Data Analytics Project

BY JAZREENA HARLOW

DATA ANALYTICS AND PROJECT MANAGEMENT TALENT EXPO | NIYO BOOTCAMPS | 2024

ABOUT ME

JAZREENA HARLOW

- Graduated in Fashion Design and Retail Management - 2007
- Discovered my love for data analytics during a 12 year career span in Fashion Buying & Merchandising.
- Currently run my own Personal Development, Team Optimisation & Wellness Coaching Business (5 years whilst raising a young family of 3)
- Started the Full Stack Development bootcamp to up my tech skills but soon realised Data Analytics & Project Management was the correct choice for my immediate goals.
- Actively seeking a Data Analyst role with the hopes to transition into a Data Scientist or Business Intelligence to utilise my skills from working in corporate, running my own business and enthusiasm for all things data.

NEW SKILLS

Technical Skills

- Power Query / SQL
- Python (Pandas / Matlab)
- Tableau / Power BI

Functional Skills

- Data Cleaning & Analysis
- Data Visualisation & Storytelling
- Project Management

Soft Skills

- Deep Curiosity
- Determination
- Adaptability

SKILLS OWNED

Technical Skills

- Microsoft Excel
- Google Sheets
- Google Analytics

Functional Skills

- Statistical Analysis
- Critical Thinking
- Attention to Detail

Soft Skills

- Communication
- Strong Intuition
- Collaboration

DATA SET OBJECTIVE

3 DATA SHEETS

Retail Store: Customer Transactions in 2011 - 2014

This data set was from Kaggle.

Objective:

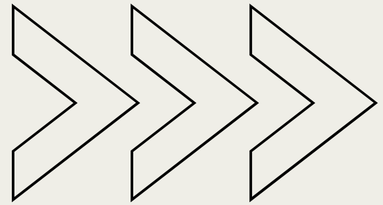
- Calculate key sales metrics - total sales revenue, no. of transactions, average order value.
- Identify interesting trends such as best selling product categories by region and store type and any customer trends.
- Review findings to help future purchasing decisions, marketing campaigns and personalise customer segmentation.

CUSTOMER INFORMATION
Customer_id
Date of Birth
Gender
City_Code

PRODUCT HIERARCHY
Prod_cat_code
Prod_cat
Prod_subcat_code
Prod_subcat

TRANSACTIONS OF CUSTOMER
Transaction_id
Cust_id
Tran_date
Prod_subcat_code
Prod_cat_code
Qty
Rate
Tax
Total_amt
Store_type

DATA ANALYSIS



DATA PREPERATION

- Data cleaned using Power Query in Excel

  – Removed outlier: City ’0'
  – Removed outlier: Year ‘2014’ - only 2 months (Jan & Feb) worth of sales
  – Reattributed transactions as ‘0’ in Gender to be Female - Products bought were women & kids categories so made an executive decision to change Gender to ‘F’ for Female.

- Data Integration & Added new data columns

  – Vlookup / Pivot Tables / Charts
  – Customer Age: Used DOB to calculate Customer Age
  – Cat_SubCat: Combined Cat & Sub_Cat to get unique identifier
  – Returns: Attributed a Yes or No

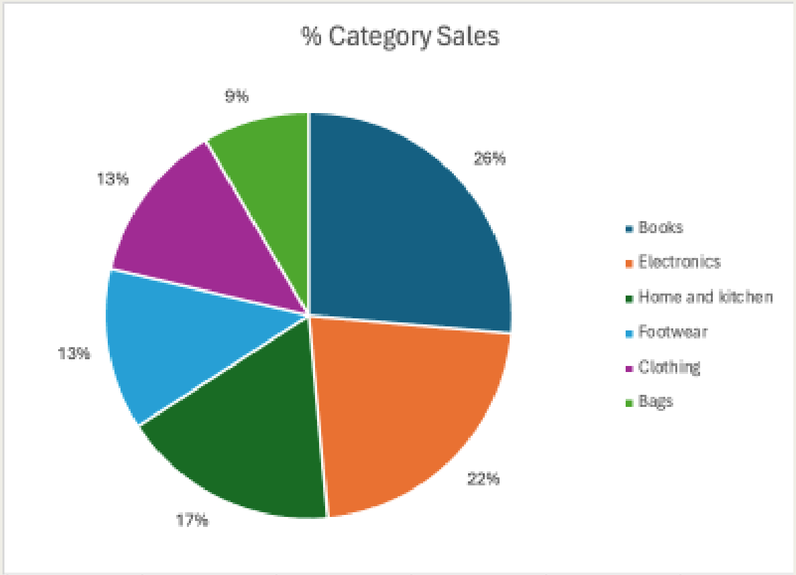
EXCEL PIVOT TABLE ANALYSIS

With data cleaned I used a Vlookup to link sheets and then used Pivot Tales to start descriptive analysis:

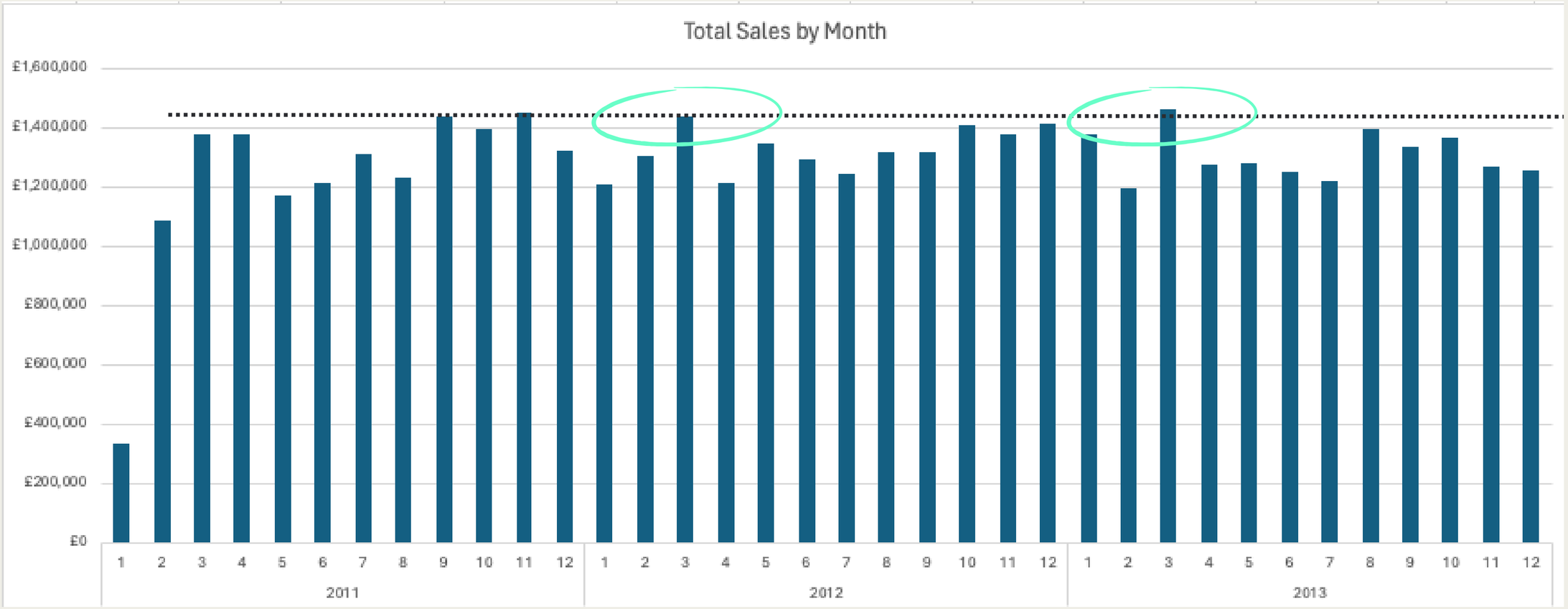
INSIGHTS

- Books was the highest selling product category across all years - 26% of Total sales, making £12.2M in revenue

Row Labels	Sum of total_amt	% Sum of total_amt	Sum of Qty	% Sum of Qty
Books	£12,236,613	26.4%	13,951	26.1%
Electronics	£10,230,606	22.1%	11,783	22.0%
Home and kitchen	£8,033,644	17.3%	9,488	17.7%
Footwear	£5,964,445	12.9%	6,982	13.0%
Clothing	£5,939,988	12.8%	6,826	12.8%
Bags	£3,923,964	8.5%	4,486	8.4%
Grand Total	**£46,329,261**	**100.0%**	**53,516**	**100.0%**



BEST SELLING MONTHS



- Noticed an interesting correlation in **2012 and 2013,** with sales in **March** being the highest and wanted to investigate why...

MARCH BEST SELLING CATEGORY

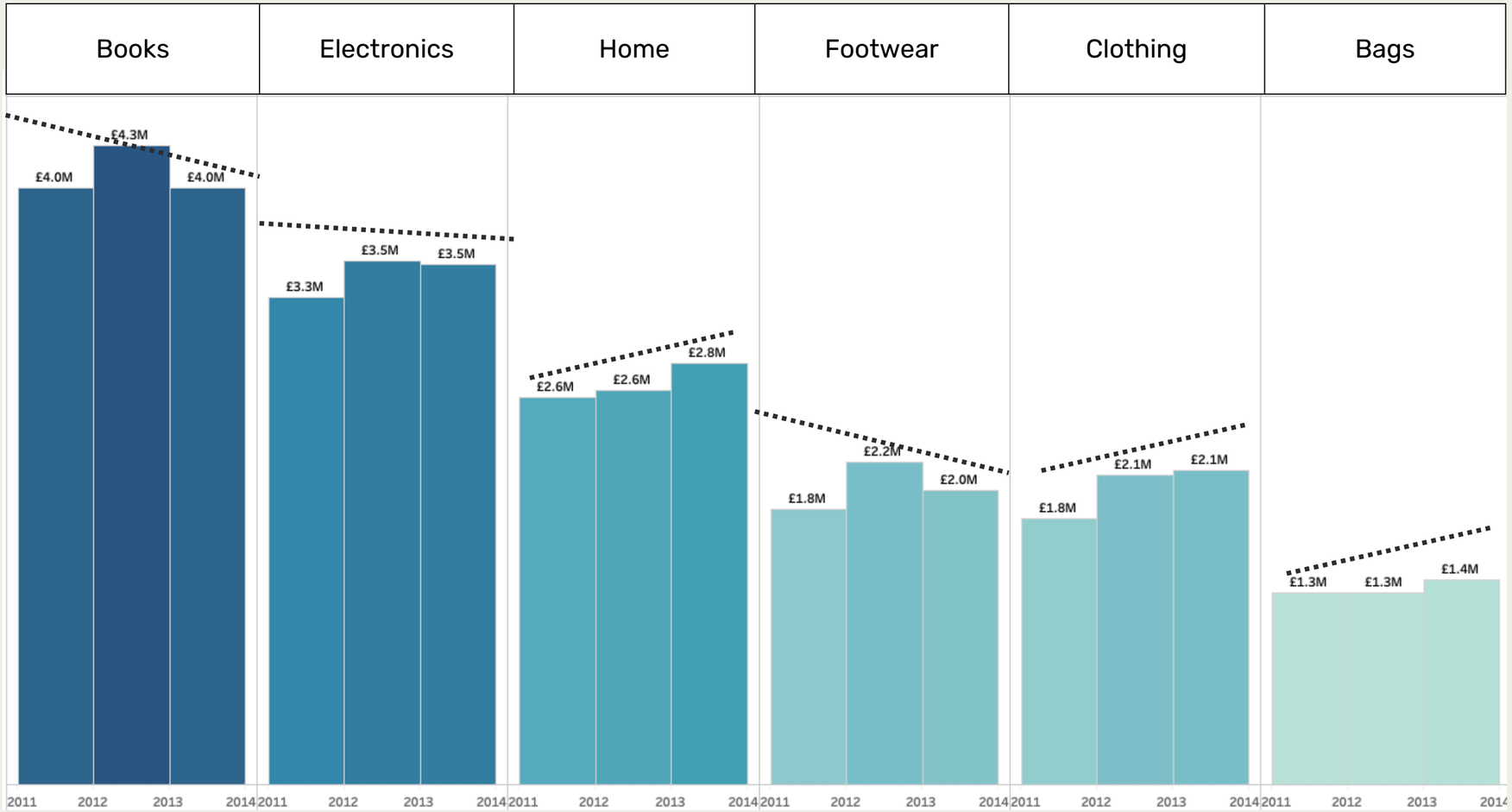
City	(All)	
tran_month	3	
Row Labels	**Sum of total_amt**	**Sum of Qty**
2013	**£1,465,627**	**1703**
Books	£393,130	434
Electronics	£339,161	405
Home and kitchen	£269,392	315
Clothing	£210,510	252
Footwear	£138,483	175
Bags	£114,950	122
2012	**£1,440,358**	**1604**
Books	£387,220	399
Electronics	£303,117	331
Home and kitchen	£239,333	323
Footwear	£199,396	219
Clothing	£185,440	198
Bags	£125,852	134
2011	**£1,376,537**	**1530**
Books	£398,109	454
Electronics	£311,116	359
Clothing	£226,052	215
Home and kitchen	£176,052	187
Bags	£136,554	154
Footwear	£128,654	161
Grand Total	**£4,282,521**	**4837**

Looked into the highest selling category in March for each year - it was books. I believe this is attributed to '**World Book Day' which happens in March.**

***Highest Selling Book Category was **Children's books** in March 2012 and 2013 to further correlate this insight.

Sum of total_amt	Column			
Row Labels	**2011**	**2012**	**2013**	**Grand Total**
Mar	**£398,109**	**£387,220**	**£393,130**	**£1,178,459**
Books Children	£55,986	£85,387	£94,794	£236,166
Books Non-Fiction	£84,011	£77,675	£55,197	£216,883
Books Fiction	£80,347	£56,963	£72,827	£210,137
Books DIY	£54,512	£59,547	£75,081	£189,141
Books Academic	£66,711	£58,783	£53,314	£178,808
Books Comics	£56,543	£48,865	£41,917	£147,325

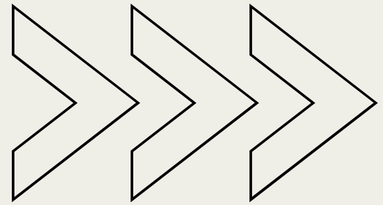
SALE TRENDS IN CATEGORY BY YEAR



KEY TRENDS BY YEAR ACROSS CATEGORY:

- Bags, Clothing, and Home have all increased YOY.
- Books and Footwear both declined in sales from 2012 to 2013.
- Electronics was flat YOY at £3.5M

SQL ANALYSIS & KEY TRENDS IN TABLEAU



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KEY SALES METRICS + AOV

```sql
-- Show number of transactions, total sales,and qty and show the results formatted --
SELECT
    CONCAT(FORMAT(COUNT(ret_transactions.transaction_id),0)) AS No_Transactions,
    CONCAT('£', FORMAT(SUM(ret_transactions.total_amt),0)) AS Total_Sales,
    CONCAT(FORMAT(SUM(ret_transactions.qty),0)) AS Total_Qty_sold
FROM ret_transactions
```

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- Total Sales, Qty and Orders

No_Transactions	Total_Sales	Total_Qty_sold
21,980	£46,329,261	53,516

```sql
-- Show Highest, minimum and average order value (Only orders greater then 0)
SELECT
    CONCAT('£',FORMAT(MAX(total_amt),0)) AS Highest_Order_Value,
    CONCAT('£',FORMAT(MIN(total_amt),0)) AS Min_Order_Value,
    CONCAT('£',FORMAT(AVG(total_amt),0)) AS Avg_Order_Value
FROM ret_transactions
WHERE
    total_amt > 0;
```

=

- Max, Min and Average Order Value

Highest_Order_Value	Min_Order_Value	Avg_Order_Value
£8,288	£77	£2,607

*Used a ‘WHERE’ query to exclude any transactions that had returned sales. AOV incl. returns = £2,108

GENDER % SALES

```sql
-- Show Number of transactions across gender as a percentage--
SELECT
    cust.gender,
    COUNT(trans.transaction_id) AS transaction_count,
    COUNT(trans.transaction_id) * 100.0 / SUM(COUNT(trans.transaction_id))
OVER() AS gender_percentage_spilt
FROM
    ret_customer AS cust
LEFT JOIN
    ret_transactions AS trans ON cust.cust_id = trans.cust_id
GROUP BY
    cust.gender;
```

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- Total Gender Split

gender	transaction_co...	gender_percent
M	57254	51.45224
F	54022	48.54776

Males = 52%
Females = 48%

GENDER TRENDS BY CITY

	Female	Male
City 1	£2.31M	£2.24M
City 2	£2.06M	£2.57M
City 3	£2.26M	£2.69M
City 4	£2.28M	£2.64M
City 5	£2.29M	£2.38M
City 6	£2.20M	£2.01M
City 7	£2.53M	£2.15M
City 8	£1.80M	£2.84M
City 9	£2.30M	£2.13M
City 10	£2.40M	£2.25M

- Gender split by city generally in line with Male 52% vs 48% topline
- **Except City 8 - big disparity between female (29%) vs male (71%) sales**

	City 1	City 2	City 3	City 4	City 5	City 6	City 7	City 8	City 9	City 10
Academic	4.4%	4.3%	3.9%	4.9%	5.1%	3.2%	5.1%	3.4%	4.1%	3.8%
Audio and video	4.9%	4.9%	4.5%	4.6%	5.3%	4.3%	4.3%	3.3%	3.2%	4.3%
Bath	4.6%	4.1%	4.0%	4.1%	5.0%	4.8%	4.2%	3.6%	4.7%	4.3%
Cameras	4.4%	4.3%	4.3%	4.8%	4.0%	4.4%	4.3%	4.7%	4.3%	4.4%
Children	3.0%	4.6%	5.4%	5.1%	4.2%	5.6%	3.8%	4.8%	4.5%	4.7%
Comics	5.2%	5.0%	4.3%	4.4%	4.3%	4.1%	3.3%	3.6%	5.0%	4.3%
Computers	3.6%	4.5%	5.3%	3.9%	3.8%	4.4%	4.6%	4.8%	4.0%	4.4%
DIY	4.5%	4.5%	4.5%	3.3%	4.0%	4.5%	5.3%	4.2%	4.2%	3.8%
Fiction	4.2%	4.1%	6.1%	4.9%	4.8%	4.7%	4.9%	4.6%	3.7%	3.3%
Furnishing	4.9%	4.7%	3.6%	4.2%	4.1%	4.8%	3.9%	3.7%	4.2%	4.8%
Kids	9.2%	8.6%	8.3%	8.6%	9.7%	7.9%	10.1%	8.2%	7.9%	8.6%
Kitchen	3.8%	4.5%	4.0%	4.8%	3.9%	3.5%	3.4%	5.3%	4.5%	4.5%
Mens	13.3%	12.1%	12.4%	12.0%	10.9%	13.7%	12.3%	15.0%	13.0%	12.1%
Mobiles	4.2%	4.8%	4.6%	5.1%	4.6%	3.8%	4.5%	5.1%	4.5%	4.5%
Non-Fiction	3.8%	4.8%	4.1%	4.1%	4.7%	5.0%	4.7%	4.2%	4.2%	5.0%
Personal Appliances	4.0%	4.7%	4.5%	4.2%	3.7%	4.7%	4.6%	3.1%	5.4%	5.1%
Tools	5.9%	2.7%	5.0%	5.0%	5.0%	4.4%	4.6%	4.6%	4.3%	3.5%
Women	12.2%	12.7%	11.0%	11.9%	12.9%	12.1%	12.0%	13.9%	14.4%	14.6%

- City 8 Male sales driven by 15% sales in Mens
- Attributed by high sales in Mens Footwear, Clothing & Home

CITY 8 % SPLIT

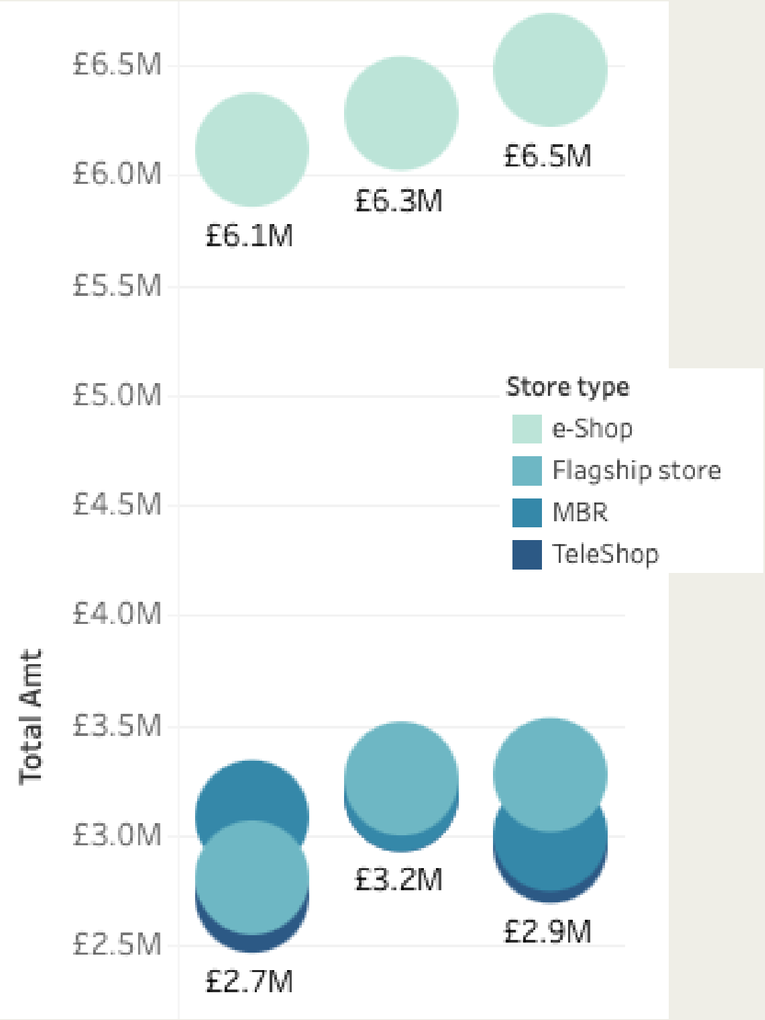
		City 8
Academic	Books	3.4%
Audio and video	Electronics	3.3%
Bath	Home	3.6%
Cameras	Electronics	4.7%
Children	Books	4.8%
Comics	Books	3.6%
Computers	Electronics	4.8%
DIY	Books	4.2%
Fiction	Books	4.6%
Furnishing	Home	3.7%
Kids	Clothing	4.2%
	Footwear	4.0%
Kitchen	Home	5.3%
Mens	Bags	4.2%
	Clothing	5.3%
	Footwear	5.5%
Mobiles	Electronics	5.1%
Non-Fiction	Books	4.2%
Personal Appliances	Electronics	3.1%
Tools	Home	4.6%
Women	Bags	5.0%
	Clothing	4.2%
	Footwear	4.6%

STORE TYPE QUERY & INSIGHTS

```sql
--  Find total amount, quantity, and percentage split by store type
SELECT
    store_type,
    CONCAT('£', FORMAT(SUM(total_amt), 2)) AS total_amount,
    SUM(qty) AS total_quantity,
    CONCAT(FORMAT((SUM(total_amt) * 100.0) / (SELECT SUM(total_amt) FROM ret_transactions), 2), '%') AS percentage_split
FROM
    ret_transactions
GROUP BY
    store_type;
```

=

store_type	total_amount	total_quantity	percentage_split
e-Shop	£18,876,141.50	21679	40.74%
TeleShop	£8,852,487.61	10427	19.11%
Flagship store	£9,333,740.52	10682	20.15%
MBR	£9,266,891.34	10728	20.00%



BESTSELLING STORE TYPE:

- **e-Shop** was the best selling store type taking **40% of total sales** = £18.8M. Books was the best seller with 27% of sales

- e-Shop also doubled the amount of units sold than other store types

TOP 10 CUSTOMER SPENDERS, AGE & CITY

```sql
-- Top 10 Total Spend per customer incl. City & Age --
SELECT CONCAT('Total Sales: £', FORMAT(SUM(trans.total_amt),0)) AS Spend_per_customer,
     cust.cust_id, cust.city, cust.customer_age
FROM ret_transactions AS trans
JOIN ret_customer AS cust ON trans.cust_id = cust.cust_id
WHERE trans.total_amt > 0
GROUP BY trans.cust_id, cust.city, cust.customer_age
ORDER BY SUM(trans.total_amt) DESC
LIMIT 10;
```

=

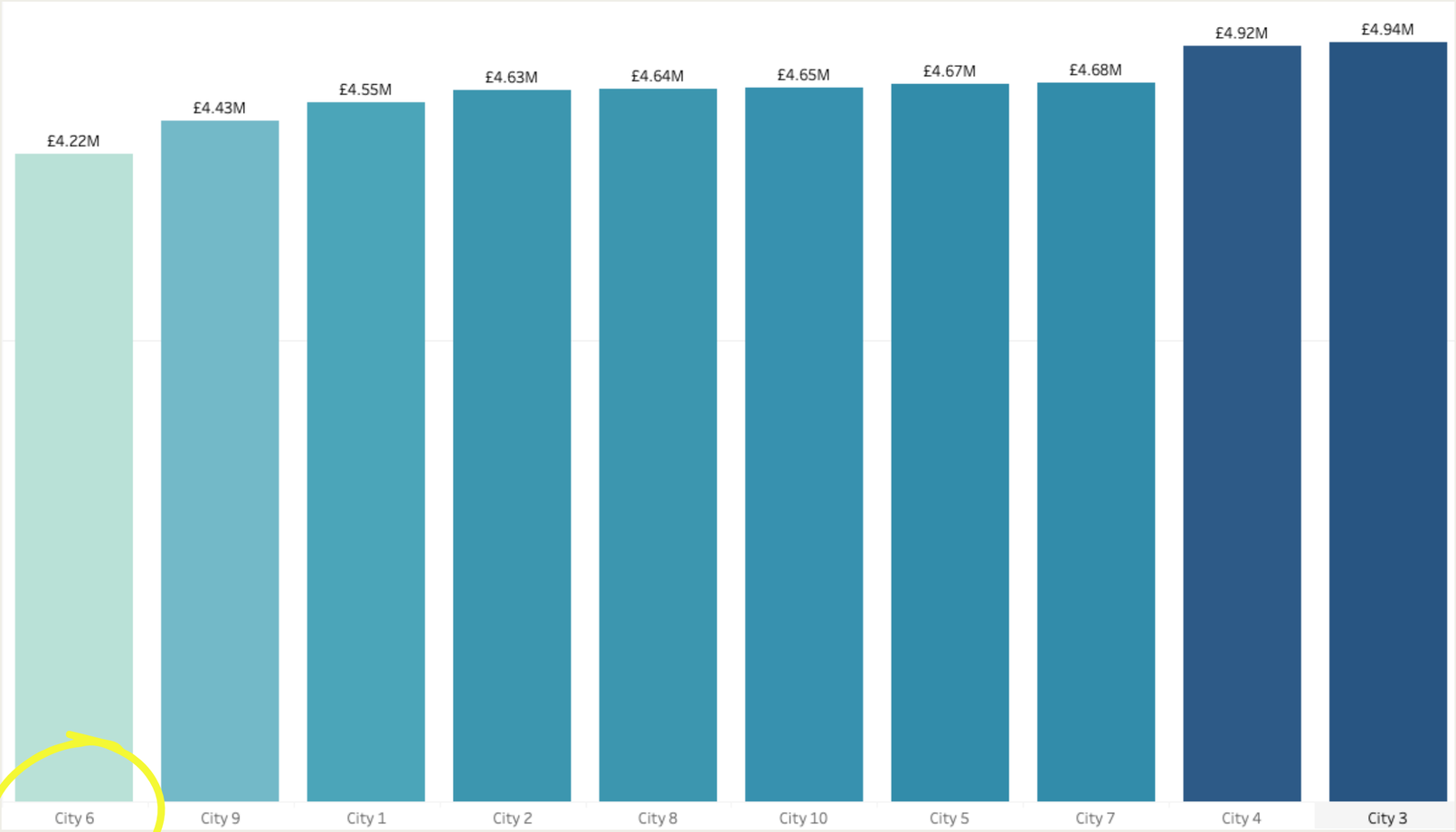
Spend_per_customer	cust_id	city	customer_age
Total Sales: £259,852	274227	6	32
Total Sales: £237,681	272354	10	33
Total Sales: £219,357	272799	6	38
Total Sales: £214,688	270458	2	41
Total Sales: £210,125	273481	3	35
Total Sales: £209,178	271797	2	32
Total Sales: £196,175	271862	8	40
Total Sales: £179,872	271834	9	32
Total Sales: £179,872	271834	9	31
Total Sales: £173,534	274854	1	35

MIN, MAX & AVG AGE

Max_Age	Min_Age	Avg_Age
43	19	31

- Top 10 Customers are aged between **31-41**
- ‘City 6’ twice in the top 3 customers = £479K - highest spenders

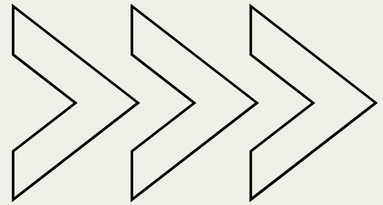
SALES BY CITY



KEY CITY TRENDS ACROSS CATEGORY:

- Whilst two of the top 10 customers purchased from **City 6** it was the **least selling** store in general.
- **City 3** was the **best** selling store with £4.94M in sales

DASHBOARD IN TABLEAU



Jazreena Harlow

Retail Transactions Dataset

Sales period: from Jan 1, 2011 to Dec 31, 2013

Niyo Bootcamp Dashboard Presentation

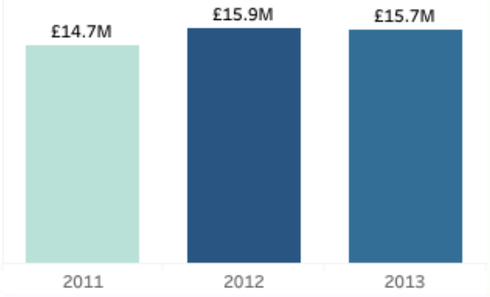
Total Sales
£46.3M

Total Items Sold
53,516

Average Order Value
£2.6K

Number of Transactions
19,913

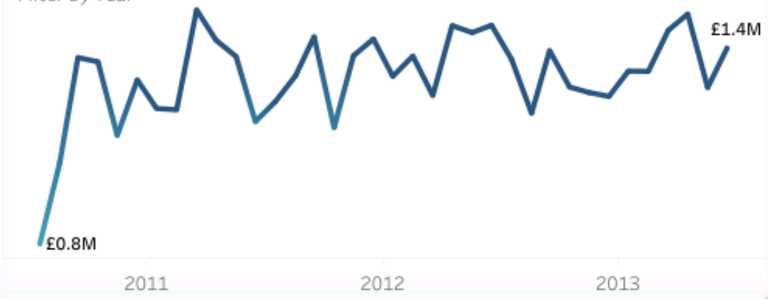
Sales by Year



Sales by Month

All

Filter by Year



Sales Gender Split and by City

	Female	Male
City 1	£2.31M	£2.24M
City 2	£2.06M	£2.57M
City 3	£2.26M	£2.69M
City 4	£2.28M	£2.64M
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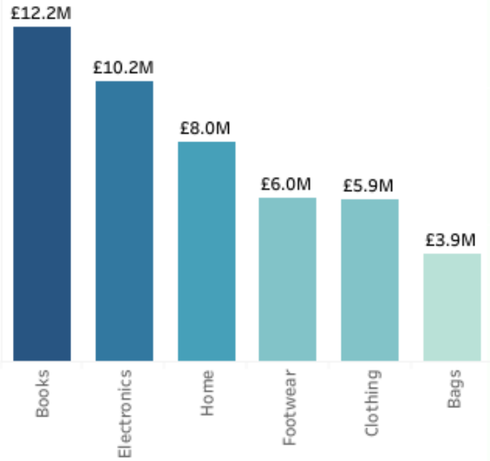
Sales by Product Category

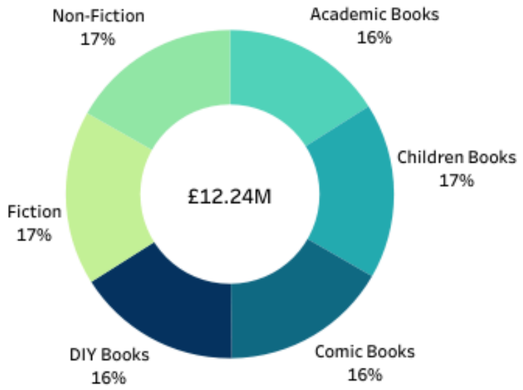


% Sales Sub Category

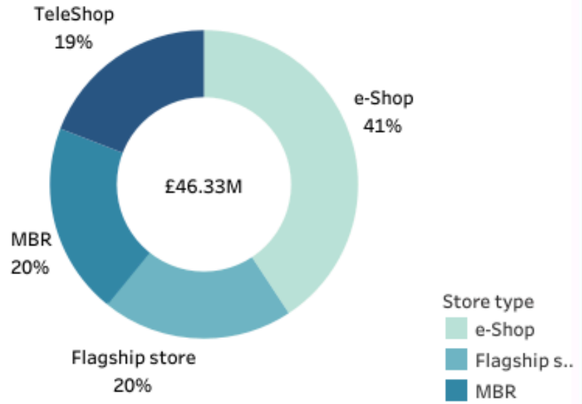
Filter by category and gender

Books

All



Sales by Store Type



INSIGHTS

MARKETING CAMPAIGNS

- Focus on ***increasing marketing for book sales :*** the best selling category
  – Target ‘book’ specific segmented email campaigns to **target e-Shop** customers.
  – Push ***marketing campaign for World Book Day*** across <u>all store types</u> to further increase March sales as best selling product is books specifically Children’s Books.
  – ***‘Back to School’ and ‘Xmas Campaigns’*** as September and December followed closely in sales .

FUTURE PRODUCT RANGE

- ***Increase spending budget on Books*** - buy more depth in stock and/or increase childrens book range

STORES / CUSTOMERS

- Target ‘high spenders’ in our lowest selling city store ‘City 6’ to increase sales
- Implement a ***dedicated Footwear and Clothing department for Men*** in City 8 and a small increase in ***Home & Kitchen products.***

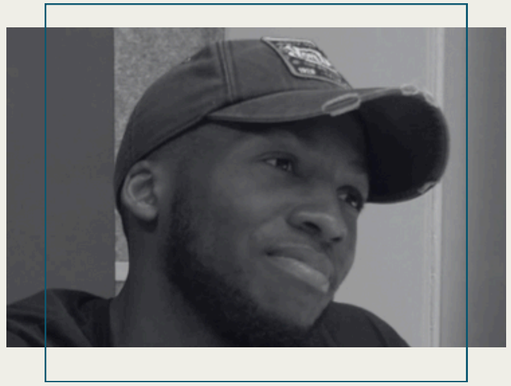
CHALLENGES

- Tableau public disconnecting and losing work if issues with connection - save often!!
- Not much variances in the sales data, quite hard to draw to conclusions as data felt quite flat.
- Would have loved to have done a map of sales but didn’t add city names to city #’s in the data sheet
- Reasons for returns may have been interesting to gain more insights from customers on any product issues.

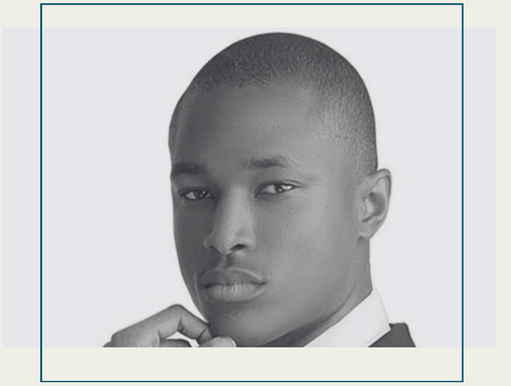
THANKS TO THE NIYO TEAM & BOOTCAMP STUDENTS FOR YOUR SUPPORT!

Chinazor

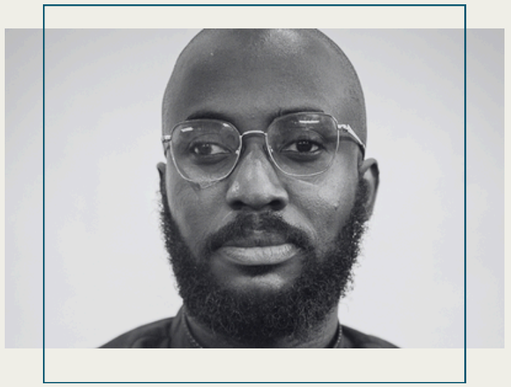
Karen



Junior



David



Balogun

Hannah

Thank you!

LET'S CONNECT

LINKEDIN: SEARCH 'JAZREENA HARLOW'

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