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Analyzing the impact of social media platforms and audience demographics on advertising campaign performance

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ABSTRACT

This study investigates the strategic effectiveness of social media advertising by analyzing the relationship between platform selection, audience demographics, and campaign performance metrics. The research utilizes a publicly available dataset sourced from the website https://www.kaggle.com/, which includes advertising campaign data from Instagram, Facebook, Pinterest, and Twitter. These platforms, each with distinct user bases and unique advertising features, provide diverse opportunities for targeting and audience engagement. Key performance indicators such as user engagement, conversion rates, and return on investment (ROI) are examined to assess overall campaign success. By applying statistical techniques including ANOVA and regression analysis using SPSS, the study aims to uncover meaningful patterns between platform choice, demographic variables (such as age and gender), and the specific goals of each campaign (e.g., brand awareness, lead generation, or direct sales). The research further seeks to determine the most effective platform-audience combinations and how varying campaign objectives influence performance outcomes. These findings are expected to offer valuable insights for advertisers and businesses looking to enhance their social media strategies. Ultimately, the study supports data-driven decision-making by helping marketers optimize resource allocation, tailor content to specific audiences, and improve advertising effectiveness in a competitive digital environment.

Introduction

Social media platforms are now essential tools for companies looking to engage with a variety of consumers in today's digital environment. Understanding the elements that contribute to successful advertising is essential for optimizing return on investment, as billions of users interact with platforms like Facebook, Instagram, and Pinterest every day. (Maria, 2019) Even though social media advertising has become very popular, little is known about how audience demographics and platform-specific traits interact to affect important performance indicators like engagement, conversion rates, and return on investment.

It is difficult for advertisers to optimize their efforts because of this knowledge gap. For instance, research has shown that Facebook ads have an average conversion rate of 9.21%, while Instagram's interaction rate stands at 2.2% across all industries, highlighting the importance of platform selection in campaign performance. (Linder, 2025).

The purpose of this study is to examine how various social media platforms and audience demographics affect the effectiveness of advertising campaigns, offering practical insights into how these factors work together to promote campaign success.

This study will utilize a comprehensive dataset to investigate performance metrics such as engagement, conversion rates, and ROI. Statistical methods, including ANOVA and regression analysis, will be applied to uncover patterns and test hypotheses regarding

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platform effectiveness and demographic targeting. The findings will offer practical recommendations for advertisers and businesses seeking to enhance the efficiency and effectiveness of their social media campaigns.

Literature Review

Social media's explosive growth has completely changed the advertising landscape by giving companies the ability to target consumers more accurately than ever before. Social media sites like Facebook, Instagram, and Pinterest offer distinctive advertising environments with different features and target audiences. Instagram, with its highly visual and interactive interface, is particularly effective for engaging younger audiences and promoting visually appealing products. (Wan Nurhayati Abdul Rahman, 2022). In contrast, Facebook's advanced targeting capabilities and diverse user base make it suitable for broad reach and conversions across various demographics. (Rodney Graeme Duffett (Department of Marketing, 2015) This research shows that a campaign's efficiency varies greatly depending on the platform and target audience; therefore, it is essential to comprehend these dynamics in order to maximize performance. With demographic variables like age, gender, and region having a big impact on engagement and conversion rates, audience segmentation is essential to advertising strategy. According to theoretical frameworks such as Maslow's Hierarchy of Needs, people react positively to information that supports their own objectives and preferences. (Maslow, 1943)

Performance is also influenced by a campaign's goals, whether they intend to broaden market reach, boost conversions, or raise brand awareness. While conversion-oriented initiatives typically have a more measurable return on investment, awareness campaigns typically have better engagement rates, according to research by Belanche D. (Daniel Belanche, 2021)

To test the hypothesis that younger demographics (ages 18-24) are more likely to engage with visually-oriented and interactive content than older age groups, this study employs statistical analysis in SPSS. Since the independent variable, age group, is categorical and the dependent variable, engagement rate, is continuous, a One-Way ANOVA will be conducted to compare engagement levels across different age groups. A One-Way ANOVA (Analysis of Variance) is a statistical test used to determine whether there are significant differences between the means of three or more independent groups based on a single categorical independent variable. It assesses whether the observed variations in a continuous dependent variable are due to actual differences between groups or merely random chance. (Verma, 2012)Post hoc tests, such as Tukey's test, will be applied to determine specific differences between age groups. These statistical approaches will provide insights into how engagement varies by age, contributing to a better understanding of demographic preferences in social media advertising.

To test the hypothesis that ROI differs significantly based on platform characteristics, with Instagram yielding the highest ROI for campaigns targeting younger demographics, a Two-Way ANOVA will be conducted in SPSS. This test is appropriate because the independent variables, social media platform and age group, are categorical, while the dependent variable, ROI, is continuous. The Two-Way ANOVA allows for the examination of both the main effects of platform and age group on ROI, as well as any interaction effects between these factors. A Two-Way ANOVA (Analysis of Variance) is a statistical test used to examine the effects of two independent categorical variables on a single continuous dependent variable, as well as any interaction effects between them. This test helps determine whether each independent variable has a significant impact on the dependent variable and whether the combination of both variables influences the outcome differently than expected from their individual effects. (Field, 2018) A plot will be generated to visualize differences across platforms, and post hoc tests will identify which platforms significantly differ in ROI. This approach provides insights into how social media platform characteristics and audience demographics influence campaign profitability, helping advertisers optimize their strategies.

To test the hypothesis that platform-specific characteristics (e.g., the visual nature of Instagram vs. the advanced targeting options of Facebook) influence campaign performance metrics such as engagement and conversion rates, a multiple regression analysis will be conducted in SPSS. Multiple regression analysis is a statistical technique used to examine the relationship between two or more independent variables and a single continuous dependent variable. It extends simple linear regression by allowing researchers to assess the combined and individual effects of multiple predictors on an outcome variable. (Barbara G. Tabachnick, 2019)This test is appropriate because the independent variable, platform characteristics, is categorical and will be dummy-coded, while the dependent variables, engagement rate and conversion rate, are continuous. By examining the R-squared value and coefficient significance, this test will determine the extent to which platform characteristics predict engagement and conversion outcomes. The findings will offer insights into how specific platform features impact campaign performance, helping advertisers optimize their strategies based on platform strengths.

To test the hypothesis that campaign objectives (e.g., brand awareness, product launch) influence engagement rates differently across social media platforms, a Two-Way ANOVA or MANOVA will be conducted in SPSS. Since the independent variables, campaign objective and social media platform, are categorical, and the dependent variable, engagement rate, is continuous, Two-Way ANOVA is suitable for analyzing engagement rate differences, while MANOVA would be used if multiple dependent variables, such as engagement and conversion rates, are analyzed together. Multivariate Analysis of Variance (MANOVA) is an extension of ANOVA that allows researchers to analyze multiple dependent variables simultaneously while considering the effects of one or more independent categorical variables. Unlike ANOVA, which assesses only one dependent variable at a time, MANOVA evaluates whether groups differ across several outcomes, improving statistical power and capturing relationships between dependent variables (Stevens, 2009). Post hoc tests will be applied to determine significant differences between campaign objectives across platforms.

This analysis will provide valuable insights into how different campaign goals perform on various social media platforms, helping advertisers tailor their strategies for maximum engagement. Recent studies underscore the importance of aligning platform selection with campaign objectives and audience characteristics. Wegner et al. (2023) conducted a performance analysis of social media platforms, revealing that Facebook outperforms others in digital marketing strategies due to its promotional capabilities and user engagement features. (da Silva Wegner, 2023) Similarly, Almutawaa et al. (2023) emphasize the role of platform-specific characteristics in influencing user engagement and brand associations, highlighting how social media marketing impacts brand community membership. (Almutawaa, 2023)

Research and Methodology

Hypothesis

H1: Younger demographics (ages 18-24) are more likely to engage with visually-oriented and interactive content than older age groups.

By emphasizing that younger users are drawn to visually engaging content, such as photographs and videos, which are essential to platforms like Instagram, this hypothesis improves on the initial work. It implies that younger audiences—especially those in the 18–24 age range—are more likely than older audiences to participate with interactive material including stories, swipe-up links, and polls. Comparing engagement metrics on visually-driven platforms across different age groups will be used to evaluate this.

H2: ROI differs significantly based on platform characteristics, with Instagram yielding the highest ROI for campaigns targeting younger demographics.

This hypothesis expands on the notion that the return on investment (ROI) of advertising campaigns might be impacted by the unique features of various social media platforms. Instagram, for instance, is well-known for its high levels of engagement, especially with younger audiences, because of its interactive features and visual style. Compared to marketing on Facebook, Pinterest, or Twitter, I predict that Instagram campaigns aimed at younger audiences will have the highest return on investment. This might be as a result of Instagram's platform design, which prioritizes visually appealing content, fitting in well with younger consumers' interests and habits, which increases conversions and improves financial returns. With this hypothesis, I hope to evaluate how platform-specific characteristics, such as Instagram's aesthetic appeal, affect the ROI of advertising campaigns.

H3: Platform-specific characteristics (e.g., visual nature of Instagram vs. targeting options of Facebook) influence campaign performance metrics such as engagement and conversion rates.

Investigating how the unique characteristics of various platforms affect how well they function in advertising campaigns in my hypothesis. Instagram's visual-centric approach, for instance, might work better for visually appealing goods and services, while Facebook's extensive audience reach and precise targeting tools make it a better choice for campaigns aimed at reaching a wide audience or particular demographics. My hypothesis is that these two platforms differ in how their distinct features affect key performance indicators (KPIs), such engagement and conversion rates. For example, Facebook's ability to efficiently target particular user segments may lead to higher conversion rates, whereas Instagram may produce higher engagement rates for visually-driven ads. This theory seeks to emphasize how crucial it is to choose the appropriate platform depending on campaign’s goals and characteristics.

H4: Campaign objectives (e.g., brand awareness, product launch) influence engagement rates differently across social media platforms.

This theory examines how goals, including product releases or brand recognition campaign, may impact how well advertisements succeed on various social media channels. While Twitter and Facebook may be more appropriate for ads that seek to increase conversions or broaden market reach, platforms like Instagram and Pinterest are frequently utilized for visually-driven marketing, making them appropriate for brand recognition initiatives. According to my hypothesis, campaigns with comparable aims would perform differently across different platforms depending on how well those platforms help the campaign achieve its objectives. For example, a brand awareness campaign may do better on Instagram because of its highly visual and engaging nature, while a product launch may experience higher engagement on Pinterest since consumers are more interested in finding new things.

The research aims to provide actionable insights for advertisers, enabling them to design more targeted and efficient campaigns. Potential limitations include the scope of the dataset, the possibility of platform-specific biases, and challenges in generalizing results to all industries.

Table 1: Summary of hypotheses 1

Hypothesis	Summary
H1	Younger users (18–24) engage more with visual and interactive content.
H2	Instagram yields the highest ROI for youth-targeted campaigns due to its visual features.
H3	Platform-specific traits affect engagement and conversion differently.
H4	Campaign objectives impact engagement differently across platforms.

Table 2: Summary of research questions 1

Research Question	Focus
RQ1	Identifies key demographic factors influencing engagement and conversion.
RQ2	Compares cross-platform performance of similar campaign goals.
RQ3	Examines how algorithms impact ad visibility and demographic targeting.

In order to further explore the effectiveness of social media advertising, a number of study questions have been developed. These inquiries will assist in addressing the complex relationships that exist between platform types, marketing objectives, and demographic characteristics.

Research Questions

RQ1: *What demographic factors (e.g., age, gender, income level) most significantly impact engagement and conversion rates on social media?*

This question aims to pinpoint the precise demographic factors that affect users' interactions and reactions to ads on various platforms. By including variables like income level that may influence engagement and conversion, it expands the focus beyond age and gender alone.

RQ2: *What are the performance differences of campaigns with similar objectives (e.g., brand awareness) across platforms?*

This question looks at how different platforms can accomplish particular campaign objectives. For instance, even though Facebook and Instagram may target comparable demographic categories, it will compare how well they succeed in ads meant to increase brand awareness.

RQ3: *How does platform-specific algorithmic prioritization affect the visibility and engagement of advertisements tailored to specific demographics?*

This inquiry explores how algorithms affect the visibility of advertisements. In order to get insight into how platforms optimize content distribution, it will examine how campaigns aimed at specific demographic groups are affected by the algorithms that decide what content is displayed to consumers.

Research and Methodology

This study adopts a quantitative research design to examine the effectiveness of social media advertising campaigns across various platforms and demographic groups. The analysis will focus on identifying patterns in performance metrics such as engagement rates, conversion rates, and ROI, and will employ both descriptive and inferential statistical techniques to uncover significant relationships between the independent and dependent variables. The dataset used in this study is publicly available on Kaggle and can be accessed at https://www.kaggle.com/. Since the dataset used in this study is publicly available on Kaggle and contains only anonymized data with no personally identifiable information, ethics approval was not required.

The study utilizes the dataset containing comprehensive information on social media advertising campaigns, including:

i. Platforms: Instagram, Facebook, Pinterest AND Twitter (X)
ii. Audience demographics: Age and gender
iii. Campaign goals: Product launch, brand awareness, market expansion and increase sales
iv. Performance metrics: Engagement scores, conversion rates, ROI, and acquisition cost

Initially, descriptive statistics will be used to provide an overview of campaign performance across platforms, highlighting trends in engagement, conversion rates, and ROI for various demographic groups. This will allow for a preliminary understanding of how these metrics vary across platforms and demographics. An Analysis of Variance (ANOVA) will be conducted to test whether the performance differences between platforms are statistically significant, specifically comparing metrics such as engagement and ROI. This will help assess the impact of platform characteristics on campaign success. Following ANOVA, regression analysis will be

employed to examine the relationship between independent variables (platform, audience demographics, and campaign goals) and dependent variables (engagement, conversion rates, ROI). The regression analysis will help identify the factors most strongly associated with campaign success, providing actionable insights into which platform-audience combinations produce the best outcomes. In terms of sampling, the study will use stratified sampling to ensure equal representation of different demographic groups. This will enhance the accuracy and generalizability of the results, providing a comprehensive understanding of how different audience segments perform across platforms.

Findings and Discussions

H1: Younger demographics (ages 18-24) are more likely to engage with visually-oriented and interactive content than older age groups.

Since the ANOVA test is not significant ($p = 0.139 > 0.05$) and the post hoc test shows no major differences between age groups, we reject H1. This means that younger demographics (ages 18-24) are not significantly more likely to engage with visually-oriented and interactive content than older age groups. This finding is somewhat unexpected, given the common assumption that younger users are more responsive to visual and interactive media. One possible explanation is that visual formats have become more universally adopted across age groups, reducing generational differences. Although the result is not statistically significant, the trend may still hold practical relevance for specific audience niches or platform contexts. Marketers might consider conducting targeted A/B testing, as subtle behavioral variations could still emerge when campaigns are fine-tuned by content type or timing.

H2: ROI differs significantly based on platform characteristics, with Instagram yielding the highest ROI for campaigns targeting younger demographics.

Univariate Analysis of Variance

Table 3: Univariate Analysis of Variance

Variable		Value Label	N
kanal1	**1**	Facebook	75164
2		Instagram	75101
3		Pinterest	75082
4		Twitter	74653
target1	**1**	All Ages	33447
2		Men 18-24	33181
3		Men 25-34	33346
4		Men 35-44	33204
5		Men 45-60	33491
6		Women 18-24	33593
7		Women 25-34	33482
8		Women 35-44	33142
9		Women 45-60	33114

Test of Between-Subjects Effects

Dependent variable: ROI

Table 4: Test of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	606794.312[a]	35	17336.980	4296.305	<.001
Intercept	3030529.679	1	3030529.679	751000.427	<.001
kanal1	606552.886	3	202184.295	50103.615	<.001
target1	27.524	8	3.441	.853	.556
kanal1 * target1	84.343	24	3.514	.871	.645
Error	1210451.782	299964	4.035		
Total	4846562.957	300000			
Corrected Total	1817246.094	299999			

a. R Squared= 334 (Adjusted R Squared=.334)

The analysis reveals that the advertising channel significantly impacts ROI ($F = 50103.615$, $p < 0.001$), indicating that different social media platforms (Facebook, Instagram, Pinterest, Twitter) yield varying returns. However, the target audience does not have a significant effect on ROI ($F = 0.851$, $p = 0.556$), suggesting that demographic factors such as age and gender do not drive ROI

differences. Additionally, the interaction between platform and target audience is not significant ($F = 3.514$, $p = 0.645$), meaning the influence of platforms on ROI remains consistent across demographic groups.

The model explains 33.4% of the variance in ROI ($R^2 = 0.334$), indicating a moderate effect but suggesting other factors contribute to ROI variations. These findings partially support the hypothesis that ROI differs based on platform characteristics but do not confirm that Instagram yields the highest ROI for younger audiences, leading to the rejection of H2. While Facebook, Instagram, and Twitter show similar ROI levels, Pinterest performs the worst. This suggests that platform choice is a key factor in ROI outcomes, whereas demographic targeting may be less influential in determining campaign success across social media platforms.

Despite strong statistical results for platform effects, the absence of interaction with target demographics suggests limited practical value in tailoring platform selection based solely on age or gender. This underscores the need to consider platform-specific strategies that go beyond demographic targeting to optimize ROI.

H3: Platform-specific characteristics (e.g., visual nature of Instagram vs. targeting options of Facebook) influence campaign performance metrics (such as engagement and conversion rates

Engagement score as dependent variable:

Regression

Variables entered/removed[a]

Table 5: Regression Results

Model	Variables Entered	Variables Removed	Method
1	Kanal1[b]		Enter

a.Dependent Variable: Engagement_Score

b. All reguested variables entered.

Model Summary

Change statistics

Table 6: Model Summary

Model	R Square Change	F Change	df1	df2	Sig. F Change
1	.025[a]	7770.001	1	299998	<.001

a.Predictors: (Constant), kanal1

Coefficients[a]

Model		Unstandardized B	Coefficients Std. Error	Standardized Coefficient Beta	t	Sig
1	(Constant)	5.490	.014		394.101	<.001
	kanal1	-.449	.005	-.159	-88.148	<.001

a. Dependent Variable: Engagement_Score

The variable *kanal1* represents different social media platforms (1 = Facebook, 2 = Instagram, 3 = Pinterest, 4 = Twitter), with a negative coefficient indicating that as the platform value increases (moving from Facebook to Twitter), engagement scores decrease. This suggests that Facebook has the highest engagement, while Twitter has the lowest, assuming a linear trend. The significant *p*-value ($p < 0.001$) confirms that platform choice influences engagement.

The negative relationship implies that visually driven platforms like Instagram and Pinterest or conversational platforms like Twitter may have lower engagement compared to Facebook in this dataset. While platform-specific features do impact engagement, the effect is significant but relatively small, indicating that other factors also contribute to engagement levels. Based on these findings, we accept H3. This small effect size suggests limited practical significance. Although platform choice statistically influences engagement, its actual impact on campaign outcomes may be minor.

In practical terms, marketers should be cautious about overemphasizing platform selection alone and instead consider additional variables—such as content quality, posting strategy, or audience behavior—that likely have a stronger influence on engagement. It highlights the importance of considering other influential factors beyond platform selection.

Conversion rate as dependent variable:

Regression

Table 7: Regression Results

Variables entered/removed[a]

Model	Variables Entered	Variables Removed	Method
1	kanal1		Enter

a.Dependent Variable: Conversion_Rate

b. All requested variables entered.

Model Summary

Model	R Square Change	F Change	df1	df2	Sig. F Change
1	.000a	7.019	1	299998	.008

a. Predictors: (Constant), kanal1

Coefficients[a]

Model	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1 (Constant)	.080	.000		438.841	<.001
kanal1	.000	.000	.005	2.649	.008

a. Dependent Variable: Conversion_Rate

The coefficient for *kanal1* is 0.000 with a *p*-value of 0.008, making it statistically significant at the 1% level. The positive coefficient indicates that as the platform value increases (moving from Facebook to Twitter), conversion rates show a slight increase. This supports the hypothesis that platform-specific features influence conversion rates. However, while the relationship is statistically significant, its practical impact appears minimal, suggesting that other factors play a much larger role in driving conversions. This highlights the distinction between statistical and practical significance, particularly in studies with large sample sizes where even minimal effects can reach statistical significance. While platform characteristics do show a measurable influence, their real-world impact on conversion rates appears negligible, reinforcing the need to examine other drivers such as message relevance, call-to-action strength, or ad placement. Compared to engagement, which was more affected by platform choice in the previous analysis, conversion rates seem to be much less dependent on the platform itself. Based on these findings, we accept H3.

H4: Campaign objectives (e.g., brand awareness, product launch) influence engagement rates differently across social media platforms.

Univariate Analysis of Variance

Between-Subjects Factors

Table 8: Univariate Analysis of Variance

		N
Campaign_Goal	Brand Awareness	75248
	Increase Sales	74963
	Market Expansion	74759
	Product Launch	75030
Channel_Used	Facebook	75164
	Instagram	75101
	Pinterest	75082
	Twitter	74653

Tests of Between-Subjects Effects

Dependent variable: engagement_score

Table 9: Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1136895.837[a]	15	75793.056	12275.997	<.001
Intercept	5729952.805	1	5729952.805	928065.016	<.001
Campaign_Goal	7.921	3	2.640	.428	.733
Channel_Used	1136793.557	3	378931.186	61374.463	<.001
Campaign_Goal * Channel_Used	37.790	9	4.199	.680	.728
Error	1852126.879	299984	6.174		
Total	8716039.000	300000			
Corrected Total	2989022.716	299999			

a. R Squared = .380 (Adjusted R Squared = .380)

The analysis shows that the campaign goal does not have a significant effect on engagement scores ($p = 0.733$, $F = 0.428$), indicating that different campaign objectives do not impact engagement rates, regardless of the platform used. However, the platform itself has a highly significant effect on engagement scores ($p < 0.001$, $F = 61374.463$), confirming that engagement levels vary across different social media platforms. The interaction effect between campaign goal and platform is not significant ($p = 0.728$, $F = 0.680$), meaning that campaign objectives do not perform differently depending on the platform. These findings suggest that while some platforms naturally generate higher engagement, the specific campaign goal does not play a significant role in influencing engagement outcomes. As a result, we reject H4, as there is no strong evidence that campaign objectives affect engagement or that certain goals perform better on specific platforms.

Discussion

The findings of this study provide key insights into the role of platform-specific characteristics, demographic factors, and campaign objectives in determining the effectiveness of social media advertising. While some hypotheses were supported, others were rejected, indicating that social media advertising effectiveness is a complex interplay of multiple factors rather than a straightforward relationship between demographic groups, platform types, and campaign goals.

Younger demographics and engagement with visual content

Younger users were not significantly more likely to engage with visual or interactive content, challenging assumptions about generational media preferences (H1). This finding contradicts the common assumption that younger audiences are inherently more drawn to visual and interactive content. The lack of statistical significance suggests that engagement behaviors may be more evenly distributed across different age groups, potentially due to increasing adoption of visual content consumption across all demographics. This unexpected result calls for a reassessment of common assumptions about generational media behavior. It may reflect a shift where older users are closing the gap in digital habits, especially as platforms become more user-friendly and universally adopted. Additionally, engagement may depend more on content relevance than on age alone, suggesting that segmentation by interest or behavior could be more effective than by demographic category.

ROI differences based on platform characteristics

The study partially supports H2, which posited that ROI differs based on platform characteristics and that Instagram would yield the highest ROI for younger demographics. Although ROI varied significantly across platforms, demographic factors like age and gender did not contribute meaningfully to these differences. This suggests that platform characteristics play a more critical role in determining ROI than audience segmentation alone. Notably, Pinterest exhibited the lowest ROI performance, reinforcing the idea that visually-driven platforms may not always translate to financial success.

Platform-specific characteristics and campaign performance metrics

The results strongly support H3, confirming that platform-specific characteristics significantly influence key performance metrics, including engagement and conversion rates. Facebook outperformed visual platforms in engagement, countering assumptions that visual-first platforms like Instagram or Pinterest inherently drive more interaction. Instead, it suggests that other factors, such as user interaction styles and algorithmic prioritization, play a crucial role in engagement outcomes. Similarly, conversion rates were found to be influenced by platform characteristics, but the effect size was relatively small. This implies that while platform selection matters for campaign effectiveness, other variables—such as ad content, targeting strategies, and user intent—may have a greater impact on conversions.

Campaign objectives and engagement rates across platforms

Contrary to expectations, H4 was rejected, as the analysis found no significant relationship between campaign objectives (e.g., brand awareness, product launch) and engagement rates. Engagement levels varied by platform, but not by campaign objective, suggesting

platform mechanics outweigh goal specificity (H4). This finding suggests that platform-specific factors, such as content presentation and algorithmic prioritization, may have a stronger influence on engagement than the strategic intent behind an advertisement. It also highlights the importance of platform selection based on historical engagement trends rather than on assumed suitability for specific campaign goals. The rejection of H4 raises questions about how users engage with content in relation to campaign intent. It may indicate that engagement is driven more by content execution and platform dynamics than by strategic messaging goals. This suggests a need for advertisers to prioritize tailoring content to platform mechanics and audience expectations, rather than relying solely on objective-driven design.

Implications for advertisers

These findings provide several actionable insights for advertisers aiming to optimize social media campaigns:

i. Platform selection matters more than audience segmentation for ROI: Advertisers should prioritize choosing the right platform for their campaigns rather than focusing solely on demographic targeting.

ii. Engagement is not solely driven by visual appeal: While visual content remains important, engagement is also influenced by platform-specific factors such as content interaction mechanisms and algorithmic distribution.

iii. Campaign objectives should be adapted to platform strengths: Since engagement rates do not significantly differ based on campaign goals, advertisers should align their strategies with platform-specific strengths rather than rigidly adhering to preconceived notions about goal-platform fit.

Conclusion

This study explored the impact of social media platform characteristics, audience demographics, and campaign objectives on advertising performance metrics such as engagement rates, conversion rates, and return on investment (ROI). The findings provide valuable insights into the role of platform selection and demographic targeting in optimizing social media advertising strategies.

The results indicate that platform choice significantly affects both ROI and engagement rates. Facebook emerged as the most effective platform for engagement, while Twitter had the lowest engagement levels. Although Instagram and Pinterest are highly visual platforms, they did not outperform Facebook in engagement, suggesting that platform interactivity and audience behavior may play a crucial role. The analysis also revealed that ROI varies significantly across platforms, with Pinterest yielding the lowest ROI, confirming that platform selection is a key determinant of advertising success.

These insights advance theoretical understanding by challenging assumptions around age-based engagement preferences and the presumed effectiveness of demographic targeting. The findings suggest a shift in focus from traditional segmentation models toward platform-centered strategy design, contributing to evolving frameworks in digital marketing theory.

However, the hypothesis that Instagram would yield the highest ROI for younger demographics was not supported, as demographic factors such as age and gender did not significantly influence ROI.

Contrary to expectations, demographic factors did not have a significant impact on engagement or ROI, leading to the rejection of H1 and H2. This suggests that while audience segmentation is important in advertising strategy, the effectiveness of campaigns is more strongly influenced by platform characteristics than by demographic factors alone. Additionally, the study found that while platform-specific features influence engagement and conversion rates (supporting H3), their practical impact on conversion is minimal. This implies that while platform choice affects engagement, conversion rates are likely driven by other factors such as ad content, targeting precision, and campaign execution.

Finally, the study examined whether campaign objectives influence engagement rates differently across platforms (H4). The results showed that while platform choice significantly affects engagement, the specific campaign objective (e.g., brand awareness, product launch) does not play a significant role. The interaction effect between campaign goals and platform choice was also not significant, meaning that different campaign goals do not perform distinctly better on specific platforms. These findings suggest that engagement is largely platform-dependent rather than being influenced by campaign objectives, leading to the rejection of H4.

Overall, the findings highlight the importance of selecting the right platform for advertising success, as platform characteristics have a greater influence on engagement and ROI than demographic targeting or campaign objectives. Advertisers should focus on leveraging platform strengths rather than relying solely on audience segmentation or campaign type to drive performance.

For practitioners, the results underscore the need to align content strategies with the unique features and user behaviors of each platform, rather than defaulting to audience or campaign-driven assumptions. This platform-centric approach can help marketers better adapt to the dynamic nature of digital advertising ecosystems.

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References

Abdul Rahman, W. N., & Sulaiman, D. (2022). Consumer engagement with visual content on Instagram: Impact of different features of posts by prominent brands. *International Journal of E-Services and Mobile Applications (IJESMA), 14*(1).

Almutawaa, D. S. (2023). The impact of social media marketing on brand community membership: A higher education perspective of university students' experiences in Kuwait. *Proceedings*.

Belanche, D., Vélazquez, L. S., & Sánchez, M. (2021). Understanding influencer marketing: The role of congruence between influencers, products and consumers. *Journal of Business Research*.

da Silva Wegner, R. (2023). Performance analysis of social media platforms: Evidence of digital marketing. *Journal of Marketing Analytics*.

Duffett, R. G., & Partington, C. (2015). Facebook advertising's influence on intention-to-purchase and purchase amongst millennials. *Emerald Insight*.

Field, A. (2018). *Discovering statistics using IBM SPSS statistics* (5th ed.). SAGE Publications.

Linder, J. (2025). Digital marketing industry statistics. *Gitnux*.

Maria, S. P. (2019). The effect of social media marketing, word of mouth, and effectiveness of advertising on brand awareness and intention to buy. *Jurnal Manajemen Indonesia*, 19(2), 107–122.

Maslow, A. H. (1943). A theory of human motivation. *Psychological Review, 50*(4), 370–396.

Stevens, J. P. (2009). *Applied multivariate statistics for the social sciences* (5th ed.). Routledge/Taylor & Francis Group.

Tabachnick, B. G., & Fidell, L. S. (2019). *Using multivariate statistics* (7th ed.). Pearson.

Verma, J. (2012). One-way ANOVA: Comparing means of more than two samples. In *Data analysis in management with SPSS software* (pp. 1–20). Springer India.

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