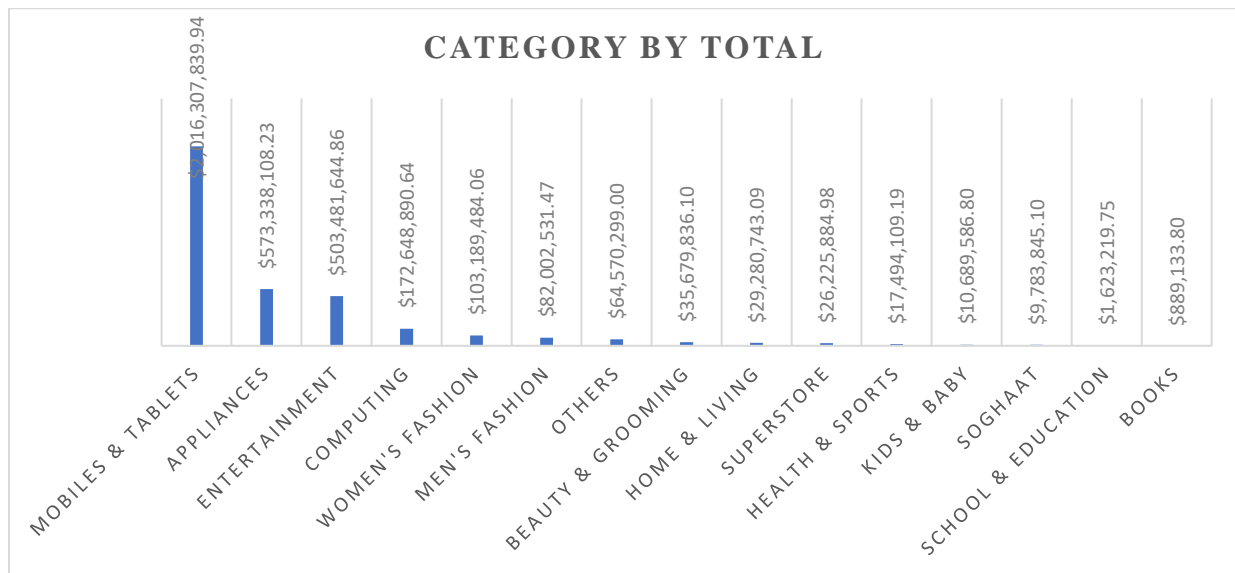


# E-commerce Analytics: Understanding Pakistani Market

## Executive Summary:

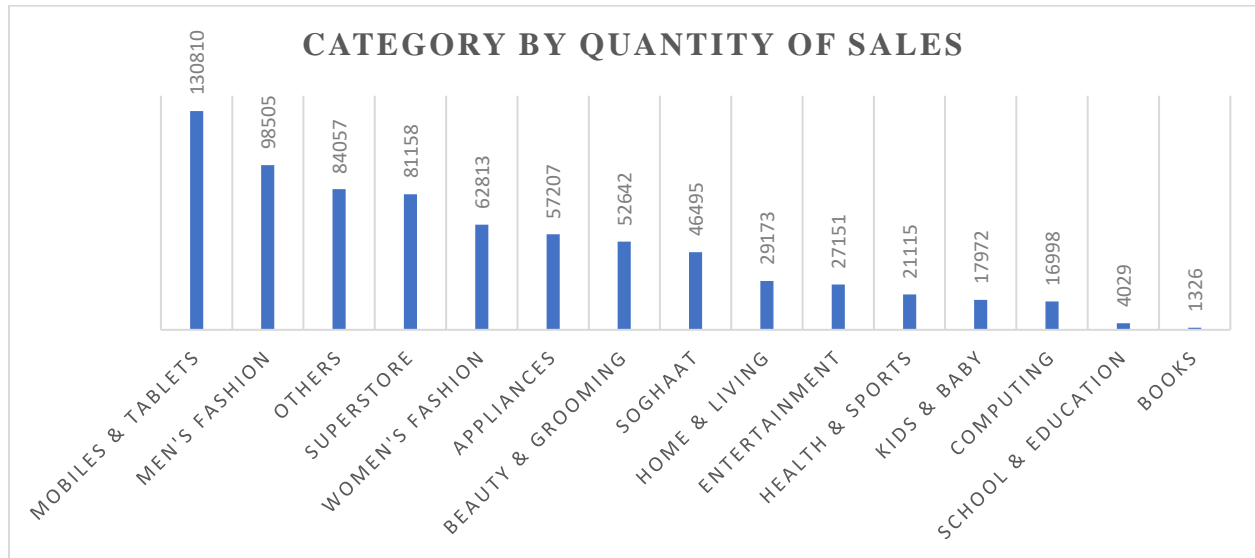
This project delves deep into a rich dataset containing detailed information about e-commerce orders in Pakistan. It leverages descriptive and inferential statistics using spreadsheets to uncover insights about the e-commerce market in Pakistan, allowing for data-driven decision-making.

## Performance by Category:

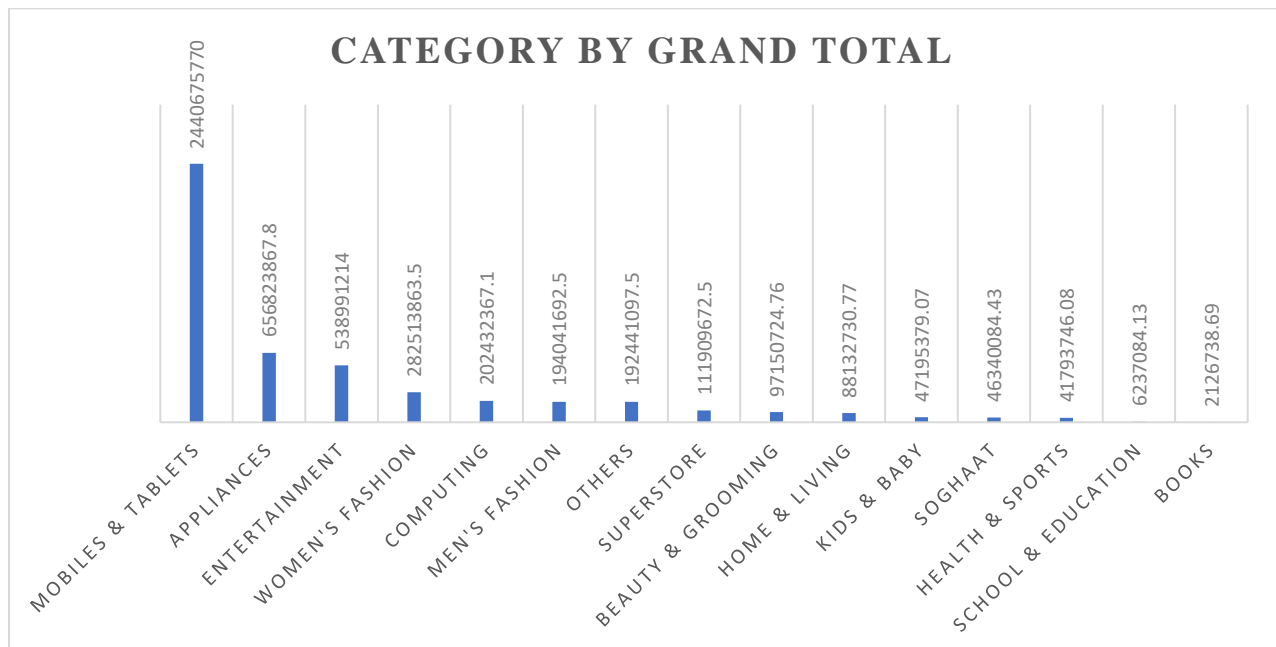


The chart above shows that Mobiles & Tablets and Appliances top the list with total sales of \$2,016,307,839.94 and \$573,338,108.23, respectively. In contrast, School & Education and Books are at the bottom in terms of sales, with total sales of \$1,623,219.75 and \$889,133.80, respectively.

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The Category by Quantity of Sales chart above reveals that Mobiles & Tablets and Men's Fashion are the leaders with 130,810 and 98,505 units sold, respectively, while School & Education and Books are at the bottom with 4,029 and 1,326 units sold, respectively.



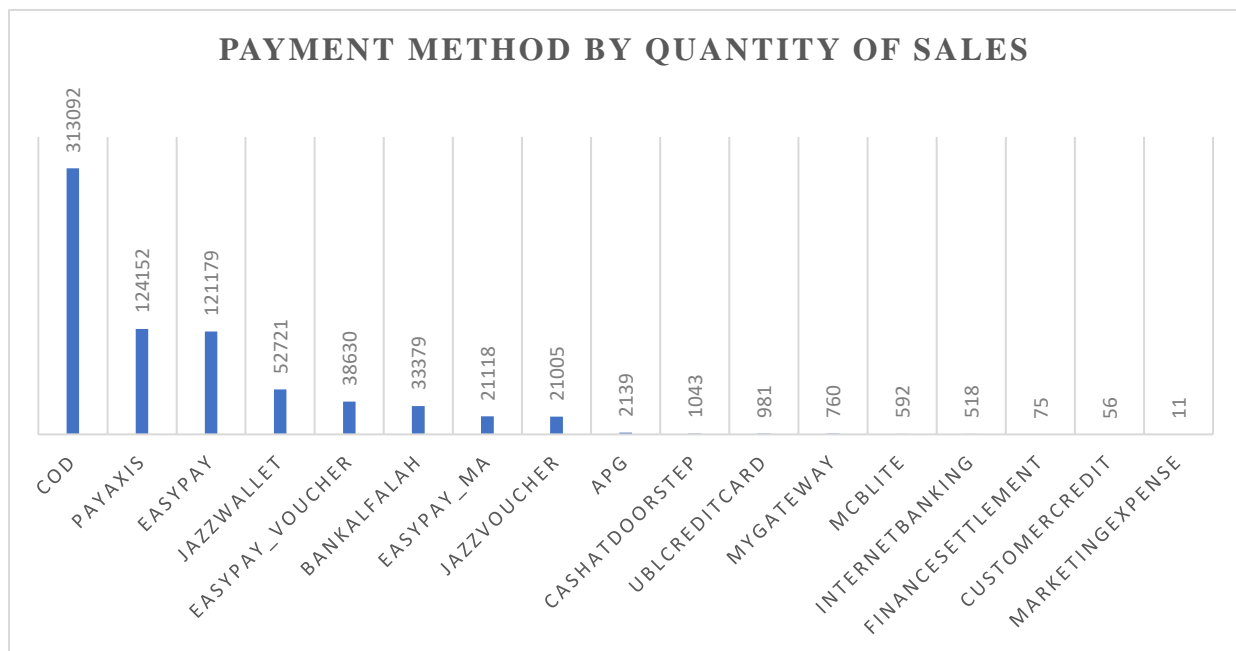
The Category by Grand Total chart above indicates that Mobiles & Tablets and Appliances categories are at the top with \$2,440,675,770.37 and \$656,823,867.76, respectively. Conversely, School & Education and Books categories are at the bottom with \$6,237,084.13 and \$2,126,738.69, respectively.

# E-commerce Analytics: Understanding Pakistani Market

## Insights:

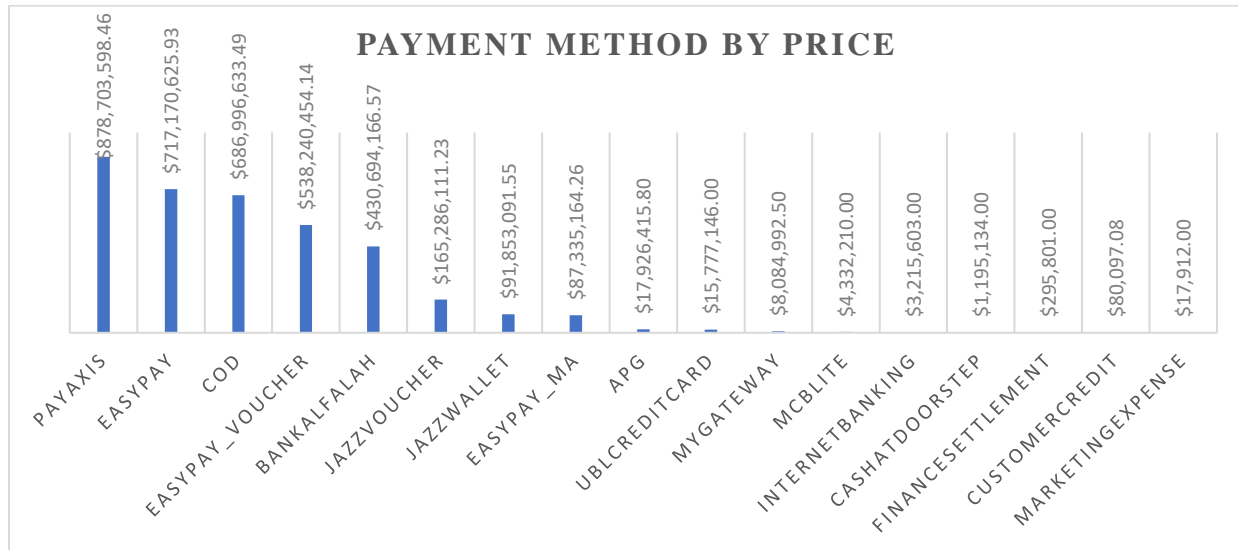
The charts show that Mobiles & Tablets recorded the highest amount on sales, with a grand total of \$2,440,675,770.37 and total number of sold items is 130810, followed, with a huge margin, by Appliances with a grand total on sales of \$656,823,867.76. We can, therefore conclude that Mobiles & Tablets are selling more and hence should yield more profit.

## Performance by Payment Method:

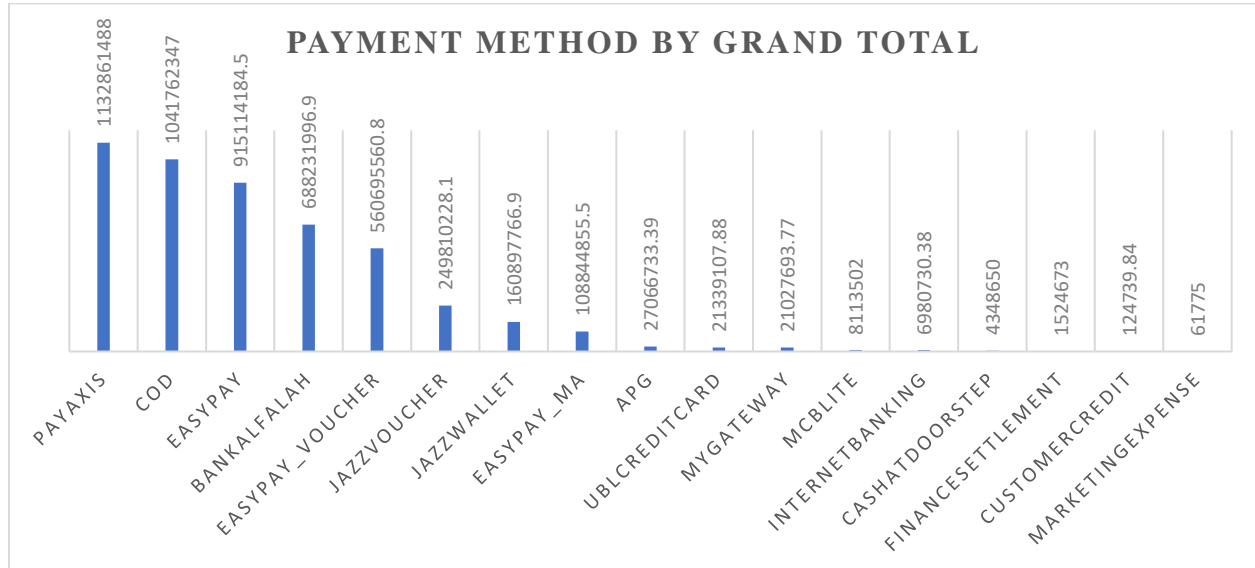


The Payment Method by Quantity of Sales chart reveals that Cash on Delivery (COD) and PAYAXIS are the most popular payment methods with 313,092 and 124,152 transactions, respectively, while Marketing Expense was rarely used by customers.

# E-commerce Analytics: Understanding Pakistani Market



The Payment Method by Price chart shows that PAYAXIS and Easypay top the list with \$878,703,598.46 and \$717,170,625.93 in sales, respectively, while Customer Credit and Marketing Expense have the lowest sales, with \$80,097.08 and \$17,912.00, respectively.



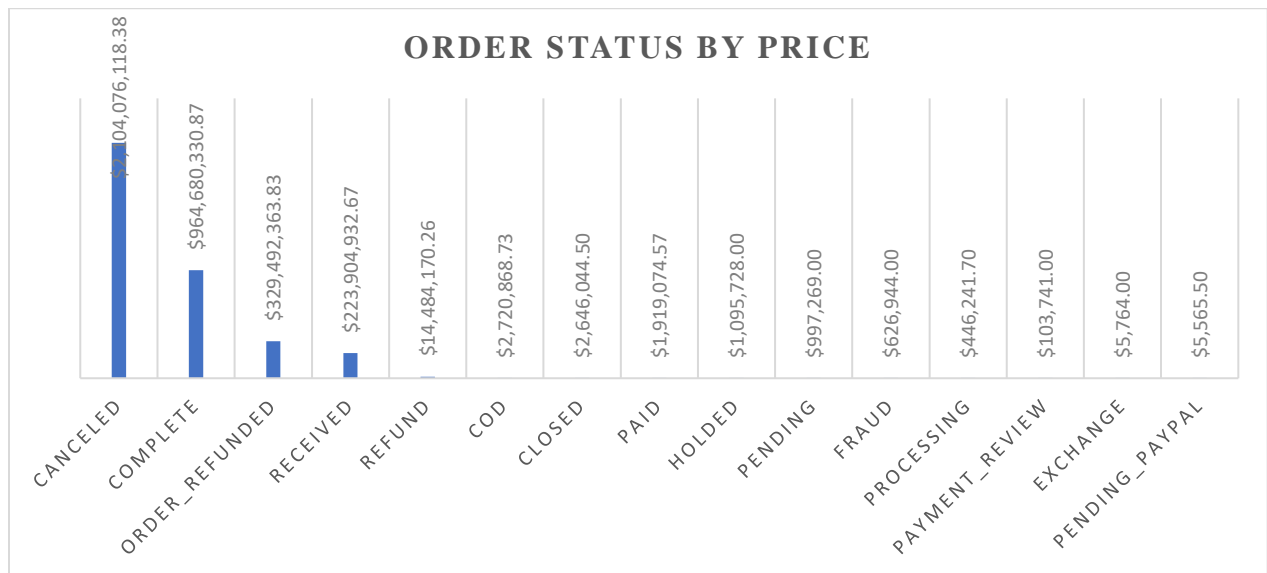
The Payment Method by Grand Total chart indicates that Payaxis and Cash on Delivery (COD) lead with a grand total of \$1,132,861,488 and \$1,041,762,347, respectively, while Customer Credit and Marketing Expense are at the bottom with grand totals of \$124,739.84 and \$61,775, respectively.

# E-commerce Analytics: Understanding Pakistani Market

## Insight:

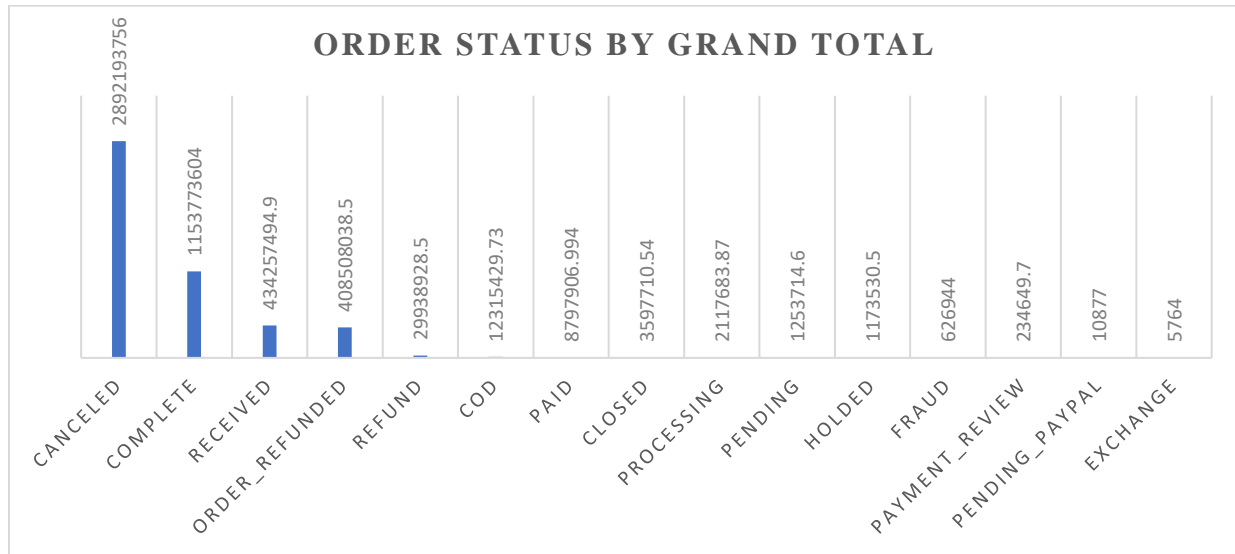
The charts show that most customers paid a grand total of \$1,132,861,488.00 for 124,152 items through Payaxis and \$1,041,762,347.24 for 313,092 items through COD. Therefore, Payaxis and COD are highly preferred payment methods.

## Performance by Order Status:

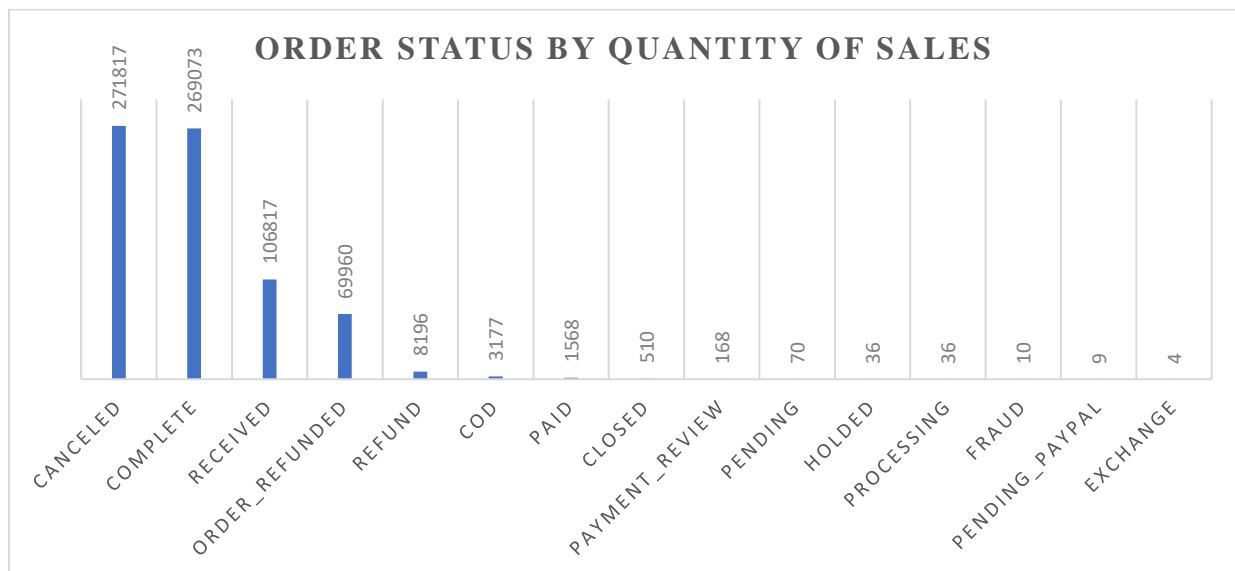


The Order Status by Price chart reveals that canceled orders amounted to \$2,104,076,118.38, while completed orders amounted to \$964,680,330.87, which is less than 50% of the canceled orders. Additionally, the total price lost to fraud was \$626,944.00.

# E-commerce Analytics: Understanding Pakistani Market



The Order Status by Grand Total chart indicates that the total number of canceled orders was 2,892,193,756, while the number of completed orders was 1,153,773,604. Furthermore, the grand total lost to fraud was \$626,944.



The Order Status by Quantity of Sales chart shows that the total canceled orders amounted to 271,817, while completed orders were 269,073. A total of 10 products were lost to fraud.

# E-commerce Analytics: Understanding Pakistani Market

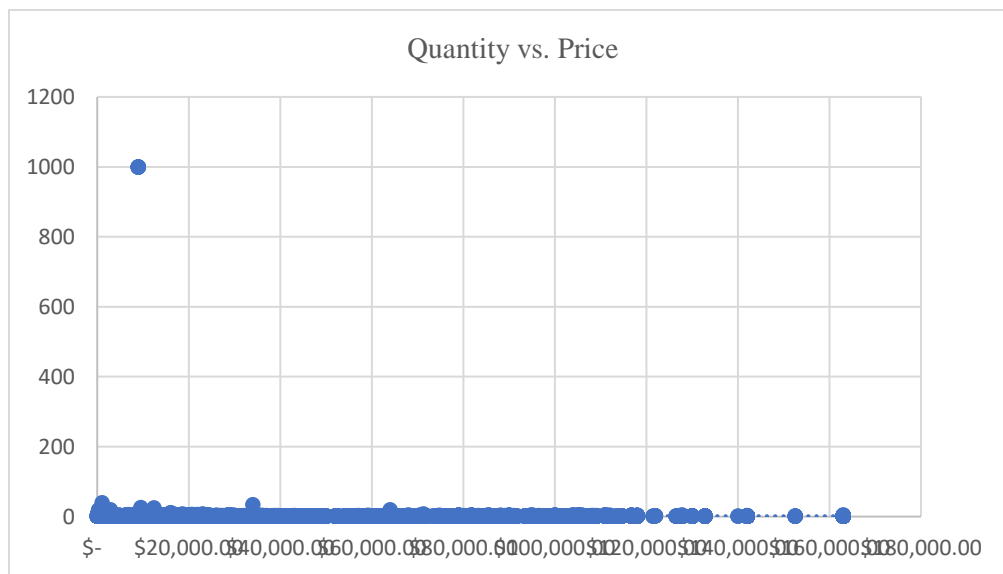
## Insight and Recommendation:

The charts highlight that a substantial number of ordered items, with a grand total of \$2,892,193,756.02, were canceled, resulting in a significant loss to the market compared to completed orders, which totaled \$1,153,773,604.26. Additionally, the grand total lost to fraud amounted to \$626,944.00, signifying a considerable loss. Therefore, it is crucial to investigate the reasons for the high number of canceled orders and improve security measures against fraud to enhance profitability.

Orders	Appliances	Mobiles & Tablets
Completed	20263	40816
Canceled	21524	53595

This table further proves that the store could have gained a lot more in profits.

## Deduction from Scatter Plot:



The scatter plots reveal that there is no evidence of a significant relationship between the quantity of items bought and their respective prices. In other words, we cannot conclude that the price of an item determines the number of items bought.

# E-commerce Analytics: Understanding Pakistani Market

## TEST STATISTICS:

Statistics	Payaxis Price	Easypay Price	Easypay Quantity	Payaxis Quantity
Average	9139.548365	8685.607677	1.467591135	1.291326462
Standard Deviation	17096.17101	16354.48892	2.465839702	0.987430427
p-value	0.05		0.05	
T.test	1.13669E-08		6.37886E-92	
	Canceled Price	Canceled Quantity	Complete Price	Complete Quantity
Average	8605.294882	1.25133395	2155.475466	1.121485704
Standard Deviation	17126.06164	6.673031131	6317.898297	0.913701625
p-value	0.05		0.05	
T.test	0		0	
	Appliances Prices	Mobiles & Tablets Prices		
Average	11131.26581	11970.07344		
Standard Deviation	16438.26434	19103.63838		
T.Test	0			
p-value	0.05			

In the test statistics table above, the t-test value is less than our confidence level (0.05) for all the indicators. This reinforces our conclusions on Category, Payment method, and Order Status. The observed differences are statistically significant, leading us to conclude that our assumptions are valid.



# E-commerce Analytics: Understanding Pakistani Market

## Analysis of Variance (ANOVA):

Mobiles & Tablets by Payment Method

### SUMMARY

Groups	Count	Sum	Average	Variance
apg	247	6454307	26130.8	1E+09
bankalfalah	6076	2.86E+08	47013.83	1.65E+09
cashatdoorstep	26	110122	4235.462	18200760
cod	22763	1.67E+08	7317.138	1.62E+08
customercredit	2	12898	6449	75645000
Easypay	18757	3.78E+08	20172.23	5.05E+08
easypay_voucher	11566	2.97E+08	25704.95	5.79E+08
financesettlement	10	253593	25359.3	1.05E+09
Internetbanking	66	1208542	18311.24	4.91E+08
jazzvoucher	3801	69097932	18178.88	5.16E+08
jazzwallet	4908	29498126	6010.213	2.03E+08
mcblite	51	1312101	25727.47	1.01E+09
mygateway	129	4160329	32250.61	1.12E+09
Payaxis	23309	4.5E+08	19295.39	5.26E+08
ublcreditcard	274	9216529	33636.97	9.12E+08

Alpha = 0.05

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	9.33E+12	14	6.66E+11	1337.173	0	1.691878
Within Groups	4.58E+13	91970	4.98E+08			
Total	5.52E+13	91984				

# E-commerce Analytics: Understanding Pakistani Market

## **Insight:**

F-statistics (1337.173) > F-critical value (1.691878), the test is significance.

P-value (0) < 0.05, hence there is a difference between the payment method

In the analysis of variance table, it is evident that there is a significant difference in the payment methods used by buyers of Mobiles & Tablets. Further study, using ANOVA post-hoc tests (e.g., Tukey, Bonferroni, or Holm), is needed to determine where these differences lie. Based on the Payment method performance analysis, it is likely that the key differences can be attributed to the Payaxis and COD payment methods.

# E-commerce Analytics: Understanding Pakistani Market

Appliances by  
Payment  
Method

## SUMMARY

Groups	Count	Sum	Average	Variance
apg	275	5077633	18464.12	528323120.5
bankalfalah	1584	27914665	17622.89457	462629780.2
cashatdoorstep	30	458384	15279.46667	269105436.4
cod	10096	67902210.98	6725.654812	130660000.5
customercredit	4	5355	1338.75	873374.25
Easypay	9786	109955762.6	11236.02725	301180919.2
Easypay_MA	1826	16414767.44	8989.467382	155091181.4
719	5587	83270377.71	14904.3096	293649521.6
Internetbanking	23	214827	9340.304348	243484061.4
jazzvoucher	1714	23868477	13925.59918	332007059.8
jazzwallet	2389	22132123.9	9264.179113	192244929.1
mcblite	24	620024	25834.33333	1554878956
mygateway	21	726500	34595.2381	856238536.2
Payaxis	8349	117459532.2	14068.69472	318752298.9
ublcreditcard	78	1478123	18950.29487	402263255.5

Alpha = 0.05

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	4.78098E+11	14	34149868605	131.4442048	0	1.692007438
Within Groups	1.08523E+13	41771	259805053			
Total	1.13304E+13	41785				

**Insight:**

# E-commerce Analytics: Understanding Pakistani Market

F-statistics (131.4442048) > F-critical value (1.692007438), the test is significance.

P-value (0) < 0.05, hence there is a difference between the payment method

Similarly, in the analysis of variance table for Appliances, there is a significant difference in the payment methods used by buyers of Appliances. As with Mobiles & Tablets, further study using ANOVA post-hoc tests is recommended to pinpoint the specific payment methods responsible for this difference. From the Payment method performance analysis, it is likely that Payaxis and COD payment methods are contributing factors.

# E-commerce Analytics: Understanding Pakistani Market

## Conclusion:

This comprehensive analysis of e-commerce data in Pakistan has uncovered essential insights into the performance of various categories, payment methods, and order statuses. These insights offer valuable guidance for decision-makers in the e-commerce industry.

In terms of Category Performance, it is evident that Mobiles & Tablets and Appliances dominate the market in both total sales and quantities sold. On the other hand, School & Education and Books lag behind considerably. These findings highlight the potential for increased profits if strategies are devised to bolster the performance of the less-performing categories.

The Payment Method Performance analysis reveals that Payaxis and Cash on Delivery (COD) are the preferred payment methods among customers. These payment methods significantly outperform others in terms of both sales and quantities sold. In contrast, Marketing Expense and Customer Credit represent only a small fraction of the overall transactions. To optimize profits, businesses may consider leveraging the popularity of Payaxis and COD while exploring strategies to boost the adoption of less-utilized payment methods.

Furthermore, the investigation into Order Status shows a concerning trend. The high number of canceled orders, totaling a substantial sum, poses a significant challenge to profitability. Additionally, the losses incurred due to fraud highlight the importance of enhancing security measures. Addressing these issues is imperative to mitigate potential revenue loss and foster customer trust.

In the absence of a significant relationship between item price and quantity sold, it is crucial for businesses to focus on other factors influencing consumer purchasing decisions.

The statistical analyses, including t-tests and ANOVA, corroborate the significance of the observed differences in category performance and payment methods, reinforcing the validity of our conclusions.

In conclusion, this analysis serves as a valuable tool for stakeholders in the Pakistani e-commerce market. By optimizing category performance, diversifying payment methods, and addressing challenges related to order status, businesses can work toward maximizing profitability and ensuring a thriving e-commerce landscape in Pakistan.