

Getting Started with Microsoft Flow

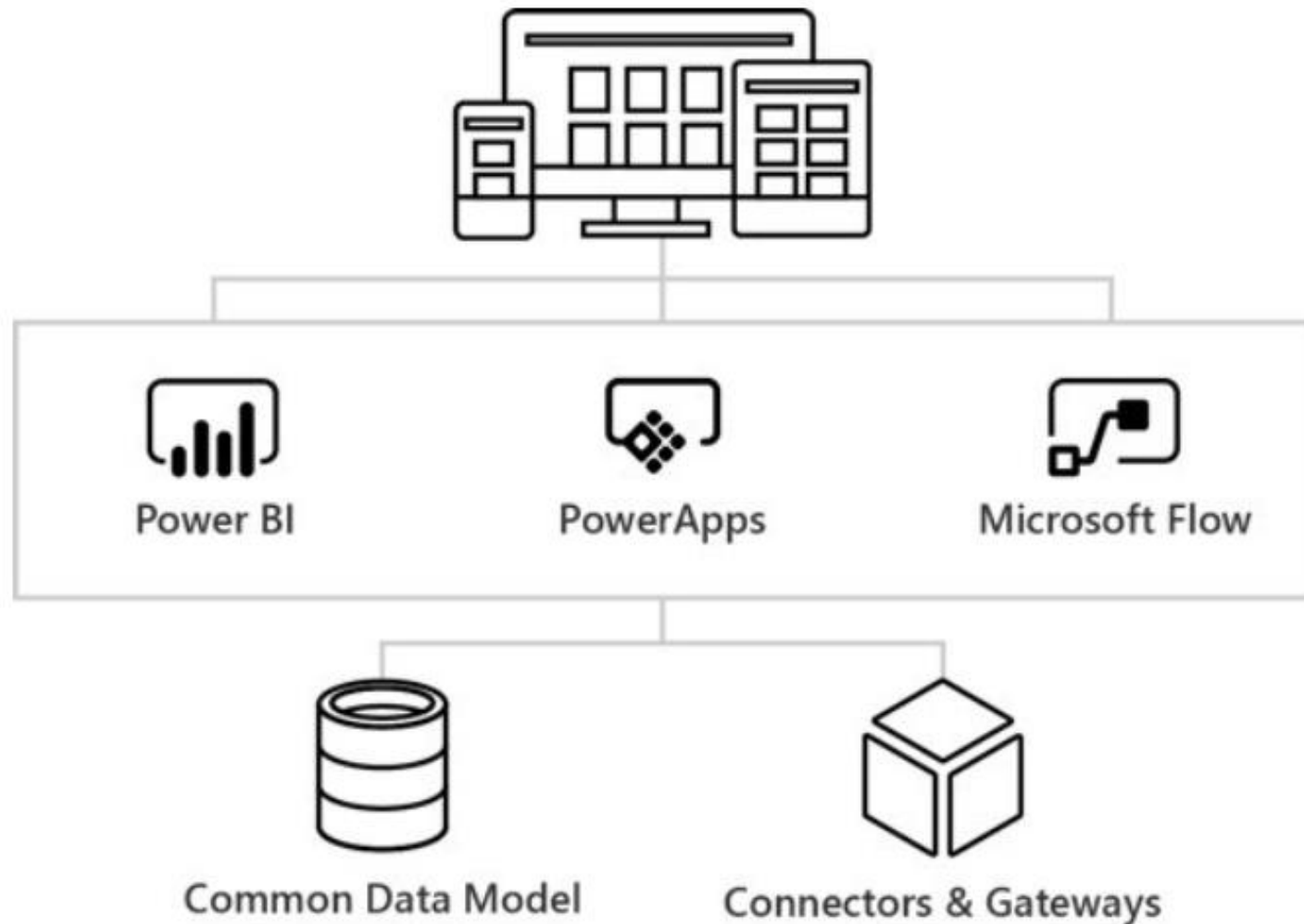


Agenda

- Setting Up a PowerApps Environment
- Understanding Flow Fundamentals
- Creating and Testing Flows
- Using Control-of-Flow Actions
- Writing Flow Expressions
- Automating Document Generation



What is the Power Platform?



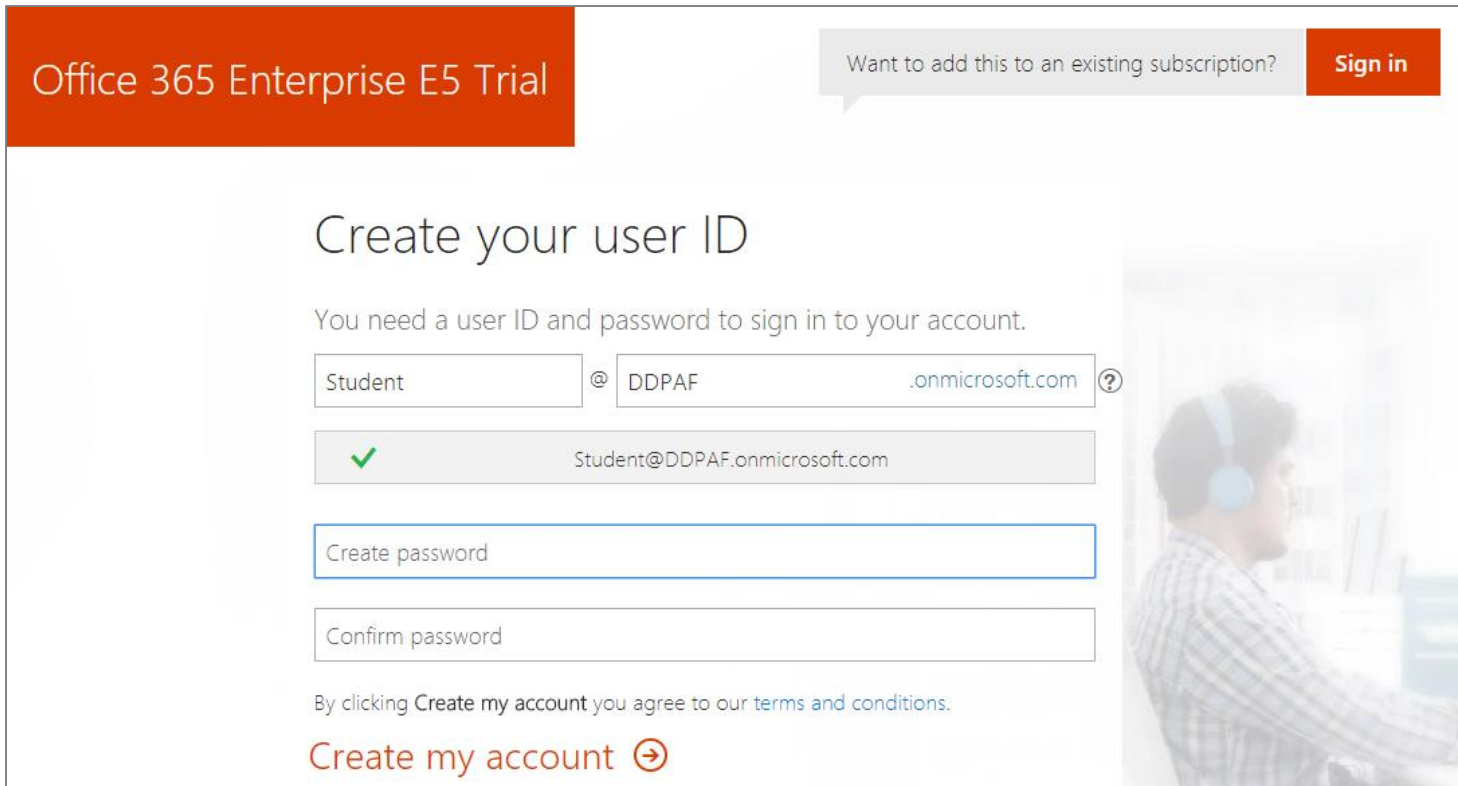
What Can You Build with PowerApps?

- Canvas Apps
 - Built using PowerApps Studio
- Connections
 - Used to connect Canvas apps to external data
- Flows
 - Used to process data and run workflows
- Common Data Service for Apps (CDS for Apps)
 - Used to create business-centric data solutions
- Model-driven Apps
 - Application platform built on top of CDS for Apps



Creating an Office 365 E5 Trial Tenant

- All students will create an Office 365 trial tenant
 - Provides an isolated development environment for lab exercises
 - Trial accounts will last for 30 days



The screenshot shows the 'Create your user ID' page for an Office 365 Enterprise E5 Trial. At the top left, there is an orange banner with the text 'Office 365 Enterprise E5 Trial'. At the top right, there is a grey button that says 'Sign in' and a link that says 'Want to add this to an existing subscription?'. The main heading is 'Create your user ID'. Below this, it says 'You need a user ID and password to sign in to your account.' The form has three input fields: 'Student' (containing 'Student'), '@' (containing 'DDPAF'), and '.onmicrosoft.com' (containing '.onmicrosoft.com'). Below these fields, there is a green checkmark and the email address 'Student@DDPAF.onmicrosoft.com'. Below this, there are two more input fields: 'Create password' and 'Confirm password'. At the bottom, there is a link that says 'By clicking Create my account you agree to our terms and conditions.' and a red button that says 'Create my account' with a right arrow icon. On the right side of the page, there is a blurred image of a person wearing a headset and working at a computer.

Office 365 Enterprise E5 Trial

Want to add this to an existing subscription? [Sign in](#)

Create your user ID

You need a user ID and password to sign in to your account.

Student @ DDPAF .onmicrosoft.com ?

✓ Student@DDPAF.onmicrosoft.com

Create password

Confirm password

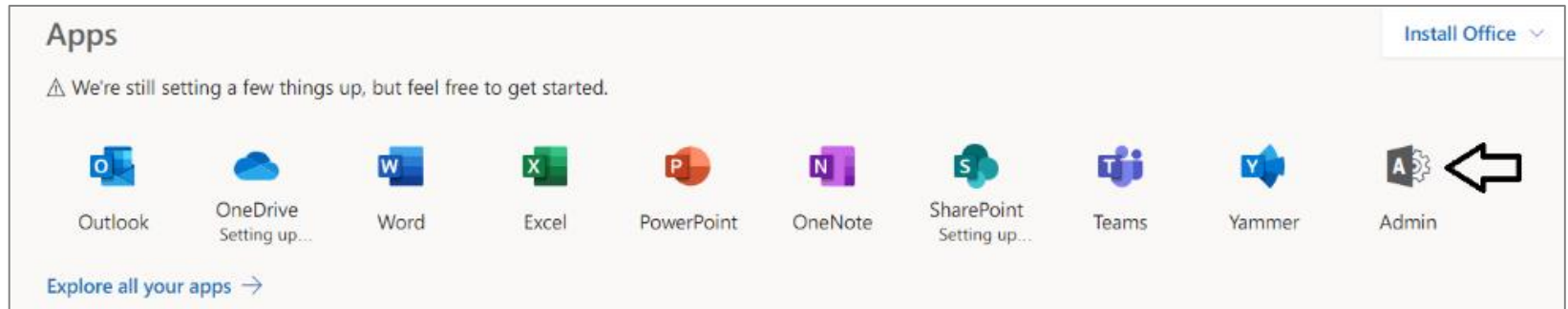
By clicking [Create my account](#) you agree to our [terms and conditions](#).

[Create my account](#) ➔

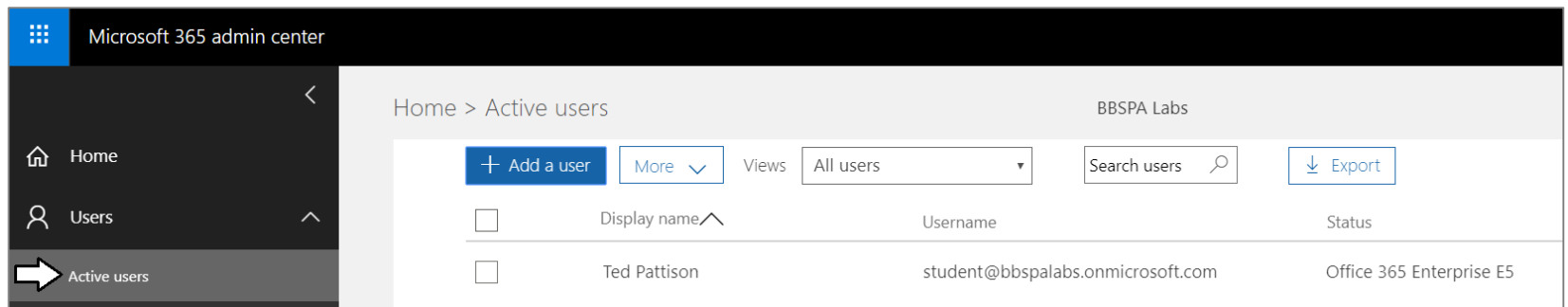


Microsoft 365 Admin Center

- Navigate to the Microsoft 365 Admin center

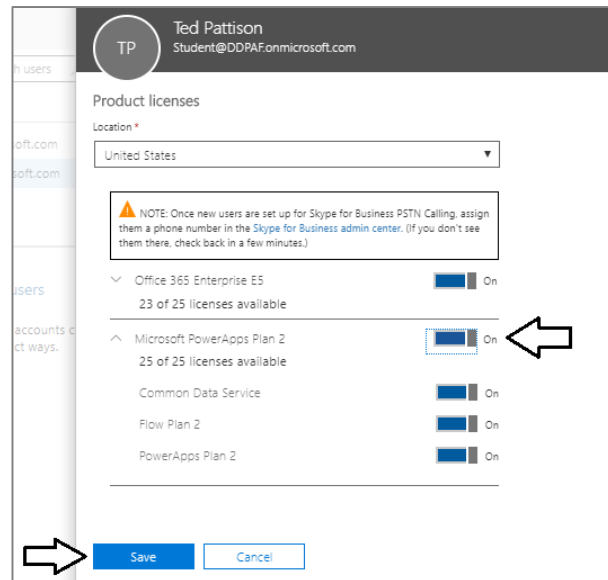
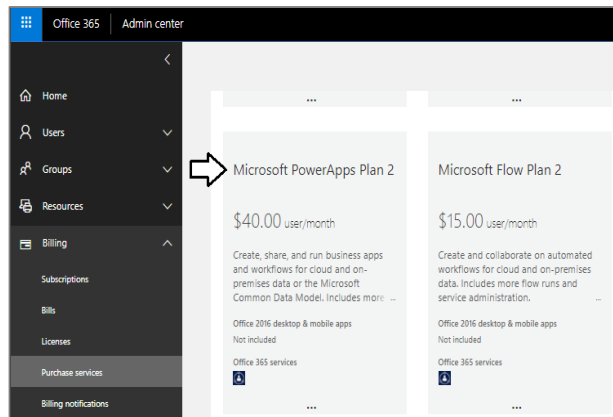


- Allows for management of users accounts and licensing



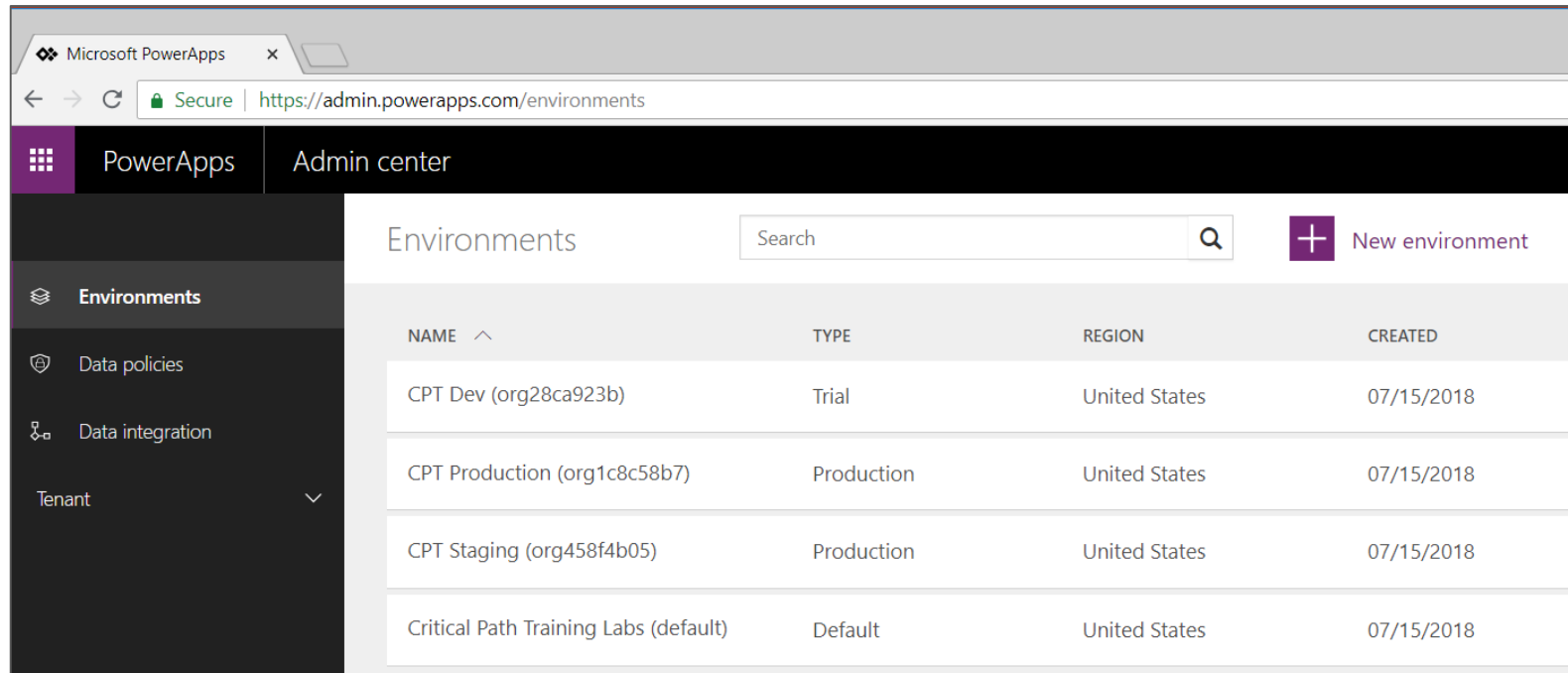
Configuring a PowerApps Plan 2 License

- Certain design tasks require PowerApps Plan 2
 - You can start a 30-day trial for PowerApps Plan 2
 - License must be assigned to individual user accounts



PowerApps Admin Center & Environments

- PowerApps architecture based on environments
 - Environment provides context for creating apps and flows
 - Every tenant is automatically created with default environment
 - Organization can create multiple environments for dev & staging
 - PowerApps Plan 2 license required to manage environments



The screenshot displays the Microsoft PowerApps Admin Center interface. The browser address bar shows the URL <https://admin.powerapps.com/environments>. The left sidebar contains navigation options: Environments (selected), Data policies, Data integration, and Tenant. The main content area is titled 'Environments' and includes a search bar and a '+ New environment' button. Below this is a table listing the environments for the tenant.

NAME ^	TYPE	REGION	CREATED
CPT Dev (org28ca923b)	Trial	United States	07/15/2018
CPT Production (org1c8c58b7)	Production	United States	07/15/2018
CPT Staging (org458f4b05)	Production	United States	07/15/2018
Critical Path Training Labs (default)	Default	United States	07/15/2018





DEMO

Configuring PowerApps Plan 2 Licenses

Agenda

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- Understanding Flow Fundamentals
 - Creating and Testing Flows
 - Using Control-of-Flow Actions
 - Writing Flow Expressions
 - Automating Document Generation



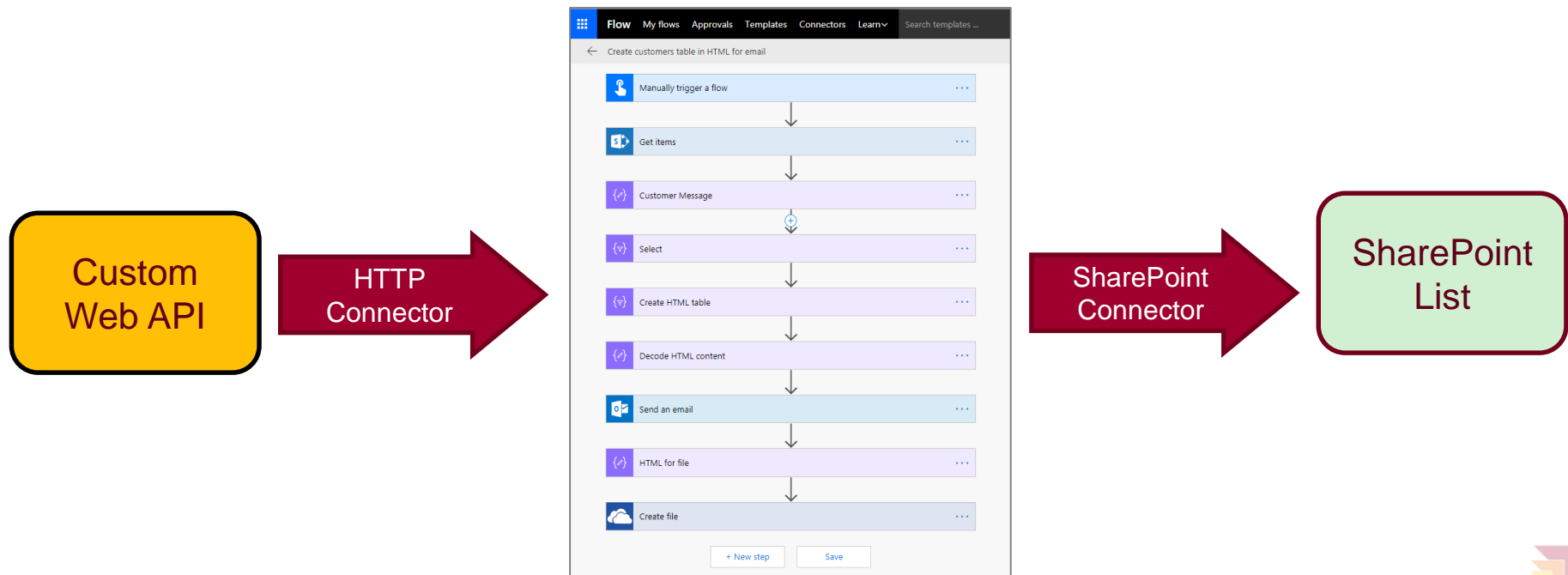
What is Flow?

- Service for automating workflows across other services
 - Designed by Microsoft for business users more than developers
- What can you do with Flow?
 - Get notifications
 - Copy files
 - Collect data
 - Automate approvals



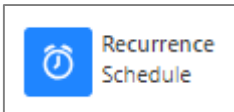
Building Blocks of Flow

- **Triggers** - events that start a flow
- **Actions** - tasks and operation executed by flow
- **Services** - sources and destinations for data
- **Connectors** - wrappers to communicate with service APIs

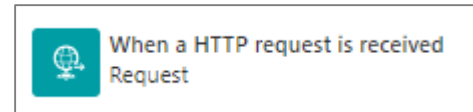
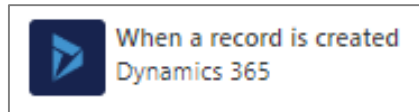
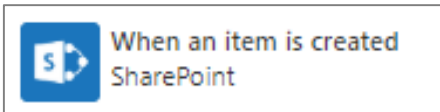


Flow Trigger Types

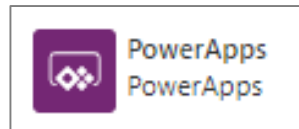
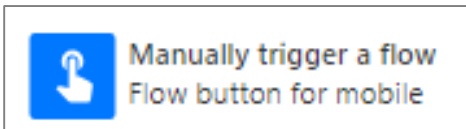
- Scheduled Flow Triggers
 - Runs periodically based on an interval



- Automated Flow Triggers
 - Runs when something happens

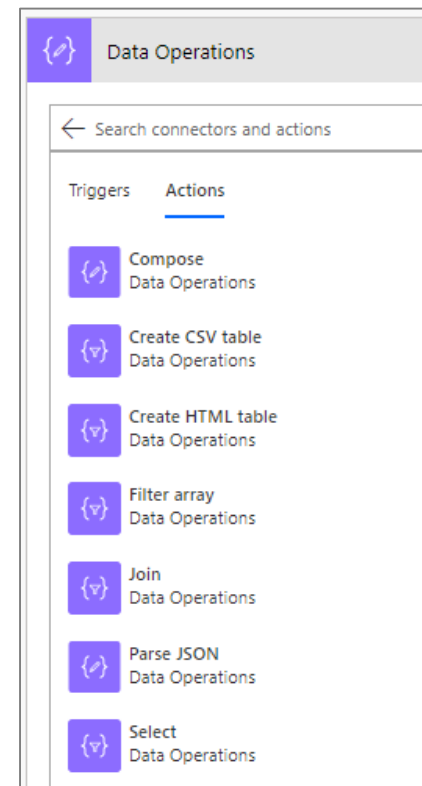
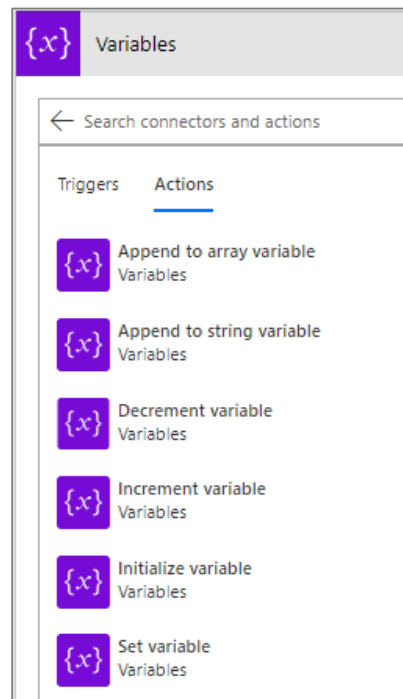
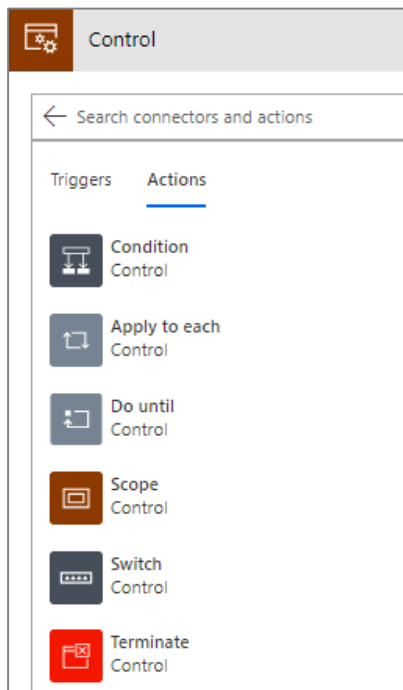


- On-demand Flow Triggers
 - Runs when a user clicks a button



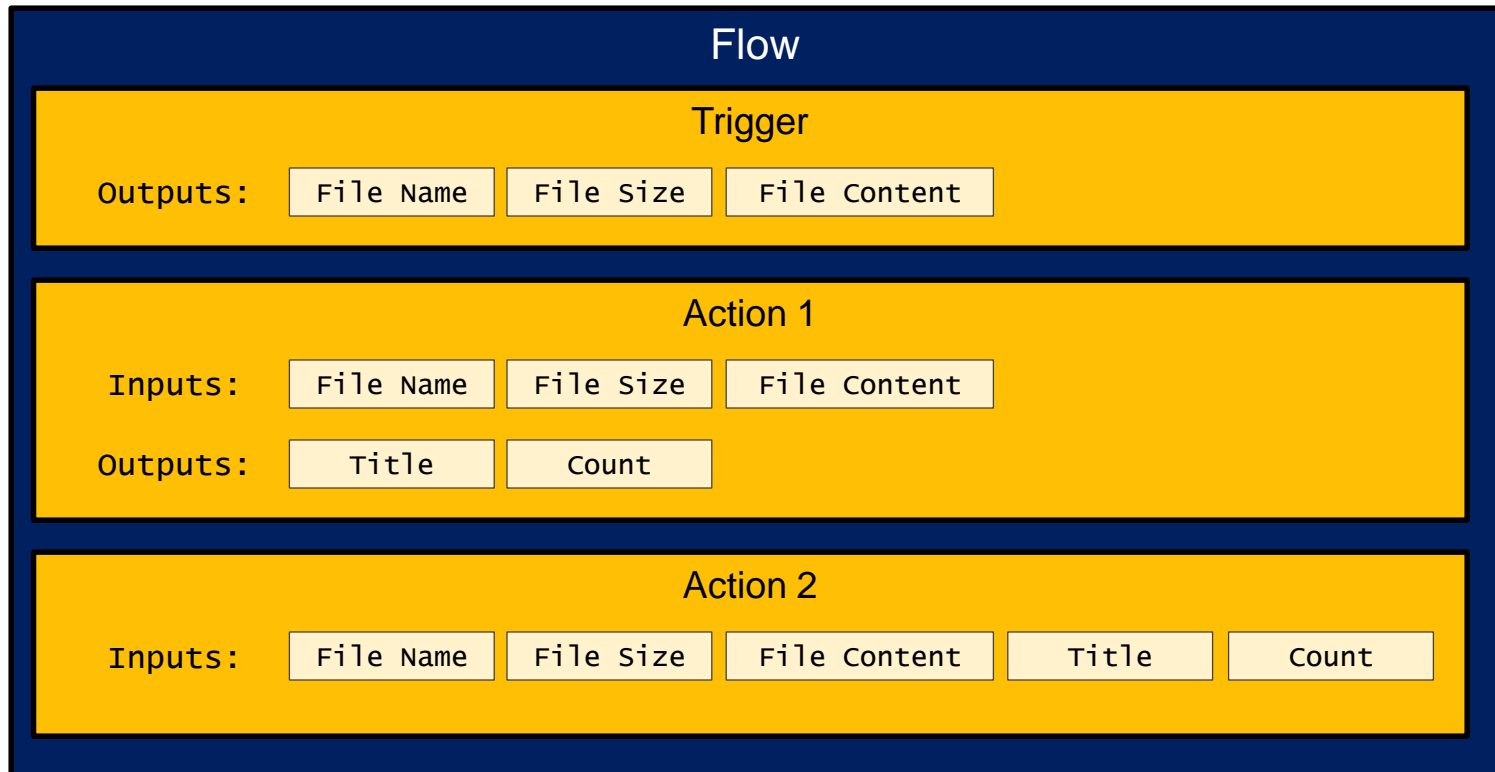
Core Action Categories

- **Control:** actions to provide control-of-flow
- **Variables:** actions to manage state within flow lifetime
- **Data operations:** action to process data & prepare content



Data Automatically Flows from Step to Step

- Data in flows added by step outputs
 - Data added in step output is available in later steps
 - It's easy to configure step input data using output data in previous steps
 - Certain outputs displayed/hidden based on types of input and output



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Creating and Managing Flows

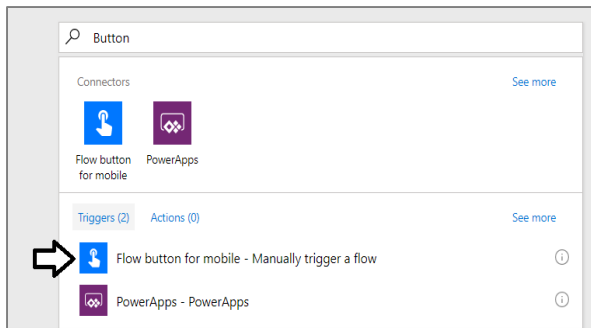
- Flow user portal allows users to manage and edit flows
 - Accessible through <https://flow.microsoft.com>
 - Flow can be created from blank or from template

The screenshot displays the Microsoft Flow user portal. On the left is a navigation sidebar with options: Home, Approvals, My flows (selected), Templates, Connectors, Data, and Learn. The main content area is titled 'Flows' and includes tabs for 'My flows', 'Team flows', and 'Business process flows'. A red dashed box highlights the '+ New' button, with a red arrow pointing to its dropdown menu. The dropdown menu lists four options: 'Create from template', 'Create from Visio template', 'Automated—from blank', and 'Instant—from blank'. Below the menu, a table lists existing flows with columns for Name, Modified, and Type.

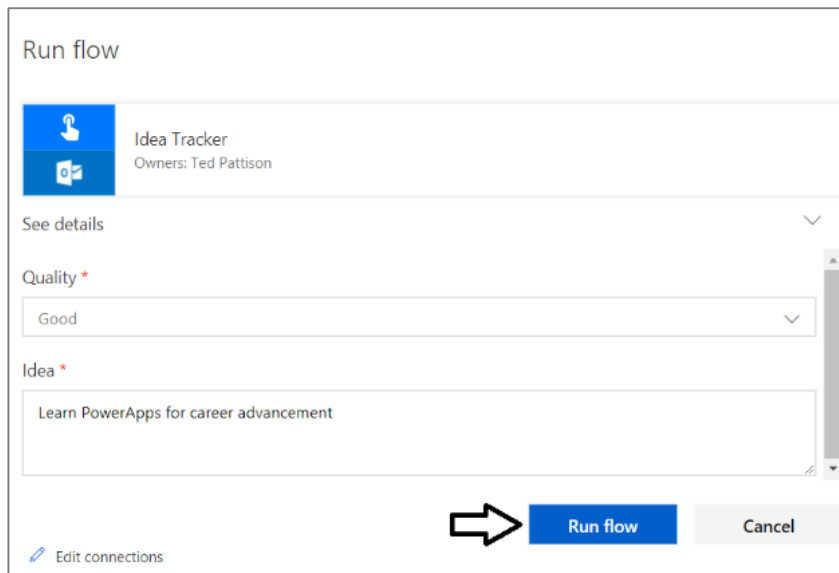
Name	Modified	Type
Save SharePoint Leads List	23 h ago	Instant
Lead Tracker	1 d ago	Automated
Idea Tracker	2 d ago	Instant
Track new Tweets containing #PowerApp	2 d ago	Automated

Creating a Flow Trigger by Manual Button

- Use Run button for Mobile as flow trigger



- Trigger can be extended with one or more input fields



This screenshot shows the 'Run flow' dialog box for the 'Idea Tracker' flow. The dialog box has a title bar that says 'Run flow'. Below the title bar, there is a section for the flow details, which includes the flow name 'Idea Tracker' and the owner 'Owners: Ted Pattison'. Below this, there is a 'See details' link. The main part of the dialog box contains two input fields: 'Quality *' and 'Idea *'. The 'Quality *' field has a dropdown menu with 'Good' selected. The 'Idea *' field has a text input with the value 'Learn PowerApps for career advancement'. At the bottom of the dialog box, there are three buttons: 'Edit connections' (with a pencil icon), 'Run flow' (with a blue background and a white arrow icon), and 'Cancel' (with a grey background).




Building Out The Idea Tracker Flow


Flow name

Idea Tracker

✓ Update flow

✕ Close

 Manually trigger a flow

 Quality

Please enter your input

...

List Options


Lame


Good


Great


Brilliant


Enter another option










 Idea

Please enter your input

...

+


 Add an input

 Send an email

* To


Student@DDPAF.onmicrosoft.com;

* Subject

 Quality ✕

 Idea for consideration

* Body

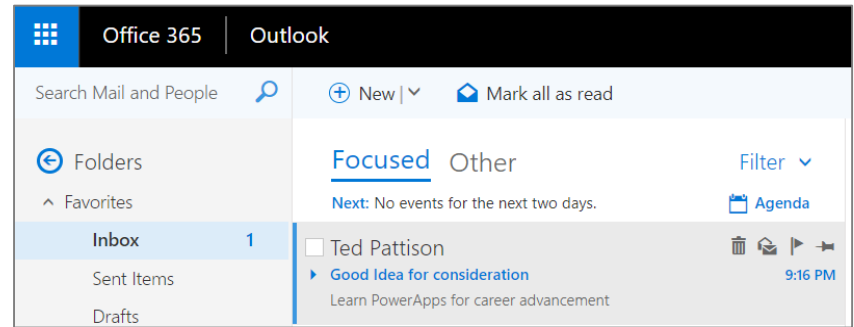
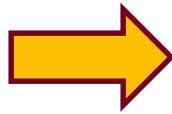
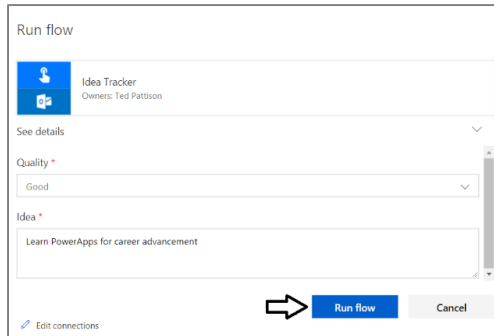
 Idea ✕

Show advanced options ▾

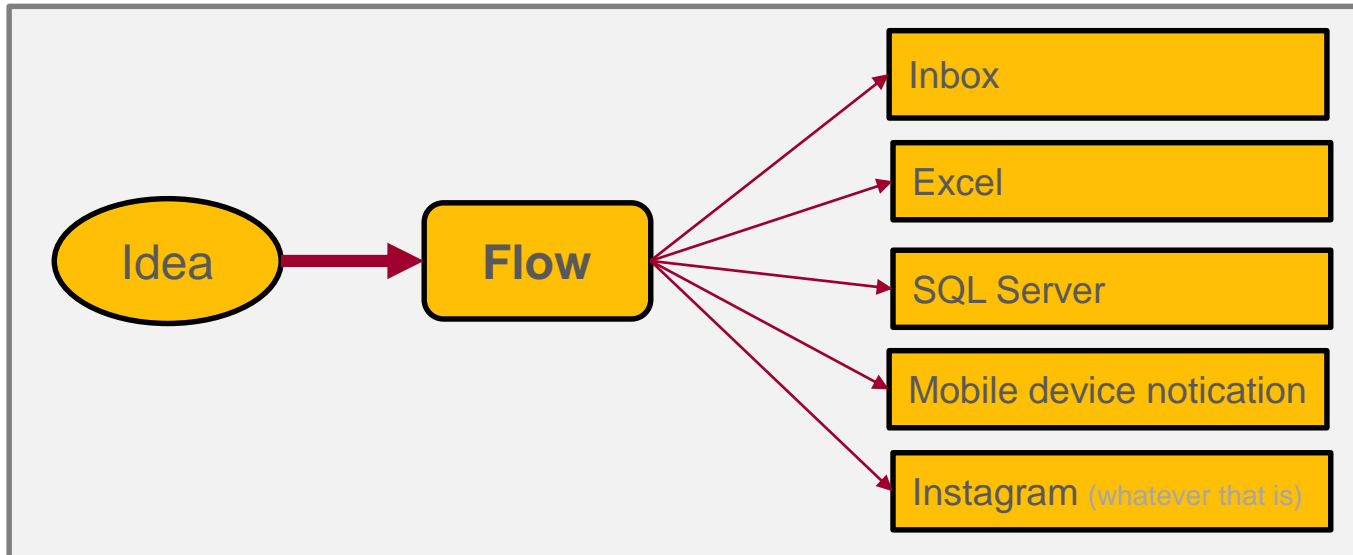


Where Should You Write the Idea?

- You can track the idea by sending an email

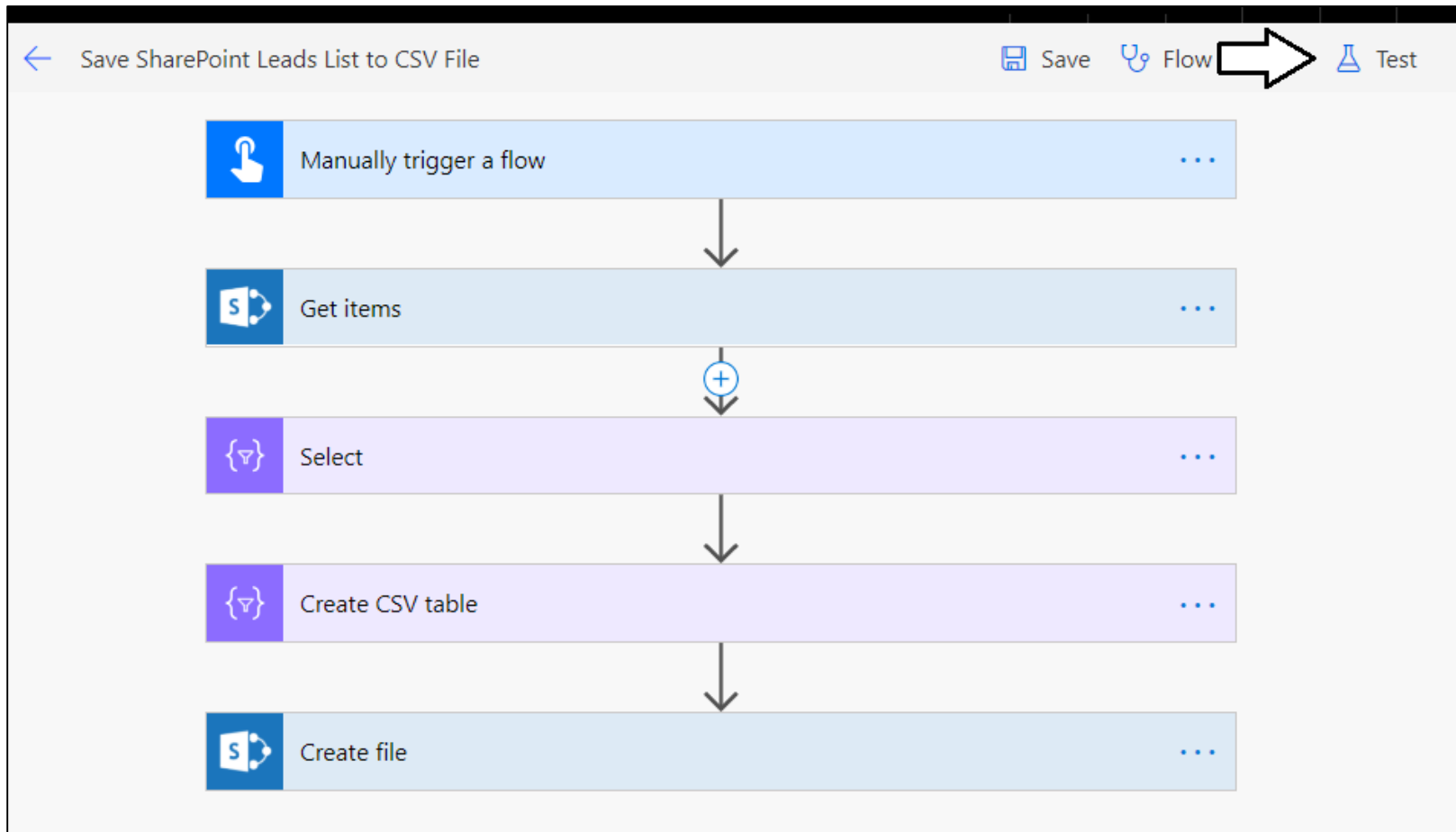


- Or get even more extravagant



Testing a Flow

- Flow can be run/tested from edit mode



Flow Checker

- Automatically checks flows for errors and omissions

The screenshot displays the Microsoft Flow Builder interface. The main workspace shows a flow named "Send an email when a new item is created in SharePoint." with two steps:

- When a new item is created** (SharePoint connector):
 - * Site Address**: Example: `https://contoso.sharepoint.com/sites/sitename`. Below the input field is the error message: "Include a Site Address."
 - * List Name**: SharePoint list name. Below the input field is the error message: "Include a List Name."
- Send an email** (Outlook connector):
 - * To**: Specify email addresses separated by semicolons like `someone@contoso.com`. Below the input field is the error message: "Using the default values for the parameters. [Edit](#)"

A downward arrow indicates the flow sequence from the first step to the second.

The **Flow Checker** panel on the right side of the screen shows the detected errors:

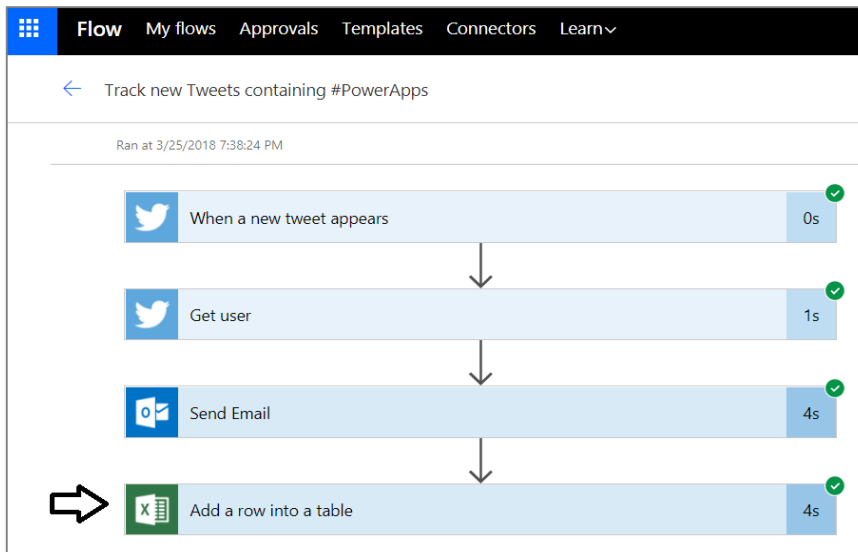
- Errors (2)**
 - When a new item is created (2)**
 - Include a Site Address.
 - Include a List Name.

Run History

- Flow provides history flows that have run

RUN HISTORY			
➡	✓ Succeeded	9 minutes ago	8 seconds
	✓ Succeeded	2 hours ago	0 seconds
	✓ Succeeded	3 hours ago	0 seconds

- Provides read-only view of data for auditing & monitoring





DEMO

Creating and Testing a Simple Flow

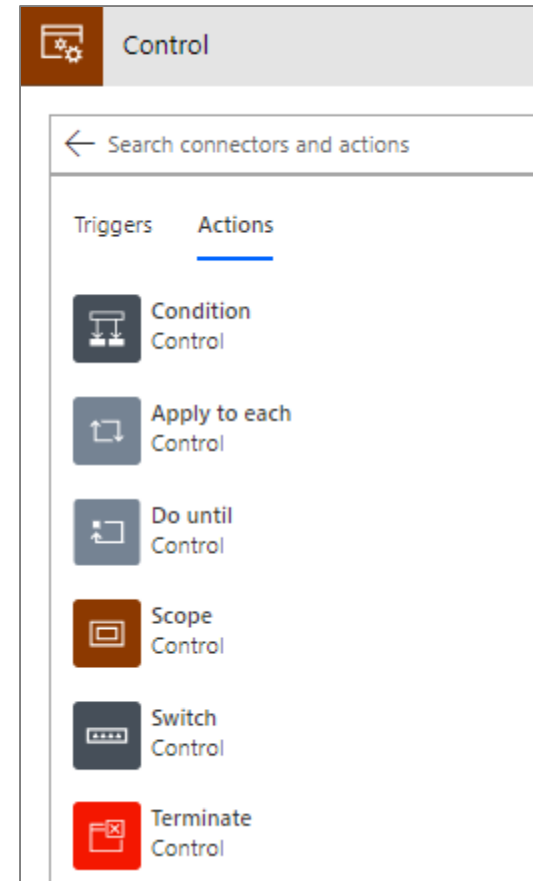
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Control of Flow

- Condition
 - Provides logical structure for If Then Else
- Apply to each
 - Enumerate through collection (e.g. list items)
- Do until
 - Repeat until condition changes
- Scope
 - Create an action container with a private scope
- Switch
 - Select Case flow
- Terminate
 - Completes a flow



Using a Condition

- Send alert email if expense amount greater than \$500
 - Condition runs test which returns true or false
 - Condition provide **If yes** branch and **If no** branch

Flow name Large Expense Alert ✓ Create flow ✕ Close

When an item is created

* Site Address

* List Name

Condition

is greater than or equal to

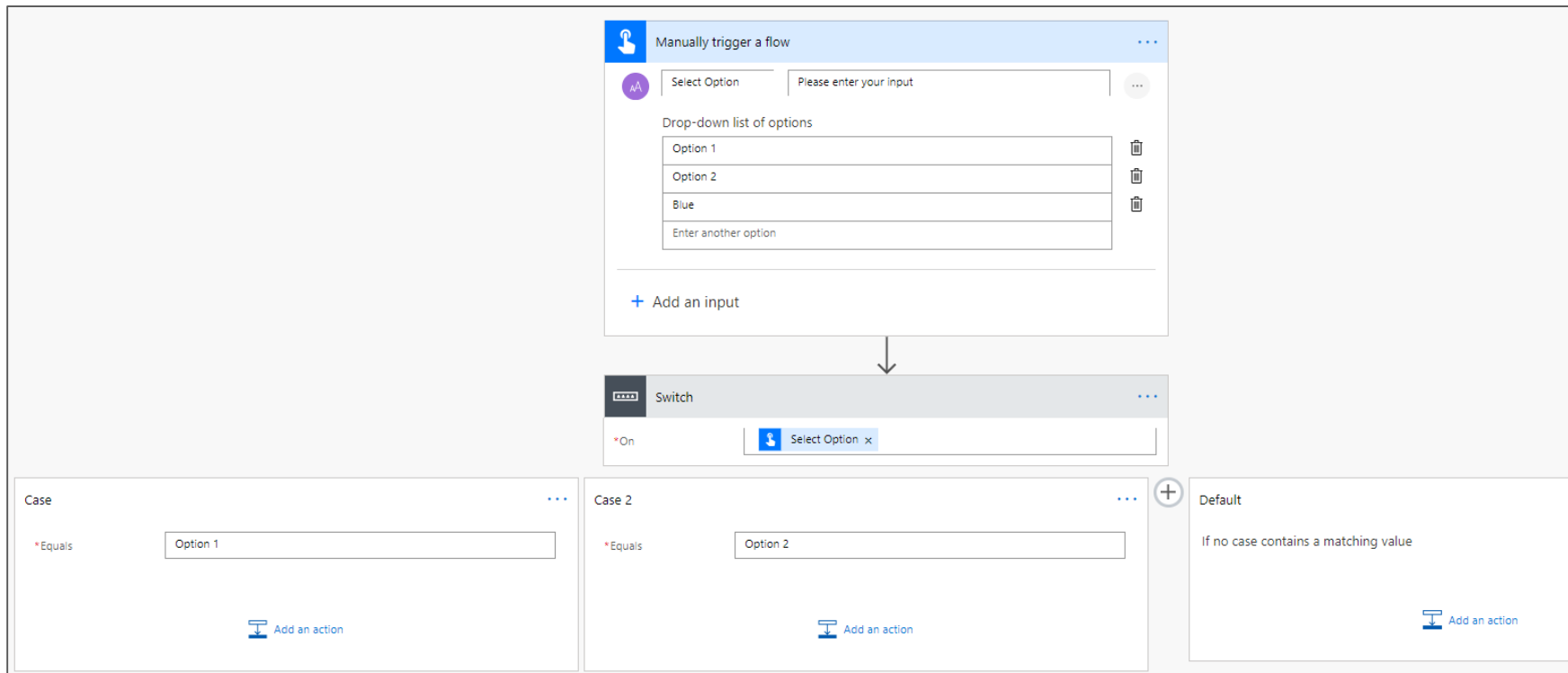
[Add dynamic content](#) [Edit in advanced mode](#) [Collapse condition](#)

✓ If yes ✕ If no



Switch Action

- Switch actions provides cases
 - Each case represents separate execution path
 - Only one execution path will execute
 - Default case executes when no other case is matched



Using Apply to Each

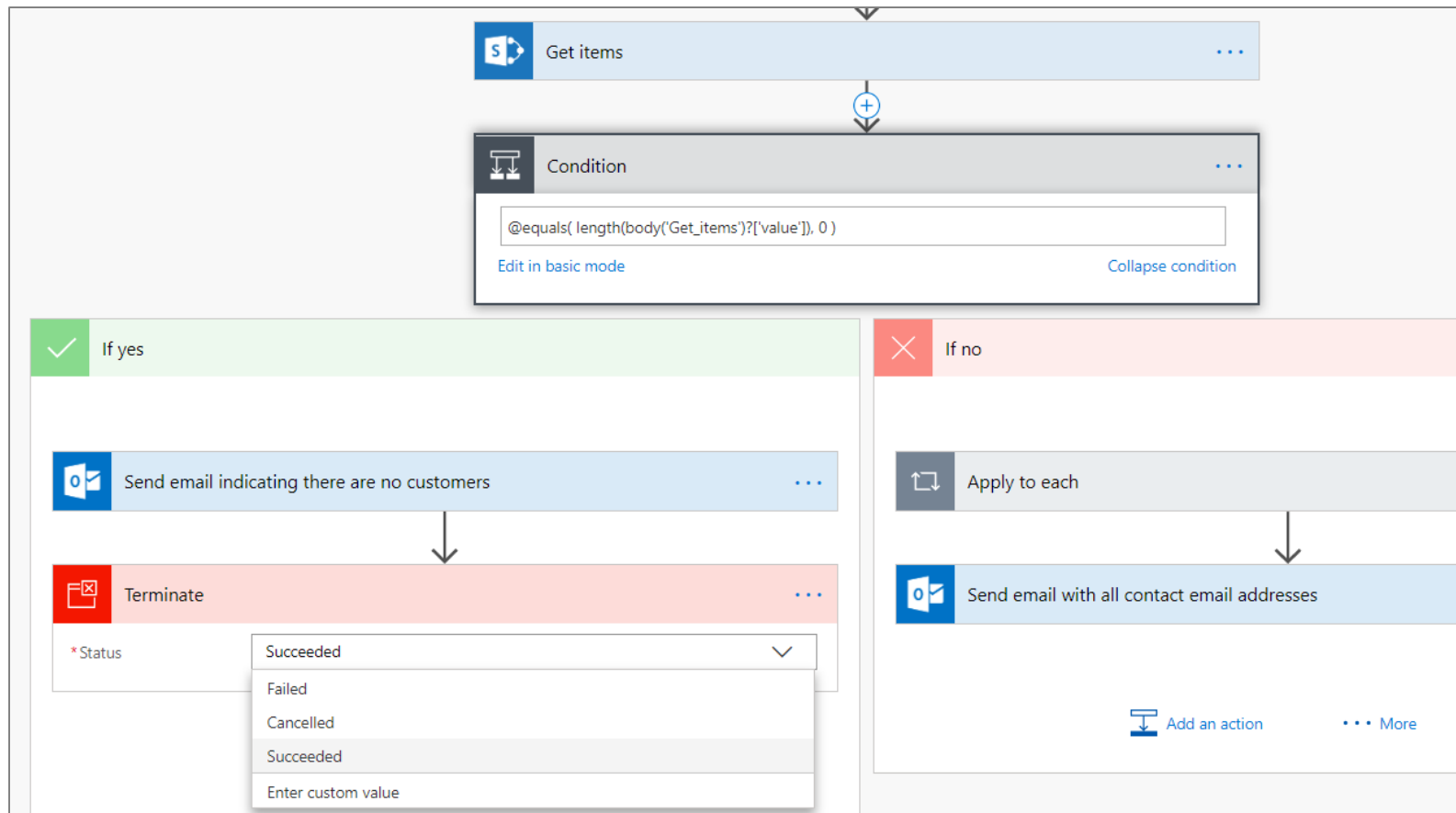
- Automatically added when list is used from output
- Destination step enumerates over list items

The screenshot displays a workflow editor interface. At the top, a 'Get items' step is configured with the Site Address 'https://msd0910.sharepoint.com/' and List Name '0769e0e8-aec5-4441-8c88-6283a6799718'. Below this, an 'Apply to each' step is shown, which is automatically added when a list is used from an output. The 'Apply to each' step has a dropdown menu showing 'value'. Below the 'Apply to each' step, a 'Delete item' step is configured with the Site Address 'Critical Path Training Labs Team Site - https://msd0910.sharepoint.com/', List Name 'List1', and Id 'ID'. At the bottom of the editor, there are buttons for 'Add an action', 'Add a condition', and 'More'.



Terminate action

- Used to stop a flow at any point
 - Terminate status can be set to Succeeded, Cancelled, Failed



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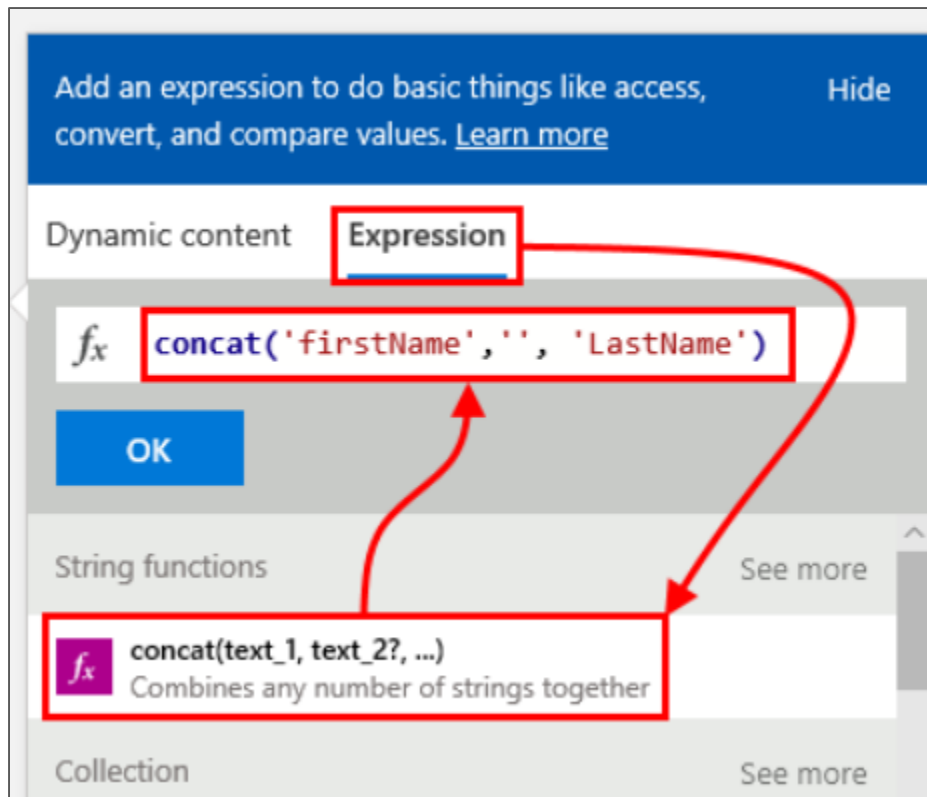
Writing Flow Expressions

- Scenarios for writing Flow expressions
 - Perform string manipulation
 - Generate a GUID or a random number
 - Convert types
 - Perform simple inline calculations
 - Handling optional values
 - Writing conditional statements using "If" statements
 - Working with arrays



Writing Expressions

- Expressions written in fx textbox
- Click OK to enter expressions



Workflow Definition Language (WDL)

- Flow expressions written in Workflow Definition Language
 - Same language used in Azure Logic Apps
 - WDL is more powerful yet more complicated than PowerApps
 - WDL does not overload operators like PowerApps does
 - WDL requires single quotes instead of double quotes

<code>fx "this is a test"</code>	Invalid: no double quotes
<code>fx 'this is a test'</code>	Valid
<code>fx 'this is a ' + 'test'</code>	Invalid : + operator not supported
<code>fx 'this is a ' & 'test'</code>	Invalid : & operator not supported
<code>fx concat('this is a ', 'test')</code>	Valid




Working with Strings

- Parse text together using **concat()**
- Parse out text using **substring()**
- Convert casing using **toLowerCase()** and **toUpperCase()**
- Search string using **indexOf** and **startsWith()**
- Create new GUID identifier using **guid()**

 **concat(text_1, text_2?, ...)**
Combines any number of strings together

 **substring(text, startIndex, length)**
Returns a subset of characters from a string

 **replace(text, oldText, newText)**
Replaces a string with a given string

 **guid()**
Generates a globally unique string (GUID)


 **toLowerCase(text)**
Converts a string to lowercase using the casing rules of the i...

 **toUpperCase(text)**
Converts a string to uppercase using the casing rules of the i...

 **indexOf(text, searchText)**
Returns the first index of a value within a string (case-insensi...

 **lastIndexOf(text, searchText)**
Returns the last index of a value within a string (case-insensit...

 **startsWith(text, searchText)**
Checks if the string starts with a value (case-insensitive, invar...

 **endsWith(text, searchText)**
Checks if the string ends with a value (case-insensitive, invari...



Performing Arithmetic Operations

- You cannot use standard arithmetic operators
 - No support for familiar operators such as **+**, **-**, *****, **/**
 - This does not work: **2 + 2**
 - This works: **add(2, 2)**

fx **min(collection or item1, item2?, ...)**
Returns the minimum value in the input array of numbers

fx **max(collection or item1, item2?, ...)**
Returns the maximum value in the input array of numbers

fx **rand(minValue, maxValue)**
Generates a random integer within the specified range (inclu...

fx **add(summand_1, summand_2)**
Returns the result from adding the two numbers

fx **sub(minuend, subtrahend)**
Returns the result from subtracting two numbers

fx **mul(multiplicand_1, multiplicand_2)**
Returns the result from multiplying the two numbers

fx **div(dividend, divisor)**
Returns the result from dividing the two numbers

fx **mod(dividend, divisor)**
Returns the remainder after dividing the two numbers (mod...



Working with Dates and Time

- Get Greenwich Meantime using **utcnow()**
- Use **add*()** functions to move time back/forward
- **convertTimeZone()** used to handle local times
- **formatDateTime()** used to format

fx **addMinutes(timestamp, minutes, format?)**
Adds an integer number of minutes to a string timestamp passed in

fx **addHours(timestamp, hours, format?)**
Adds an integer number of hours to a string timestamp passed in

fx **addDays(timestamp, days, format?)**
Adds an integer number of days to a string timestamp passed in

fx **convertTimeZone(timestamp, sourceTimeZone, destinationTimeZone, format?)**
Converts a string timestamp passed in from a source time zone to a destination time zone

fx **convertToUtc(timestamp, sourceTimeZone, format?)**
Converts a string timestamp passed in from a source time zone to UTC

fx **convertFromUtc(timestamp, destinationTimeZone, format?)**
Converts a string timestamp passed in from a UTC to a target time zone

fx **formatDateTime(timestamp, format)**
Returns a string in date format

fx **startOfHour(timestamp, format)**
Returns the start of the hour to a string timestamp passed in

fx **startOfDay(timestamp, format)**
Returns the start of the day to a string timestamp passed in

fx **startOfMonth(timestamp, format)**
Returns the start of the month of a string timestamp

fx **dayOfWeek(timestamp)**
Returns the day of week component of a string timestamp

fx **dayOfMonth(timestamp)**
Returns the day of month component of a string timestamp

fx **dayOfYear(timestamp)**
Returns the day of year component of a string timestamp

fx **ticks(timestamp)**



Understanding Arrays in Flow


- Flow arrays are zero-based
 - Primitive value arrays

0	Daugherty
1	Hernandez
2	Mack
3	Wiley

- Object arrays

	Last Name	First Name	Company	Business Phone	Home Phone
0	Daugherty	Cindy	Wonka Industries	1(337)111-4444	1(337)111-7777
1	Hernandez	Zane	Vandelay Industries	1(757)666-3333	1(757)777-1111
2	Mack	Chang	Wonka Industries	1(480)111-4444	1(480)777-0000
3	Wiley	Ramona	Ecumena	1(201)777-8888	1(201)777-2222

Accessing an Array using ['value']

 Get items ⓘ ⋮

*Site Address ✕

*List Name ✕

Show advanced options ▾



`body('Get_items')?['value']`

	Last Name	First Name	Company	Business Phone	Home Phone
0	Daugherty	Cindy	Wonka Industries	1(337)111-4444	1(337)111-7777
1	Hernandez	Zane	Vandelay Industries	1(757)666-3333	1(757)777-1111
2	Mack	Chang	Wonka Industries	1(480)111-4444	1(480)777-0000
3	Wiley	Ramona	Ecumena	1(201)777-8888	1(201)777-2222



Retrieving List Items

- Use **first()** and **last()** to get lead at head or tail
- Individual items retrieved using zero-based array syntax
 - SharePoint list item array - `body('Get_items')?['value']`
 - First list item in array - `body('Get_items')?['value'][0]`
 - Field value of first item - `body('Get_items')?['value'][0]['ID']`

The screenshot shows a workflow configuration interface. At the top, there is a 'Get items' step. Below it, a 'Delete item' step is selected. The 'Delete item' step has three input fields: '* Site Address' with the value 'Critical Path Training Labs Team Site - https://msd0910.sharepoint.com/', '* List Name' with the value 'List1', and '* Id' with a dynamic content expression. The expression is shown as a purple box with 'fx' and 'body(...)' followed by a dropdown arrow. A blue button labeled 'Add dynamic content' is at the bottom right of the 'Delete item' step.

The screenshot shows the 'Expression' tab of a dynamic content editor. The 'Expression' tab is selected, and the text area contains the formula `body('Get_items')?['value'][0]['ID']`. Below the text area is a blue button labeled 'Update'.



Writing Expressions with item()

- You can access current item inside flow loops
 - Use `item()` function provided by WDL
 - Example below formats all company names in upper case
 - Requires using `toUpper(item()['Company'])` in Apply to each loop

The screenshot displays a Power Automate flow with the following steps:

- Get items**: The first step in the flow.
- Apply to each**: A loop step that iterates over the items returned by the 'Get items' step. The 'Select an output from previous steps' dropdown is set to 'value'.
- Update item**: An action within the 'Apply to each' loop. It is configured with the following fields:
 - Site Address**: Communication site - <https://summatime.sharepoint.com/>
 - List Name**: Customers
 - ID**: ID
 - Last Name**: Last Name
 - Company**: `toUpper(item()['Company'])`
 - First Name**: (Empty)
 - E-Mail**: (Empty)

The 'Update item' action's 'Company' field is highlighted with a pink background, and the expression `toUpper(item()['Company'])` is visible. A blue button labeled 'Update' is at the bottom right of the 'Update item' action card.





DEMO

**Enumerating through SharePoint List
Items to Perform Cleanup Operations**

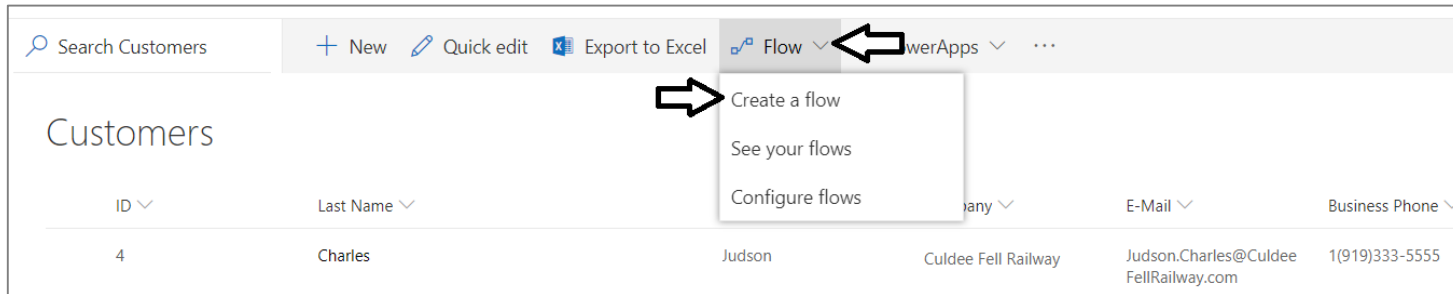
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- Automating Document Generation

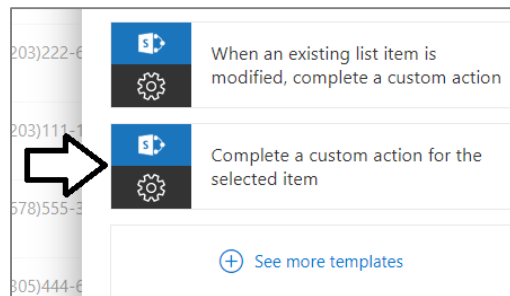
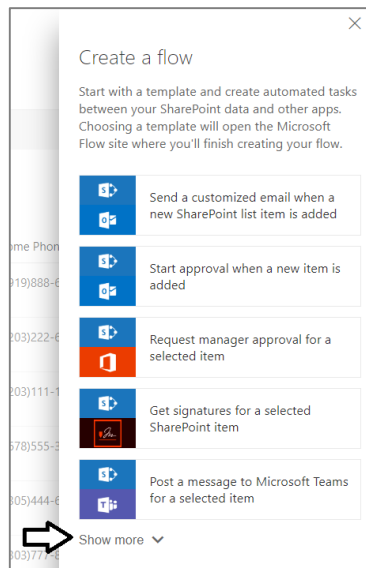


Adding Flows for SharePoint Selected Item

- You can create a flow for a specific SharePoint list



- Select option to **Complete a custom action for the selected item**



Custom Action for Selected Item Flow

- Flow is initially created with a trigger and an action
 - Flow created with a **For a selected item** trigger
 - Flow also contain **Get item** action to get list item field values

The screenshot displays the Microsoft Flow configuration interface. At the top, a navigation bar shows a back arrow and the text 'Complete a custom action for the selected item'. Below this, the 'For a selected item' trigger is configured with the following fields:

- * Site Address:
- * List Name:
- Show advanced options: ☐

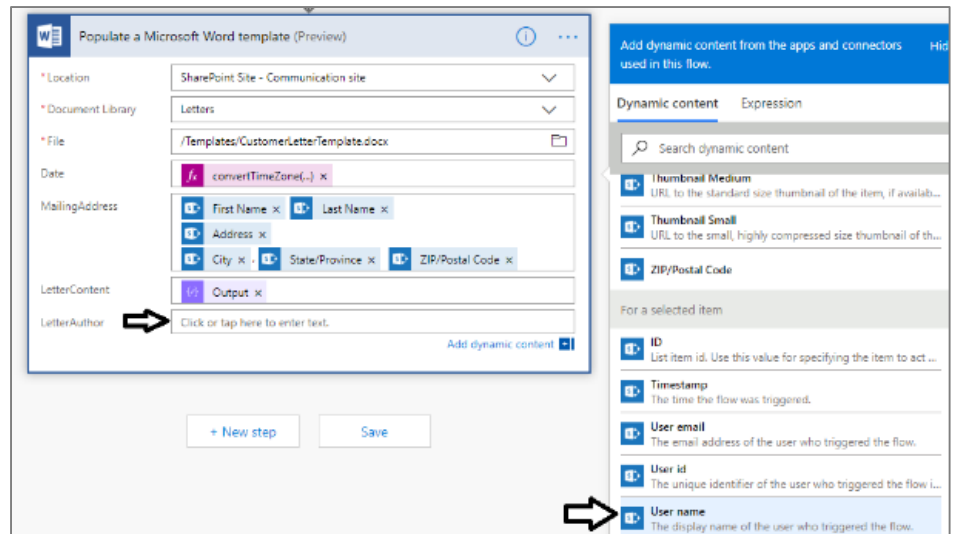
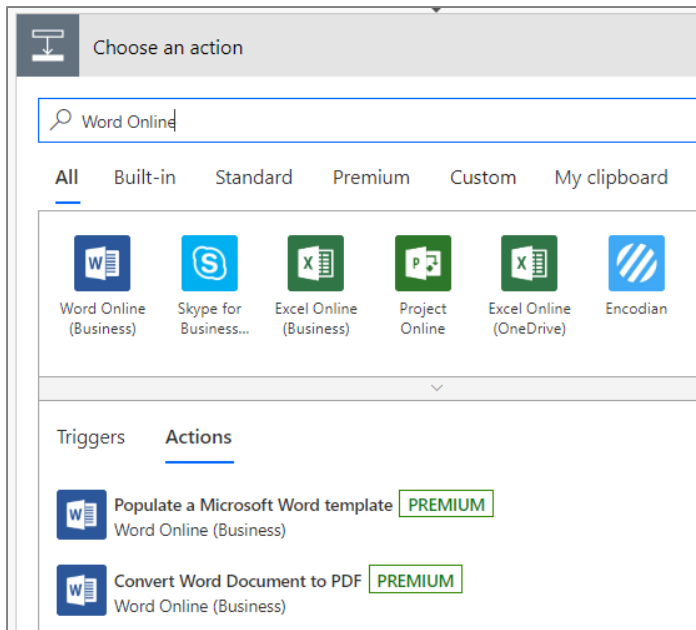
An arrow points down to the 'Get item' action, which is also configured with the following fields:

- * Site Address:
- * List Name:
- * Id:
- Show advanced options: ☐



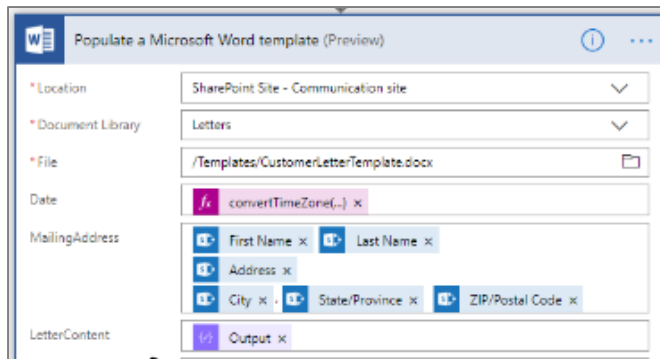
Word Online Connector

- Word Online connectors provides two valuable actions
 - Populate a Microsoft Word template
 - Convert Word Document to PDF

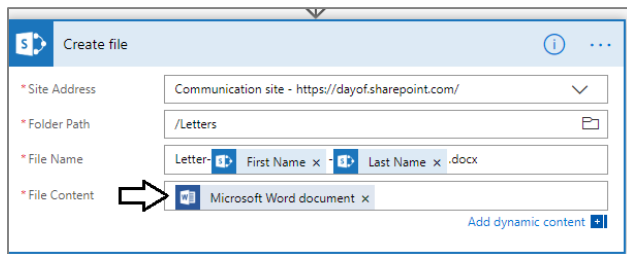


Populate a Microsoft Word template

- Using Populate a Microsoft Word template action
 - Select Word document template with named content controls
 - Dynamically add content into named content controls

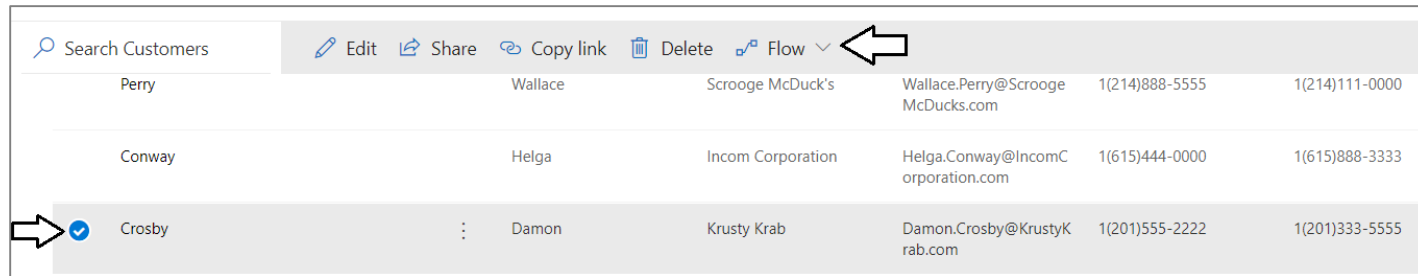


- Populate a Microsoft Word template doesn't create file
 - You must add another action to actually create the DOCX file



Running a For a Selected Item Flow

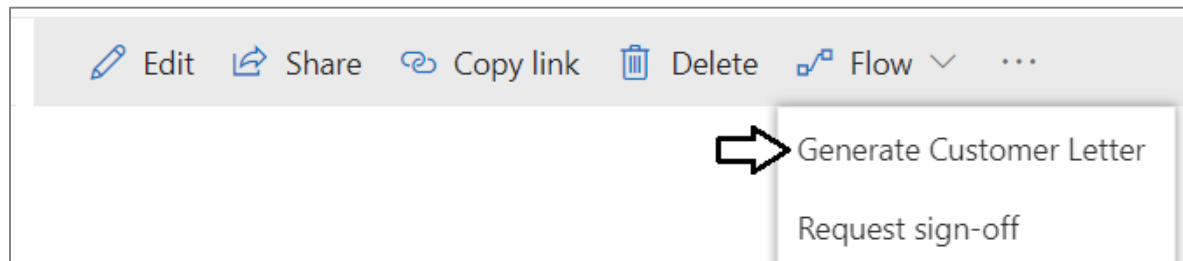
- For a selected item flow runs on one item at a time
 - Make sure just one item is selected then drop down Flow menu



The screenshot shows a table with customer information. The 'Flow' menu is open, and the 'Crosby' row is selected. An arrow points to the 'Flow' menu, and another arrow points to the 'Crosby' row.

Search Customers	Edit	Share	Copy link	Delete	Flow	
Perry	Wallace	Scrooge McDuck's	Wallace.Perry@Scrooge McDucks.com	1(214)888-5555	1(214)111-0000	
Conway	Helga	Incom Corporation	Helga.Conway@IncomC corporation.com	1(615)444-0000	1(615)888-3333	
<input checked="" type="checkbox"/> Crosby	:	Damon	Krusty Krab	Damon.Crosby@KrustyK rab.com	1(201)555-2222	1(201)333-5555

- For a select item flows should appear in dropdown menu





DEMO

Generating DOCX Files with the Word Online Connector

Summary

- ✓ Setting Up a PowerApps Environment
- ✓ Understanding Flow Fundamentals
- ✓ Creating and Testing Flows
- ✓ Using Control-of-Flow Actions
- ✓ Writing Flow Expressions
- ✓ Automating Document Generation

