LEARNING MADE EASY

Microsoft® Power Platform™

for dummies®

A Wiley Brand

Build intelligent low-code and no-code solutions

Wrangle data, create apps, and automate your work

Implement the platform across an organization

Jack Hyman

Author of *Microsoft Power BI™ For Dummies*

Microsoft® Power Platform™

for dummies®
A Wiley Brand

Microsoft® Power Platform™

by Jack Hyman

for dummies®
A Wiley Brand

Microsoft® Power Platform™ For Dummies®

Published by: **John Wiley & Sons, Inc.,** 111 River Street, Hoboken, NJ 07030-5774, www.wiley.com

Published simultaneously in Canada

Library of Congress Control Number is available from the publisher.

ISBN 978-1-394-27700-1 (pbk); ISBN 978-1-394-27702-5 (ePDF); ISBN 978-1-394-27701-8 (epub)

Contents at a Glance

Table of Contents

Introduction

Microsoft Power Platform enables organizations to reimagine the way they develop and deliver business solutions. Microsoft designed the Power Platform suite of tools so that any user, from the business analyst to the senior developer, can create data-driven solutions rapidly. This way, users of all skill levels throughout an organization can build solutions to analyze data, automate processes, create autonomous agents, and more. Meanwhile, seasoned developers can shift their attention to more robust efforts that require more analytical focus. This is all made possible by the powerful, low-code applications and services provided in the Power Platform suite.

This book explains the capabilities of each component of Power Platform, and shows how to set up the environment to get the most from the available applications. Here is a quick rundown of the Power Platform applications covered in this book, and a brief description of what each application does:

- **Power Apps (canvas and model-driven):** Enables users to build custom applications that are highly graphical or data-driven.
- **Power BI:** Business intelligence and data analysis functionality.
- **Power Automate:** Workflow automation.
- **Dataverse:** Web-based data transformation.
- **Power Pages:** Data-driven, low-code website development.
- **CoPilot for Power Platform:** Virtual agent creation.

This book is designed to be your compass in navigating the expansive world of Microsoft Power Platform, providing you with the knowledge and skills needed to leverage its full potential. While by no means will you learn everything you need to get your black belt, *Microsoft Power Platform For Dummies* gives you the essentials you need to produce applications, data products, and workflow automation at speed and scale.

About This Book

Microsoft Power Platform is a suite of low-code solutions that provide a secure and trusted framework, powered by Microsoft Cloud services, to work with other Microsoft products, such as Azure, Dynamics 365, and Microsoft 365. Most users leveraging the Power Platform do not require extensive technical skills, although some features do require a bit more hands-on-the-key knowledge. *Microsoft Power Platform For Dummies* is intended for the following users:

- **Business analysts:** These users leverage Power BI for analyzing data, creating reports, and deriving insights to make informed decisions. They also use Power Apps to build custom business applications without needing to write code.
- **IT professionals:** IT users are those who aren't developers but fill roles such as business, data, and security engineers. Each of these roles uses the Power Platform for automating business processes, managing data and app environments, applying authentication and authorization to applications, enforcing data governance, and integrating with existing systems using Power Automate and Power Apps.
- **Developers:** There are two types of developers in the Power Platform community, *citizen developers* (beginning-to-intermediate developers) and *professional developers* (probably have a computer science degree).
  - **Citizen developers** are apt to design applications requiring little to no-code, using Power App Canvas features. These users are also more inclined to build less sophisticated reports and apply the workflows in their quest to rapidly deploy a solution.
  - **Professional developers** extend the capabilities of the Power Platform by creating custom connectors, integrating with external data sources, and using Azure functions for more complex workflows or processes. Professional developers traditionally have skills as .NET or web developers, so their experience in deploying web applications extends the power of the platform.
- **Data scientists and analysts:** Users whose job it is to transform data into actionable insights use Power BI along with AI-based solutions such as Fabric and Copilot to create comprehensive data models, perform analytics, and share insights across the organization. The result of the data professionals' work are power reports, dashboards, and KPIs for dissemination within a solution. Their work can be standalone as well.
- **End users:** When the application is complete, end users benefit from the applications and automation orchestrated across each Power Platform application. End users gain access to custom-built apps for daily tasks, access reports, and dashboards leveraging Power BI for insights independently or embedded in an app. Also, end users are beneficiaries of automated workflows that simplify processes whether the automation is desktop-based or in the cloud.

- **Administrators:** Unlike developers who create and manage the applications, the administrator must ensure that the applications in the cloud apply the appropriate compliance, security, and data resources. Administrators oversee deployments of applications across one or more tenants, work to ensure authentication and authorization rights propagate from Microsoft 365 and Dynamics 365, and monitor the health of the application environment.

This book provides something for everyone, but the focus is on the true "power user" who has beginning-to-intermediate technical skills and wants to learn to develop solutions, analyze data, or administer the application.

Throughout the book, certain conventions have been used as a way to help power you through your journey.

- **Bold text** means that you're meant to type the text just as it appears in the book. The exception is when you're working through a steps list: Because each step is bold, the text to type is not bold.
- Web addresses and code snippets appear in `monofont`. If you are reading the digital edition of *Power Platform for Dummies,* you can click on these links, and they will take you to the intended URL in a jiffy.
- There are a few times when command sequences are presented using Power Platform's low-code language, Power Fx. In those cases, you'll sequence these steps similar to Tables ➪ New Table ➪ Create A New Table to create a new table in Dataverse from the Power Apps Maker Portal.
- Several images include black arrows, incorporate rectangles around a screen segment, or have a letter pointing to one or more application functions. This is done to help guide you to specific references made in the text.

To make the content more accessible, this book is divided into five parts:

- **Part 1, "Grasping Power Platform Foundations,"** is your entry point into learning the Power Platform. In Chapter 1, you explore terminology, and Chapters 2 and 3 cover administration and data concepts that are essential to building solutions.
- **Part 2, "Getting Your Power Apps Hat On,"** is your crash course into building canvas apps, model-driven apps, and portals, all built using a common construct, Power Apps.
- **Part 3, "Telling the Data Story with Power BI,"** takes you on a journey from data exploration and cleansing to visualization and sharing using Microsoft enterprise data analytics solution, Power BI.

- **Part 4, "Simplifying Workflows with Automation,"** introduces cloud and desktop workflow automation leveraging Power Automate. You'll get hands-on practice with basic exercises utilizing triggers, actions, flows (automated, instant, and scheduled), connectors, conditions, loops, and expressions, all of which are used to automate workflows between apps and services.
- **Part 5, "The Part of Tens,"** describes best practices and third-party resources many of the industry pros use when seeking help.

Foolish Assumptions

Diving into Microsoft Power Platform can be a bit intimidating at first because of its sprawling capabilities. Microsoft has designed the Power Platform to be a comprehensive suite for business analytics, app development, and process automation, with the goal that all users can engage with the platform. Reality check: There are many nuances that a newbie will not be able to handle out of the gate. Because the aim is to go beyond creating simple apps, workflows, and data insights, the breadth of Power Platform's offerings requires a bit of technical prowess and will sometimes feel daunting.

This book is crafted to guide end users through the critical features of the Power Platform, without assuming prior expertise or deep technical knowledge. This book is not a guide aimed at certification seekers or those looking to delve into the depths of platform administration or advanced development techniques. This is a true foundational concept book. For those areas, there are other resources more specifically suited to those purposes on the market. In *Microsoft Power Platform For Dummies*, I'll point you toward the official Microsoft documentation and other resources, when appropriate, where you can expand your understanding of specific technical details as needed. Remember, this book should serve as a roadmap for the beginning-to-intermediate developer wanting to get a taste of each major feature across the Power Platform. Also, the platform is ever-evolving; what is presented in the first edition of Power Platform for Dummies may vary slightly from your current user experience using each of the tools. Why is that? Microsoft is making updates to the user experience and functionality almost weekly (although sometimes it can even be more frequent), especially as they infuse Microsoft Copilot throughout the product. So, please don't be alarmed by the slight variations.

To ensure that you can follow along and make the most out of this book, I've based our journey on a few key assumptions about your starting point:

- **Access to Power Platform tools:** I assume that you've purchased a copy of Microsoft 365, which comes with many of the Power Platform suite applications, including Power Apps, Power Automate, and Power BI. To get more of the advanced features, I recommend procuring the Per User Premium licenses. While certain aspects of these tools are available for free, such as Power BI Desktop, comprehensive use of the platform often requires a paid subscription.
- **Internet connectivity:** This might seem straightforward, but it's crucial. All components of the Power Platform require an internet connection, as Power Platform is 100 percent cloud-based.
- **Engagement with a meaningful project:** The assumption here is that you have a project or a dataset that is significant and relevant to your work or interests. Throughout the book, I provide a thematic example and cite sample datasets. However, applying what you learn to your own real-world experiences greatly enhances your understanding and skills. A meaningful project should involve a dataset that is complex enough to challenge you but not so vast as to be unmanageable for learning purposes.
- **Basic understanding of your business processes:** I assume you have a basic understanding of the business processes you want to improve or automate. Power Platform is most powerful when applied to real-world scenarios, and having a grasp of the processes you want to enhance will greatly aid in learning to use the platform effectively.

If you are equipped with these foundational tools and knowledge, you will be better positioned to explore the more complex functionalities of Power Platform, turning the seemingly daunting into powerful solutions.

Icons Used in This Book

Throughout *Microsoft Power Platform For Dummies*, you see some icons along the way. Here's what they mean:

Tips help you identify shortcuts or ways to expedite the development and delivery of Power Platform solutions.

Remember icons help you identify the big concepts that you need to understand to be proficient in the use of Microsoft Power Platform. Consider these the equivalent of a foundation in the house.

The Technical Stuff icon calls attention to technical configurations, settings, or features that go beyond the low-code advertising Microsoft promotes with Power Platform.

Don't panic when you see the Warning icon. These warnings point out technical issues that may require closer attention on your part.

When a resource is available on the Web, particularly an indispensable one from Microsoft, you'll find a link recommending you check it out. Many of these links provide access to resources and code snippets that simply cannot be put in a *For Dummies* book.

Beyond the Book

In addition to the content you're reading in this book, you have access to a free Microsoft Power Platform Cheat Sheet. Similar to the structure of the book, the Cheat Sheet contains sections for Dataverse, Power Apps, Power Pages, Power BI, Power Automate, and Copilot for the Power Platform. To find the Cheat Sheet, go to `www.dummies.com` and enter **Microsoft Power Platform For Dummies** in the Search box.

Throughout this book, you are also directed to publicly available datasets and free utilities that can help accelerate your delivery of Power Platform solutions.

Where to Go From Here

Power Platform is meant to work as a complete solution, meaning all the applications support one another, but as you can guess, most users don't use it that way. That's why you can start at any chapter in this book, and you will be just fine. If you want to focus on data analytics only, head over to Part 3. If your mission is to learn about data-driven website development, see Chapter 8. The book has been written using a building blocks mentality, but if you need to jump around, go ahead and have fun. You won't be missing anything!

1

Grasping Power Platform Foundations

IN THIS PART . . .

Assess what you and your business can achieve with Power Platform.

Explore the Power Platform admin center and Power Apps Maker Portal.

Use Microsoft Dataverse to organize and secure large datasets, and create business process flows for model-driven apps.

IN THIS CHAPTER

- Recognizing the business value of Microsoft Power Platform
- Identifying the key components of Power Platform

Chapter 1
Touring the Power Platform

Until recently, only skilled technicians could develop software, provide data analytics, automate workflows, and work with artificial intelligence. Now, business technology tools, such as the tools that make up the Microsoft Power Platform suite, can help users of just about any skill level perform application development and data analysis. With these tools, you can develop enterprise solutions by using simple drag-and-drop interfaces — the tools do all the coding magic behind the scenes.

This chapter provides an overview of the capabilities included in Microsoft Power Platform. I discuss the benefits that Microsoft Power Platform's highly adaptable and open platform offers. The platform greatly simplifies business operations and allows for significant integration opportunities, not just across Microsoft applications, but for a broad range of enterprise vendors outside the Microsoft ecosystem.

Grasping the Power of Power Platform

Microsoft Power Platform is a suite of Microsoft tools that enables users of all skill levels to rapidly develop applications. You don't need to be a programmer to use these tools. You simply need to know how all the tools work together and have a strong sense of logical reasoning that you can apply.

Now, you might be wondering what I mean by a *suite.* Well, Power Platform includes a collection of tools within a single application: tools for application development, enterprise data analytics, workflow automation, virtual agent design, data connection deployment, and data platform design. The Microsoft 365 suite also bundles a collection of tools together: Word for document management, Excel for data analysis, PowerPoint for presentations, and Access for consumer-oriented database management.

Table 1-1 lists each tool included in Microsoft Power Platform and briefly describes its purpose. The section "Zooming into the Platform Features," later in this chapter, discusses each of Power Platform's tools, or *components,* in more detail.

TABLE 1-1 **Microsoft Power Platform Tool Capabilities**

Tool	Purpose
Power Apps	Low-code development tool to create custom business applications. Makes app creation more accessible and less time-consuming.
Power BI	A sophisticated tool for data visualization and business analytics. Users can create comprehensive reports and dashboards with a variety of charts and visuals.
Power Automate	Robust business process automation tool for the desktop and cloud, with a focus on operational efficiency.
Power Pages	A web design tool that you can use to create professional websites or public-facing portals without having to use code. Integrates with Power Apps, Power Automate, and Power BI.
Dataverse	A cloud-based data repository that enables users to store and manage data used by business applications such as Power Platform and Dynamics 365.

Benefiting from a low-code, no-code solution

Low-code, no-code development means that a developer, either professional or amateur, can design and develop a product for the Web by using a set of intuitive drag-and-drop tools that reduce or even eliminate the need for code. Sure, you need to bring your objects together on the application or *report canvas,* the area in which you design the low-code capability, by referencing specific parameters (using short *references* or code snippets). But by no means do you have to write a novella's worth of code just so a user can click a button or activate a drop-down menu. Those days are long gone.

REMEMBER

Unlike your traditional coders, Power Platform developers fall into two types — citizen developers and professional developers:

- **Citizen developer:** Knows enough to be dangerous when it comes to web development and their business, but has no professional training in developing complete software applications.
- **Professional developer:** Has many years of experience with programming languages that are available in Microsoft Visual Studio and understands more than just drag-and-drop capabilities. Professional developers are familiar with more than one programming language (such as C# and PowerShell) and frameworks (such as .NET Framework and ASP.NET).

Low-code platforms

Low-code platforms, such as Power Platform, provide pre-built components, templates, and drag-and-drop tools so that developers can reduce the amount of hand-coding they need to input to develop applications. Notice that I say reduce — you still likely need to do some hand-coding, even when you work in a highly visual environment for creating your end product, not just a glorified code editor.

If you work in the visual development environment of a low-code platform, you can drag and drop application components, such as check boxes, drop-down menus, labels, or galleries; connect them by using predefined workflows, data connections, or custom formulas; and configure each component's properties via logical units. Most developers do find, however, that they have to do some hand-coding to incorporate complex functionality or logic. More complicated coding practices might include using multistep logic, such as if-else or do-while logic.

Low-code platforms can help you with rapid development when you need to scale over time. Whether you're a professional developer who has decades of experience or an industry professional who needs to quickly create functional solutions, these platforms can assist. For example, industry professionals commonly want to convert a legacy .NET application into a model-driven Power Apps app. The datastore for the .NET app often takes the form of an Access or SQL Server database, which is then migrated to Dataverse. Although this process may seem straightforward, it often requires careful execution to ensure flawless conversion.

No-code platforms

No-code platforms eliminate the need for you, as the developer, to do any hand-coding, period. You don't need programming skills to use these platforms. You

simply drag, drop, and click, using a visual interface. No-code platforms offer pre-built templates that offer a wide array of out-of-the-box interfaces to help users configure applications. If you've ever used Microsoft Word (who hasn't?), created a table, and then saved your document as an HTML, you've effectively created a no-code document — ta-da!

Unlike low-code platforms (see the preceding section), where you might need to have some development skills to use them — hence users may shy away from those tools — no-code platforms enable just about anyone to get involved in the application development, data analytics, and workflow automation lifecycle. You just need to have an idea, generally know where to place the content, and then click a Save button. Essentially, most users who leverage a canvas app (which you can read about in the section "Power Apps," later in this chapter) follow that process in conjunction with the help of Microsoft 365 applications such as Excel (Microsoft's spreadsheet program), PowerPoint (its presentation program), and SharePoint (an online collaboration and content management offering).

Connecting with the Microsoft ecosystem and beyond

Microsoft made sure that every application in its enterprise lineup works with Microsoft Power Platform, and you can use them all without having the skills of a lifelong coder.

And believe me, Microsoft isn't alone in its quest to move away from requiring users to have deep technical know-how. The industry is leaning overall toward a focus on allowing business users to be more efficient in their ability to develop applications, analyze data, and automate their business operations. In its marketing, Microsoft showcases hundreds of ways that businesses can effectively use Microsoft products, but here are three takeaways I think are worth pointing out:

- **Business application productivity:** With Power Platform, you can easily integrate with Microsoft 365 (formerly Office 365) applications such as Word (Microsoft's word processor), Excel (its spreadsheet software), PowerPoint (presentation software), Outlook (its e-mail service), and SharePoint (Microsoft's spot for online content storage) to create business workflows, analyze data created from defined lists, or create small applications from structured datasets.

  For example, you can go to the Automate menu in Excel to trigger Workflows or the Integrate menu in SharePoint to execute Power Platform functionality with one click. It's that easy.

- **Enterprise applications:** Dynamics 365 is Microsoft's suite of enterprise resource planning (ERP) and customer relationship management (CRM) applications. A developer can create customer forms for either the ERP or CRM application suite, establish business workflows when a user enters specific data into the system, or curate highly graphical reporting to augment data stored in the applications without much programmatic effort.
- **Cloud computing connectivity:** Power Platform utilizes Microsoft's cloud platform, Azure, for advanced features. For example, Azure Logic Apps supports the creation of advanced workflow automation, and Azure AI services enhance intelligent application capabilities, including integration with Microsoft Copilot (Microsoft's AI-powered digital assistant).

Microsoft offers one of the most comprehensive security, compliance, and governance solution sets. Applications built by using Power Platform benefit from Azure's robust security features, including those that are low-code and no-code (which I talk about in the section "Benefiting from a low-code, no-code solution," earlier in this chapter). Additionally, administrators of Power Platform applications can govern and monitor their applications by using a wide range of compliance and governance tools built right into the Microsoft 365 console.

Zooming into the Platform Features

Microsoft Power Platform, as illustrated in Figure 1-1, provides a unified application platform designed to streamline business processes, improve data visualization, and simplify application development within the Microsoft ecosystem. The top row displays each of the Power Platform applications. These applications can connect to other data sources in one of three ways:

- Connecting to Microsoft and third-party data connectors to push and pull data
- Using Microsoft's own Dataverse data repository
- Integrating with one or more Microsoft AI services, such as Copilot, to assist users in automating workflows, generating insights, and building applications more efficiently through natural language interactions

All of these Power Platform applications require access to data for them to work successfully.

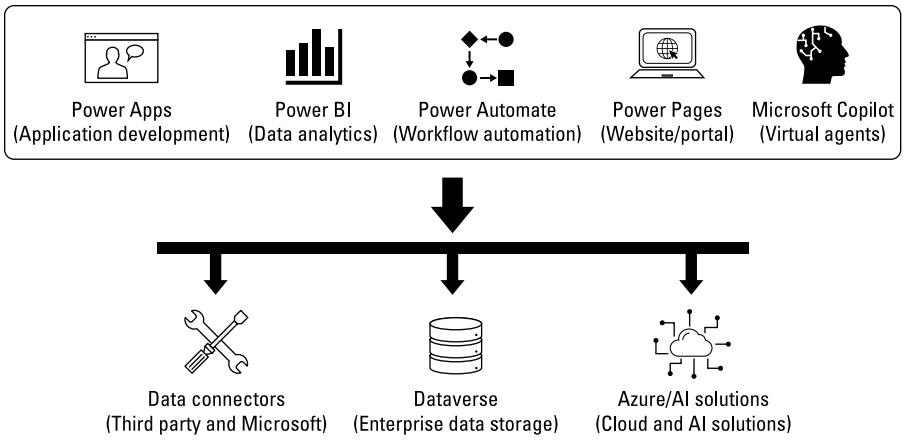

FIGURE 1-1: Microsoft Power Platform components and capabilities.

TECHNICAL STUFF

Microsoft has integrated some low-code programming languages (see the section "Low-code platforms," earlier in this chapter) into Power Platform:

- **Power Fx (Power Platform's low-code programming language):** Allows users to define logic and automate functionality across the platform by using simple, Excel-like formulas to manipulate data, trigger actions, and call parameters.
- **DAX (Data Analysis Expressions):** Used specifically in Power BI (discussed in Part 3 of this book), DAX is a collection of functions and operators that you can combine to create formulas and expressions for performing advanced data analysis and reporting. It allows users to manipulate and analyze data within Power BI, enhancing reporting capabilities.

Microsoft Power Platform applications allow access to almost every enterprise relational database player in the market; not just Power BI, but also SQL Server, Oracle, DB2, MySQL, PostgreSQL, Sybase, and Amazon Redshift, to name a few.

Power Apps

The cornerstone of Power Platform is the Power Apps tool, which enables users to build custom apps without requiring traditional coding. By using the Power Apps tool, you can speed up the delivery of customized applications at a fraction of the cost of traditional development because you don't need a team of data and design experts. I talk about Power Pages, the external portal functionality that you can derive from Power Apps, in the section "Power Pages," later in this chapter, and in Part 2 of this book.