📁 Data Upload

Upload a CSV file with your marketing data.

Choose a CSV file

Drag and drop file here

Limit 200MB per file • CSV

Browse files

Expected Schema

```
date           (datetim
Sales          (numeric
TV_Spend       (numeric
Radio_Spend    (numeric
Digital_Spend  (numeric
```

📊 Marketing Mix Modeling (MMM) App

Analyze the effectiveness of your marketing channels on sales performance. Upload your data or use synthetic demo data to get started.

📊 No file uploaded. Using synthetic demo data (52 weeks).

📋 Data Overview

Total Observations	Date Range	Total Sales	Total Spend
52	357 days	$8,335,165	$1,571,843

› 🔍 View Raw Data

📈 Summary Statistics

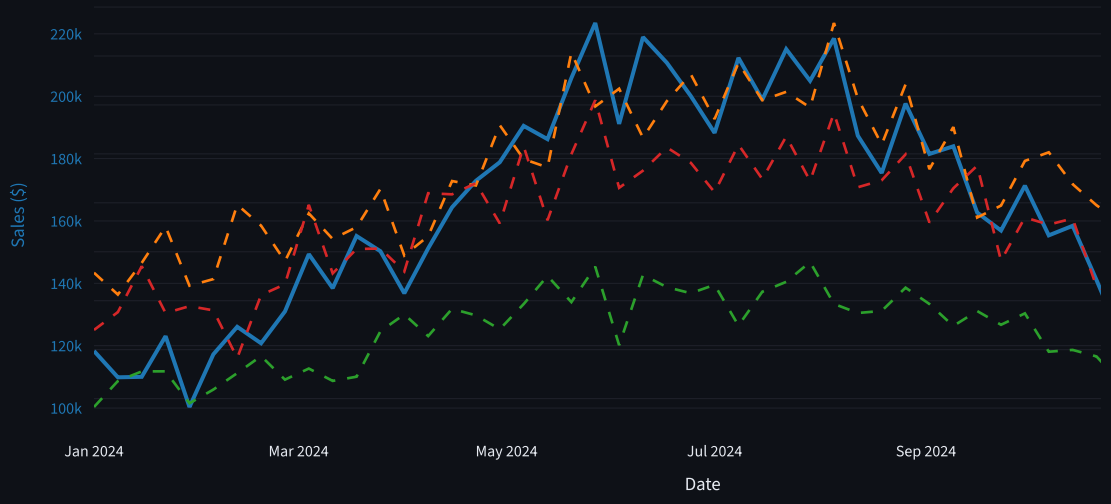
	Sales	TV_Spend	Radio_Spend
count	52	52	52
mean	160291.63	12773.94	6519.21
std	35355.24	2959.54	1643.27
min	100342.22	7467.74	3658.46
25%	130647.98	10531.51	5038.04
50%	156155.38	12289.61	6654.82
75%	188810.25	15236.76	7864.94
max	223482.48	19348.28	9581.6

📊 Visualizations

1️⃣ Sales Trend Over Time

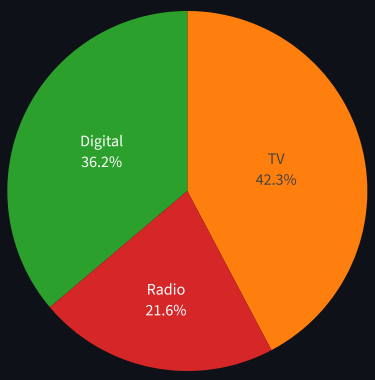
Line chart showing sales performance over the time period

Sales and Marketing Spend Over Time

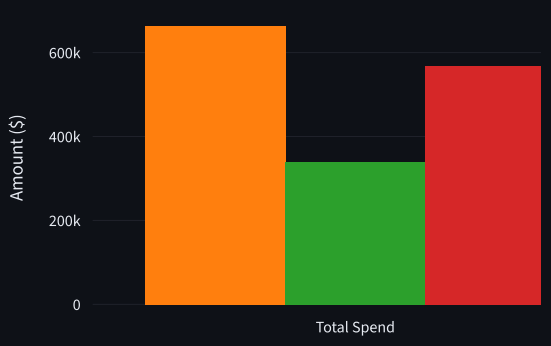


Marketing Spend Distribution by Channel

Total Spend by Channel



Spend Comparison

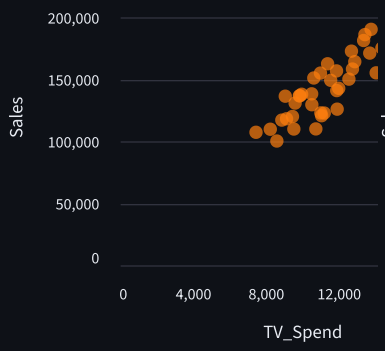


🔗 Marketing Spend vs Sales Analysis

2️⃣ Channel Performance: Spend vs Sales Relationships

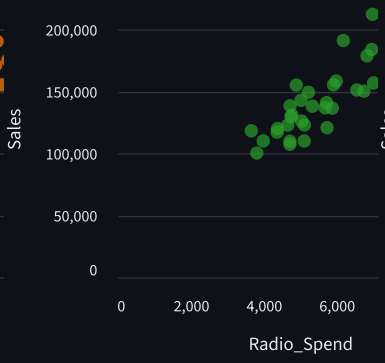
Scatter plots showing the relationship between marketing spend and sales for each channel

TV Spend vs Sales



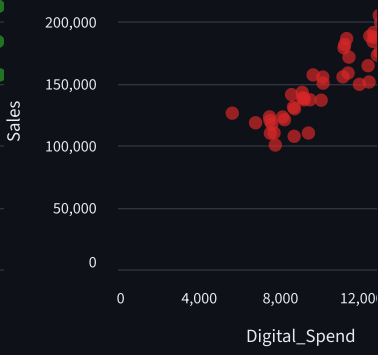
Pearson: 0.921 | Spearman: 0.921

Radio Spend vs Sales



Pearson: 0.893 | Spearman: 0.897

Digital Spend vs Sales



Pearson: 0.921 | Spearman: 0.924

3️⃣ Spearman Correlation Matrix

Non-parametric correlation coefficients between sales and all marketing channels (Spearman's rank correlation)

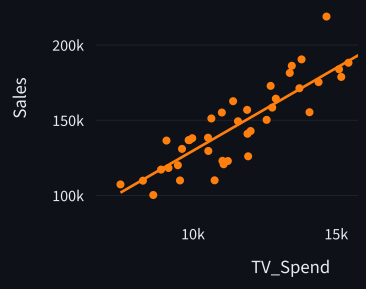
	Sales	TV_Spend	Radio_Spend
Sales	1.000	0.921	0.897
TV_Spend	0.921	1.000	0.797
Radio_Spend	0.897	0.797	1.000
Digital_Spend	0.924	0.821	0.857

Interpretation: Values range from -1 to +1. Values closer to +1 indicate strong positive correlation, values closer to -1 indicate strong negative correlation, and values near 0 indicate weak or no correlation. Spearman correlation measures monotonic relationships and is robust to outliers.

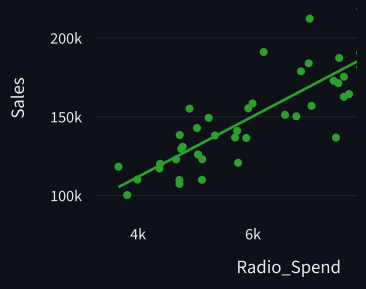
Detailed Correlation Analysis with Trendlines

Interactive scatter plots with linear regression trendlines for deeper insights

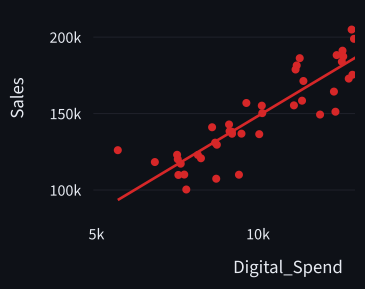
TV Spend vs Sales



Radio Spend vs Sales



Digital Spend vs Sales



Pearson Correlation	Pearson Correlation	Pearson Correlation
0.921	0.893	0.921

📐 Linear Marketing Mix Model

4 Model Performance & Predictions

Linear regression model to predict sales based on marketing spend across all channels

R^2 Score	MAE (Mean Absolute Error)	MAPE (Mean Absolute % Error)
0.9527	$6,074.65	4.04%

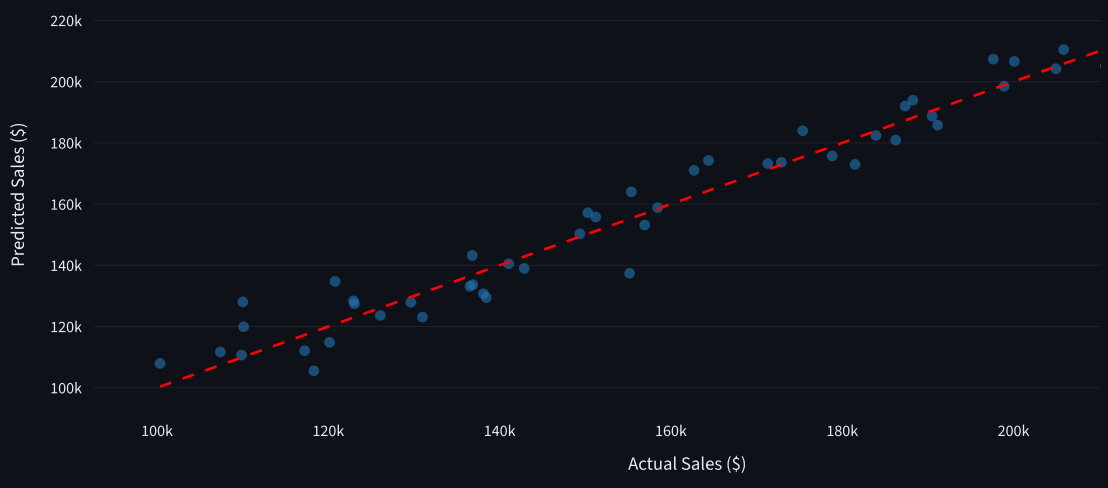
Model Coefficients (ROI Multipliers)

How much sales increase for each dollar spent on each channel

Intercept (Base Sales)	TV Coefficient	Radio Coefficient	Digital Coefficient
$5,322.85	5.210x	6.237x	4.368x

Actual vs Predicted Sales

Scatter plot comparing actual sales with model predictions - points closer to the diagonal line indicate better predictions



Model Equation

Sales = $5,322.85 + 5.210 × TV_Spend + 6.237 × Radio_Spend + 4.368 × Digital_Spend

This equation shows how each marketing channel contributes to total sales

5 Channel-wise ROI Analysis

Detailed return on investment analysis for each marketing channel

Marketing Channel Coefficients (Marginal ROI)

Each coefficient represents the increase in sales for every $1 spent on that channel

Comprehensive ROI Table

Detailed breakdown of spending, contribution, and return on investment by channel

Channel	Total Spend	Sales Contribution	Marginal ROI (per $1)
TV	$664,244.86	$3,460,474.03	5.210x
Radio	$338,998.69	$2,114,446.41	6.237x
Digital	$568,599.20	$2,483,456.34	4.368x

📊 **How to Interpret This Table:**

- **Total Spend**: Total amount invested in each marketing channel during the period
- **Sales Contribution**: Total sales attributed to this channel (Coefficient × Total Spend)
- **Marginal ROI (per $1)**: Additional sales generated for every $1 spent (the coefficient from the model)
- **Total ROI**: Overall return ratio (Sales Contribution / Total Spend)

💡 **Key Insights:**

- Higher Marginal ROI means better efficiency per dollar spent
- Total ROI shows the overall effectiveness of the channel
- Channels with Marginal ROI > 1.0 generate more in sales than they cost
- Compare these values to optimize your marketing budget allocation

🎯 Scenario Planner

6️⃣ What-If Analysis: Predict Sales from Custom Marketing Spend

Adjust marketing spend for each channel and see predicted sales impact compared to baseline

📊 **Baseline Scenario (Current Average Spend)**

Avg TV Spend	Avg Radio Spend	Avg Digital Spend	Predicted Sales
$12,773.94	$6,519.21	$10,934.60	$160,291.64

🎨 **Custom Scenario: Adjust Marketing Spend**

Move the sliders or enter custom values to see how changes in marketing spend affect predicted sales

TV Spend ($) 12773.94

Radio Spend ($) 6519.21

Digital Spend ($) 10934.60

Scenario Results

Predicted Sales
$160,291.64
↑ $0.00 (+0.0%)

Total Marketing Spend
$30,227.75
↑ $0.00 (+0.0%)

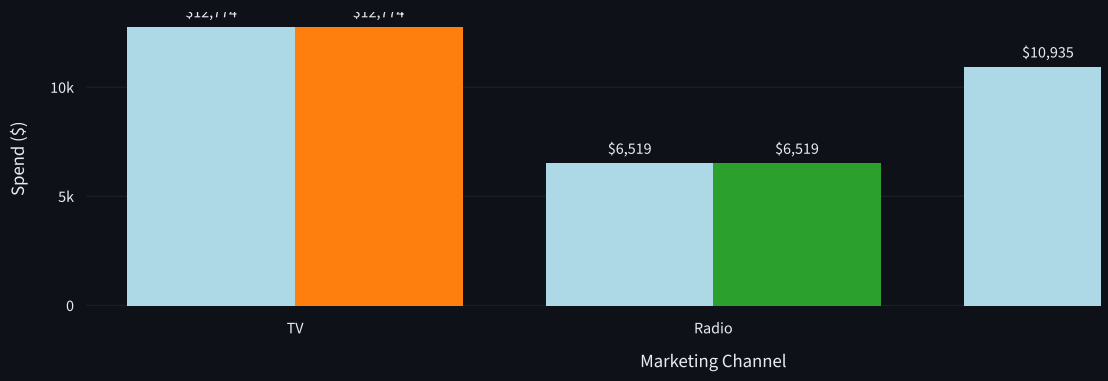
Overall ROI
5.303x
↑ +0.000x

Incremental ROI
N/A

Detailed Breakdown

Channel	Baseline Spend	Scenario Spend	Δ Spend	Baseline Contribution	Scenario Cont
TV	$12,773.94	$12,773.94	$+0.00	$66,547.58	$66,547.58
Radio	$6,519.21	$6,519.21	$+0.00	$40,662.43	$40,662.43
Digital	$10,934.60	$10,934.60	$+0.00	$47,758.78	$47,758.78

Baseline vs Scenario Comparison



How to Use the Scenario Planner:

1. **Baseline:** Shows your current average spend and predicted sales
2. **Adjust Inputs:** Modify spend for each channel to test different budget allocations
3. **View Impact:** See predicted sales, ROI, and comparison to baseline
4. **Optimize Budget:** Experiment to find the best channel mix for your goals

Key Metrics:

- **Δ vs Baseline:** Shows the change from your current average performance
- **Incremental ROI:** Return on additional spend compared to baseline
- **Overall ROI:** Total sales efficiency for the scenario

Marketing Mix Modeling App | Built with Streamlit