

Building Flows to Manage Content and Approvals



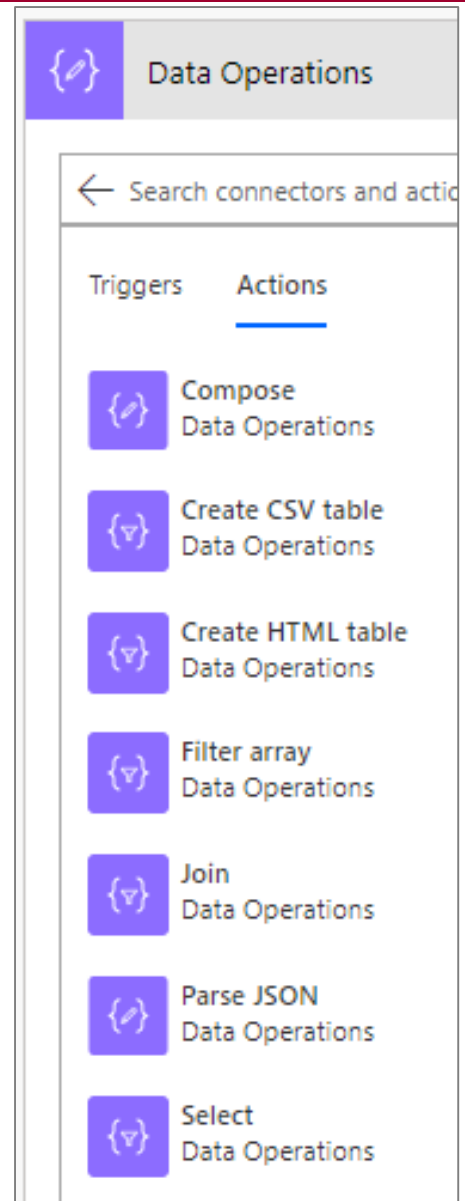
Agenda

- Converting and Reshaping Data
- Uploading Photos to SharePoint
- Automating Approval Processes
- Integrating Flow with Microsoft Forms
- Handling Runtime Errors
- Understanding Parallel Execution



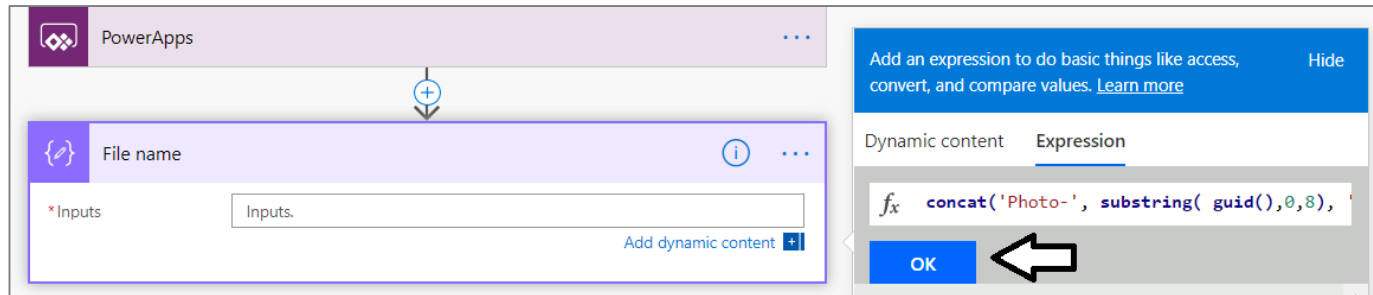
Actions with Data Operations

- Compose
 - Used to parse together text, HTML, JSON, etc.
- Create CSV Table
 - Used to export data files with CSV format
- Create HTML Table
 - Used to create HTML tables for use in email messages
- Filter Array
 - Filter the contents of an existing array
- Join
 - Parse email address array into single string
- Parse JSON
 - Parse JSON returned from HTTP call into an object
- Select
 - Remap the columns in an array

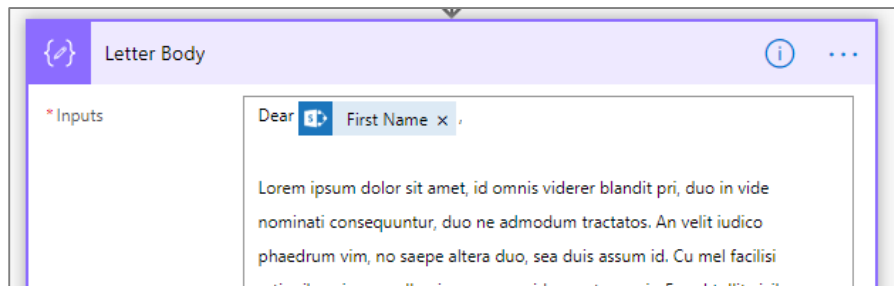


Making Flows Maintainable with Compose

- Compose actions used to simplify flow building
 - Separates parsing content into its own named action
 - Makes flows easier to read and understand
 - Example 1: use Compose step to create a file name

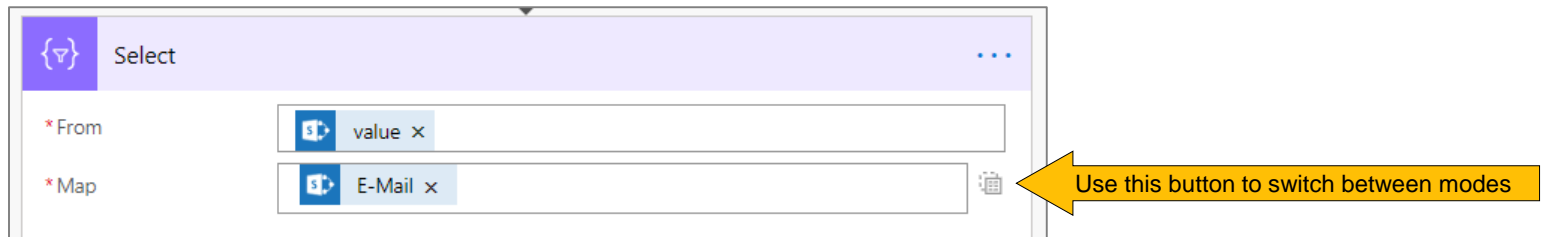


- Example 2: use compose step to generate content for letter

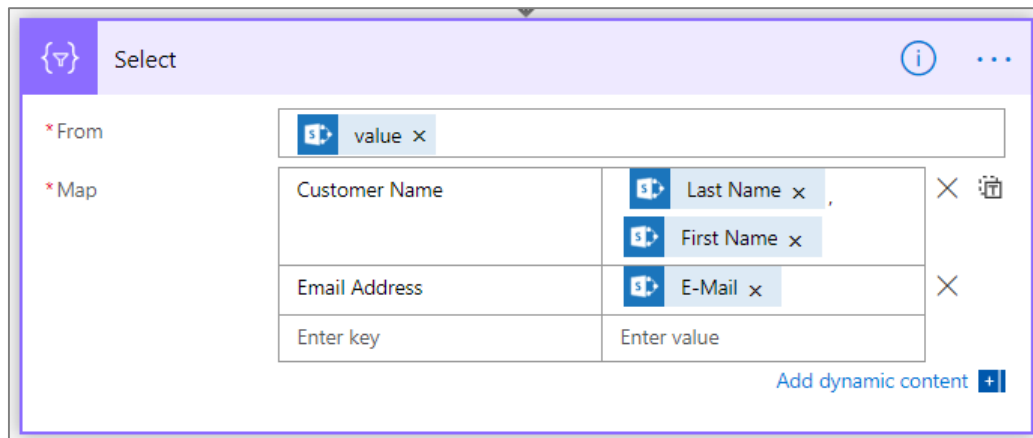


Transforming Arrays using a Select Action

- The Select action configured to **Text mode** or **Key-Value mode**
- Text mode used to create a simple array
 - Example: use Text mode to create an array of email addresses

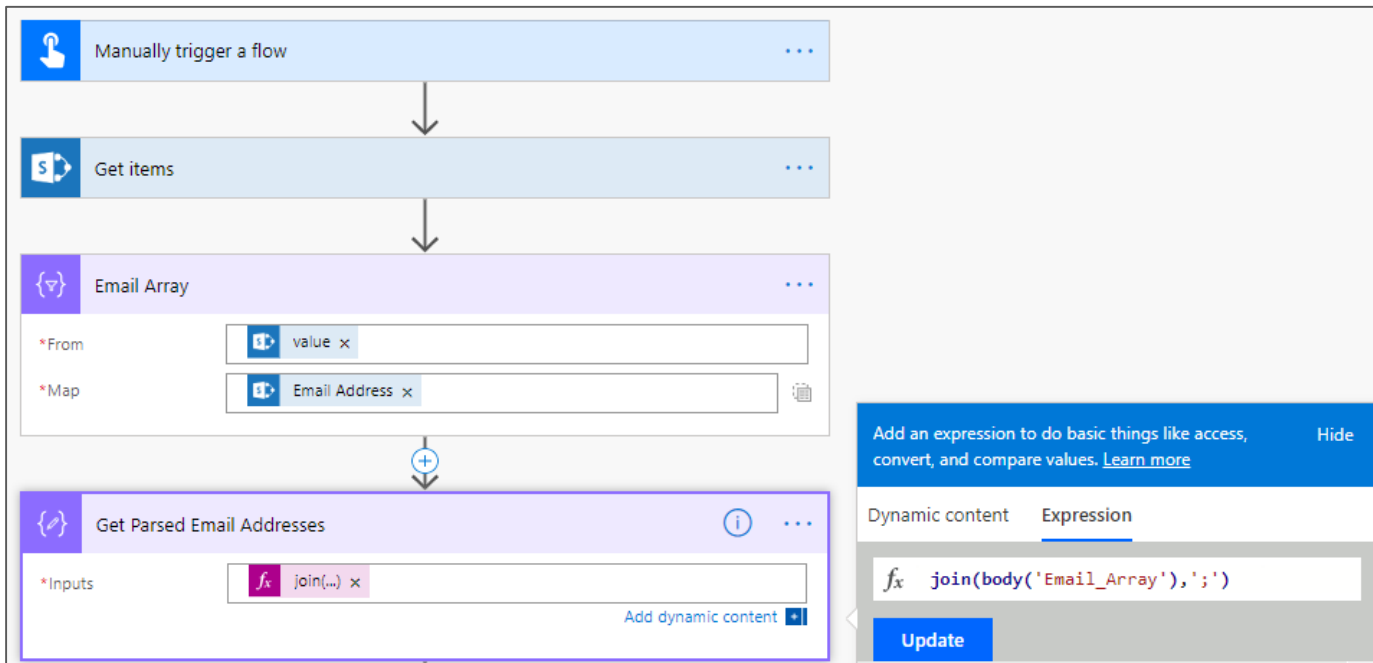


- Key-Value mode allows you to remap columns from table or list
 - Example use Key-Value mode to remap columns from Customers list



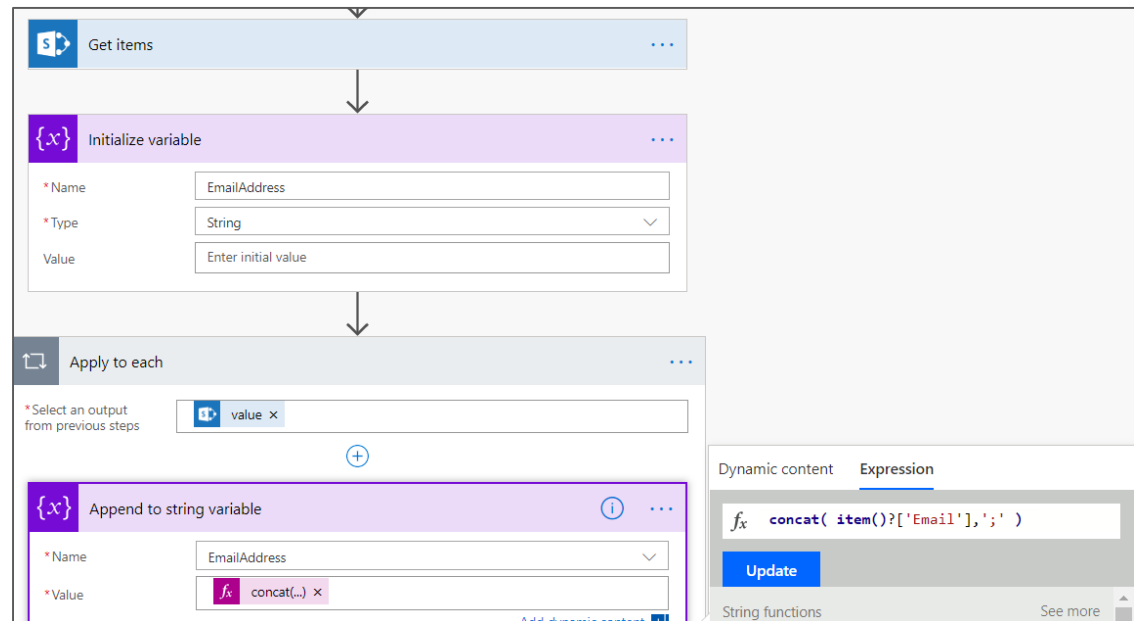
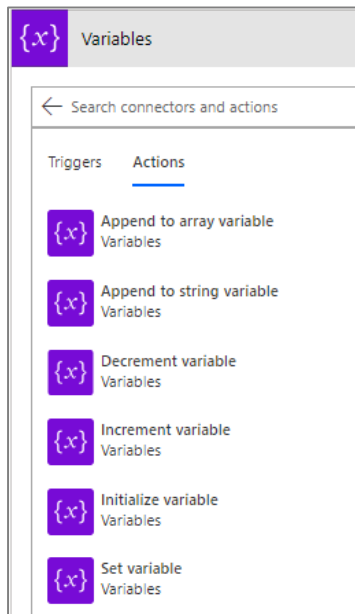
Convert Array of Email Addresses to String

- Steps to create a semicolon-delimited list of emails
 - Use **Get Items** action to get SharePoint Customers list
 - Use **Select** action to create array of email addresses
 - Use **Compose** action to build string from array of email addresses
 - This string can be used in **To** field of **Send an Email** action



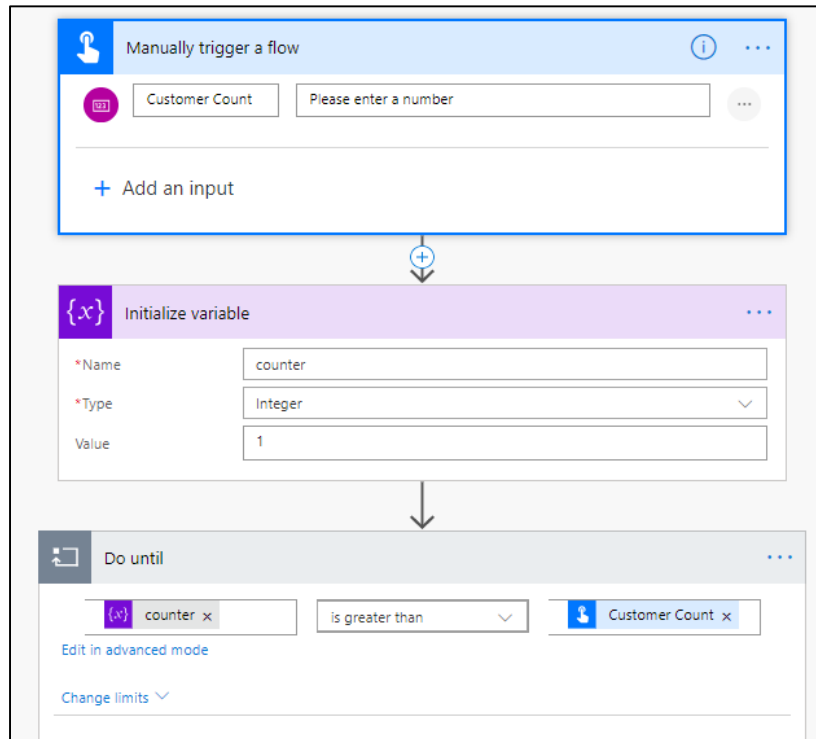
Tracking State using Variables

- Variables used to track state during flow lifetime
 - **Initialize Variable** action used to create variable instance
 - Other variable actions uses to update variable values
 - By default, variable value persisted for lifetime of flow
 - Variables can be initialized inside **Scope** action to reduce lifetime



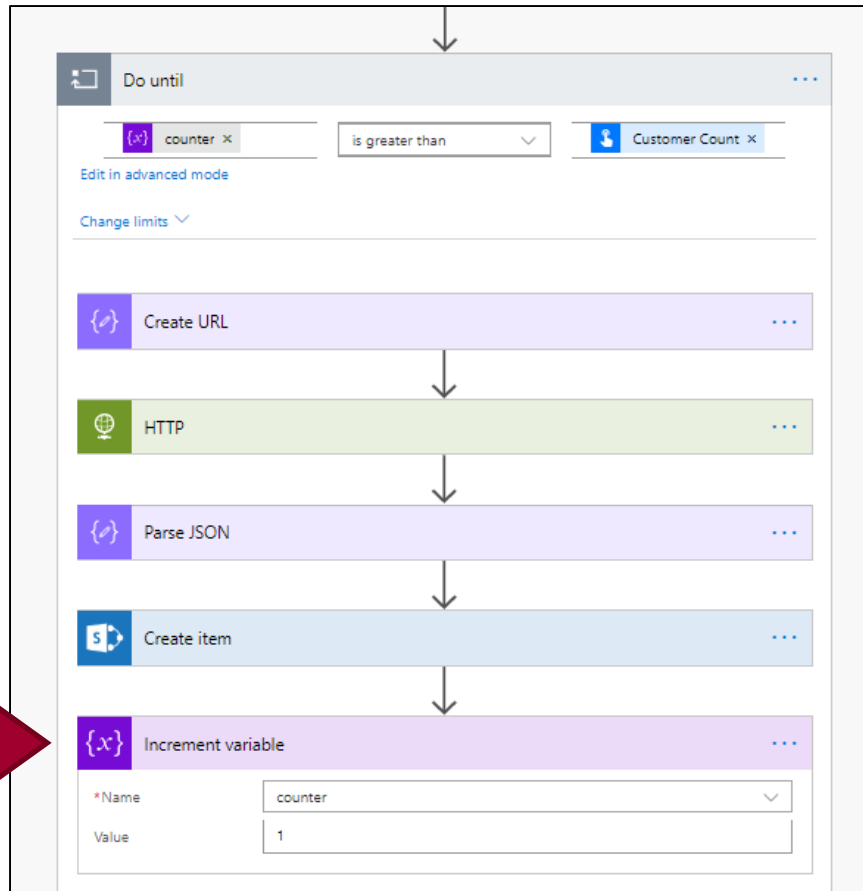
Do Until Action with Counter Variable

- Using a variable to control looping in **Do until** action
 - Initialize integer variable before **Do until** action to act as counter
 - **Do until** action condition checks variable value
 - **Do until** action body requires action to increment variable value



Executing Operations inside Do Until Loop

- Implementation of **Do until** action body
 - **Increment variable** action used to change variable value



Handling Type Conversion

- Some conversion is automatic
 - Sometimes conversions are performed for you
 - In other cases, you must explicitly convert between types



string(value)

Convert the parameter to a string



float(value)

Convert the parameter argument to a floating-point number



bool(value)

Convert the parameter to a Boolean



base64(value)

Returns the base 64 representation of the input string



base64ToBinary(value)

Returns a binary representation of a base 64 encoded string



base64ToString(value)

Returns a string representation of a base 64 encoded string



binary(value)

Returns a binary representation of a value



dataUriToBinary(value)

Returns a binary representation of a data URI



dataUriToString(value)

Returns a string representation of a data URI



dataUri(value)

Returns a data URI of a value



uriComponent(value)

Returns a URI encoded representation of a value



uriComponentToBinary(value)

Returns a binary representation of a URI encoded string



uriComponentToString(value)

Returns a string representation of a URI encoded string



dataUriToBinary()

- PowerApps photos require conversion
 - Allows you to upload photos to SharePoint
 - Accomplished using **dataUriToBinary()** function

```
dataUriToBinary(triggerBody()['Createfile_FileContent'])
```

The screenshot displays a PowerApps flow with two steps:

- Get File Name**: The input field contains the expression `concat(...)`.
- Create file**: This step has four fields:
 - Site Address**: Critical Path Training Labs Team Site - <https://msd0910.sharepoint.com/>
 - Folder Path**: /My Photos
 - File Name**: Output
 - File Content**: `dataUriToBinary(...)`

On the right, a dynamic content panel shows the expression `dataUriToBinary(triggerBody()['Createfile_...])` and a list of string functions, including `concat(text_1, text_2?, ...)`.



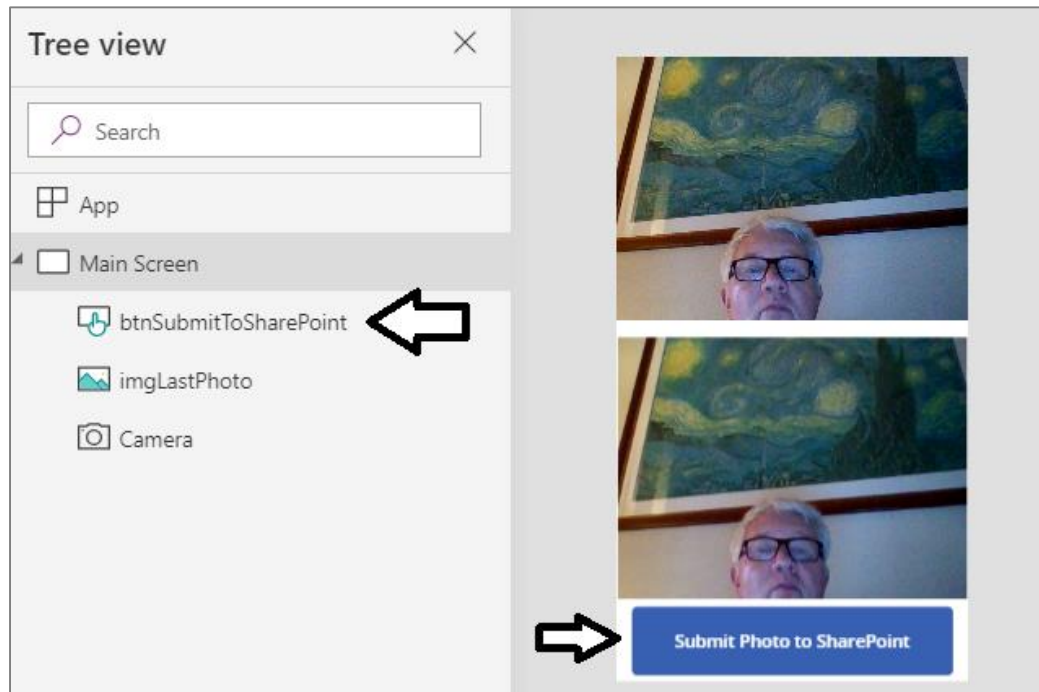
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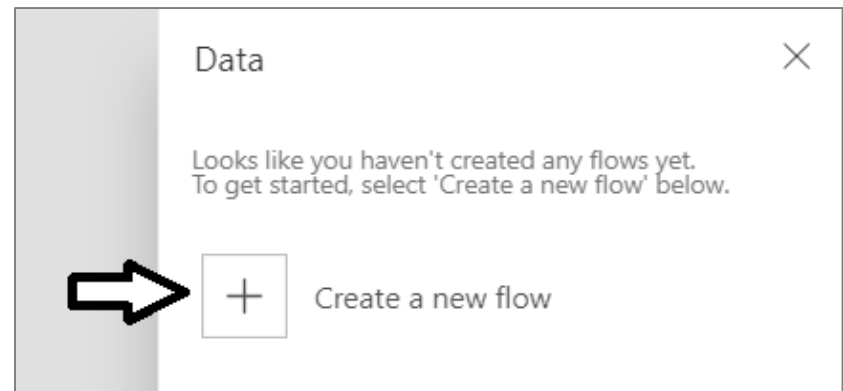
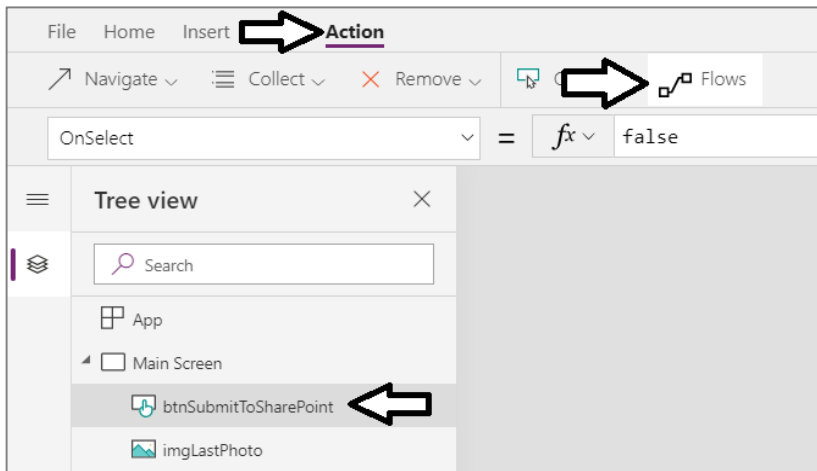
Creating a Canvas App to Upload Photos

- Begin by creating a blank canvas app
 - Add a Camera control
 - Add an Image control to display camera's last photo
 - Add a button control to trigger a flow to upload photo



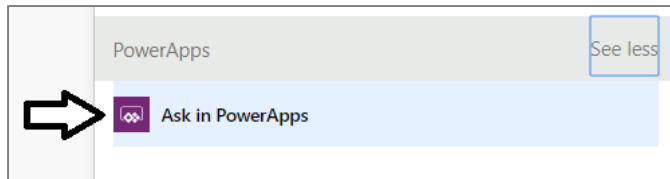
Creating a Flow with a PowerApps Trigger

- Create a new flow from the Canvas App editor
 - Select the button which should trigger the flow
 - Click Flows button in Action tab to display the Data pane
 - Click the **Create a new flow** button
 - The new flow automatically created with PowerApps button trigger

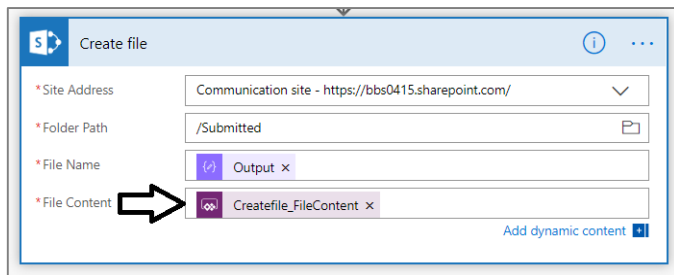


Adding Parameters with Ask In PowerApps

- PowerApps trigger provides Ask in PowerApps parameter
 - Clicking **Ask in PowerApps** automatically creates new parameter

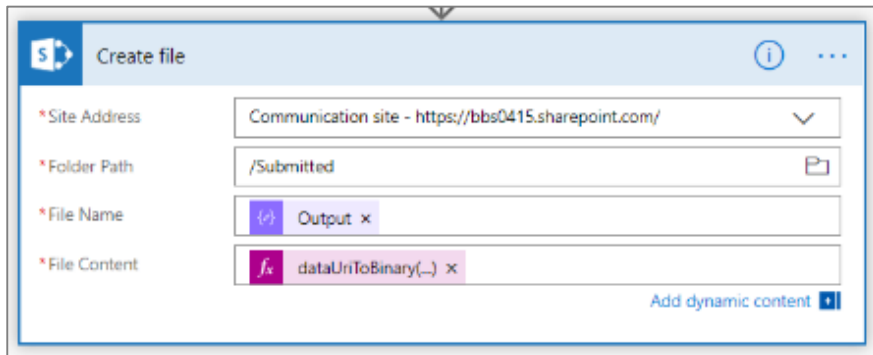


- New parameters used to pass data from canvas app to flow

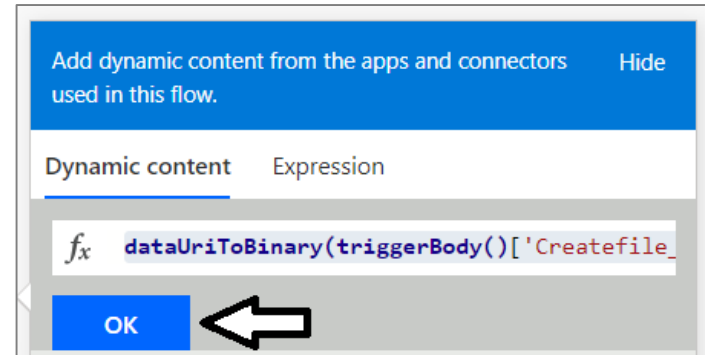


Converting Photos to Binary Format

- Camera control image not compatible with SharePoint
 - Camera control photo image based on Data Uri format
 - SharePoint document library expects files in binary format
 - You must convert photos using **dataUriToBinary** function



The screenshot shows the 'Create file' dialog in SharePoint. It has four fields: 'Site Address' (Communication site - https://bbs0415.sharepoint.com/), 'Folder Path' (/Submitted), 'File Name' (Output), and 'File Content' (dataUriToBinary(...)). The 'File Content' field is highlighted with a pink background. There is an 'Add dynamic content' button at the bottom right.



The screenshot shows the 'Add dynamic content' dialog. It has a blue header with the text 'Add dynamic content from the apps and connectors used in this flow.' and a 'Hide' button. Below the header, there are two tabs: 'Dynamic content' and 'Expression'. The 'Dynamic content' tab is selected, showing the expression 'dataUriToBinary(triggerBody()['Createfile_'])'. There is an 'OK' button at the bottom left, and a large white arrow points to it from the right.





DEMO

Using a Flow to Upload a Photo to a SharePoint Document Library

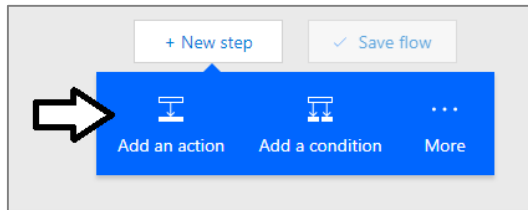
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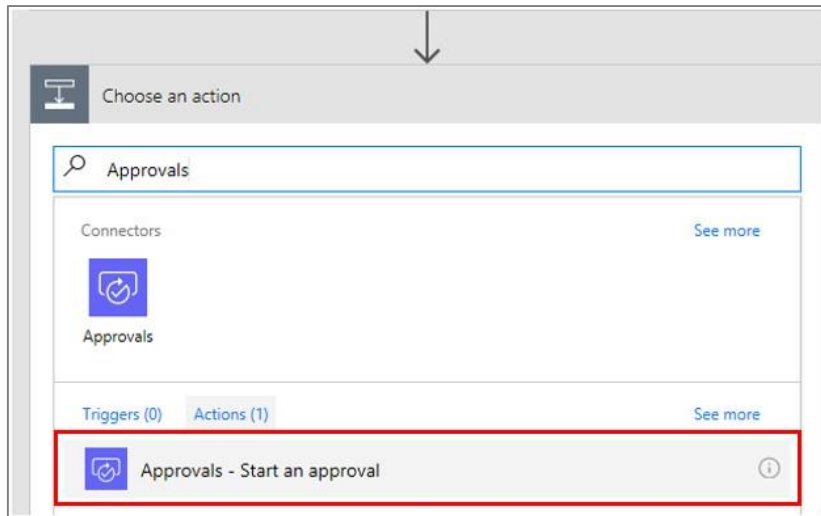


Add the Start an Approval Action

- An **Approval** process is added as an action




- Select the Approvals action named **Start an approval**



Approval Types

- There are two types of approvals
 - Determine behavior when there are two or more approvers
 - "Anyone" allows single approver to complete approval process
 - "Everyone" requires all approver to approve the request



The screenshot shows a 'Start an approval' dialog box. The title bar is light blue with a circular arrow icon on the left and an information icon and three dots on the right. Below the title bar, there is a label '* Approval type' followed by a dropdown menu. The dropdown menu is open, showing four options: 'Who should approve this?' (the selected item), 'Anyone from the assigned list', 'Everyone from the assigned list', and 'Enter custom value'. A red rectangular box highlights the three options below the selected item.

Start an approval

* Approval type

Who should approve this?

Anyone from the assigned list

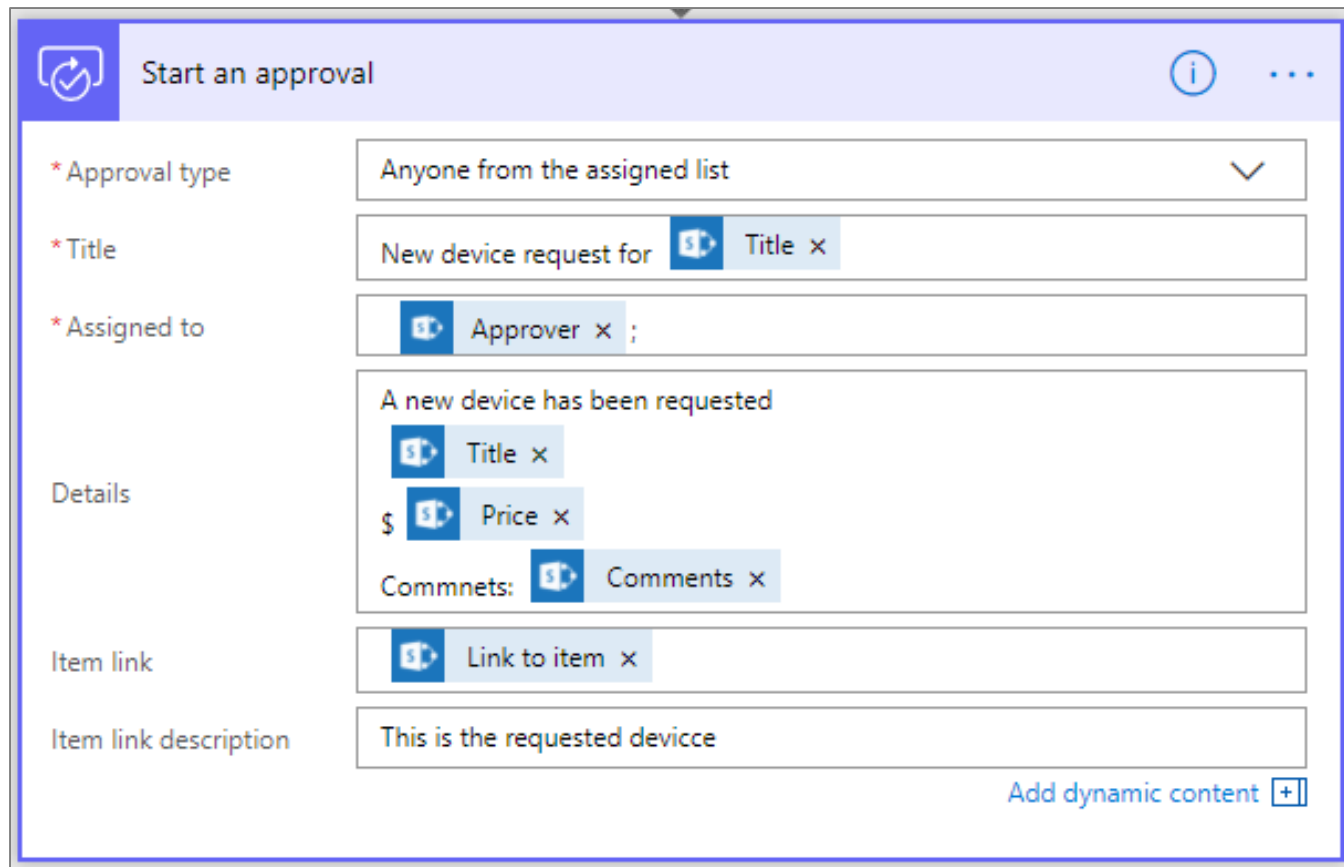
Everyone from the assigned list

Enter custom value



Building Out The Start an Approval Action

- You provide data which is sent to approver



The screenshot shows a 'Start an approval' dialog box with the following fields and content:

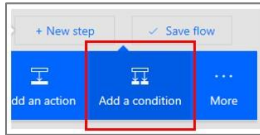
- * Approval type:** A dropdown menu with the text 'Anyone from the assigned list' and a downward arrow.
- * Title:** A text field containing 'New device request for' followed by a dynamic content placeholder (blue square with 'S' and a dot) and 'Title x'.
- * Assigned to:** A text field containing a dynamic content placeholder (blue square with 'S' and a dot) and 'Approver x ;'.
- Details:** A text area containing the text 'A new device has been requested' followed by three lines of dynamic content: a placeholder and 'Title x', a placeholder and 'Price x', and the text 'Comments:' followed by a placeholder and 'Comments x'.
- Item link:** A text field containing a dynamic content placeholder (blue square with 'S' and a dot) and 'Link to item x'.
- Item link description:** A text field containing the text 'This is the requested device'.

At the bottom right of the dialog box, there is a link that says 'Add dynamic content' followed by a plus icon in a square box.

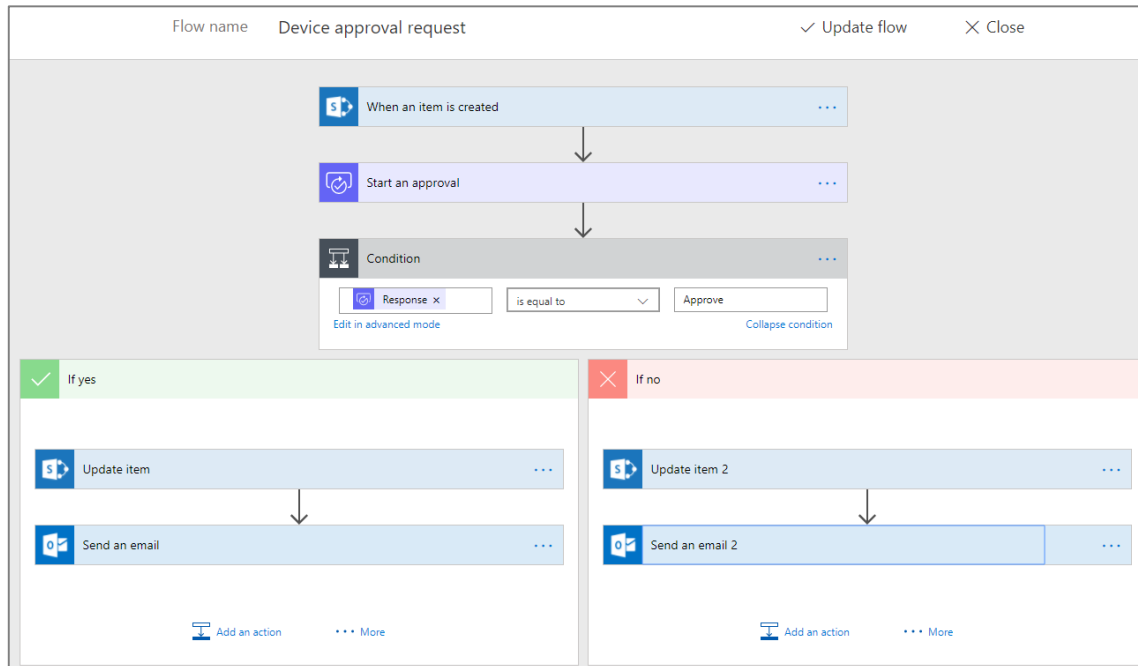


Responding to the Approval Response

- Start an Approval action followed by a condition
 - Allows flow to determine if approval was accepted or rejected

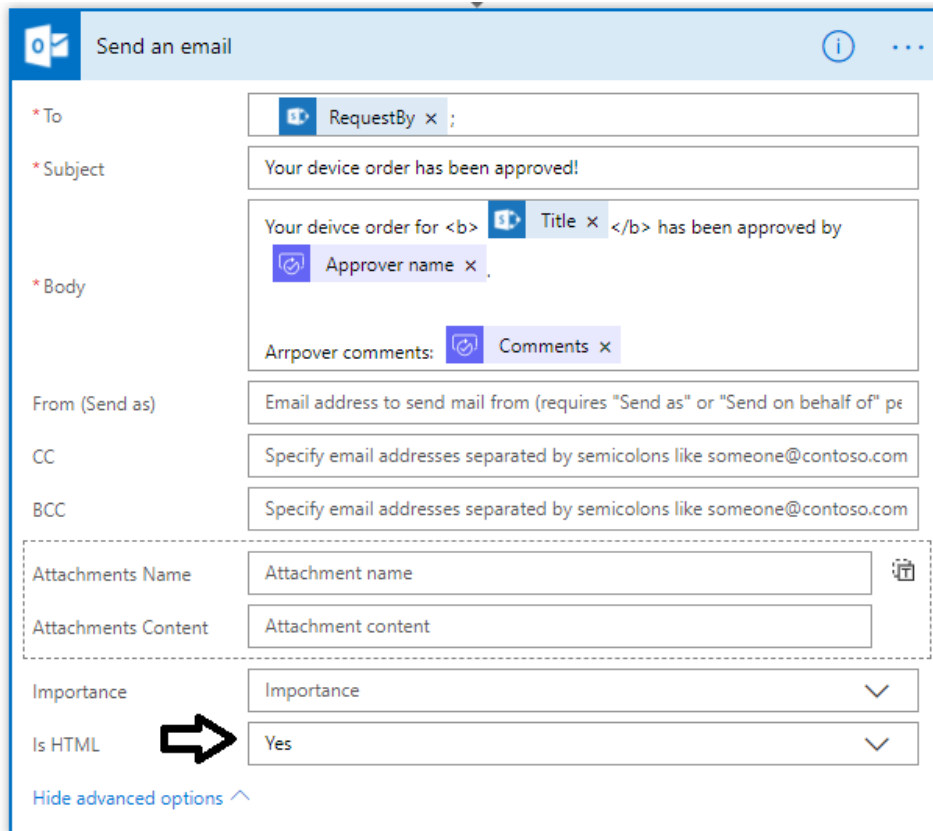


- Condition has If yes branch and If no branch for both outcomes



Implementing If yes Branch using Email

- If request is approved, send notification email to requestor



The screenshot displays the 'Send an email' dialog box with the following fields and values:

- To:** RequestBy x ;
- Subject:** Your device order has been approved!
- Body:**
 - Your device order for Title x has been approved by
 - Approver name x
 - Approver comments: Comments x
- From (Send as):** Email address to send mail from (requires "Send as" or "Send on behalf of" pe
- CC:** Specify email addresses separated by semicolons like someone@contoso.com
- BCC:** Specify email addresses separated by semicolons like someone@contoso.com
- Attachments:**
 - Name:** Attachment name
 - Content:** Attachment content
- Importance:** Importance
- Is HTML:** Yes (indicated by a large black arrow)

At the bottom left, there is a link: [Hide advanced options ^](#)



Testing the Approval Flow

- Start by creating a new device request

The screenshot shows the 'Device Ordering App' interface. It features three device cards: ProBook 4440s (\$679.00), ProBook 4545s (\$499.00), and Compaq Pro 4300 (\$859.00). The ProBook 4545s card is highlighted. To the right is a form with fields for Title, Price, Approver, Comments, and RequestBy. A 'Submit device request' button is at the bottom right.

Device Ordering App

ProBook 4440s
\$679.00
HP Laptop
Intel Core i5-3210M (2.5 GHz)
4GB DDR3
500GB

ProBook 4545s
\$499.00
HP Laptop
Intel Core i3-3110M (2.4 GHz)
4GB DDR3
500GB

Compaq Pro 4300
\$859.00
HP All in one
Intel Core i5-3470S (2.9 GHz)
4GB DDR3
500GB

Title
HP - ProBook 4545s
Price
499
Approver
student@DDPAF.onmicrosoft.com
Comments
I really need this laptop
RequestBy
Student@DDPAF.onmicrosoft.com

Submit device request

- Adding item to SharePoint list triggers approval process to start

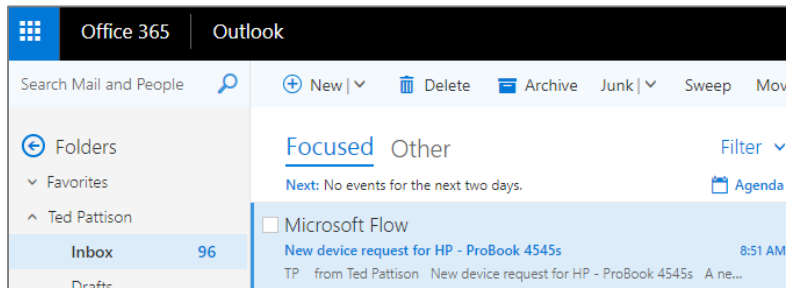
The screenshot shows a SharePoint list titled 'DeviceOrder' on the 'Critical Path Labs Team Site'. The list has columns for Title, DeviceID, Price, RequestBy, Approver, ApprovalStatus, and Comments. A single entry is visible for the ProBook 4545s.

Title	DeviceID	Price	RequestBy	Approver	ApprovalStatus	Comments
HP - ProBook 4545s	45	\$499.00	Student@DDPAF.onmicrosoft.com	student@DDPAF.onmicrosoft.com	InReview	I really need this laptop

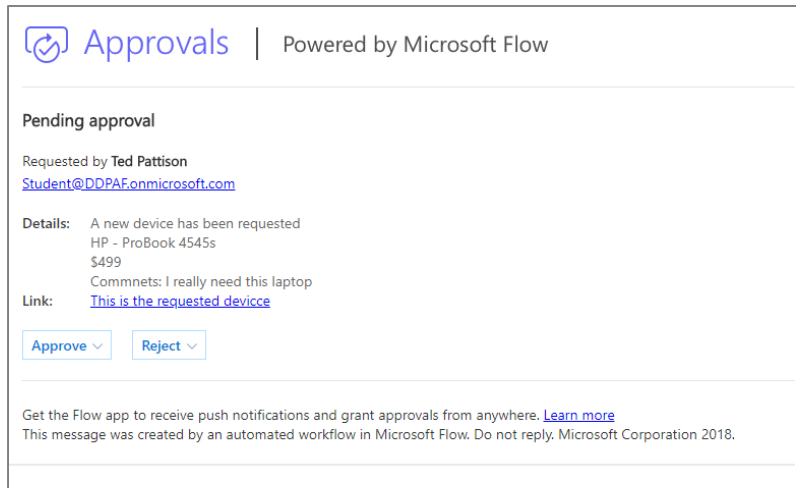


Sending Email Notification to an Approver

- The flow sends notification email to the approver
 - Flow execution currently paused inside **Start an Approval** action

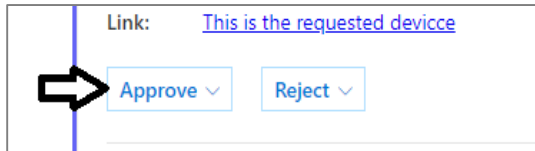


- Email allows approver to approve or reject approval request

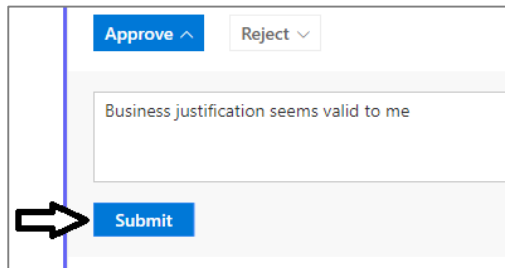


Approving an Approval Request

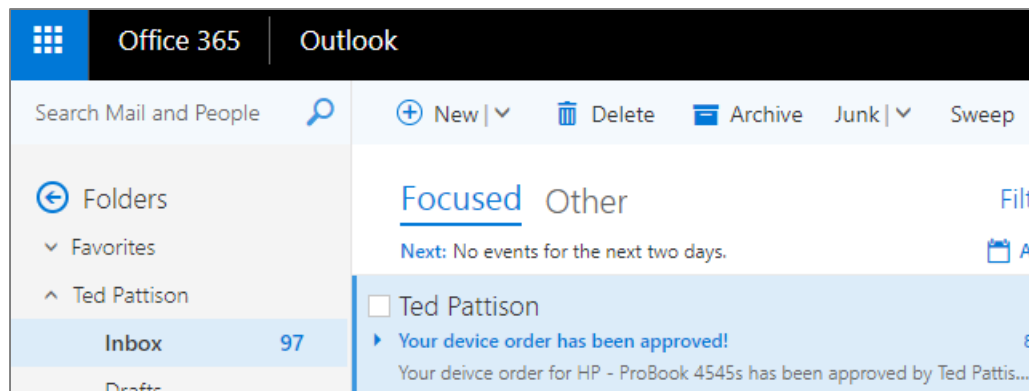
- Notification email provides button to approve or reject request



- Approver can enter comment and submit approval (or rejection)



- Approval or rejection unblocks flow which continue down appropriate branch
 - Approval response determines whether to send approval email or rejection email




Rejecting an Approval Request


- In the case of a rejected request...

Details: A new device has been requested
Toshiba - Portege Z935-ST4N02
\$979.99
Comments: I already have a great laptop but I want another one for no good reason.

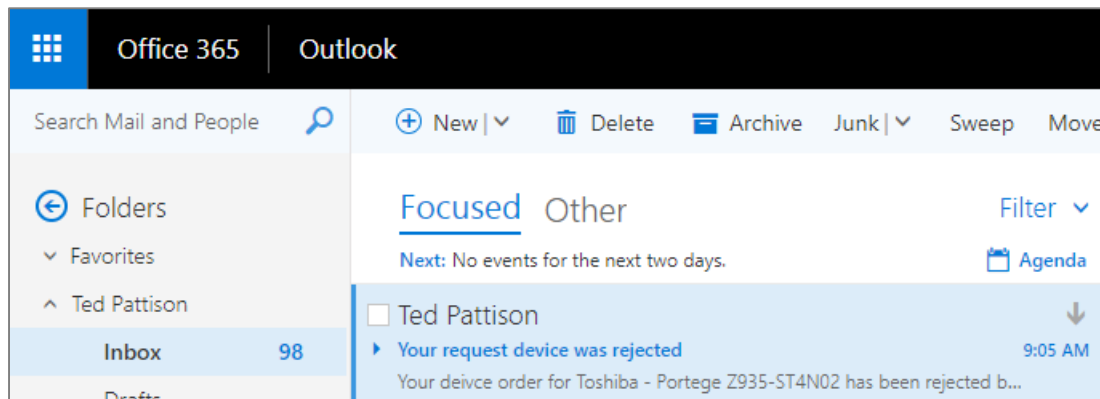
Link: [This is the requested device](#)

Approve  Reject ^

You only need one laptop!

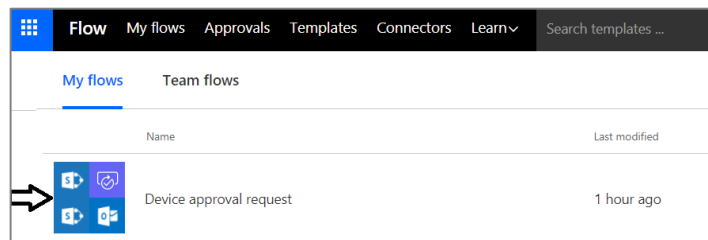
 Submit

- Approval flow sends a notification about rejection

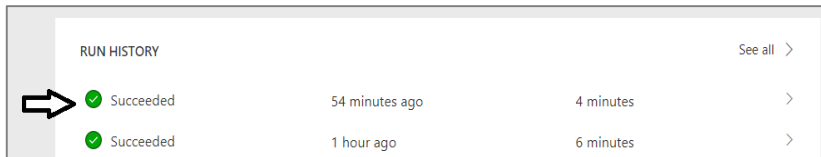


Run History

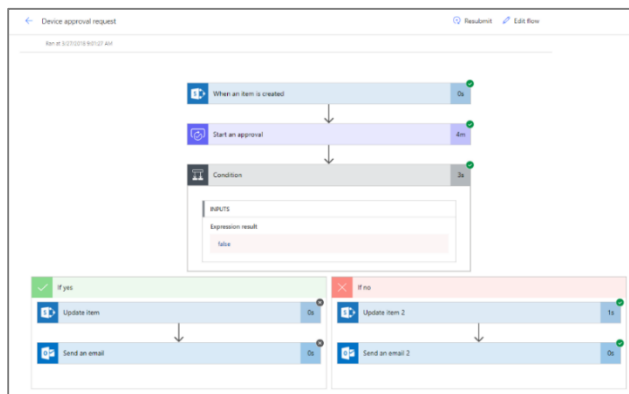
- Flow tracks run history of flow that have started
 - Click on a flow to see its RUN HISTORY list



- RUN HISTORY list has entry for each flow that has started

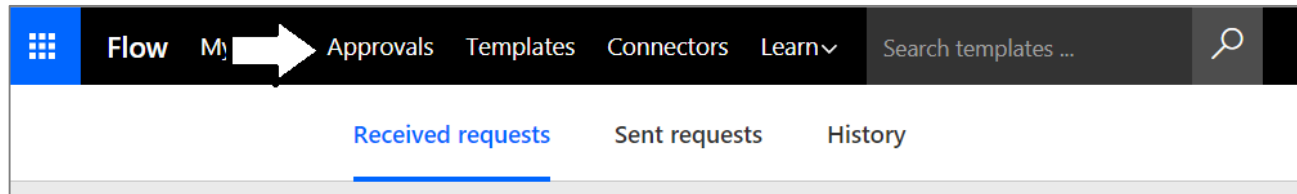


- Drilling into flow run history shows execution path and data



Approvals Center

- Microsoft Flow provides Approvals Center
 - Provides alternative to email for approve/reject processing
 - Accessible through browser



- Provides monitoring of completed approvals and pending approvals

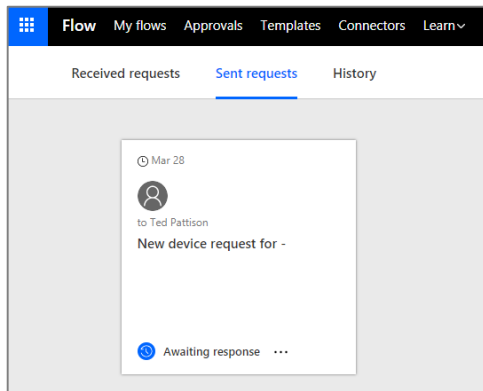
This screenshot shows the 'History' tab in the Microsoft Flow Approvals Center. It features a search bar 'Filter by title' and a dropdown menu 'Received'. Below is a table with four columns: REQUESTER, TITLE, DATE, and OUTCOME. The table contains two rows of data.

REQUESTER	TITLE	DATE	OUTCOME
TP Ted Pattison	New device request for Toshiba - Portege Z935-S...	52 minutes ago	Rejected
TP Ted Pattison	New device request for HP - ProBook 4545s	1 hour ago	Approved

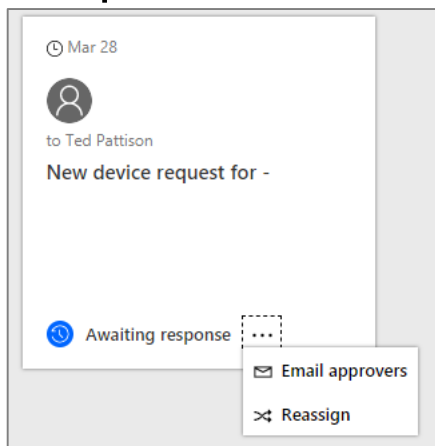


Examining Sent Requests

- Requester can view requests he/she has submitted

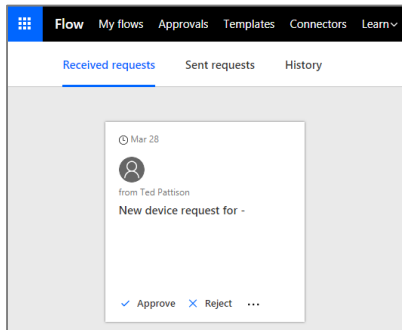


- Requester can email approver(s) or resign to different approver

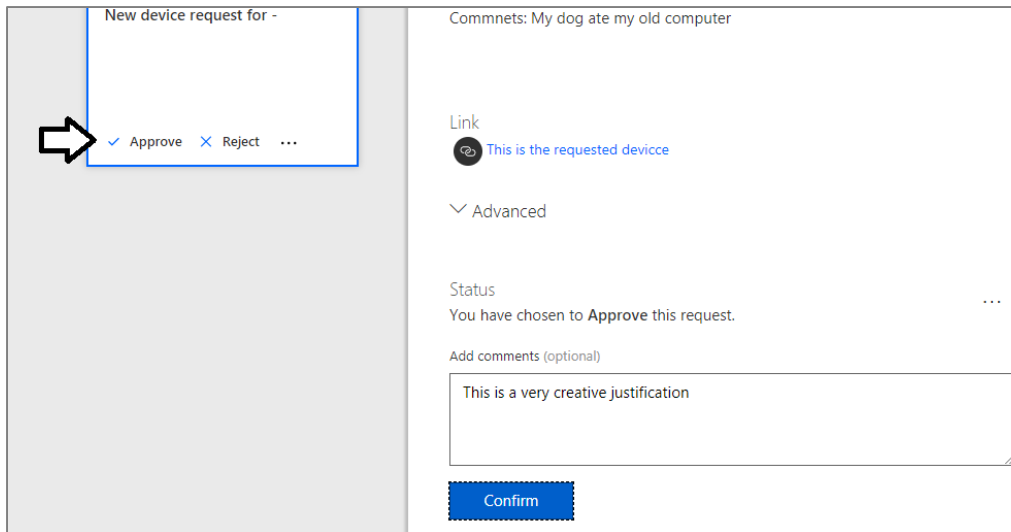


Examining Received Requests

- Approvers can see list of all their approval requests



- Approver can approve or reject approval request



Updating a SharePoint List Item

- Approval flow can update SharePoint list items
 - Used to show SharePoint users the outcome of approval process

Home

CP Critical Path Labs Team Site

+ New Quick edit Export to Excel Flow PowerApps ...

DeviceOrder

Title ▾	DeviceID ▾	Price ▾	RequestBy ▾	Approver ▾	ApprovalStatus ▾
HP - ProBook 4545s	45	\$499.00	Student@DDPAF.onmicrosoft.com	student@DDPAF.onmicrosoft.com	Approved
Toshiba - Portege Z935-ST4N02	98	\$979.99	Student@DDPAF.onmicrosoft.com	student@DDPAF.onmicrosoft.com	Rejected



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Creating a Flow to Process Forms Created using Microsoft Forms

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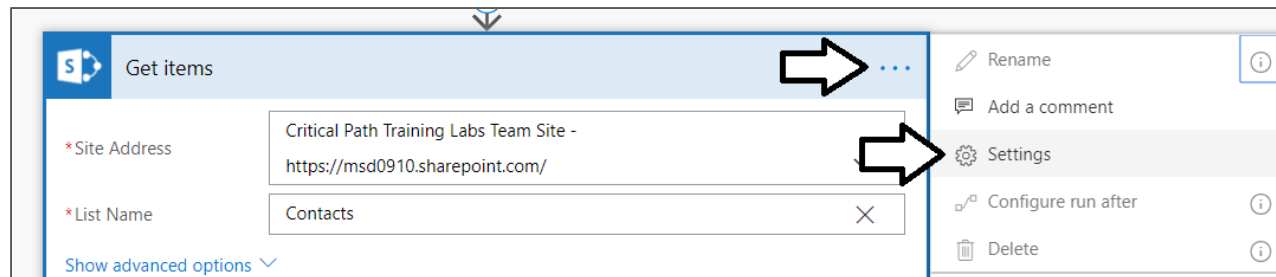
Normal action execution

- Standard behavior of a flow
 - Action steps execute in sequential order
 - Flow terminates if error occurs (failure or timeout)
- After flow runs, every action left in 1 of 4 possible states



Action Settings


- Settings let you configure
 - Async Actions
 - Timeouts
 - Retry Policy
 - Sequential Behavior
 - And more!




Error Handling

- Select the **Run after** option from action menu
 - Choose which error conditions, the arrow will turn dotted red
 - Use parallels for errors that are not at end of flow
 - Retry policy by default handles transient failures
 - Recommended to select exponential as they last a long time

'Handle duplicate file names' should run after:

 This step will only run if the flow couldn't create the file because there's already another one with the same name. It will add some numbers to the end of the file name to make it unique.

 **Create file**
Failed

☐ is successful
☒ has failed
☐ is skipped
☐ has timed out

Done **Cancel**

Retry Policy
A retry policy applies to intermittent failures, characterized as HTTP status codes 408, 429, and 5xx, in addition to any connectivity exceptions. The default retry policy is to retry 4 times with a 20 second delay between each attempt.

Retry policy type

Interval ⓘ

Count

Done **Cancel**



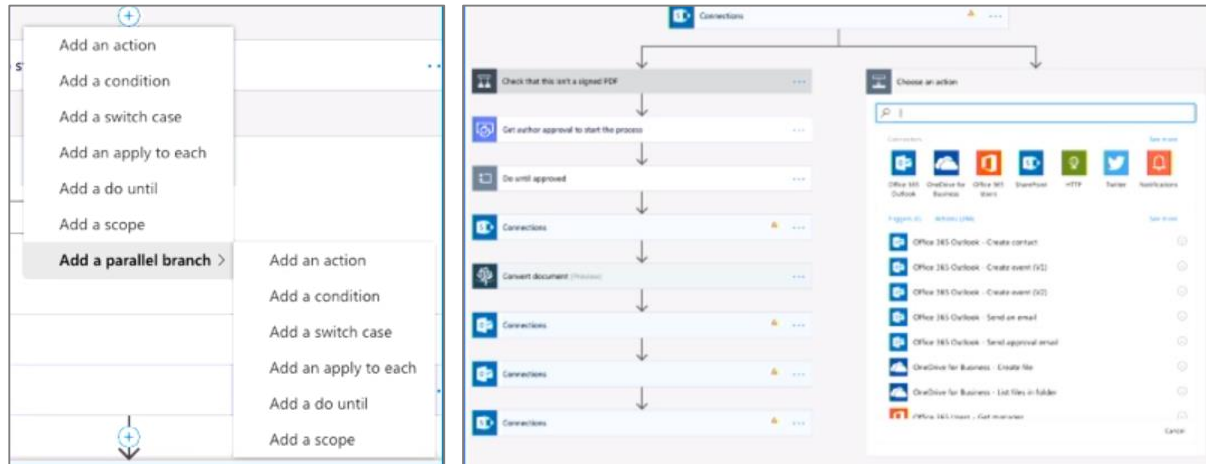
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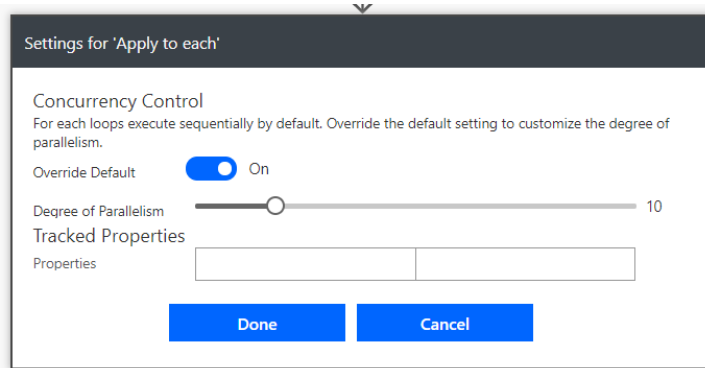


Parallel Execution

- Add parallel branch from above using ⊕



- Apply to each is sequential by default
 - Adding parallel execute to Apply to each



Summary

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