How Does Business Intelligence Provide Actionable Insights?

A Practical Example

Customer Deliveries In Full and On Time (DIFOT)

68.3%

0.0%　　80%　　100.0%
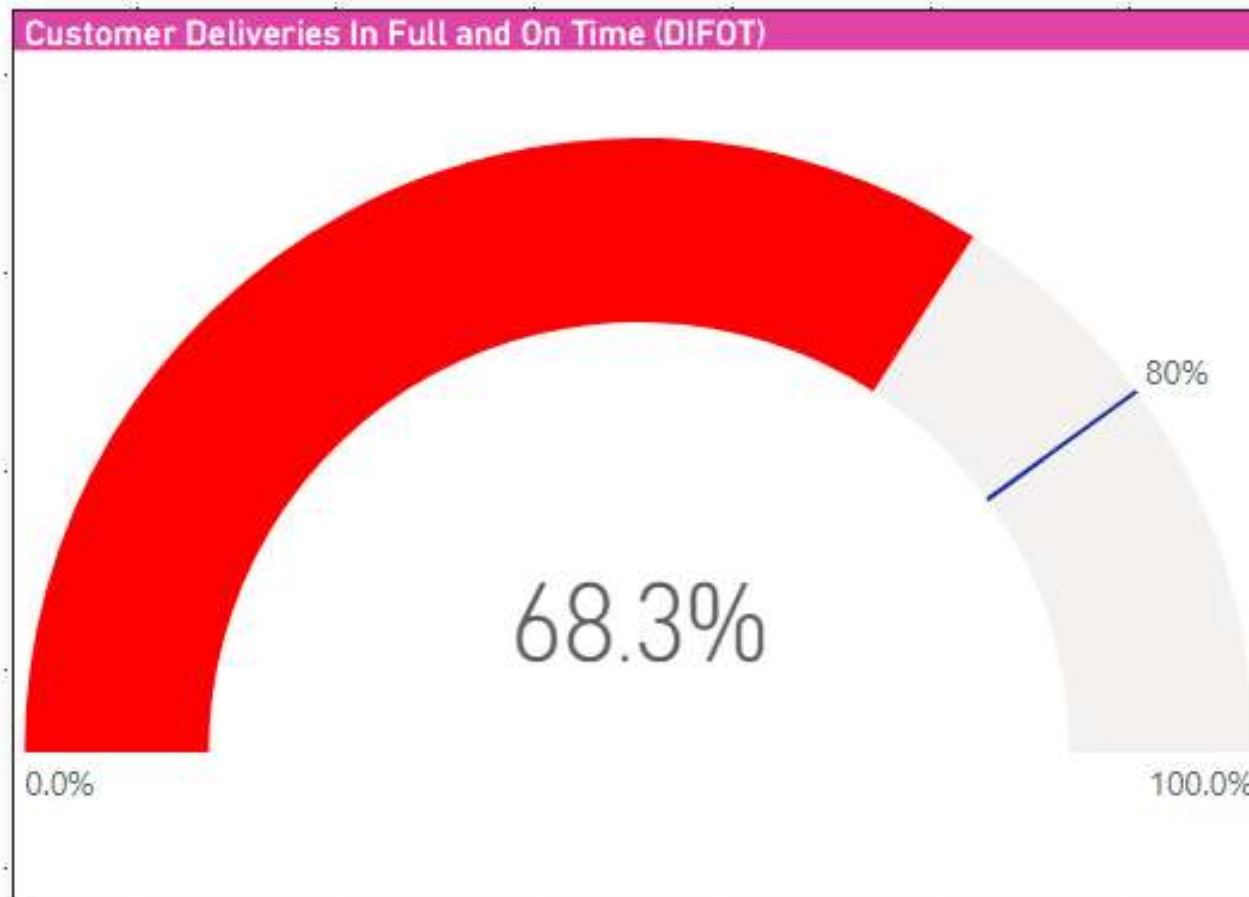
One of the key benefits that Business Intelligence software applications promise is "Actionable Insights" into data.

According to www.techpedia.com, an Actionable Insight is "**information that gives enough insight into the future that actions that should be taken become clear for decision makers**".

And the pyramid on the left shows that the "information" comes from "data", being the raw data in, say, your ERP system, that is transformed into a data model suitable for analysis by a Business Intelligence application, such as Power BI.

A well-designed Business intelligence system combines Actional Insights with Simplicity, so that, as a Business User, you arrive at Actionable Insights simply by following the data.

This article will provide a practical example of how a Business Intelligence system, developed using Microsoft Power BI, provides several Actionable Insights simply by following the data and asking questions.

This example is for a Key Performance Indicator (KPI) that is one of the most important for a company that has Inventory and Supply Chain Management as one of its core business functions.

It is the DIFOT Ratio – Deliveries In Full and On Time – and it measures the percentage of sales order lines that are delivered in full and on time to a company's customers. A company with a low DIFOT Ratio risks losing sales to its competitors who can deliver the same or similar products to its customers in full and on time.

For Best-In-Class companies, the target DIFOT Ratio is 95%. In this example, the target has been set as 80% because this example company is a long way off the mark at 68%. The goal is to get to 80% first, then improve further to the 95% achieved by Best-In-Class companies.

Let's get started.
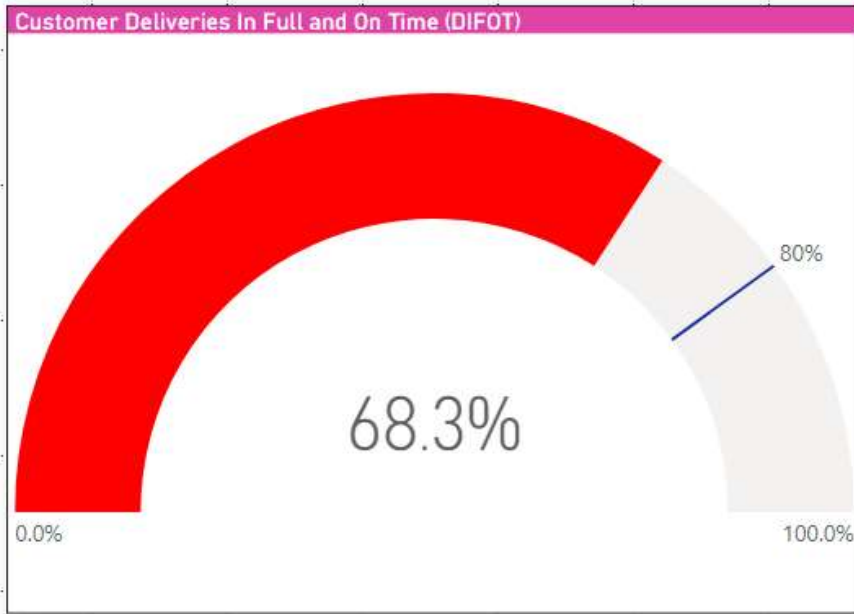
The first visual to look at in Power BI is at a high-level, being the **Gauge** on the left that shows Customer Orders are being delivered in full and on time only 68.3% of the time.

This is the DIFOT Ratio, expressed as a percentage.
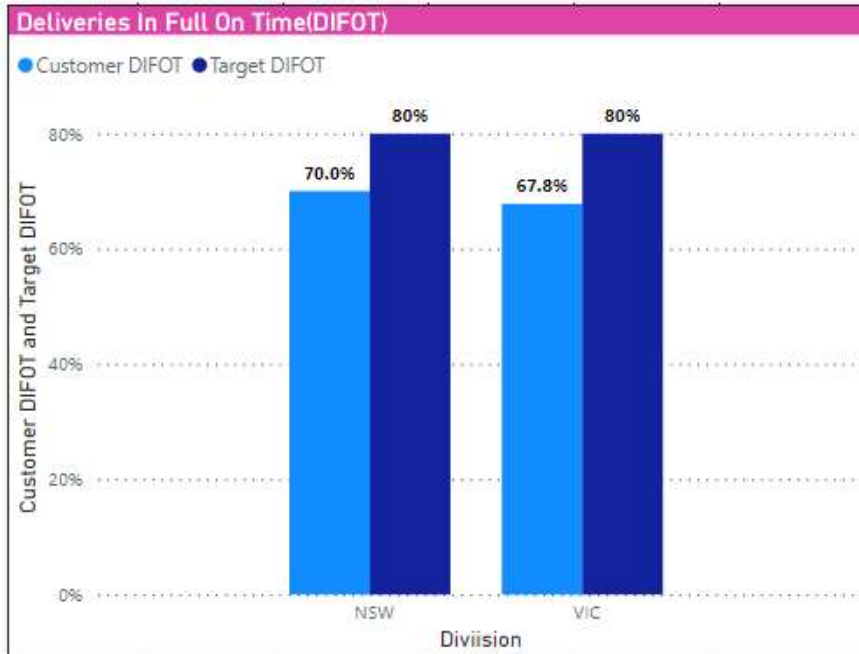
The **Column Chart** on the left shows that for the NSW Division, the DIFOT Ratio is 70.0% and for the VIC Division, it is 67.8%.

We will investigate the VIC Division, being the lower figure.

Power BI allows you to create a "drill-through" from one page of a report to another page in the same report, or even another page in another report.

In this case, we can drill-through from the VIC Customer DIFOT column to the Customer by Product DIFOT Chart, shown on the next page.

This is a Combined Column and Line Chart – the columns being the Sales Order Lines and the Order Lines Delivered In Full and On Time, and the Line being the Product DIFOT Ratio (expressed as a percentage).
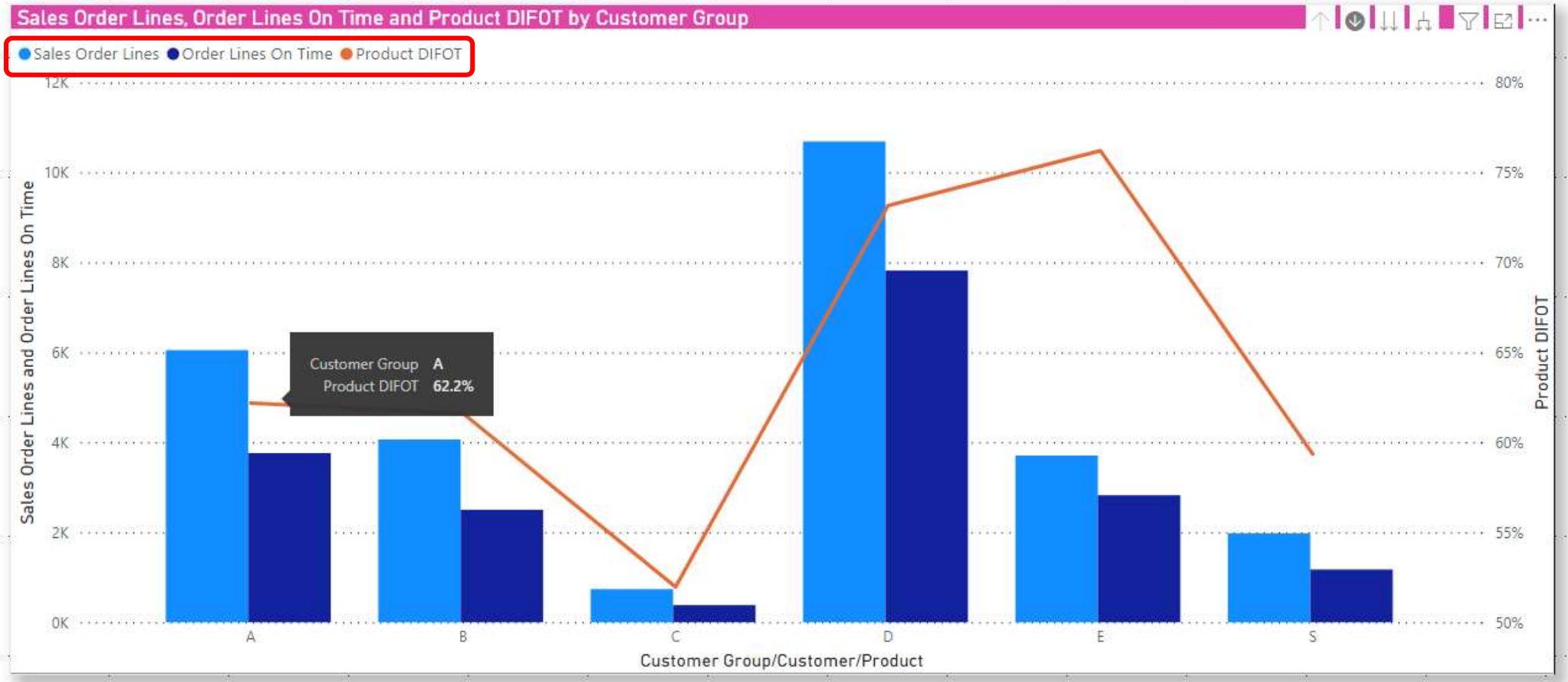

Overall, the Customer DIFOT and the Product DIFOT provide the same figure. The difference is that the Customer DIFOT is calculated for each customer and the Product DIFOT is calculated for each product. We are going to drill-down to the product level, and will be using the Product DIFOT.

The highest DIFOT ratio is being achieved for Customer Group E at about 76%, and the lowest is for Customer Group C at about 52%. But Customer Group C does not have many sales orders in comparison to the other Customer Groups.

Customer Group D has the most sales orders and will need to be investigated as its DIFOT ratio is too low at about 73%, but we will investigate Customer Group A first, as it has a lower DIFOT ratio of about 62%, and around 6,000 sales order lines, a number significant enough for investigation.

Drilling down on the Sales Order Lines column for Customer Group A produces the chart on the next page.

This chart shows the Sales Order Lines, Order Lines On Time, and the DIFOT ratio for each customer in Customer Group A.
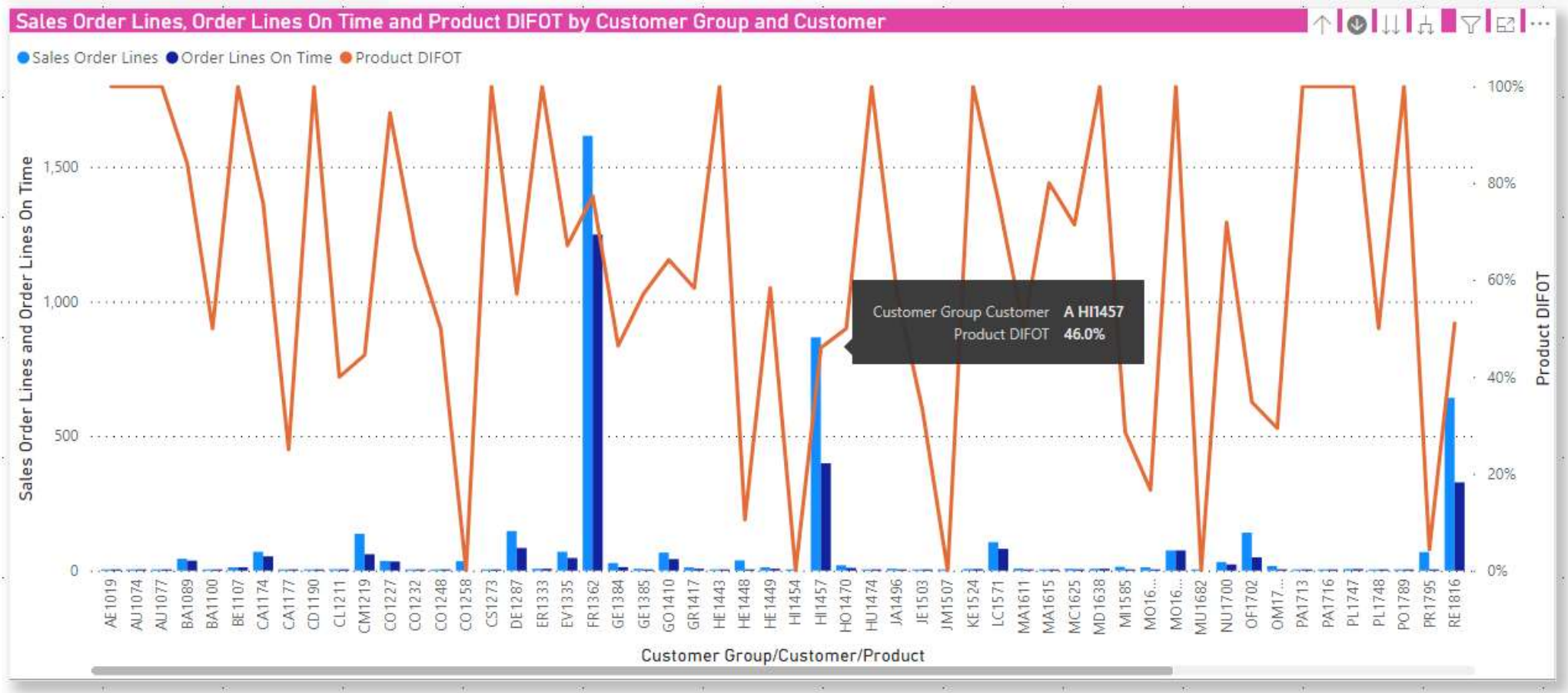
There are quite a number that have high DIFOT ratios, and they mostly have small numbers of sales order lines. They can be filtered out to make the chart less cluttered if you wish, but it is easy enough to find customers with reasonable sales volumes and low DIFOT ratios to investigate further.

One such customer is customer code HI1457 in Customer Group A, which has a DIFOT ratio of only 46.0%, and around 850 sales order lines for the year. Clicking on the column for that customer drills down to the products ordered by that customer, shown in the chart on the next page.

This chart initially showed all the products ordered by the customer during the year. A couple of filters have been applied to only include those where the DIFOT ratio is less than 80% and the number of sales order lines is greater than 2.
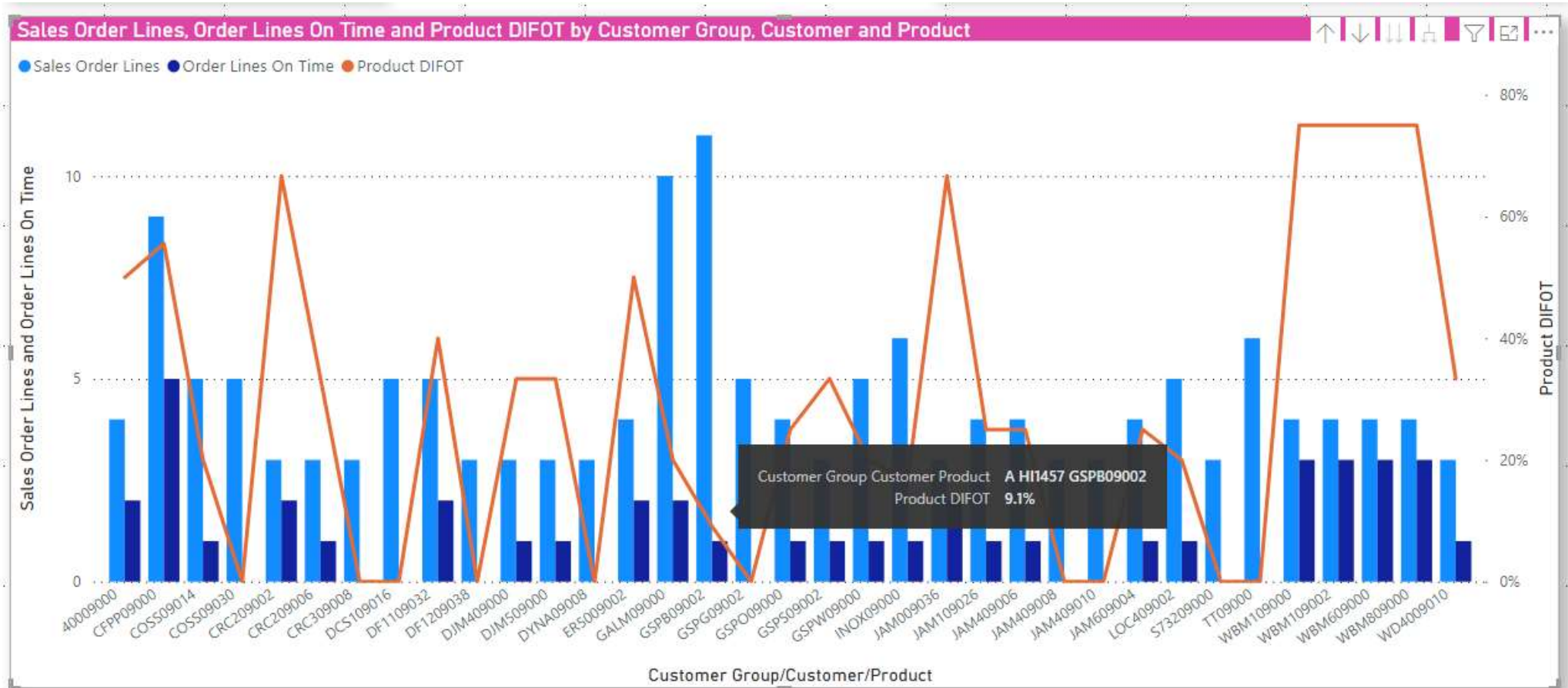

Product GSPB09002 has been chosen for further investigation, It has a very low DIFOT Ratio of only 9.1%, and has been ordered several times throughout the year by this customer.

Is this low DIFOT ratio just for the customer, or is this product delivered late for other customers as well?

The chart on the next page provides the answer.

This chart is produced by drilling through to the Product Deliveries In Full and On Time page in the same Power BI report, and filtering down to this individual product only.
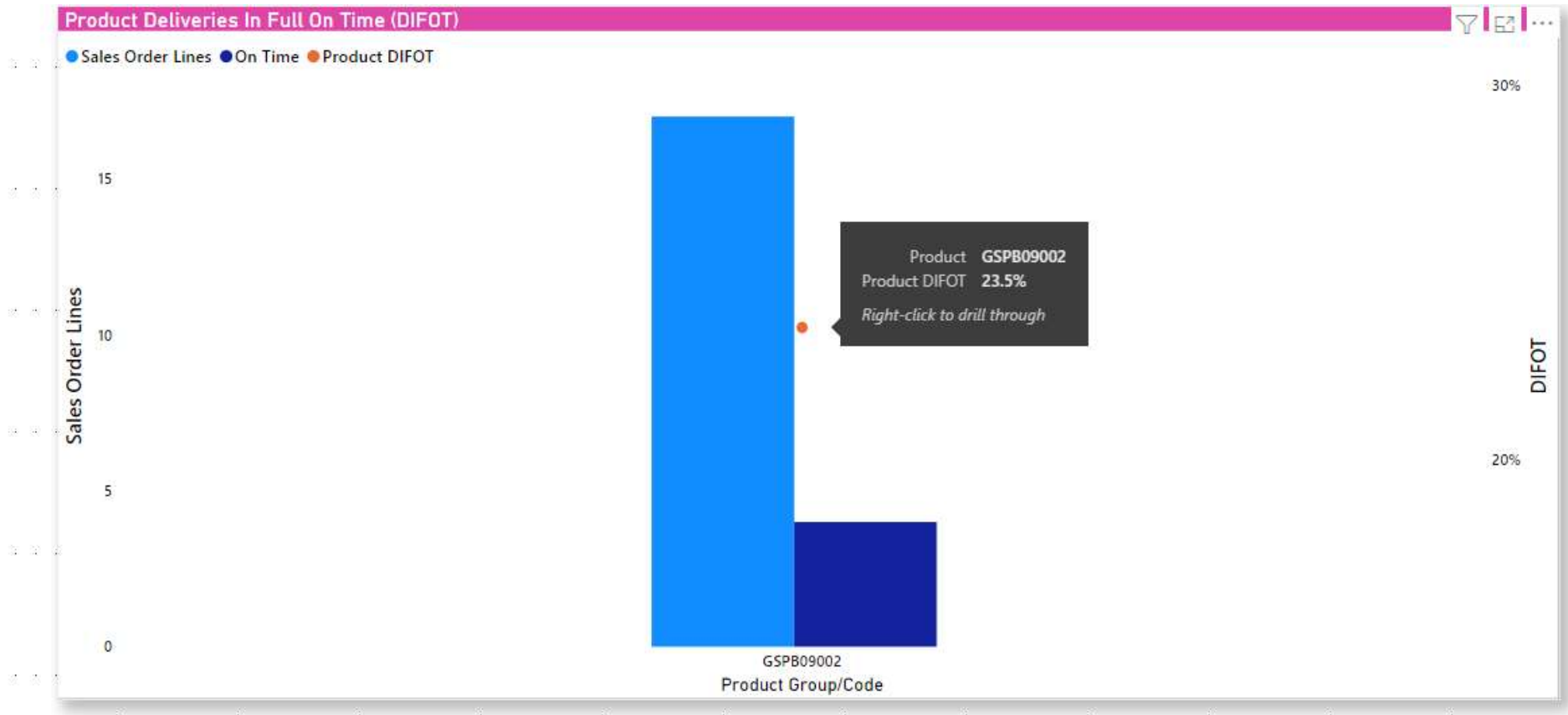
It shows that this product does in fact have a low DIFOT ratio – 23.5% - for all customers.

Why?

We need to drill down into the detail to find out why.

The Product DIFOT chart on the previous page can drill through to this page in the same report, which displays the number of Days Late for each sales order line of this product, and the Product DIFOT Ratio for the product.

Product Sales Orders

Product Group	Qty Ordered	Date Due	Last Despatch Date	Days Late
⊟ 600				
⊟ 602				
⊟ GSPB09002				
316368	8	1/07/2020	16/07/2020	8
316869	24	23/07/2020	27/07/2020	-3
318029	24	10/09/2020	17/09/2020	0
317188	8	6/08/2020	18/09/2020	36
318222	8	18/09/2020	30/09/2020	5
319128	10	28/10/2020	12/11/2020	8
319682	6	20/11/2020	11/12/2020	14
320353	10	16/12/2020	11/01/2021	19
320410	12	18/12/2020	11/01/2021	17
320696	6	18/01/2021	1/02/2021	7
321197	14	9/02/2021	2/03/2021	14
322441	12	6/04/2021	9/04/2021	-4
322249	8	25/03/2021	23/04/2021	22
323238	8	12/05/2021	21/05/2021	2
323394	12	18/05/2021	28/05/2021	3
323384	24	18/05/2021	3/06/2021	9
324212	8	23/06/2021	23/06/2021	-7

Product DIFOT Summary

Product Group	Product DIFOT
⊟ 600	
⊟ 602	
GSPB09002	23.5%

The visual titled Product Sales Orders shows that Sales Order Number 316368 is the first sales order with this product that is late – 8 days late.

This report can drill through to another page in this same report that shows all the sales order lines in Sales Order 316368, as shown on the next page.

This report shows that the Product Code we have been investigating, GSPB09002, is on Line 6 of the sales order, and it was despatched to the customer on 16/07/202, 8 days after the Date Due for delivery of the entire sales order.

Sales Orders

Division	Sales Order	Customer	Pickup	Date Ordered	Line	Product	Qty Despatched	Date Due	Date of Last Despatch	Days Late	Purchase Order Date Requested	Purchase Order Date Received	Purchase Order Qty Received
VIC	316368	HI1457	False	1/07/2020	1	S6WF09014	14.00	8/07/2020	16/07/2020	8			
VIC	316368	HI1457	False	1/07/2020	2	LOC209016	8.00	8/07/2020	16/07/2020	8	29/06/2020	8/07/2020	8.00
VIC	316368	HI1457	False	1/07/2020	3	CRC209006	8.00	8/07/2020	22/07/2020	14	2/07/2020	22/07/2020	12.00
VIC	316368	HI1457	False	1/07/2020	4	JAM409010	14.00	8/07/2020	16/07/2020	8	6/07/2020	9/07/2020	14.00
VIC	316368	HI1457	False	1/07/2020	5	GSPB09004	10.00	8/07/2020	16/07/2020	8			
VIC	316368	HI1457	False	1/07/2020	6	GSPB09002	8.00	8/07/2020	16/07/2020	8			
VIC	316368	HI1457	False	1/07/2020	7	S6WF09016	8.00	8/07/2020	16/07/2020	8			
VIC	316368	HI1457	False	1/07/2020	8	DCS109016	40.00	8/07/2020	16/07/2020	8			

The Pickup column shows that this sales order was not waiting to be picked up by the customer – it was waiting to be despatched by the company to the customer. Thus, we can rule out the customer being late to collect the products ordered as being a reason for the late delivery of the order.

The last three columns show that purchase orders had to be placed for Lines 2, 3 and 4 of the sales order, meaning that the company was out of stock for the products on these order lines. Thus, being out of stock is a valid reason for late delivery of these three order lines.

But no purchase orders were placed for the other 5 lines on the order, which means that stock was available for these order lines, including for Product Code GSPB09002, the product we are investigating.

Each of these 5 lines could have been delivered in full and on time.

Why the wait?

The company was waiting for receipt of stock for Product Code CRC209006 on order line 3, as it would have been more efficient to deliver all order lines to the customer at the same time. But the wait for CRC209006 became too long, and the 7 other lines were delivered on 16/07/2020, as shown by the Date of Last Despatch.

The stock for Sales Order Line 3 did not arrive until 22/07/2020. This purchase order was delivered by the supplier very late. The date requested by the company was 2/07/2020, but the supplier did not deliver until 22/07/2020, and the sales order line was despatched on the same day.

Is this Supplier is often late with satisfying the purchase orders placed on it by the company. The Supplier DIFOT report does in fact show that this Supplier has a very low DIFOT ratio of only 15.6%.

Is this unusual, or do many suppliers to the company have a low DIFOT ratio?
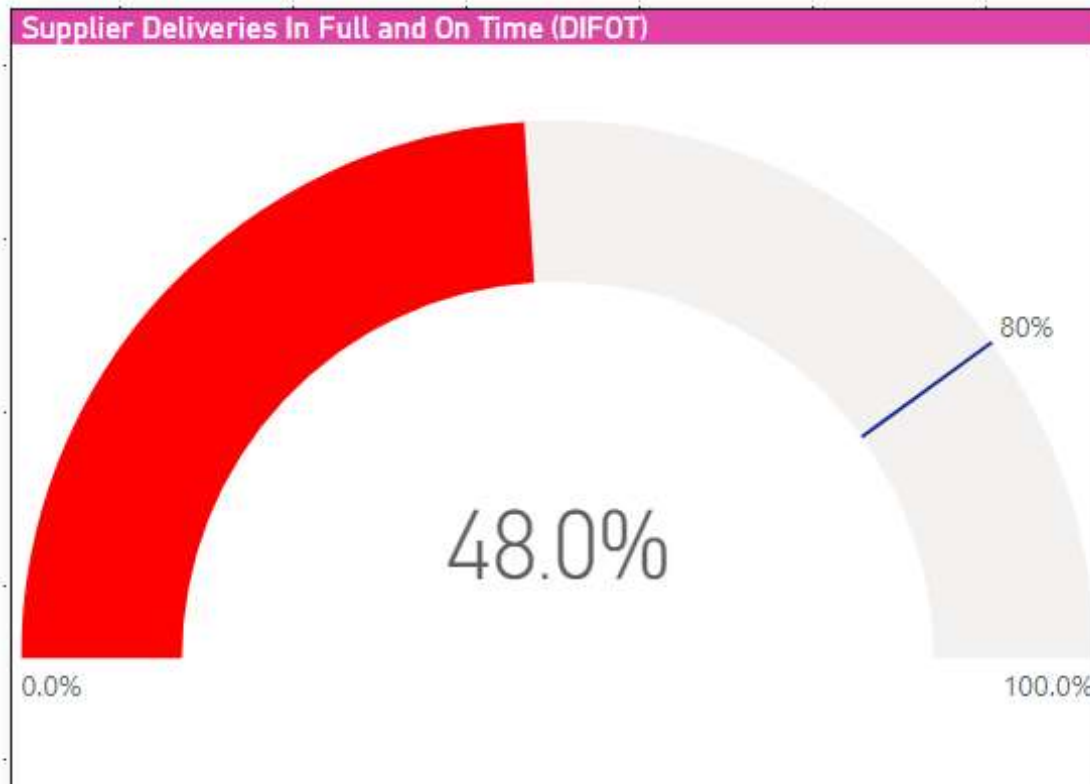
The Gauge on the left tells us that suppliers to the company are often late with deliveries, with an overall Supplier DIFOT Ratio of only 48%.

This completes out investigation into the data. The Actionable Insights we have gained are listed on the next page.

The Actionable Insights from this investigation can be summarised as follows:

1. The company is often out of stock. A review of the Stock Reordering settings is required. Are Stock Reorder Points and Supplier Lead Times too low? Does the company have enough cash to finance the amount of stock it needs to carry?

2. There may be a problem with Inventory Accuracy, where the stock balances recorded in the ERP system overstate the physical quantities available for allocation to customer sales orders. A review of how stock movements are being stock recorded is required. Are cyclical stock counts being conducted satisfactorily?

3. The customer should be contacted if there is going to be a delay of only a few days in delivering the sales order in full and on time. The customer may not be too concerned about such an occurrence, and may readily agree to a new delivery date. If so, the due date on the sales order should be changed to the new date agreed to by the customer, so that the DIFOT Ratio reflects the true status of delivery performance.

4. Sales Order Lines that do have stock available should be despatched as soon as practicable, subject to Point 3, and should not be held back for a lengthy period of time awaiting receipt of stock for one or more other products on the order.

5. Suppliers with a low DIFOT ratio need to be advised that their delivery performance is unsatisfactory. If such suppliers simply cannot meet delivery lead times, then the Supplier Lead Yimes should be lengthened, which will probably require an increase in Stock Reorder Points. Alternatively, other suppliers could be sought out.

CONCLUSION

This exercise is just one example of how a Business Intelligence application such as Power BI, together with well-structured data models and visualized reports, can be used to provide the Actionable Insights that managers need to improve business performance.

If you think your company could benefit from this sort of analysis, please do not hesitate to contact:

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Perennial Software has produced a **package of Power BI Data Models and Visualized Reports** that provide the analytical features presented in this article, as well as many others across 4 business perspectives:

- Sales and Customers
- Purchases and Suppliers
- Products and Stock
- Financials

You can download examples of the Visualized Reports that we provide from www.perennial.com.au, or simply uses these links:

https://www.perennial.com.au/products/Perennial_BI_Sales_Examples.pdf

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https://www.perennial.com.au/products/Perennial_BI_Products_Examples.pdf

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Alternatively, Perennial Software can provide **customized Power BI Visualized Reports for your business**, together with the structured data models required. We have a lot of expertise in relational database management systems, and the data modelling Best Practices that optimize Power BI implementations.