

# Building Custom Solutions using PowerApps

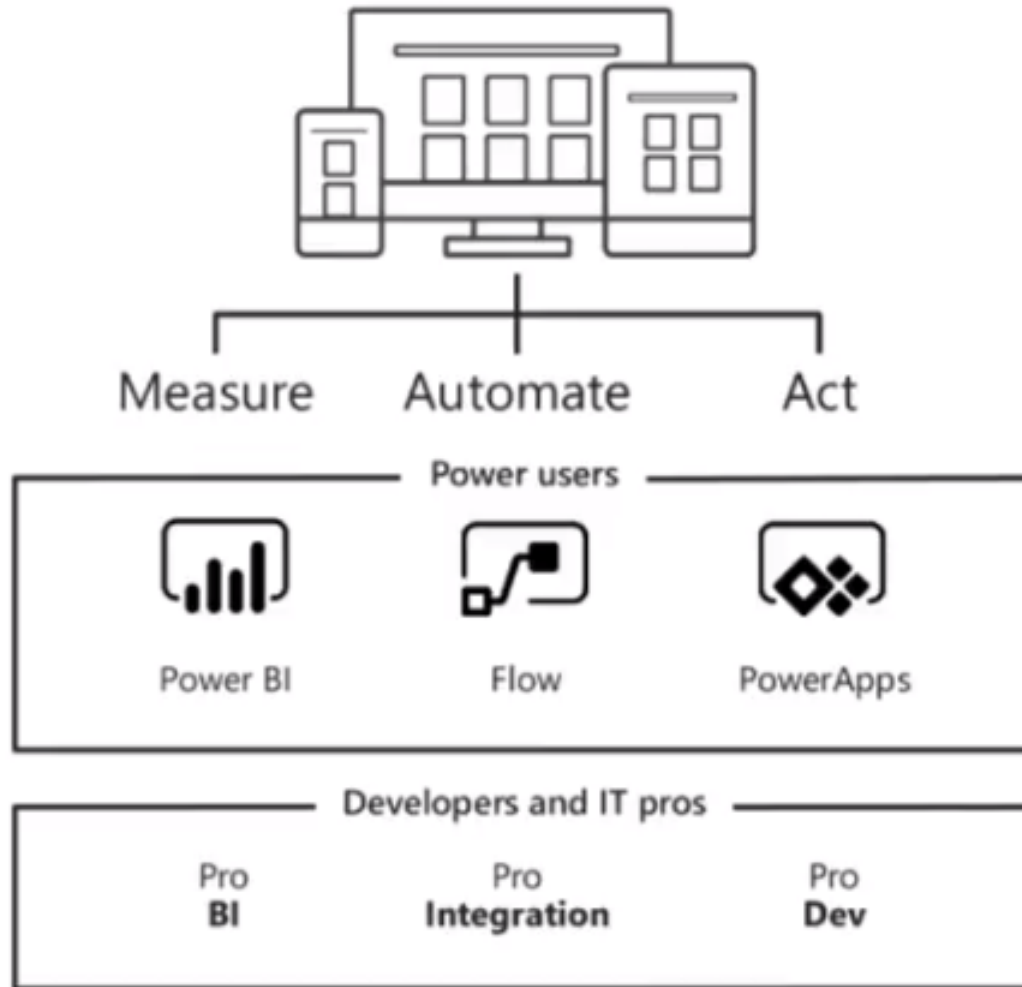


# Agenda

- Getting Started with PowerApps Studio
  - Creating an App From Scratch
  - Connecting to Data
  - Integrating PowerApps with SharePoint Online



# Business Application Platform



# Creating PowerApps from a Template

- Create app based on a template for a specific scenario
  - Pre-built layouts and colour schemes for different app screens
  - Templates have predefined screens, features, and sample data
- Customize app made from template
  - Change layout, screens, features, and delete sample data



# Learning from Template Apps

- Learn how controls are being configured for common actions such as:
  - Submit data from a form by clicking on a button
  - Transition from one app screen to the other
  - Show a list of items from my data, etc.
  - Data flows in and out of your app
  - Wire up your data source to your app
  - Camera or GPS are being integrated into your app



# Phone Layout Templates

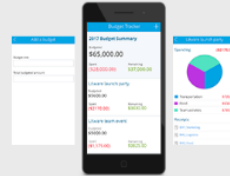
## Templates



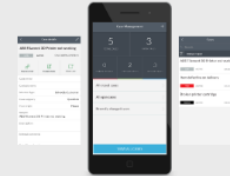
Alumni Association



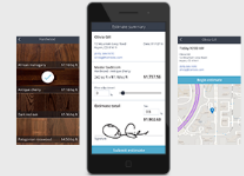
Asset Checkout



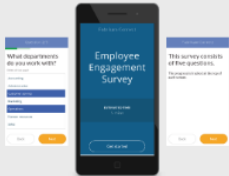
Budget Tracker



Case Management



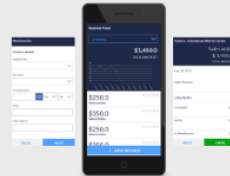
Cost Estimator



Employee Engagement Survey



Health Plan Selector



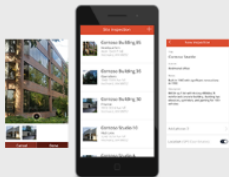
Invoice Management



Quick Tips



Service Desk



Site Inspection





# Tablet Layout Templates

## Templates



Asset Checkout



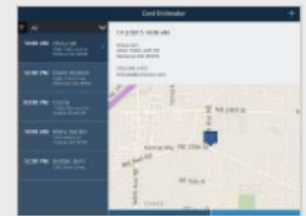
Budget Tracker



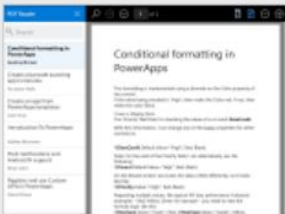
Case Management



Contest Registration



Cost Estimator



PDF Reader



Product Showcase



Service Desk



Site Inspection



# PowerApps Studio Interface

The screenshot displays the PowerApps Studio interface for a 'Budget Tracker' app. The interface is divided into several key areas:

- Ribbon (Top):** Contains tabs for File, Home, Insert, View, Action, and Screen. The 'Insert' tab is currently selected.
- Property Pane (Right):** Shows the 'BudgetScreen' selected. It includes sections for Properties, Data, and Advanced. The 'Fill' property is set to `RGBA(255, 255, 255, 1)`.
- Left Pane (Screens):** Lists available controls and screens. The 'BudgetScreen' is highlighted.
- Main Canvas:** Displays the 'Budget Tracker' app design. It features a table of budgets, a pie chart for 'Total spent', and a list of 'Expenses'.

**Budget Tracker App Design:**

All budgets		
	Budgeted	Spent
Team events at Contoso	\$10,000	\$1,950
Spring customer visits	\$5,000	\$3,175
Meta Conference XVI	\$10,000	\$8,732
Litware team event	\$5,000	\$1,175

**Total spent: \$1,950**

**Attached receipts:** No receipts

**Expenses:**

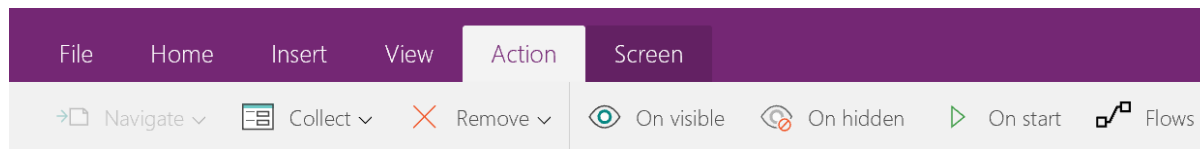
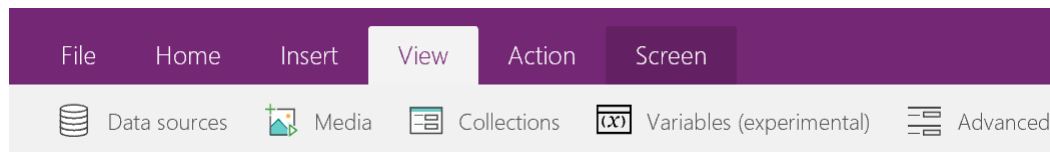
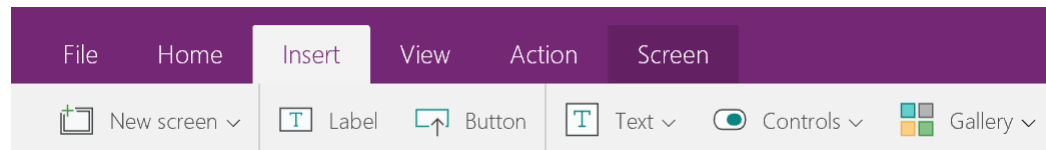
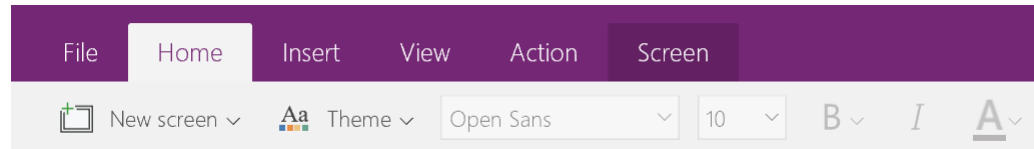
Cake	\$300
Movie	\$500
Extra	\$1,000
Cleaning	\$150



# Ribbon

- Set of context-sensitive tabs which will display controls you can use to build your app:

- Home tab
- Insert tab
- View tab
- Action tab



# Panels

- **Properties Panel**
  - Will expose most common properties of any control you can configure visually without writing an expression
- **Data Panel**
  - Will surface configuring data sources and binding fields to Gallery and Form controls
- **Advanced Panel**
  - Used for more advanced customizations for controls



# Properties Panel

- Configure controls without using a formula
  - Varies based on control
- Configure properties such as:
  - Text
  - Tooltip text
  - Position
  - Look & Feel
    - Size
    - Padding
    - Colors
    - Borders

**BUTTON**

Button2

Properties Data Advanced

Text: No value

Tooltip: No value

Position: X: 656 Y: 475

Size: Width: 40 Height: 40

Padding: Top: 5 Bottom: 5 Left: 5 Right: 5

Color: A

Border: — 2

Focused border thick...: 4

Radius: 60

Auto disable on select: On


Display mode: Edit


Visible: On


Disabled color: A

# Data Panel


- Will list existing data sources
- Also provides ability to add new data sources






 Properties

 Data

 Advanced


Data sources ?


 Add data source


	<b>Budgets</b> zoe@ck2017.onmicrosoft.com OneDrive for Business	...
	<b>Expenses</b> zoe@ck2017.onmicrosoft.com OneDrive for Business	...
	<b>Categories</b> zoe@ck2017.onmicrosoft.com OneDrive for Business	...
	<b>ExpenseByCategory</b> zoe@ck2017.onmicrosoft.com OneDrive for Business	...
	<b>Receipts</b> zoe@ck2017.onmicrosoft.com OneDrive for Business	...

# Advanced Panel

- Configure more advanced customizations for controls

 Properties

 Data

 Advanced

**ACTION**  
OnSelect  

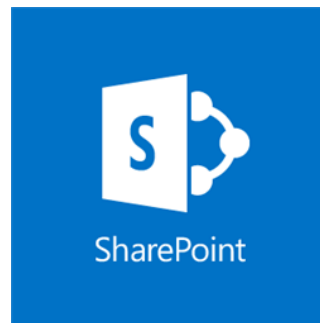
```
Navigate  
(AddExpenseScreen,ScreenTransition.Fade,  
{SpendRecord:SpendRecord,Record:Defaults(Expenses)});ResetForm  
(FormNewExpense);NewForm  
(FormNewExpense);Clear  
(ReceiptsCollect)
```

**DATA**  
Tooltip

**DESIGN**  
AutoDisableOnSelect  
  
Color

# Create App from Data Source

- In PowerApps, you can automatically generate an app based on a data source which includes:
  - SharePoint List
    - Create directly from SharePoint list
    - Or create a connection to the SharePoint list
  - Excel data
  - CDS Entity



# Excel Data

- You can use an Excel file that has table data.
- Excel files must be uploaded to a cloud service before you can create the PowerApp:
  - Box
  - Dropbox
  - FTP
  - Google Drive
  - OneDrive
  - OneDrive for Business





# Agenda

- ✓ Getting Started with PowerApps Studio
- Creating an App From Scratch
  - Connecting to Data
  - Integrating PowerApps with SharePoint Online



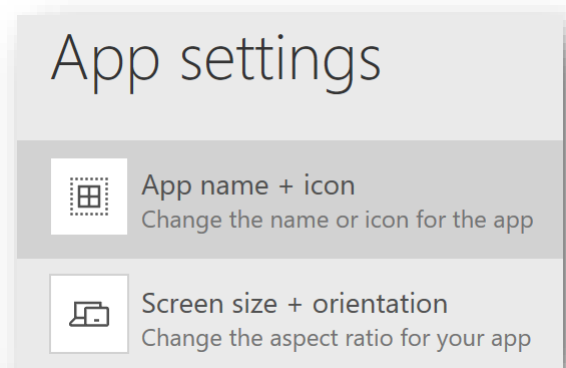
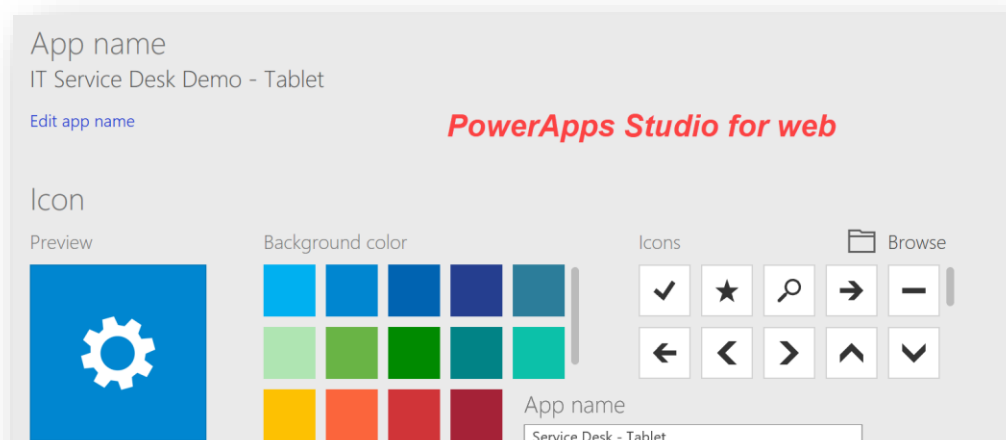
# Creating Custom PowerApps

- You can create your own app from scratch using the Blank app template:
  - Using any one of a variety of data sources and then adding more sources later.
  - This approach is much more time-intensive than generating an app automatically.
  - Experienced app makers can build the best app for their needs.
  - Specify the appearance and behavior of each UI element so that you can optimize the result for your exact goals and workflow.



# App Name & Icon

- Name, icon, and description settings your app
- **File tab > App Settings (PowerApps Studio)**



## Description

Describe what people can do with this app. This will appear with you

## Icon

Preview



Background color



Icons



Browse

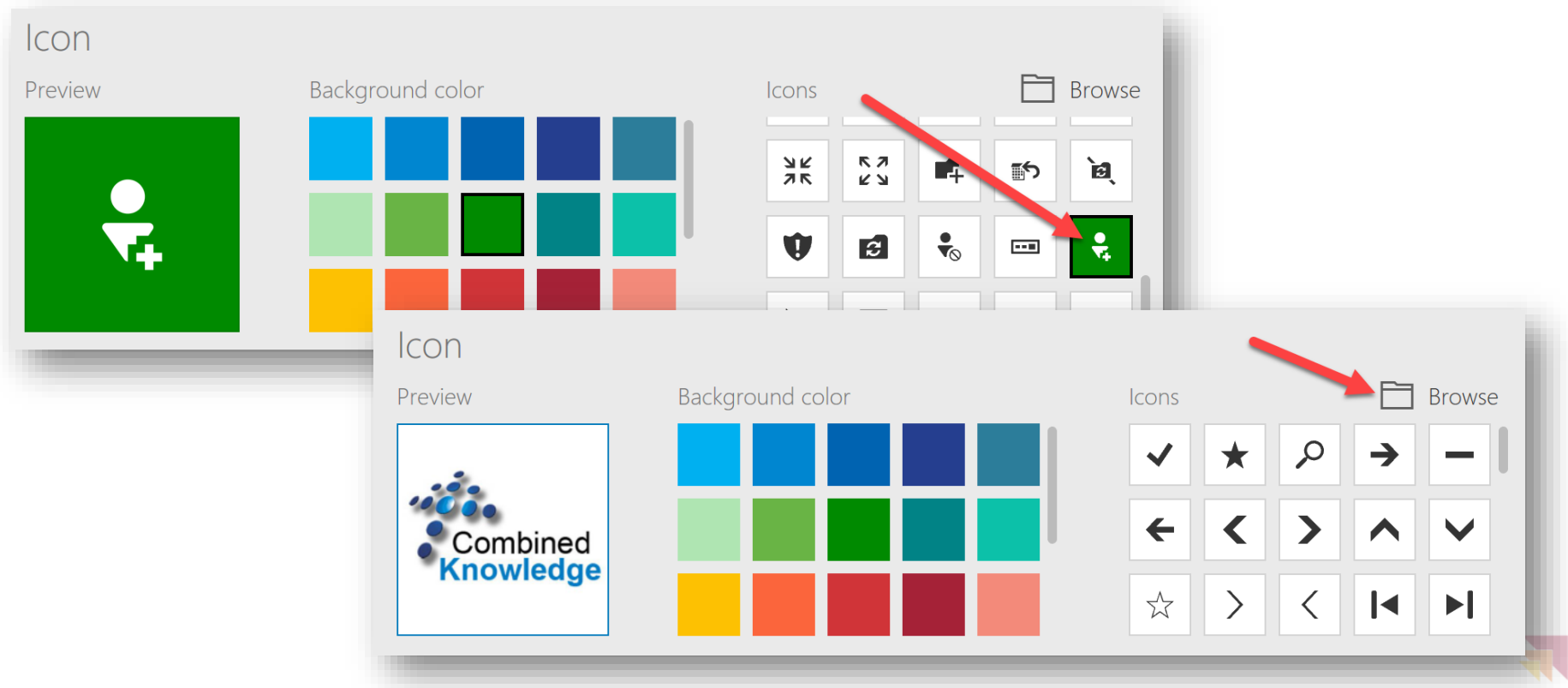
## Description

Describe what people can do with this app. This will appear with your app on users' Dynamics 365 home page. [Learn about Dynamics 365.](#)



# App Background & Icon


- Use pre-defined icons & change background color or use your own image
  - For best results, use square icon (i.e. 300x300)




# Screen Size & Orientation

## Phone layout


### App settings



**App name + icon**  
Change the name or icon for the app



**Screen size + orientation**  
Change the aspect ratio for your app



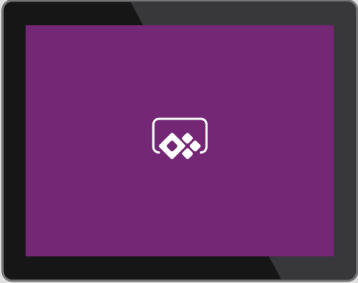
**Orientation**  
☒ Landscape  
☐ Portrait

**Advanced settings**  
**Lock aspect ratio**  
Locking this automatically maintains the ratio between height and width to prevent distortion.  
☒ On  
**Lock orientation**  
Locking orientation keeps the screen in its current orientation, even when the device is rotated.  
☒ On

## Tablet layout

### Screen size + orientation

Choose the screen size and orientation that your users will most likely be using.



1024 x 768

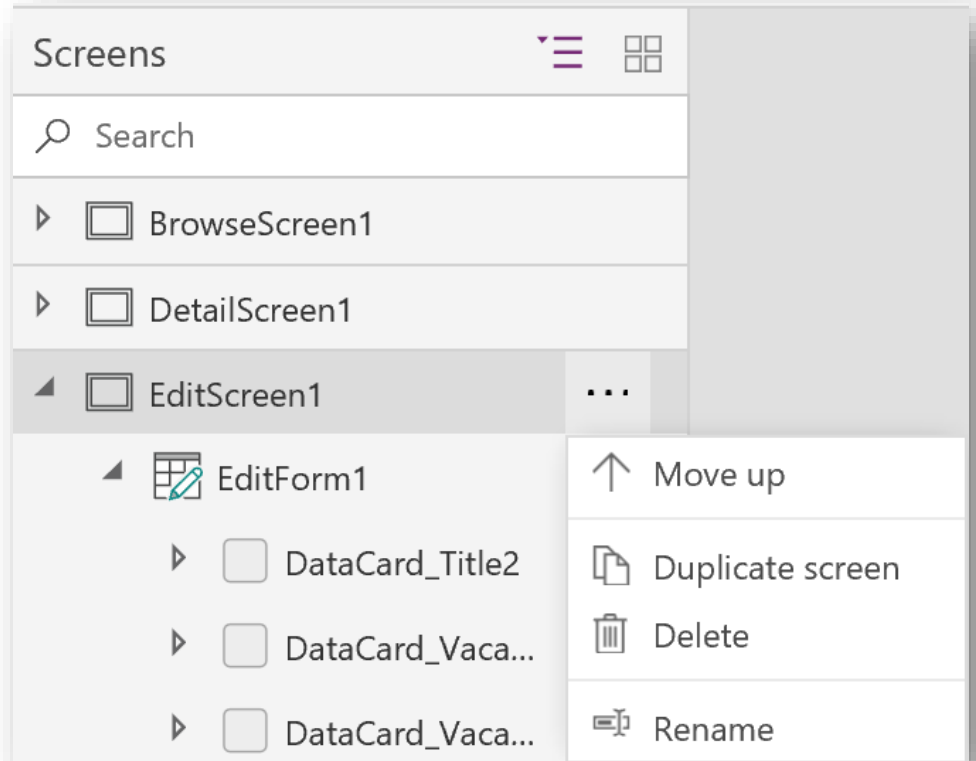
**Orientation**  
☒ Landscape  
☐ Portrait

**Size**  
☐ 16:9 (Default)  
☐ 3:2 (Surface Pro 3)  
☐ 16:10 (Widescreen)  
☒ 4:3 (iPad)

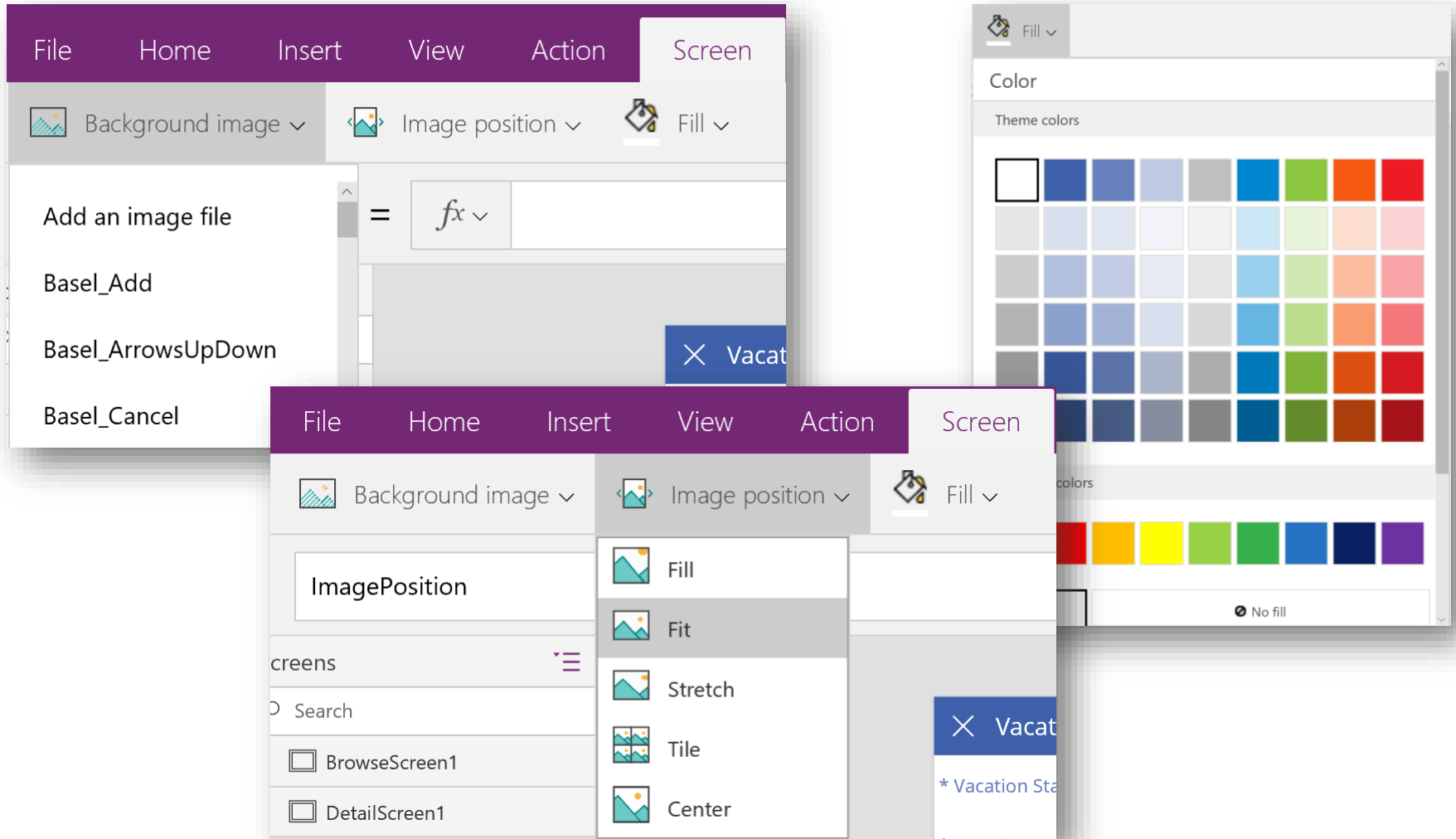
**Advanced settings**  
**Lock aspect ratio**  
Locking this automatically maintains the ratio between height and width to prevent distortion.  
☒ On  
**Lock orientation**  
Locking orientation keeps the screen in its current orientation, even when the device is rotated.  
☒ On

# Customizing Screens

- Move (reorder)
- Duplicate
- Add screens
- Delete screens
- Rename screens



# Screen Layout Settings





# Form Layouts

The image shows a SharePoint form titled "Vacation Request" in edit mode. The form is titled "CARD" and "DataCard\_PTO2". It has three tabs: "Properties", "Data", and "Advanced". The "Data" tab is selected. The form contains the following fields:

- \* Vacation Start Date: 12/31/2001
- \* Vacation End Date: 12/31/2001
- \* Time Off Type: (dropdown menu)
- Comments: (text area)

Below the form, there is a "Card : PTO" section with a "PTO" toggle switch. The form is currently in a vertical layout. The "Form layout" pane on the right shows the "Vertical" layout selected. The "Form layout" pane also shows a "Horizontal" layout option.

At the bottom of the form, there is a "DataCard\_PTO2" label and a zoom slider set to 40%.



# Controls

- You can add a variety of UI elements to your app which are called controls.
  - Controls have properties that can be configured to change the appearance and behavior of each control
- Properties can be configured:
  - Directly from the toolbar
  - In the **Properties** tab
  - Or in the formula bar



# Adding Controls

- **Text:** Label, Text input, HTML Text, Pen input
- **Controls:** Button, Dropdown, Date picker, List box, Checkbox, Radio, Toggle, Slider, Rating, Timer
- **Gallery:** Vertical, Horizontal, Flexible height, Blank vertical, Blank horizontal, Blank flexible height
- **Data table**
- **Forms:** Edit, Display, Entity form
- **Media:** Image, Camera, Barcode, Video, Audio, Microphone, Add picture
- **Charts:** Column chart, Line chart, Pie chart
- **Icons**



# Modifying Control Properties

The image shows a mobile application interface with a 'Vacation Request' card and a properties panel for editing its controls.

**Vacation Request Card:**

- Title
- Vacation Start Date
- Vacation End Date
- Time Off Type
- Card : PTO (locked)
- PTO (toggle switch)
- Request Status
- Modified

**Properties Panel (DataCard\_PTO1):**

- Properties** (selected), Data, Advanced
- Position:** X=0, Y=320
- Size:** Width=640, Height=103
- Color:** (color picker)
- Border:** (style dropdown), 0 (width), (border color picker)
- Display mode:** View (dropdown)
- Visible:** On (toggle switch)
- Width fit:** Off (toggle switch)



# Card Controls and Data Cards

- **Card controls**
  - Building blocks of the **Edit** and **Display** form controls
  - Form represents entire record
  - **Card** represents a single field of the record
- Interact with **cards** in right-hand pane after you select a form control in design workspace
  - In the pane:
    - Choose which fields to show
    - Change order of fields
    - Change how to show each field



# Data Cards

The image displays a PowerApps interface with a 'Vacation Request' data card and its customization pane.

**Data Card Fields:**

- Title:** Time off Request
- Vacation Start Date:** 9/4/2017
- Vacation End Date:** 9/10/2017
- Time Off Type:** (Dropdown menu)
- Comments:** SharePoint conference in Stockholm
- PTO:** (Toggle switch, currently on)
- Request Status:** (Dropdown menu)

**Customization Pane (DataCard\_Title2):**

- Form customization:** Includes a 'Refresh' button.
- Layout:** Set to 'Vertical'.
- Fields:** A list of fields to customize. The 'Title' field is selected, and a dropdown menu is open showing options: 'View text', 'View phone', 'View email', 'Edit text', 'Edit multi-', and 'Allowed'. The 'Edit text' option is highlighted with a red box.

A red box highlights the 'Title' field on the data card, and a red arrow points from it to the 'Title' field in the customization pane, which is also highlighted with a red box.

# Working with the Formula Bar

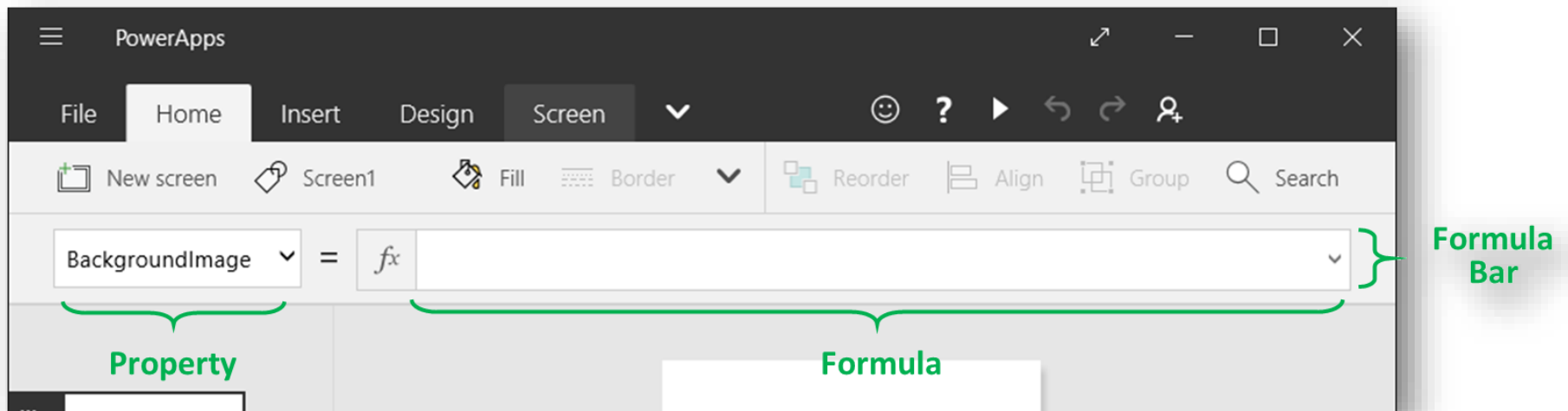
- **Excel Formulas**
  - Build formulas that populate cells
  - Create tables and charts
- **PowerApps Formulas**
  - Build formulas similar to Excel as you configure controls instead of cells
  - Build formulas that apply specifically to apps instead of spreadsheets





# Working with the Formula Bar

- Formula sits on top of the screen and has two parts:
  - **Property list:** Each control and screen has a set of properties. Use this list to select a specific property.
  - **Formula:** The formula to be calculated for this property, made up of values, operators, and functions.



# Working with the Formula Bar

- Formula **Text** of a **Label** control
  - All strings must be in double quotes **“string text”**

The screenshot shows the Xamarin Studio interface with the **Label** tab selected in the top menu. The **Formula Bar** is visible, showing the **Text** property of a **Label** control. The formula is set to `"Vacation Request"`. Red annotations highlight the components:

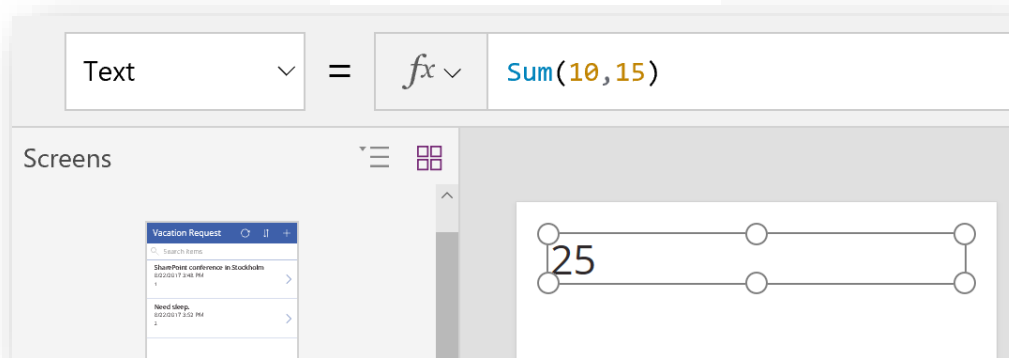
- Property "Text"**: A red bracket points to the **Text** property dropdown in the Formula Bar.
- Formula: string "Vacation Request"**: A red bracket points to the formula input field containing `"Vacation Request"`.

The background shows a preview of a screen titled "Vacation Request" with fields for Title, Vacation Start Date, and Vacation End Date. The right sidebar shows the **Properties** tab for the **LblAppName3** control, with the **Text** property set to `Vacation Request`.

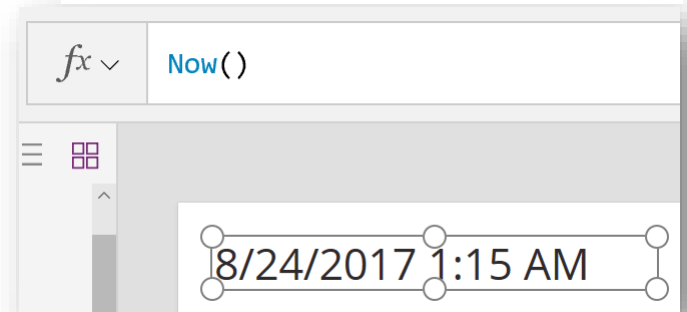


# Formula Examples (Label Text)

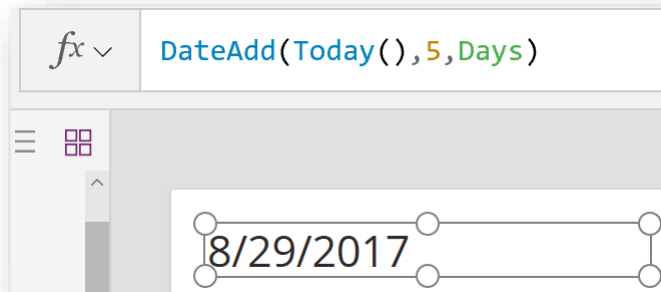
Sum of numbers



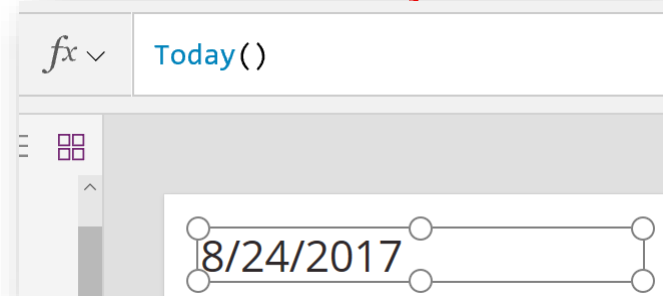
Return now (date and time)



Add 5 days to today's date



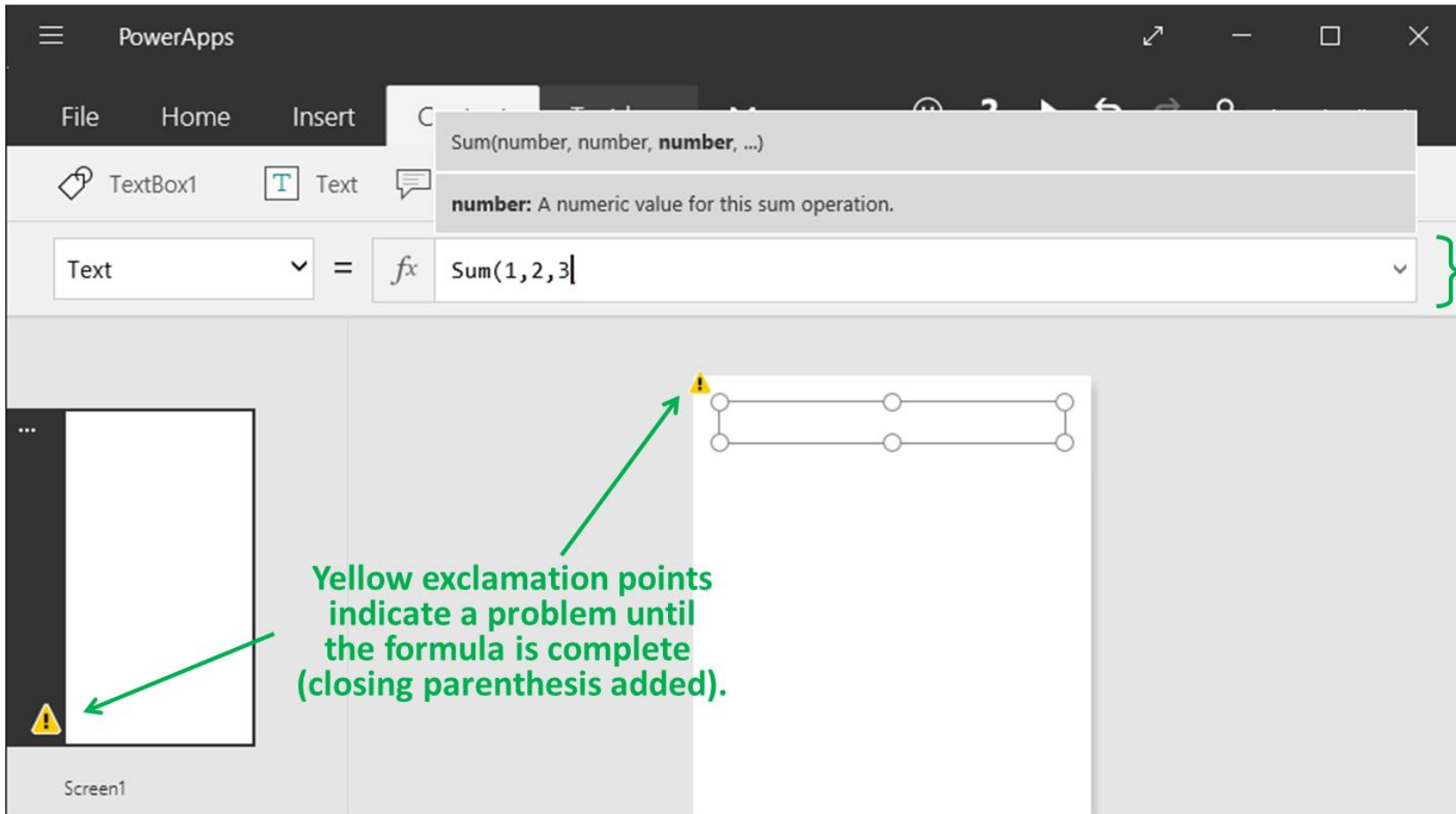
Return today's date



<https://powerapps.microsoft.com/en-us/tutorials/formula-reference/>



# Formula Errors



Formula:  
Partial,  
missing an  
ending paren

Yellow exclamation points  
indicate a problem until  
the formula is complete  
(closing parenthesis added).



# Change Value Based on Input

Book1 - Excel		
$f_x$	= A1 + A2	
	A	B
1	49	
2	64	
3	113	
4		

**A3's** formula depends on the values of cells **A1** and **A2**

Text  $f_x$  TextInput1 + TextInput2

49 ← TextInput1

65 ← TextInput2

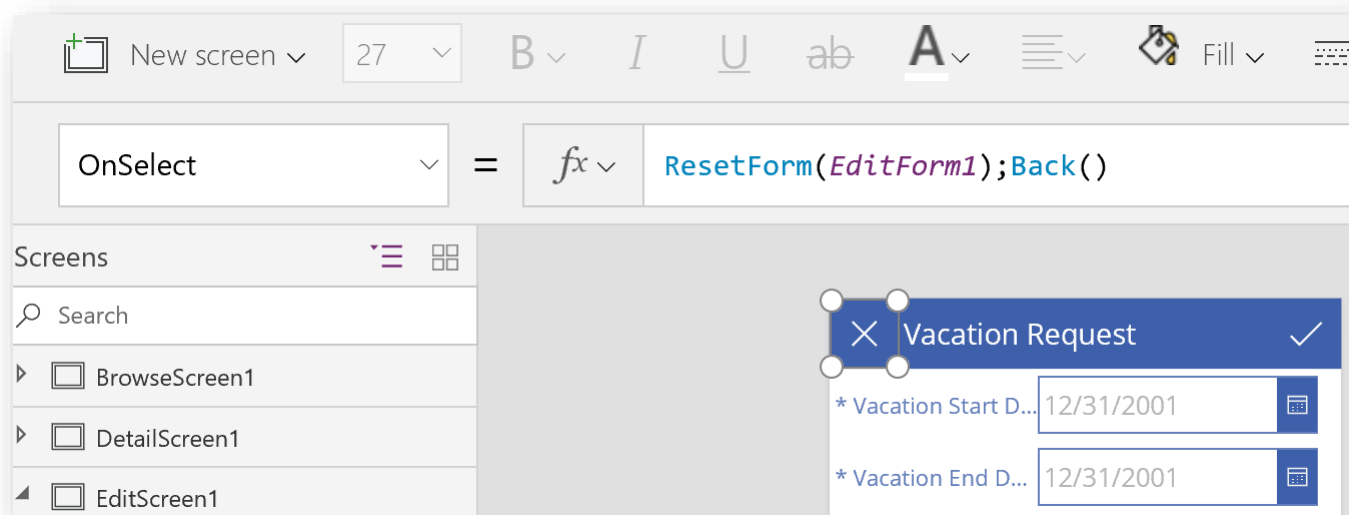
114 ← TextBox1

Screen1



# Form Interactivity & Navigation

- Create buttons and set the navigation to go back and forth between screens



# Data Sources & Connectors

- **Data Sources**

- External information stored in cloud services
- Examples: Excel workbooks, SharePoint lists, SQL tables

- **Connectors**

- A proxy or wrapper around an API which allows the underlying service to talk to PowerApps and Flow



SharePoint



Office 365 Users



Salesforce

PREMIUM



Dropbox



Excel



SQL Server



Twitter



OneDrive for Business



Dynamics 365



OneDrive





# Components of a Connector

- Components offers a set of operations:
  - **Actions**
    - Changed directed by a user such as an action to lookup, write, or delete data
  - **Triggers**
    - Can notify your app when a specific event occurs
- Two types of triggers:
  - **Polling triggers** – These triggers call your service at a specified frequency to check for new data.
  - **Push triggers** – Provides ability to send various notifications that directly targets your Apps. Trigger push notification directly from an App or from a Flow.



# SharePoint List

- Generate an app automatically based on data in a SharePoint list
  - Users can manage items in app for SharePoint list
  - Libraries are NOT supported
- By default, the app will have 3 screens:
  - **BrowseScreen1** - browse through all records in the list
  - **DetailsScreen1** - view all fields for a specific record
  - **EditScreen1** - create or edit a record
- Customize these screens based on your needs
- Not all columns are supported



# Supported/Unsupported Columns

Column type	Support	Default cards
Single line of text	Yes	View text
Multiple lines of text	Yes	View text
Choice	Yes (single values only)	View lookup
Number	Yes	View percentage View rating View text
Currency	Yes	View percentage View rating View text
Date and Time	Yes	View text
Lookup	Yes (single values only)	View lookup Edit lookup
Boolean (Yes/No)	Yes	View text View toggle



# Supported/Unsupported Columns

Column type	Support	Default cards
Person or Group	Yes (single values only)	View lookup Edit lookup
Hyperlink	Yes	View URL View text
Picture	Yes (read-only)	View image View text
Calculated	Yes (read-only)	
Task Outcome	No	
External data	No	
Managed Metadata	Yes (read-only)	
Rating	No	



# Summary

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