Power BI Fundamentals to Advanced Dashboards

A Complete Guide for Weeks 5 & 6

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Week 5: Fundamentals, Data Import, and Basic Visualisations

Learning Objectives

By the end of Week 5, you will:

- Understand Power BI Desktop interface and core components
- Import data from various sources including databases, Excel files, and web services
- Transform and clean data using Power Query Editor
- Create fundamental visualisation types
- Build your first basic dashboard

Getting Started with Power BI

What is Power BI?

Power BI is Microsoft's business analytics solution that enables you to visualise data and share insights across your organisation. It consists of:

- **Power BI Desktop**: Windows application for creating reports
- **Power BI Service**: Cloud-based service for sharing and collaboration
- **Power BI Mobile**: Mobile apps for iOS, Android, and Windows

Power BI Desktop Interface Overview

Main Components:

1. **Ribbon**: Contains commands and tools organised in tabs (Home, Insert, Modelling, View)
2. **Canvas**: Central area where you build your reports
3. **Visualisations Pane**: Contains chart types and formatting options
4. **Fields Pane**: Shows available data fields and tables
5. **Filters Pane**: Manages report, page, and visual-level filters

Three Main Views:

- **Report View**: Design and create visualisations
- **Data View**: Examine your data in tabular format
- **Model View**: Manage relationships between tables

Data Import and Connection

Supported Data Sources

Power BI connects to numerous data sources:

File Sources:

- Excel workbooks (.xlsx, .xlsm)
- CSV files
- XML files
- JSON files
- PDF files

Database Sources:

- SQL Server
- MySQL
- PostgreSQL
- Oracle Database
- SQLite

Cloud Services:

- SharePoint Online
- OneDrive for Business
- Google Analytics
- Salesforce
- Azure services

Web Sources:

- Web pages (HTML tables)
- REST APIs
- OData feeds

Getting Data Process

Step 1: Connect to Data Source

```
1. Click "Get Data" on Home ribbon
2. Select your data source type
3. Provide connection details
4. Authenticate if required
```

Step 2: Preview and Select Data

```
1. Power Query Editor opens with data preview
2. Select tables or sheets to import
3. Review data quality indicators
4. Click "Transform Data" or "Load"
```

Step 3: Data Loading Options

- **Load**: Import data directly into Power BI
- **Transform Data**: Open Power Query Editor for cleaning
- **Load To**: Choose specific destination (Data Model, Worksheet)

Connection Modes

Import Mode:

- Data copied into Power BI file
- Faster performance for visualisations
- Limited by file size and memory
- Requires data refresh for updates

DirectQuery Mode:

- Queries sent to source database in real-time
- Always shows current data
- Performance depends on source database
- Limited transformation capabilities

Live Connection:

- Direct connection to Analysis Services or Power BI datasets
- No data import or DirectQuery overhead
- Limited to specific data sources

Data Transformation with Power Query

Power Query Editor Interface

Components:

1. **Query Pane**: Lists all queries and data sources
2. **Data Preview**: Shows sample data with column profiling
3. **Query Settings**: Displays applied transformation steps
4. **Ribbon**: Contains transformation commands

Common Data Transformations

Column Operations:

```
Remove Columns: Select columns → Right-click → Remove
Rename Columns: Double-click column header
Change Data Type: Select column → Data Type dropdown
```

Row Operations:

```
Remove Top Rows: Home → Remove Rows → Remove Top Rows
Remove Blank Rows: Home → Reduce Rows → Remove Blank Rows
Filter Rows: Click dropdown arrow in column header
```

Text Transformations:

```
Split Column: Select column → Transform → Split Column
Merge Columns: Select columns → Transform → Merge Columns
Extract Text: Transform → Extract → First Characters/Last Characters
Clean Text: Transform → Format → Trim/Clean/Upper/Lower Case
```

Date Transformations:

```
Parse Dates: Transform → Date & Time Column → Parse
Extract Date Parts: Transform → Date & Time Column → Date/Year/Month/Day
Calculate Age: Add Column → Date & Time Column → Age
```

Conditional Columns:

```
Add Column → Conditional Column
Define conditions using IF-THEN logic
Apply to create calculated fields
```

Data Quality Assessment

Column Quality Indicators:

- **Green**: Valid values percentage
- **Red**: Error values percentage
- **Grey**: Empty values percentage

Column Distribution:

- Shows unique vs distinct values
- Identifies potential data issues
- Helps understand data patterns

Column Profile:

- Detailed statistics for selected column
- Value distribution histogram
- Min, max, average values

Creating Basic Visualisations

Fundamental Chart Types

Bar and Column Charts

- **Use for**: Comparing categories
- **Best Practice**: Sort by value for clarity
- **Variations**: Clustered, stacked, 100% stacked

```
Creating a Column Chart:
1. Select Column chart from Visualisations pane
2. Drag category field to Axis
3. Drag numeric field to Values
4. Format colours and labels as needed
```

Line Charts

- **Use for**: Showing trends over time
- **Best Practice**: Start Y-axis at zero unless showing variance
- **Variations**: Line, area, stacked area

```
Creating a Line Chart:
1. Select Line chart from Visualisations pane
2. Drag date/time field to Axis
3. Drag numeric field to Values
4. Add multiple lines by dragging fields to Legend
```

Pie and Donut Charts

- **Use for**: Part-to-whole relationships with few categories
- **Best Practice**: Limit to 5-7 categories maximum
- **When to avoid**: Many small slices, comparing values

Tables and Matrices

- **Tables**: Show detailed records
- **Matrices**: Cross-tabulation with row and column groupings
- **Best Practice**: Use conditional formatting for insights

Cards and KPIs

- **Cards**: Display single important numbers
- **Multi-row cards**: Show related metrics together
- **KPI visuals**: Show performance against targets

Visual Formatting Principles

Colour Usage:

- Use consistent colour schemes
- Employ semantic colours (red for negative, green for positive)
- Consider colour-blind accessibility
- Limit colour palette to 3-5 colours

Text and Labels:

- Use clear, descriptive titles
- Format numbers appropriately (thousands, percentages)
- Enable data labels when they add value
- Ensure text is readable at different screen sizes

Layout and Spacing:

- Align visualisations to grid
- Maintain consistent spacing
- Group related visuals together
- Leave adequate white space

Hands-on Lab Session 1

Lab Exercise: Northwind Traders Sales Analysis

Objective: Create a basic sales dashboard using the Northwind database

Dataset: Northwind traders sample database (provided in course materials)

Part 1: Data Import and Preparation

Task 1.1: Connect to Data Source

```
1. Open Power BI Desktop
2. Click "Get Data" → "Database" → "MySQL"
3. Connect to provided Northwind database
4. Select all tables for import
```

Task 1.2: Data Exploration

```
1. Switch to Data View
2. Examine each table structure:
   - Customers: Customer information
   - Orders: Order headers with dates
   - OrderDetails: Order line items
   - Products: Product catalog
   - Categories: Product categories
   - Employees: Sales staff information
```

Task 1.3: Data Quality Check

```
1. Switch to Model View
2. Verify table relationships
3. Check for missing relationships:
   - Orders → Customers (CustomerID)
   - Orders → Employees (EmployeeID)
   - OrderDetails → Orders (OrderID)
   - OrderDetails → Products (ProductID)
   - Products → Categories (CategoryID)
```

Part 2: Basic Visualisations

Task 2.1: Sales Overview Dashboard

Create a new report page titled "Sales Overview"

Visual 1: Total Sales Card

```
1. Add Card visual
2. Create measure: Total Sales = SUM(OrderDetails[Quantity]) *
SUM(OrderDetails[UnitPrice])
3. Format as currency
4. Add descriptive title
```

Visual 2: Sales by Category (Pie Chart)

```
1. Add Pie chart
2. Legend: Categories[CategoryName]
3. Values: [Total Sales] measure
4. Enable data labels showing percentages
```

Visual 3: Monthly Sales Trend (Line Chart)

```
1. Add Line chart
2. Axis: Orders[OrderDate] (by Month/Year)
3. Values: [Total Sales] measure
4. Format axis to show months clearly
```

Visual 4: Top 10 Products (Bar Chart)

```
1. Add Clustered bar chart
2. Axis: Products[ProductName]
3. Values: [Total Sales] measure
4. Apply Top N filter for top 10 products
5. Sort descending by sales value
```

Task 2.2: Geographic Analysis

Create a new report page titled "Geographic Analysis"

Visual 1: Sales by Country (Map)

```
1. Add Map visual
2. Location: Customers[Country]
3. Size: [Total Sales] measure
4. Format bubble sizes and colours
```

Visual 2: Country Sales Table

```
1. Add Table visual
2. Columns: Customers[Country], [Total Sales]
3. Sort by Total Sales descending
4. Apply conditional formatting to highlight top performers
```

Part 3: Interactive Features

Task 3.1: Add Slicers

```
1. Add Date slicer for Orders[OrderDate]
2. Add Category slicer for Categories[CategoryName]
3. Add Employee slicer for Employees[FirstName] + [LastName]
4. Test interactions between slicers and visuals
```

Task 3.2: Cross-Filtering

```
1. Test clicking on pie chart segments
2. Observe how other visuals filter automatically
3. Modify interaction settings if needed
```

Part 4: Formatting and Polish

Task 4.1: Dashboard Formatting

```
1. Apply consistent colour theme
2. Align all visuals to grid
3. Add report title and page titles
4. Format number displays consistently
5. Add company logo if available
```

Task 4.2: Performance Optimisation

```
1. Check query reduction settings
2. Verify visual loading performance
3. Optimise any slow-loading visuals
```

Week 6: Advanced Dashboards, Reports, and Publishing

Learning Objectives

By the end of Week 6, you will:

- Create sophisticated visualisations using advanced chart types
- Design professional dashboards following best practices
- Implement interactive features and drill-through capabilities
- Publish reports to Power BI Service
- Configure sharing and security settings

Advanced Visualisation Techniques

Custom Visuals and Marketplace

AppSource Custom Visuals:

- **Bullet Chart**: KPI tracking with targets
- **Word Cloud**: Text frequency visualisation
- **Gantt Chart**: Project timeline management
- **Sankey Diagram**: Flow visualisation
- **Radar Chart**: Multi-dimensional comparisons

Installing Custom Visuals:

```
1. Click "..." in Visualisations pane
2. Select "Get more visuals"
3. Browse AppSource marketplace
4. Click "Add" for desired visuals
5. Visual appears in Visualisations pane
```

Advanced Chart Configurations

Combo Charts

```
Purpose: Combine different chart types
Use case: Sales values (columns) vs Growth rate (line)
Configuration:
1. Add Clustered column chart
2. Add field to Line values
3. Configure secondary Y-axis
4. Format both chart elements
```

Waterfall Charts

```
Purpose: Show cumulative effect of sequential values
Use case: Budget vs Actual analysis
Configuration:
1. Category: Budget line items
2. Y-axis: Variance amounts
3. Breakdown: Positive/Negative variance
```

Funnel Charts

```
Purpose: Show progressive reduction through stages
Use case: Sales pipeline, conversion analysis
Configuration:
1. Group: Process stages
2. Values: Count or amount at each stage
```

DAX Measures for Advanced Analytics

Time Intelligence Functions

```
-- Year-over-Year Growth
YoY Growth =
DIVIDE(
    [Total Sales] - CALCULATE([Total Sales],
SAMEPERIODLASTYEAR(Dates[Date])),
    CALCULATE([Total Sales], SAMEPERIODLASTYEAR(Dates[Date]))
)

-- Running Total
Running Total =
CALCULATE(
    [Total Sales],
    FILTER(
        ALL(Dates[Date]),
        Dates[Date] <= MAX(Dates[Date])
    )
)

-- Moving Average (3-month)
Moving Average 3M =
CALCULATE(
    AVERAGE(Sales[Amount]),
    DATESINPERIOD(
        Dates[Date],
        LASTDATE(Dates[Date]),
        -3,
        MONTH
    )
)
```

Statistical Measures

```
-- Median Sales
Median Sales = MEDIAN(OrderDetails[Quantity])

-- Standard Deviation
Sales StdDev = STDEV.P(OrderDetails[UnitPrice])

-- Percentile Rankings
Top 25% Threshold = PERCENTILE.INC(Sales[Amount], 0.75)
```

Conditional Formatting with DAX

```
-- Traffic Light Status
Status Colour =
SWITCH(
    TRUE(),
    [Actual] >= [Target] * 1.1, "Green",
    [Actual] >= [Target] * 0.9, "Yellow",
    "Red"
)
```

Dashboard Design Principles

Visual Hierarchy and Layout

F-Pattern Layout

- Most important information in top-left
- Secondary metrics across top row
- Supporting details down left side
- Detailed analysis in bottom-right

Z-Pattern Layout

- Key metric top-left
- Related metrics top-right
- Supporting information middle
- Call-to-action bottom-right

Grid System

- Use consistent spacing (8px or 16px grid)
- Align elements to invisible grid lines
- Maintain consistent margins and padding
- Group related visualisations together

Colour Psychology and Branding

Colour Principles:

- **Primary Colour**: Brand colour for key metrics
- **Secondary Colours**: Complementary colours for categories
- **Neutral Colours**: Grey scale for supporting information
- **Semantic Colours**: Red (negative), Green (positive), Yellow (warning)

Accessibility Considerations:

- Minimum contrast ratio 4.5:1 for text
- Avoid relying solely on colour for meaning
- Test with colour-blind simulation tools
- Provide alternative indicators (shapes, patterns)

Typography and Readability

Font Hierarchy:

- **Headers**: 18-24pt, bold weight
- **Subheaders**: 14-16pt, medium weight
- **Body Text**: 10-12pt, regular weight
- **Captions**: 8-10pt, light weight

Best Practices:

- Use maximum 2-3 font families
- Maintain consistent font sizes across similar elements
- Ensure adequate line spacing
- Use sentence case for readability

White Space and Balance

Principles:

- **Active White Space**: Intentional spacing for grouping
- **Passive White Space**: Natural spacing around elements
- **Macro White Space**: Large areas between major sections
- **Micro White Space**: Small spaces between related items

Interactive Features and Filters

Advanced Filtering Techniques

Slicer Configurations

```
Date Range Slicer:
1. Add Slicer visual
2. Add date field
3. Change to "Between" style
4. Enable relative date filtering
5. Set default to "Last 12 months"

Hierarchy Slicer:
1. Create hierarchy in Model view
2. Add hierarchy to slicer
```

```
3. Enable drill-down functionality
4. Test multi-level filtering
```

Top N Filtering

```
Dynamic Top N:
1. Create parameter for N value
2. Use TOPN() DAX function
3. Reference parameter in measure
4. Allow users to change N dynamically
```

Drill-Through and Drill-Down

Drill-Through Configuration

```
Setup:
1. Create detail page
2. Add fields to "Drill-through" well
3. Configure drill-through filters
4. Add "Back" button
5. Test from summary page

Use Cases:
- Product summary → Product details
- Regional overview → City breakdown
- Time summary → Daily details
```

Drill-Down Hierarchies

```
Date Hierarchy: Year → Quarter → Month → Day
Geography: Country → State → City
Product: Category → Subcategory → Product

Implementation:
1. Create hierarchy in Model view
2. Add hierarchy to visual axis
3. Enable drill-down buttons
4. Configure drill actions
```

Bookmarks and Navigation

Creating Bookmarks

```
Process:
1. Configure page state (filters, selections)
2. View → Bookmarks → Add
3. Name bookmark descriptively
4. Test bookmark restoration

Advanced Features:
- Capture visual states
- Include/exclude filters
- Show/hide visuals
- Update visual properties
```

Navigation Patterns

```
Tab Navigation:
1. Create bookmark for each "tab" state
2. Add shapes/buttons as tab headers
3. Assign bookmark actions to buttons
4. Format for clear visual states

Menu Navigation:
1. Create landing page with options
2. Link to different report pages
3. Add consistent navigation on each page
4. Include breadcrumb navigation
```

Tooltips and Context

Custom Tooltips

```
Creating Tooltip Pages:
1. Create new page
2. Set page type to "Tooltip"
3. Design compact information layout
4. Reference in visual tooltip settings

Best Practices:
- Keep tooltips concise
- Include relevant context
- Use consistent formatting
- Test on different screen sizes
```

Publishing and Sharing

Power BI Service Overview

Service Components:

- **Workspaces**: Collaboration areas for teams
- **Apps**: Packaged content for distribution
- **Dashboards**: Pin visuals from multiple reports
- **Datasets**: Data sources for report creation
- **Dataflows**: Self-service data preparation

Publishing Process

Initial Publication

```
From Power BI Desktop:
1. Click "Publish" in Home ribbon
2. Select destination workspace
3. Choose publishing options
4. Monitor upload progress
5. View published report in service
```

Report Management

```
In Power BI Service:
1. Navigate to workspace
2. Manage report settings
3. Configure data refresh
4. Set up sharing permissions
5. Create dashboard from report visuals
```

Data Refresh Configuration

Scheduled Refresh Setup

```
For Import Datasets:
1. Go to dataset settings
2. Configure data source credentials
3. Set refresh schedule
4. Configure failure notifications
5. Test refresh manually

Refresh Frequency Options:
- Up to 8 times daily (Pro license)
```

```
- Up to 48 times daily (Premium)
- Real-time with streaming datasets
```

Gateway Configuration

```
For On-Premises Data:
1. Install Personal/Enterprise Gateway
2. Configure data source connections
3. Set up service account credentials
4. Test connectivity
5. Schedule refresh through gateway
```

Sharing and Security

Sharing Methods

Direct Sharing

```
Process:
1. Open report in Power BI Service
2. Click "Share" button
3. Enter recipient email addresses
4. Set permission levels
5. Add message and send
```

App Distribution

```
Creating Apps:
1. Develop content in workspace
2. Prepare app for publication
3. Configure app settings and navigation
4. Publish app to organisation
5. Manage app updates and permissions

Benefits:
- Simplified end-user experience
- Controlled content distribution
- Version management
- Usage analytics
```

Row-Level Security (RLS)

```
Setup Process:
1. Define security roles in Power BI Desktop
2. Create DAX filter expressions
```

```
3. Test roles before publishing
4. Publish dataset to service
5. Assign users to roles in service

Example RLS Expression:
[SalesPersonEmail] = USERNAME()
[Region] = LOOKUPVALUE(Users[Region], Users[Email], USERNAME())
```

Workspace Management

Workspace Types

- **Personal Workspace**: Individual development area
- **Shared Workspace**: Team collaboration space
- **Premium Workspace**: Enhanced features and capacity

Best Practices

```
Development Workflow:
1. Develop in personal workspace
2. Share draft with stakeholders
3. Move to shared workspace for collaboration
4. Create app for end-user distribution
5. Maintain separate development/production workspaces
```

Hands-on Lab Session 2

Lab Exercise: Advanced Northwind Analytics Dashboard

Objective: Create an executive dashboard with advanced features

Part 1: Advanced Calculations and Measures

Task 1.1: Create Date Table

```
-- Create date table
Date Table =
ADDCOLUMNS(
    CALENDAR(DATE(1996,1,1), DATE(1998,12,31)),
    "Year", YEAR([Date]),
    "Quarter", "Q" & QUARTER([Date]),
    "Month", FORMAT([Date], "MMM"),
    "MonthNumber", MONTH([Date]),
    "Weekday", FORMAT([Date], "dddd"),
    "IsWeekend", WEEKDAY([Date]) IN {1,7}
)
```

Task 1.2: Advanced Business Measures

```
-- Revenue Measures
Total Revenue =
SUMX(
    OrderDetails,
    OrderDetails[Quantity] * OrderDetails[UnitPrice] * (1 -
OrderDetails[Discount])
)

Revenue LY =
CALCULATE(
    [Total Revenue],
    SAMEPERIODLASTYEAR('Date Table'[Date])
)

Revenue Growth % =
DIVIDE(
    [Total Revenue] - [Revenue LY],
    [Revenue LY]
)

-- Customer Metrics
Active Customers =
DISTINCTCOUNT(Orders[CustomerID])

New Customers =
CALCULATE(
    DISTINCTCOUNT(Orders[CustomerID]),
    FILTER(
        Orders,
        Orders[OrderDate] =
        CALCULATE(
            MIN(Orders[OrderDate]),
            ALL(Orders[OrderDate])
        )
    )
)

-- Product Performance
Product Rank =
RANKX(
    ALL(Products[ProductName]),
    [Total Revenue],,
    DESC
)

ABC Classification =
SWITCH(
    TRUE(),
    [Product Rank] <= COUNTROWS(Products) * 0.2, "A",
    [Product Rank] <= COUNTROWS(Products) * 0.5, "B",
```

```
    "C"
)
```

Part 2: Executive Dashboard Creation

Task 2.1: Dashboard Layout Design

Create new page titled "Executive Summary"

KPI Section (Top Row)

```
1. Total Revenue Card
   - Value: [Total Revenue]
   - Format: Currency, millions
   - Conditional formatting based on target

2. Revenue Growth Card
   - Value: [Revenue Growth %]
   - Format: Percentage
   - Colour coding: Green (>5%), Yellow (0-5%), Red (<0%)

3. Active Customers Card
   - Value: [Active Customers]
   - Format: Whole number
   - Include trend indicator

4. Average Order Value Card
   - Value: [Total Revenue] / COUNT(Orders[OrderID])
   - Format: Currency
   - Include comparison to previous period
```

Task 2.2: Advanced Visualisations

Waterfall Chart: Revenue Bridge

```
1. Add Waterfall chart
2. Category: Revenue components
3. Y-axis: Revenue impact values
4. Show cumulative impact on revenue changes
```

Combo Chart: Revenue and Growth Trend

```
1. Add Line and clustered column chart
2. Shared axis: Date (Month/Year)
3. Column values: [Total Revenue]
4. Line values: [Revenue Growth %]
```

```
5. Configure dual Y-axis
6. Format for clear distinction
```

Matrix: Product Performance

```
1. Add Matrix visual
2. Rows: Categories[CategoryName], Products[ProductName]
3. Values: [Total Revenue], [Product Rank], [ABC Classification]
4. Conditional formatting on revenue
5. Enable drill-down on categories
```

Part 3: Interactive Analytics Page

Task 3.1: Customer Analysis Dashboard

Create new page titled "Customer Analytics"

Customer Segmentation Analysis

```
1. RFM Analysis Setup:
   - Recency: Days since last order
   - Frequency: Number of orders
   - Monetary: Total revenue per customer

2. Create measures for RFM scoring:
Recency Score =
SWITCH(
    TRUE(),
    [Days Since Last Order] <= 30, 5,
    [Days Since Last Order] <= 60, 4,
    [Days Since Last Order] <= 90, 3,
    [Days Since Last Order] <= 180, 2,
    1
)

3. Scatter Plot:
   - X-axis: Frequency Score
   - Y-axis: Monetary Score
   - Size: Customer count
   - Colour: Recency Score
```

Geographic Analysis

```
1. Filled Map:
   - Location: Customers[Country]
   - Values: [Total Revenue]
   - Tooltips: Customer count, Average order value
```

```
2. Tree Map:
   - Group: Customers[Country]
   - Values: [Total Revenue]
   - Conditional formatting by performance
```

Part 4: Drill-Through Implementation

Task 4.1: Product Detail Page

Create new page titled "Product Details"

Configure Drill-Through

```
1. Add Products[ProductName] to drill-through filters
2. Create detailed product analysis:
   - Sales trend over time
   - Customer segments buying product
   - Geographic distribution
   - Profitability analysis
```

Task 4.2: Customer Detail Page

Create new page titled "Customer Profile"

Configure Drill-Through

```
1. Add Customers[CustomerName] to drill-through filters
2. Create customer profile dashboard:
   - Order history timeline
   - Product purchase patterns
   - Revenue contribution over time
   - Customer lifetime value
```

Part 5: Navigation and User Experience

Task 5.1: Create Navigation System

Bookmark Navigation

```
1. Create bookmarks for different dashboard views:
   - "Overview" - Executive summary
   - "Customers" - Customer analytics
   - "Products" - Product performance
   - "Geography" - Regional analysis

2. Add navigation buttons:
```

```
   - Create shapes as buttons
   - Assign bookmark actions
   - Format with hover states
   - Position consistently across pages
```

Task 5.2: Add Interactive Elements

Dynamic Filtering

```
1. Date Range Slicer:
   - Add relative date slicer
   - Default to "Last 12 months"
   - Enable relative filtering

2. Category Filter:
   - Multi-select slicer
   - Search functionality enabled
   - Apply to all relevant visuals

3. Employee Performance Filter:
   - Dropdown slicer for sales employees
   - Show all by default
   - Enable single-select mode
```

Part 6: Publishing and Sharing

Task 6.1: Prepare for Publication

Pre-Publication Checklist

```
1. Data Validation:
   - Verify all calculations
   - Check data refresh dates
   - Validate filter interactions

2. Performance Optimisation:
   - Remove unused fields
   - Optimise DAX measures
   - Check visual loading times

3. User Experience Testing:
   - Test on different screen sizes
   - Verify mobile responsiveness
   - Check accessibility features
```

Task 6.2: Publish to Power BI Service

Publication Process

```
1. Save Power BI Desktop file
2. Click "Publish" → Select workspace
3. Navigate to Power BI Service
4. Verify report functionality
5. Configure data refresh schedule
```

Task 6.3: Create and Share App

App Creation

```
1. In workspace, click "Create app"
2. Configure app settings:
   - Name: "Northwind Analytics"
   - Description: Executive analytics dashboard
   - Navigation: Configure page order

3. Set permissions:
   - Define audience
   - Set sharing permissions
   - Configure security settings

4. Publish app and share with stakeholders
```

Part 7: Performance Monitoring

Task 7.1: Usage Analytics

Monitor Dashboard Usage

```
1. Access usage metrics in Power BI Service
2. Analyse user engagement patterns
3. Identify most/least used features
4. Plan improvements based on usage data
```

Task 7.2: Performance Optimisation

Ongoing Maintenance

```
1. Monitor query performance
2. Optimise slow-loading visuals
3. Update data refresh schedules
4. Maintain data quality checks
5. Plan regular review cycles
```

Conclusion

This guide provides the foundation for becoming proficient in Power BI, from basic data import through advanced dashboard creation and enterprise deployment. The hands-on exercises using the Northwind database ensure practical experience with real-world scenarios.

Key Takeaways

Week 5 Fundamentals:

- Master data import from various sources
- Apply data transformation techniques
- Create meaningful basic visualisations
- Understand Power BI Desktop interface

Week 6 Advanced Features:

- Design professional dashboards
- Implement interactive features
- Configure enterprise sharing and security
- Establish performance monitoring practices

Next Steps

1. **Practice Regularly**: Apply these techniques to your own datasets
2. **Stay Updated**: Follow Power BI monthly updates and new features
3. **Join Community**: Participate in Power BI user groups and forums
4. **Advanced Learning**: Explore DAX programming and custom visuals development
5. **Certification**: Consider Microsoft Power BI certification paths

Additional Resources

- **Microsoft Learn**: Free Power BI learning paths
- **Power BI Blog**: Latest features and best practices
- **Community Forums**: Peer support and knowledge sharing
- **DAX Guide**: DAX function reference
- **Power BI Desktop**: Monthly updates with new features

Remember: The key to mastering Power BI is consistent practice and staying curious about new ways to visualise and analyse data effectively.