

# Getting Started with Microsoft Flow



# Agenda

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



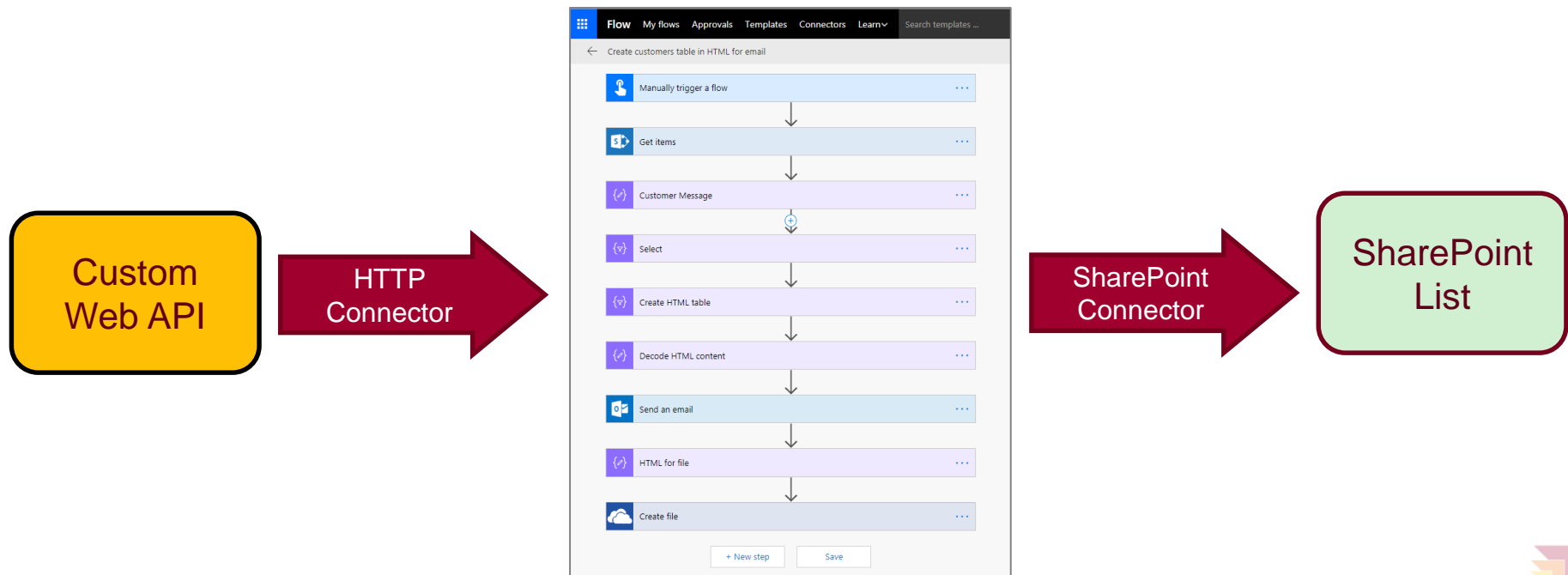
# What is Flow?

- 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



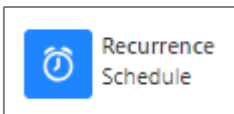
# Building Blocks of Flow

- **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

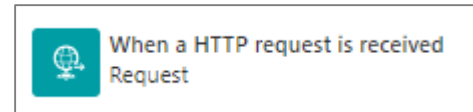
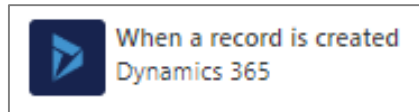
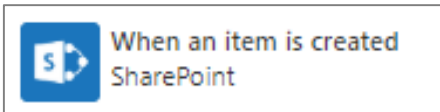


# Flow Trigger Types

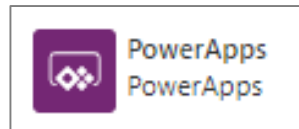
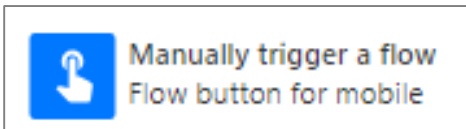
- Scheduled Flow Triggers
  - Runs periodically based on an interval



- Automated Flow Triggers
  - Runs when something happens

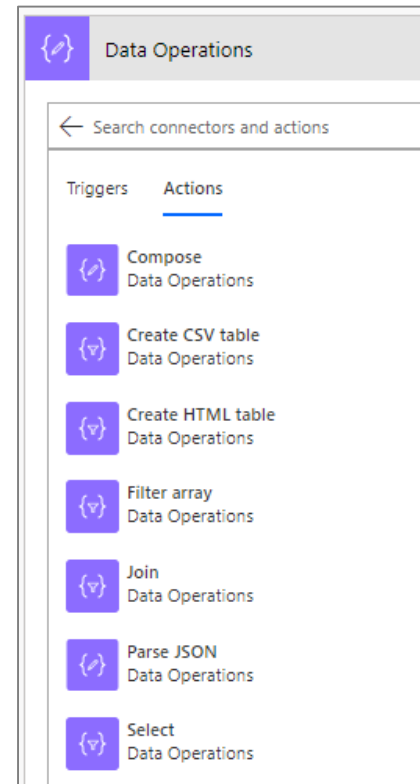
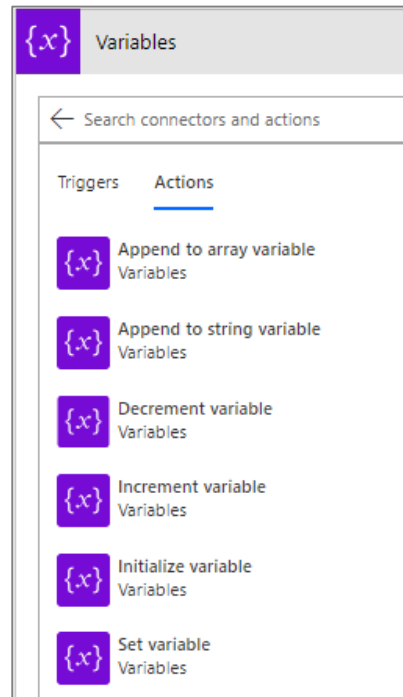
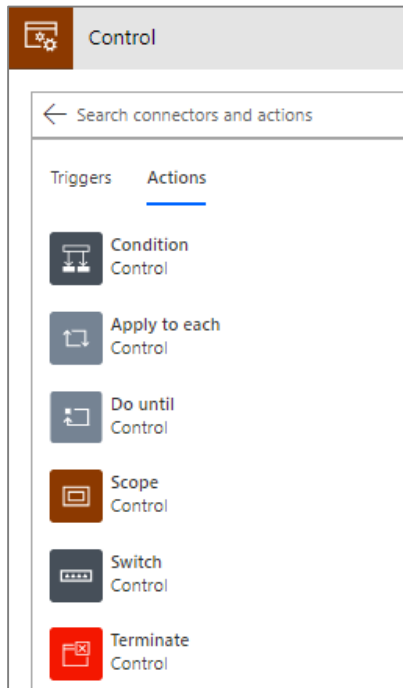


- On-demand Flow Triggers
  - Runs when a user clicks a button



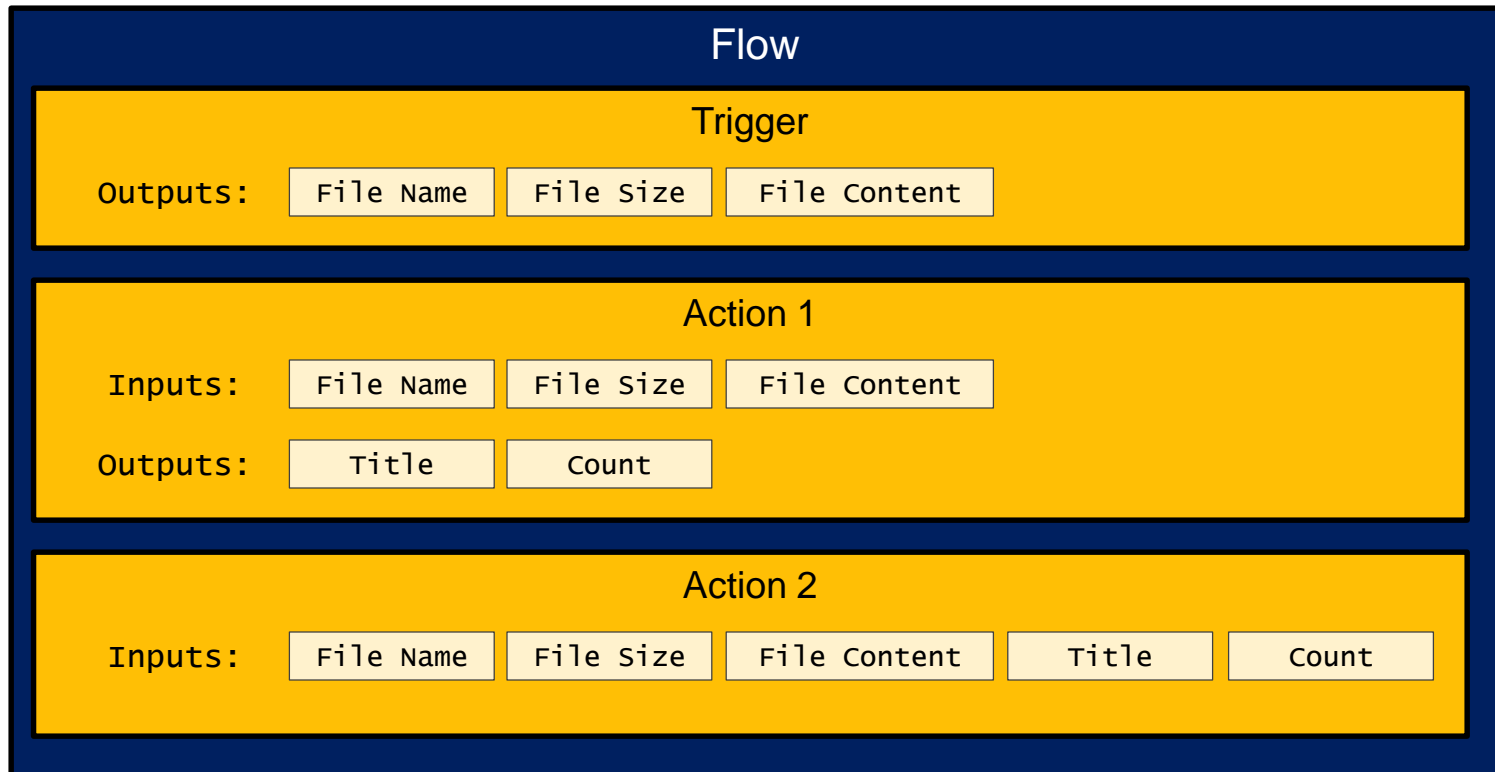
# Core Action Categories

- **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



# Agenda

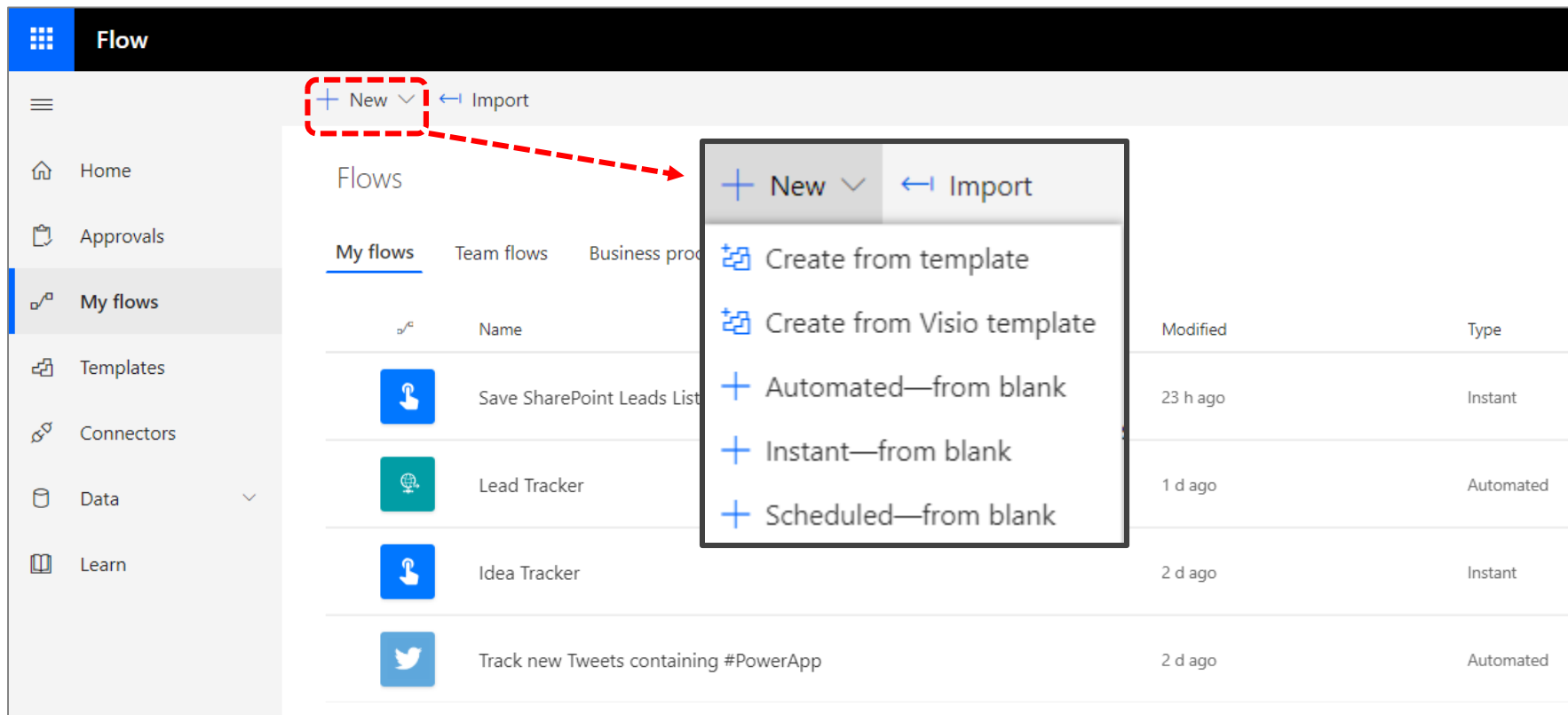
- ✓ Understanding Flow Fundamentals
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  - Using Control-of-Flow Actions
  - Writing Flow Expressions
  - Automating Document Generation





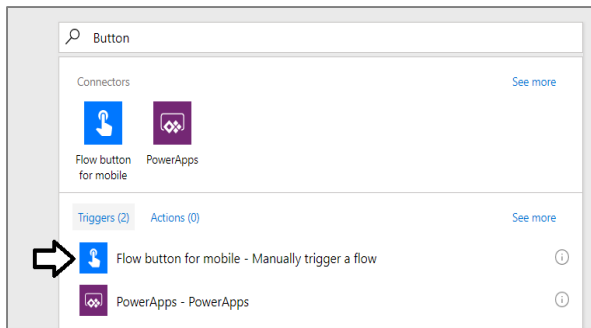
# Creating and Managing Flows

- 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

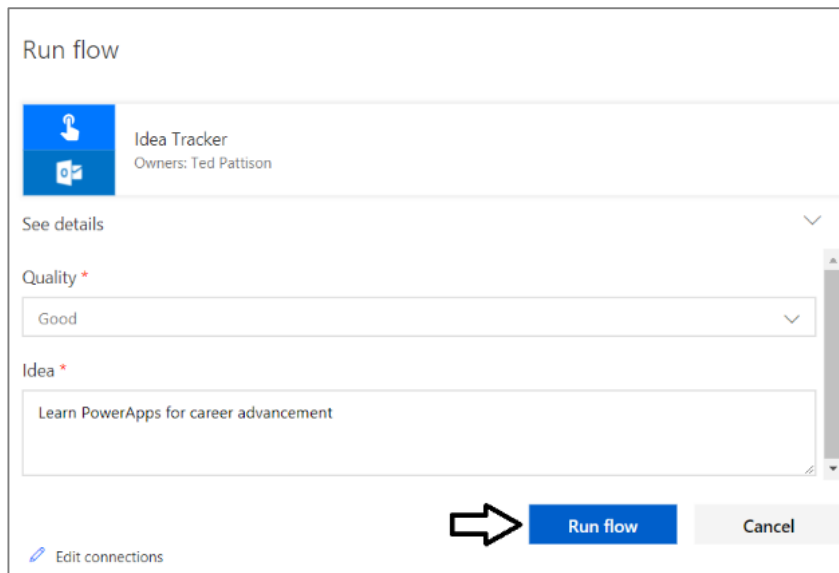


# Creating a Flow Trigger by Manual Button

- 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 flow is owned by 'Ted Pattison'. The 'Quality' field is a dropdown menu with 'Good' selected. The 'Idea' field is a text input box containing 'Learn PowerApps for career advancement'. At the bottom, there is a blue 'Run flow' button and a grey 'Cancel' button. A black arrow points to the 'Run flow' button. There is also an 'Edit connections' link at the bottom left.




# Building Out The Idea Tracker Flow


Flow name

Idea Tracker

✓ Update flow

✕ Close

 Manually trigger a flow ⋮

 Quality  ⋮

List Options


Lame


Good


Great


Brilliant


Enter another option












 Idea  ⋮

 Add an input

 Send an email i ⋮


\* To

\* Subject 


 Quality ✕


 Idea for consideration

\* Body 

 Idea ✕

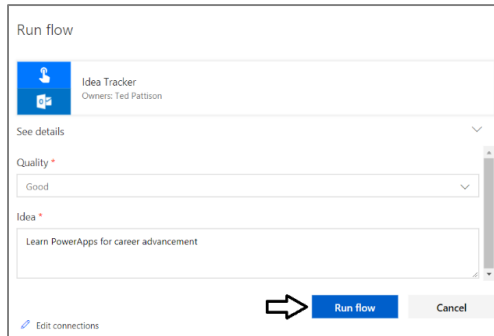
Show advanced options ∨



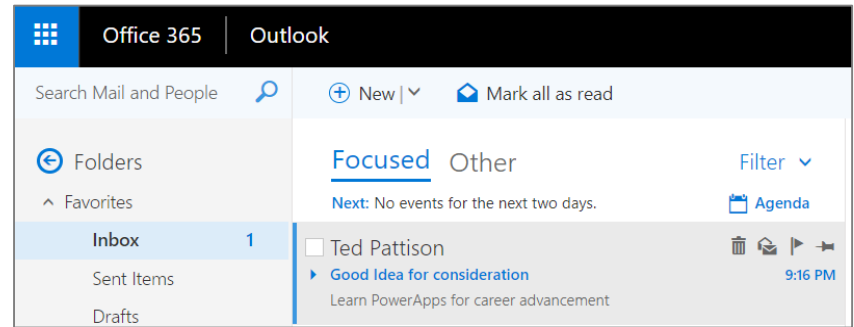
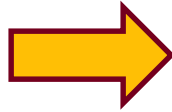


# Where Should You Write the Idea?

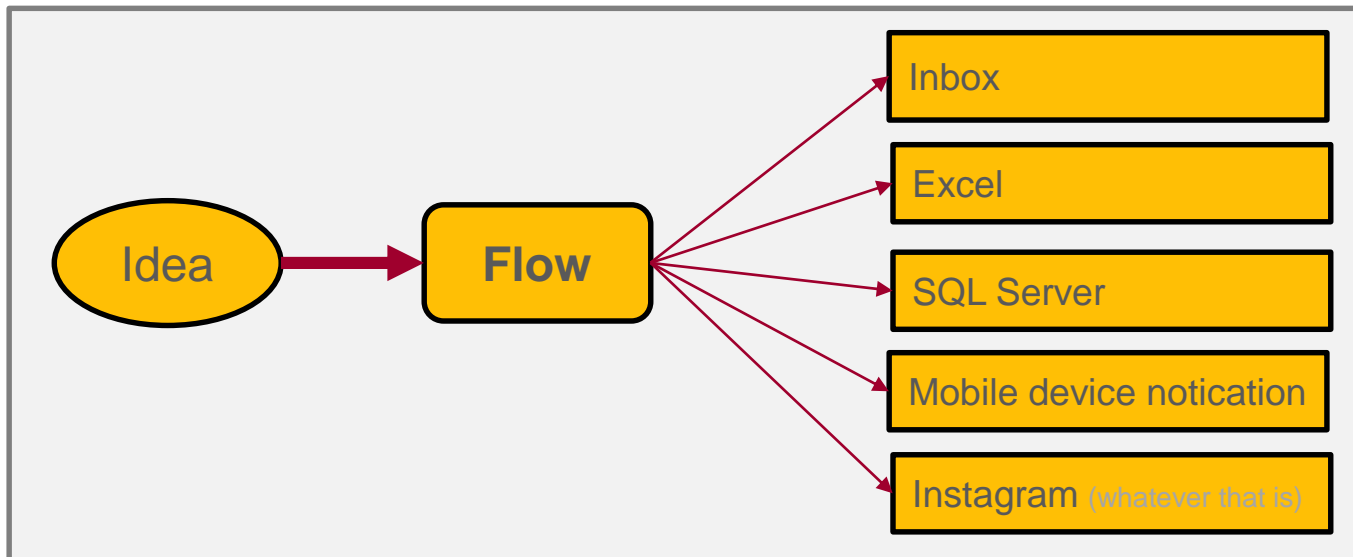
- You can track the idea by sending an email



The 'Run flow' dialog for 'Idea Tracker' (owned by Ted Pattison) is shown. It includes a 'See details' section with a 'Quality' dropdown set to 'Good' and an 'Idea' text box containing 'Learn PowerApps for career advancement'. At the bottom, there is a 'Run flow' button and a 'Cancel' button.

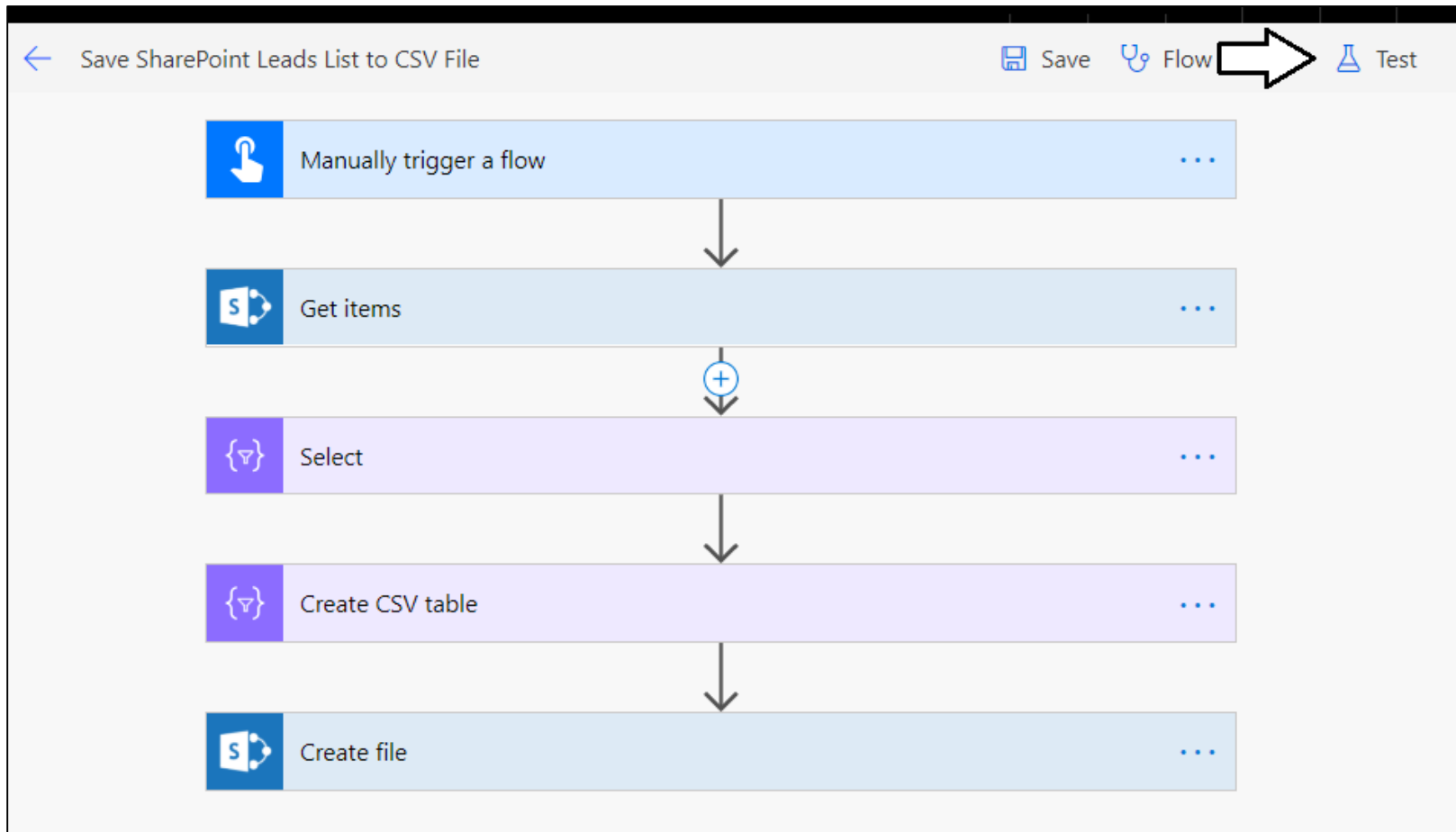


- Or get even more extravagant



# 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 titled "Send an email when a new item is created in SharePoint." with two steps: "When a new item is created" and "Send an email".

The "When a new item is created" step has two required parameters:

- \* 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."

A downward arrow indicates the flow continues to the "Send an email" step, which has one required parameter:

- \* To**: Specify email addresses separated by semicolons like `someone@contoso.com`. Below the input field is the error message: "Include a List Name."

The "Flow Checker" panel on the right shows the results of the automatic check:

- Errors (2)**: A collapsed section.
- When a new item is created (2)**: A collapsed section showing two errors: "Include a Site Address." and "Include a List Name."

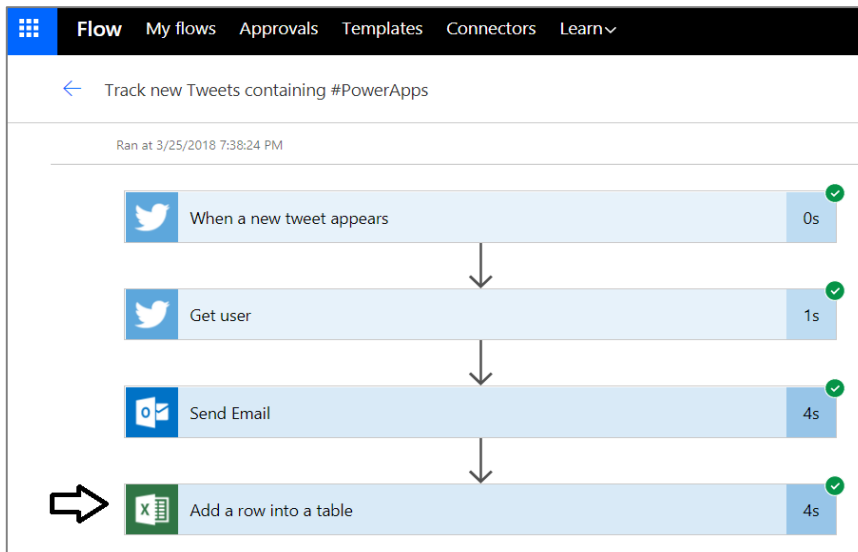
The "Send an email" step also shows an error: "Include a List Name."

# 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**



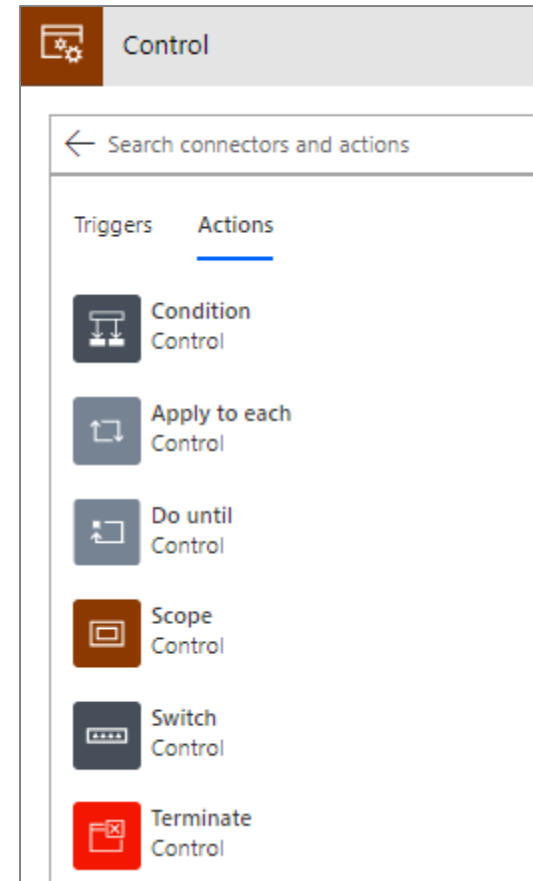
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# Control of Flow

- 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

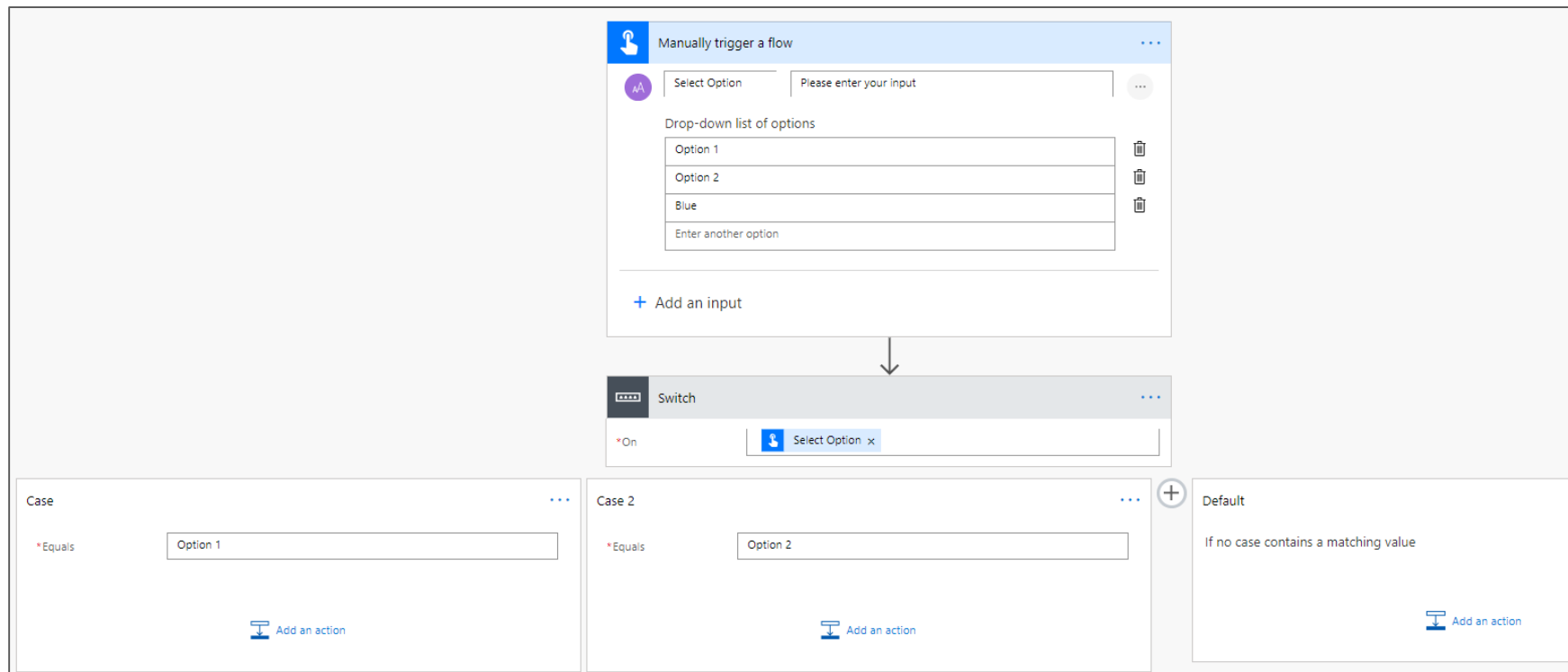
[Add dynamic content](#) [Edit in advanced mode](#) [Collapse condition](#)

✓ 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

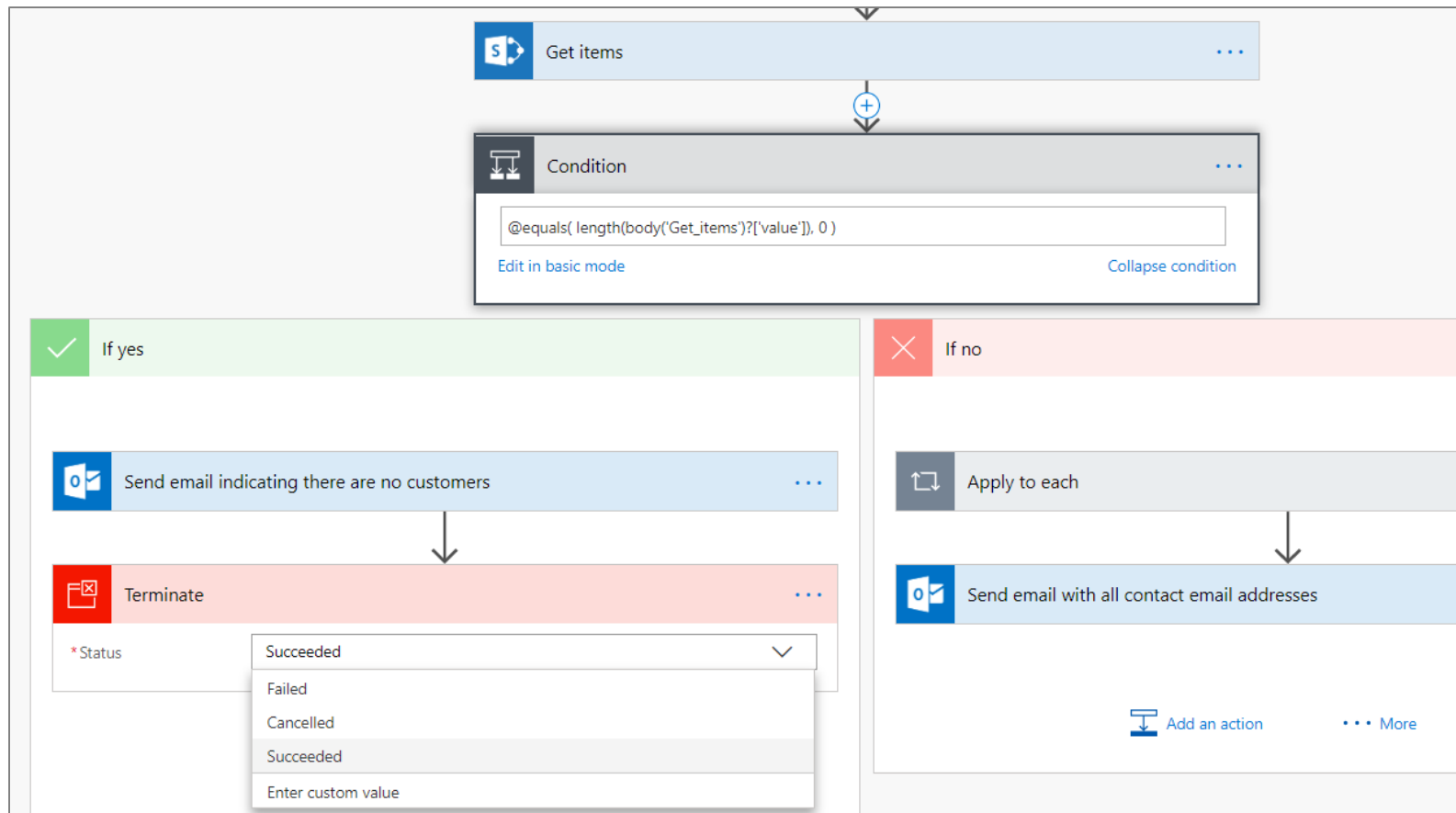
- Automatically added when list is used from output
- Destination step enumerates over list items

The screenshot displays a workflow editor interface. At the top, a 'Get items' step is configured with 'Site Address' set to 'https://msd0910.sharepoint.com/' and 'List Name' set to '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 x'. Below the 'Apply to each' step, a 'Delete item' step is visible, configured with 'Site Address' set to 'Critical Path Training Labs Team Site - https://msd0910.sharepoint.com/', 'List Name' set to 'List1', and 'Id' set to 'ID x'. 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

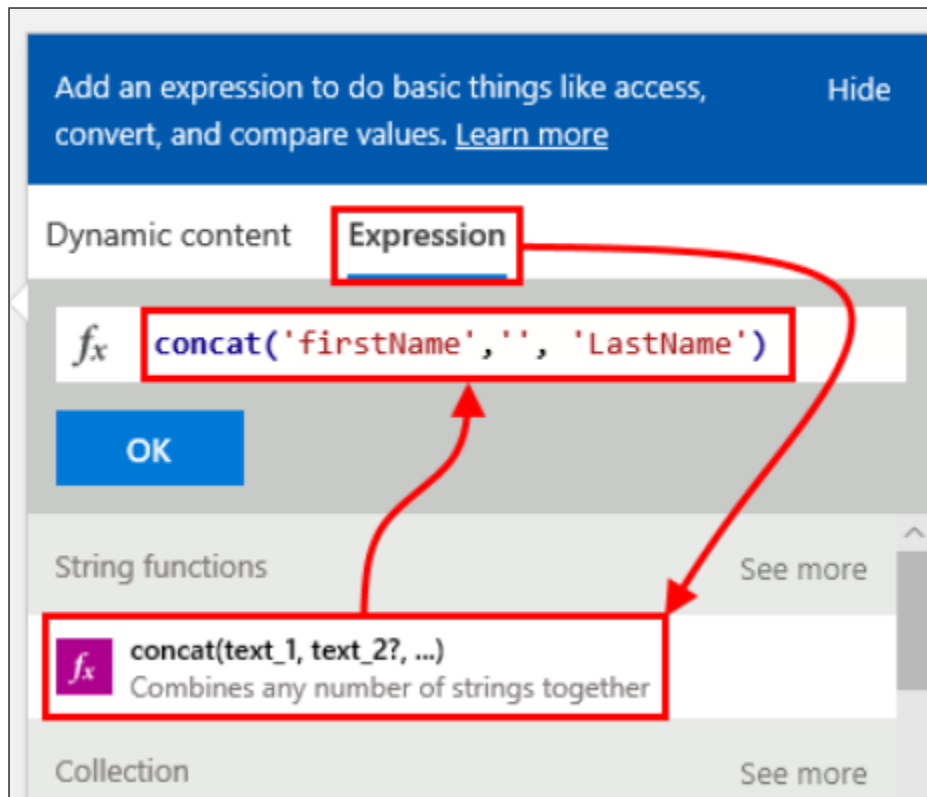
- Scenarios for writing Flow expressions
  - Perform string manipulation
  - Generate a GUID or a random number
  - Convert types
  - Perform simple inline calculations
  - Handling optional values
  - Writing conditional statements using "If" statements
  - Working with arrays





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




# 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

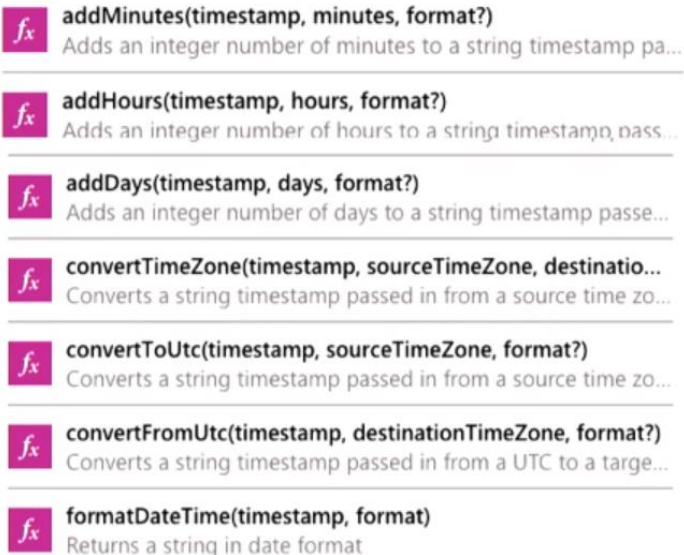
**fx** **div(dividend, divisor)**  
Returns the result from dividing the two numbers


**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


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


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

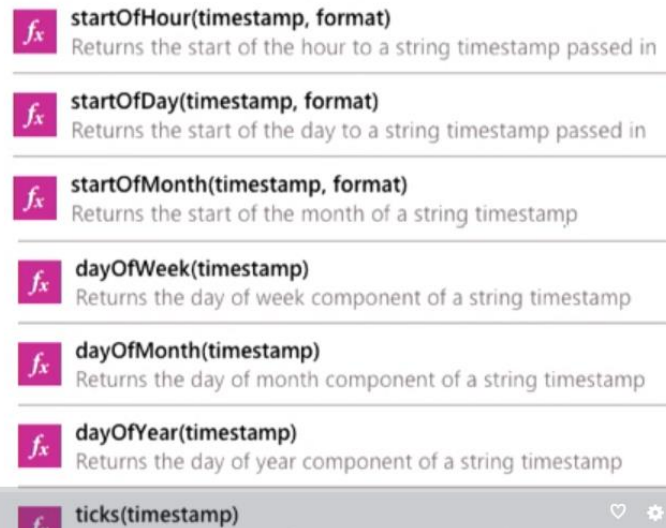
 **addDays(timestamp, days, format?)**  
Adds an integer number of days to a string timestamp passed in


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


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


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


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


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


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

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

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

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

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

 **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']`

Workflow configuration for 'Delete item' step:

- Site Address: Critical Path Training Labs Team Site - <https://msd0910.sharepoint.com/>
- List Name: List1
- Id: `body('Get_items')?['value'][0]['ID']`

Dynamic content Expression:

```
body('Get_items')?['value'][0]['ID']
```

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. It begins with a 'Get items' action, which feeds into an 'Apply to each' loop. The loop's 'value' is selected as 'value x'. Inside the loop, there is an 'Update item' action. The 'Update item' action is configured with the following fields:

- \*Site Address: Communication site - <https://summatime.sharepoint.com/>
- \*List Name: Customers
- \*Id: ID x
- \*Last Name: Last Name x
- First Name: (empty)
- Company: `toUpper(item()['Company'])`
- E-Mail: (empty)

On the right side of the 'Update item' action, there is a panel with a blue header 'Add an expression to do basic things like access, convert, and compare values. [Learn more](#)'. Below this header, there are two tabs: 'Dynamic content' and 'Expression'. The 'Expression' tab is selected, showing the formula `toUpper(item()['Company'])`. At the bottom of this panel is a blue 'Update' button.



The background of the slide is a close-up, low-angle shot of a server rack. The rack is filled with numerous server units, each featuring a grid of small, glowing blue lights. The perspective is looking up the length of the rack, creating a sense of depth and scale. The lighting is predominantly blue, giving it a high-tech, digital feel.

**DEMO**

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

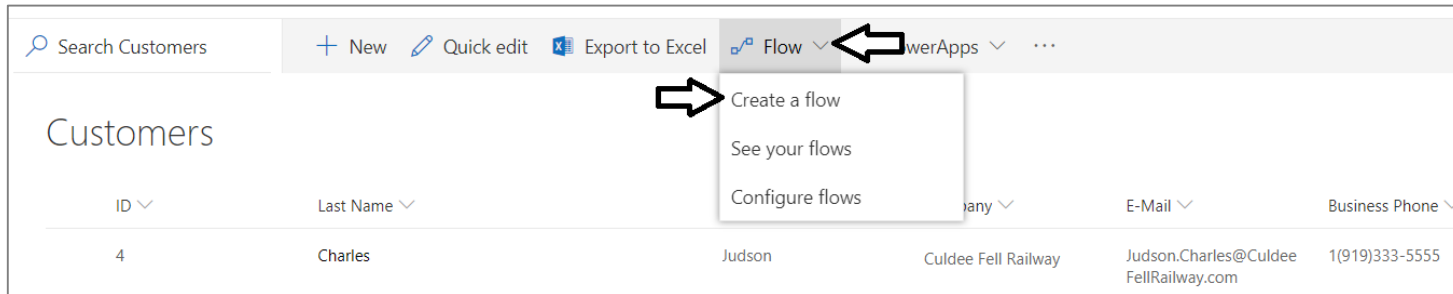
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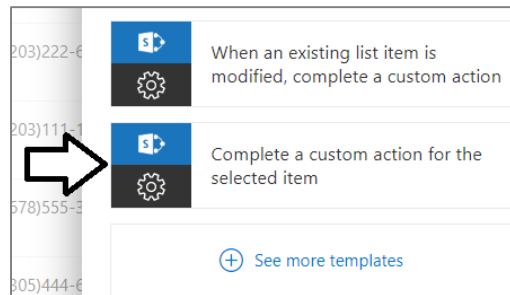
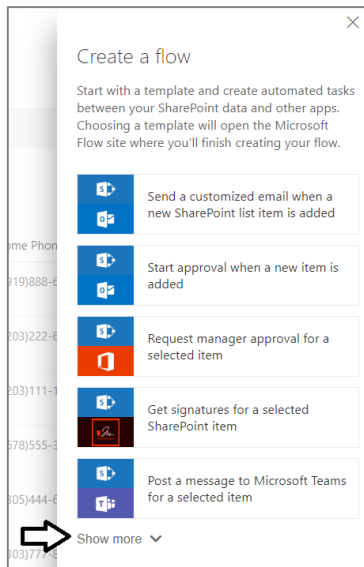


# Adding Flows for SharePoint Selected Item

- 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: ☐

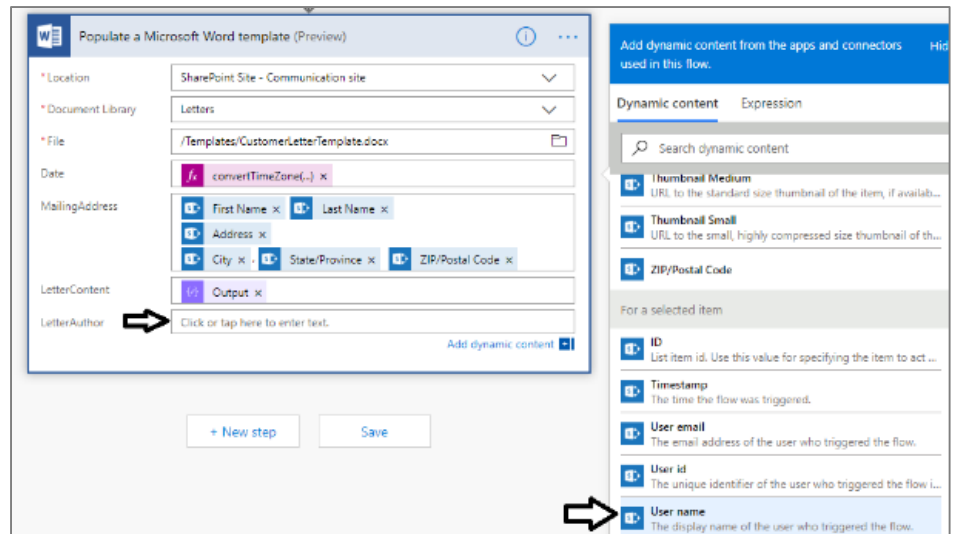
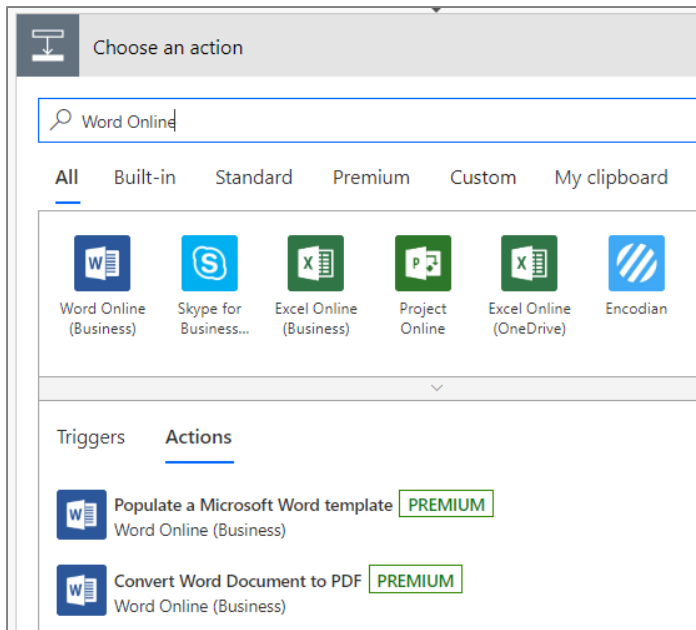
An arrow points down to the 'Get item' action, which is also configured with the following fields:

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



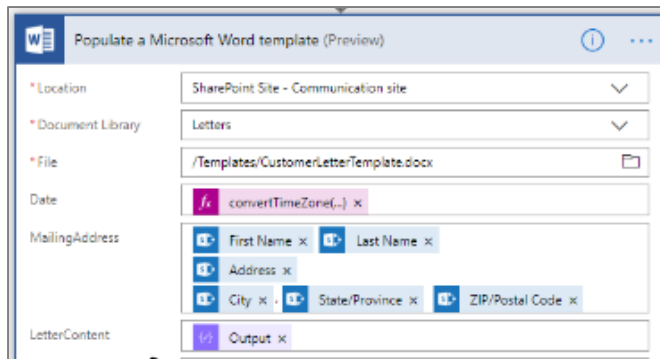
# Word Online Connector

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

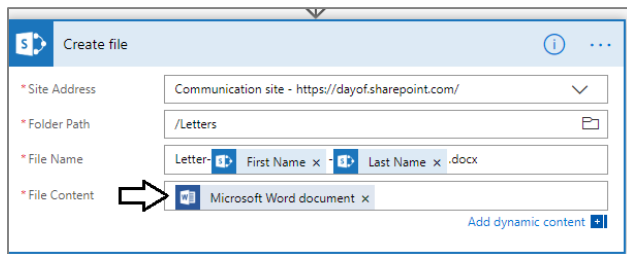


# Populate a Microsoft Word template

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

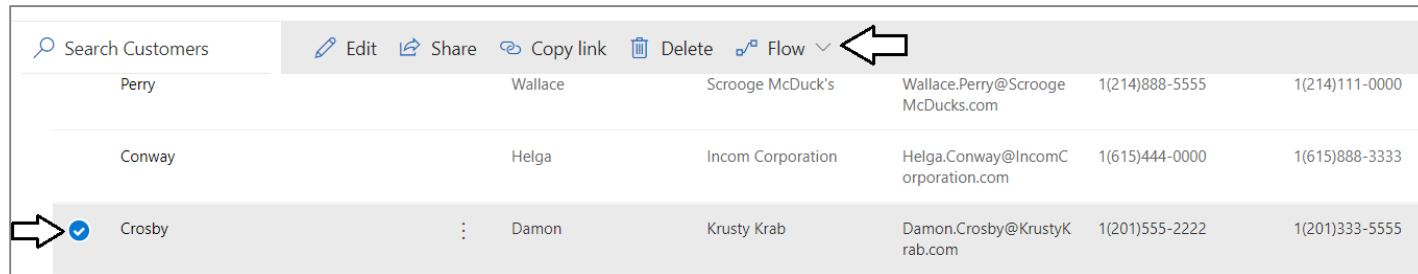


- Populate a Microsoft Word template doesn't create file
  - You must add another action to actually create the DOCX file



# Running a For a Selected Item Flow

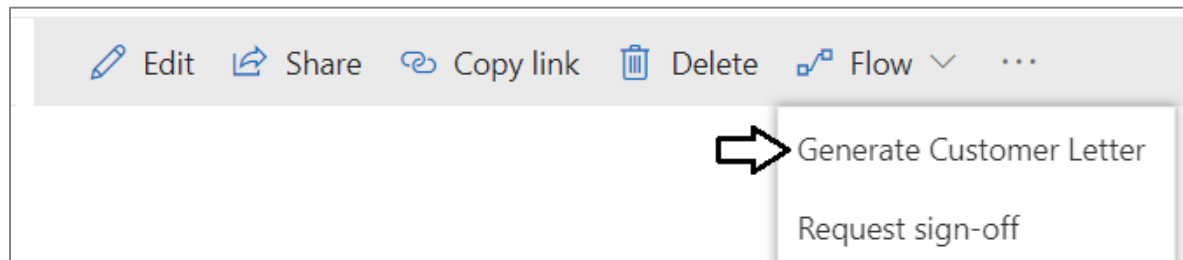
- For a selected item flow runs on one item at a time
  - Make sure just one item is selected then drop down Flow menu



A screenshot of a web application showing a table of customers. The table has columns for name, last name, company, email, and phone numbers. The 'Crosby' row is selected, indicated by a blue checkmark in a circle. The 'Flow' menu is open, showing options like 'Generate Customer Letter' and 'Request sign-off'. 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

- ✓ Understanding Flow Fundamentals
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