Understanding how advertising budgets influence product sales performance

Sales Prediction Analysis

Dataset Overview

Analyzing ad spend and sales data across multiple channels

- The dataset consists of **200 entries** containing ad budgets for TV, Radio, and Newspaper, along with corresponding sales units.
- Sales values range approximately from 1.6 to 27 units, with an average of 14.02 units.

Descriptive Statistics of Ad Spends

Analyzing average spends and variability across different advertising mediums, particularly TV

The analysis reveals average spends for TV, Radio, and Newspaper ads. Notably, the **standard deviation** of TV spends is significantly higher, indicating greater variability compared to other mediums, which emphasizes the **importance of TV** in advertising strategy.

01

Pearson Coefficients Overview

The Pearson coefficients indicate the strength of the linear relationship between ad spends and sales.

02

TV and Radio Correlation

TV shows a strong correlation at **0.78**, while Radio has a moderate correlation of **0.58**.

03

Newspaper's Weak Influence

With a low correlation of **0.23**, Newspaper's impact on sales is deemed negligible and less effective.

Correlation Analysis

Sales are most strongly influenced by TV ads, moderately by Radio, and weakly by Newspaper.

Advertising Combination Effects

Understanding how each combination of advertising medium affects sales

Interaction of multi-platform advertising on sales performance High sales values often correspond to combined high TV and moderate-to-high Radio ad spend. Newspape does not significantly enhance sales when added to TV and Radio budgets.

Extreme Cases and Outliers

High and low performing budget allocations

Some entries with very low Newspaper spend and high TV + Radio budgets achieve the highest sales (>25 units). Few cases of high Newspaper spending show minimal sales lift, highlighting its inefficiency as a standalone channel.

Projected Sales from Budgets

Estimating sales output based on advertising expenditures across mediums

Example input: TV = $200k, Radio = $40k, Newspaper = $50k
Predicted sales output: 23.53 units
Confirms that strategic TV and Radio budgeting can lead to high returns on sales volume.

Comparing Advertising Strategies: What Happens When TV is Removed?

Analyzing the effects of excluding TV

Sales estimates become less accurate and more inconsistent without including TV ads.

Both approaches try to understand how different ad budgets affect product sales.

The analysis only looks at Radio and Newspaper advertising, ignoring the impact of TV.

Key Takeaways from Sales Prediction Analysis

Highlights of media influence on sales

- TV is the **most impactful** advertising medium
- Radio shows a **significant contribution** to sales
- Newspaper advertising has a **negligible effect**
- For maximizing sales, prioritize TV with supplementary Radio allocation.
- Sales patterns are predictable and align closely with investment in high-impact media.

Sales-Only Conclusions

- High sales clusters correspond to multi-channel strategies led by visual media. Targeted ad budgeting can substantially optimize product unit turnover.
- Newspaper investment should be minimized unless serving a niche role.


thank you