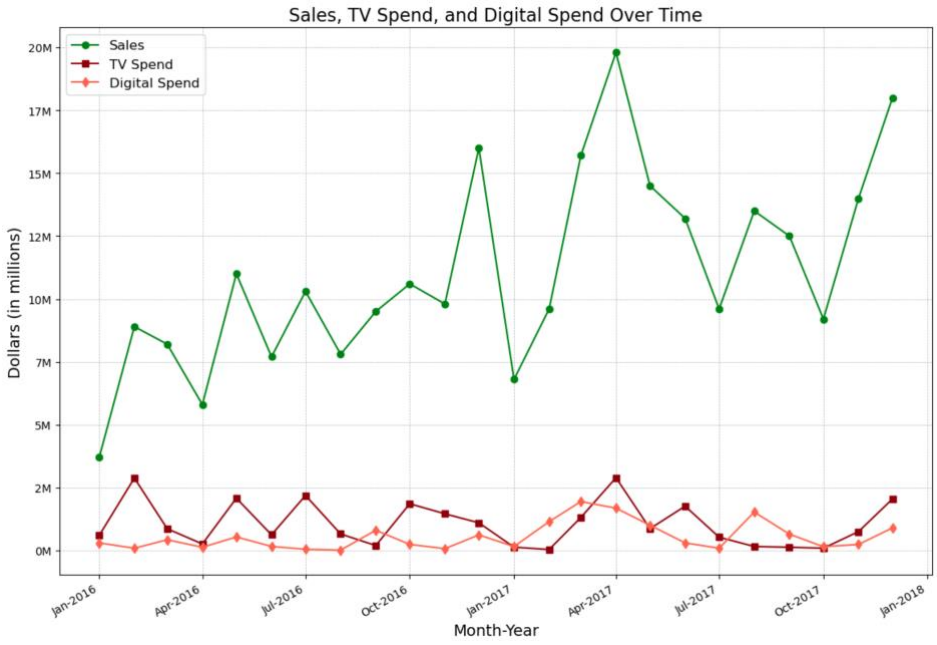
Plot of sales, TV investment and Digital investment in the y-axis with time in the x-axis:



Correlations among sales, TV and Digital investment:

	sales	tv_spend	digital_spend
sales	1.000000	0.440686	0.664765
tv_spend	0.440686	1.000000	0.072059
digital_spend	0.664765	0.072059	1.000000

- **Sales and TV spend:** Correlation of 0.44 indicates a moderate positive correlation between sales and TV spend.
- **Sales and Digital spend:** Correlation of 0.66 indicates a moderate-to-strong positive correlation between sales and digital spend. This implies a significant relationship between them, such that an increase in digital spend relates to an increase in sales.
- **TV spend and Digital spend:** Correlation of 0.07 indicates a very weak correlation between TV spend and digital spend. This implies that these two variables are independent of each other.

Adjusted R-squared:
The adjusted R-squared value is 0.558616056482552. This means that approximately 55.86% of variability in the sales data can be explained by the TV spend and digital spend variables together.

P-value and Significance of each regressor:

const	0.0000006717198
tv_spend	0.009746777
digital_spend	0.00016192

- **Constant (const)**: Highly significant
- **TV Spend (tv_spend)**: Significant
- **Digital Spend (digital_spend)**: Highly significant

Contribution from TV Spend to sales in % and absolute dollar value:

```
TV Contribution to Sales: 16.6%
TV Contribution to Sales (absolute): $44,108,224
```

TV return on investment (ROI):

```
TV ROI: 1.73
```

Expected sales value for the first 3 months of 2018:

```
Predicted Sales for the first three months of 2018:
Month 1: $8,334,056
Month 2: $9,082,486
Month 3: $10,892,394
```

Additional data that can improve the model:

1. **Promotional and Discount data:** Promotional strategies and discounts directly affect sales. It can explain the spikes in sales, relating to any active promotions at that time.

2. **Additional Marketing spend data:** If other marketing techniques are used, such as s ocial media marketing (for early teenagers), it can explain more variability in sales.

3. **Seasonality indicators:** Dummy variables for major holidays can also explain spikes in sales. For e.g., the ‘xmas’ indicator is given in the data, which aligns with spikes in sales observed in December, but there are more spikes like May and July (2016) and April (2017) which might be due to any major holidays or summer vacations.