

```
In [1]: import pandas as pd
import plotly.express as px
import plotly.io as pio
import plotly.graph_objects as go
pio.templates.default = "plotly_white"

data = pd.read_csv("customer_acquisition_cost_dataset.csv")
data.head()
```

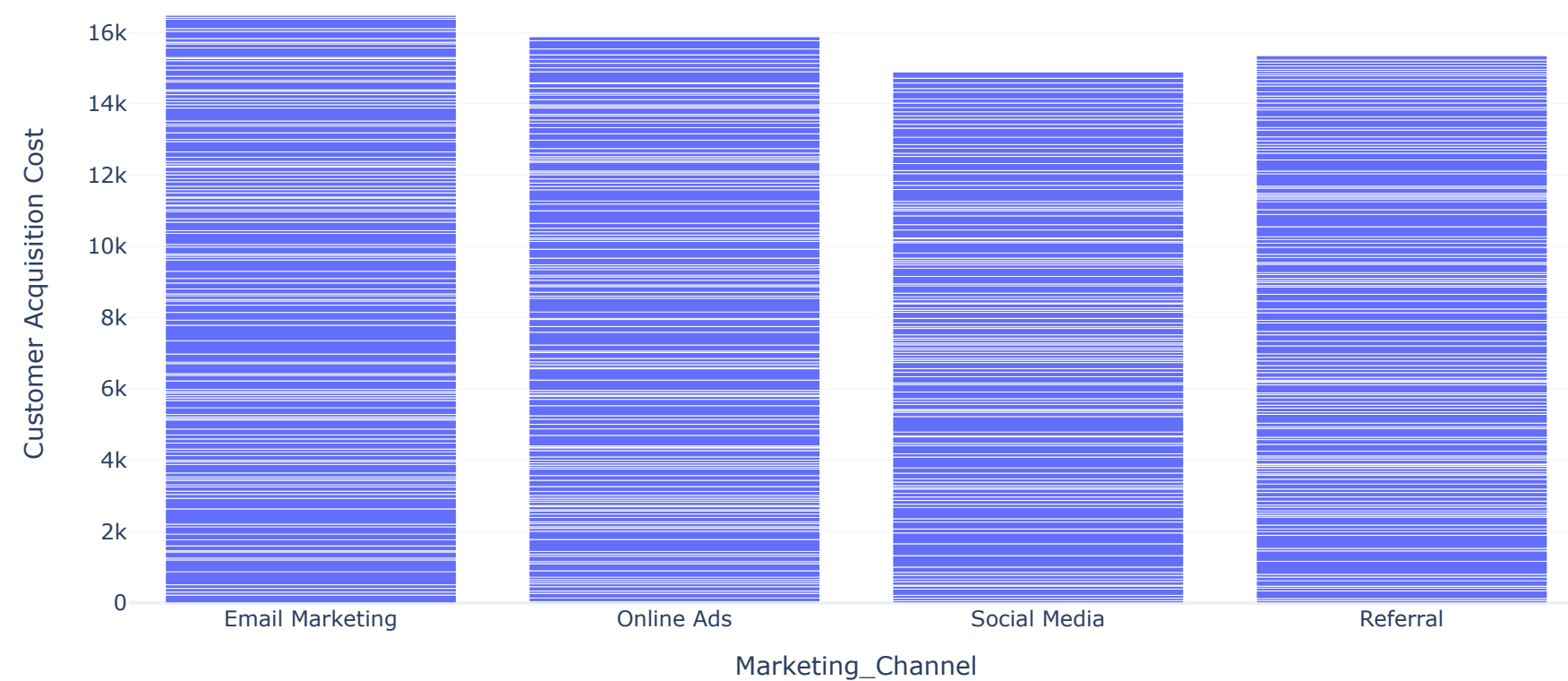
```
Out[1]:
```

	Customer_ID	Marketing_Channel	Marketing_Spend	New_Customers
0	CUST0001	Email Marketing	3489.027844	16
1	CUST0002	Online Ads	1107.865808	33
2	CUST0003	Social Media	2576.081025	44
3	CUST0004	Online Ads	3257.567932	32
4	CUST0005	Email Marketing	1108.408185	13

```
In [2]: data['Customer Acquisition Cost'] = data['Marketing_Spend'] / data['New_Customers']
```

```
In [3]: fig = px.bar(data, x='Marketing_Channel',
                    y='Customer Acquisition Cost', title='Customer Acquisition Cost based on Marketing Channel')
fig.show()
```

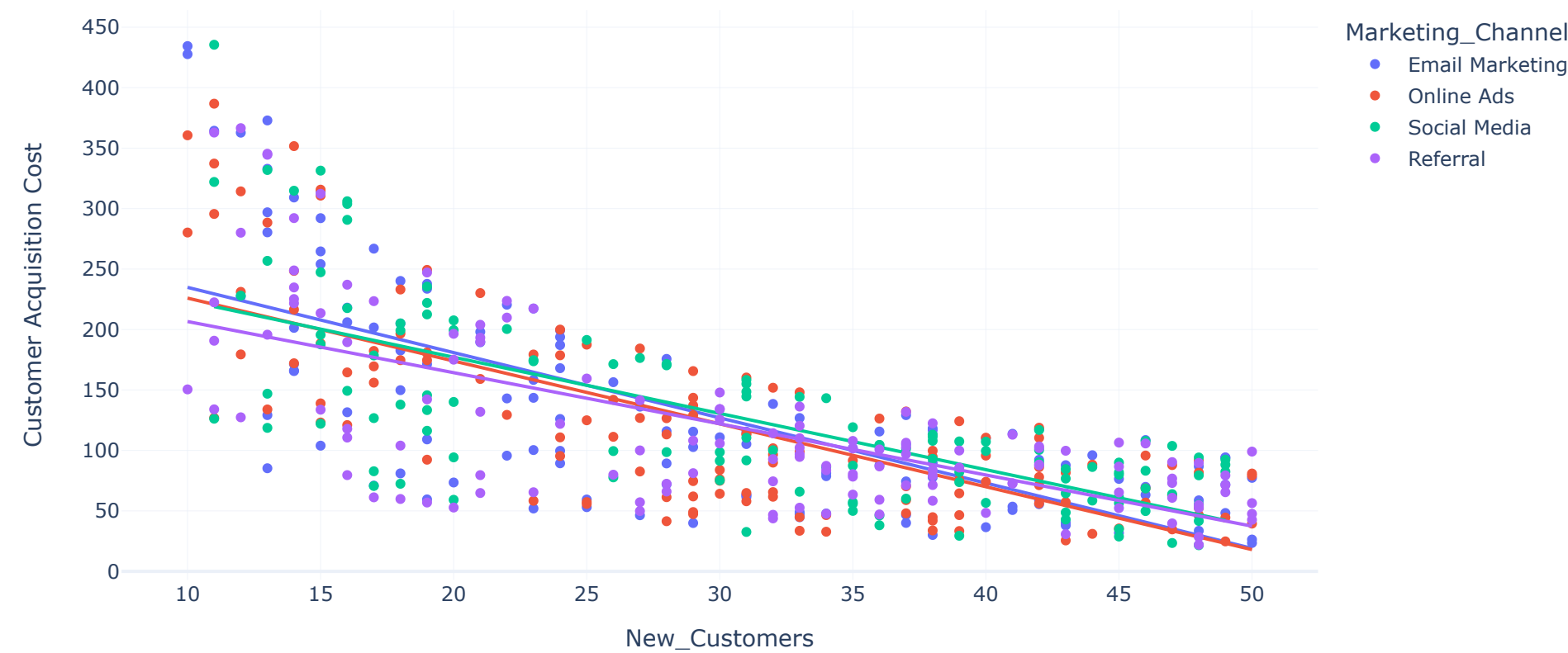
Customer Acquisition Cost based on Marketing Channel



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In [4]: fig2 = px.scatter(data, x='New_Customers',
                        y='Customer Acquisition Cost', color='Marketing_Channel',
                        title='New Customers vs Customer Acquisition Cost',
                        trendline='ols')

fig2.show()
```

New Customers vs Customer Acquisition Cost



The negative trend line suggests a tendency for channels with higher number of new customers, the lower customer acquisition costs.

Hence, the more effective the marketing efforts in acquiring customers, the lower the cost per customer.

```
In [5]: summaryStatistics = data.groupby('Marketing_Channel')['Customer Acquisition Cost'].describe()
summaryStatistics
```

Out [5]:

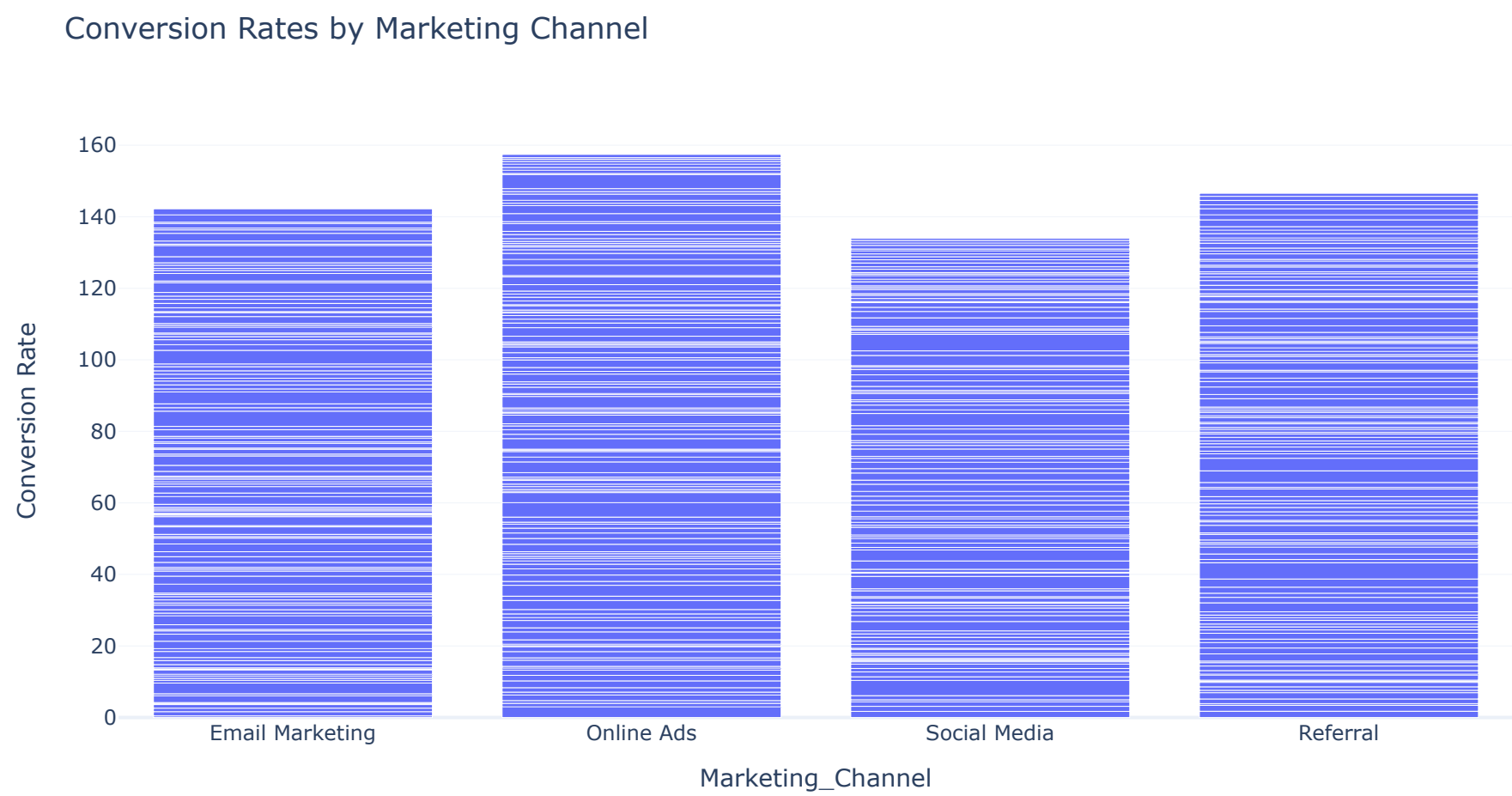
	count	mean	std	min	25%	50%	75%	max
Marketing_Channel								
Email Marketing	124.0	132.913758	89.597107	23.491784	68.226195	106.940622	177.441898	434.383446
Online Ads	130.0	122.135938	79.543793	24.784414	62.207753	97.736027	163.469540	386.751285
Referral	128.0	119.892174	74.101916	22.012364	71.347939	99.835688	137.577935	366.525209
Social Media	118.0	126.181913	77.498788	21.616453	75.633389	102.620356	167.354709	435.487346

There are multiple information that could be understood from the summary statistics above.

- 1. Mean tells us average cost of customer acquisition across different Marketing Channels. If the company was looking to reduce Customer Acquisition Cost, focussing on Marketing Channels with a lower mean value should be of priority.
- 2. Standard Deviation (std) is assesses the consistency of Customer Acquisition Cost within each channel. Higher standard deviation suggests higher variability, and companies might need to understand the causes of such cost fluctuation.
- 3. Quartiles could be used to assess the distribution of the Customer Acquisition Values. Example use could be if companies want to prioritise cost-effective customer acquisition, then companies should focus on

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In [6]: data['Conversion Rate'] = data['New_Customers'] / data['Marketing_Spend'] * 100
```

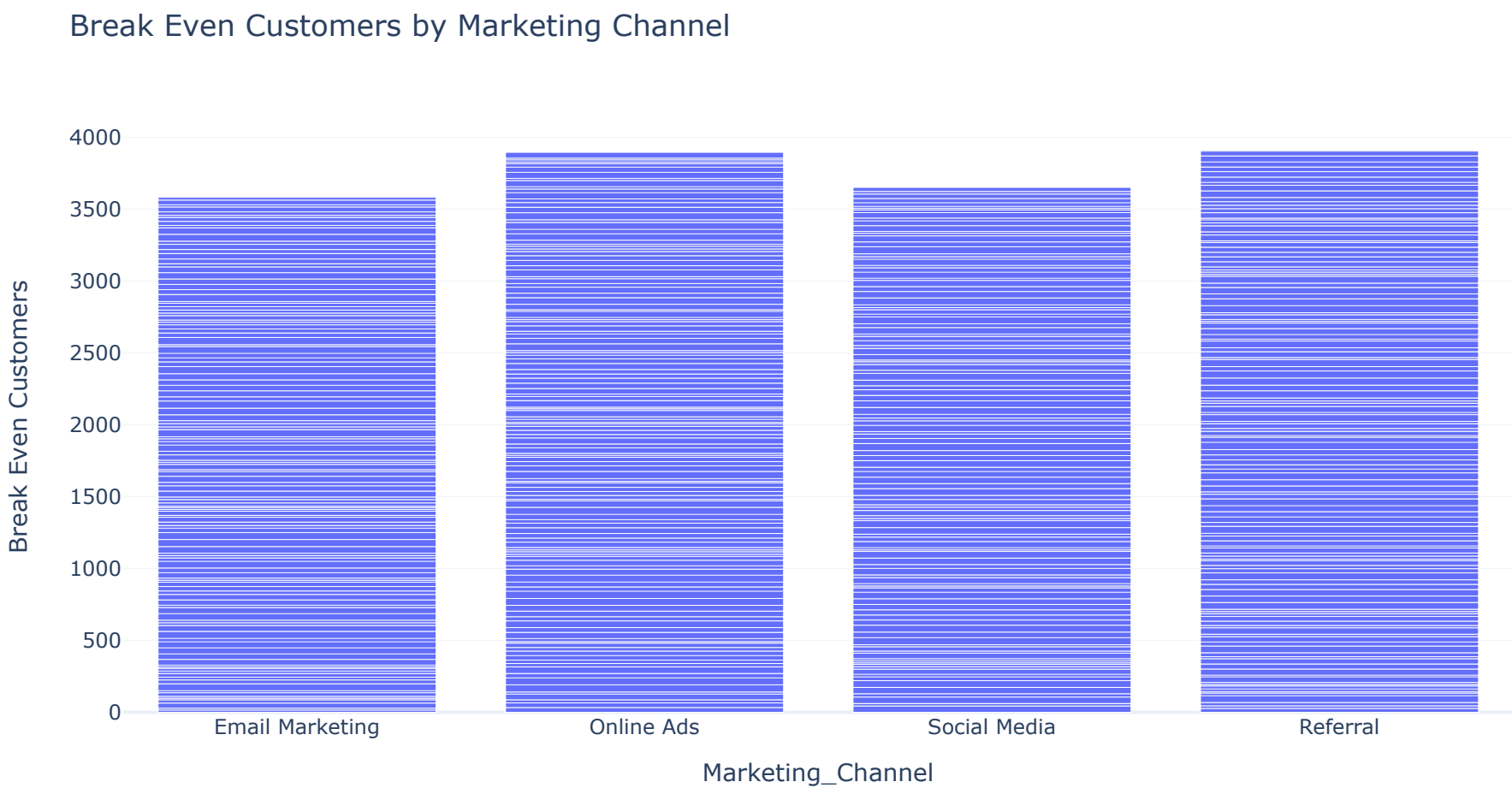
```
In [7]: fig = px.bar(data, x='Marketing_Channel',
                  y='Conversion Rate',
                  title='Conversion Rates by Marketing Channel')
fig.show()
```



It is seen here that Online Ads haad the best conversion rate amongst all the other marketing channels for this marketing campaign.

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In [8]: data['Break Even Customers'] = data['Marketing_Spend'] / data['Customer Acquisition Cost']

fig = px.bar(data, x='Marketing_Channel',
             y='Break Even Customers',
             title='Break Even Customers by Marketing Channel')
fig.show()
```



Now we analyse the number of customers that the company needs to acquire through a specific marking channel to cover the associated costs to be considered "breaking even".

If the number of customers acquired through these channels exceed the break even number, then the marketing efforts are considered to be generating more revenue than costs which results in a profit.

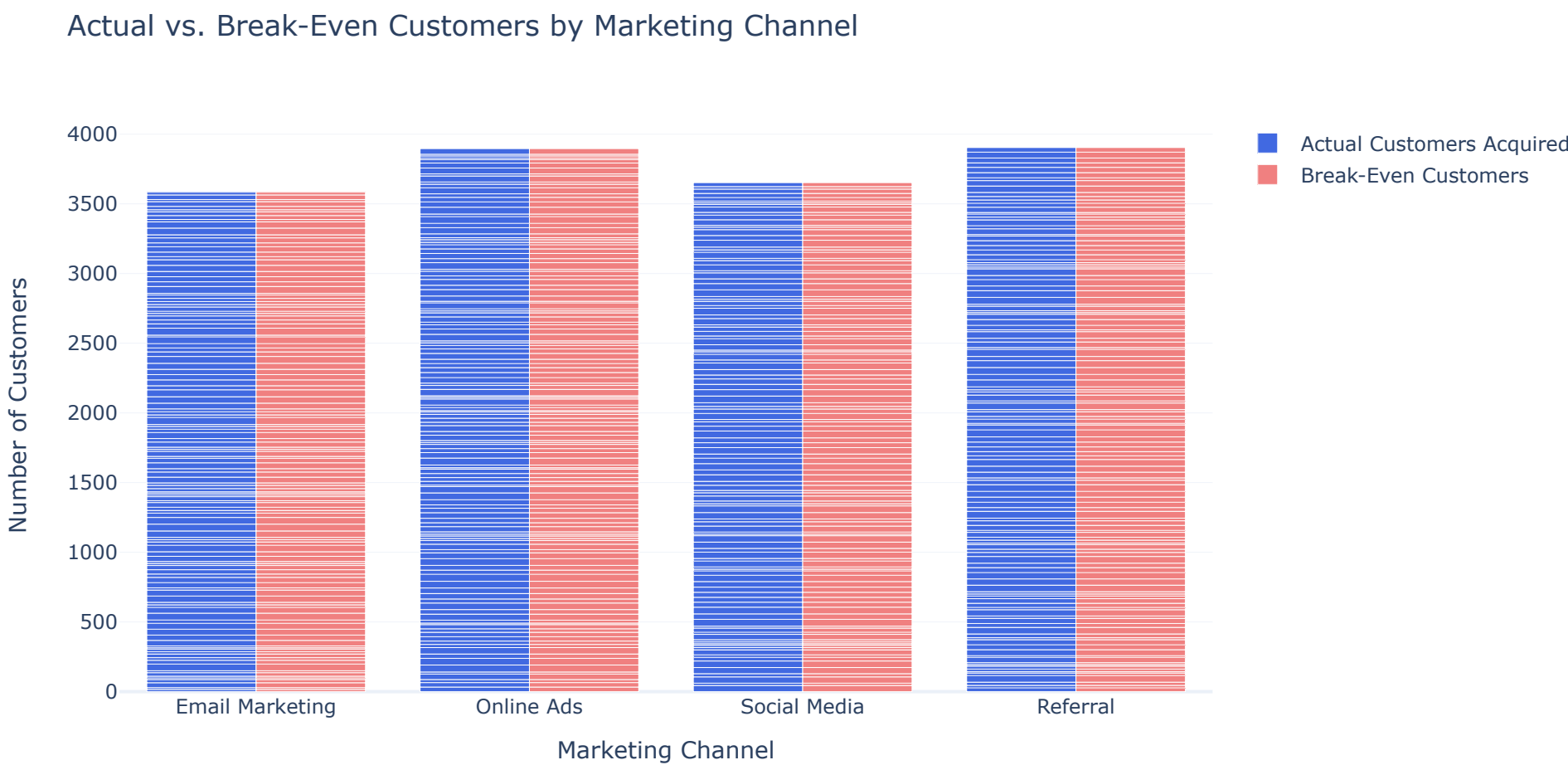
```
In [9]: fig = go.Figure()

# Actual Customers Acquired
fig.add_trace(go.Bar(x=data['Marketing_Channel'], y=data['New_Customers'],
                    name='Actual Customers Acquired', marker_color='royalblue'))

# Break-Even Customers
fig.add_trace(go.Bar(x=data['Marketing_Channel'], y=data['Break Even Customers'],
                    name='Break-Even Customers', marker_color='lightcoral'))

fig.update_layout(barmode='group', title='Actual vs. Break-Even Customers by Marketing Channel',
                  xaxis_title='Marketing Channel', yaxis_title='Number of Customers')

fig.show()
```



The above shows a positive result of the marketing campaign as the actual number of custoemrs acquired from all marketing channels exactly match the break-even customers.

If actual customers acquisition were lower than the break even point, it would have indicated a need to reaccess marketing strategies and business decisions.