

ROLL NO: 727823TUIT128

NAME: MONISHA V

SALES FORECASTING & ANOMALY DETECTION (AI PROJECT)

PROBLEM STATEMENT :

A retail organization wants to shift from reactive reporting to predictive analytics using AI. Management aims to forecast future sales, detect unusual sales patterns, and identify risks early. Manual analysis is no longer effective due to increasing data volume. As an Advanced BI Analyst, AI-powered features in Power BI are used for forecasting and anomaly detection. The goal is to generate automated insights using Smart Narratives for better decision-making. The organization needs AI-driven insights to proactively manage sales performance. Power BI forecasting and anomaly detection help identify trends, risks, and opportunities early. Smart Narratives automatically summarize insights for faster management decisions.

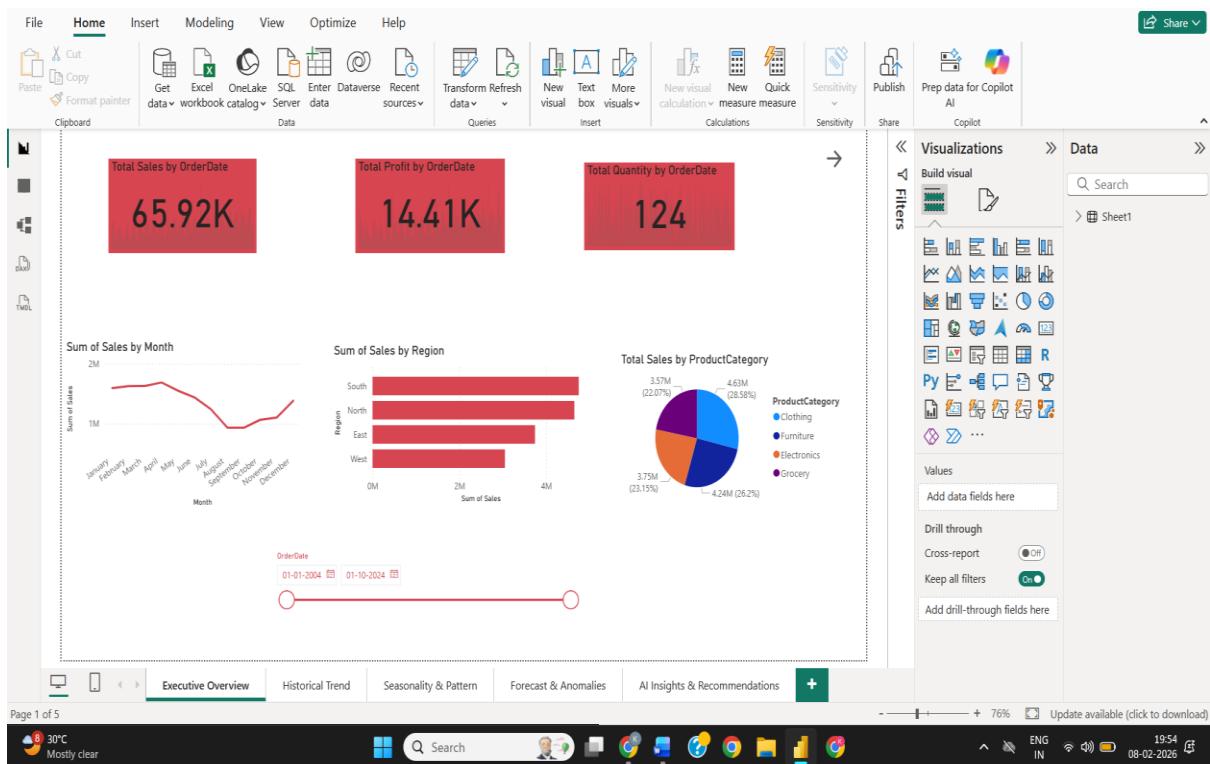
MEASURES ADDED:

- ```
1. Quarter = "Q" & FORMAT(Sheet1[OrderDate], "Q")
2. Day Type = IF(
 WEEKDAY(Sheet1[OrderDate],2) <= 5,
 "Weekday",
 "Weekend")
```

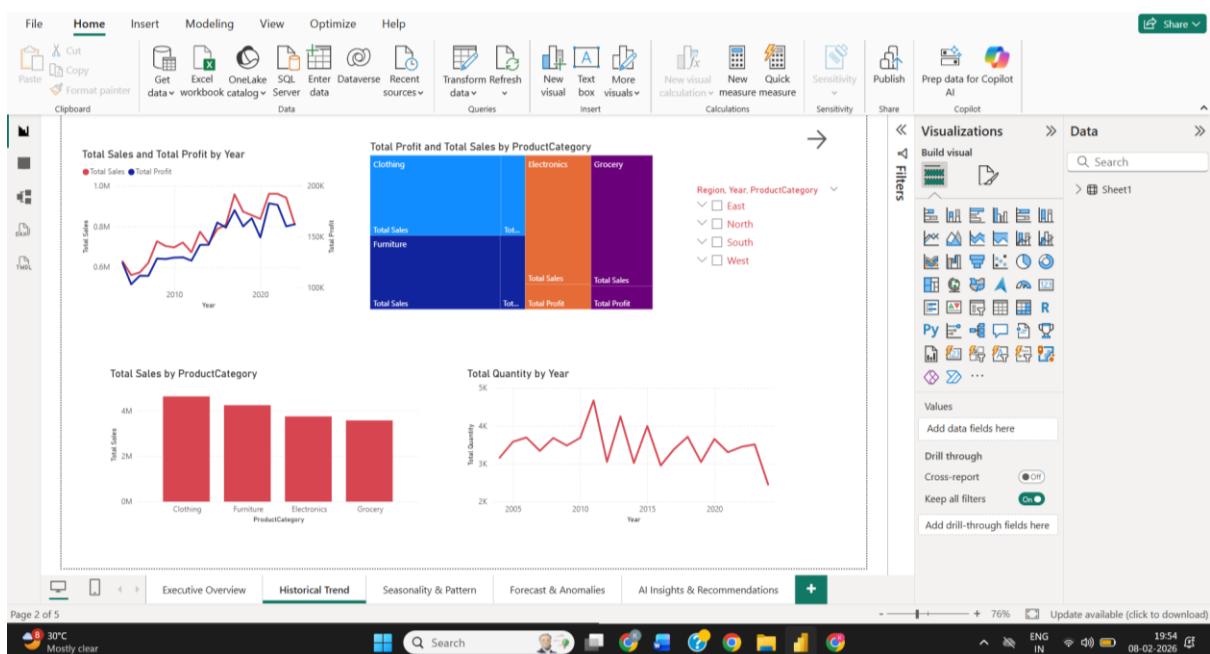
| Data              |      |       |         |        |                 |           |          |          |         |          |  |
|-------------------|------|-------|---------|--------|-----------------|-----------|----------|----------|---------|----------|--|
| Sheet1            |      |       |         |        |                 |           |          |          |         |          |  |
| OrderDate         | Year | Month | MonthNo | Region | ProductCategory | Sales     | Profit   | Quantity | Quarter | Day Type |  |
| 01 January 2004   | 2004 | Jan   | 1       | North  | Clothing        | 63973.71  | 13461.21 | 228      | Q1      | Weekday  |  |
| 01 April 2004     | 2004 | Apr   | 4       | North  | Clothing        | 79504.75  | 14611.08 | 452      | Q2      | Weekday  |  |
| 01 May 2004       | 2004 | May   | 5       | North  | Clothing        | 50710.39  | 13091.32 | 277      | Q2      | Weekend  |  |
| 01 August 2004    | 2004 | Aug   | 8       | North  | Furniture       | 36019.97  | 6455.25  | 168      | Q3      | Weekend  |  |
| 01 January 2005   | 2005 | Jan   | 1       | North  | Furniture       | 63435.7   | 13500.91 | 444      | Q1      | Weekend  |  |
| 01 March 2005     | 2005 | Mar   | 3       | North  | Furniture       | 57700.66  | 12584.66 | 126      | Q1      | Weekday  |  |
| 01 October 2005   | 2005 | Oct   | 10      | North  | Electronics     | 32373.28  | 6156.81  | 361      | Q4      | Weekend  |  |
| 01 November 2005  | 2005 | Nov   | 11      | North  | Grocery         | 40240.23  | 7702.88  | 165      | Q4      | Weekday  |  |
| 01 February 2006  | 2006 | Feb   | 2       | North  | Electronics     | 20483.16  | 3463.16  | 349      | Q1      | Weekday  |  |
| 01 April 2006     | 2006 | Apr   | 4       | North  | Clothing        | 7326.09   | 14189.78 | 196      | Q2      | Weekend  |  |
| 01 August 2006    | 2006 | Aug   | 8       | North  | Grocery         | 50497.72  | 12355.77 | 253      | Q3      | Weekday  |  |
| 01 October 2006   | 2006 | Oct   | 10      | North  | Electronics     | 27217.8   | 4070.58  | 394      | Q4      | Weekend  |  |
| 01 January 2007   | 2007 | Jan   | 1       | North  | Electronics     | 66170.91  | 13230.45 | 302      | Q1      | Weekday  |  |
| 01 May 2007       | 2007 | May   | 5       | North  | Electronics     | 70407.73  | 10792.38 | 352      | Q2      | Weekday  |  |
| 01 June 2007      | 2007 | Jun   | 6       | North  | Electronics     | 53070.95  | 11978.31 | 93       | Q2      | Weekday  |  |
| 01 July 2007      | 2007 | Jul   | 7       | North  | Furniture       | 43574.81  | 8587.95  | 238      | Q3      | Weekend  |  |
| 01 September 2007 | 2007 | Sep   | 9       | North  | Grocery         | 22671.82  | 5428.49  | 187      | Q3      | Weekend  |  |
| 01 December 2007  | 2007 | Dec   | 12      | North  | Furniture       | 62950.24  | 9600.24  | 177      | Q4      | Weekend  |  |
| 01 January 2008   | 2008 | Jan   | 1       | North  | Clothing        | 68745.95  | 15142.79 | 210      | Q1      | Weekday  |  |
| 01 June 2008      | 2008 | Jun   | 6       | North  | Clothing        | 60093.41  | 12960.25 | 118      | Q2      | Weekend  |  |
| 01 July 2008      | 2008 | Jul   | 7       | North  | Furniture       | 54240     | 12932.14 | 94       | Q3      | Weekday  |  |
| 01 September 2008 | 2008 | Sep   | 9       | North  | Electronics     | 29866.26  | 4412.5   | 83       | Q3      | Weekday  |  |
| 01 December 2008  | 2008 | Dec   | 12      | North  | Furniture       | 114047.85 | 26205.85 | 476      | Q4      | Weekday  |  |
| 01 February 2009  | 2009 | Feb   | 2       | North  | Furniture       | 73325.24  | 11769.41 | 240      | Q1      | Weekend  |  |
| 01 March 2009     | 2009 | Mar   | 3       | North  | Clothing        | 60649.32  | 10267.29 | 95       | Q1      | Weekend  |  |
| 01 April 2009     | 2009 | Apr   | 4       | North  | Grocery         | 62520.86  | 12996.63 | 187      | Q2      | Weekday  |  |
| 01 August 2009    | 2009 | Aug   | 8       | North  | Electronics     | 48207.76  | 7072.02  | 249      | Q3      | Weekend  |  |
| 01 September 2009 | 2009 | Sep   | 9       | North  | Electronics     | 40393.09  | 8017.37  | 173      | Q3      | Weekday  |  |
| 01 November 2009  | 2009 | Nov   | 11      | North  | Electronics     | 50391.16  | 8762.3   | 330      | Q4      | Weekend  |  |
| 01 January 2010   | 2010 | Jan   | 1       | North  | Electronics     | 68713.39  | 16490.17 | 348      | Q1      | Weekday  |  |
| 01 March 2010     | 2010 | Mar   | 3       | North  | Electronics     | 60304.74  | 10103.18 | 91       | Q1      | Weekend  |  |

| Day Type          |      |       |         |        |                 |           |          |          |         |          |           |            |
|-------------------|------|-------|---------|--------|-----------------|-----------|----------|----------|---------|----------|-----------|------------|
|                   | Year | Month | MonthNo | Region | ProductCategory | Sales     | Profit   | Quantity | Quarter | Day Type | Structure | Formatting |
| 01 January 2004   | 2004 | Jan   | 1       | North  | Clothing        | 63973.71  | 13446.21 | 228      | Q1      | Weekday  |           |            |
| 01 April 2004     | 2004 | Apr   | 4       | North  | Clothing        | 79504.75  | 14661.08 | 453      | Q2      | Weekday  |           |            |
| 01 May 2004       | 2004 | May   | 5       | North  | Clothing        | 58126.77  | 12578.05 | 277      | Q2      | Weekend  |           |            |
| 01 August 2004    | 2004 | Aug   | 8       | North  | Furniture       | 38818.97  | 8455.25  | 168      | Q3      | Weekend  |           |            |
| 01 January 2005   | 2005 | Jan   | 1       | North  | Furniture       | 63435.7   | 13500.91 | 444      | Q1      | Weekend  |           |            |
| 01 March 2005     | 2005 | Mar   | 3       | North  | Furniture       | 57700.66  | 12584.6  | 126      | Q1      | Weekday  |           |            |
| 01 October 2005   | 2005 | Oct   | 10      | North  | Electronics     | 32373.28  | 6156.81  | 361      | Q4      | Weekend  |           |            |
| 01 November 2005  | 2005 | Nov   | 11      | North  | Grocery         | 42040.23  | 7702.88  | 165      | Q4      | Weekday  |           |            |
| 01 February 2006  | 2006 | Feb   | 2       | North  | Electronics     | 28483.16  | 3463.16  | 349      | Q1      | Weekday  |           |            |
| 01 April 2006     | 2006 | Apr   | 4       | North  | Clothing        | 73226.09  | 14189.78 | 196      | Q2      | Weekend  |           |            |
| 01 August 2006    | 2006 | Aug   | 8       | North  | Grocery         | 50497.72  | 12355.77 | 255      | Q3      | Weekday  |           |            |
| 01 October 2006   | 2006 | Oct   | 10      | North  | Electronics     | 27217.8   | 4070.58  | 394      | Q4      | Weekend  |           |            |
| 01 January 2007   | 2007 | Jan   | 1       | North  | Electronics     | 66170.91  | 13230.45 | 302      | Q1      | Weekday  |           |            |
| 01 May 2007       | 2007 | May   | 5       | North  | Electronics     | 70407.73  | 10792.24 | 352      | Q2      | Weekday  |           |            |
| 01 June 2007      | 2007 | Jun   | 6       | North  | Electronics     | 55870.95  | 11978.31 | 93       | Q2      | Weekday  |           |            |
| 01 July 2007      | 2007 | Jul   | 7       | North  | Furniture       | 43574.81  | 8587.95  | 238      | Q3      | Weekend  |           |            |
| 01 September 2007 | 2007 | Sep   | 9       | North  | Grocery         | 22671.82  | 5428.49  | 187      | Q3      | Weekend  |           |            |
| 01 December 2007  | 2007 | Dec   | 12      | North  | Furniture       | 62956.98  | 12885.89 | 177      | Q4      | Weekend  |           |            |
| 01 January 2008   | 2008 | Jan   | 1       | North  | Clothing        | 68748.95  | 15142.79 | 210      | Q1      | Weekday  |           |            |
| 01 June 2008      | 2008 | Jun   | 6       | North  | Clothing        | 60934.41  | 13960.25 | 118      | Q2      | Weekend  |           |            |
| 01 July 2008      | 2008 | Jul   | 7       | North  | Furniture       | 54248     | 12922.14 | 94       | Q3      | Weekday  |           |            |
| 01 September 2008 | 2008 | Sep   | 9       | North  | Electronics     | 29826.26  | 4412.5   | 83       | Q3      | Weekday  |           |            |
| 01 December 2008  | 2008 | Dec   | 12      | North  | Furniture       | 114847.85 | 26265.84 | 476      | Q4      | Weekday  |           |            |
| 01 February 2009  | 2009 | Feb   | 2       | North  | Furniture       | 73335.24  | 11769.41 | 240      | Q1      | Weekend  |           |            |
| 01 March 2009     | 2009 | Mar   | 3       | North  | Clothing        | 68649.32  | 10267.29 | 95       | Q1      | Weekend  |           |            |
| 01 April 2009     | 2009 | Apr   | 4       | North  | Grocery         | 65250.86  | 12986.63 | 187      | Q2      | Weekday  |           |            |
| 01 August 2009    | 2009 | Aug   | 8       | North  | Electronics     | 48207.76  | 10722.02 | 249      | Q3      | Weekend  |           |            |
| 01 September 2009 | 2009 | Sep   | 9       | North  | Electronics     | 40393.09  | 8017.37  | 113      | Q3      | Weekday  |           |            |
| 01 November 2009  | 2009 | Nov   | 11      | North  | Electronics     | 50391.16  | 8765.3   | 330      | Q4      | Weekend  |           |            |

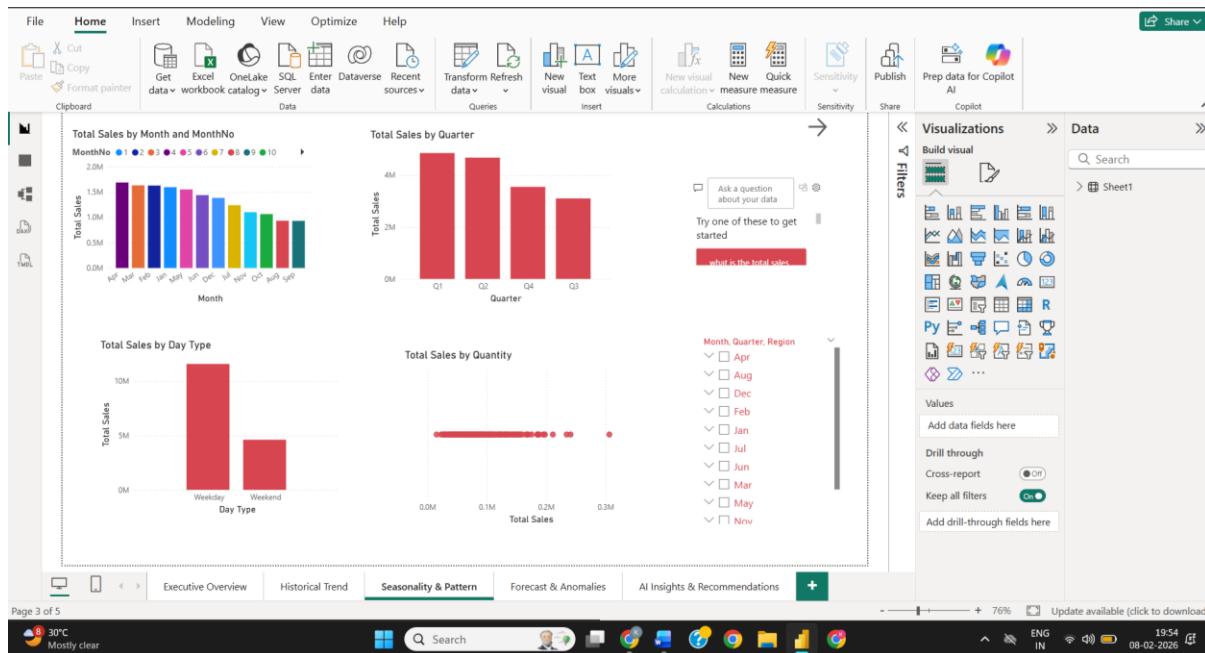
## Executive Overview :



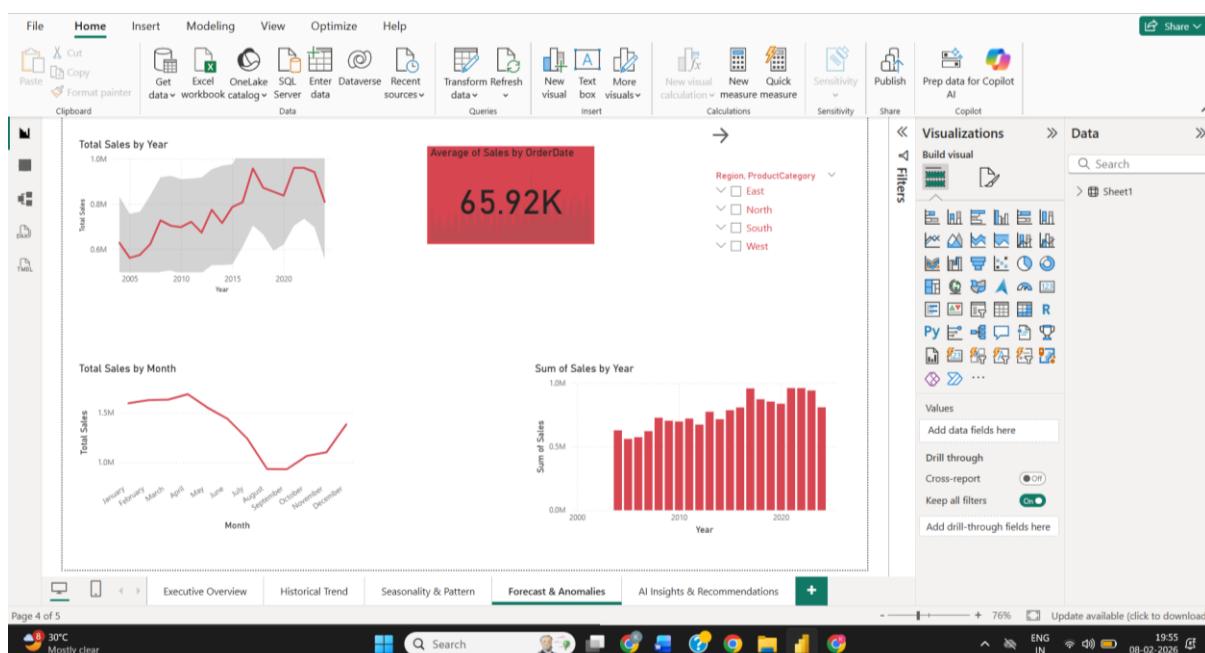
## Historical Trend :



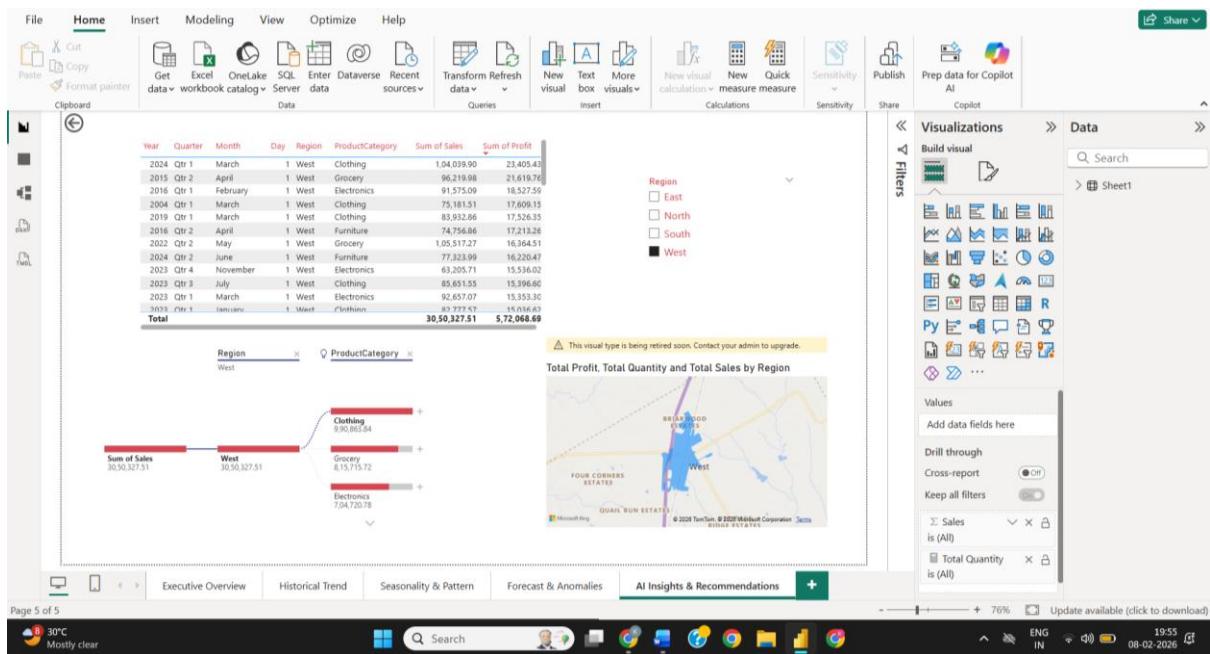
## Seasonality & Pattern :



## Forecast & Anomalies :



# AI Insights & Recommendations :



## Description:

The retail organization aims to enhance decision-making by moving from traditional reporting to AI-driven analytics. With growing data volumes, manual analysis has become inefficient and time-consuming. Power BI is used to analyse historical sales trends and identify seasonality patterns. AI forecasting models help predict future sales performance accurately. Anomaly detection highlights unusual sales spikes or drops automatically. These anomalies may indicate demand surges, supply issues, or external market changes. Smart Narratives convert complex data into easy-to-understand insights. Overall, the solution enables proactive risk management and opportunity identification.