

PELICAN STORES

Exploratory Data Analysis — Managerial Report

Division of National Clothing | Promotional Coupon Campaign Evaluation

Sample: n = 100 in-store credit card transactions

1. Background & Objectives

Pelican Stores is a women's apparel chain operating as a division of National Clothing. A one-day promotional campaign was run in which discount coupons were distributed to customers of other National Clothing stores. A random sample of 100 in-store credit card transactions was collected on that day.

The dataset contains the following variables:

Variable	Type	Description
Customer ID	Numeric	Unique transaction identifier (1–100)
Type of Customer	Categorical	Promotional (used coupon) or Regular (no coupon)
Items	Numeric	Total number of items purchased in the transaction
Net Sales	Numeric	Total amount charged to the credit card — KEY variable
Method of Payment	Categorical	Proprietary Card, Visa, MasterCard, Discover, Amex
Gender	Categorical	Male or Female
Marital Status	Categorical	Married or Single
Age	Numeric	Customer age in years

2.. Descriptive Statistics — Net Sales

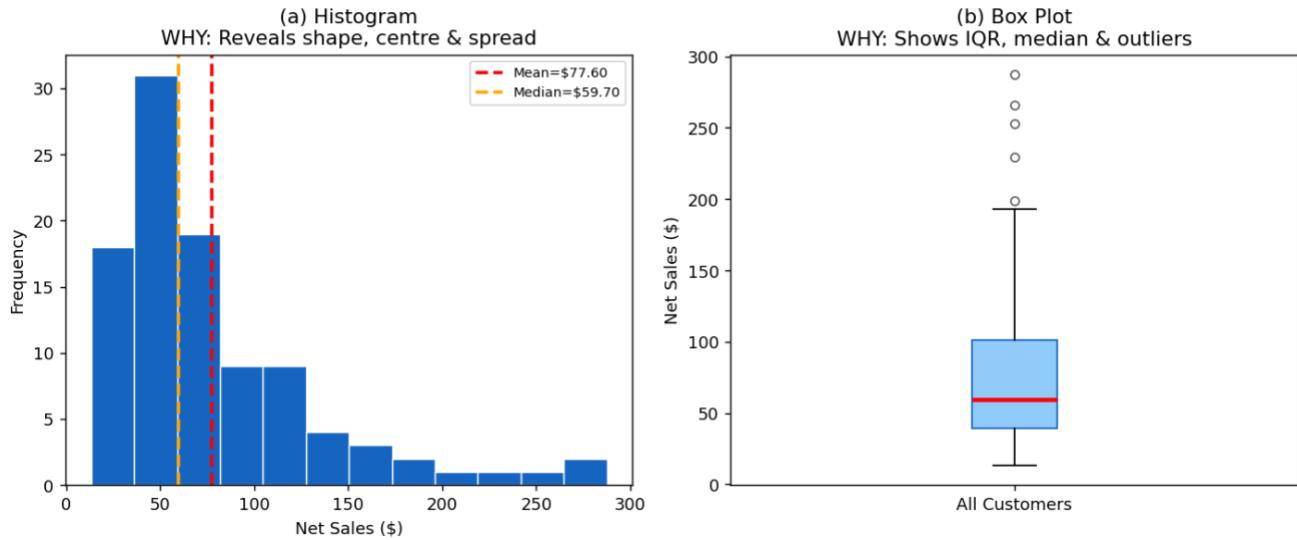
2.1 Overall Net Sales Summary

The following statistics describe Net Sales across all 100 transactions.

Statistic	Value	Statistic	Value
Sample Size (n)	100	Minimum	\$13.23
Mean	\$77.60	Maximum	\$287.59
Median	\$59.70	Range	\$274.36
Std Deviation	\$55.66	Q1 (25th %ile)	\$39.60
Skewness	1.715 (right)	Q3 (75th %ile)	\$100.90
Mean – Median gap	\$17.90	IQR (Q3 – Q1)	\$61.30

Key observation: The mean (\$77.60) is substantially higher than the median (\$59.70) showing a gap of \$17.90. This shows a positive (right) skew, confirmed by a skewness value of 1.715. A small number of high-spending promotional customers (e.g., Customer 98: \$287.59, Customer 97: \$253.00) are pulling the mean upward. The median is therefore a more representative measure of the "typical" Pelican customer's spend.

Figure 1: Distribution of Net Sales (All 100 Customers)



The histogram shows a right-skewed distribution; the box plot highlights multiple high-value outliers.

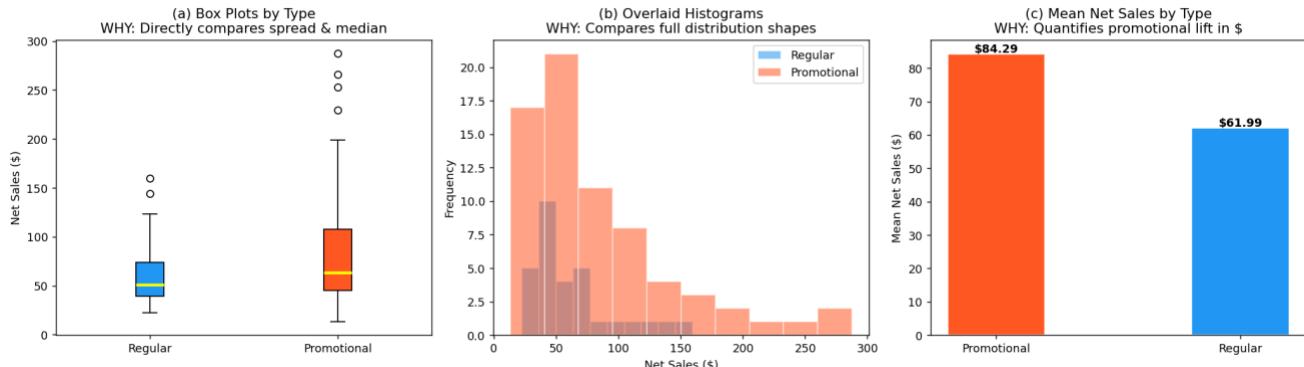
2.2 Net Sales by Customer Type

The most important split in this dataset is between Promotional and Regular customers.

Metric	Promotional (n=70)	Regular (n=30)	Difference
Mean	\$84.29	\$61.99	+\$22.30 (promo spends 36% more)
Median	\$63.42	\$51.00	+\$12.42
Std Deviation	\$61.46	\$35.07	Promo has much greater variability
Minimum	\$13.23	\$22.50	—
Maximum	\$287.59	\$159.75	Promo has higher ceiling spend
IQR	Wider	Narrower	Promo distribution more spread out

Key observation: Promotional customers spend an average of \$22.30 more per transaction than regular customers. Crucially, the promotional group also has a much larger standard deviation (\$61.46 vs \$35.07), indicating that the coupon attracted a wide variety of spending behaviors from low value purchases (\$13.23) to very high purchases (\$287.59).

Figure 2: Net Sales — Regular vs Promotional Customers



Side by side Box Plots show the promotional group has a higher median and more outliers, Overlaid Histograms reveal the broader spread of promotional spending, Mean Bar Chart quantifies the \$22.30 per-transaction uplift.

3. Net Sales by Categorical Variables

3.1 Method of Payment

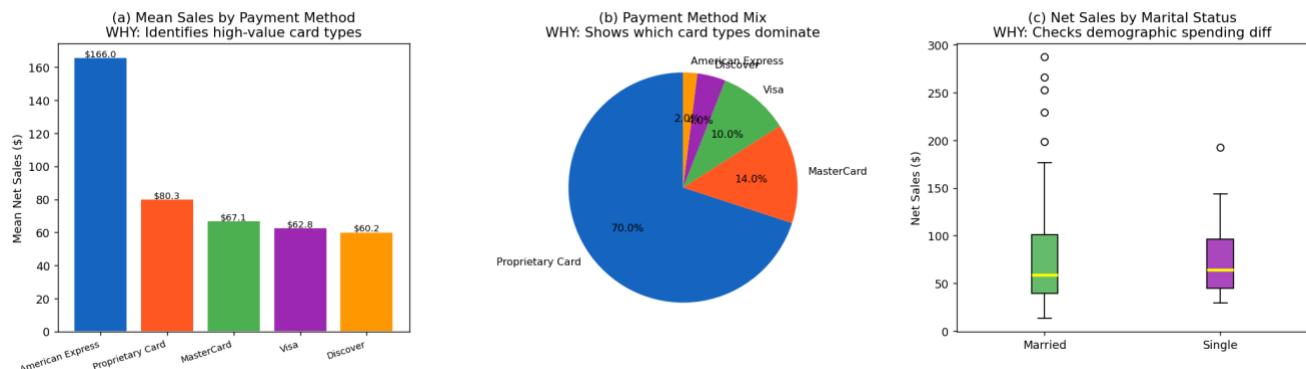
The Proprietary Card (National Clothing's own store card) accounts for a dominant 70% share. This reflects strong brand loyalty and suggests that Proprietary Card holders are Pelican's most engaged customer segment.

Payment Method	Transactions	Share
Proprietary Card	70	70%
MasterCard	14	14%
Visa	10	10%
Discover	4	4%
American Express	2	2%

3.2 Marital Status

Married customers constitute 84% of the sample (n=84) versus 16% single (n=16). Mean Net Sales are almost identical between groups (Married: \$78.03, Single: \$75.35), suggesting marital status has negligible influence on spending at Pelican Stores.

Figure 3: Net Sales by Payment Method & Marital Status



American Express and Proprietary Card holders show the highest average spend, Proprietary Card dominates at 70%, distributions are very similar between Married and Single groups.

3.3 Gender Profile

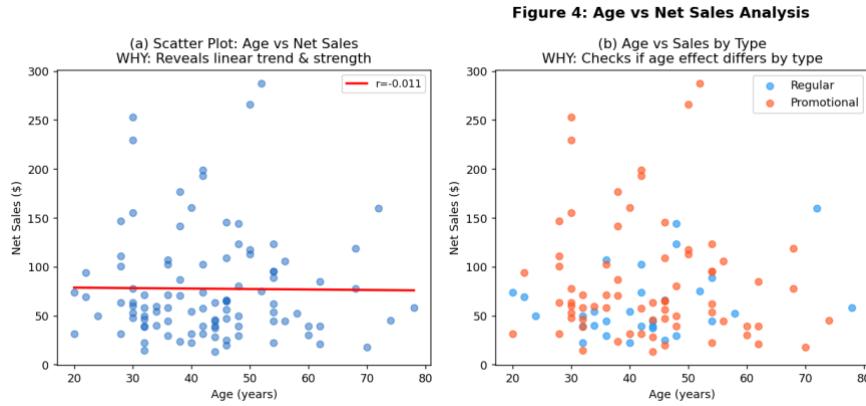
95% of customers in the sample are female. Since Pelican is a women's apparel chain, this is expected and consistent with the store's core market. Gender will not be analyzed further as there are insufficient male observations to draw any meaningful comparisons.

4. Relationship Between Age and Net Sales

A scatter plot is used to visualize the relationship, and Pearson's r is calculated to quantify it.

Measure	Value	Interpretation
Pearson's r	-0.011	Nearly zero, no linear relationship

Pearson's r of -0.011 is essentially zero. This suggests knowing a customer's age gives us almost no ability to predict how much they will spend.



the near-flat trend line and $r = -0.011$ reflect no relationship, Scatter colored by Customer Type confirms the age pattern holds for both groups, neither type shows age-related spending differences.

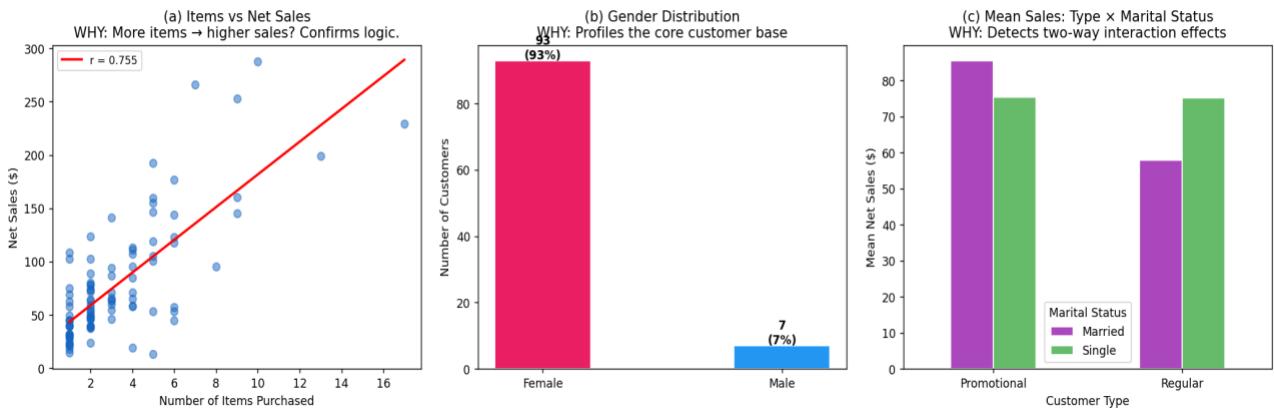
5. Items Purchased, Gender & Interaction Analysis

A key additional insight emerges from examining the relationship between Items Purchased and Net Sales.

Relationship	Pearson's r	Interpretation
Items vs Net Sales	0.755	Strong positive relationship — more items = higher bill (expected, validates data integrity)
Age vs Net Sales	-0.011	No relationship — age does not predict spending

The strong $r = 0.755$ between Items and Net Sales tells management that the number of items purchased is a far better predictor of the transaction value than the customer's age or marital status.

Figure 5: Items Purchased, Gender & Interaction Analysis



Promotional customers outspend Regular customers for both Married and Single groups.

6. Summary & Managerial Conclusions

6.1 Key Findings

- The Net Sales distribution is right-skewed (skewness = 1.715). The mean (\$77.60) is substantially higher than the median (\$59.70), driven by a small number of very high-spend promotional customers. The median is the better measure of a "typical" transaction.
- Promotional customers spend an average of \$22.30 more per transaction than regular customers (\$84.29 vs \$61.99).
- Promotional customers show far greater variability in spending (std = \$61.46) than regular customers (std = \$35.07), suggesting the coupon attracts a diverse range of buyers.
- The Proprietary Card accounts for 70% of all transactions which is strong evidence of brand loyalty within the National Clothing ecosystem.
- Age has virtually no relationship with Net Sales. Age-based targeting would be ineffective for this customer base.
- The number of items purchased is strongly correlated with Net Sales ($r = 0.755$).
- Marital status and gender show minimal influence on spending, confirming that the promotion works broadly across demographic subgroups.