

Excel BI and Dashboards in 7 Days

*Build interactive dashboards for
powerful data visualization and insights*

Jared Poli



www.bpbonline.com

First Edition 2024

Copyright © BPB Publications, India

ISBN: 978-93-55519-467

All Rights Reserved. No part of this publication may be reproduced, distributed or transmitted in any form or by any means or stored in a database or retrieval system, without the prior written permission of the publisher with the exception to the program listings which may be entered, stored and executed in a computer system, but they can not be reproduced by the means of publication, photocopy, recording, or by any electronic and mechanical means.

LIMITS OF LIABILITY AND DISCLAIMER OF WARRANTY

The information contained in this book is true to correct and the best of author's and publisher's knowledge. The author has made every effort to ensure the accuracy of these publications, but publisher cannot be held responsible for any loss or damage arising from any information in this book.

All trademarks referred to in the book are acknowledged as properties of their respective owners but BPB Publications cannot guarantee the accuracy of this information.

To View Complete
BPB Publications Catalogue
Scan the QR Code:



Dedicated to

My beloved wife:

Laura

and

My daughter April

About the Author

Jared Poli is an enthusiastic designer of BI solutions and data analytics with ten years of experience in the industry.

He has worked with a wide range of stakeholders across all levels of seniority and has extensive experience in tailoring solutions to meet that range of demands. He has knowledge utilizing a skill set built up of many of the popular BI tools in the market today. He has years of experience as an Excel expert, using it to deliver everything from dashboards to automation tools. He has delivered function-wide Excel training to colleagues of various technical backgrounds. He is effective at tailoring training to the skill level and proficiency of the trainees, maximizing the understanding and value takeaway for what is delivered.

Jared is passionate about Excel and considers it the kind of tool anybody can use, being flexible enough to do just about anything you can imagine. For example, he's used it for budget tracking and baby planning and even made a mastermind and sudoku generator!

About the Reviewers

- ❖ **Juan Sebastian Osorio Ospina** seamlessly integrates his roles as an innovation and entrepreneurship consultant and educator. As a professor at La Colegiatura, he shares his extensive knowledge in data science and innovation processes with the next generation of aspiring professionals. Juan Sebastian holds a degree in public accounting and brings a robust financial perspective to his technical assessments.

With over eight years of hands-on experience, he has actively contributed to projects challenging traditional business models. Currently, Juan Sebastian is deeply involved in freelance work, collaborating with various startups and small enterprises. His expertise in business intelligence and data management proves pivotal in enabling these ventures to leverage data for strategic decision-making.

Outside the professional realm, Juan Sebastian enjoys reading thrillers, expressing himself through storytelling as an art form, and conquering mountains. In all these activities, he seamlessly applies his data knowledge to enhance personal growth and contribute to improving his environment.

- ❖ **Staci Warne** is a highly skilled Microsoft Certified Trainer (MCT), Project Management Professional (PMP), and a published author with over 25 years of experience training individuals at all skill levels. She obtained her MCT certification in 2008 and holds an array of other certifications such as Microsoft Certified Professional (MCP) and Microsoft Office Master Instructor, Ic3 Internet and Core computer instructor, Modern Classroom Certified Trainer (MCCT) and most recently Certified AI Specialist (CAIS). She has been a Financial Analyst, lead technology trainer for the Federal Reserve Bank of San Francisco, and technology trainer at CompUSA. Staci provides quality training to thousands of business, military, and corporate professionals in all industries. Her most immense joy in the classroom comes from seeing the students have those Aha moments when learning a new tool they never knew was available. Staci's style is not to train out of the book but to offer individual insights and augment course materials with her tips and tricks to meet your needs.

Acknowledgement

I want to express my sincere gratitude to my family and friends for their steadfast support and advice and for the unwavering patience of my wife, Laura, and daughter, April.

I am also grateful to BPB Publications for their guidance and expertise in bringing this book to fruition. It was a long journey of revising this book, with valuable participation and collaboration of reviewers, technical experts, and editors.

I would also like to acknowledge the valuable contributions of my excellent colleagues and co-workers during many years working in the tech industry, who have taught me so much and provided valuable feedback on my work, and for my supportive managers, who have allowed me to nurture my skills under their leadership and guidance (especially Alistair and Kat).

Finally, I would like to thank all the readers who have taken an interest in my book and for their support in making it a reality. Your encouragement has been invaluable.

Preface

Everyone thinks of Excel differently, and its full potential is often untapped. Businesses tend to decide to invest heavily in proper BI tools, assuming that Excel has a minimal role in that industry. This perception is wrong!

Excel can be used effectively to collect, refresh, transform, and visualize your data in beautiful and eye-catching ways. This book covers building those skills and unlocking Excel and your potential in just seven days.

Understanding the full power behind Excel will allow you to improve your spreadsheet game and prove that you can do it all with one industry standard tool and this book.

This book is for everyone who wants to be a powerful user of Excel and leverage its tools for maximum data insight. It is a highly attractive book for finance teams, sales and marketing teams, MIS Analysts, BI aspirants, and all those who work with Excel sheets daily and want to refine that skill set into something more practical. Aimed at those with the most basic understanding of Excel, focusing on dashboard building— if you can open a spreadsheet, then start here!

The book breaks down the dashboard development into distinct sections, allowing the reader to understand the building blocks of what constructs their dashboard, from data to delivery.

Chapter 1: Getting Started with Data Management Techniques – It begins by setting out the basic understanding of using a spreadsheet for data manipulation and some core techniques behind Excel navigation and use.

Chapter 2: Aggregating and Summarizing Data – It deepens the understanding of Excel for data manipulation, explaining how to take our large data sheets and turn that unintelligible grid into some meaningful summaries.

Chapter 3: Using Charts to Visualize Data – It introduces taking our consolidated figures and demonstrating how they can be visualized

differently to communicate information, gaining a basic understanding of Excel's charting tools.

Chapter 4: Organizing and Customizing Your Excel Dashboard – It takes the reader through setting up the controls and interactions a user will make when interacting with our dashboards.

Chapter 5: Refining the Component Look – It will take what we have learned thus far and add some consistency to the visual elements, covering other enhancements we can make that will add appeal and ease of use to our layouts.

Chapter 6: Designing the Dashboard – It takes the principles of visuals, interactions, and other design components and brings them together concerning layout and content, thinking about how our content will sit on a page.

Chapter 7: Maintaining and Refreshing Your Dashboard – It finishes the learning by bookending the development and wrapping things up with documentation and refresh techniques.

Chapter 8: Dashboard Case Studies - We will dive into a few worked examples of dashboards from data and see how we can use the skills developed in this book to convert a data spreadsheet into a dashboard conveying meaningful and usable information.

Coloured Images

Please follow the link to download the
Coloured Images of the book:

<https://rebrand.ly/92yxn8a>

We have code bundles from our rich catalogue of books and videos available at **<https://github.com/bpbpublications>**. Check them out!

Errata

We take immense pride in our work at BPB Publications and follow best practices to ensure the accuracy of our content to provide with an indulging reading experience to our subscribers. Our readers are our mirrors, and we use their inputs to reflect and improve upon human errors, if any, that may have occurred during the publishing processes involved. To let us maintain the quality and help us reach out to any readers who might be having difficulties due to any unforeseen errors, please write to us at :

errata@bpbonline.com

Your support, suggestions and feedbacks are highly appreciated by the BPB Publications' Family.

Did you know that BPB offers eBook versions of every book published, with PDF and ePub files available? You can upgrade to the eBook version at www.bpbonline.com and as a print book customer, you are entitled to a discount on the eBook copy. Get in touch with us at :

business@bpbonline.com for more details.

At **www.bpbonline.com**, you can also read a collection of free technical articles, sign up for a range of free newsletters, and receive exclusive discounts and offers on BPB books and eBooks.

Piracy

If you come across any illegal copies of our works in any form on the internet, we would be grateful if you would provide us with the location address or website name. Please contact us at **business@bpbonline.com** with a link to the material.

If you are interested in becoming an author

If there is a topic that you have expertise in, and you are interested in either writing or contributing to a book, please visit **www.bpbonline.com**. We have worked with thousands of developers and tech professionals, just like you, to help them share their insights with the global tech community. You can make a general application, apply for a specific hot topic that we are recruiting an author for, or submit your own idea.

Reviews

Please leave a review. Once you have read and used this book, why not leave a review on the site that you purchased it from? Potential readers can then see and use your unbiased opinion to make purchase decisions. We at BPB can understand what you think about our products, and our authors can see your feedback on their book. Thank you!

For more information about BPB, please visit **www.bpbonline.com**.

Join our book's Discord space

Join the book's Discord Workspace for Latest updates, Offers, Tech happenings around the world, New Release and Sessions with the Authors:

<https://discord.bpbonline.com>



Table of Contents

| | |
|--|-----------|
| 1. Getting Started with Data Management Techniques..... | 1 |
| Introduction..... | 1 |
| Structure..... | 2 |
| Objectives..... | 2 |
| Tables and ranges..... | 2 |
| Basic formula to enhance our data..... | 5 |
| Advanced lookup formula to enhance our data..... | 11 |
| Cleaning the data with tools..... | 20 |
| Saving time with keyboard shortcuts..... | 29 |
| Power Query for advanced data table manipulation..... | 30 |
| Freezing panes for easier viewing..... | 35 |
| Data formats..... | 37 |
| Understanding copy-paste..... | 37 |
| Ensuring data compliance with requirements..... | 42 |
| Conclusion..... | 42 |
| 2. Aggregating and Summarizing Data..... | 43 |
| Introduction..... | 43 |
| Structure..... | 43 |
| Objectives..... | 44 |
| Cell names and name ranges..... | 44 |
| Pivot tables..... | 47 |
| Grouping data in pivot tables..... | 55 |
| Pivot tables calculated fields..... | 56 |
| Referencing from a pivot table..... | 58 |
| Aggregation formula..... | 59 |
| The data model..... | 63 |
| Power query aggregation..... | 66 |

| | |
|---|------------|
| Conclusion | 68 |
| 3. Using Charts to Visualize Data..... | 69 |
| Introduction..... | 69 |
| Structure..... | 70 |
| Objectives..... | 70 |
| Charting basics..... | 70 |
| Selecting and changing chart data | 76 |
| Formatting charts..... | 78 |
| Pivot charts and normal charts..... | 85 |
| Advanced data labels..... | 87 |
| Basic analytical enhancements..... | 89 |
| Conclusion | 91 |
| 4. Organizing and Customizing Your Excel Dashboard | 93 |
| Introduction..... | 93 |
| Structure..... | 93 |
| Objectives..... | 94 |
| Slicers and timelines..... | 94 |
| Formatting Slicers and timelines | 100 |
| Adapting controls for multiple visuals | 102 |
| Data validation and developer controls | 103 |
| Single data point summaries..... | 109 |
| Print area | 112 |
| Object alignment for consistent layout..... | 113 |
| Conclusion | 115 |
| 5. Refining the Component Look | 117 |
| Introduction..... | 117 |
| Structure..... | 117 |
| Objectives..... | 118 |
| Design standards | 118 |

| | |
|---|------------|
| Colors | 119 |
| Iconography..... | 124 |
| Prettifying a table..... | 126 |
| The camera tool..... | 129 |
| Conclusion | 130 |
| 6. Designing the Dashboard..... | 133 |
| Introduction..... | 133 |
| Structure..... | 133 |
| Objectives..... | 134 |
| An introduction to Dashboards..... | 134 |
| Layout principles | 136 |
| Visual layout advice | 140 |
| Indicators for performance monitoring..... | 143 |
| Understanding stakeholders..... | 144 |
| Judging page success..... | 145 |
| Linking between tabs | 146 |
| Conclusion | 148 |
| 7. Maintaining and Refreshing Your Dashboard | 149 |
| Introduction..... | 149 |
| Structure..... | 149 |
| Objectives..... | 150 |
| Taking notes..... | 150 |
| Supporting documentation | 151 |
| Reference page | 152 |
| Refreshing data | 153 |
| Workbook and worksheet protection | 155 |
| Conclusion | 159 |
| 8. Dashboard Case Studies | 161 |
| Introduction..... | 161 |

Structure.....161

Objectives.....161

Dashboard #1: Electric vehicles in Washington162

Dashboard #2: Vehicle collisions165

Dashboard #3: HR data.....171

Conclusion180

Index181-183

CHAPTER 1

Getting Started with Data Management Techniques

Introduction

In this chapter, we cover enhancing your data, adding important calculated information, and cleaning up what we start with. On its own, inputting data is not enough. Getting the data clean, concise, and relevant will be the foundation for building our final product. We will discuss how to decide what needs to be done and consider how the work will shape our development.

After addressing the data, structure, formatting, and any columns we need to add, we will look at power pivot for handling table manipulations that are difficult to cover with conventional methods or things that we could only achieve with Power Pivot. We will also cover more advanced formulas to give the reader a comprehensive understanding, such as **VLOOKUP** vs. **INDEX MATCH**, when to use them, and explain why we chose this over working in Power Pivot.

We will assume that at this stage in your work, you would have a task in mind or a business problem to solve and have your data available. You will have engaged with your stakeholders to understand what they are looking for from your dashboard. These conversations are essential when dashboarding, as we must ensure that what we build is fit for purpose. In some cases, you

may be the subject matter expert on the data, but it is always worth getting the opinions of your dashboard users to check what they consider essential to be successful in their roles. Maintaining alignment with the objectives of your stakeholders will not only improve the reception of your product but also speed up the development process at each level because you will know more clearly why and for what purposes you are making decisions and improving your data.

Structure

In this chapter, we will cover the following topics:

- Tables and ranges
- Basic formula to enhance our data
- Advanced lookup formula to enhance our data
- Cleaning the data with tools
- Saving time with keyboard shortcuts
- Power Query for advanced data table manipulation
- Freezing panes for easier viewing
- Data formats
- Understanding copy-paste
- Ensuring data complies with requirements

Objectives

By the end of this chapter, you will be equipped with the core techniques to manipulate, transform, and restructure your data in Excel. You will understand how to use simple and more advanced formulas to add additional columns to your data, either through calculation or reference from other data tables.

You will consider and understand the purpose of our actions in this chapter and how they will support us with the work in the following chapters when building a dashboard.

Tables and ranges

The first thing you would be greeted with when opening a data spreadsheet is data; however, how Excel stores information on the sheet can affect our work.

Traditionally, when you start with a blank worksheet to input some data, you work with the cells, rows, and columns as they are. Once you have completed your data input, we will refer to this data as a range. A range of data does not have any particular implications in Excel. It is how we refer to the table size on the spreadsheet. For example, see *Figure 1.1*:

| | A | B | C | D | E |
|----|-------------|---------------|-------------|---------------|--------------|
| 1 | OrderNumber | Sales Channel | Online Sale | WarehouseCode | ProcuredDate |
| 2 | SO - 000101 | In-Store | Not Online | WARE-UHY1004 | 31/12/2017 |
| 3 | SO - 000102 | Online | Online | WARE-NMK1003 | 31/12/2017 |
| 4 | SO - 000103 | Distributor | Not Online | WARE-UHY1004 | 31/12/2017 |
| 5 | SO - 000104 | Wholesale | Not Online | WARE-NMK1003 | 31/12/2017 |
| 6 | SO - 000105 | Distributor | Not Online | WARE-NMK1003 | 10/04/2018 |
| 7 | SO - 000106 | Online | Online | WARE-PUJ1005 | 31/12/2017 |
| 8 | SO - 000107 | In-Store | Not Online | WARE-XYS1001 | 31/12/2017 |
| 9 | SO - 000108 | In-Store | Not Online | WARE-PUJ1005 | 10/04/2018 |
| 10 | SO - 000109 | In-Store | Not Online | WARE-PUJ1005 | 31/12/2017 |
| 11 | SO - 000110 | In-Store | Not Online | WARE-UHY1004 | 31/12/2017 |
| 12 | SO - 000111 | Distributor | Not Online | WARE-XYS1001 | 31/12/2017 |
| 13 | SO - 000112 | In-Store | Not Online | WARE-NMK1003 | 10/04/2018 |
| 14 | SO - 000113 | In-Store | Not Online | WARE-PUJ1005 | 10/04/2018 |
| 15 | SO - 000114 | In-Store | Not Online | WARE-PUJ1005 | 10/04/2018 |
| 16 | SO - 000115 | In-Store | Not Online | WARE-NMK1003 | 31/12/2017 |
| 17 | SO - 000116 | In-Store | Not Online | WARE-MKL1006 | 31/12/2017 |
| 18 | SO - 000117 | In-Store | Not Online | WARE-PUJ1005 | 10/04/2018 |
| 19 | SO - 000118 | In-Store | Not Online | WARE-XYS1001 | 10/04/2018 |
| 20 | SO - 000119 | In-Store | Not Online | WARE-MKL1006 | 10/04/2018 |
| 21 | SO - 000120 | Online | Online | WARE-NMK1003 | 31/12/2017 |
| 22 | SO - 000121 | Wholesale | Not Online | WARE-NMK1003 | 10/04/2018 |
| 23 | SO - 000122 | In-Store | Not Online | WARE-PUJ1005 | 10/04/2018 |
| 24 | SO - 000123 | In-Store | Not Online | WARE-XYS1001 | 10/04/2018 |

Figure 1.1: A range of data

In this example, our range of data spans from cell A1 to cell G25. The other way that Excel can store our data for us is as a table. When dealing with a table, Excel takes care of naming, referencing, formatting, and many other helpful aspects that we might have to complete when working with a range manually.

In some cases, you would use both; a range is easy to work with, and Excel will make no assumptions about our intentions. We have complete control and work with the sheet on a cell-by-cell basis. In contrast, a table allows Excel to understand the size of our data, and it will make assumptions as we work out our intent. An example of this would be adding a new column of data. When we add the column, the size of the table will change. If we were to type a formula into the first cell of the new column, Excel would automatically populate the rest of the columns with the equivalent formula for each row. You can see how useful this can be, and it can save us lots of needless clicks, as we would have to do with a range. The main benefit of a range is its simplicity, which is precisely what you see on the spreadsheet using Row/Column referencing.

Now that we have discussed the differences, we will cover several ways to convert a range to a table. You must select your range by highlighting all cells in your data, then navigate to the Insert ribbon. Click the **Table** button (Figure 1.2). In the pop-up, you will see the selected range displayed and an option for headers:

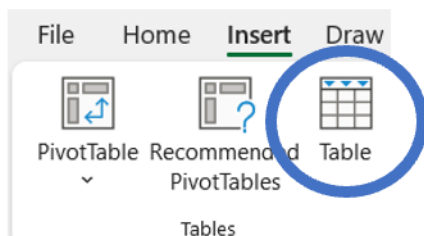


Figure 1.2: The table button

Clicking **OK** here will complete the setup (Figure 1.3):

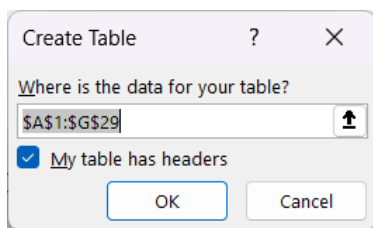


Figure 1.3: The table pop-up dialogue

Other methods involve clicking the table button before selecting the cells and selecting your range after the pop-up appears. If we click one cell in our data, Excel will often assume the range of our data for us when clicking the table button. If you create a table like this, ensure that the range in the pop-up is what you expect. Finally, instead of clicking the table button, you can use the Windows keyboard shortcut **Ctrl + T** to convert a range to a table quickly. Remember that a table must have a title in the first row of each column (Excel will fill these generically if none are available). These should be meaningful to the content of each column to aid with your analysis.

If you want to convert your table back to a range, right-click anywhere in your data table, then select **Table | Convert to the range**. This will remove all the table referencing, but the range of data will persist in the style formatting of the table.

A final note on tables: Excel will format them, removing them from a classic blank spreadsheet's white and grey pattern. The default will be blue, with the rows being banded. You can change the theme or revert to the classic design

using the table styles under the Table Design ribbon, which is visible when selecting any cell within your table (Figure 1.4).

It should be noted that any data created by Power Query will always be returned as a table, and it is usually advisable to leave it as such, which will be discussed in detail further on:

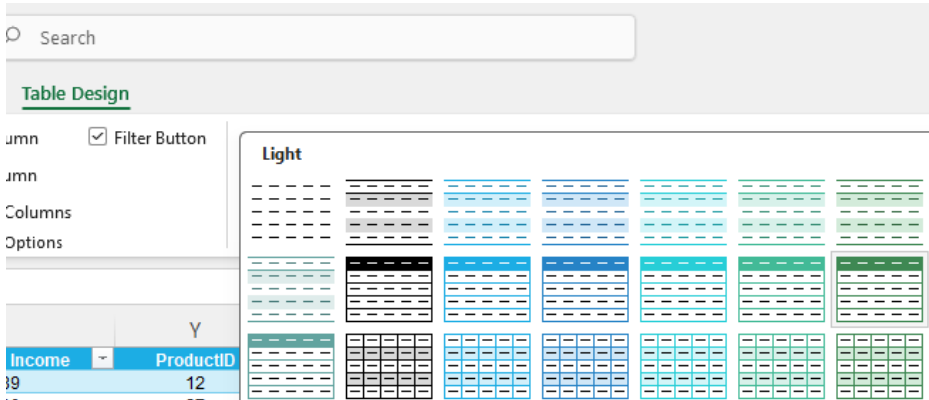


Figure 1.4: Table design; see the top left option for unformatted style

Basic formula to enhance our data

Now that we understand how our data sits on the sheet, we can start by enhancing our data, using basic formulas to add additional columns. We will be working through a sales report example throughout this book.

In this first example, we have two columns **OrderDate** and **DeliveryDate**. A useful column may be **DaystoDelivery**, which we can use to measure our order fulfillment speed.

The first thing will be deciding where your data will sit, either next to the dependent columns or at the end of your data. It generally makes sense to keep similar columns of information grouped, and it can be useful to put new columns in place near where the columns dependent for those calculations are. However, sometimes placing them at the end will be more suitable. One example would be copying and pasting data into the sheet from another source and adding additional columns. In this case, a column in the middle will interfere with the correct placement of your data when pasting. This method is generally ineffective, and good use of Power Query can help streamline copy-paste data activities, which we will cover further on.

To add our column, right-click the column header to the right of the column we want our data to sit next to and select **Insert**. A new column will be