yes' and 'If no'. The 'If yes' path is currently selected and shows a list of actions under the 'SAP Incidents' connector. The actions listed are 'Create Equipment SAP Incidents', 'Create Incident SAP Incidents', 'Create InvolvedPerson SAP Incidents', and 'Create InvolvedPersonRole'. A mouse cursor is hovering over the 'Create Incident SAP Incidents' action.

# Architectural Blueprint






# **Applied Business Cases**

**Extending the Reach of SAP into the Field and Beyond**

# Self-Service Portals



Home | Electric Service Request Form | FAQ | Contact Us | Q | Sign in

[Home](#) > Electric Service Request Form

## Electric Service Request Form

Instructions found in the tooltip. Please see the [FAQ](#) for more information.

1 Service Address

2 Primary Contact

3 Electrician

4 Service Information

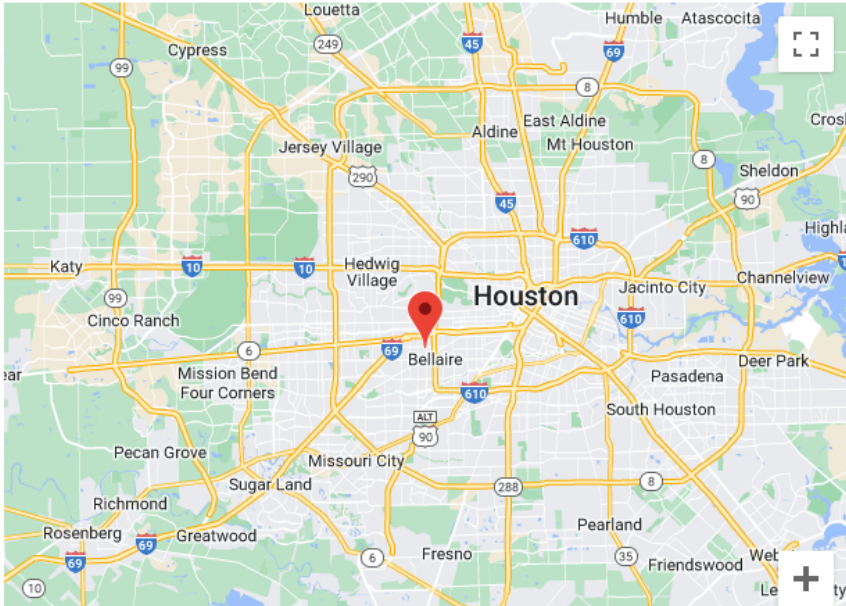
5 Attachments

**Street Address (or nearest address) \***

**City \***

**Zip Code \***

**Business Name (if applicable)**



# Mash-Up Applications (1)



Welcome, C\_Lori Beck!

Start  
04:00 AM

End  
12:00 PM

< Wednesday, October 5, 2022 >

Timesheet Overview

Team Lead

Add Standing WO

Add Future Time

Add Work Order

Add Time Event

Review Timesheet

Priority	Work Order	Address	Type	WO Time	Addl Time		
✓	S000101935267	7616 TIMBERSIDE DR	MNTSLT	0 hrs 2 min	2 hrs 0 min	⋮	→
✓	S000103698488	4100 GRIMES	MNTSLT	2 hrs 2 min	2 hrs 0 min	⋮	→

Timesheet Total Hours

2 hrs 4 mins

SHIFT-1048

SHIFT-1048

Work Orders out of Shift

Work Order

Address

Type

Duration

Start Time

End Time

Team

> C\_Derrick Jackson

< C\_Lori Beck

Employee ID: M0230155

Shift: 0 hrs 1 min

Total hours: 0.06666667

Classification: Headlineman

# Mash-Up Applications (2)



←

📄

🔗

👤 Clone

💾 Save

💾 Save & Close

➕ New

🚫 Deactivate

🗑️ Delete

🔄 Refresh

🔍 Check Access

👤 Assign

🔗 Share

✉️ Email a Link

⋮

Resource Plan for: 10/11/2022 - Saved

10/11/2022 8:00 AM  
Plan Date

Resource Plan

General

Controller View

Related

Crews

Resources

Baytown

Morning

Baytown

Morning

Publish

Tue Oct 11 2022

Search People

C\_Daniel Perla  
Supervisor  
Available

Search Equipment

0001  
X  
Available

0002  
D  
Available

0003  
Single Bucket  
Available

0004

Search Shifts by Person

Create a Crew Assignment

0003  
Single Bucket  
Available

Mark Unavailable  
Drop Resources Here

Hide Resources

# Web & Mobile Apps



The image shows a tablet and a smartphone displaying web and mobile app interfaces. The tablet screen displays a web form titled "Operator Rounds Approval". The form includes the following fields:

- Round: U3 Boiler Round (dropdown menu)
- Status: In Process (dropdown menu)
- Submitted By: (text input field)
- Submitted On: 10/3/2021 (calendar icon) to 10/4/2021 (calendar icon)
- Search: (green button)

The smartphone screen displays a mobile app interface titled "Edit Address". The form includes the following fields:

- Address: (text input field)
- City: (text input field)
- Country: USA (dropdown menu)
- Region: Texas (dropdown menu)
- Postal Code: (text input field)
- Geocoordinates section:
  - Latitude: 33.049583 (text input field)
  - Longitude: -97.077896 (text input field)
- Lookup: (blue button)
- Apply: (blue button)

# Model-Driven Apps



Incident Management

Home

Recent

Pinned

Incidents

Incidents

Locations

Locations

Incidents

Save Save & Close New Flow

New Incident - Unsaved

General Location Conditions Persons

Incident Number \* ---

Category Safety Observation

Title Work Truck Has Worn Tires

Confidential No

What Happened?

Description

Noticed that the work truck with license #GRGXY has bald tires on both right tires. These need to be replaced.

When Did it Happen?

# WYSIWYG Editor Experience



Power Apps | Form

Search

Environment: D365 Sales for SAP

James Wood

Back | Undo | Redo | Copy | Paste | Delete | Add Form field | Add Component | Form settings | Switch to classic | Save | Publish

### Table columns

Search

+ New table column

☒ Show only unused table columns

- Created By (Delegate)
- ☐ Incident Status ...
- Modified By
- Modified By (Delegate)
- Modified On
- Owning Business Unit
- ☐ Status
- ☐ Status Reason

### New Incident

Incident

General | Location | Conditions | Persons | Related

Incident Number: ---

Title: ---

Incident Status: ☐ ...

What Happened?

When Did it Happen?

Start Time	---	Reported By	---
End Time	---	Reported Time	---

Where Did It Happen?

Desktop (1920 x 1080) | Show hidden: Off | 64 %

**Live SAP Fields**

# Low-Code Integration Flows



Microsoft Azure Search resources, services, and docs (G+)

Home > sap-to-d365-employees-worker

sap-to-d365-employees-worker | Logic app designer

Logic app

Search

Save Discard Run Trigger Designer Code view Parameters Templates Connectors Help Info

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Development Tools

Logic app designer

Logic app code view

Versions

API connections

Quick start guides

Settings

Workflow settings

Authorization

Access keys

Identity

Properties

Locks

Initialize Email

For Each Employee Header Record

Select an output from previous steps

fx xpath(...) x

Lookup Current User Information by Email Address

Set Current Employee

Set Employee ID

Set Email

Set User Name

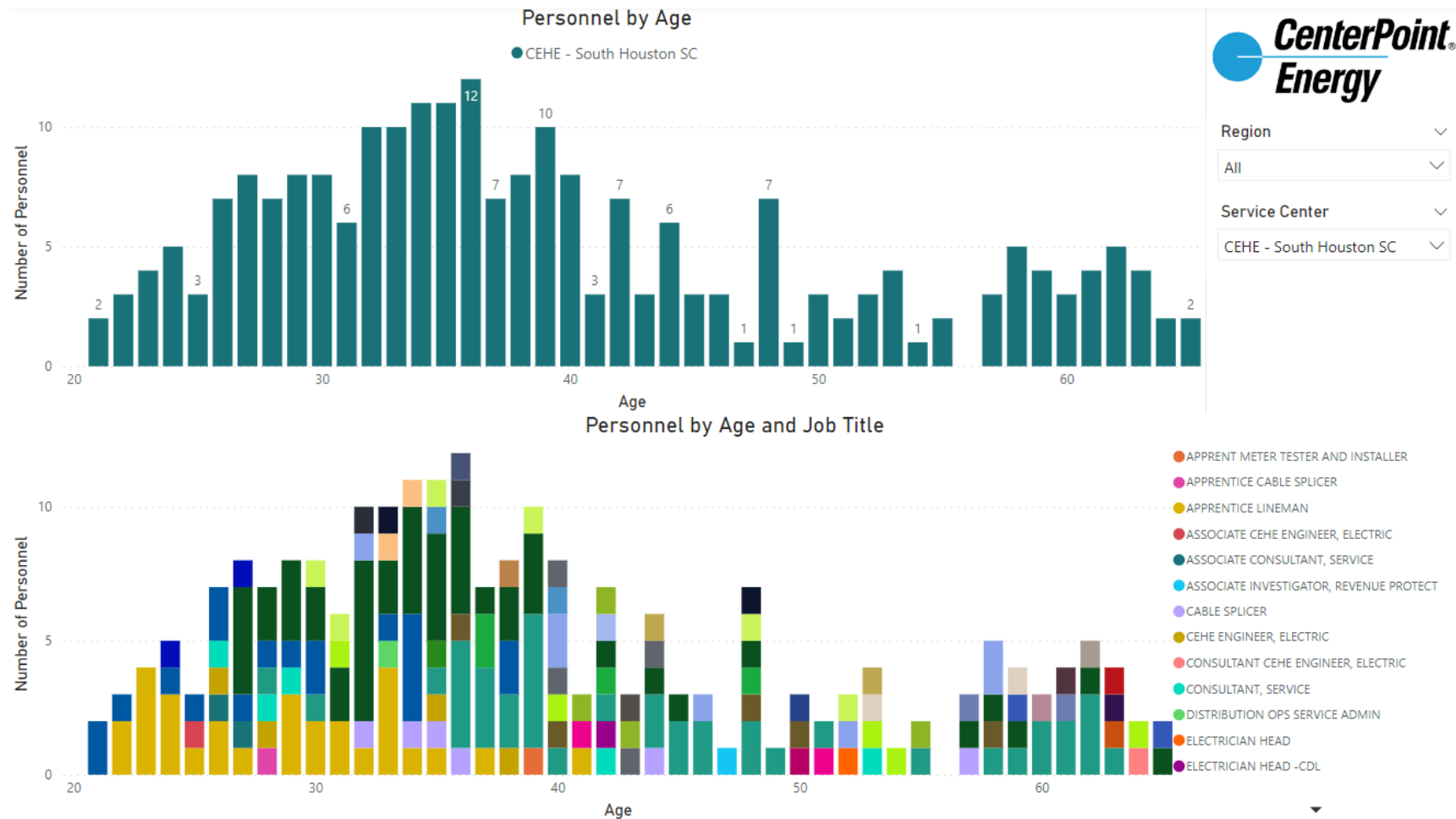


# Workflows & Approvals



The screenshot displays a Microsoft Teams interface. On the left, a sidebar shows a workflow titled "List Timesheets" with a "For Each Timesheet" loop. The steps in the loop are: "Select an output from previous steps" (with a "value x" output), "Set Current Timesheet", "Read Timesheet File", "Send the Timesheet File to SAP", and "Delete the Timesheet File from A". The main chat area shows a message from "James Wood via Power Automate" at 4:23 PM. The message content is a "Work Order TE4139599: On Hold" with the following details: Customer Address (2500 Victory Ave, Dallas, Texas, 75219), Issue (Cable Failure - Cause Unknown), Notes (On hold - assigned technician unavailable due to unexpected illness), and Available Technicians (Daniel Perla). At the bottom of the message are buttons for "Reassign Order" and "Contact Customer". The chat window has a search bar at the top and a "New conversation" button at the bottom.

# Power BI Dashboards



# **Next Steps**

**Delivering Solutions at Scale**

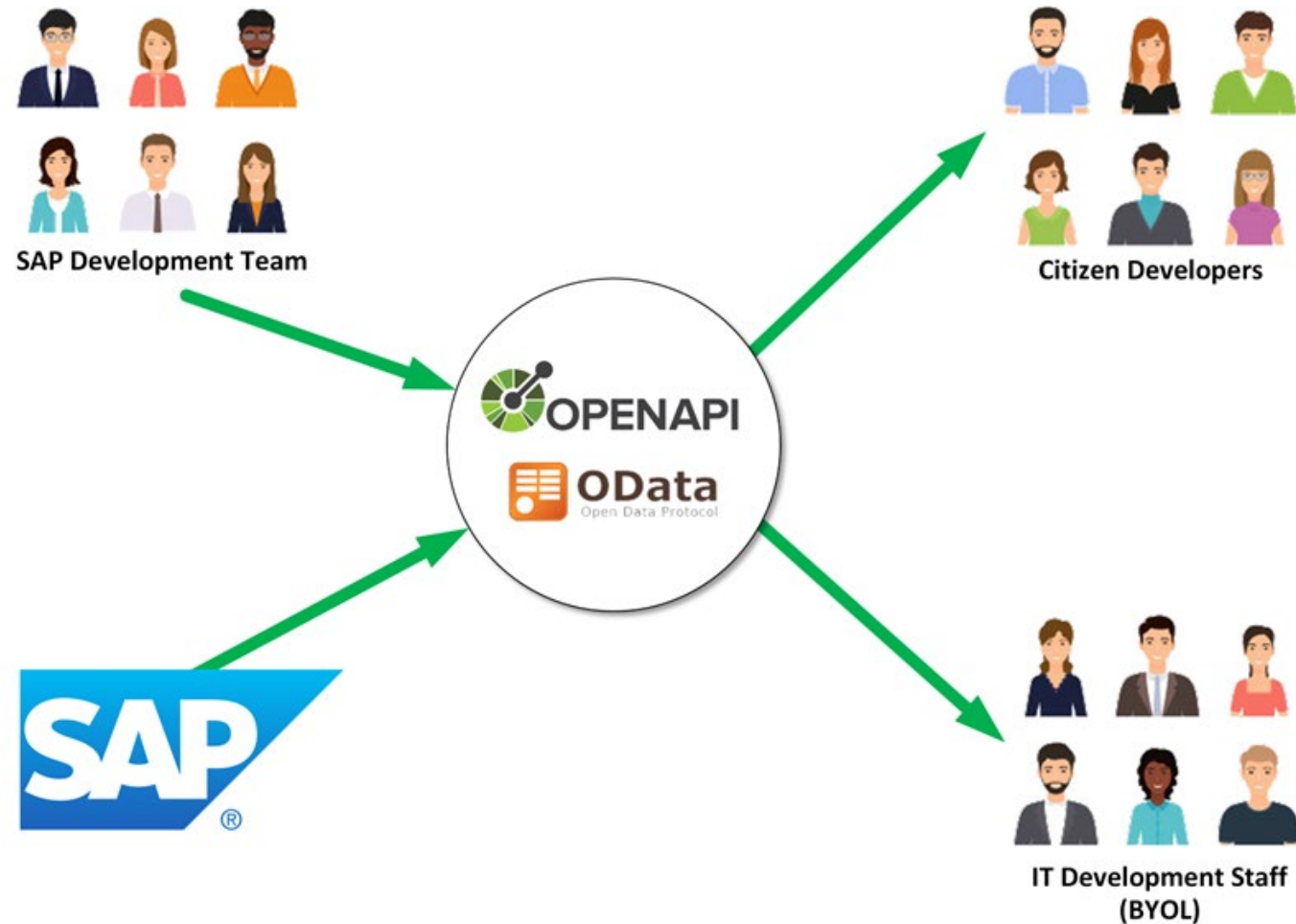
# Stretching Pro-Code Resources

- Using a low-code approach, pro-code SAP development can be limited to just API development
- With SAP Gateway and HANA, these APIs can come together quickly:
  - SAP data can be modeled using [Core Data Services](#) (CDS)
  - From here, there are many [tools](#) that make it easy to (securely) expose SAP data through OData services
- These investments offer many repeat benefits as they can be reused in other app scenarios

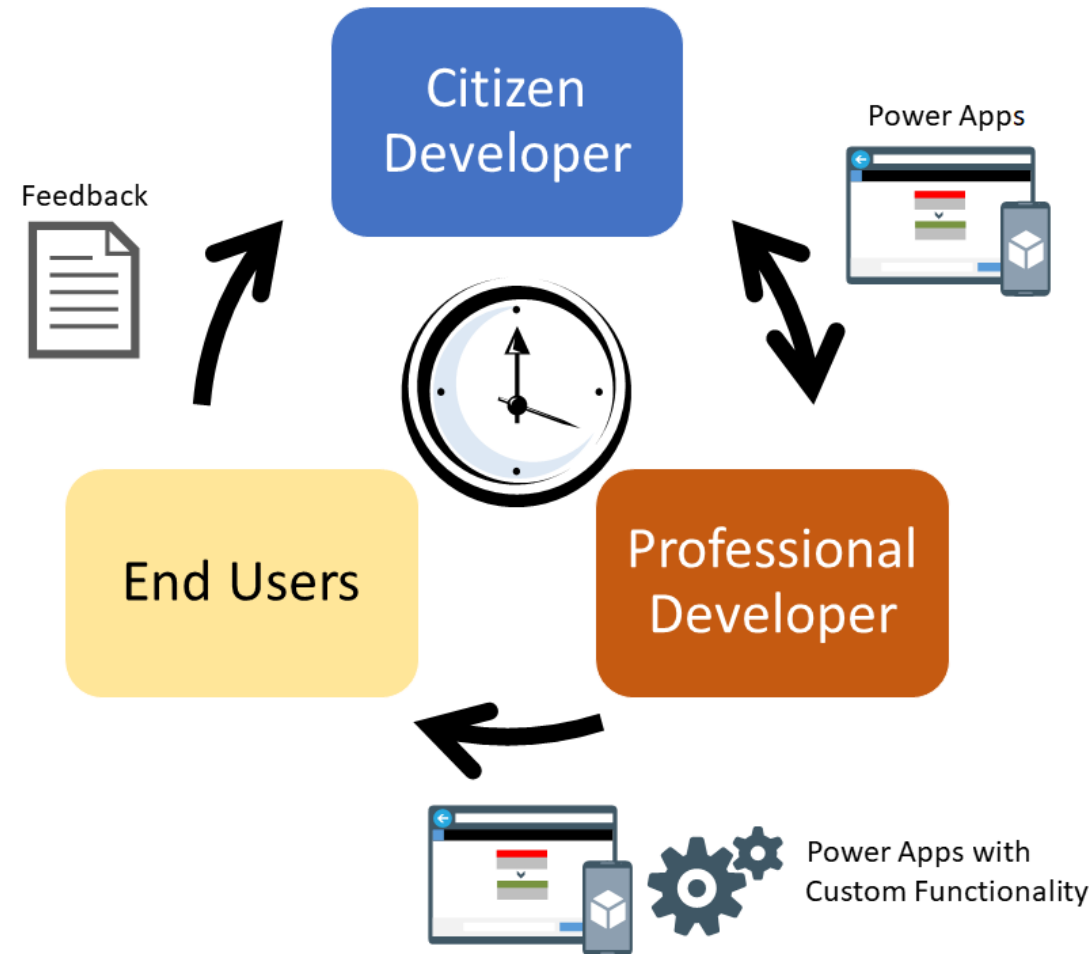
# Introducing Fusion Teams

- Gartner defines [fusion teams](#) as “multidisciplinary digital business teams that blend technology and business domain expertise to drive initiatives to create digital products and solutions”
- This combined approach allows the team to play to their respective strengths:
  - Business analysts and SMEs can focus on the improving business processes
  - IT / pro-code developers can fill in technical gaps where needed

# Low-Code + Pro-Code Unite



# A New Development Paradigm



# **Wrap-Up**



# Key Points to Take Home

- SAP pro-code development still has its place but there are some notable limitations that make it difficult to gain traction with digital transformation initiatives
- Low-code development platforms can be used to innovate around the edges with SAP
- Regardless of your direction, it's vitally important to focus your attention on SAP API enablement
- Embracing the fusion team concept can supercharge your digital transformation journey

# Q&A

Questions ==> { Answers }

# Thank you!

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Web: <https://www.bowdark.com>