Pro Microsoft Power Platform

Solution Building for the Citizen Developer

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Brian Knight
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Pro Microsoft Power Platform: Solution Building for the Citizen Developer

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ISBN-13 (pbk): 978-1-4842-6007-4
ISBN-13 (electronic): 978-1-4842-6008-1
https://doi.org/10.1007/978-1-4842-6008-1

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Cover image designed by Freepik (www.freepik.com)

Distributed to the book trade worldwide by Springer Science+Business Media New York, 233 Spring Street, 6th Floor, New York, NY 10013. Phone 1-800-SPRINGER, fax (201) 348-4505, e-mail orders-ny@springer-sbm.com, or visit www.springeronline.com. Apress Media, LLC is a California LLC and the sole member (owner) is Springer Science + Business Media Finance Inc (SSBM Finance Inc). SSBM Finance Inc is a **Delaware** corporation.

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About the Authors

Mitchell Pearson is a business intelligence consultant and the training content manager for Pragmatic Works. He has authored books on SQL Server and Power BI and spends his time at Pragmatic Works developing new courses on business intelligence and Microsoft Azure. Mitchell has experience developing enterprise-level BI solutions using the full suite of products offered by Microsoft (SSRS, SSIS, SSAS, Power BI, and Azure). He is active in the community, running the local Power BI user group, presenting at SQL Saturday events and at PASS virtual chapters, and giving free webinars for Pragmatic Works.

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Treb Gatte is a business intelligence analyst with many years of industry experience. He is an entrepreneur and a teacher with a passion for helping people to get the value they deserve from the software they have purchased. He is a technical expert and early adopter, with 24 combined years of software experience spanning the banking, government, and transaction processing industries.

Acknowledgments

Mitchell Pearson

I would like to thank God for the gifts and opportunities afforded me and most of all for sending his son Jesus Christ. I would like to thank my beautiful wife Jen for her incredible support and patience. I also thank my children, Brookelynne, Braxton, and Bella, for their unconditional love and great personalities! I thank Brian Knight for changing my life and giving me an incredible opportunity with no previous experience in the field of business intelligence. I would also like to thank the many mentors that have provided guidance and encouragement along the way. Thank you Anthony Martin, Dustin Ryan, Bradley Schacht, Devin Knight, Jorge Segarra, Bradley Ball, and many others!

Brian Knight

Thanks to everyone who made this book possible. As always, I owe a huge debt to my wife, Jenn, for putting up with my late nights. I wouldn't be here if it weren't for your tireless dedication to lifting me up. Also to my children, Colton, Liam, Camille, and John, for being so patient with their tired dad who has always overextended himself.

Finally, I would like to thank Shawn Trautman, my line dancing instructor. This will be the year that we complete the United Country Western Dance Council's goal of making line dancing a competitive sport worldwide.

Devin Knight

I must give thanks to God; without God in my life, I would not be as blessed as I am daily. Thanks for the amazing team of authors: Brian, Mitchell, and Manuel have put in time after hours away from their families to bring this great book together. To my wife, Erin, and three children, Collin, Justin, and Lana, who were all patient during nights that daddy had to spend writing. Finally, I would like to thank Alan "Nasty" Nash, my personal Toe Wrestling coach, for training a rising star like myself in the fine techniques of professional Toe Wrestling. I know this will be the year that we earn the world championship title.

Manuel Quintana

Thank you to all my family and friends who support me in all of my endeavors. Special praise must be given to my wife for supporting me during late hours working and some weekends being dedicated to writing this book; without her I wouldn't be the person I am proud of being today. Also, I must say thank you to all my coworkers at Pragmatic Works; each one of them has mentored me in one way or another, and all my success can be traced back to them. I hope to make everyone mentioned here proud of what I have done and what I will achieve.

Introduction

Pro Microsoft Power Platform dives into the world of the citizen developer and explores the suite of powerful no-code/low-code tools made available by Microsoft. This book is divided into four parts; the first three parts cover the technologies of Power Apps, Power Automate, and Power BI individually and in depth. The fourth and last part focuses on how each of these tools integrates with one another to extend their capability. With the suite of Power Platform tools, self-sufficient citizen developers can drive change in their organization, multiply their productivity, and save the company significant money. Tasks that were once reserved for consultants or the IT Department can now be easily and quickly accomplished by an empowered workforce with little to no IT background!

Who Is This Book For?

This book has been designed specifically with the "citizen developer" in mind. The citizen developer is a problem solver, generally with little to no background in code, but usually has experience in Microsoft Excel or other self-service analytical tools. *Pro Microsoft Power Platform* is for Power users, analysts, and problem solvers that need access to a comprehensive set of tools to accomplish complex challenges and bring their visions to life. The reader may sometimes be considered part of a "Rogue IT" department that takes on tough projects that need to be done quickly, but if put in IT's hands could take months or even years to complete. The reader of *Pro Microsoft Power Platform* is likely familiar with one of the three Power Platform tools but has yet to be exposed to the other two in a way that fully explains how they all integrate. Every department in an organization has a "problem solver," the person everyone looks to when others have tried but failed. This book gives every "problem solver" the support they need to become efficient citizen developers.

What This Book Covers

Part 1: Building Line of Business Applications with Power Apps

Often, the first step when developing Power Platform solutions is to build a data collection application. Part 1 of this book covers how citizen developers can build their own applications. Building an application sounds like an impossible task, even to some of us that work in IT. However, building applications in Power Apps is surprisingly easy! Power Apps offers a low-code and easy-to-understand development interface for application development.

In Part 1, the reader will learn how to create apps, how to customize those apps to make them more dynamic and responsive, how to leverage the formula language, and finally how to manage sharing and administration.

Part 2: Task automation with Power Automate

Part 2 is about creating automated workflows with Power Automate to reduce redundant tasks and improve consistency across processes within an organization. With Power Automate, the reader will learn how to design workflows from existing templates and from a blank canvas leveraging a low-code development environment with an intuitive and clear graphical user interface. The reader will also learn how to build dynamic approval flows and how to extend that capability further with conditional logic, dynamic content, and automation. Finally, the reader will learn how to share workflows and perform necessary administrative tasks.

Part 3: Dashboards, Reporting, and Analytics with Power BI

Part 3 explores the building of interactive reports and dashboards with Power BI. Power BI provides unmatched analytical performance with its in-memory technology. The reader will learn how to connect to data sources, cleanse the data, build a data model, and provide additional value through Data Analysis Expressions, also known as DAX. DAX is an easy-to-learn expression language for creating calculated columns and measures to further extend the analytical capabilities of Power BI. The reader will learn about the rich analysis that can be performed through the building of interactive reports and responsive dashboards. Finally, the reader will learn about the Power BI service and how to share reports and dashboards with others.

Part 4: Integrating the Power Platform Tools Together

In Part 4, the reader will learn how each of these technologies can be integrated together expanding their capabilities. Independently, each of the Power Platform tools can be leveraged to add great value to any organization. However, Microsoft's suite of self-service tools can unlock endless possibilities when used together. Common scenarios for how these tools can easily integrate with one another will be highlighted in this section.

PART I

Building Line of Business Applications with Power Apps

CHAPTER 1

Introduction to Power Apps

Over the past few years, Power Apps' popularity has gone from a little-known edge product to one that's being used by millions of people monthly. Power Apps allows you to build applications fast. So fast, you can deliver value to your business in just a few minutes. In this chapter, you'll learn about the types of Power Apps you can build and the tools of the trade. This chapter sets the stage for getting your hands dirty in subsequent chapters.

What Is Power Apps

Power Apps is a low-code/no-code solution platform for building applications quickly. It enables almost anyone to build applications quickly with minimal IT intervention. The ideal Power Apps solution built replaces a manual process or paperwork and is accessed generally with employees in the Active Directory. Power Apps can also be accessed with guest accounts for outside partners or vendors and can also be accessed anonymously for portal applications.

Types of Apps

The first decision you must make when you're looking to create a Power App is what type of Power App you want to create. There are three types of applications – canvas, model-driven, and portal applications – and each has its pros and cons. One of the main drivers in the past was a licensing decision, but that's now changed as Power Apps has unified most of its pricing. Now, the decision is more about functionality and what you want the app to do.

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M. Pearson et al., *Pro Microsoft Power Platform*, https://doi.org/10.1007/978-1-4842-6008-1_1

Canvas Applications

Canvas applications (shown in Figure 1-1) allow you to create pixel-perfect applications for your users but require a bit more work to implement in many cases. Canvas applications can connect to hundreds of data sources (called connectors) and can even use some connectors for initiating an action, like texting a customer or displaying a map. Because it is pixel-perfect, the use cases for canvas applications are endless, and there is very little that can't be done with this type of application.

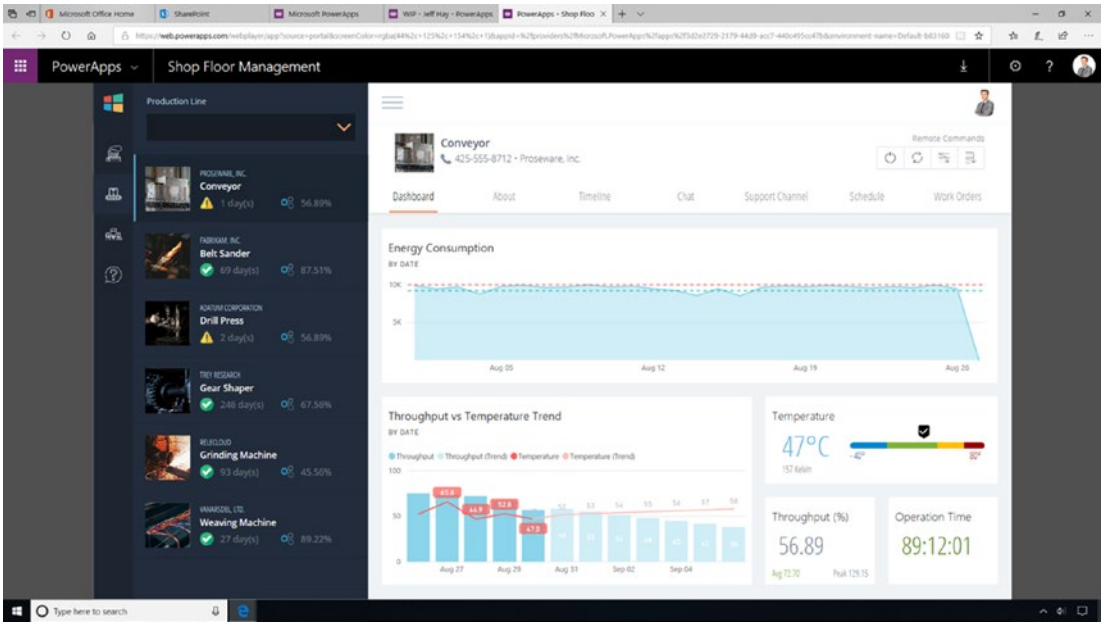

Figure 1-1. *Canvas application with Power BI reporting*

Model-Driven Applications

Model-driven applications focus on creating simple data entry style applications that can have a defined workflow. A perfect use case for this type of application is an employee onboarding application where there is a defined business process where data flows from onboarding the tax records, then payroll, and finally security access. This type of business process can be seen in Figure 1-2 with the dots on top of the screen. One key requirement of model-driven applications is they use Common Data Services, which will be discussed later in this chapter.

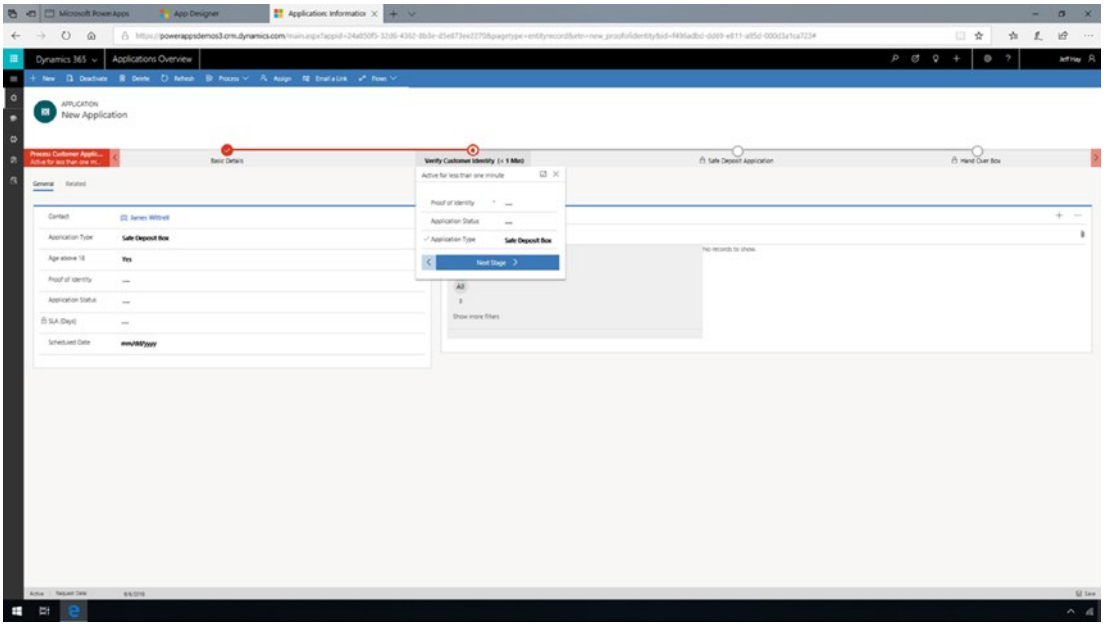

Figure 1-2. *Model-driven applications*

Portal Applications

Portal applications create intranet or extranet sites for you and your customers or partners. They allow for anonymous access to the application, or you can force users to authenticate with numerous providers like Active Directory, Facebook, or LinkedIn. These applications also require Common Data Services as the data repository. A perfect use case for a portal application is a county's website where they might have dozens of forms they want to expose to their citizens.

Common Data Services

When you're looking to create any type of application, you typically first create a database schema to store your data and then build the application to interface with that schema. This can take time to build the perfect schema to store employees, products, and other common objects. Common Data Services provides the application builder a set of common objects called entities that can store that data.

Common Data Services (CDS) includes dozens of common entities you're likely going to need, and this list can be extended or existing ones modified by the developer. Behind the scenes is storing the data in an Azure data repository. The nice thing about this is you don't need to purchase an additional license for a database. Each Power Apps environment can have one CDS database, and this database is shared with Dynamics 365 if Dynamics is installed in the environment. Data can be synchronized into CDS with Power Query if you have the need to bring data on-prem or in another cloud database into CDS.

Why Power Apps

In most companies, there exist hundreds of silos of data and users trying to access those silos. We speak with dozens of companies each month that have Access databases or Excel spreadsheets that act almost like applications for doing budgeting, quotas, or inventory. Power Apps is squarely positioned to take on those silos and build applications quickly to enable users to access that data quickly and from any device.

You can build a Power App in two ways: by starting with data or from scratch. If you start with data, you can build the application by pointing to a data store (Excel, a table, or a cloud resource, to name just a few), and Power Apps will create the core screens for you in under a minute. For many people who want just an application to read and write to a data store, this application is all they'll ever need. For others, this may just be the starting point, or they'll choose to build the application from scratch to have full control of the experience.

Each time you build an application, it's accessible through a web link, a phone device, or other support Microsoft tools like SharePoint, Dynamics 365, or Teams. For phone access, there is a native Power Apps application that presents the user an internal company store of applications that they have access to, so you don't have to worry about submitting your applications to Apple or Google. As you share your Power Apps, those applications are centrally managed, and you can see who has used your application and some of the telemetry around their usage.

Creating Power Apps

Power Apps are created through a browser at https://make.powerapps.com. There is no classic application builder outside the browser because the design interface changes online at least monthly with new improvements and features. Once you log in with your credentials, you can create an application from scratch, by starting with data or by using templates of beautiful prebuilt applications.

This book is a hands-on book after this introductory chapter. To roll your sleeves up and get your hands dirty with the authors, you'll want to have at least a trial account to do the examples and get the most out of this book. If your company does not have Power Apps deployed, you can use the Community Plan to try all the concepts of this book out for free. To sign up for the Community Plan, simply go to https://powerapps.microsoft.com/en-us/communityplan/. The apps you build with this plan are meant for individual use only.

Environments

Environments are used to segment applications and data in the Power Platform. Each environment can have its own CDS database. Most companies use environments to segment development from production. A minority of other companies use them to segment various major departments like HR and Sales. You can navigate between environments on the top bar of https://make.powerapps.com.

If you do decide to create an environment for development, QA, and production, mechanisms exist to export applications, data, and connections out of one environment and import into another environment.

Admin Interface

To administer Power Apps, click the gearbox on the top right and select Admin Center (https://admin.powerapps.com/). This is where you can create and modify environments, modify the security, and set up data retention policies to prevent data from leaving your company. If you don't have a CDS database already created, you can create a new one by clicking Create Database while viewing the properties of an environment.

Each application also has an administration interface to set security, deploy, and roll back versions. You can access this interface by clicking the ellipsis button next to your application name and selecting Details. From there, you'll also be able to export the application for use by a customer or another environment.

Try It Out

For our first "Try It Out" section, you're going to confirm that your environment is set up and ready for the rest of the chapters around Power Apps and that the CDS database is created.

Lesson Requirements

To perform the examples in this book, you'll want to have access to an environment or create a new one with a CDS database. If your company does not have one, you can sign up for a personal Community Plan account and configure it.

Hints

Navigate to the Admin Center at `https://make.powerapps.com` and select the environment that you want to use throughout this book. Alternatively, you can create a new environment and CDS database.

Step by Step

Don't forget, if you're not an administrator of your environment, you can sign up for the Community Plan individually (`https://powerapps.microsoft.com/en-us/communityplan/`) to make sure you can do the full extent of the book.

---

1. Open `https://make.powerapps.com` and click the gearbox on the top right. Select Admin Center.