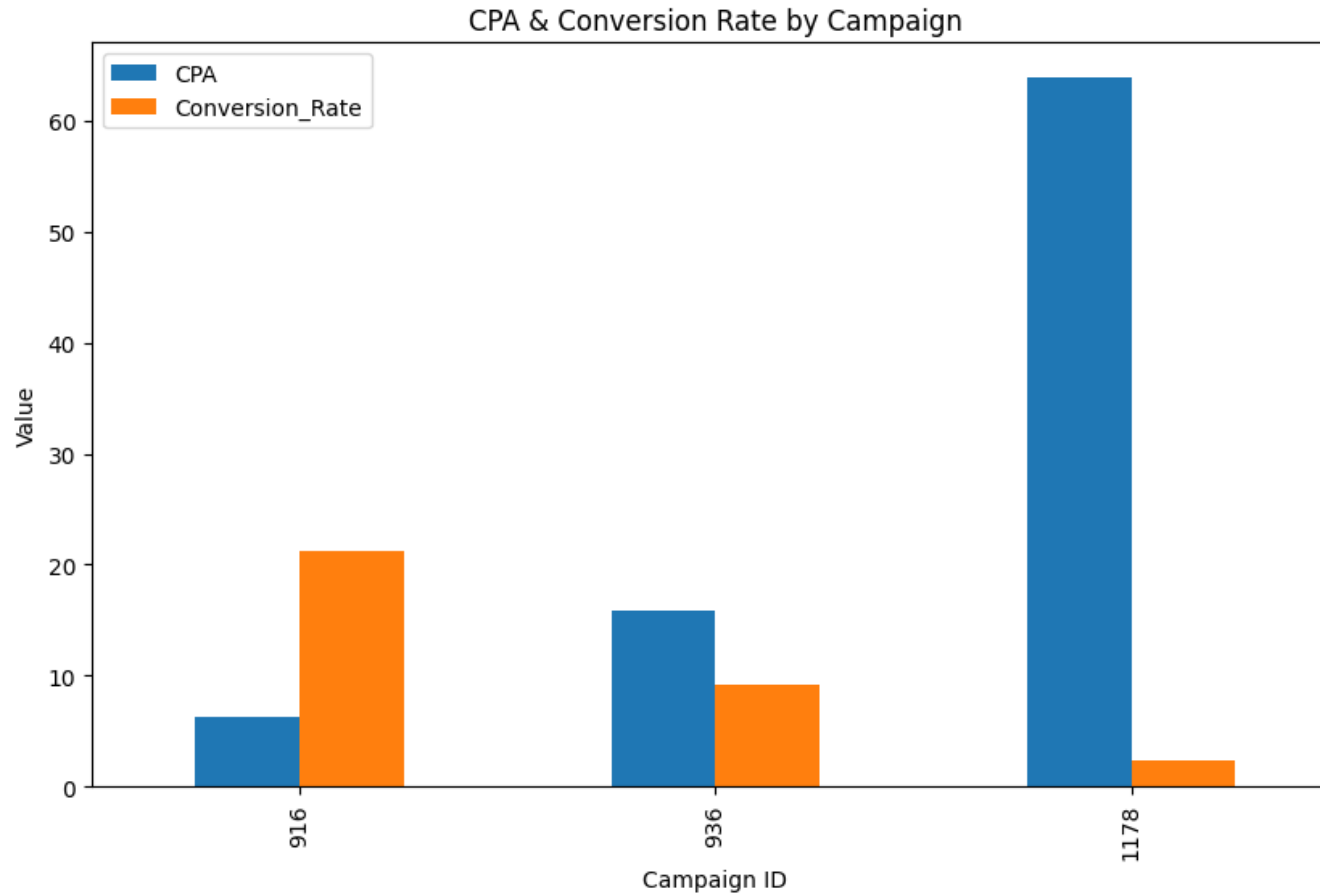


Optimizing Social Media Ad Campaign Performance for Audience Engagement and ROI



Campaign 1178 performed best in cost efficiency (CPA)
Campaign 916 had the highest Conversion Rate but lower CPA
Campaign 936 is balanced but weaker than others.

	Impressions	Clicks	Spent	Approved_Conversion	CTR	Conversion_Rate	CPA
Age_Gender							
45-49_F	38455591	9441	13433.209993	112	0.024550	1.186315	119.939375
40-44_F	23396175	5177	7396.579984	93	0.022128	1.796407	79.533118
45-49_M	25277267	4411	7317.460004	96	0.017450	2.176377	76.223542
35-39_F	21439505	4161	6061.349992	95	0.019408	2.283105	63.803684
40-44_M	16208132	2559	4193.149997	77	0.015788	3.008988	54.456493
35-39_M	20665139	2933	5051.080003	112	0.014193	3.818616	45.098929
30-34_F	31571576	5099	7611.479995	195	0.016151	3.824279	39.033231
30-34_M	36421443	4384	7640.919991	299	0.012037	6.820255	25.554916

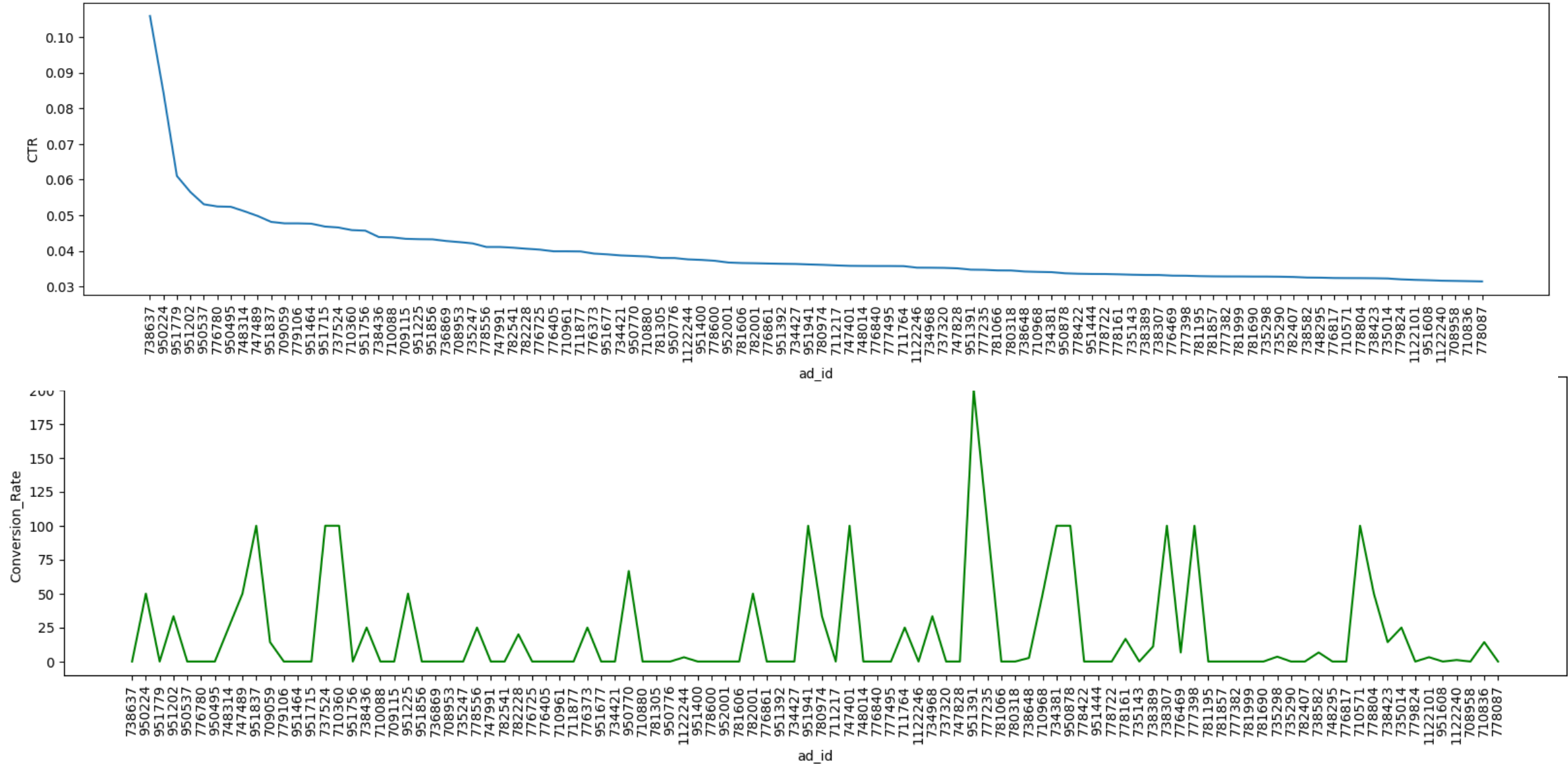
Best audience are 30–34 Males having highest conversions and lowest cost.

Good audience are 30–34 Females having strong performance and cost-effective.

Moderate audience are 35–39 age group.

Low priority for 45–49 Females having high CTR .

Focus most of your marketing budget on males and females of age 30s, because they give you the best results at the lowest cost.

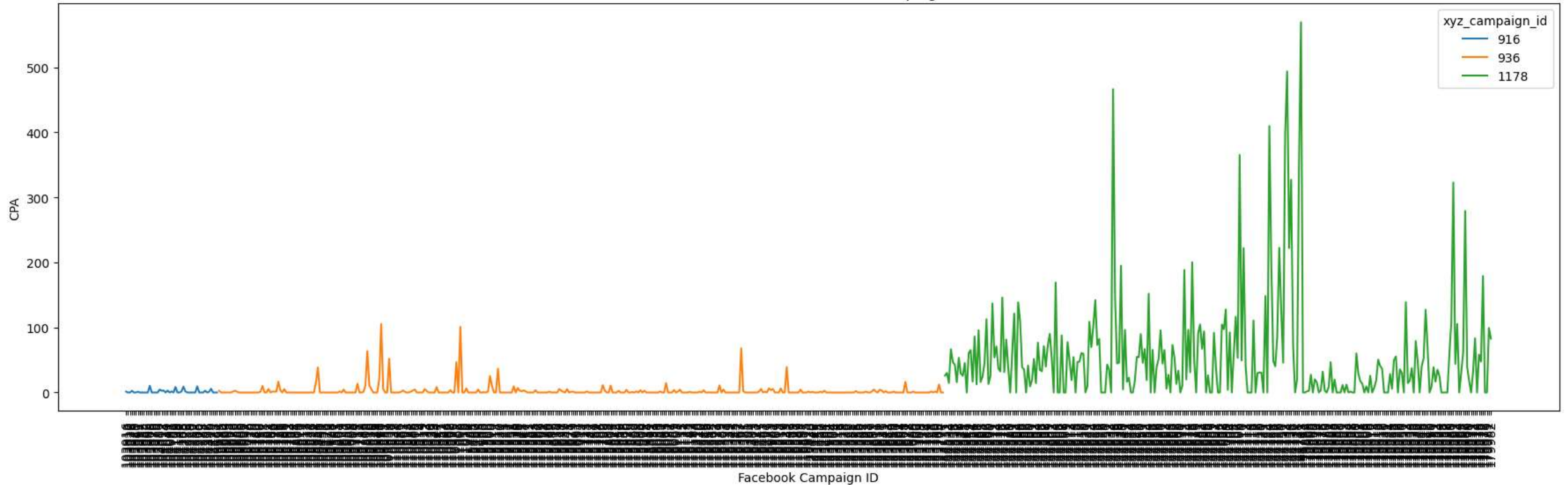


Top-performing ads are having high CTR and high conversions so focus more budget on them.

High CTR but low conversions ads are may need better landing pages.

Low CTR and low conversions ads are underperforming and should be paused.

CPA Trends across Facebook Campaigns



Campaign 916 is very stable, keeping costs per acquisition (CPA) consistently low across time.
Campaign 936 performs fairly well overall, but it has occasional cost spikes
Campaign 1178, while capable of generating high conversions.
This suggests that advertisers should focus spending on 916.

	Age_Gender	Spent	Approved_Conversion	CPA	CPS	ROI	ROI_Positive	Recommended_Budget	Exp_CPA	Exp_ROI
0	30-34_F	7611.479995	195	39.033231	0.025619	1.561920	1.561920	11962.049214	61.343842	0.630155
1	30-34_M	7640.919991	299	25.554916	0.039131	2.913141	2.913141	15281.839983	51.109833	0.956571
2	35-39_F	6061.349992	95	63.803684	0.015673	0.567308	0.567308	4344.757239	45.734287	1.186543
3	35-39_M	5051.080003	112	45.098929	0.022173	1.217348	1.217348	9323.124795	83.242186	0.201314
4	40-44_F	7396.579984	93	79.533118	0.012573	0.257338	0.257338	1970.836407	21.191789	3.718809
5	40-44_M	4193.149997	77	54.456493	0.018363	0.836328	0.836328	6405.067255	83.182692	0.202173
6	45-49_F	13433.209993	112	119.939375	0.008338	-0.166245	0.000000	0.000000	0.000000	0.000000
7	45-49_M	7317.460004	96	76.223542	0.013119	0.311931	0.311931	2388.938344	24.884774	3.018521

Females aged 30–34 are the strongest performing, generating the highest conversions and ROI, so they deserve a larger share of future budgets.

Males and females aged 35–39 also perform reasonably, so they can receive moderate investment. Older groups 45–49 show negative ROI, meaning money spent here is less effective and should be reduced.

To maximize ROI, more money should go to the younger high-performing segments.

	xyz_campaign_id	Spent	Approved_Conversion	CPA	CPS	ROI	ROI_Positive	Recommended_Budget	Exp_CPA	Exp_ROI
0	916	149.710001	24	6.237917	0.160310	15.030993	15.030993	299.420001	12.475833	7.015497
1	936	2893.369999	183	15.810765	0.063248	5.324805	5.324805	5786.739998	31.621530	2.162402
2	1178	55662.149959	872	63.832741	0.015666	0.566594	0.566594	1589.781964	1.823144	53.850289

Campaign 916 gives the best ROI with low spend and strong conversion, so it should receive more budget in future.

Campaign 936 performs well, generating decent conversions at a sustainable CPA, so it can keep a healthy share of funding.

Campaign 1178 consumes the largest budget but delivers very poor ROI , future spending here should be reduced.

Future budgets should be shifted toward high-ROI campaigns 916 and 936, cutting down on low-return campaigns 1178.

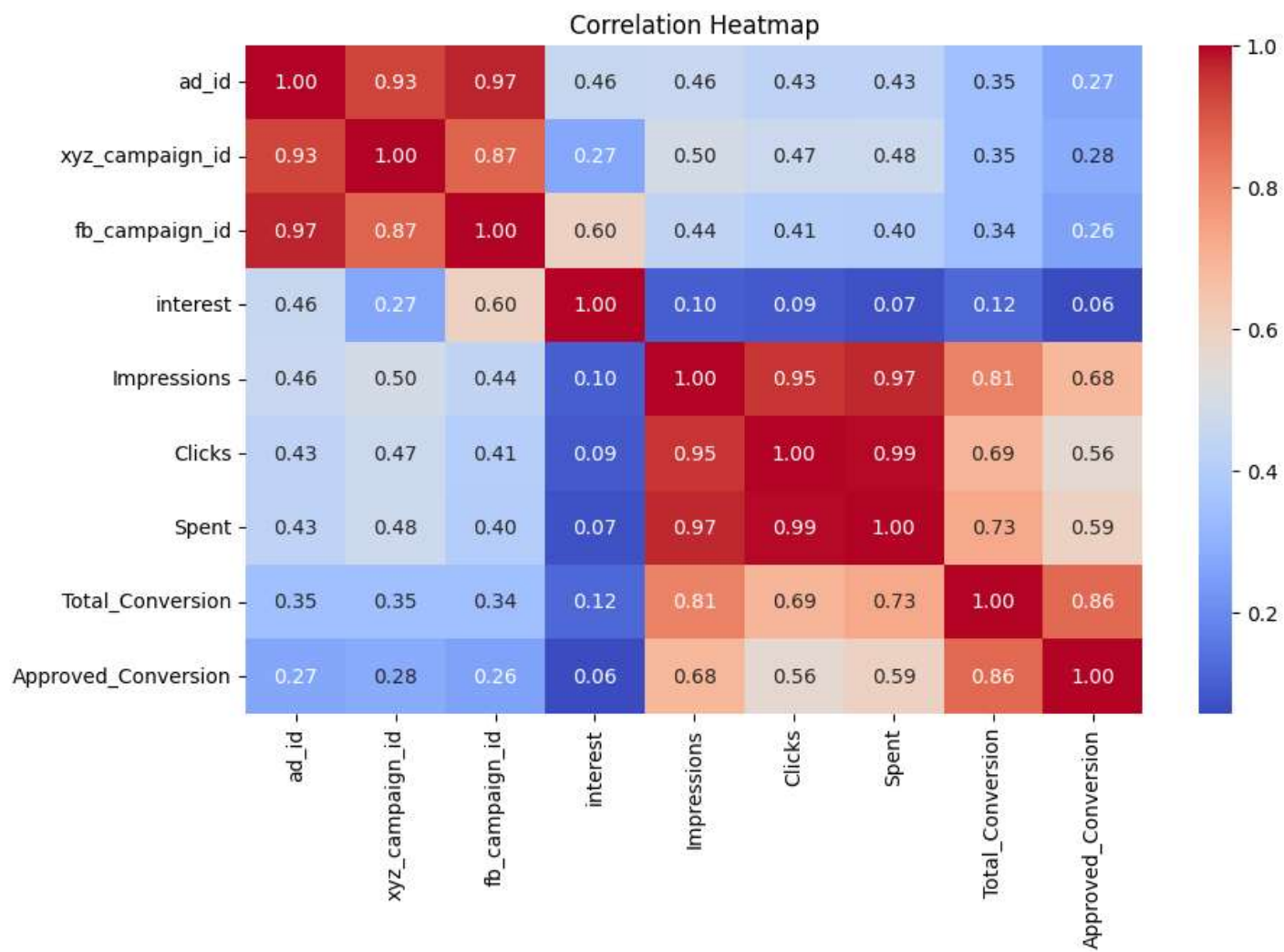
	interest	Spent	Approved_Conversion	CPA	CPS	ROI	ROI_Positive	Recommended_Budget	Exp_CPA	Exp_ROI
0	2	503.450005	19	26.497369	0.037740	2.773960	2.773960	755.175007	39.746053	1.515973
1	7	648.929999	19	34.154210	0.029279	1.927897	1.927897	973.394998	51.231316	0.951931
2	10	5086.379995	91	55.894286	0.017891	0.789092	0.789092	1040.395875	11.432922	7.746671
3	15	2597.259995	63	41.226349	0.024256	1.425633	1.425633	1879.658545	29.835850	2.351673
4	16	8084.909990	141	57.339787	0.017440	0.743990	0.743990	980.930216	6.956952	13.374111
5	18	2425.070001	33	73.486970	0.013608	0.360785	0.360785	475.685813	14.414722	5.937352
6	19	1940.359993	33	58.798788	0.017007	0.700715	0.700715	923.874106	27.996185	2.571915
7	20	1960.770001	47	41.718511	0.023970	1.397017	1.397017	1841.929557	39.189991	1.551672
8	21	824.209999	27	30.526296	0.032759	2.275864	2.275864	1236.314998	45.789444	1.183909
9	22	1039.859998	12	86.655000	0.011540	0.154002	0.154002	203.046791	16.920566	4.909968
10	23	595.650001	7	85.092857	0.011752	0.175187	0.175187	230.978988	32.996998	2.030579
11	24	670.059999	15	44.670667	0.022386	1.238606	1.238606	1005.089998	67.006000	0.492404
12	25	1603.859994	19	84.413684	0.011846	0.184642	0.184642	243.445526	12.812922	6.804621
13	26	1591.769995	23	69.207391	0.014449	0.444932	0.444932	586.631231	25.505706	2.920691
14	27	5176.169992	54	95.855000	0.010432	0.043242	0.043242	57.013926	1.055813	93.713701
15	28	3205.850004	42	76.329762	0.013101	0.310105	0.310105	408.864956	9.734880	9.272340
16	29	5045.190008	132	38.221136	0.026164	1.616353	1.616353	2131.117968	16.144833	5.193932
17	30	616.630003	12	51.385834	0.019461	0.946062	0.946062	924.945004	77.078750	0.297374
18	31	299.099999	16	18.693750	0.053494	4.349381	4.349381	448.649999	28.040625	2.566254

19	32	1970.530003	35	56.300857	0.017762	0.776172	0.776172	1023.361517	29.238900	2.420101
20	36	205.740000	10	20.574000	0.048605	3.860504	3.860504	308.609999	30.861000	2.240336
21	63	2484.060002	34	73.060588	0.013687	0.368727	0.368727	486.156519	14.298721	5.993632
22	64	1486.129996	27	55.041852	0.018168	0.816799	0.816799	1076.927709	39.886211	1.507132
23	65	542.010001	19	28.526842	0.035055	2.505470	2.505470	813.015001	42.790263	1.336980
24	66	230.760000	4	57.690000	0.017334	0.733403	0.733403	346.140001	86.535000	0.155602
25	100	574.309992	9	63.812221	0.015671	0.567098	0.567098	747.703190	83.078132	0.203686
26	101	757.689998	25	30.307600	0.032995	2.299502	2.299502	1136.534997	45.461400	1.199668
27	102	215.069999	7	30.724286	0.032548	2.254754	2.254754	322.604999	46.086428	1.169836
28	103	479.130005	5	95.826001	0.010436	0.043558	0.043558	57.430177	11.486035	7.706224
29	104	387.919999	8	48.490000	0.020623	1.062281	1.062281	581.879999	72.735000	0.374854
30	105	647.799993	6	107.966665	0.009262	-0.073788	0.000000	0.000000	0.000000	0.000000
31	106	482.150004	5	96.430001	0.010370	0.037022	0.037022	48.812057	9.762411	9.243371
32	107	923.179993	20	46.159000	0.021664	1.166425	1.166425	1384.769990	69.238499	0.444283
33	108	586.200004	7	83.742858	0.011941	0.194132	0.194132	255.957349	36.565336	1.734831
34	109	815.820001	8	101.977500	0.009806	-0.019392	0.000000	0.000000	0.000000	0.000000
35	110	521.350005	9	57.927778	0.017263	0.726288	0.726288	782.025007	86.891667	0.150858
36	111	370.649998	10	37.065000	0.026980	1.697963	1.697963	555.974997	55.597500	0.798642
37	112	483.799999	15	32.253333	0.031005	2.100455	2.100455	725.699998	48.380000	1.066970
38	113	342.830000	7	48.975714	0.020418	1.041828	1.041828	514.245000	73.463571	0.361219
39	114	282.619998	4	70.655000	0.014153	0.415328	0.415328	423.929997	105.982499	-0.056448

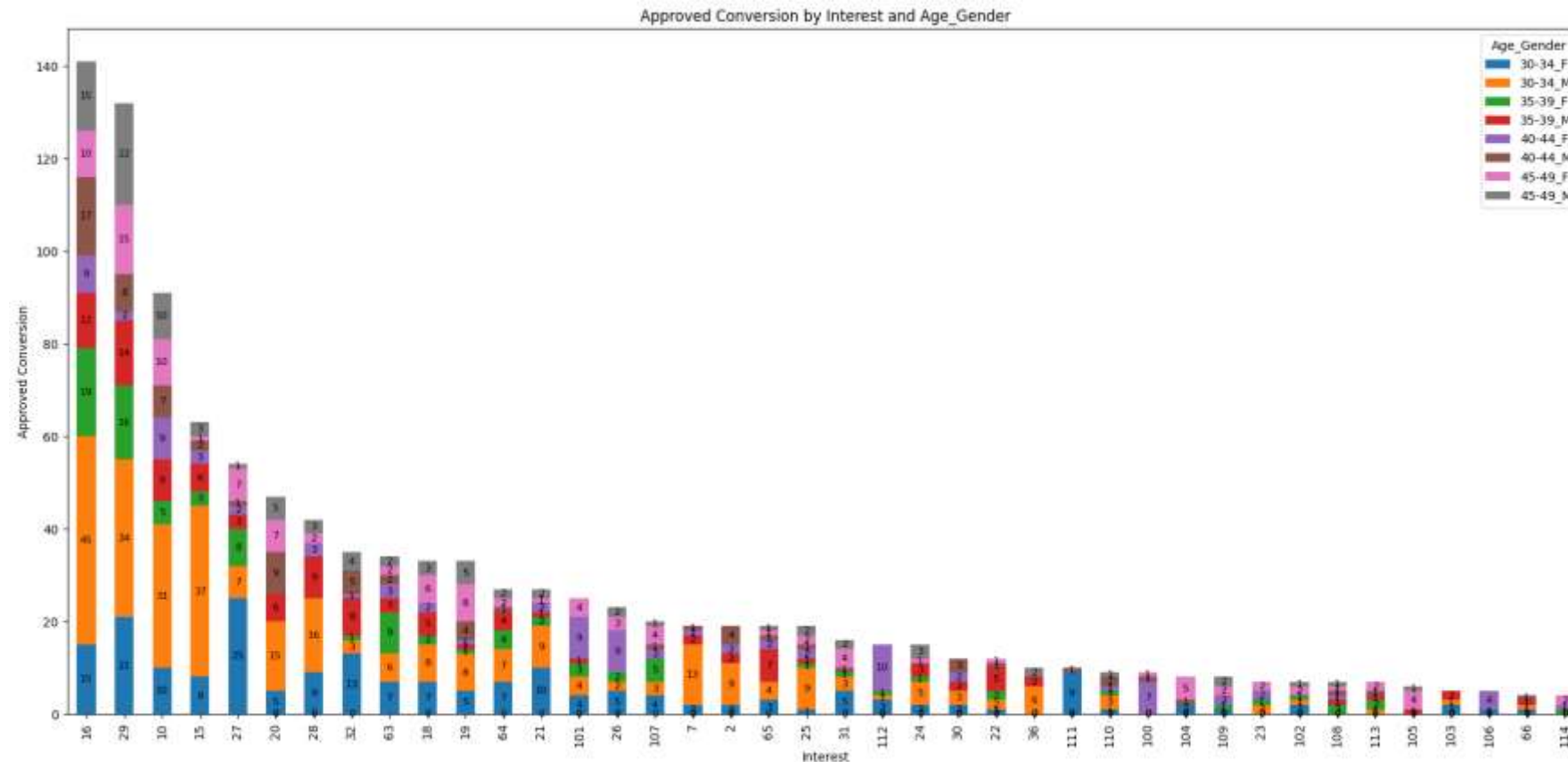
Segments interest 2, 7, 21, 31, and 36 deliver strong ROI with relatively low costs, making them the best for higher investment.

Segments interest 22, 23, 25, 26, 29, 104, and 109 show negative ROI, they consume budget without giving back enough value, so spending here should be reduced.

High-spend segments 16 and 29 generate a lot of conversions but have poor ROI, which suggests the strategy should be optimized rather than heavily funded.



Impressions, Clicks, and Spent are very strongly correlated .
Interest has very weak correlation with conversions and spending.



16, 29, 10, and 15 interest drive the highest conversions. Within these top interests, males aged 30–34 stand out as the largest contributors.

30–34 male segment is the biggest driver of results. To maximize outcomes, businesses should focus budget on the top interests where younger and mid-age groups perform best.

Ad Performance Optimization Dashboard

Interest

Age with Gender

XYZ Campaign ID

Total Spent

58,705.23

Approved Conversion

1079

CTR

0.02

Conversion Rate

2.83

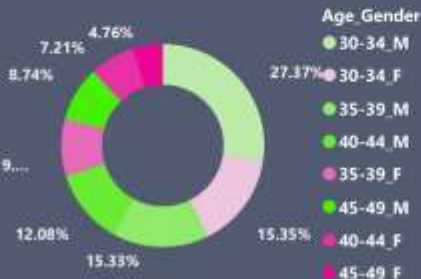
CPA

54.41

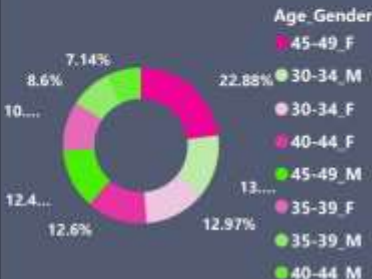
ROI

0.84

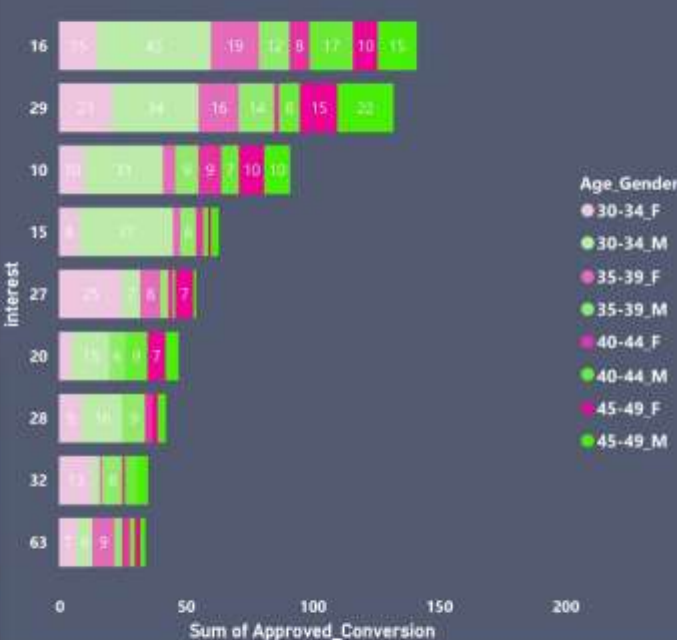
Conversion Rate by Age Gender



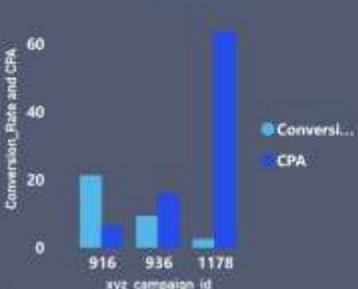
Total Spent by Age Gender



Approved Conversion by Interest and Age Gender



Conversion Rate and CPA by XYZ Campaign Id

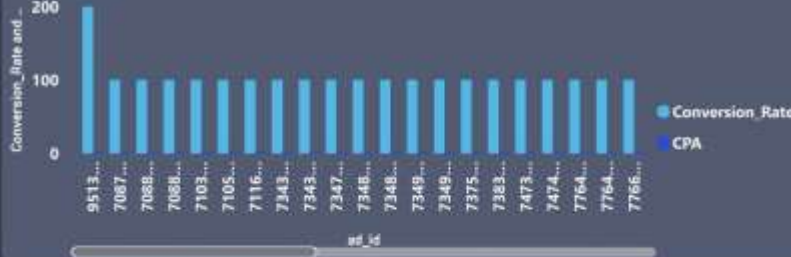


CPA, Conversion Rate and Spent by Age Gender



Age_Gender	CTR	Total_Spent	Recommended_Budget	Conversion_Rate	ROI	Exp_ROI	CPA	Exp_CPA
30-34_M	0.01	7,640.92	15,281.84	6.82	2.91	0.96	25.55	51.10
30-34_F	0.02	7,611.48	15,222.96	3.82	1.56	0.28	39.03	76.06
35-39_M	0.01	5,051.08	10,102.16	3.82	1.22	0.11	45.10	90.20
40-44_M	0.02	4,193.15	8,386.30	3.01	0.84	-0.08	54.46	108.92
35-39_F	0.02	6,061.35	12,122.70	2.28	0.57	-0.22	63.80	127.60
45-49_M	0.02	7,317.46	14,634.92	2.18	0.31	-0.34	76.22	152.44
40-44_F	0.02	7,396.58	14,793.16	1.80	0.26	-0.37	79.53	159.06
45-49_F	0.02	13,433.21	0.00	1.19	-0.17	0.00	119.94	0.00
Total	0.02	58,705.23	6,417.84	2.83	0.84	15.81	54.41	107.90

Conversion Rate and CPA by Ad Id



CPA by FB Campaign Id and XYZ Campaign Id



Final Recommendations

- **Audience Targeting**
 - Focus budget on **30–34 Males and Females**, as they deliver the **highest conversions at the lowest CPA**.
 - Provide **moderate investment** for the **35–39 age group**, as they still perform reasonably well.
 - **Reduce or stop spending** on the **45–49 segment**, especially females, since ROI is negative here.
- **Campaign Strategy**
 - **Campaign 916**: Best ROI, stable low CPA, and strong conversions → **prioritize and expand budget**.
 - **Campaign 936**: Balanced performance with sustainable CPA → **retain steady funding**.
 - **Campaign 1178**: High spend but poor ROI → **reduce budget significantly** and only keep for reach if optimized.
- **Ad Creative & Optimization**
 - Ads with **high CTR + high conversions** should receive **maximum budget**.
 - Ads with **high CTR but low conversions** need **better landing pages** or audience alignment.
 - Ads with **low CTR and low conversions** are underperforming → **pause them**.
- **Interest Segments**
 - Strong ROI interests: **2, 7, 21, 31, 36** → increase spend.
 - Poor ROI interests: **22, 23, 25, 26, 29, 104, 109** → cut spending.
 - High-spend but weak ROI interests (**16 & 29**) → **optimize targeting/creatives** before reinvesting.
- **Future Optimization**
 - Track **time-series data** (daily/weekly) for deeper seasonality insights.
 - Strong correlation exists between **Impressions, Clicks, and Spend**, but **interest alone is weakly correlated** with conversions → better audience refinement is needed.

Conclusion

- The analysis shows that the **most profitable strategy is reallocating budget toward 30–34 year-olds (both males and females)**, with campaigns **916 and 936** as the main drivers of ROI. Interest segments like **2, 7, 21, 31, and 36** should receive higher investment due to strong cost efficiency.
By reducing low-ROI campaigns (1178) and underperforming segments (22, 23, 25, etc.), advertisers can **maximize ROI while lowering costs**. Future campaigns should **improve creatives, optimize landing pages, and capture time-based data** to refine performance further.
- In short: **Double down on 30–34 audiences + Campaigns 916 & 936, cut waste on 1178 and weak interests, and improve creative strategy for long-term growth.**