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Integrating Design Thinking and Advertising Analytics for Startup Marketing Optimization

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ABSTRACT

In an increasingly competitive digital environment, startups in the creative industry face challenges in maintaining audience engagement and improving advertising effectiveness due to social media saturation and rapidly changing platform algorithms. Conventional promotional approaches are becoming less effective as consumers increasingly prefer authentic, educational, and interactive content. **This study aims** to develop and evaluate a consumer-centered Instagram advertising strategy using the Design Thinking approach. The novelty of this research lies in integrating Design Thinking stages with digital advertising performance metrics to design and assess empathy-based advertising content for a beaded jewelry startup. **This study** employed a mixed-methods exploratory sequential design. The qualitative phase involved participatory observation, social listening, and analysis of audience interactions on the Instagram account @pritistuff.id to identify consumer pain points and develop advertising content prototypes. The quantitative phase utilized A/B testing through Meta Ads Manager to evaluate campaign performance using Click-Through Rate (CTR), Cost Per Click (CPC), Cost Per Mille (CPM), and conversion rate. **The findings** identified three major consumer concerns uncertainty regarding product quality, difficulty visualizing product size when worn, and resistance to hard-selling advertisements. These insights were translated into educational Carousel content and User-Generated Content (UGC)-based Reels prototypes. The campaign achieved a CTR of 22.49%, CPC of IDR 70 per interaction, CPM of IDR 15,646, and a Conversion Rate of 1.99%, indicating improved engagement and advertising efficiency. **The study** concludes that Design Thinking provides an effective framework for developing consumer-centered digital advertising strategies that enhance audience engagement and support sustainable business growth.

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1. INTRODUCTION

The 21st-century global economy is undergoing a structural transformation driven by advancements in digital technology and a growing shift toward sustainability [1–3]. At the center of this transformation are "startupreneurs" who convert innovative ideas into business ventures [4, 5]. However, the creative craft sector, particularly beaded jewelry businesses, continues to face high early-stage failure rates [6, 7], primarily due to

the inability to achieve product-market fit, understand latent consumer needs, and effectively communicate a compelling visual value proposition [8–10].

For craft startups, instagram serves as a vital marketing infrastructure, where instagram ads provide micro-targeting capabilities that help drive brand awareness and conversions with limited budgets [11, 12]. Nevertheless, global advertising metrics from 2024-2025 reveal significant challenges, organic engagement has declined by 24% YoY, accompanied by content fatigue caused by continuously changing platform algorithms [13]. In this hyper-competitive environment, traditional top-down and hard-selling marketing tactics are becoming less effective, as modern consumers increasingly reject intrusive content and prefer empathetic, educational, and interactive experiences [14–16].

To overcome this strategic challenge, startupreneurs require design thinking as a human-centered business model solution [17]. Its five iterative phases systematically uncover consumer psychological pain points, such as doubts regarding material quality or product sizing [18, 19]. This empathy-driven approach enables marketers to experimentally develop adaptive campaigns, including educational carousel content and UGC based Reels, which have been shown to increase CTR while minimizing CPC with relatively low financial risk [20, 21]. On a macro level, optimizing these strategies directly supports SDG 8 (Decent Work and Economic Growth) and SDG 9 (Industry, Innovation, and Infrastructure), as sustainable craft businesses contribute to local economic development and encourage industrial innovation. Based on this background, this study aims to formulate a conceptual and practical framework for designing Instagram advertising content prototypes using a design thinking approach, with a specific focus on a beaded jewelry startup case study [22].

2. LITERATURE REVIEW

2.1. Human-Centered Design (HCD)

HCD Design is an approach that places users at the center of the solution design process [23]. This concept emphasizes that the success of a product or strategy is determined not only by technical aspects, but also by the extent to which the solution can address users' needs, preferences, and experiences in real-world settings [24]. In the context of digital marketing, this approach has become increasingly relevant because modern consumers tend to reject intrusive and overly sales-oriented content [25]. Instead, they are more responsive to content that is empathetic, informative, and provides added value. Therefore, HCD is used as the foundation for understanding audience behavior and designing more contextual and relevant advertising content. This approach is operationalized through the design thinking method, which consists of five stages, empathize, define, ideate, prototype, and test. Each stage serves to ensure that the resulting solution is truly based on user needs rather than producer assumptions [26].

2.2. Design Thinking as an Innovation Model

Design Thinking is an innovation framework that focuses on creative and iterative problem-solving. This method is not only used in product design but has also evolved into a strategic approach in business, including digital marketing. Conceptually, design thinking consists of five main stages:

- Empathize: Understanding user needs and problems
- Define: Formulating the problem specifically
- Ideate: Generating various alternative solutions
- Prototype: Creating an initial representation of the solution
- Test: empirically evaluating the solution

In this study, design thinking is used as a framework for designing Instagram advertising content that is not only visually appealing but also capable of addressing consumer pain points. With this approach, advertising content is no longer one-way (top-down), but instead becomes the result of an iterative process based on user feedback [27, 28].

2.3. Consumer Behavior Theory in Digital Marketing

Consumer behavior in the digital context has undergone significant changes compared to conventional marketing [29]. Today's consumers have greater control over the information they consume and therefore tend to avoid advertisements they perceive as intrusive or irrelevant [30]. One relevant concept is consumer resistance to advertising, which refers to the tendency of consumers to avoid overly aggressive promotional messages [31]. Instead, consumers are more receptive to content that is authentic, personally relevant, and value-driven. In addition, the concept of social proof also plays an important role in purchasing decisions. User experience-based content, such as UGC, is considered more credible than conventional advertising because it reflects real experiences. This study uses consumer behavior theory to explain how an empathy-based content approach and UGC can influence engagement and conversion rates.

2.4. Digital Marketing and Social Media Advertising

Digital marketing refers to marketing activities that utilize digital technology to reach consumers in a more broad and measurably larger way [32]. One of the main channels in digital marketing is social media, particularly instagram, which is characterized by its visual and interactive nature [33]. In the context of digital advertising, campaign effectiveness is measured using several key metrics, including:

- CTR: The rate of clicks on an advertisement
- CPC: The cost incurred per interaction
- CPM: The cost per 1,000 impressions
- Conversion Rate: The percentage of conversions resulting from interactions

These metrics are crucial indicators for evaluating advertising campaign performance. However, effectiveness is determined not only by technical aspects but also by the quality of the content presented. This research integrates digital marketing concepts with a design thinking approach to produce a content strategy that is not only optimal in terms of metrics but also psychologically relevant to the audience.

2.5. UGC and Authenticity

UGC refers to content created by users or consumers rather than directly by brands. In recent years, UGC has become one of the most effective strategies in digital marketing because it is considered more authentic and credible. The advantages of UGC lie in its ability to build trust, provide social proof, and reduce the perception of excessive commercialism. Content such as unboxing videos, reviews, and product demonstrations provides potential consumers with real-world experiences, thereby reducing uncertainty in the decision-making process. In this study, UGC is used as part of an advertising content prototyping strategy, particularly in the Reels video format, to increase campaign engagement and effectiveness.

2.6. Integration of Theoretical Framework

Based on the concepts that have been explained, this research integrates several main elements, namely HCD as a basic approach, design thinking as an operational method, Consumer behavior as a psychological basis, digital marketing metrics as an evaluation tool and UGC as a content strategy. This integration forms a logical flow as follows in Figure 1.

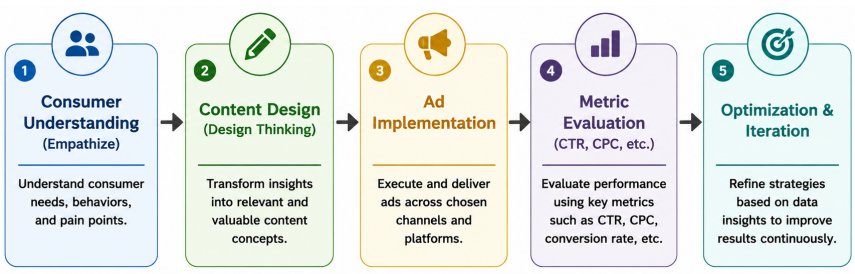


Figure 1. Integrated Workflow of Consumer-Centered Digital Advertising Strategy

This framework explains that the effectiveness of digital advertising depends not only on the platform or budget, but on the extent to which the content strategy is able to address the real needs and preferences of the audience. Figure 1 illustrates an integrated workflow for developing and evaluating digital advertising strategies. The process begins with consumer understanding (empathize) to identify audience needs, preferences, and behaviors, followed by content design (design thinking) to transform these insights into relevant advertising content. The designed content is then executed through Ad Implementation, and its performance is assessed through Metric Evaluation using indicators such as CTR and CPC. Finally, the results are used for Optimization and Iteration to continuously improve campaign effectiveness. As shown in Figure 1, the framework emphasizes that successful digital advertising depends not only on advertising platforms or budgets but also on how effectively content strategies are aligned with the actual needs and expectations of the target audience.

2.7. Global academic literature

increasingly emphasizes the integration of digital entrepreneurship and sustainability agendas. Technologies such as AI, blockchain, digital platforms, and data analytics lower market entry barriers for MSMEs and creative startups, enabling broader participation in global trade and fostering innovation ecosystems aligned with SDG 9 (Industry, Innovation, and Infrastructure). However, digitalization alone does not guarantee long-term viability, without commercial profitability, a startup's social and environmental contributions cannot be sustained. Strategic failures in achieving product-market fit and controlling CAC frequently threaten startup survival. Consequently, digital marketing capabilities through major social media platforms are essential for startups to monetize innovation, improve business competitiveness, ensure profitability, and create employment opportunities, thereby contributing to SDG 8 (Decent Work and Economic Growth).

2.8. Digital Marketing Dynamics and Instagram Ad Performance

Technological advancements and widespread smartphone adoption have permanently shifted consumer behavior toward online interactions (O2O), evolving social media platforms into digital marketplaces where commercial transactions begin. Instagram serves as a cornerstone for startup digital marketing due to its favorable user demographics, visual interface ideal for aesthetic products like beaded jewelry, and Meta's machine learning ad infrastructure. Instagram ad performance data for 2024–2025 shows that the In-feed format dominates ad revenue at 53.7%, followed by Stories at 24.6%. However, the rapid growth of Reels to compete with TikTok is projected to reduce the combined share of Feed and Stories to 73.8% by 2025. Beyond format selection, ad success relies heavily on content. Recent studies highlight that micro-influencer content and UGC with transparent sponsor disclosures are perceived as more authentic. Consequently, ads featuring human-centered elements, such as real consumers and everyday language, consistently achieve higher conversion rates by reducing consumer resistance to commercial advertising.

2.9. Conceptual Framework

This study integrates HCD, design thinking, consumer behavior theory, UGC, and digital marketing metrics into a unified conceptual framework. HCD is operationalized through the design thinking process (empathize, define, ideate, prototype, and test) to develop consumer-centered advertising content. Consumer behavior theory suggests that audiences prefer authentic and value-driven content over intrusive promotional messages, therefore, empathy-based content is expected to reduce advertising resistance and enhance engagement. To strengthen authenticity and social proof, the proposed strategy incorporates UGC through instagram reels and educational carousel formats. Its effectiveness is evaluated using digital marketing metrics, including CTR, CPC, CPM, and conversion rate. Accordingly, design thinking-driven consumer insights support the development of authentic advertising content that improves advertising performance and contributes to sustainable business growth. As illustrated in Table 1, previous studies have extensively examined digital advertising strategies, the role of UGC in enhancing authenticity, and the application of design thinking in business and innovation contexts. However, these studies generally treat these concepts separately, focusing either on post-campaign performance evaluation, consumer engagement outcomes, or the conceptual benefits of design thinking. Limited research has integrated empathy-based advertising design with data-driven instagram ads analytics to systematically develop, implement, and evaluate advertising content within startup marketing environments. Furthermore, few studies have demonstrated how consumer insights generated through design thinking can be translated into measurable advertising outcomes using key digital marketing metrics such as CTR, CPC, CPM, and conversion rate.

Table 1. Comparison of Previous Studies and Research Gaps

No	Researchers & Journals (Year)	Research Title / Focus	Findings	Research Gap
1	MDPI Sustainability [34]	The Relevance of AI-Driven Marketing Through Design Thinking for a Strategic Approach to Resilient Problem-Solving and Communication for SMEs	Integrating Design Thinking into MSME marketing strategies has been proven to result in more robust problem-solving and human-centered brand communications.	Previous research has tended to position Design Thinking as a conceptual approach without specific implementation on digital advertising platforms. This study contributes by operationalizing Design Thinking in designing Instagram advertising content based on performance metrics.
2	Makarti Journal [35]	Instagram Marketing Strategies and Community Building: A Case Study of Fashion SMEs in Bandung, Indonesia	Instagram Ad tactics (campaign optimization, UGC, and content production) significantly improve brand image and engagement among fashion MSMEs.	The study focuses on post-campaign evaluation. This research offers a pre-campaign framework for designing advertisements from scratch using Design Thinking methods.
3	MDPI Sustainability [36]	Enhancing Social Innovation Through Design Thinking, Challenge-Based Learning, and Collaboration in University Students	Design Thinking facilitates validated Minimum Viable Product (MVP) development and contributes directly to social innovation and SDG achievement.	The study focuses on social innovation in higher education. This research applies the concept to the creative economy sector (beaded jewelry creativepreneurs) and evaluates outcomes using CPC and CTR metrics.
4	MDPI Education Sciences [37]	Design Thinking in Education: Evaluating the Impact on Student Entrepreneurship Competencies	Design Thinking significantly improves creative problem-solving and value-creation competencies among aspiring entrepreneurs.	The study emphasizes entrepreneurship education. This research extends Design Thinking into a practical business framework for digital marketing startups aligned with SDGs 8 and 9.

Therefore, this study addresses this gap by proposing and empirically evaluating a design thinking-based advertising framework that combines consumer-centered content development, UGC strategies, and digital advertising performance measurement in the context of a beaded jewelry startup.

3. METHOD

This study employed an exploratory sequential mixed-methods design integrating qualitative and quantitative approaches. The qualitative phase applied the design thinking framework to identify consumer pain points and develop empathy-based advertising content prototypes. The unit of analysis consisted of audience interactions on the instagram account @pritistuff.id, including comments, reactions, profile visits, engagement patterns, and audience feedback. The analysis focused on recurring concerns related to product quality, sizing, and advertising preferences. The quantitative phase utilized A/B testing on meta ads Manager to compare conventional content with design thinking-based content. Campaign performance was evaluated using digital advertising metrics, including impressions, reach, clicks, interactions, CTR, CPC, CPM, and conversion rate. All data were obtained from meta ads manager and verified through manual calculations. These metrics served as the primary indicators for assessing content effectiveness, while design thinking functioned as both a conceptual framework and an exploratory tool for generating content design hypotheses tested in the quantitative phase.

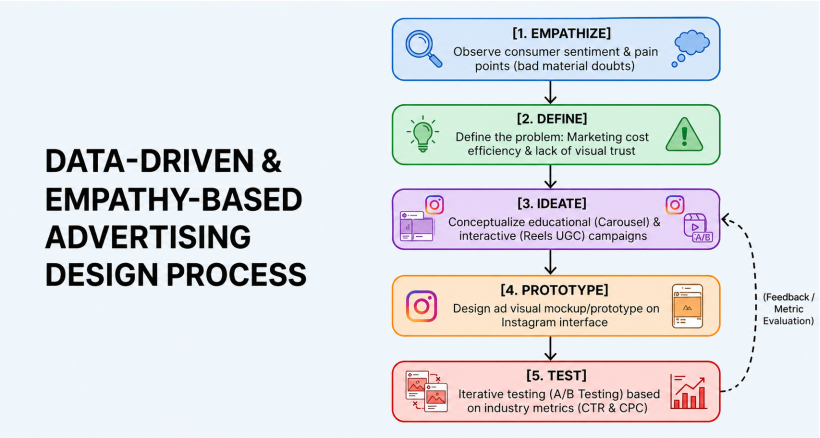


Figure 2. Design Thinking Method

Figure 2 presents the design thinking framework used in this study to transform consumer insights into human-centered advertising strategies. The framework consists of five stages. Empathize (identifying consumer behavior and pain points), define (formulating marketing challenges), ideate (developing campaign concepts), prototype (creating advertising content), and test (evaluating performance using CTR and CPC metrics). This study employed an exploratory sequential mixed-methods design, in which qualitative findings informed the quantitative phase. Consumer pain points identified through participatory observation, social listening, and interaction analysis were used to develop advertising content prototypes. Qualitative data were analyzed thematically to identify patterns of consumer needs and complaints, while quantitative analysis was conducted descriptively and comparatively by evaluating performance metrics between control and experimental groups through A/B testing. The quantitative phase served to validate and extend the qualitative findings, enabling methodological triangulation, strengthening internal validity, and enhancing the reliability of the research results.

4. RESULT AND DISCUSSION

This discussion presents the implementation of the five design thinking stages in developing an instagram advertising campaign for a beaded jewelry startup. The analysis focuses on translating qualitative consumer insights into measurable advertising performance. Based on participatory observation and social listening of the target audience aged 18–35 years, three key pain points were identified concerns about product quality when presented through static images, uncertainty regarding product size when worn (sizing blind spot), and resistance to intrusive hard-selling advertisements. These findings informed the define stage, indicating the need for advertising content that not only showcases product aesthetics but also educates consumers, builds trust, and reduces CAC. Based on these empathy-driven insights, the ideate stage generated two campaign prototypes designed to address consumer concerns rather than merely promote discounts, namely:

- Prototype A (Educational Carousel Format): A visual campaign consisting of 5–7 slides. The first slide serves as an attention-grabbing element, showcasing the product's aesthetics. Subsequent slides provide detailed information on hook quality, bead material details, and conclude with a care guide to prevent fading. This approach psychologically shifts the startup's position from merely a "salesperson" to a trusted craft expert.
- Prototype B (UGC-based Interactive Reels Format): A 15-30 second vertical video prototype utilizing UGC. The video features real consumers unboxing and demonstrating how to style beaded jewelry with various casual and formal outfits. This approach helps overcome sizing-related uncertainty while providing authentic social proof.

The campaign prototypes were evaluated through a one-day A/B testing experiment using meta ads manager. Although the limited testing period represents a study limitation, the results provide meaningful preliminary insights for comparison with the control campaign. The empirical results presented in Table 1 were used to assess the effectiveness of the design thinking-based content prototypes on digital advertising performance. While the findings indicate promising campaign outcomes, future studies should employ longer observation periods and larger campaign samples to enhance external validity and generalizability.

Table 2. Advertising Performance Metrics Calculation

Metric	**Formula (Manual View)**	**Results**	**Unit**
CPM (Cost Per Mille)	(Main_Data!B7 / Main_Data!B2) $*$ 1000	Rp. 15,646	IDR
CPE (Per Interaction)	Main_Data!B7 / Main_Data!B3	Rp. 70	IDR
CPC (Per Profile Visit)	Data_Utama!B7 / Data_Utama!B4	Rp. 3,500	IDR
CTR Interaction	(Main_Data!B3 / Main_Data!B2) $*$ 100	22.49	%
Conversion Rate (Visits)	(Main_Data!B4 / Main_Data!B3) $*$ 100	1.99	%

The results presented in Table 2 indicate favorable advertising performance across several key digital marketing metrics. The campaign achieved a CTR of 22.49%, suggesting strong audience interest and interac-

tion with the advertising content. Advertising efficiency was reflected in a low CPE of IDR 70 per interaction and a CPC of IDR 3,500 per profile visit, while the CPM reached IDR 15,646. Furthermore, the conversion rate of 1.99% indicates that a portion of engaged users proceeded to visit the business profile. Overall, these findings suggest that the design thinking-based advertising content was effective in attracting audience attention and generating meaningful engagement.

The implementation results of the beaded jewelry advertising prototype demonstrated positive outcomes in both audience engagement and cost efficiency. As shown in Table 2, the campaign achieved a CTR of 22.49%, a CPC of IDR 70 per interaction, a cost of IDR 3,500 per profile visit, a CPM of IDR 15,646, and a conversion rate of 1.99%. These results indicate that the design thinking-based content effectively attracted audience attention and generated meaningful engagement, although the findings remain limited to a single case study. The proposed campaign was subsequently implemented on the Instagram account @pritistuff.id using Prototype B, a UGC-based reels strategy. The content, titled ”GRWM + little unboxing moment,” showcased authentic consumer experiences through product unboxing and real-life demonstrations. By analyzing views, interactions, and profile activity, the study provides insights into how human-centered and educational content strategies influence audience engagement in digital marketing environments.

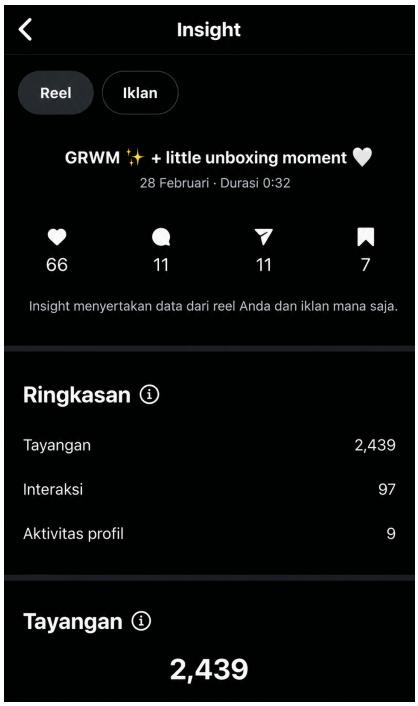


Figure 3. Reels UGC content insights

The test results show that the educational and human-centered content approach is associated with increased audience attention and engagement. As illustrated in Figure 3, the Reels video campaign recorded strong cumulative performance:

- Reach and Impressions: The campaign reached 2,079 unique accounts and generated 2,439-2,894 impressions, indicating effective distribution of short-form video content by the Instagram algorithm.
- Authentic Interaction: The campaign generated more than 100 interactions, including 66-73 likes, 7-10 saves, and 11 shares, demonstrating strong audience engagement.
- Saves and Shares: High save and share rates suggest that the GRWM-based unboxing content was perceived as valuable and informative, helping reduce sizing uncertainty while generating 9-12 profile visits that created additional conversion opportunities.

4.1. Audience Demographic Analysis

Utilization of instruments micro-targeting on meta ads produces a demographic distribution that provides new insights for startupreneurs @pritistuff.id:



Figure 4. Ads Insights by Age

The test results show that the educational and human-centered content approach (human-centered) is associated with increased audience attention and engagement. As illustrated in Figure 4.

- Age Range: The audience distribution closely matched the initial target market, with 53% aged 18-24 and 38% aged 25-34. These findings confirm that consumers aged 18-35 are highly responsive to the Design Thinking-based approach, which emphasizes visual authenticity over static catalog images.



Figure 5. Ads Insights by Gender

- Gender: Figure 5 reveals an interesting demographic finding: although beaded jewelry is commonly associated with female consumers, the advertisement was dominated by male audiences (77.6%), compared to 23.7% female audiences. This may indicate a growing unisex fashion trend or a strong purchase intention among men buying jewelry as gifts for their partners.



Figure 6. Ads Insights by region

- Geographic Distribution: Audience penetration is dominated by central urban communities, with DKI Jakarta leading in absolute numbers (87%), followed by Banten (14%), as seen in the Figure 6. This concentration aligns with the characteristics of urban consumers who readily adapt to digital economy and creative industry trends. Meta ads evaluation results, macro and quantitative data from insights. @pritistuff.id validates research hypotheses.

Empathy-based advertising content developed through the empathize stage reduced consumer resistance to conventional advertising. Through a UGC-based Reels prototype featuring authentic unboxing experiences, @pritistuff.id successfully built audience trust while demonstrating that design thinking can improve marketing efficiency and support sustainable business growth. These findings indicate that design thinking is not only a content design tool but also a strategic approach for business adaptability, cost optimization, and sustainable entrepreneurial scalability.

5. MANAGERIAL IMPLICATION

The findings of this study provide practical guidance for startupreneurs and MSMEs to improve digital advertising performance in increasingly crowded social media environments. The results show that effective advertising should be based on a clear understanding of consumer needs, concerns, and behavior rather than focusing only on promotional messages. Through design thinking, businesses can identify customer pain points and create content that is more relevant and engaging. The study also highlights the importance of authenticity in digital marketing. The positive results of UGC-based campaigns indicate that consumers respond better to content that shows real product experiences. Businesses can encourage customers to share reviews, testimonials, unboxing videos, and product demonstrations to build trust and support purchase decisions.

From a managerial perspective, the findings emphasize the importance of using advertising analytics in decision-making. Metrics such as CTR, CPC, CPM, and conversion rate should be monitored regularly to measure campaign performance and improve marketing efficiency. For startups with limited budgets, the proposed framework offers a practical way to test and improve advertising concepts before launching larger campaigns.

By combining customer-focused content with data-driven evaluation, businesses can reduce customer acquisition costs, improve campaign results, and better adapt to changing consumer preferences. This approach can support sustainable business growth while keeping marketing strategies aligned with market needs.

6. CONCLUSION

In a hyper-competitive digital economy, startups in the craft industry, particularly beaded jewelry businesses, face increasing challenges due to social media saturation and continuously evolving platform algorithms. Conventional hard-selling advertising approaches are becoming less effective as consumers increasingly prefer authentic and relevant content. This study demonstrates the value of integrating design thinking into digital advertising strategy as a human-centered framework that prioritizes empathy and consumer understanding. The novelty of this research lies in systematically combining design thinking stages with digital advertising performance metrics to develop campaign content that addresses consumer pain points rather than focusing solely on product promotion.

The empirical findings from the meta ads campaign implemented on @pritistuff.id validate the effectiveness of this approach. The UGC based reels campaign successfully reached the intended target market, with 91% of the audience belonging to the productive age group of 18-34 years, including 53% aged 18-24 years and 38% aged 25-34 years. The campaign also attracted substantial interest from male consumers, representing 77.6% of the audience, while achieving strong geographic concentration in Jakarta at 87%. These results indicate that empathy-driven content can generate stronger audience relevance and improve the precision of market targeting.

The campaign achieved a CTR of 22.49% and a CPC of IDR 70 per interaction, indicating favorable advertising performance. However, the magnitude of improvement should be interpreted cautiously because baseline campaign data were not systematically documented. Combined with stable organic engagement indicators, these findings suggest that consumer-centered content development can simultaneously enhance audience engagement and advertising efficiency. Therefore, design thinking can serve not only as an innovation methodology but also as a practical framework for designing effective digital advertising strategies, enabling startups to build stronger customer connections while optimizing marketing expenditures in increasingly competitive digital environments.

7. DECLARATIONS

7.1. About Authors

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7.2. Author Contributions

Conceptualization: NP; Methodology: AM; Software: AF; Validation: NP and AM; Formal Analysis: AF and SJ; Investigation: AM; Resources: AM.; Data Curation: NP; Writing Original Draft Preparation: NP and SJ; Writing Review and Editing: NP and AM; Visualization: AF; All authors, NP, AM, AF and SJ, have read and agreed to the published version of the manuscript.

7.3. Data Availability Statement

The data presented in this study are available on request from the corresponding author.

7.4. Funding

The authors did not receive any financial support for conducting the research, preparing the manuscript, or publishing this article.

7.5. Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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