Power BI Dashboard - Complete Beginner's Guide

SECL Attendance & Productivity Analysis

🎯 What You're Building

A 6-page interactive dashboard that shows:

1. **Executive Summary** - Overall KPIs and trends
2. **Operations Dashboard** - Daily monitoring
3. **Attendance Impact** - Correlation analysis
4. **Financial Performance** - Profit and costs
5. **Manpower Planning** - Workforce optimization
6. **Trends & Forecasting** - Patterns and predictions

Time to Complete: 2-3 hours for basic version

📋 Before You Start

What You Need:

- ✅ Power BI Desktop (free download from Microsoft)
- ✅ Your CSV file: `phase3_feature_engineered_dataset.csv`
- ✅ 2-3 hours of focused time
- ✅ Basic computer skills

Your Data Quick Facts:

- **13,140 records** (one per shift at each area)
- **3 mining areas**: Korba, Kusmunda, Dipka
- **3 shifts**: Morning, Evening, Night
- **Date range**: January 1 - December 31, 2025
- **Total production**: 67.8 Million tonnes of coal
- **Total profit**: ₹126.5 Billion

🚀 STEP-BY-STEP INSTRUCTIONS

STEP 1: Open Power BI and Load Data (5 minutes)

What to do:

1. Open **Power BI Desktop** (if you don't have it, download from microsoft.com/power-bi)
2. You'll see a welcome screen - look for **"Get data"** button
3. Click **Get data** → Choose **Text/CSV**
4. Browse to your file: `phase3_feature_engineered_dataset.csv`
5. Click **Open**
6. A preview window will show - click **Load** (not Transform)

What you should see:

- A loading bar that says "Loading data..."
- After ~10 seconds, you'll see your data in the Fields pane (right side)
- You'll see a list of 29 fields (columns) from your CSV

✅ **Success check:**

Look at the right side of screen - do you see a "Fields" section with items like:

- date
- area
- shift
- total_present
- coal_production_tonnes

If YES → Move to Step 2!
If NO → The file didn't load. Try Get Data again.

STEP 2: Create a Calendar Table (10 minutes)

Why you need this:

Power BI needs a special "Date Table" to do time-based filtering and analysis properly.

What to do:

1. Look at the top menu - find the **"Modeling"** tab
2. Click **Modeling** → **New Table** (it's in the Calculations section)
3. A formula bar will appear at the top
4. **DELETE** whatever is there

5. **COPY** this entire formula and **PASTE** it in:

```
DateTable =
ADDCOLUMNS(
    CALENDAR(DATE(2025,1,1), DATE(2025,12,31)),
    "Year", YEAR([Date]),
    "Month", MONTH([Date]),
    "MonthName", FORMAT([Date], "MMMM"),
    "Quarter", "Q" & FORMAT([Date], "Q"),
    "WeekNum", WEEKNUM([Date]),
    "DayName", FORMAT([Date], "DDDD")
)
```

6. Press **Enter** (or click the checkmark ✓)
7. Wait 2-3 seconds for it to process

✅ **Success check:**

- Look at Fields pane (right side)
- You should now see a new item called **DateTable** with a calendar icon
- Click the arrow next to it to expand
- You should see: Date, Year, Month, MonthName, Quarter, WeekNum, DayName

If YES → Great! Move to Step 3!
If you see an ERROR → Check that you copied the formula exactly as shown. Every comma, parenthesis, and quotation mark matters!

STEP 3: Connect Your Tables (5 minutes)

Why you need this:

You need to tell Power BI how the DateTable relates to your Data table.

What to do:

1. Look at the **left sidebar** - it has 3 icons:
    - Report (bar chart icon) ← You're probably here now
    - Data (table icon)
    - Model (connected boxes icon) ← Click THIS one
2. You'll see two boxes:
    - **Data** (big box with all your columns)

- **DateTable** (smaller box with date columns)

3. Now the important part - **DRAG** from one to the other:
    - Find **"date"** in the **Data** table
    - Click and HOLD on "date"
    - DRAG your mouse to **"Date"** in the **DateTable** table
    - Let go of the mouse button
4. A line will appear connecting them! A popup window will show:
    - Make sure it says **"Many to One"** (*)
    - Click **OK**

✅ **Success check:**

- You should see a line connecting Data[date] to DateTable[Date]
- The line should have:
    - An asterisk (*) on the Data side (many)
    - A "1" on the DateTable side (one)

If YES → Perfect! Go back to Report view (click the bar chart icon on left) and move to Step 4!

STEP 4: Create Your First 4 Measures (15 minutes)

What are measures?

Measures are calculations that Power BI will do on your data. You'll use these in every chart.

What to do:

You'll create **4 measures**. For EACH measure, follow these steps:

1. Click **Modeling** tab (top menu)
2. Click **New Measure**
3. A formula bar appears at the top
4. DELETE whatever is there
5. COPY one of the formulas below and PASTE it in
6. Press **Enter**
7. Repeat for all 4 measures!

The 4 Essential Measures:

Measure 1: Total Production

```
Total_Production = SUM('Data'[coal_production_tonnes])
```

Measure 2: Average Attendance

```
Avg_Attendance_Pct = AVERAGE('Data'[attendance_pct])
```

Measure 3: Total Profit

```
Total_Profit = SUM('Data'[net_profit_inr])
```

Measure 4: Production Achievement

```
Production_Achievement = AVERAGE('Data'[production_achievement_pct])
```

✅ **Success check:**

Look at the Fields pane (right side). You should see these 4 new items with a calculator icon 🧮:

- Total_Production
- Avg_Attendance_Pct
- Total_Profit
- Production_Achievement

All 4 there? → Excellent! Move to Step 5!

STEP 5: Create Your First Visual - KPI Cards (20 minutes)

What you're making:

4 big number cards that show your key metrics at the top of the page.

Card 1: Total Production

1. Look at the **Visualizations pane** (right side, above Fields)
2. Find and click the **Card** icon (looks like a rectangle with "123")
3. A blank card appears on your canvas
4. Now, from the **Fields pane**, find **Total_Production** (it has a calculator icon)
5. **DRAG** Total_Production into the card (or just check the box next to it)
6. The card now shows a big number!

Now format it to look good:

7. With the card selected, look at the **Format** section (paint brush icon) below Visualizations
8. Click **Callout value** (expand it)
9. Find **Display units** → Click dropdown → Choose **Custom**
10. In the format box that appears, type: `0.0,,"M"`
11. Press Enter

The card should now show something like "67.8M"!

12. **Resize the card**: Click the card, then drag the corners to make it wider and shorter
13. **Position it**: Drag the whole card to the top-left of your canvas

Cards 2, 3, and 4: Repeat for other measures

Card 2: Attendance

- Add another Card visual
- Drag in **Avg_Attendance_Pct**
- Format → Display units → Custom → Type: `0.0%`
- Should show "91.1%" or similar
- Position it to the right of first card

Card 3: Achievement

- Add another Card visual
- Drag in **Production_Achievement**
- Format → Display units → Custom → Type: `0%`
- Should show "232%" or similar
- Position it to the right of second card

Card 4: Profit

- Add another Card visual
- Drag in **Total_Profit**
- Format → Display units → Custom → Type: `₹0.0,,"B"`
    - To get ₹ symbol: Copy it from here: ₹
- Should show "₹126.5B" or similar
- Position it to the right of third card

Make them look pretty:

For EACH card:

1. Select the card
2. Format pane → **Visual** section → **Effects**
3. Click **Background**
4. Turn it ON
5. Choose a color (white is good)
6. Click **Border**
7. Turn it ON
8. Width: 3
9. Color: Choose from your palette (Blue for production, Teal for attendance, Orange for achievement, Green for profit)

✅ **Success check:**

You should have 4 cards in a row at the top showing:

- 67.8M (or similar)
- 91.1% (or similar)
- 232% (or similar)
- ₹126.5B (or similar)

STEP 6: Add a Line Chart (15 minutes)

What you're making:

A line chart showing production over time.

What to do:

1. Click on an **empty area** of the canvas (not on a card)
2. In Visualizations pane, click the **Line chart** icon (looks like a zigzag line)
3. A blank chart appears

Now add your data to it:

4. Look at the **Visualizations pane** - you'll see boxes for:
    - X-axis
    - Y-axis
    - Legend
5. **Add X-axis (the dates):**
    - Find **DateTable** in Fields pane (right side)

- Expand it (click the arrow)
- Find **Date** (should have a calendar icon)
- **DRAG** Date into the **X-axis** box
- OR just click the checkbox and Power BI will figure it out

6. **Add Y-axis (the production):**
    - Find your **Total_Production** measure
    - **DRAG** it into the **Y-axis** box

You should now see a line chart with dates across the bottom and production amounts going up and down!

Make it look better:

7. **Add a title:**
    - Format pane → **General** → **Title**
    - Turn it ON if not already
    - Change text to "Coal Production Trend - 2025"
    - Font size: 14 or 16
    - Color: Navy or dark color
8. **Add an average line:**
    - Click on the chart
    - Look for the **Analytics** pane (magnifying glass icon)
    - Click **Average line**
    - Click **+ Add**
    - Now you have a horizontal line showing the average!
9. **Resize and position:**
    - Make it wide (left to right)
    - Position it below your KPI cards

✅ **Success check:**

You have a line chart that:

- Shows dates on the bottom (x-axis)
- Shows production values on the left (y-axis)
- Has a wavy line going across
- Has a straight line for the average
- Has a title at the top

STEP 7: Add Area Filters (Slicers) (10 minutes)

What you're making:

Dropdown filters so users can choose which mining area to view.

What to do:

1. Click an **empty area** of canvas
2. In Visualizations pane, find the **Slicer** icon (looks like a funnel or filter)
3. Click it - a blank slicer appears
4. From **Fields pane**, find **area** (under Data table)
5. **DRAG** area into the slicer's Field box
6. You should now see three checkboxes:
    - Korba
    - Kusmunda
    - Dipka

Make it a dropdown instead:

7. With slicer selected, click **Format** pane
8. Find **Slicer settings**
9. Under **Options**, find **Style**
10. Change from "Vertical list" to **Dropdown**
11. Now it's a compact dropdown!

Position it: 12. Drag the slicer to the **top-right** corner of your page 13. Make it small and neat

Add a Date Slicer:

14. Add another Slicer (same steps as above)
15. Drag **Date** from DateTable into it
16. Format → Slicer settings → Style → Choose **Between**
17. Now you have a date range picker!
18. Position it next to the area slicer

✅ **Success check:**

- Click the Area dropdown - does it show Korba, Kusmunda, Dipka?
- Select one area - do your charts update to show only that area?

- Drag the date sliders - do your charts update?

If YES → You're doing great!

STEP 8: Save Your Work! (2 minutes)

IMPORTANT: Save now before you go further!

1. Click **File → Save**
2. Choose where to save (Desktop is fine)
3. Name it: "SECL_Dashboard_v1.pbix"
4. Click Save

From now on, save every 10-15 minutes using Ctrl+S

🎨 Making It Look Professional

Color Scheme to Use

Copy these exact color codes into Power BI:

For Production/Main charts: #1E2761 (Navy Blue) **For Attendance charts**: #028090 (Teal) **For Profit/Financial**: #2C5F2D (Forest Green) **For Warnings/Targets**: #F96167 (Coral Orange)

How to apply colors:

1. Select any visual (chart, card, etc.)
2. Format pane → **Visual → Colors**
3. Click the color box
4. In "Hex" field at the bottom, **paste** one of the codes above (include the #)
5. Press Enter

📊 What to Add Next (Building the Other Pages)

You've built the basics! Here's what to add to complete Page 1:

More Charts for Page 1:

1. **Scatter Plot** (Attendance vs Production)
    - Visualization: Scatter chart
    - X-axis: attendance_pct

- Y-axis: coal_production_tonnes
- Size: net_profit_inr
- Shows correlation!

2. **Column Chart** (Area Comparison)
   - Visualization: Clustered column
   - X-axis: area
   - Y-axis: Total_Production
   - Shows which area produces most
3. **Table** (Detailed Data)
   - Visualization: Table
   - Add: date, area, shift, total_present, coal_production_tonnes
   - Shows raw numbers

Creating Pages 2-6:

At the bottom of Power BI, you'll see **"Page 1"**

1. Click the + button next to it
2. A new blank page appears!
3. Name it: Right-click "Page 2" → Rename → Type "Operations Dashboard"
4. Add different charts based on what that page needs

Suggested pages:

- **Page 2 - Operations**: Daily staffing, shift breakdown
- **Page 3 - Attendance Analysis**: Correlation charts, scatter plots
- **Page 4 - Financial**: Profit margins, cost analysis
- **Page 5 - Manpower Planning**: Overtime, staffing needs
- **Page 6 - Trends**: Forecasts, patterns

🐛 Troubleshooting Common Problems

Problem 1: "Can't see my measures in the Fields list"

Solution: Look for them under the **Data** table in Fields pane. They have a calculator icon 🧮

Problem 2: "My chart is blank"

Solution:

- Check that you dragged fields into the right boxes (X-axis, Y-axis)

- Make sure your slicers aren't filtering out all data
- Click "Clear filters" icon at top of chart

Problem 3: "Numbers show as 67788469 instead of 67.8M"

Solution:

- Select the visual
- Format pane → Callout value (or Y-axis if a chart)
- Display units → Custom → Type the format code

Problem 4: "Slicers don't do anything when I click them"

Solution:

- Click on a chart
- Format menu → **Edit interactions** (top ribbon)
- Make sure charts show a filter icon (funnel), not a "none" icon

Problem 5: "Can't create the relationship in Step 3"

Solution:

- Make sure you're in **Model view** (left sidebar)
- Drag from the **date** field in Data table (all lowercase)
- Drag TO the **Date** field in DateTable (capital D)
- If it still won't work, delete DateTable and recreate it (Step 2)

✅ Checklist Before You Present

Before showing your dashboard to anyone:

- [ ] All 4 KPI cards show correct numbers
- [ ] Charts have clear titles
- [ ] Numbers are formatted properly (M for millions, B for billions, % for percentages)
- [ ] Slicers work when you click them
- [ ] All pages have names (not "Page 1", "Page 2")
- [ ] Colors are consistent across all pages
- [ ] You've saved your work
- [ ] You can explain what each chart shows
- [ ] You've tested with different filter combinations

🎯 Quick Reference: Common Tasks

Add a new chart:

1. Click empty space on canvas
2. Click chart type in Visualizations pane
3. Drag fields into X-axis and Y-axis boxes

Change a chart type:

1. Click the chart
2. Click different chart type in Visualizations pane

Delete something:

1. Click on it
2. Press Delete key

Copy a chart:

1. Click the chart
2. Ctrl+C to copy
3. Ctrl+V to paste
4. Change the fields it uses

Align multiple charts:

1. Hold Ctrl and click each chart
2. Format tab → Align → Choose alignment

Make charts the same size:

1. Select first chart, note its width and height (shown when selected)
2. Select second chart
3. Type the exact same width and height

📞 Getting Help

If you get stuck:

1. **Power BI Help**: Press F1 or click Help menu

2. **Search YouTube**: "Power BI [your problem]" - tons of tutorials
3. **Community Forum**: community.powerbi.com
4. **Official Docs**: docs.microsoft.com/power-bi

Common search terms:

- "Power BI how to format numbers"
- "Power BI relationship many to one"
- "Power BI slicer not working"
- "Power BI change chart colors"

💡 Pro Tips

1. **Save versions**: Save as "Dashboard_v1", "Dashboard_v2" etc. so you can go back if needed
2. **Test with real users**: Show it to a colleague and watch what they click - they'll find issues you missed
3. **Start simple**: Don't try to make all 6 pages perfect. Get Page 1 working great first!
4. **Use bookmarks**: You can save filter combinations as "bookmarks" for quick access
5. **Mobile view**: There's a "Mobile layout" view - use it if people will view on phones
6. **Keep it clean**: Better to have fewer, clearer charts than many cluttered ones
7. **Ask for feedback**: "What questions does this answer?" "What's confusing?"
8. **Print to PDF**: File → Export to PDF works great for sharing static versions

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🎓 What You've Learned

After completing this guide, you now know how to:

✅ Import data into Power BI
✅ Create a Date Table for time intelligence
✅ Create relationships between tables
✅ Write basic DAX measures
✅ Create KPI cards with formatted numbers
✅ Create line charts
✅ Add slicers (filters)
✅ Apply consistent colors
✅ Save and organize your work

That's the foundation of Power BI! Everything else is just variations of these skills.

🚀 Next Steps

Now that you have the basics:

1. **Add more charts** to Page 1 (scatter plots, column charts, tables)
2. **Create Pages 2-6** with different views of the data
3. **Publish to Power BI Service** (online) so others can view it
4. **Set up automatic refresh** if your data updates regularly
5. **Create a mobile version** for viewing on phones
6. **Add bookmarks** for common filter states
7. **Build drill-through pages** for detailed analysis

📊 Full Measures Library (Copy As Needed)

Here are ALL the measures you might need. Create them as needed:

Production Metrics

```
Total_Production = SUM('Data'[coal_production_tonnes])
Avg_Production = AVERAGE('Data'[coal_production_tonnes])
Target_Production = SUM('Data'[target_production])
Production_Variance = [Total_Production] - [Target_Production]
```

Attendance Metrics

```
Avg_Attendance_Pct = AVERAGE('Data'[attendance_pct])
Avg_Critical_Attendance = AVERAGE('Data'[critical_attendance_pct])
Total_Present = SUM('Data'[total_present])
Total_Absent = SUM('Data'[total_absent])
```

Financial Metrics

```
Total_Revenue = SUM('Data'[revenue_inr])
Total_Cost = SUM('Data'[total_cost_inr])
Total_Profit = SUM('Data'[net_profit_inr])
Avg_Profit_Margin = AVERAGE('Data'[profit_margin_pct])
Profit_Per_Tonne = DIVIDE([Total_Profit], [Total_Production], 0)
```

Efficiency Metrics

```
Avg_Tonnes_Per_Worker = AVERAGE('Data'[tonnes_per_worker])
```

```
Avg_Tonnes_Per_Critical = AVERAGE('Data'[tonnes_per_critical_worker])
Total_Overtime_Hours = SUM('Data'[total_overtime_hours])
```

📝 Format Codes Quick Reference

Copy these into Display units → Custom:

What You Want	Format Code	Example
Millions with 1 decimal	`0.0,,"M"`	67.8M
Billions with 1 decimal	`0.0,,,"B"`	126.5B
Percentage with 1 decimal	`0.0%`	91.1%
Whole percentage	`0%`	232%
Currency with commas	`₹#,##0`	₹1,639
Number with commas	`#,##0`	13,140
Rupees in Billions	`₹0.0,,,"B"`	₹126.5B

🎉 Congratulations!

You've built your first Power BI dashboard!

Remember:

- Don't worry about making it perfect the first time
- Every professional started as a beginner
- The best way to learn is by doing
- Save often and experiment freely

You got this! 🚀

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📧 Questions?

If you get stuck on any step:

1. Re-read the step carefully
2. Check the Troubleshooting section
3. Search YouTube for the specific task
4. Take a break and come back fresh!

Good luck! 🎯