

Learn

Microsoft PowerApps

Build customized business applications without writing any code



Matthew Weston

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Matthew Weston



BIRMINGHAM - MUMBAI

Learn Microsoft PowerApps

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*For my wife, Laura, and my sons, Eddie and Reggie, who are the inspiration
for everything that I do.*

*For Mom and Dad, without whose support growing up, I may never have had
these opportunities.*

- Matthew Weston



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Contributors

About the author

Matthew Weston is an Office 365 and SharePoint consultant based in the Midlands in the United Kingdom. Matthew is a passionate evangelist of Microsoft technology, blogging and presenting about Office 365 and SharePoint at every opportunity. He has been creating and developing with PowerApps since it became generally available at the end of 2016. Usually, Matthew can be seen presenting within the community about PowerApps and Flow at SharePoint Saturdays, PowerApps and Flow User Groups, and Office 365 and SharePoint User Groups. Matthew is a **Microsoft Certified Trainer (MCT)** and a **Microsoft Certified Solutions Expert (MCSE)** in Productivity.

I would like to thank Laura, my wife, for supporting me throughout the writing of this book. She has kept me focused and free of distraction. She was as important to the creation of this book as I was.

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He also enjoys driving his Mustang GT convertible, doing yoga, reading books, and listening to music.

I would like to thank my wife, Shefali, and my kids, Aisha and Ishan, for their constant support, without whom this wouldn't have been accomplished.

Special thanks to my parents and my brother, Pradeep, for their super support and guidance.

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Preface

I would like to take this opportunity to welcome you and thank you for choosing this book. With *Learn Microsoft PowerApps*, you will learn how to build functional canvas apps and model-driven apps using the Microsoft PowerApps application. Throughout the book, you will not only learn about its components and what they do but also put them into practice by incrementally building an app through a number of labs.

The book itself endeavors to introduce new topics in each chapter, gradually introducing more and more of PowerApps' functionality to help you understand how you can continually improve your apps to build something that is just as powerful as a custom-built application.

The book is structured into four sections:

1. The first four chapters deal with the fundamentals of PowerApps, such as how to use the studio, how to publish, and how to create a basic app. This book is intended to be used by a number of different audiences; however, it assumes no prior understanding of what PowerApps is and how it works. Therefore, we will talk through how to set yourself up in terms of licensing, look at how you can install the apps, and then cover how to start to create basic apps.
2. The next four chapters build upon the basic understanding of PowerApps gained in section 1 and begin to address how to build functionality. These are the main chapters, where you will start to see your app take shape as we introduce the controls and look at how they can be used to achieve different effects within our apps. We'll also look at data and connectors to begin to build dynamic content into our apps.
3. Next, we'll begin to add a layer of complexity to our apps by diving into some of the more advanced functionality that you can use within PowerApps, including the ability to use GPS and barcodes to allow your users to do more with their app, especially when the app is being used on a mobile device. Within this section, we will also look at some of the more complex tasks, such as being able to provide offline capabilities as well as introducing security.
4. Finally, we'll look at model-driven apps. This is addressed separately as, commonly, canvas apps and model-driven apps have very different audiences and require development in drastically different ways.

Throughout the book, we will be building an app that relates to a fictional company called Griffon IT Solutions, and we will be using PowerApps to build an asset management app. In each chapter, we will build more and more functionality into the app to leverage each topic that we discuss and to allow you to put the techniques into practice. All of the files that are used within the labs can either be created manually or can be downloaded from the GitHub repository: <https://github.com/PacktPublishing/Learn-Microsoft-PowerApps>.

Updates to PowerApps

PowerApps is subject to frequent updates from Microsoft. As a result of this, there may be times when the illustrations or explanations within this book appear out of date. This is purely a consequence of working within an evergreen platform, so please don't let this stop you from following through and building the examples. While the interfaces may change, the techniques and thought processes that we introduce in the book are likely to remain the same regardless of what else comes along in the world of PowerApps.

We hope that you enjoy the book and find it useful, and we wish you the very best in creating some rich, powerful, and enjoyable PowerApps.

Who this book is for

This book is intended for anyone who has an interest in developing PowerApps. Whether you are a developer or a business user, this book will provide you with the key information needed to develop solutions to your business problems.

What this book covers

Chapter 1, *Introducing PowerApps*, gives a high-level overview of what PowerApps is, how it is licensed, and the development environment.

Chapter 2, *Creating Your First Canvas PowerApp*, is where we take our first steps in creating our first canvas app. We will explore the types of canvas app that we can create, looking at the use cases and also the various options that we have available to us.

Chapter 3, *Creating Apps from SharePoint*, takes a look at the close relationship between SharePoint Online and PowerApps and how the two technologies work closely together. We will also look at how to create apps from SharePoint as well as how to create a list form.

Chapter 4, *Publishing and Leveraging PowerApps*, looks at how we can take our app and leverage it across a number of platforms. We will explore how we can use our apps on mobile devices, SharePoint, and Microsoft Teams.

Chapter 5, *Exploring Controls*, focuses on the various controls that we can add into our apps to build a rich interactive user interface. We will also look at use cases for the controls as well as some of the key properties to be aware of.

Chapter 6, *Exploring Formulas*, discusses how we can write logic within PowerApps. We will explore the formula bar and look at how we can use formulas to interact with various data types such as text, dates, boolean values, and more.

Chapter 7, *Working with Data*, investigates how we can store and interact with data within our PowerApps, focusing on the functionality provided by collections and variables as well as introducing forms.

Chapter 8, *Introducing Connectors*, covers the way that we can connect our apps to services, both services within Office 365 and services provided by other suppliers. We will also look at the difference between standard and premium connectors, as well as creating our own custom connectors.

Chapter 9, *Using GPS in PowerApps*, looks at how we can start to use key functionality afforded to us by mobile devices to track location data and use it within our app.

Chapter 10, *Working with Images and Barcodes*, looks again at utilizing the functionality of the mobile device, this time using the camera to capture images and data from barcodes.

Chapter 11, *Securing Your PowerApps*, explores how various elements of security can be applied and what the impact is on the app itself. We will start from the data source and then consider how we can apply security to the various screens within the app itself.

Chapter 12, *Working Offline*, allows us to explore how we can provide our app the capability to still function even when we lose a connection to the data source.

Chapter 13, *Using Power Automate with PowerApps*, introduces another element of the Power Platform, Power Automate, which we can use to offload heavy processing tasks.

Chapter 14, *Using Azure with PowerApps*, allows us to begin to integrate services provided by Microsoft Azure into our PowerApps by exploring some of the commonly used services and the connectors that allow us to utilize them.

Chapter 15, *Introducing Model-Driven Apps*, sees us open the door to the Common Data Service, the built-in database that can be used to store data directly within the Power Platform. We will investigate entities, views, and how to build entity relationships.

Chapter 16, *Creating Model-Driven Apps*, builds on the Common Data Service to create a model-driven app that allows us to directly interact with the database and provide interfaces for the user.

Chapter 17, *Exploring Environments within Our Tenancy*, allows us to look at environments and understand how they can be used to assist with governance around PowerApps.

To get the most out of this book

In order to get the most out of this book, it is recommended that you have a basic understanding of Office 365 as we will be interacting with various elements of it as we develop our apps. It is assumed that you have a basic knowledge of the following:

- SharePoint Online
- Microsoft Teams

If you have ever written formulas using Microsoft Excel, the thought processes that you used to achieve that will help you to more closely follow the creation of formulas within PowerApps.

Download the example code files

You can download the example code files for this book from your account at www.packt.com. If you purchased this book elsewhere, you can visit www.packtpub.com/support and register to have the files emailed directly to you.

You can download the code files by following these steps:

1. Log in or register at www.packt.com.
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Once the file is downloaded, please make sure that you unzip or extract the folder using the latest version of:

- WinRAR/7-Zip for Windows
- Zipeg/iZip/UnRarX for Mac
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The code bundle for the book is also hosted on GitHub at <https://github.com/PacktPublishing/Learn-Microsoft-PowerApps>. In case there's an update to the code, it will be updated on the existing GitHub repository.

We also have other code bundles from our rich catalog of books and videos available at <https://github.com/PacktPublishing/>. Check them out!

Download the color images

We also provide a PDF file that has color images of the screenshots/diagrams used in this book. You can download it here: https://static.packt-cdn.com/downloads/9781789805826_ColorImages.pdf.

Code in Action

To see the code being executed, please visit the following link: <http://bit.ly/2OKRdRZ>.

Conventions used

There are a number of text conventions used throughout this book.

CodeInText: Indicates code words in text, database table names, folder names, filenames, file extensions, pathnames, dummy URLs, user input, and Twitter handles. Here is an example: "Understanding conditional logic and how you can define branches using `If` and `Switch` statements."

A block of code is set as follows:

```
StartsWith("Griffon IT Assets", "Griffon")
EndsWith("Griffon IT Assets", "ts")
```

When we wish to draw your attention to a particular part of a code block, the relevant lines or items are set in bold:

```
Navigate(Welcome, ScreenTransition.Cover)
```

Bold: Indicates a new term, an important word, or words that you see onscreen. For example, words in menus or dialog boxes appear in the text like this. Here is an example: "This type of logic is known as a **condition**."



Warnings or important notes appear like this.



Tips and tricks appear like this.

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1

Section 1: Getting Started with PowerApps

This section includes the first four chapters of this book and is designed to help you to understand the absolute basics of PowerApps. It will help you first of all to gain an understanding of the technology and then to start taking your first steps in PowerApp development and the use of PowerApps.

Chapter 1, *Introducing PowerApps*, doesn't go into any technical depth with regards to creating PowerApps, but really looks at what PowerApps is as a product, introducing the development environment and some of the considerations that surround the product such as licensing.

The second chapter will begin our journey with PowerApps by creating our first canvas app. This will focus on how you can create apps specifically for tablet and mobile devices, and how you can start to modify the basic app settings to start giving the app its identity. We will also take the first steps in building the app that we will continually build throughout this book.

In the third chapter, we will look at the close relationship between PowerApps and SharePoint and how this technology is starting to transform SharePoint user interfaces. It will show you how you can quickly and easily create an app directly from SharePoint, as well as create forms to improve the way in which users interact with lists.

The final chapter in this section will look at ways in which you can leverage the app once it has been developed. We will look at the ways in which you can access it through the browser or a mobile device, as well as how the apps can be integrated within other areas of Office 365.

This chapter includes the following chapters:

- Chapter 1, *Introducing PowerApps*
- Chapter 2, *Creating Your First Canvas PowerApp*
- Chapter 3, *Creating Apps from SharePoint*
- Chapter 4, *Publishing and Leveraging PowerApps*

1 Introducing PowerApps

In this chapter, we will look at some of the basic concepts of PowerApps at a high level, and look at where we can access the various aspects that add depth to our PowerApps. We will also look at some of the out of the box apps that are provided by PowerApps, in order to give you some good examples of what is easily achievable.

We will also look at the licensing around PowerApps so that you understand how they are charged for, as well as the levels of functionality available with each type of license. This is so you can plan for any specific licenses which you may need during the development of your apps.

Finally, we will look at the development environment, specifically the PowerApps portal and the studio, as part of the learning process is just finding out where information and components are located.

In this chapter, we will cover the following topics:

- Understanding PowerApps
- Understanding PowerApps licensing
- Understanding the types of app
- The start screen
- What are templates?
- Using PowerApps Studio

By the end of this chapter, you will have an understanding of the fundamentals of PowerApps and what is possible within it. You will start your PowerApps journey by discovering what apps are included and how you can get started.

Technical requirements

In order to follow this and all the subsequent chapters in this book, you will need to have access to Microsoft PowerApps. As we will be exploring both standard and premium features, I would recommend that you sign up for a PowerApps Community Plan at <https://powerapps.microsoft.com/en-us/communityplan/>.

Understanding PowerApps

PowerApps is an ever-growing part of the Microsoft Office 365 ecosystem, where developers and business users alike are empowered to create apps. In the past, for this to be achieved with SharePoint, you would have to use products such as InfoPath, where you could combine custom logic with a number of visual components to extend the user experience:

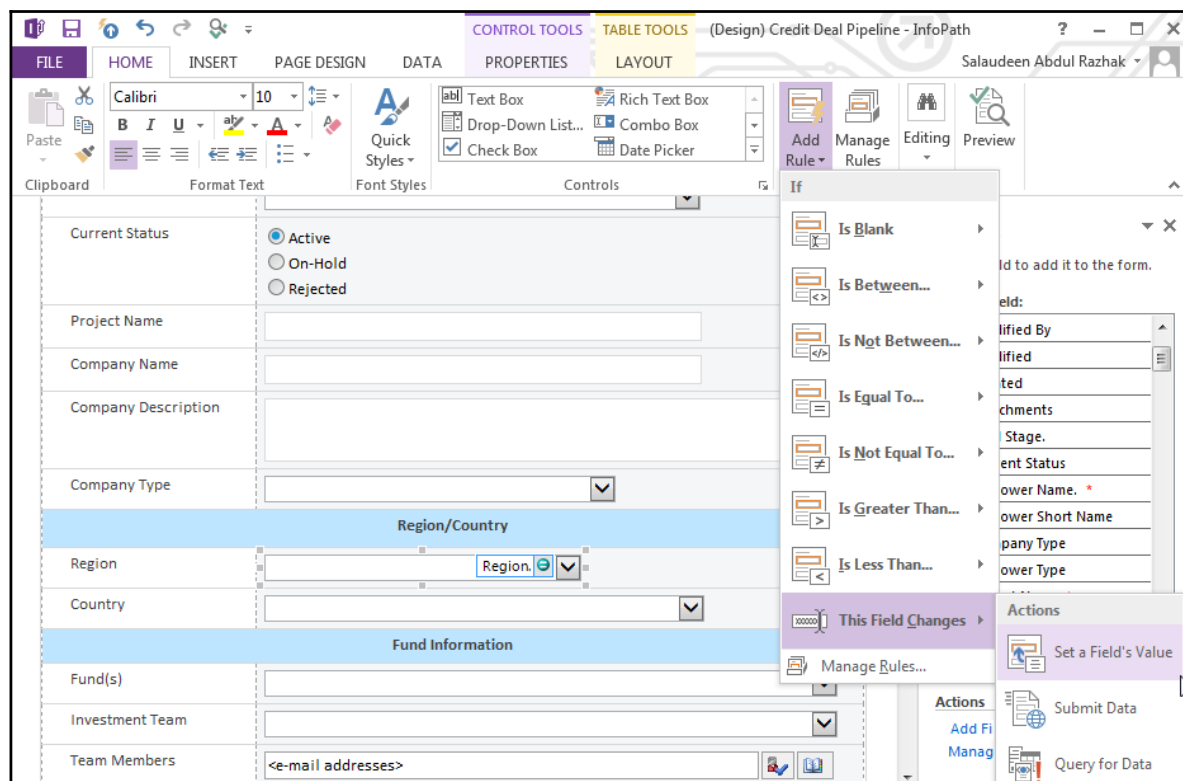


Figure 1.1: InfoPath as an editing application

PowerApps are created using visual tools that are provided through the browser and remove the dependency on needing additional applications to be installed on the desktop. However, this also builds into the Microsoft vision of mobility, where a user can work on their app anywhere in the world, at any time, from any device.

PowerApps aren't written with code; instead, they are created with formulas, similar to Microsoft Excel, a tool that the majority of the modern workforce are familiar with. For example, if we wanted to combine or concatenate strings in Excel, we would use the following formula:

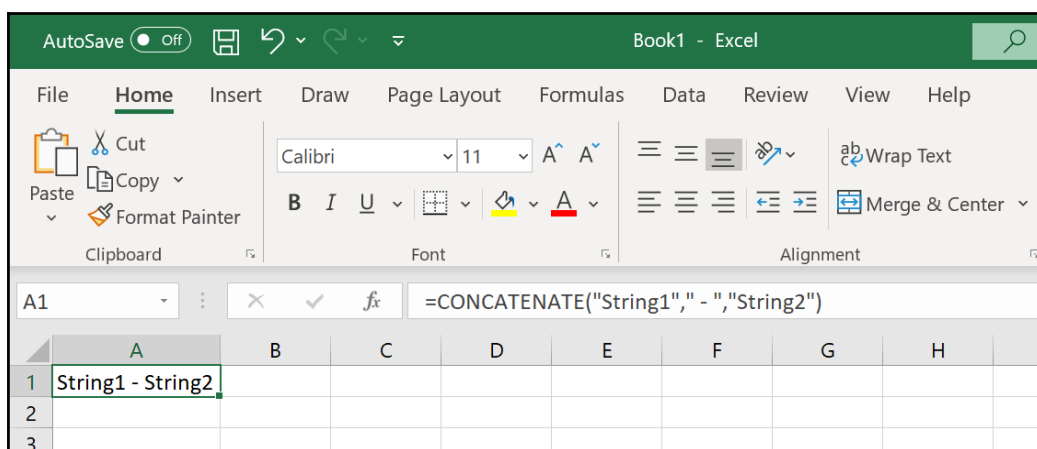


Figure 1.2: Formulas in Microsoft Excel

If we compare this to doing the same within PowerApps, you will see the similarities between the two products:

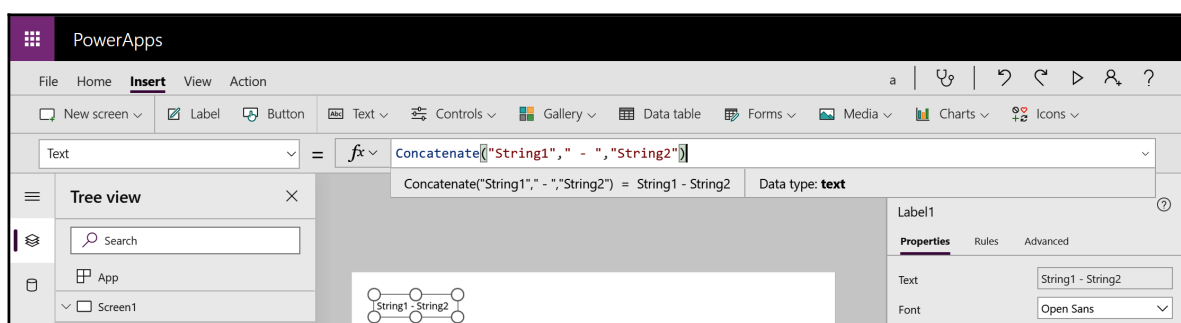


Figure 1.3: Formulas in Microsoft PowerApps

With this familiar approach to building logic, you don't need to be a developer to start creating solutions to business problems. For developers, PowerApps can be enriched using custom-developed functionality that can be deployed to and called from Azure, meaning that PowerApps is a tool that everyone on the IT spectrum can take advantage of.

From personal experience, I find PowerApps to be an excellent prototyping tool. Due to the drag and drop nature of its design, I can quickly and easily place components on a screen to establish a basic look and feel for an app while also connecting to some of the more rudimentary data sources, such as an Excel spreadsheet or a SharePoint list.

Before we dive into how we create apps, we should explore PowerApps' licensing options, since their cost will be a huge influence on the design decisions you make when creating apps.

Understanding PowerApps licensing

There are a number of options available when it comes to licensing PowerApps. Like all of Microsoft's products, there are differing levels of license available, which will govern what functionality you can use or what connectors you have available to you. As of 1st October 2019, PowerApps licensing has undergone quite a radical change, and the following sections will explain what the key licensing aspects are.

Seeded apps

PowerApps is not included with the home versions of Office 365; however, it is included with most of the business licenses and all of the enterprise licenses. This means that the majority of Office 365 users will have the ability to create and use PowerApps to enhance, extend, and customize their Office applications. This is now what is known as seeded apps; that is, they are a part of the Office 365 and Dynamics 365 licenses.

Since they are a part of the Office 365 and Dynamics 365 packages, they do not cost you or your organization anything on top of your existing license. The only thing you need to be aware of is that you only have access to a subset of the connectors that are available on the Microsoft Power Platform. For example, Azure, SQL Server, and Dynamics connectors are considered premium, and therefore not available at this license level.

Per-user plans

Per-user plans allow you to pay for a license for a single user, which allows them to access the full capabilities of PowerApps and Flow. The capabilities that are included in this plan were previously split between PowerApps Plan 1 and PowerApps Plan 2. However, in a more simplified model, the per-user plan encapsulates all of the functionality that the old plans offered.

The types of functionality that this plan unlocks for you include the ability to use the data gateway, which allows you to connect to on-premises data sources. It also gives you access to all of the premium connectors, as well as the ability to create custom connectors. We will explore connectors in more detail in [Chapter 8, *Introducing Connectors*](#).

Upgraded licensing gives you access to the management and administration areas of PowerApps, including the ability to use the **Common Data Service (CDS)** (introduced in [Chapter 15, *Introducing Model-Driven Apps*](#)) and the ability to fully utilize environments (introduced in [Chapter 17, *Exploring Environments within Our Tenancy*](#)).



It is worth noting that if your app uses premium functionality, both the PowerApp Creator and the PowerApp User will need to have a relevant license assigned to them. For example, if we were using a premium connector, both the creator and the user would require a per user plan.

Per-user plans cost \$40 per user, per month, and allows those users to run unlimited apps. If an organization doesn't want to license every user, there is an alternative, which is the per-app plan.

Per-app plan

The per-app plan is the newest type of licensing to be introduced by Microsoft and has been a response to the community suggesting that paying for a per-user plan for all users, when we only have one or two apps, is too expensive. Therefore, the per-app plan allows you to license just a single app for all the users who are part of your organization. The advantage of this approach is that you are still able to unlock the full capability of PowerApps for all the creators and users who are working with this app.

The cost of the per-app plan is \$10 per user, per app, per month. It should be understood that, in the context of this license, an app allows you to create two apps, which can either be two canvas apps, two model-driven apps, or a mix of the two.

Community Plan

If you want to really explore the capabilities of PowerApps without the license costs, you can create a free development environment using the **PowerApps Community Plan**. This is an environment that gives you complete access to the full capabilities of PowerApps; however, only a single user can use this plan, which means you can't share the apps with anyone else:

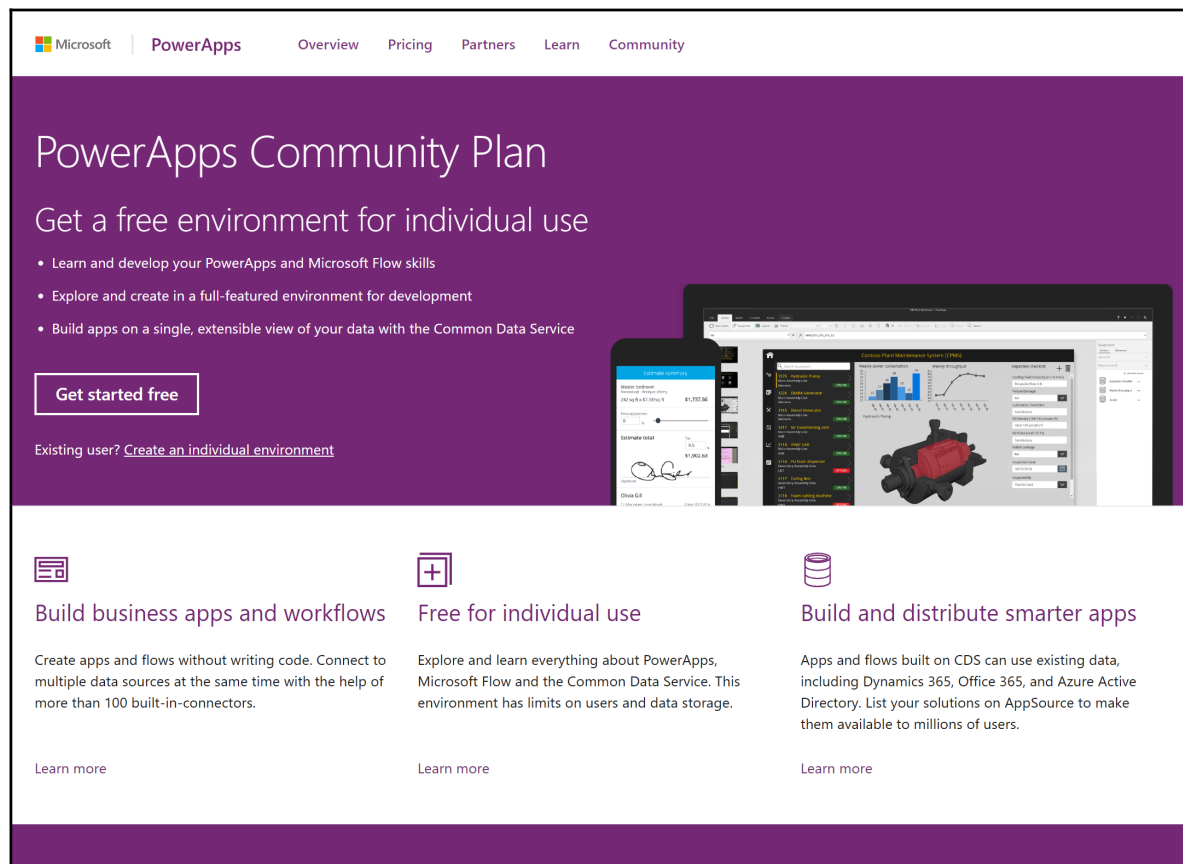


Figure 1.4: PowerApps Community Plan home screen

To sign up for this plan, navigate to <https://powerapps.microsoft.com/en-us/communityplan/> and click on **Get started free**. You will need to enter your work email address, that is, your Office 365 email address, so that the demo environment can be associated with you:

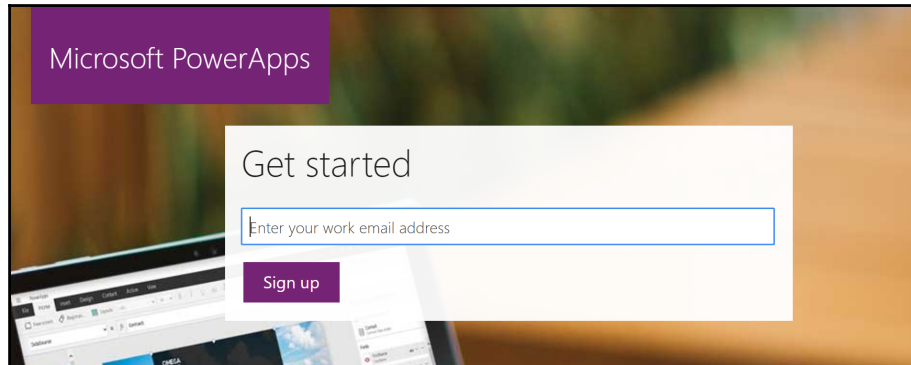


Figure 1.5: PowerApps Community Plan sign up screen

Once you have completed the signup process, a new environment will be created for you, generally with your name associated with it, for example, Matthew Weston's environment, where you can start to create and test your PowerApps.



This will be a good place for you to build the app that we will create as we proceed through the labs, since some of the elements that we'll require are features that are provided by the per user or per app (premium) plans.

Now that we have looked at how much it's going to cost us to create an app, let's have a look at what we can actually create.

Understanding the types of apps

When creating a PowerApp, there are two distinct types of app, both of which have very different applications. Before you start creating apps, you should have a clear understanding of what these two types are and what benefits they bring. This will allow you to make the right selection and therefore create a great app that will add value to your organization. Both types of app are designed to be codeless and therefore within the realm of the ability of IT professionals and power users; however, developers can add a lot of value by developing code and calling it in various ways.

The two types of app are as follows:

- **Canvas apps**
- **Model-driven apps**

Both apps allow you to easily build apps and share access to the CDS:

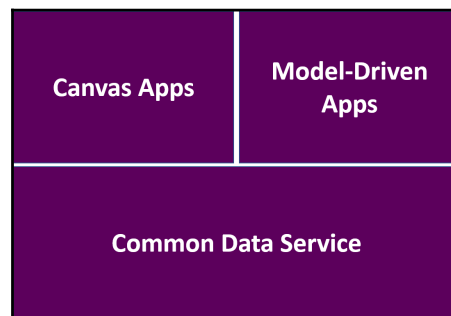


Figure 1.6: Logical hierarchy for the types of app

Understanding what the different types of app are will help you to make the correct decision when you are developing. Let's start by looking at canvas apps.

Canvas apps

Canvas apps are the mainstay of apps that are developed using PowerApps. They allow you to develop lightweight apps that are specifically intended for mobile devices, as well as apps that are being developed for tablet and desktop use:

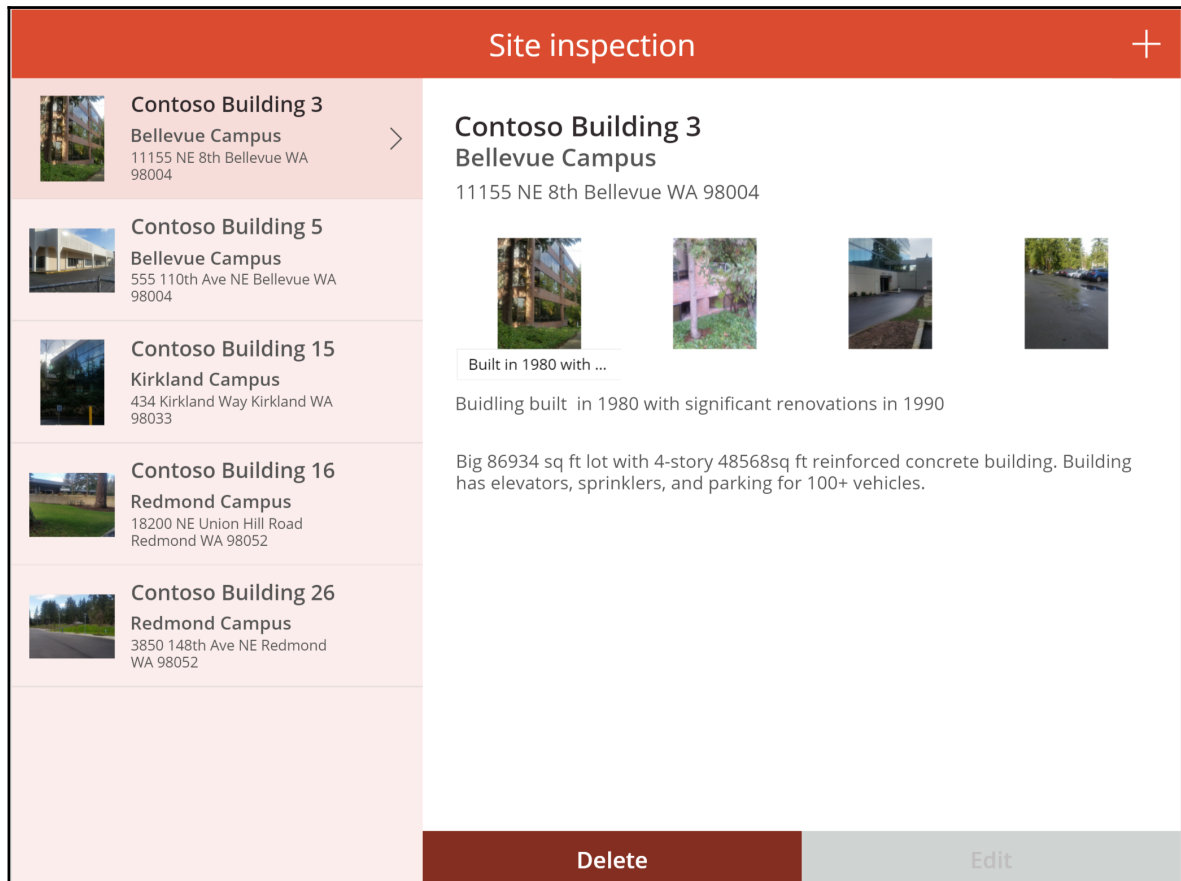


Figure 1.7: An example of a canvas app that has been generated from the Site inspection template

Creating canvas apps is simple – it follows the drag and drop methodology so that you can add components and position them onto the page, which gives the developer complete control of the layout. Combine this with the ability to create logic by using Excel-like functions and expressions, and you now have the ability to interact with data in a way that allows PowerApps developers of all skill levels to build functional apps.

Model-driven apps

Model-driven apps are used to build apps in Dynamics 365. This functionality was launched in mid-2018 and it introduced a new way of creating immersive apps to improve interaction with Microsoft Dynamics.

Model-driven apps differ slightly from canvas apps in terms of the development approach. With canvas apps being user experience-driven, model-driven apps are driven from the underlying data, as shown in the following screenshot. In contrast to canvas apps, the layouts in a model-driven app are determined based on the components that you decide to use on the screen:

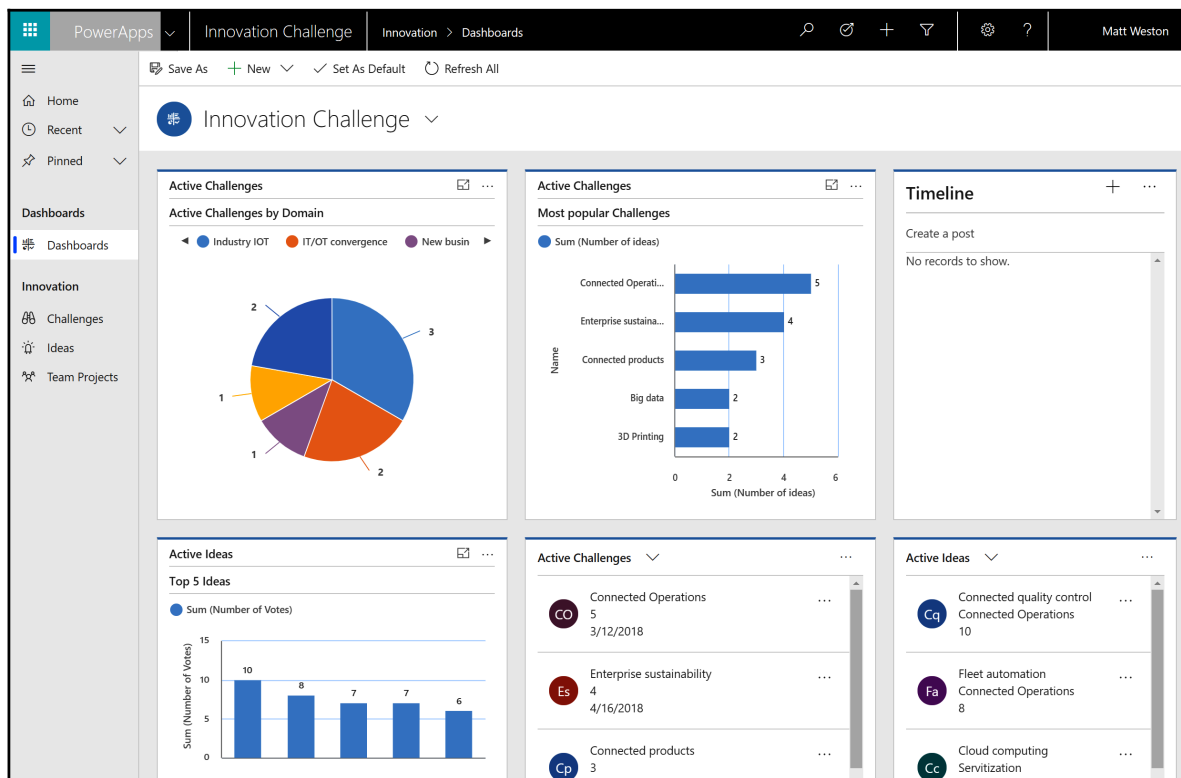


Figure 1.8: An example model-driven app

Model-driven apps share the same principles as canvas apps in that they allow you to create powerful apps without resorting to code; however, the thought process is much different and starts with the underlying data. We will investigate model-driven apps in more detail in [Chapter 16, *Creating Model-Driven Apps*](#).

The start screen

To start your PowerApps journey, we need to navigate to the start screen. Office 365 has shown that Microsoft is being much more consistent in terms of its user experience development throughout the whole ecosystem. Therefore, like other applications, PowerApps is either available from the Office 365 portal page (portal.office.com) or from the app launcher, which is located at the top left corner of the Office 365 portal, as shown in the following screenshot:

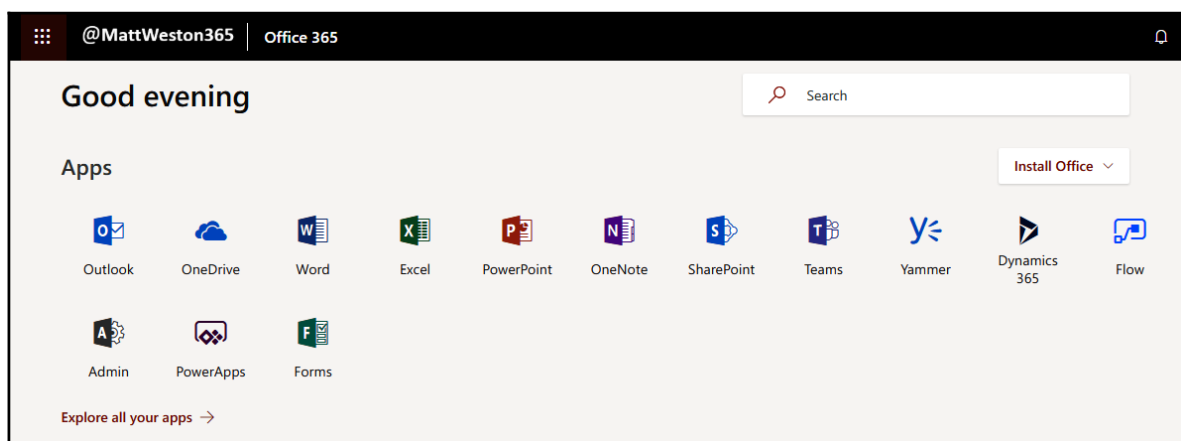


Figure 1.9: The Office 365 home page

Regardless of the navigation approach you take, you will find yourself on the PowerApps welcome screen, which will provide you with a wealth of options so that you can start developing.

The Home screen

The home screen is the first page that you will be presented with and provides you with a number of navigation options, including the ability to create new apps, open recent apps, and any apps that have been developed by someone else and shared with you:

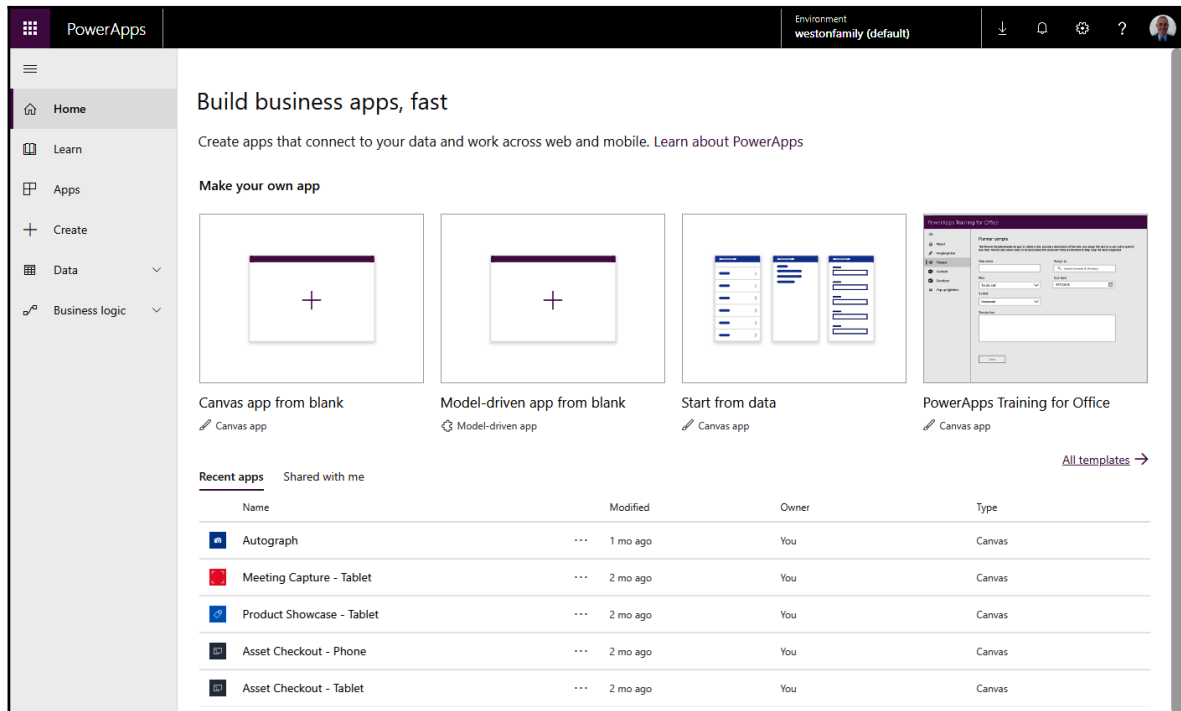


Figure 1.10: The PowerApps home screen

The screen is divided into two key areas:

- **The main screen:** This is the primary working area and will allow you to create a number of apps, which we will explore later.
- **The left-hand navigation:** This will allow us to access a number of resources that will aid us when we start building our own apps.

If you are new to PowerApps, then there will be a number of resources available to you, all of which are available from the learning resources screen.

The Learning Resources screen


Adoption is now at the forefront of the Microsoft agenda; therefore, Microsoft is providing a swathe of learning materials to help users of all abilities to create PowerApps. They have a number of guided learning lessons that provide basic computer-based training so that users can create both a basic canvas app and a basic model-driven app.

This is further enhanced by the Microsoft Docs site, which is dedicated to PowerApps, to provide additional knowledge in textual format. Both of these elements will allow you to take your first steps; however, the Microsoft PowerApps Community is the most valuable resource on here. Just like the Microsoft Tech Community (<https://techcommunity.microsoft.com/>), this is the home of a number of PowerApps experts who are willing to help and share their knowledge with other PowerApps developers.

The final part of this screen that provides a lot of value is the **What's new** section, which will provide you with announcements and updates, as and when Microsoft releases them. This includes technology advances, conference announcements, and general adoption notices:

Learn how to create apps

Quickly start to build and share apps that connect to your data. Discover how to make both model-driven and canvas-based apps with these resources.




Guided learning

Build your skills with short interactive courses.

Get started

Take an interactive tour




Help topics

Get in-depth information.

Explore

Get support




Community

Troubleshoot and share ideas.

Join in

Find a partner



What's new

25 Jan 2019

Power Platform World Tour in Silicon Valley, CA on February 19-20th

Learn about the latest Power Platform innovations straight from the source and transform the way you use do business by attending the Power Platform World Tour in Silicon Valley, CA on February 19-20. You'll learn how to bring your company through the digital transformation by gaining new understandings of your data and deepening your knowledge …

[Find out more](#)

Figure 1.11: PowerApps support resources

Now that we have familiarized ourselves with the learning resources, let's have a look at the apps screen.

The Apps screen

The apps screen works in the same way as many other Microsoft applications, where you are presented with a number of ways of quickly accessing the PowerApps that you have been developing or can access. The list of apps is split into various categories in order to help you locate the app you are looking for. These categories are as follows:

- **Recent apps:** These are apps that you have worked on recently, with the most recently modified being displayed first. It also tells you who the owner of the app is, that is, you or someone else within your organization, as well as the type of the app.
- **Shared with me:** This category shows you all of the apps that either you or someone else within your organization has explicitly granted you access to via sharing. Effectively, this is a list of apps that you can use within your environment, including ones that you have developed yourself.
- **Apps I can edit:** Apps that you can edit are those that have either been created by you or where you have been nominated as a co-owner of another app that has been developed by someone else. The co-owner's rights allow you to use, edit, and share the app, but does not allow you to delete it or change the owner.
- **Org apps:** Org apps are apps that are shared with the entire organization. This means that everyone within the tenancy who has a PowerApps license can use the app.

Now, all you need to know is how you can create new apps.

The Create screen

The creation screen is where you will decide what type of app you are going to create and how you are going to create it. You will have the option to create a canvas app (as either a mobile or a tablet app), a blank model-driven app, a model-driven app from your data, or use one of the many templates that are available to you as a starting point:

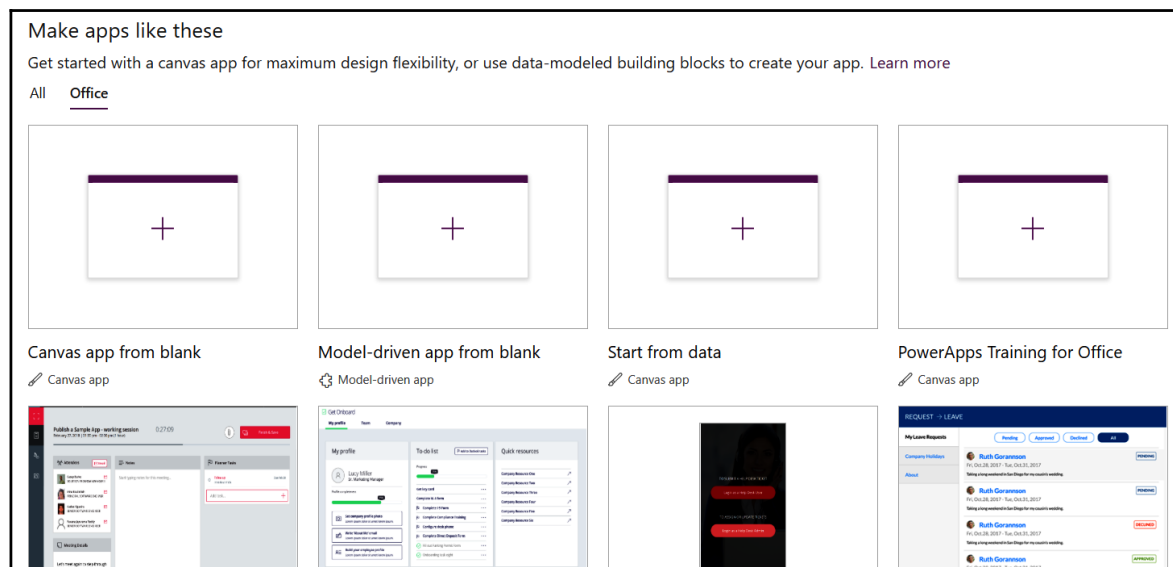


Figure 1.12: App creation screen

We will investigate the creation of apps in more detail in [Chapter 2, *Creating Your First Canvas PowerApp*](#). The next area you need to familiarize yourself with is the data menus.

The Data menu

The data section of the menu allows you to access various functionality related to source data that can be used within your PowerApp. Data sources are established through connectors, of which over 250 are available, and more are constantly being added. This also includes any connections that have currently been established and are in use, as well as the data layers, which are leveraged within the CDS.

Entities

Entities effectively allow you to model data within the CDS database. An entity defines the information that is related to a specific type of record. For example, an account entity may have an account number, a sort code, and an account name. This data can then be used within PowerApps and Flow if we refer to the entity. Microsoft provides a number of entities at the point in which you provision your CDS database to cover many basic examples, such as contacts, emails, tasks, and so on.

Each entity is comprised of several fields, each of which has a display name, an internal name, a data type, and some basic user settings so that you can govern how each field is used. Once you have these fields, you can add relationships to them so that you can enforce one-to-one, one-to-many, and many-to-many relationships with other entities.

Business rules can be applied so that you can build logic and validation routines without the user having to write any code. When selecting business rules, you will be redirected to the appropriate PowerApps screen, which relies on Dynamics 365:

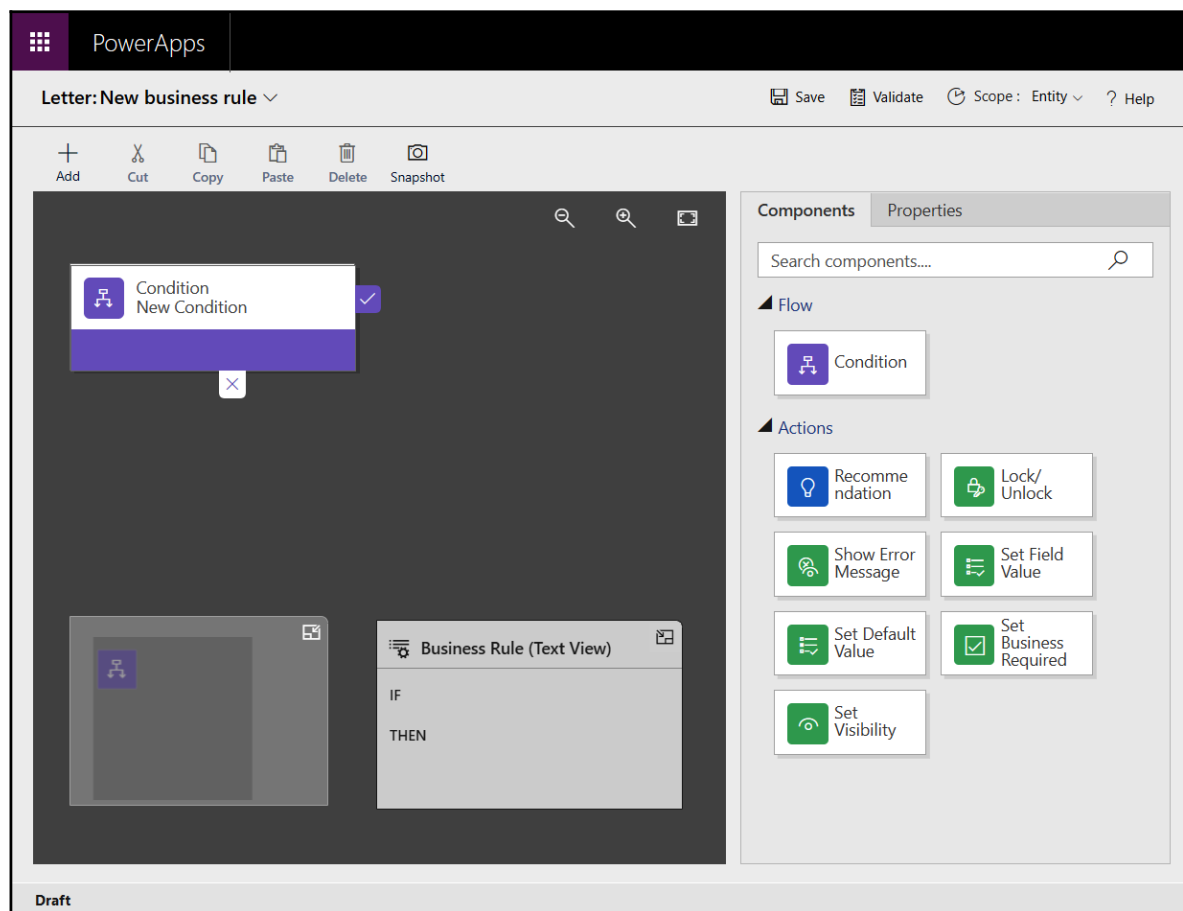


Figure 1.13: Business rule creation screen

The final area within data is related to Option sets, which we can use within our entities.

Option sets

Option sets, formerly known as pick lists, are fields that have a defined set of options available to them. Similar to Managed Metadata terms in SharePoint, they are designed to promote data consistency across the platform. Just like all the other aspects of CDS, Microsoft provides a number of system-generated **Option sets** that you can use in your own apps or which you can follow as examples. One such example is **Fiscal Period**, which has a set of options available, such as **Quarter 1**, **Quarter 2**, and so on:

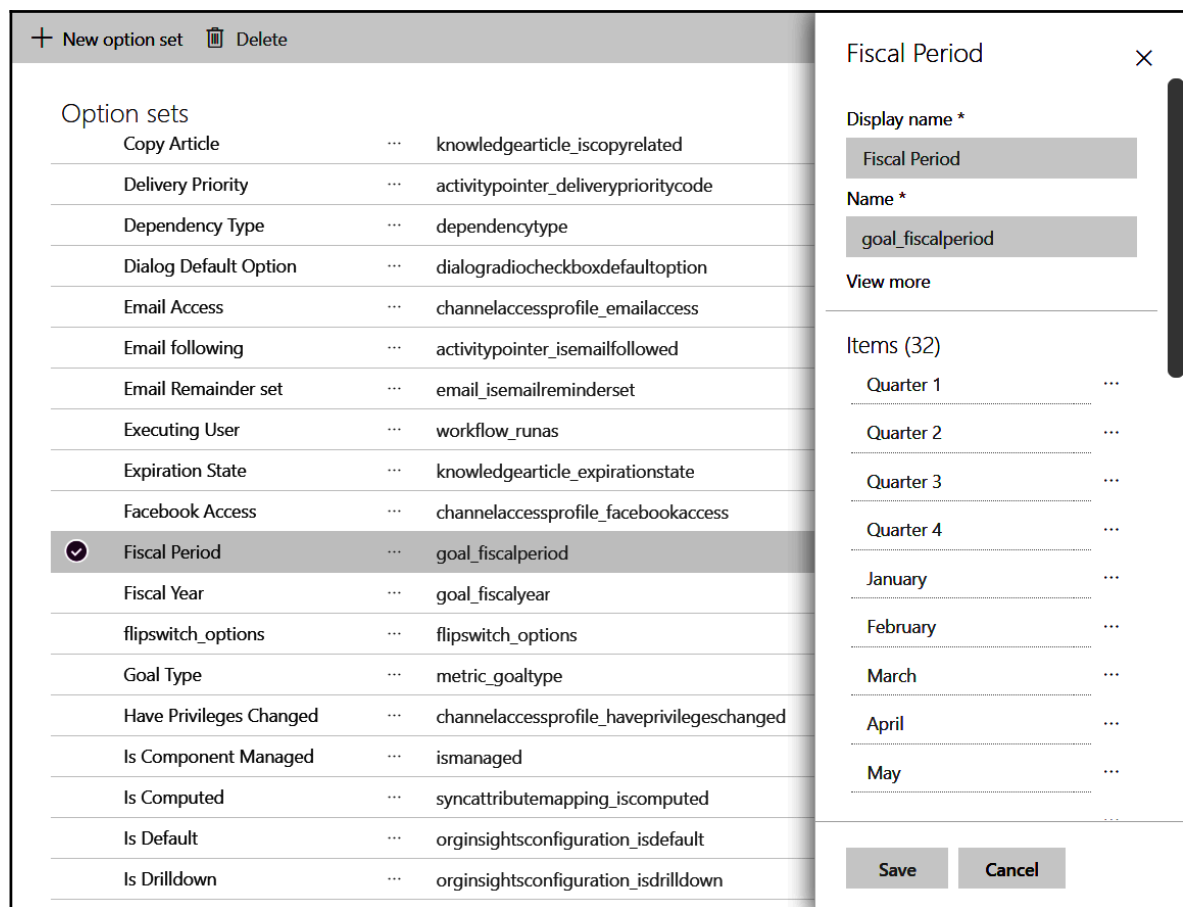


Figure 1.14: The Option sets creation screen

Now that we have looked at the data menu, we can look at the next key area, which is related to our data connections.

Connections

The connections screen is one of the most useful screens you will come across as an administrator because you can easily identify and troubleshoot any issues that may occur with your connections. You'll be able to see what systems are connected, when the connections were created, and their general health. If this screen shows an issue, then you will be able to fix it without having to log in and use PowerApp:









Connections in westonfamily (default)			
 Canvas			
Name	Modified	Status	
 Approvals Approvals	... 1 yr ago	Connected	
 MATT@WESTONFAMILY.ONLINE Azure AD	... 12 h ago	Connected	
 MATT@WESTONFAMILY.ONLINE Dynamics 365	... 21 h ago	Connected	
 Notifications Notifications	... 1 yr ago	Connected	
 LinkedIn LinkedIn (preview)	... 4 d ago	Can't sign in. Fix connection	
 MATT@WESTONFAMILY.ONLINE Microsoft Forms	... 1 d ago	Can't sign in. Fix connection	
 MATT@WESTONFAMILY.ONLINE Office 365 Outlook	... 5 h ago	Connected	

Figure 1.15: The connections list

We will investigate connectors in more detail in [Chapter 8, *Introducing Connectors*](#). Apart from looking at in-built connectors, we can also look at any connectors that we have built.

Custom connectors

There are hundreds of connectors that you can use within your PowerApps; however, there will be times where you'll need to integrate with a system that either doesn't have a native or third-party connector, which is usually something that you have developed yourself, or a third-party API that you would like to connect to, for example, OpenWeatherAPI.

Custom connectors allow you to connect to REST web services so that you can interact with data. We will look at how to do this in [Chapter 8, *Introducing Connectors*](#). Any custom connectors that have been created within your tenancy will be listed here.

Gateways

A data gateway is a way of quickly and securely passing data from your on-premises data sources to your PowerApps. This allows you to leverage a number of different data sources, such as SharePoint, SQL Server, or even Oracle databases. The gateway can be downloaded directly from this part of the welcome screen.

To take advantage of the data gateway, you need to have a per user or per app license.

Business logic

When we talk about business logic in Office 365, we're talking about Microsoft Power Automate. Power Automate is intended to be the workflow that will replace legacy SharePoint Designer workflows. Business logic will expand and allow you to open Power Automate from the left-hand navigation bar. We will explore Microsoft Power Automate in [Chapter 13, *Using Power Automate with PowerApps*](#).

What are templates?

Microsoft provides an expanding gallery of templates that you can use to get your PowerApps journey started. Each template is more than just a scaffold of an app – they are fully functional PowerApps that integrate with various aspects of your Office 365 tenancy to provide immediate functionality. In this section, we will look at two of my favorite apps, but it is recommended that you review the functionality that's contained in the others as there are lessons that can be drawn from all of them.

Leave request app

The leave request app is a good example of a generated PowerApp that can quickly add value to organizations that don't rely on an already established system so that you can manage leave requests. It creates a number of screens that show you how you can use various controls and methods of navigation to achieve quite a common business use case.

This PowerApp creates two connections: one to Outlook in order to save and retrieve leave information in your Outlook calendar and another to the Microsoft Graph in the shape of Office 365 users. This allows the PowerApp to determine the line manager of the user requesting leave so that it can send emails.

The tablet version looks as follows:

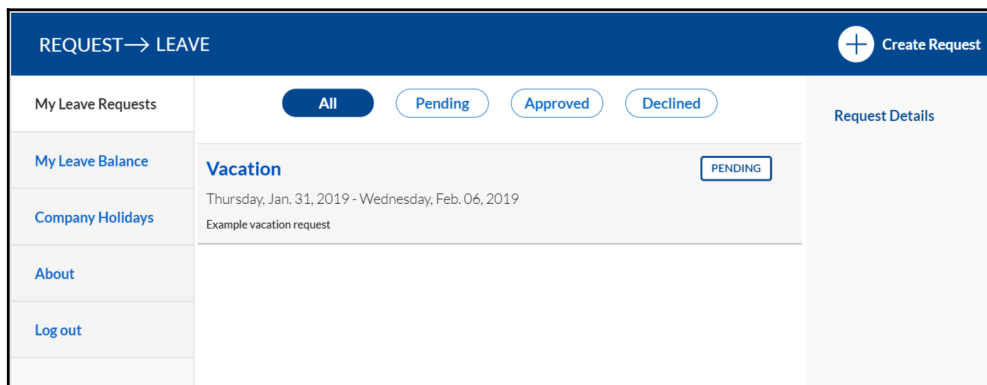


Figure 1.16: Leave request app in tablet format

The mobile version looks as follows:

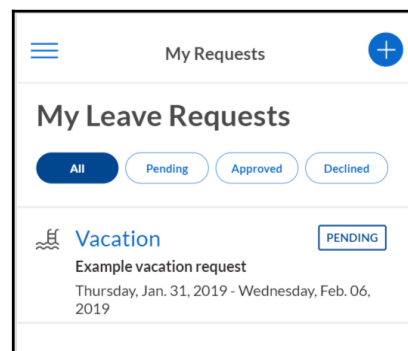


Figure 1.17: Leave request app in phone format

As well as having templates that are based around individual activities, we also have templates that are based around business functions.

Help desk app

The help desk app is another PowerApp that is commonly used by organizations to quickly add value since it captures service requests from a mobile device. This PowerApp is a great showcase regarding how you can store and modify data that's stored within a data collection, which we'll explore later in this book. It also uses connections that go back to the O365 user profile to draw data on the user who has logged in, such as their username and email address:

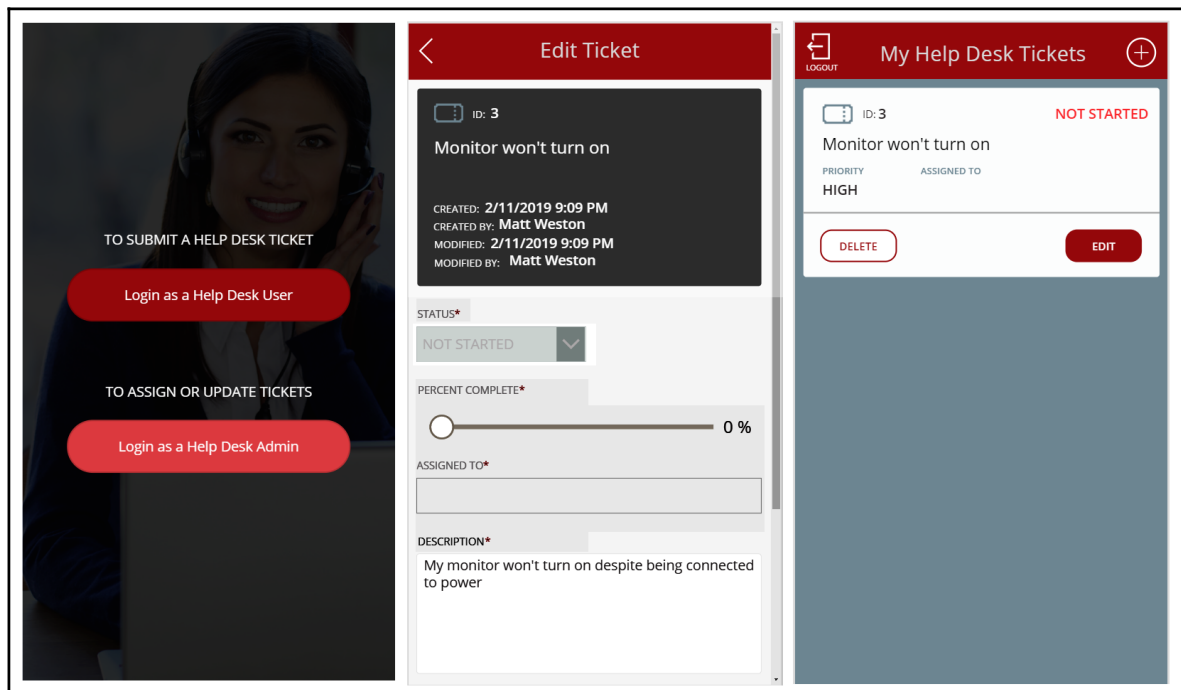


Figure 1.18: The Help desk app, a phone app focused on managing support tickets

Now that we have looked at creating some basic apps, we should familiarize ourselves with the actual development environment so that we're ready to start creating powerful apps of our own.

Using PowerApps Studio

PowerApps Studio is your primary developer tool for creating, updating, testing, and deploying canvas apps. In this section, we will explore PowerApps Studio, which is where you will take your app ideas from their conception and deliver them. It is important that you know your way around the studio so that your development time is spent creating the app rather than looking for options and controls. Understanding your development environment will vastly improve your development experience and will also allow you to greatly expand the functionality that's available within your app.

By the end of this section, you will know about the key areas of the PowerApps Studio, including the primary menu area and the formula bar. You will also learn how to view your screens, use the canvas, and find and review the properties of your PowerApp.

PowerApps Studio is completely browser-driven and is supported by all modern browsers, unlike other developer tools. Everything you do is, by default, saved to your Office 365 subscription, so you don't need to concern yourself with maintaining code in a code repository.

PowerApps Studio will launch when you start creating your app or if you open an existing app in edit mode. This screen consists of the following properties:

- Menus
- Formula bar
- Screens
- Canvas
- Properties