

Data Analysis Report

Group 4

01

Descriptive Statistics

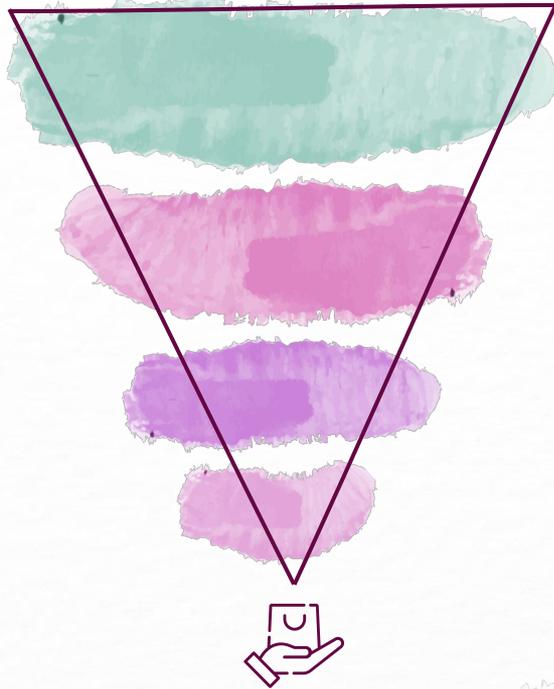
Descriptive statistics are brief descriptive coefficients that summarize a given data set, which can be either a representation of the entire population or a sample of a population. Descriptive statistics are broken down into measures of central tendency and measures of variability

Research Question 1:

Which product contributes the largest sales to the company?



Product that contributes the largest to the company



2009 **Office Machines**
732,505 sales

2012 **Office Machines**
563,308 sales

2011 **Tables**
506,812 sales

2010 **Office Machines**
446,780 sales

Analysis

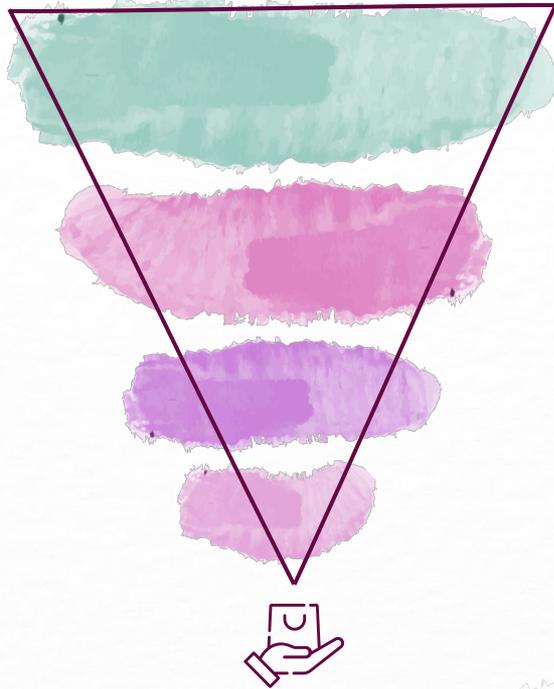
It shows the yearly sales of the company's product category and product subcategories from 2009 to 2012 and its total sales for four consecutive years. It shows that for 2009 and 2010, among the 17 product subcategories from 3 product categories, most sales for both 2009 and 2010 come from the office machines with a sales of 732,505 and 446,780, respectively. For 2011, tables had the most sales among the 17 product subcategories with an amount of 506,812. For 2012, out of 17 product subcategories, office machines had the largest sales of 563,308. From this, it can be concluded from this table that for four consecutive years, office machines bring the largest sales to the company.

Research Question 2:

Which product needs to have more stock based on the company's order quantity?



Product that needs to have more stock based on company's order quantity



2010 Paper
7,977 orders

2012 Paper
7,691 orders

2011 Paper
7,686 orders

2009 Paper
7,517 orders

Analysis

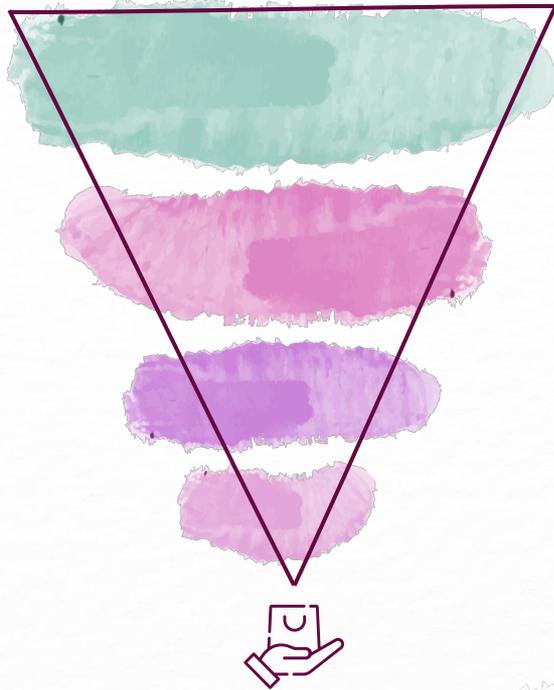
It shows the annual order quantity of the company for four years starting from 2009 up until 2012 and its total orders. From the year 2009 to 2012, paper had the highest order with 7,517, 7,977, 7,686, 7,691 orders respectively with a total of 30,871 compared to the other 16 sub-categories from the three product categories. Based on the four-year data, it can be deemed that paper needs to have more stock to avoid experiencing shortage because of high demands. It can also indicate that paper is the cheapest product from the company as it is the most ordered among them all.

Research Question 3:

Which customer segments bring large sales to the company?



Customer segment that brings large sales to the company



2009 **Corporate**
1,518,516 sales

2012 **Corporate**
1,489,335 sales

2011 **Corporate**
1,249,661 sales

2010 **Corporate**
1,241,392 sales

Analysis

It shows the four-year sales for each customer segment from 2009 to 2012 and its total sales. From the data above, among the four customer segments, from year 2009 to 2012, corporate brings the largest sales to company with a total of 5,498,904; 1,518,516 for 2009, 1,241,392 for 2010, 1,249,661 for 2011, and 1,489,335 for 2012. Therefore, the company's biggest customer is the corporate sector.

02

Inferential Statistics

the process of using data analysis to
infer properties of an underlying
distribution of probability

Research Question 1:

Is the order quantity related to the sales each year?



Year	Order Quantity	Sales
2009	54,380	4,209,139
2010	54,384	3,549,680
2011	51,564	3,436,817
2012	54,449	3,719,964

Correlation Coefficient

$$r = \frac{n\sum xy - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}}$$

$$r = 0.57$$

Hypothesis

$$H_0: \rho = 0$$

$$H_1: \rho \neq 0$$

Critical Values

$$(\alpha = 0.05)$$

$$df=2$$

Critical values are \pm 4.303

Test value

$$t = r \sqrt{\frac{n-2}{1-r^2}}$$

$$t = 0.9804$$

Make the Decision

Since the test value is not in the critical region, we do not reject the null hypothesis.

Summarize the Results

There is not enough evidence to support the claim that the order quantity is related to the sales each year.

Research Question 2:

Is the sales in 2009 greater than the sales in 2010? ($\alpha = 0.10$)



Hypothesis

$$H_0: \mu_1 = \mu_2 \quad \text{and} \quad H_1: \mu_1 > \mu_2 \text{ (claim)}$$

Compute the Test Value

$$z = \frac{(1,955 - 1,657) - 0}{\sqrt{\frac{4,171^2}{2,153} + \frac{3,256^2}{2,142}}}$$

$$z = 2.61$$

Find the P-value

For $z = 2.61$, the area is 0.99547, and $1.00000 - 0.99547 = 0.00453$ or a P-value of 0.00453

Make the Decision

Since the P-value is smaller than α , that is, $0.00453 < 0.10$, the decision is to reject the null hypothesis.

Summarize the Results.

There is enough evidence to support the claim that sales in 2009 are greater than sales in 2010.

Research Question 3:

Is there a significant difference in the average shipping cost of Nunavut and Newfoundland? ($\alpha = 0.05$)



Hypothesis

$$H_0: \mu_1 = \mu_2 \text{ and } H_1: \mu_1 \neq \mu_2 \text{ (claim)}$$

Find the critical values

Since $\alpha = 0.05$, the critical values are + 1.96 and - 1.96

Compute the test values

$$Z = \frac{(12.77 - 11.65) - 0}{\sqrt{\frac{17.87^2}{79} + \frac{14.65^2}{79}}}$$

$$z = 0.43$$

Make the decision

Since the critical value is larger than test value, the decision is to not reject the null hypothesis.

Summarize the results

There is not enough evidence to support the claim that there are significant differences between the average shipping cost in Nunavut and Newfoundland.

THANK YOU

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