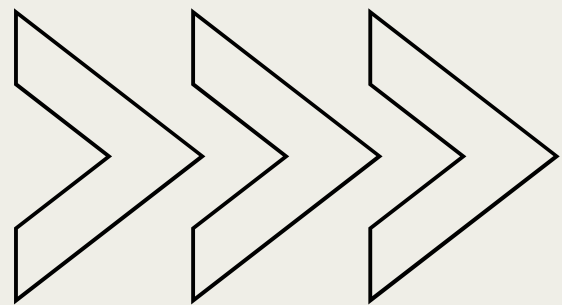


Data Analytics Project

BY JAZREENA HARLOW



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.

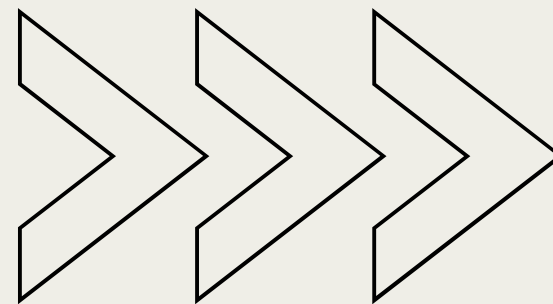
Objective:

- 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	TRANSACTIONS OF CUSTOMER
Customer_id	Transaction_id
Date of Birth	Cust_id
Gender	Tran_date
City_Code	Prod_subcat_code
	Prod_cat_code
	Qty
	Rate
	Tax
	Total_amt
	Store_type

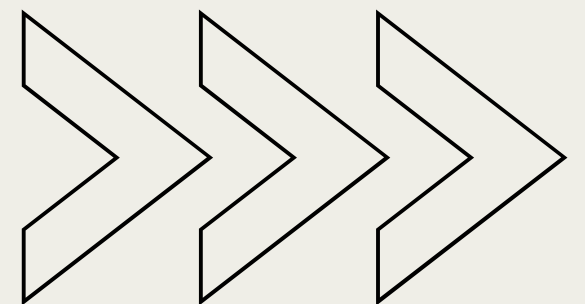
PRODUCT HIERARCHY
Prod_cat_code
Prod_cat
Prod_subcat_code
Prod_subcat

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
 - 9 Transaction were attributed as '0' in Gender - 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



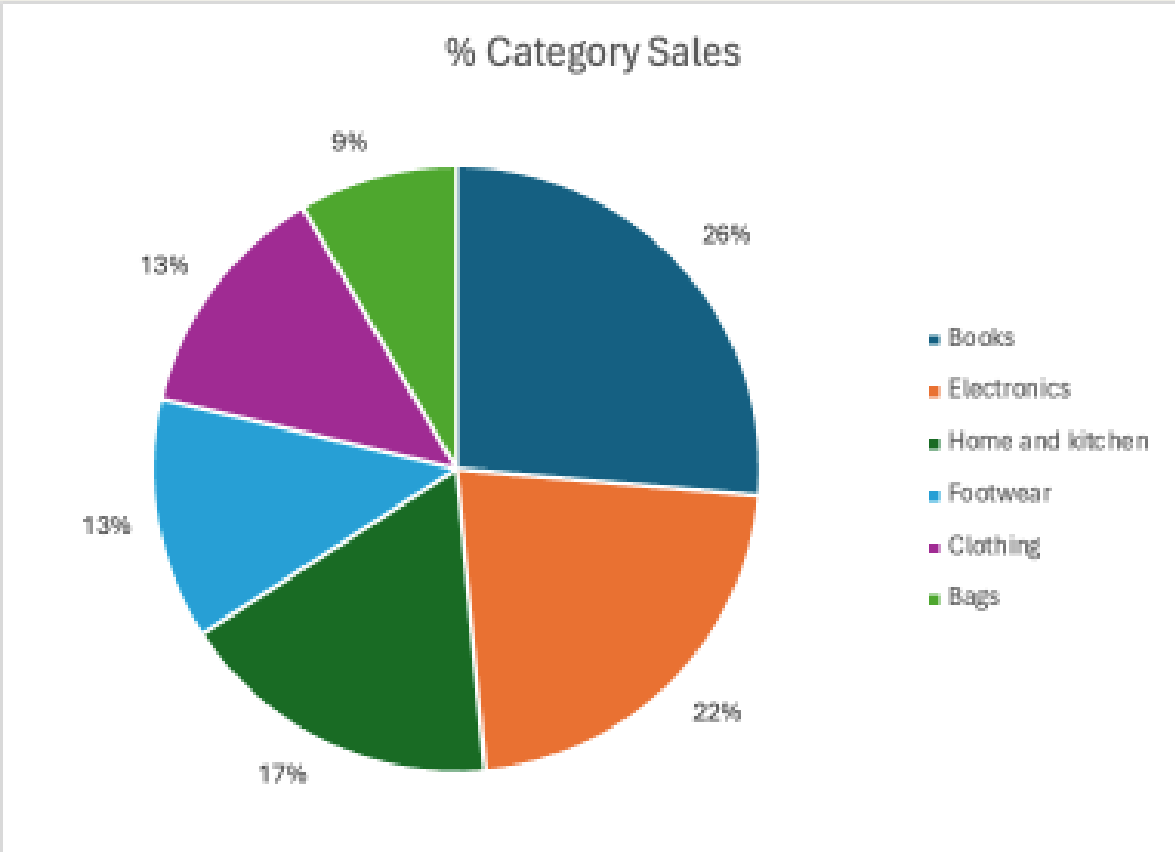
EXCEL PIVOT TABLE ANALYSIS

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

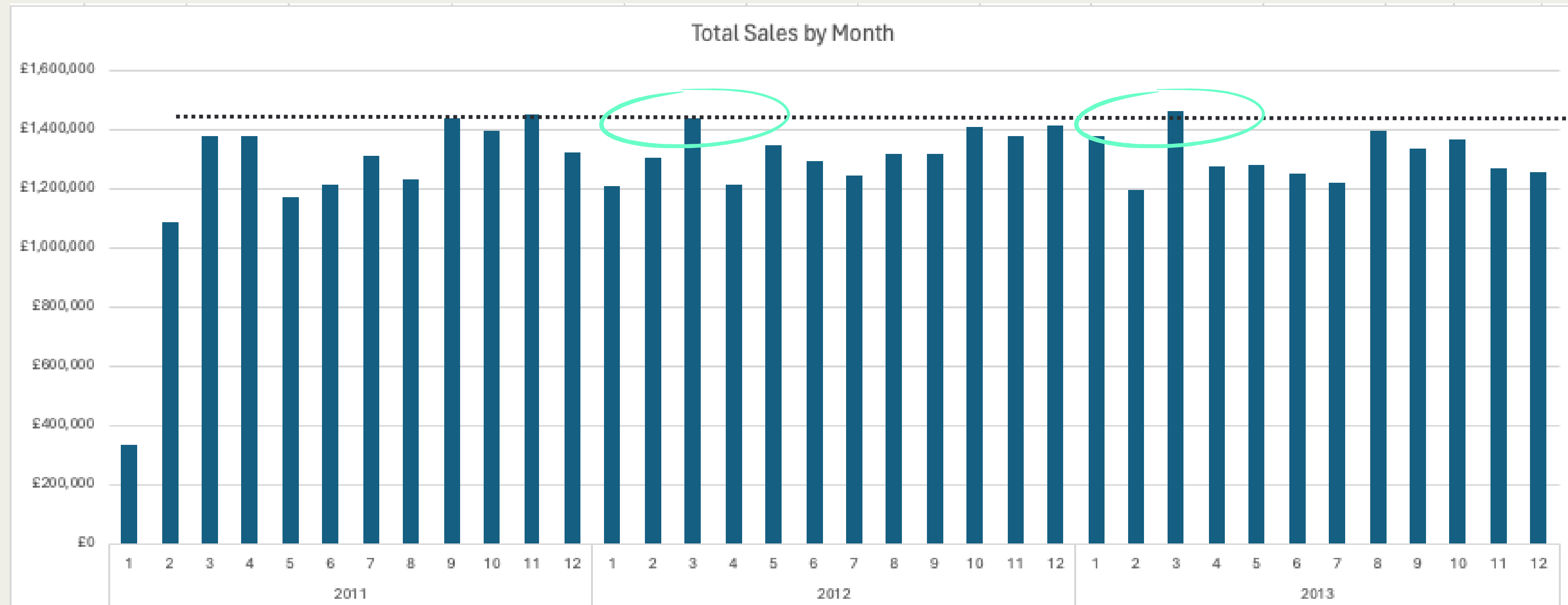
INSIGHTS

- 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

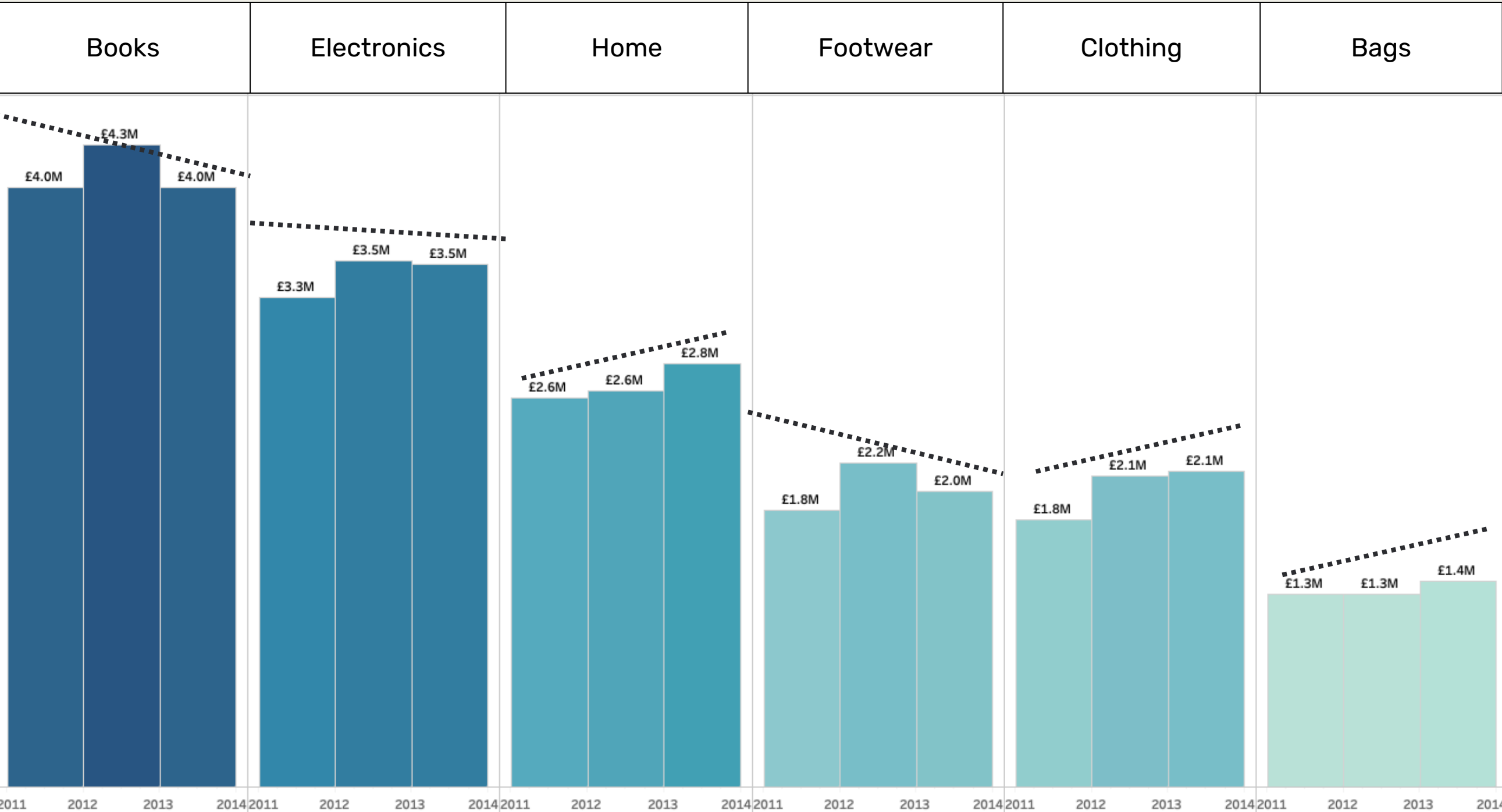
City	(All)	
tran_month	3	
Row Labels	Sum of total_amt	Sum of Qty
2013	£1,465,627	1703
Books	£393,130	434
Electronics	£339,161	405
Home and kitchen	£269,392	315
Clothing	£210,510	252
Footwear	£138,483	175
Bags	£114,950	122
2012	£1,440,358	1604
Books	£387,220	399
Electronics	£303,117	331
Home and kitchen	£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

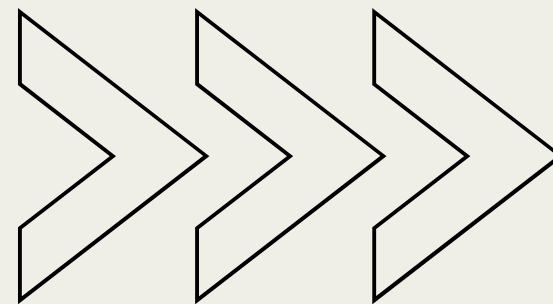
SALE TRENDS IN CATEGORY BY YEAR



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



KEY SALES METRICS + AOV

```
-- 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
```

=

- Total Sales, Qty and Orders

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

```
-- Show Highest, minimum and average order value (Only orders greater than 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

```
-- 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;
```

=

- 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 % 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%

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

STORE TYPE QUERY & INSIGHTS

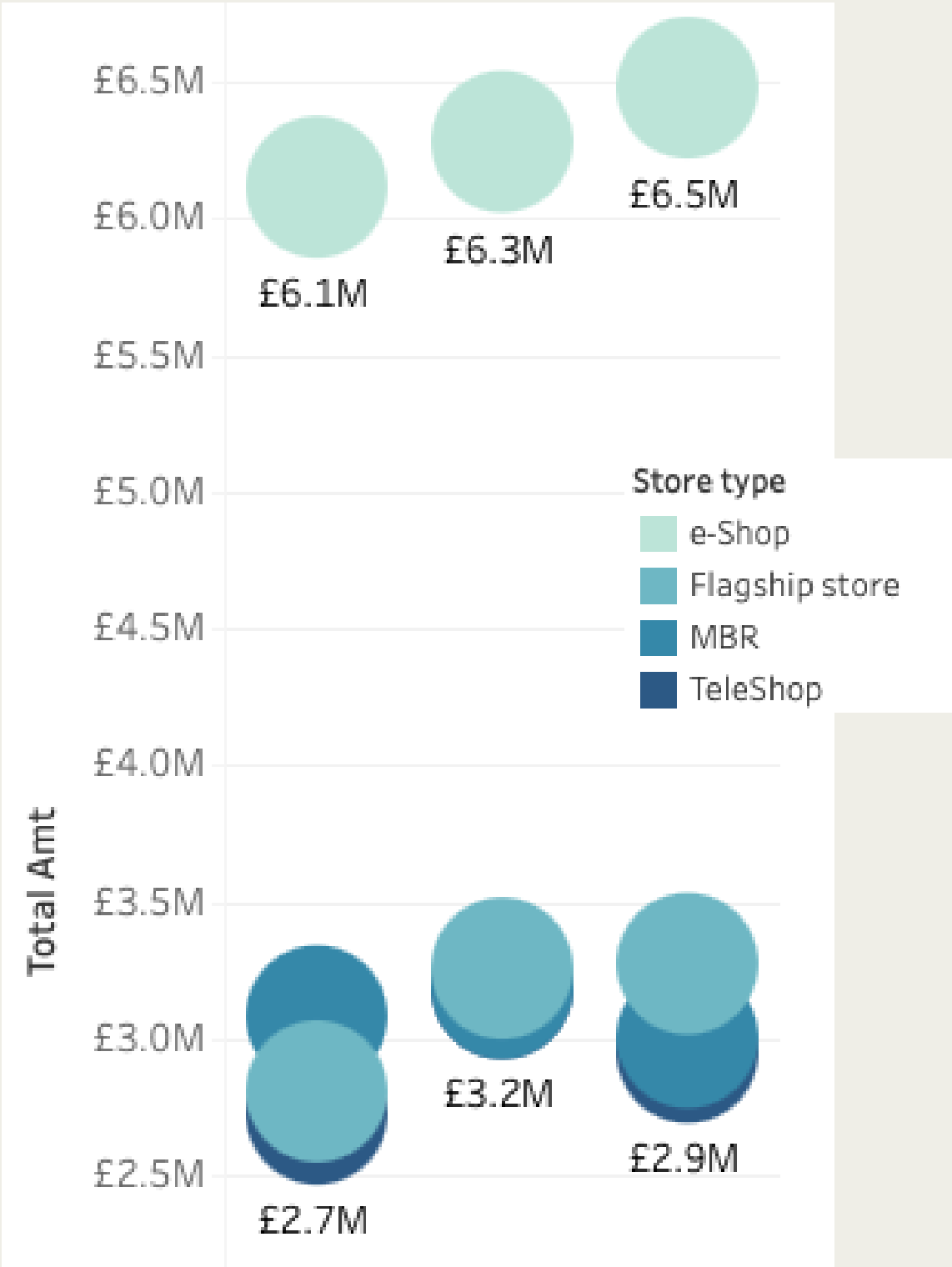
```
-- Find total amount, quantity, and percentage split by store type
SELECT
  store_type,
  CONCAT('£', FORMAT(SUM(total_amt), 2)) AS total_amount,
  SUM(qty) AS total_quantity,
  CONCAT(FORMAT((SUM(total_amt) * 100.0) / (SELECT SUM(total_amt) FROM ret_transactions), 2), '%') AS percentage_split
FROM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

```
-- 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

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

MIN, MAX & AVG AGE

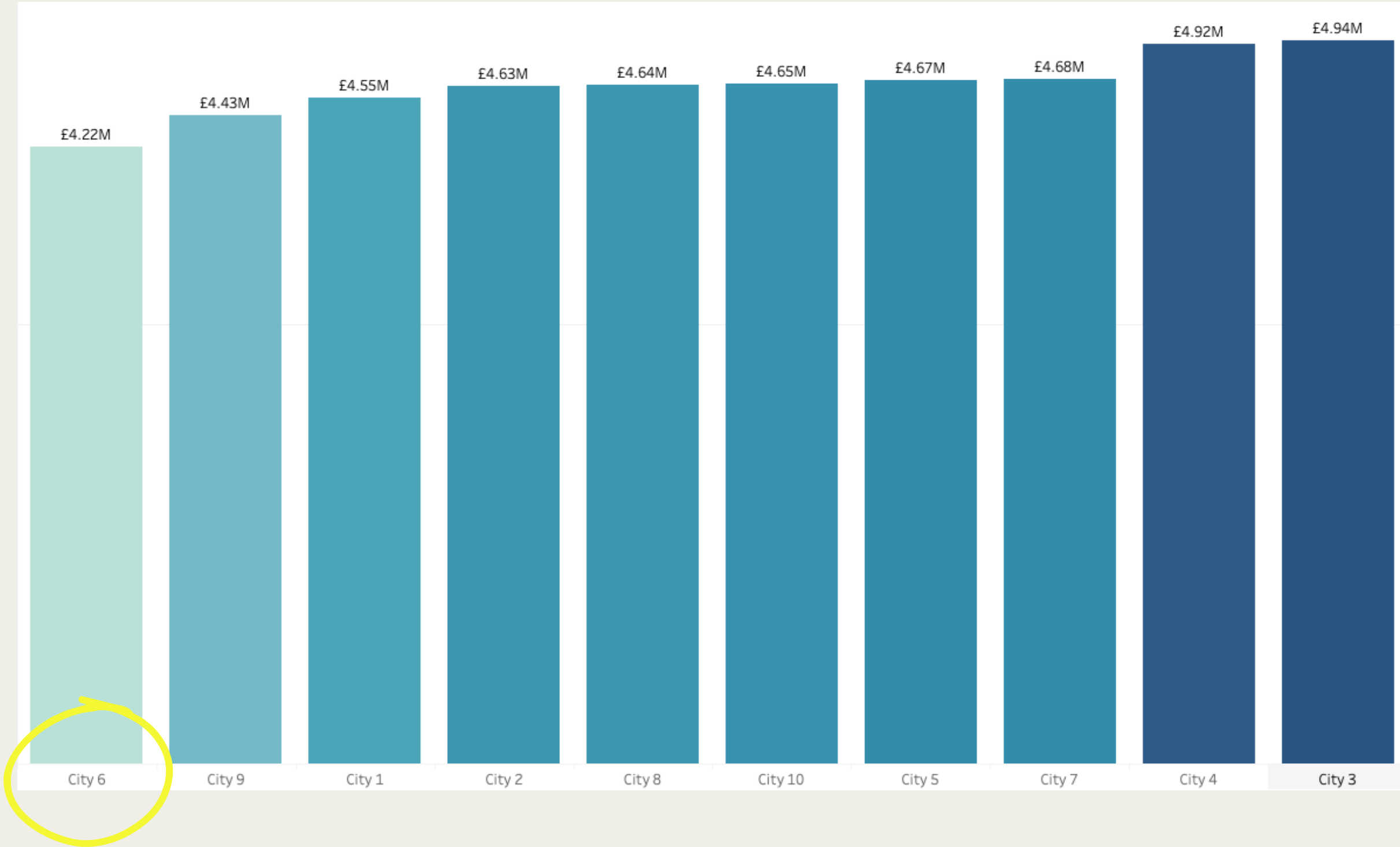
Max_Age	Min_Age	Avg_Age
43	19	31

- Top selling categories from the top 5 customers:

=

prod_cat	Top_5_cust_spe...
Books	£278,252,798
Electronics	£85,816,492
Home and kitchen	£70,768,456
Clothing	£62,985,946
Footwear	£59,461,606
Bags	£33,711,041

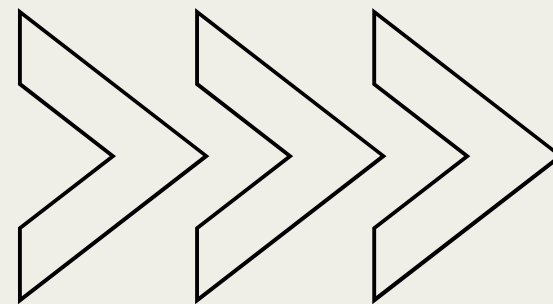
SALES BY CITY



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





Total Sales

£46.3M



Total Items Sold

53,516



Average Order Value

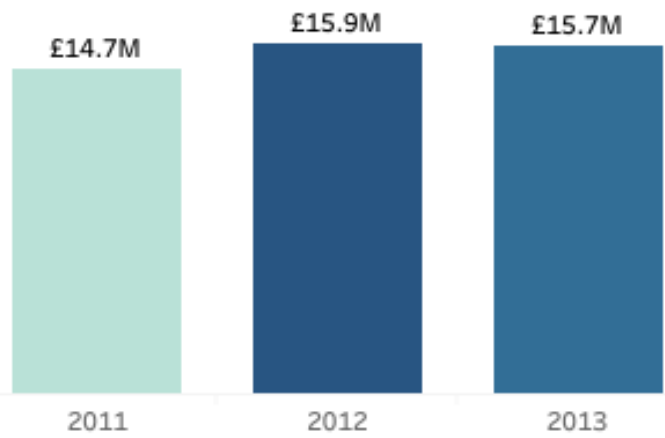
£2.6K



Number of Transactions

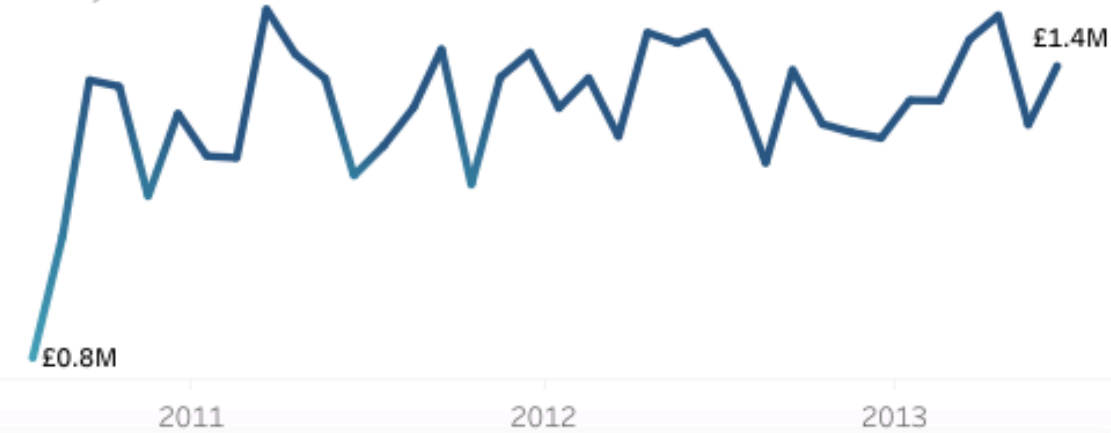
19,913

Sales by Year

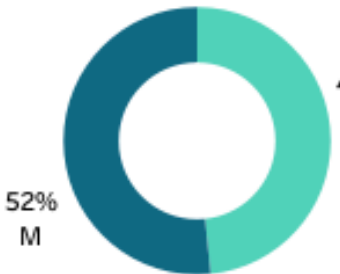


Sales by Month

Filter by Year

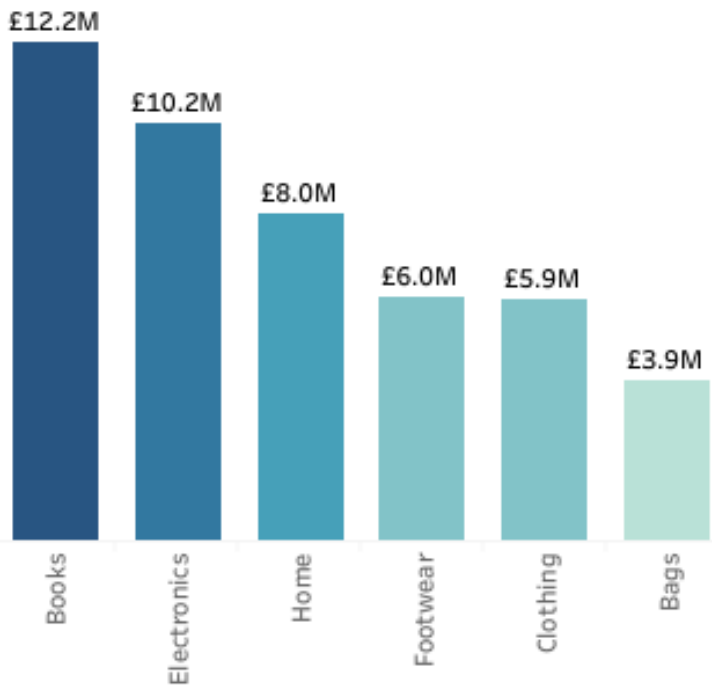


Sales Gender Split and by City



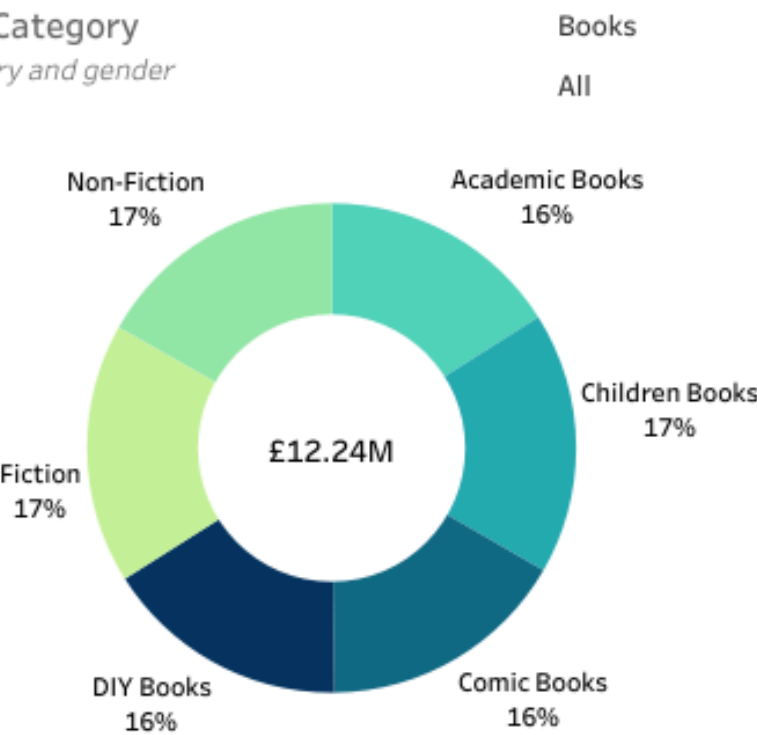
	Female	Male
City 1	£2.31M	£2.24M
City 2	£2.06M	£2.57M
City 3	£2.26M	£2.69M
City 4	£2.28M	£2.64M
City 5	£2.29M	£2.38M
City 6	£2.20M	£2.01M
City 7	£2.53M	£2.15M
City 8	£1.80M	£2.84M
City 9	£2.30M	£2.13M
City 10	£2.40M	£2.25M

Sales by Product Category

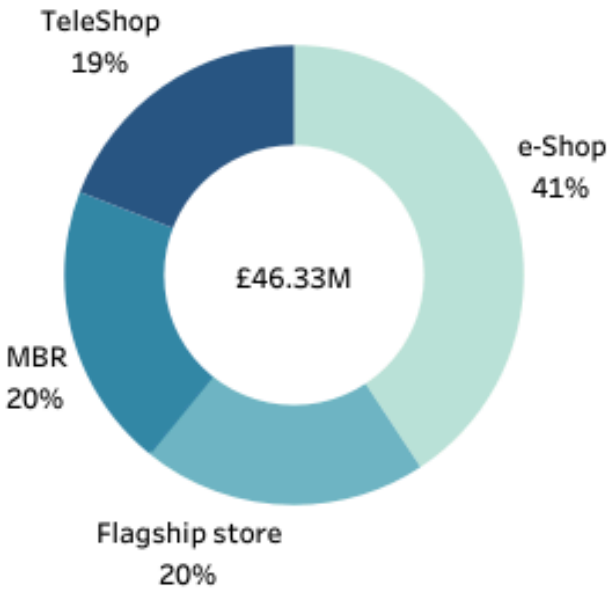


% Sales Sub Category

Filter by category and gender



Sales by Store Type



Store type
e-Shop
Flagship s..
MBR
TeleShop

INSIGHTS

MARKETING CAMPAIGNS

- Focus on **increasing book sales** : the best seller category BUT declined in sales by £300k in 2013
 - Increase ‘book’ specific segmented email campaigns to target e-Shop customers.
 - Push **marketing campaign for World Book Day** across all store types 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 / CUSTOMER EXPERIENCE

- Electrical good: 2nd biggest category but decreased in sales from 2012 to 2013. This can be done by increasing **marketing campaigns in mobile phones**.
- Target **‘high spenders’** in our lowest selling city ‘City 6’ by **increasing budget on Children books**, buy more depth in stock and/or increase children book range.
- Implement a **dedicated Footwear and Clothing department for Men** in City 8 and small increase **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 was quite flat.
- Would have loved to have done a map of sales but no names for the cities
- 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



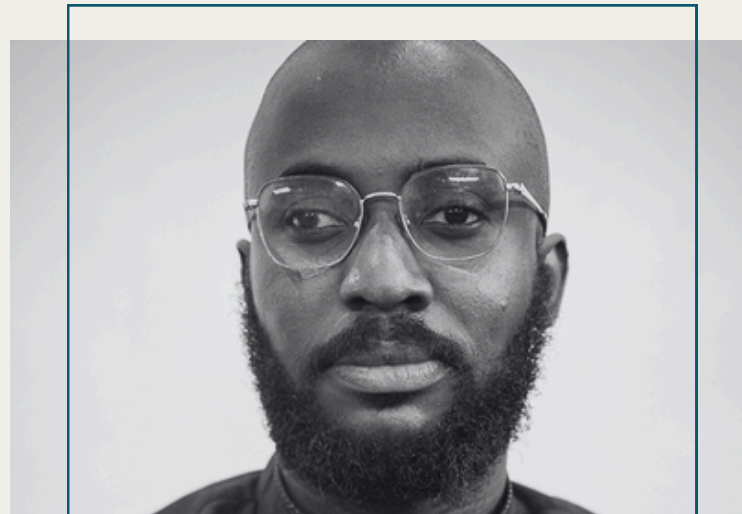
Karen



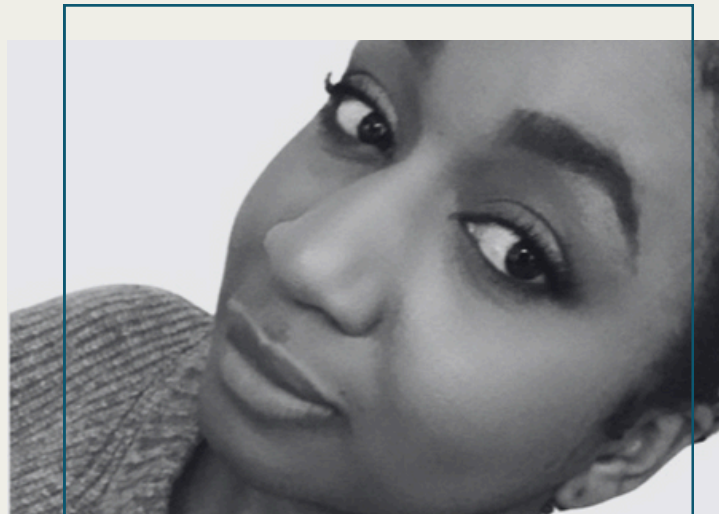
Junior



David



Balogun



Hannah

Thank you!

ANY QUESTIONS?

LINKEDIN: SEARCH 'JAZREENA HARLOW'

GITHUB: GITHUB.COM/JAZHARLOW

TABLEAU PORTFOLIO: JAZREENA.HARLOW/VIZZES

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