MODULE: BIG DATA AND BUSINESS INTELLIGENCE (CIS4008-N)

FOOTWEAR RETAIL ANALYSIS

DESIGN AND IMPLEMENTATION OF A BI SOLUTION

A report written by

VICTOR ODOH
ID: C2397722

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Executive summary

Based on specific business questions, this report details every design and implementation process taken to create a BI solution for a footwear retail company. With the dashboard created, top management and store managers can examine data that has been properly visualised and generated from several data sets within the company to produce a precise image of where the company is currently at and to provide precise insights. Analyses from the dashboard revealed that Intangibles typically produce a negative annual profit (Loss) of -£1M for every £1M annual profit made by the Ladies Fashion Boots Market Group, cancelling out the gains. Since reaching a peak in 2015, Year Over Year sales growth has been steadily declining. The lowest Sales Growth rate was observed in 2021, falling by 41.4% from 2020. The 58.9% decline in sales from web transactions for the same year and the 87.5% decline in sales of Ladies Basic Boots between 2020 and 2021 account for the majority of the 41.4% decline in sales observed in 2021.

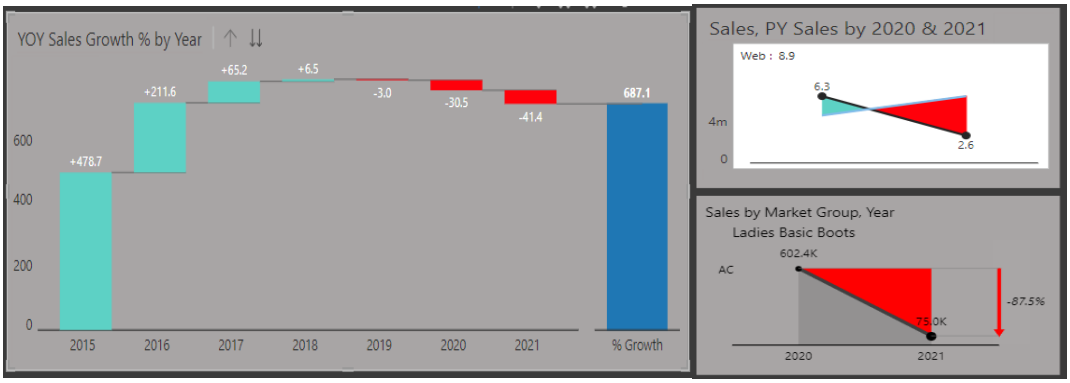


Figure 1.0: Some key visuals generated from the dashboard

More so, despite having the highest sales growth rate (478.7%), 2015 was the first and only year deficit (-£3.3m). This is due to the fact that the Cost of Goods (COGS) for that year (£6.8 million) was much higher than the yearly sales (£3.5 million).

By utilizing more online product-based marketing strategies, the sharp and ongoing decline in sales that began at the end of 2019 can be stopped. Market segments including "Ladies Sport Casual" and "Ladies Fashion Sandals" have had constant sales growth from the year 2020's beginning. More items from these groupings might be disseminated throughout all stores in an effort to boost overall business sales. The continually poor sales performance of intangible products, which is of significant concern, justifies a review and further inquiry. Better marketing tactics for intangibles such as digital assets, service contracts, etc. can reflect true profitability and reduce overall losses.

1.0 Introduction

This is a report on the design of a business intelligence (BI) solution that attempts to answer specific business issues using sales data from a footwear retail company and provide analysis that will give its executive management and store managers insights to help with decision-making and planning. For the purpose of this project, the company is assumed to be Deichmann SE, one of the largest footwear retailers in Europe. This report includes recommendations based on the analyses derived from the dashborad as well as a detailed explanation of all processes taken in the development of the BI solution and the dashboard visuals and metrics used.

1.1 Data Source

The data set that which was used for this project was retrieved from https://liveteesac-my.sharepoint.com/:x:/g/personal/a_occhipinti_tees_ac_uk/EZZMyeL2KzNFjMUElt31tYoB8y5QoBqDxEbN3-nQspF1Pw?e=FKk7ks via Teesside Universities Blackboard environment. The link opens up to a list of 23 data sets of which the "Footwear Retail Data Including Customer Data" was the 22nd. It is being hosted in the SharePoint account of the module leader, Dr. Annalisa Occhipinti.

1.1.1 The Data Set

The data set consists of 6 tables and a "READMe" text file with short details about the tables. All 6 tables are in the Microsoft Excel .csv format with names and descriptions below:

i. ***Customer Table***: Contains customer data.

Column Name	Description
customer id	Unique ID of each customer
store number	Unique store ID of customers
gender	Customer gender: Male, female or unknown
marital status	Customer marital status
create source	Source of Customer transaction
dob	Customer's Date of Birth (Empty column, no data)
create date	No data
loyalty opt in	Whether a customer registered for the loyalty programme
loyalty opt in date	Date they registered for the Loyalty programme
email opt in	Email linked to the loyalty registration.
email opt in date	Date of registration

Table 1.0: Customer Table Decription

ii. ***Date table***: Contains various time/ date formats from year 2011 to 2031 for representation

as desired in a dashboard design.

Column Name	Description
id	Unique ID for date
date	Date in Date and time format
uk_date	Date in Day, Month and Year
description	Date in words
day_of_week	Day number in week
day_number_of_calendar_month	Day in the calender month (normal / actual month)
day_number_in_calendar_year	Day in the year
day_number_of_trading_month	Number of trading month
day_number_of_trading_year	Day in trading month
calendar_year	Year
calendar_week_number	Week in calender year
calendar_month_name	Calender month in words
calendar_month_number	Number of actual month
calendar_quarter	Actual yearly quarter
trading_week_number	Number of trading week
Trading Month Name	Name of trading month
trading_month_number	Number of trading number
Trading Quarter	Trading yearly quarter
trading_season	Abbreviation of trading season
trading_season_description	Description of trading season
year_season	Abbreviation of season and year
year_season_description	Description of season and year
year_half	Yearly half and year
year_quarter	Yearly quarter and year
year_month	Number of month and year
year_week	Number of week and year
Trading Half	Yearly half of trading date
calendar_half	Yearly half
day_of_week_name	Name of days of the week
Trading Year	Year of trading
trading_date	Date of trading
trading_year_alt	Year of trading
Trading Month	Trading month abbreviated

Table 1.1: Date Table Decription

iii. ***Product table*** : Contains product data.

Column Name	Description
Market Group Code	Unique code for each Market Group
Market Group Description	Name/ description of market group
Merch Group Code	Unique code for each Merch Group
Merch Group Description	Description of merch group
Gender	Product category in terms of customer gender, sundries, others.

Table 1.2: Product Table Decription

iv. ***Store Table*** : Contains data on all the company's stores

Column Name	Description
Store name	Name of the store
Store number	Unique number or ID of each store
Region	Region the store is located (North / south)
Product type	The type of the product sold by store
Location type	The kind of store eg. High street, Retail Park etc.
Country	Country in which store is located
Store type	The type of store eg. Retail, Website, Concession etc.
Store name - short	Shortened name of each store

Table 1.3: Store Table Decription

v. ***Transaction Detail*** Table : Details of all transactions at the item level

Column Name	**Description**
Transaction ID	Unique ID of each transaction
Transaction Line Number	Represents number of items tied to each transaction ID
Transaction Type	Type of transaction (Either Sales or Return)
Sales Associate Number	ID number of Sales associate responsible for the transaction
Style Number	ID of the style
Market Group Code	Unique code for each Market Group
Colour Number	Colour ID of product
Size Number	Size Number of product
Quantity	Quantity of the item
Price	Selling price of the item / product
Cost	Cost price of product
Markdown Percentage	Percentage change between original price and any reduction in the original price
Coupon Code	Coupon code assigned to product

Table 1.4: Transaction Details Table Decription

vi. ***Transaction Header*** Table : This contains the details of all sales at the transaction level

Column Name	**Description**
Transaction ID	Unique ID of each transaction
Transaction Source	Source of the transaction (Either via Web or Store)
Store Number	Unique number or ID of each store where transaction occurred.
Customer ID	Unique ID of Customer that performed the transaction
Sales Associate Number	Unique ID of Sales associate that handled the transaction
Transaction Date	Date of the transaction
Transaction Number	Number representing the n^{th} transaction.
Till Number	Till number that handled / registered the transaction
Price	Transaction Value (Summation of the prices of all items / products of the transaction)
Transaction Lines	Represents number of items tied to each transaction ID

Table 1.5: Transaction Header Table Description

1.2 BI Requirements/ Questions

The BI solution addresses the following questions:

- How are sales distributed across stores, locations, and over time?
- What have been the sales trends? Have there been any steep changes in the yearly trends? If so, what was/were the contributing factor(s)?
- How are Market Groups performing in terms of sales volume and gross profit over time? What are the top and bottom performing Market Groups in terms of profit and how have they contributed to overall profit growth?
- How are stores performing in sales? Which are the top-performing and underperforming stores and how are the average sales across these stores influenced by product categories?
- Who are the most valuable Customers? What have been their individual contributions to overall company sales over time?

2.0 Visuals, Findings, and Discussion

The BI design consists of 7 pages, each with a number of visuals and metrics to help analyze the business questions. The pages are listed below:

i. Home Page
ii. Sales Trend Analysis
iii. Store Performance
iv. Inactive Stores
v. Market Group Overview
vi. Market Group Performance
vii. Sales Distribution & Customer

2.1 Visuals and Metrics

The following subsections further explain the charts and metrics used on each page of the dashboard design. The Home page contains buttons that navigate to each of the pages.

2.1.1 Sales Trend Analysis Visuals and metrics

The following business question is addressed on the Sales Trend Analysis page.

Business Question: What have been the sales trends? Have there been any steep changes in the yearly trends? If so, what was/were the contributing factor(s)?

Visuals / Metrics Used:

i. Inforiver Vertical Waterfall Chart - YOY Sales Growth % by Year: This line chart is used to analyze the Year Over Year (YOY) sales growth metrics (In percentage).

The YOY growth metrics measure the change in annual sales between one year and the previous year. This rate gives the user an idea of how the company's sales are performing over time.

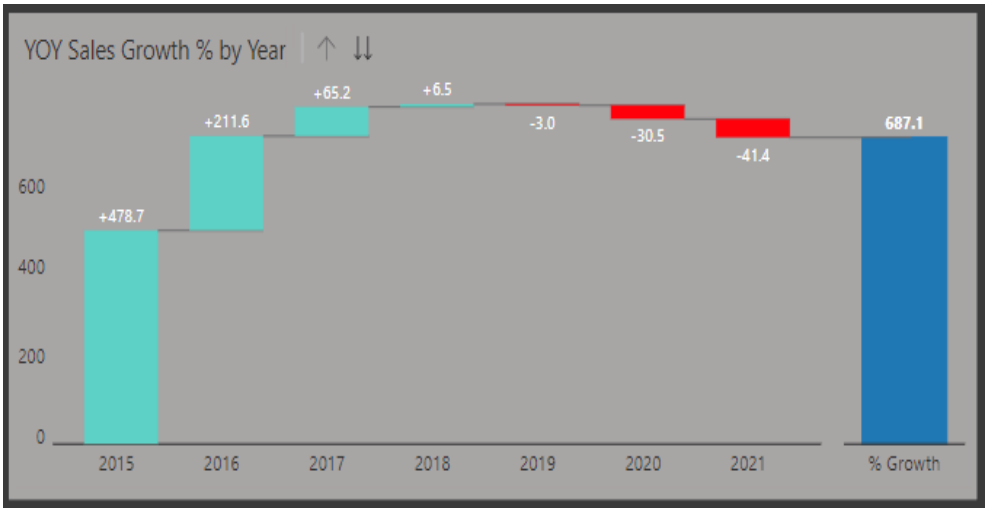


Figure 1.1: Waterfall Chart of YOY Sales Growth% by Year

ii. Inforiver Line Chart – Sales, COGS, Profit by Year: This chart visualizes the yearly sales, yearly Cost of Goods (COGS), and yearly profit for comparison. It

was introduced to complement the Waterfall Chart of YOY Sales Growth by Year (Figure 1.0). Comparing both charts gives more insight into the Sales growth trends over the years.

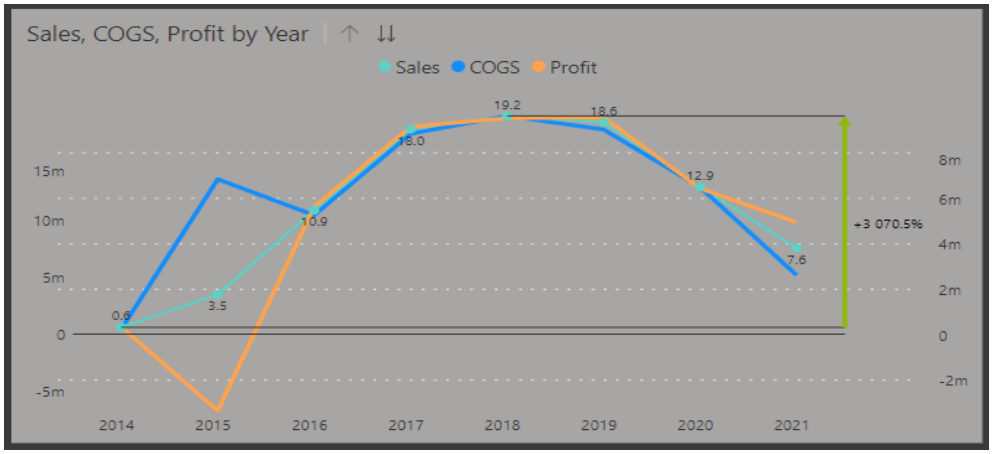


Figure 1.2: Line Chart of Sales, COGS & Profit by Year

Positioning the cursor over a data point on the chart reveals the sales, COGS and Profit corresponding to that point in time.

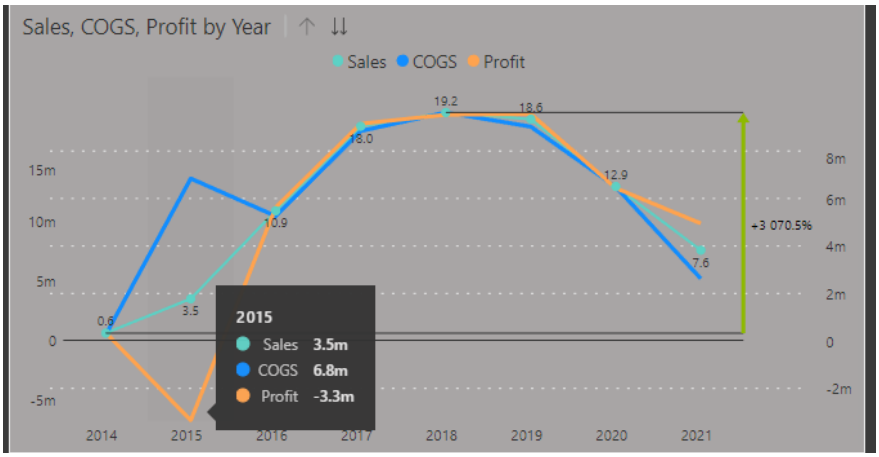


Figure 1.3: Sales, COGS, and Profit in 2015

iii. Inforiver Integrated Variance Column Chart – Sales, PY Sales by 2015: It is known that the year 2015 recorded the highest sales growth rate. This chart gives an explanation for the steep increase in sales that occurred from 2014 to 2015. It shows the Sales, the Previous Year (PY) Sales, and the change in sales for two product categories, Ladies and Children. Comparing this with figure 1.2 shows that combined sales from both product categories amount to £2.7m which accounts for more than 70% of the 2015 annual sales of £3.5m.

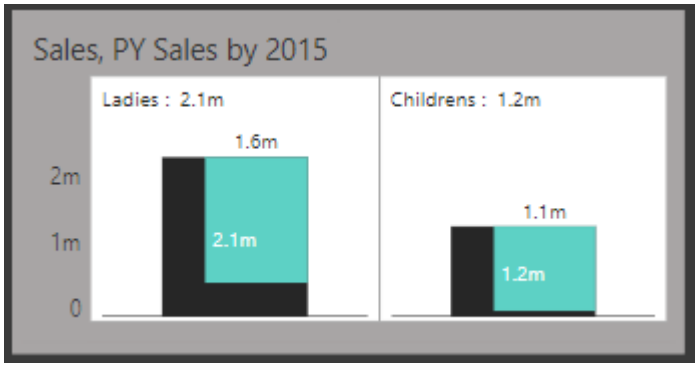


Figure 1.4: Sales, PY Sales by 2015, and product category (Ladies, Children)

iv. Inforiver Line Chart – Sales, COGS, Profit by 2014 & 2015: This chart shows sales, COGS, and Profit in 2014 and 2015 for the Girls Senior shoes product category. It gives an explanation for the loss of £3.3m recorded in 2015.

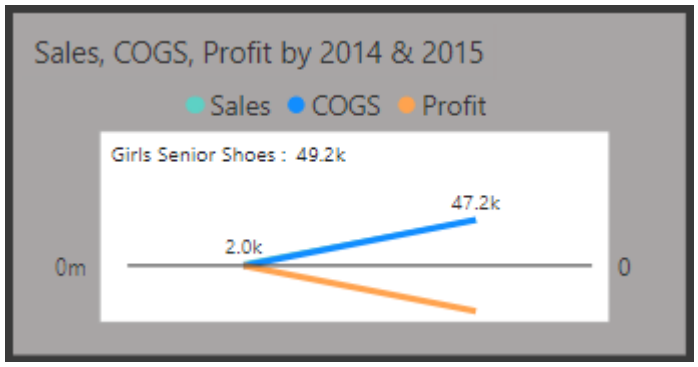


Figure 1.5: Sales, COGS, Profit by 2014 & 2014 and Girl Senior Shoes

v. Inforiver Variance Line Chart – Sales, PY Sales by 2020 & 2021: These charts visualize the sales and PY sales for the web transaction source in the years 2020 and 2021. It gives an explanation for the least Sales growth rate of 41.4% recorded in 2021.

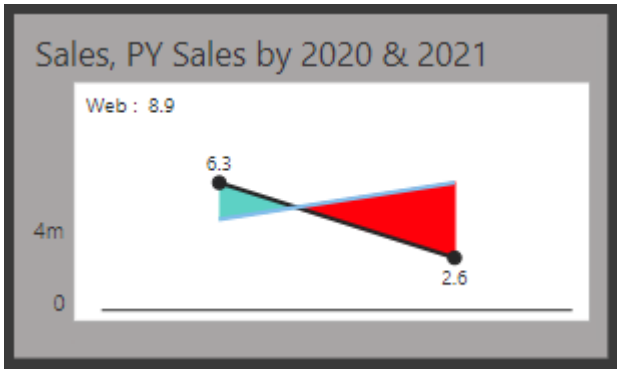


Figure 1.6: Sales, PY Sales by 2020 & 2021, and Web

vi. Zebra BI Line Chart – Sales by Market Group & Year: This chart further explains the 41.4% decrease in sales in 2021. It shows the Sales in 2020 and 2021, and the sales change % for the "Ladies Basic boots" Market category.

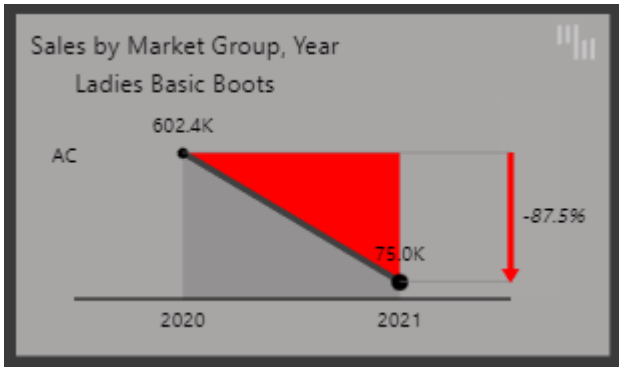


Figure 1.7: Sales by Ladies Basic Boots in 2020 and 2021

vii. Power BI built-in Line Chart – Sales Growth Rate in two years coming: The forecasting feature was added to this line chart to give the user insight on sales growth trend in two years.

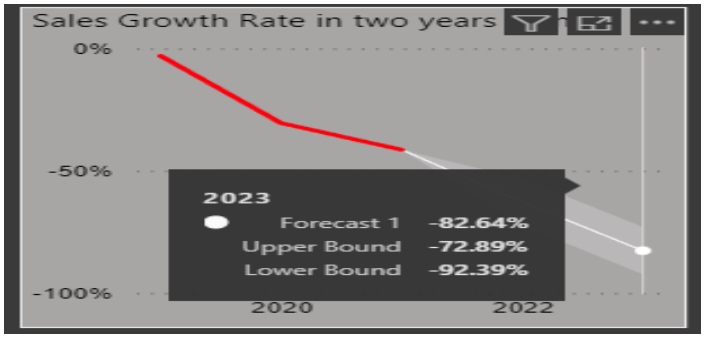


Figure 1.8: Line chart of Sales Growth rate in two years coming

viii. Multi-card KPIs by TME AG: One of the interesting features of this card visual is that icons can be added to the card visual. These cards are used to visualize the following measures/metrics:

- CAGR % (Sales): The Compound Annual Sales Growth Rate in percentage is a measure of the annual sales growth over a period of time (between 2014 and 2021), with the effect of compounding taken into action. It signifies the rate at which the company grows in sales.
- Net Sales: The total net sales from 2014 to date
- Gross Sales: The total Sales minus returns from 2014 to date

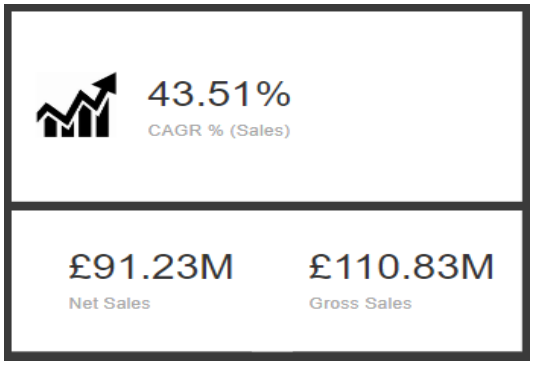


Figure 1.9: Sales Card visuals

2.1.2 Store Performance Visuals and Metrics

These visuals and metrics address the following business question:

Business Question: How are stores performing in sales? Which are the top-performing and underperforming stores and how are the average sales across these stores influenced by product categories?

Visuals / Metrics Used:

i. Zebra BI Tables Chart – Sales and PY Sales by Store name: This visualizes actual sales, PY sales, and Change in sales for each store in a table for comparison and analysis. Users can view the sales performance of each store at a glance. It is set to interact with the year slicer to provide analysis for each year.

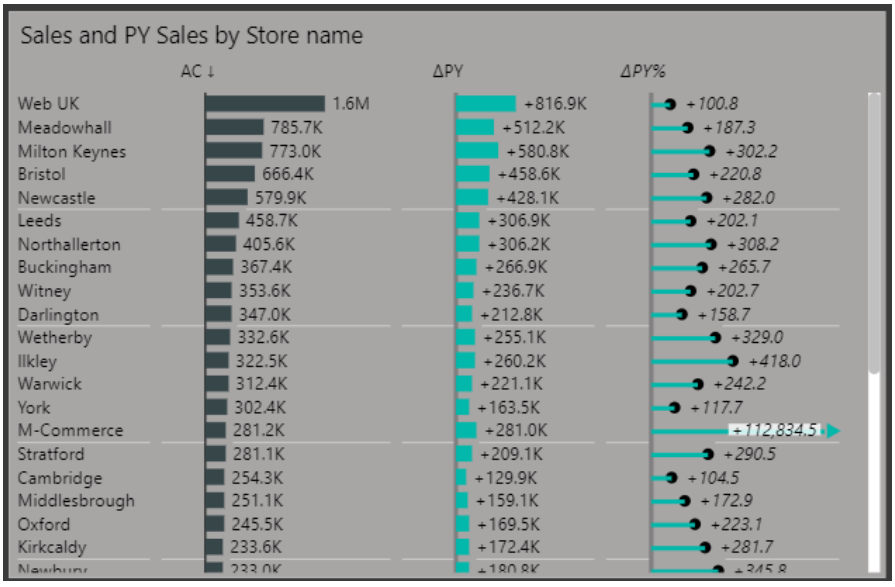


Figure 2.0: Sales and PY sales by Store name

ii. Key Influencers Visual: This was introduced in the design to analyze how product categories, stores and store types influence Sales. It is set to interact with other charts in the page hence analysis can be done for sales of individual stores when they are selected, and in the same manner for a selected year via the year selection slicer.

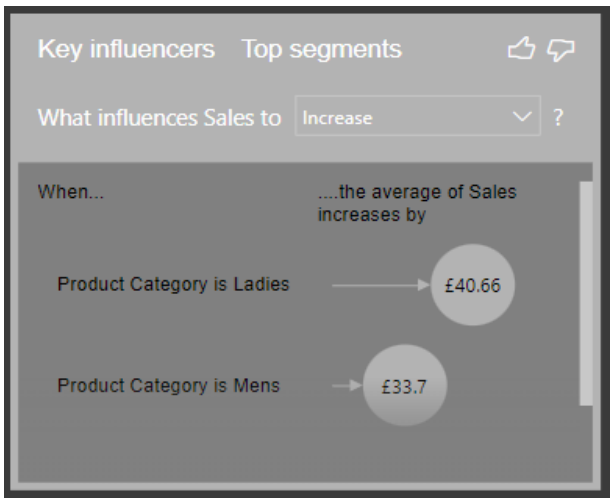
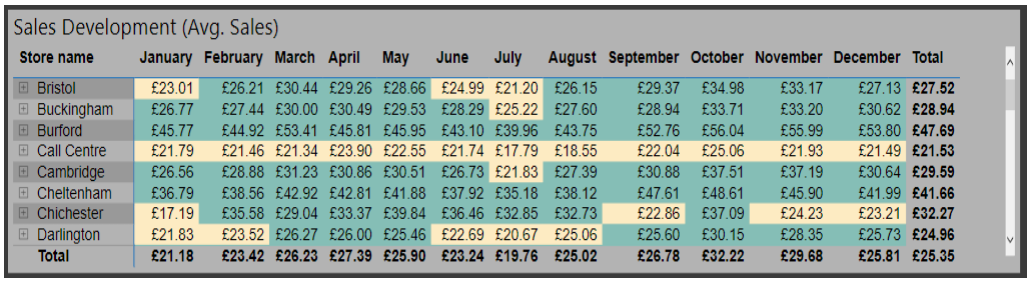


Figure 2.1: Key Influencer – Sales

iii. Matrix visual: This was introduced in the design to provide visualizations for the average sales by each store over time with options to drill down to product categories on rows and to drill through year, quarter, month and day on column. It is formatted to highlight all stores that are performing below average sales.



Sales Development (Avg. Sales)

Store name	January	February	March	April	May	June	July	August	September	October	November	December	Total
Bristol	£23.01	£26.21	£30.44	£29.26	£28.66	£24.99	£21.20	£26.15	£29.37	£34.98	£33.17	£27.13	**£27.52**
Buckingham	£26.77	£27.44	£30.00	£30.49	£29.53	£28.29	£25.22	£27.60	£28.94	£33.71	£33.20	£30.62	**£28.94**
Burford	£45.77	£44.92	£53.41	£45.81	£45.95	£43.10	£39.96	£43.75	£52.76	£56.04	£55.99	£53.80	**£47.69**
Call Centre	£21.79	£21.46	£21.34	£23.90	£22.55	£21.74	£17.79	£18.55	£22.04	£25.06	£21.93	£21.49	**£21.53**
Cambridge	£26.56	£28.88	£31.23	£30.86	£30.51	£26.73	£21.83	£27.39	£30.88	£37.51	£37.19	£30.64	**£29.59**
Cheltenham	£36.79	£38.56	£42.92	£42.81	£41.88	£37.92	£35.18	£38.12	£47.61	£48.61	£45.90	£41.99	**£41.66**
Chichester	£17.19	£35.58	£29.04	£33.37	£39.84	£36.46	£32.85	£32.73	£22.86	£37.09	£24.23	£23.21	**£32.27**
Darlington	£21.83	£23.52	£26.27	£26.00	£25.46	£22.69	£20.67	£25.06	£25.60	£30.15	£28.35	£25.73	**£24.96**
Total	**£21.18**	**£23.42**	**£26.23**	**£27.39**	**£25.90**	**£23.24**	**£19.76**	**£25.02**	**£26.78**	**£32.22**	**£29.68**	**£25.81**	**£25.35**

Figure 2.2: Matrix chart for average sales of store

iv. Store Slicer and Advance card Visuals: This a group of Advance card visuals and a Store Selection Slicer. The metrics being visualized by the advance cards give the user insight on the performance of one or more selected stores.

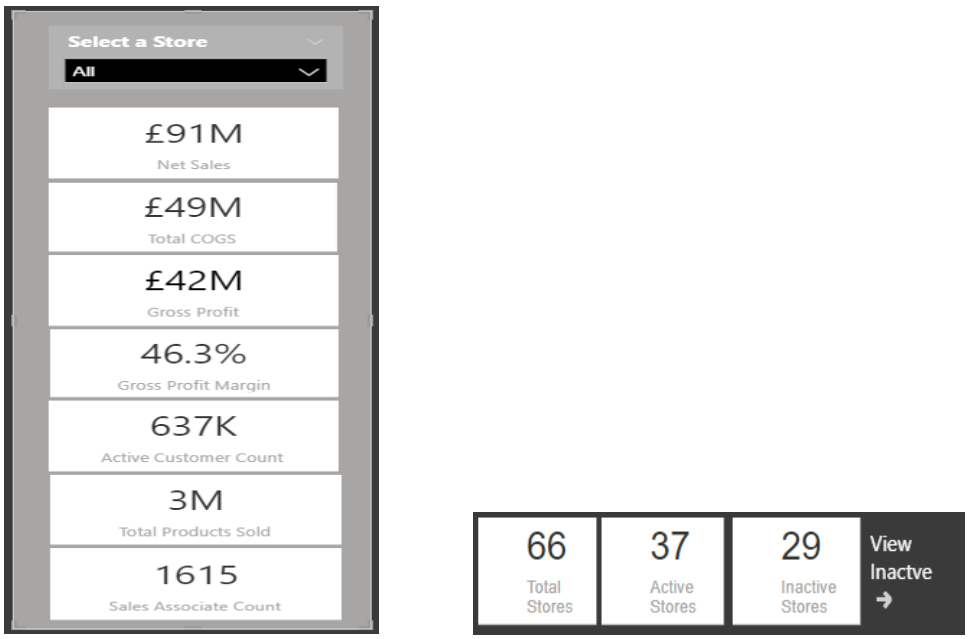


Figure 2.3: Advance Card Visuals and Store Selection Slicer.

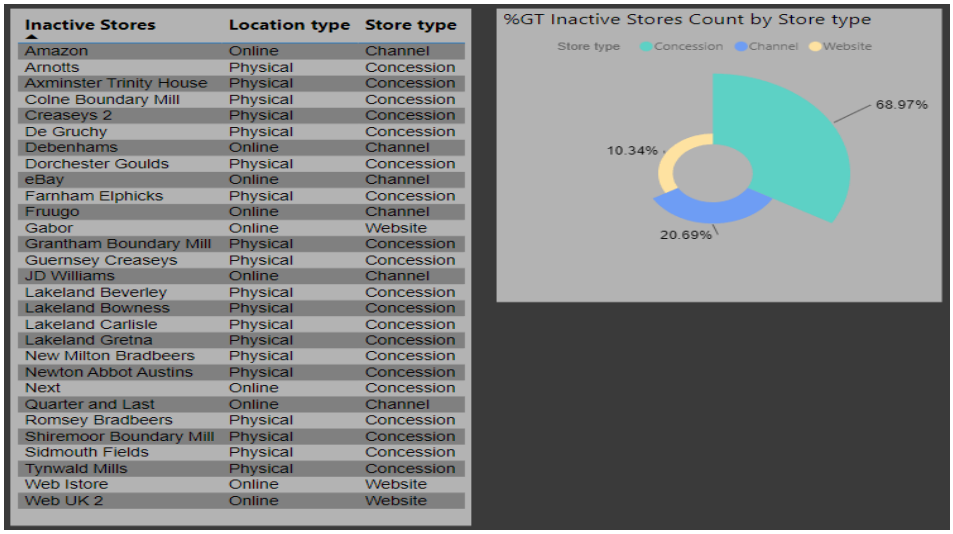
The following new measures are visualized in the Store Performance Page:

- Total COGS: The Total Cost of Goods Sold hence, the total cost of products sold.
- Gross Profit: The Net Sales minus the COGS.
- Gross Profit Margin: This measures the financial health of a selected store or the company in general. It is the Gross profit expressed as a percentage of Net Sales.
- Active Customer Count: Number of customers that have made a purchase(s) between 2014 and 2021.
- Total Products Sold

- Sales Associate Count: Numbers of Sales associates
- Total Stores
- Active Stores: All active stores since 2014
- Inactive Stores: All Stores with no activity since 2014

A "View Inactive" button was created to navigate to a list of all inactive stores.

v. Power BI built-in Table visual and Aster Plot 1.4.0 visual: In the "Inactive Stores" Page, all inactive stores are visualized using a table with "location type" and "store type" columns. The Aster plot chart shows the percentage of inactive stores by store type.



Inactive Stores	Location type	Store type
Amazon	Online	Channel
Arnotts	Physical	Concession
Axminster Trinity House	Physical	Concession
Colne Boundary Mill	Physical	Concession
Creaseys 2	Physical	Concession
De Gruchy	Physical	Concession
Debenhams	Online	Channel
Dorchester Goulds	Physical	Concession
eBay	Online	Channel
Farnham Elphicks	Physical	Concession
Fruugo	Online	Channel
Gabor	Online	Website
Grantham Boundary Mill	Physical	Concession
Guernsey Creaseys	Physical	Concession
JD Williams	Online	Channel
Lakeland Beverley	Physical	Concession
Lakeland Bowness	Physical	Concession
Lakeland Carlisle	Physical	Concession
Lakeland Gretna	Physical	Concession
New Milton Bradbeers	Physical	Concession
Newton Abbot Austins	Physical	Concession
Next	Online	Concession
Quarter and Last	Online	Channel
Romsey Bradbeers	Physical	Concession
Shiremoor Boundary Mill	Physical	Concession
Sidmouth Fields	Physical	Concession
Tynwald Mills	Physical	Concession
Web Istore	Online	Website
Web UK 2	Online	Website

Figure 2.4: Inactive Stores

2.1.3 Market Group Overview / Performance Visuals and Metrics:

The following business question is addressed here.

Business Question: How are Market Groups performing in terms of sales volume and gross profit over time?. What are the top and bottom performing Market Groups in terms of profit and how have they contributed to overall profit growth.

Visuals / Metrics Used:

i. Scroller Visual and Animated Bar Chart Race Visual: These Scroller visual is an animated chart which visualizes Market Group sales and profits with an animated effect that keeps them scrolling horizontally across the window. The Animated Bar Chart Race was introduced to visualize change in Sales trend of Market Groups over time. In figure 2.5 below, the Scroller visual is located at the top of the Animated Bar Chart Race visual.

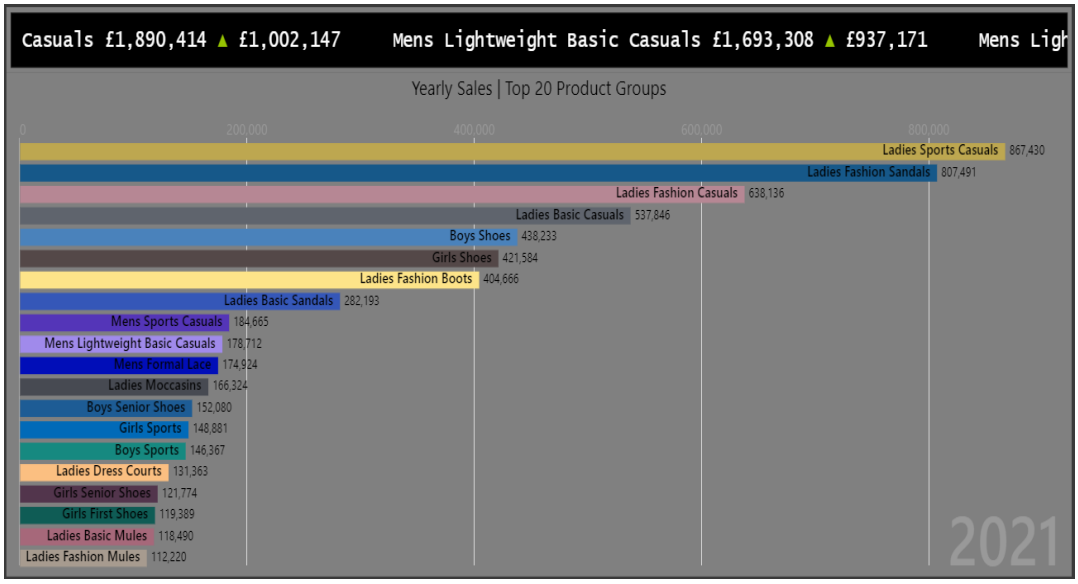


Figure 2.5: Scroller and Animated Bar Chart Race Visuals.

ii. Funnel Chart: This is used to visualize the % of the grand total of the Return on Sales, contributed by each product category. Figure 2.6 below includes a card visual displacing the total amount of Returns on Sales.

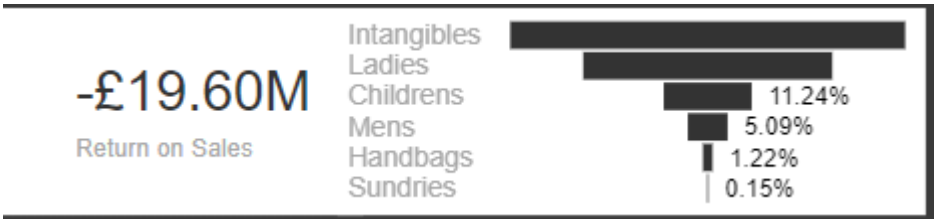


Figure 2.6: Return on Sales by Product Category

iii. Zebra BI Chart – Profit and PY Profit by Year: Found in the Market Group Performance Page. It also visualizes the percentage change in profit between a year and the previous. It is set to interact with the Profit by Top and Bottom 5 Market Groups and can be used to analyze the profit trends of each of the Top / Bottom 5 Market Groups. It also interacts with a Market Group Selection Slicer with which a user can select any Market Group to be analyzed.

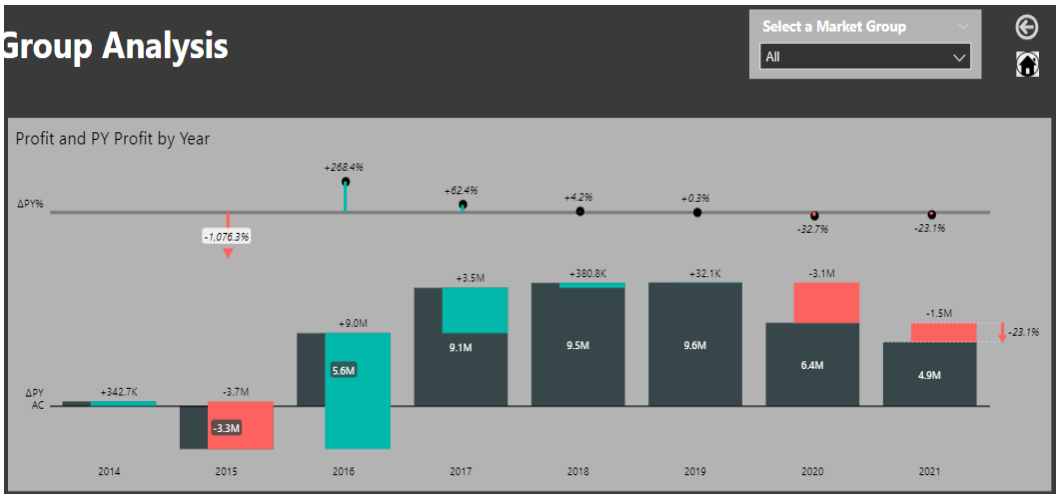


Figure 2.7: Profit and PY profit by Year with Market Group Selection Slicer

iv. Inforiver Horizontal lollipop Charts: They are used to visualize the profit by the Top 5 and Bottom 5 Market Groups showing the % difference between the highest and lowest values.

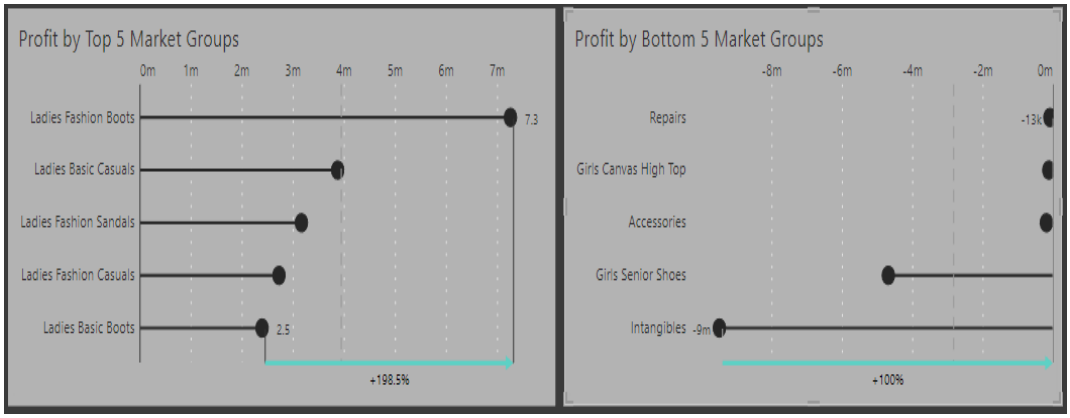


Figure 2.8: Profit by Top and Bottom 5 Market Groups

v. Area Chart – Profit by Year and Best/Worst Performer: This is used with a trend line to analyze and compare at a glance, the yearly trends of profit by the Best performing and worst performing Market Groups (Intangibles and Ladies Fashion Boots).

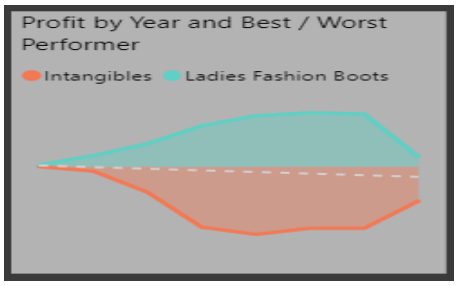


Figure 2.9: Profit by Year and Best/Worst Performer

The following new metrics were introduced:

- Avg. Revenue Per Market Group: The average of Market Group sales.
- Market Group Count: Number of Market Groups
- Return on Sales: Total amount of Sales returns
- Gross Sales, Gross Profit
- CAGR % (Profit): The Compound Annual Profit Growth Rate in percentage is a measure of the annual profit growth over a period of time (between 2014 and 2021), with the effect of compounding taken into action. It signifies the rate at which the company grows in profit.
- Profit by Top 5 Market Groups (MG)
- Profit by Bottom 5 MG
- Avg. Average Profit contributed by each of the Top 5 MG
- Avg. Profit by Bottom 5 MG: Profit contributed by each of the Bottom 5 MG

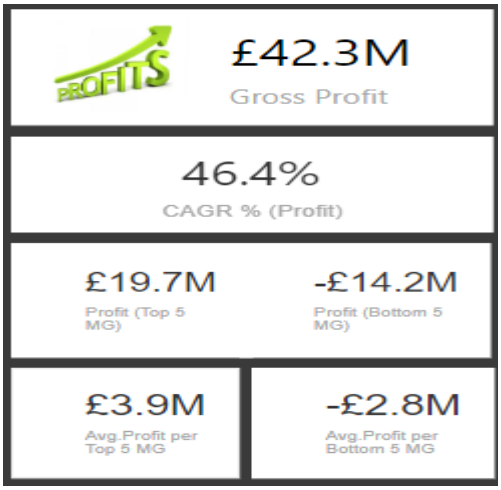


Figure 2.10: Card Visuals for Market Group Performance Measures

2.1.4 Sales Distribution and Customer Dashboard Visuals and Metrics

The following business questions are addressed here

Business Questions:

- How are sales distributed across stores, locations, and over time?
- Who are the most valuable Customers? What have been their individual contributions to overall company sales over time?

Visuals / Metrics Used:

i. Decomposition Tree: This was introduced to visualize sales distribution across 4 dimensions (Date, Store Type, Store name and Market Group).

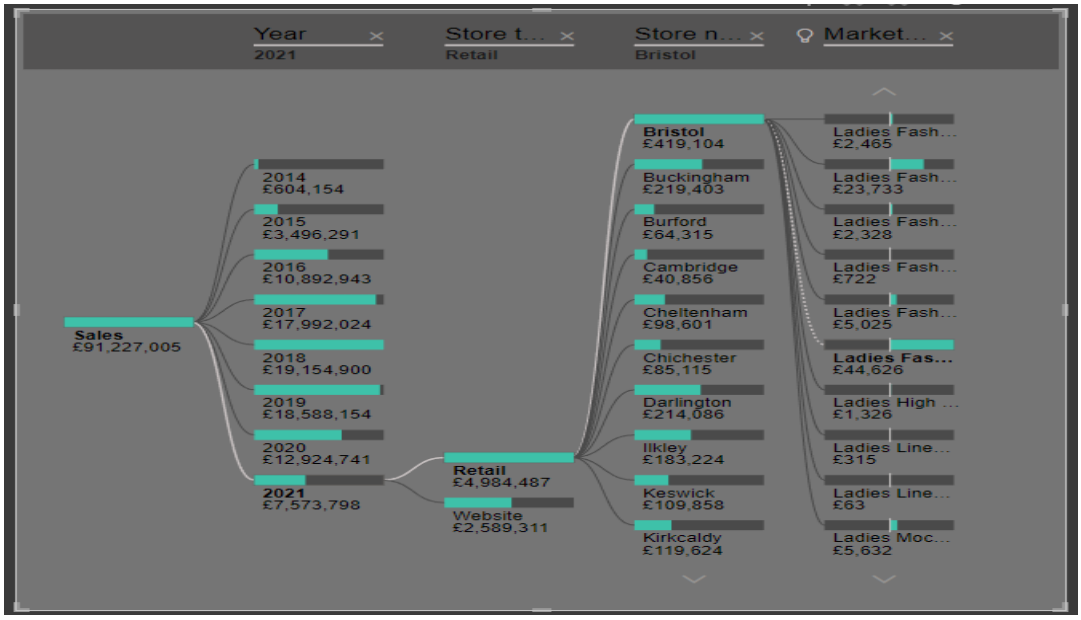


Figure 2.11: Sales Distribution Across 4 Dimensions

ii. Matrix and card Visuals: The matrix displays the top 3 customers represented by Customer ID. It includes Customer ID, Sales, and Items (number of products bought) columns. A user can drill down the rows to the Store type and Store

name where customers have made purchases.

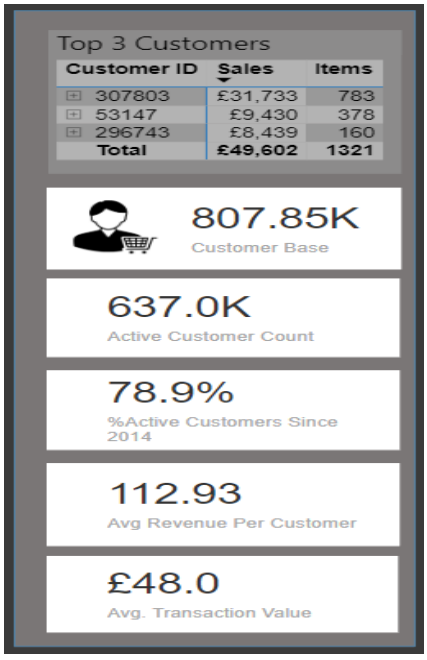


Figure 2.12: Top 3 Customers and Customer metrics

The metrics created for visualization on the page are as follows:

- Customer Base: Count of all customers in the Customer Table
- Active Customer Count: All customers that made one or more purchases between 2014 and 2021
- %Active Customers Since 2014
- Avg. Revenue Per Customer
- Avg. Transaction Value: The average amount spent on a transaction by a customer

iii. Clustered Bar Chart and Line Chart: The clustered bar chart shows sales distribution by country. The line chart shows the trend in sales distribution by calendar half over time.

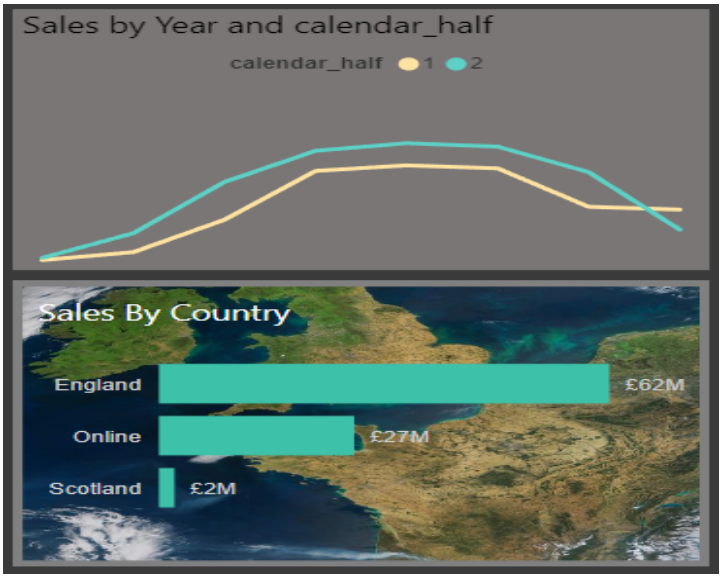


Figure 2.13: Sales Distribution by Calender half, By Country

iv. Aster Plot 1.4.0 – Sales By Store Type: Used to visualize the data in form of radical slices whose arcs represent each of the Store Types.

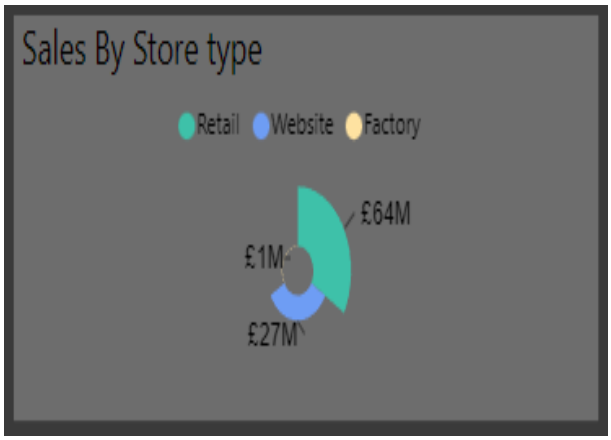


Figure 2.14: Aster Plot of Sales By Store Type

2.2 Key Findings

The following key findings are derived from analysis based on the BI visuals discussed in section 2.1 above.

- The highest YOY sales growth ever recorded was in 2015, a record 478.7% sales increase from the year 2014 to 2015 (figure 1.0).
- YOY Sales growth has been on a steady decline since its peak value in 2015 (figure 1.0).
- 2015 saw the first and only year loss (-£3.3m), despite having the highest sales growth rate (478.7%). This is because the Cost of Goods (COGS) (£6.8 million) was significantly greater than the yearly sales (£3.5 million) for that year. (figure 1.2).
- The high COGS and huge loss in 2015 can be attributed to the Market Group "Girl Senior Shoes" which recorded an annual sale of about £42, 200, annual COGS of £5.3M, and a consequent loss of £5.2M. The contributing COGS from this market group accounts for more than 70% of the total COGS (£6.8M) for 2015 (Figure 1.4)
- 2021 recorded the least Sales Growth rate, a 41.4% decline from 2020. (figure 1.0).
- Most of the 41.4% decrease in sales recorded in 2021 can be attributed to the 58.9% fall in sales via web transactions for the same year (Figure 1.5) and also the 87.5% fall in sales of Ladies Basic Boots between 2020 and 2021 (figure 1.6).
- Ladies Fashion Boots had been the best-performing Market group and maintained a constantly increasing Sales growth from 2014 to the tail end of 2019. In early 2020, its sales suddenly began to experience a steady fall till the end of 2021. At about the same time when it began to fall, the Ladies Sport Casual and Ladies Fashion Sandals Market Groups began to experience a steady increase in sales till the end of 2021. At the end of 2021, both Market Groups

were positioned at the 1st and 2nd positions respectively, in annual sales (Figure 2.5)

- Web Uk has been the best-performing store in terms of sales with a total of £17.2M in sales while Web Till records £744 pounds in sales as the worst performer (figure 2.0)
- 29 stores of the company's 66 stores have been inactive since 2014. About 70% of these inactive stores are Concession Stores (Figure 2.3, 2.4)
- The "Intangibles" product category alone contributed to 50.47% of the Return on Sales (Figure 2.6).
- On average, for every £1M annual profit contributed by the Ladies Fashion Boots Market Group, Intangibles contributes a negative annual profit (Loss) of -£1M thereby canceling the profits out (Figure 2.9).
- Over time, more sales have been recorded in the second half of the year than in the first (Figure 2.13).

3.0 Conclusion and Recommendations

Microsoft Power BI has established itself as a powerful business analytics and data visualisation tool that enables organisations of all sizes to close the information-decisions gap. It is impossible to overstate the importance of the practical knowledge acquired via the module course work and additional research for the successful design and implementation of this project.

Based on the Key findings from the analysis provided by the dashboard the following management actions are recommended:

- The rapid and continuous decrease in sales that started at the end of 2019 can be reversed by implementing more online product-based marketing techniques.
- Since the start of the year 2020, market groups including "Ladies Sport Casual" and "Ladies Fashion Sandals" have consistently increased sales. To increase overall company sales, more items from these groupings might be distributed across all stores.
- A review and further investigation are warranted due to the consistently subpar sales performance of Intangible goods, which is of grave concern. Better marketing strategies for digital assets, service contracts, etc. can reflect actual profitability and cut down on overall losses.

References

Aspin, A. (2018). Pro Power BI Desktop. Apress. https://doi.org/10.1007/978-1-4842-3210-1

Ferrari, A., & Russo, M. (2016). Introducing Microsoft Power BI. Microsoft Press.

(*Compound Annual Growth Rate (CAGR) Formula and Calculation*, n.d.)

Investopedia (n.d.). Compound Annual Growth Rate (CAGR) Formula and Calculation. Retrieved December 11, 2022, from https://www.investopedia.com/terms/c/cagr.asp