

Examining the Impact of Social Media Marketing Strategies on Customer Acquisition and Brand Equity for Digital-Native Startups

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Abstract

In today's competitive digital era, the majority of digital-native startups leverage social media sites to engage consumers and create competitive brand images in highly contested digital environments. But there are few empirical studies addressing how social media marketing strategies influence customer acquisition and brand equity within entrepreneurial ecosystems simultaneously. This study aims to investigate the effect of social media marketing strategies on customer acquisition and brand equity among digital-native startups by testing the mediating effect of customer acquisition. In this research, the methodology chosen is Quantitative Cross-Sectional Survey Approach, wherein data were gathered from 312 founders, marketing executives and senior-level officers of digital native startups operating in sectors such as e-commerce, Software as a Service (SaaS), FinTech, EdTech, HealthTech, and digital services industries, where data on social media marketing strategy were collected considering 5 core elements of social media marketing; these include quality content, customer engagement, influencer marketing, social media advertising and community management. From the above results, it can be deduced that the marketing strategies with the use of social media make a tremendous contribution towards both customer acquisition ($\beta = 0.721$, $p < 0.001$) and brand equity ($\beta = 0.438$, $p < 0.001$). Besides, customer acquisition is vital in fostering brand equity ($\beta = 0.487$, $p < 0.001$). Furthermore, from the mediation procedure, it can be found that customer acquisition acts as a mediator to the link between social media marketing strategies and brand equity, making a partial mediation effect of $\beta = 0.351$ ($p < 0.001$). The existing model is capable of explaining 52.0% of the variation in customer acquisition ($R^2 = 0.520$) and 69.4% of the variation in brand equity ($R^2 = 0.694$). In conclusion, it can be noted that effective social media marketing strategies are important for the development of customer acquisition and brand equity among native digital startups. It is possible to attract customers using their engagement, high-quality content, influencer marketing, advertising, and communities. Thus, it is possible to increase the performance of the market and obtain sustainable growth.

Keywords

Social Media Marketing, Digital-Native Startups, Customer Acquisition, Brand Equity, Digital Entrepreneurship, Customer Engagement, Startup Growth.

1. Introduction

With the advent of burgeoning digital technologies, it is easy to witness a paradigm shift in the entrepreneurial domain in the modern era, creating new breeds of digital-native start-ups focusing on online platforms and tech-enabled business models. While these start-ups continue to fuel innovation, contribute to the GDP, and create jobs across verticals like e-commerce, fintech, edtech, health tech, Saas, etc., the development of a conducive ecosystem of start-up clusters via incubators, accelerators, Venture Capital, and digital infrastructure opens up the possibilities for founders to scale up and reach customers outside geographical boundaries (Prabowo et al., 2024; Almousa, 2023). The digital entrepreneurial ecosystem hence depends to an increased

extent on acquiring and retaining the digital customers through effective strategies (Johnson et al., 2019; Naidu & Aithal, 2025).

Of the different digital technologies that can be employed by startups, social media technology is one that has proven to be an effective entrepreneurial tool that enables the firm to connect with customers, establish relationships, and sell products at a relatively lower price. Technologies like Facebook, Instagram, LinkedIn, X, and TikTok offer startups platforms where they are able to improve their brand awareness and interact with their target audience by developing interest among the customers using methods like content marketing, social media advertising, and community building. Unlike conventional marketing mediums, social media offers the benefit of direct communication with consumers.

Despite the prevalence of social media marketing strategies, there is scant literature about the effects of various social media marketing strategies in acquiring customers and building brand equity among digital natives. While most digital natives can engage effectively by implementing social media marketing strategies, few of them are capable of translating such engagements into customer acquisition and brand equity. The purpose of this paper is to examine the effects of social media marketing strategies on customer acquisition and brand equity, the link between customer acquisition and brand equity, and the main dimensions of social media marketing.

The main contribution of the study includes,

- Presents a conceptual framework that connects social media marketing approaches, customer acquisition, and brand equity for digital native startups.
- Presents empirical findings about the direct and indirect impact of customer acquisition on brand equity via social media marketing.
- Contributes to entrepreneurship and digital marketing literature by studying several dimensions of social media marketing such as content, engagement, influence, promotion, and community.
- Offers practical suggestions to the founders and marketers of startups regarding optimizing their social media approach.

The paper is comprised of seven sections. Section 2-Literature Review covers past literature on social media marketing, customer acquisition and brand equity. Also, this review identifies the gaps in the past research. Section 3-Conceptual Framework and Hypotheses Development presents the theoretical model and hypotheses of the current study. Section 4-Research Methodology comprises the data, questionnaire designs and data analysis methods. Section 5-Results and Analysis comprises the hypothesis testing and empirical outcomes of the research. Section 6-Discussion, Implications, and Recommendations discusses the results and offers pragmatic implications for business as a result of the study. And Section 7-Conclusion provides the summary of main findings, main contributions, limitations and avenues for future research.

2. Literature Review

Growing numbers of digitally born and bred startups are leveraging the Social Media marketing strategy to capture their market presence, win customers, build brand equity in an online ecosystem with heightened competition. As opposed to traditional companies, digital startups have very limited resources and use digital tools extensively for reaching the target audience and sustaining growth. Social media marketing includes such tools as content marketing, influencer collaboration, interaction, community building, and paid advertising that allow startups to interact with their customers directly and develop their brand (Iqbal et al., 2024; Kopalle et al., 2020). It is shown in research that digital-born businesses use social media not only for promotional purposes but also for managing relations with customers and collecting market information in order to boost their entrepreneurial performance and sustainability (Sautel & Pookulangara, 2023; Saleh & Nurhilalia, 2025). Branded content and interaction lead to higher consumer engagement and the creation of revenue-generating possibilities for digital-born startups (Simbolon & Yanti, 2021).

Customer acquisition can be identified as an essential goal for a startup organization that aims to acquire and retain customers through digital channels. Customer acquisition depends on four main factors, including the generation of leads, conversion optimization, communication, and decision-making based on data. Research indicates that companies with good digital skills and customer-oriented approaches have more chances of converting social media interactions into business benefits Baidya et al., (2024). In addition, social media provides opportunities for customer interaction, which adds to value perceptions and impacts consumer intentions to purchase (Yudhistira et al., 2023; Kopalle et al., 2020; Johnson et al., 2019).

Brand equity, which is comprised of brand awareness, brand associations, brand perceived quality, and brand customer loyalty, can also be seen as another case of strategic output that is affected by the organization's use of social media. Previous studies found that digital marketing and customer-based strategy lead to positive brand perceptions and sustainable customer relationship (Van Crombrugge et al., 2024; Pisoni, 2021). In addition to that, social media marketing enhances entrepreneurial resilience and distinctiveness of the business operating in a dynamic environment (Rizaldi et al., 2025; Nathaniel Carr, 2008). However, most of the previous literature considered either well-established firms or separate marketing outputs with respect to the influence of social media marketing (Ribeiro & Maués, 2023; Buschow, 2020; Silveira & Ramos, 2022).

According to the literature review, it is clear that the adoption of the social media marketing strategy has become a crucial factor for the success of start-ups born into the digital world in enhancing their customer acquisition and brand equity. It can be seen from the literature review that there is a positive relationship between content marketing, customer engagement, influencer marketing and digital advertising and the performance of businesses along with their customer relationships. It is evident from the literature review that adopting customer-focused marketing strategies and data-based marketing strategies has become important in enhancing the competitiveness of start-ups. But the major emphasis in most of the literature reviewed has been on either established companies or marketing in general without much focus on social media marketing with respect to customer acquisition and brand equity.

3. Conceptual Framework and Hypotheses Development

The theoretical framework of the research paper tries to examine the impact of SMMS on customer acquisition and brand equity of digital natives' startups. In modern times, social media marketing has become an essential part of digital entrepreneurship because it helps startups to connect with their target customers through cost-effective means and create an identity for the brand. It is for this reason that proper application of social media marketing techniques in digital entrepreneurship helps in faster market penetration.

Social Media Marketing Strategies (SMMS) can be considered as a multidimensional construct consisting of the following five dimensions: Content Quality, Customer Engagement, Influencer Marketing, Social Media Advertising, and Community Building. The dimension of content quality shows how relevant and attractive the marketing content is. Customer Engagement means the level of interaction between startups and their customers. Influencer marketing is the process of cooperation with influencers in order to carry out credible marketing activities. Social Media Advertising means paid marketing activities which help startups to get visibility and conversion. Community Building is the process of creating communities which contribute to customer loyalty and brand advocacy.

According to the theory, marketing practices in social media will have an immediate impact on customer acquisition, which will include creating awareness, generation of leads, and conversions. Apart from this, marketing practices will also have an immediate impact on the creation of brand equity, which will include brand awareness, quality, associations, and loyalty. Apart from this, according to the theory, customer acquisition will have a positive impact on brand equity, because an expanding customer base will result in higher levels of brand awareness and trust among the customers.

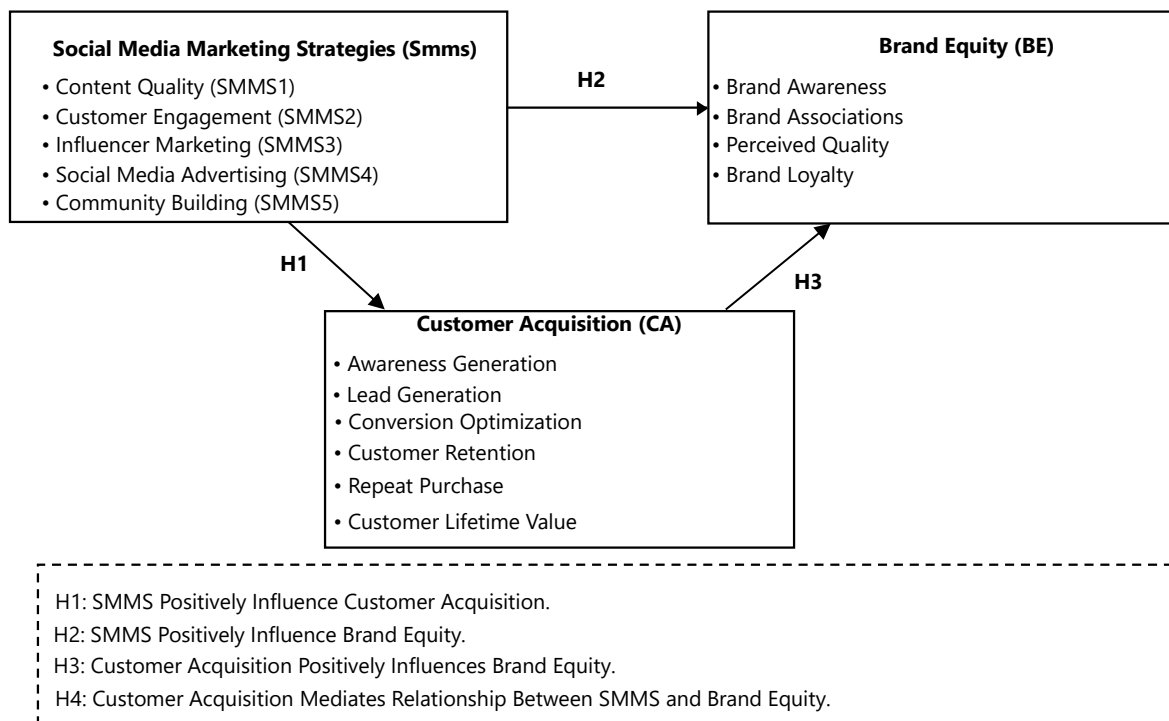


Fig. 1: Conceptual framework of social media marketing strategies, customer acquisition, and brand equity in digital-native startups

Fig. 1 shows the proposed research model showing the relationship of the social media marketing strategies (content quality, customer engagement, influencer marketing, social media advertising, and community building) with the customer acquisition and the brand equity. The model represents the direct influence of social media marketing with customer acquisition and brand equity and also implies a mediated relationship between social media marketing strategy with brand equity through the customer acquisition.

Based on the conceptual framework, the following hypotheses are proposed:

H1: Social media marketing strategies positively influence customer acquisition.

H2: Social media marketing strategies positively influence brand equity.

H3: Customer acquisition positively influences brand equity.

H4: Customer acquisition mediates the relationship between social media marketing strategies and brand equity.

4. Research Methodology

The study will employ the use of quantitative research design in an attempt to explore the impact that social media marketing strategies have on customer acquisition and brand equity in digital native start-ups. To gather information on the variables of interest and their interrelationships, cross-sectional survey technique will be applied. In this case, data will be collected only once through the survey.

The population of interest includes digital-native startups that engage in business via digital platforms in such sectors as e-commerce, Software-as-a-Service (SaaS), FinTech, EdTech, HealthTech, and other digital services. Participants of the study will include startup founders, co-founders, marketing managers, and executives with knowledge of marketing tactics and organizational performance.

Stratified purposive sampling technique methodology was used to enable representation of major startup industry sectors that are digital natives such as E-commerce, SaaS, FinTech, EdTech, HealthTech, and Digital Services. First, the population was stratified according to industry, and sampling was done proportionately,

such that bigger sectors had more representatives than smaller sectors. In every stratum, participants such as founders, marketing managers, and executives with knowledge in social media marketing were purposefully selected. This method increased the representativeness of 312 valid samples, thus increasing the reliability and validity of the research results.

The data will be collected by means of the questionnaire, which consists of closed ended questions that will be answered using a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). The following seven constructs will be used in the measurement model. Social Media Marketing Strategies construct will consist of five sub-constructs, such as Content Quality (5 questions), Customer Engagement (5 questions), Influencer Marketing (4 questions), Social Media Advertising (4 questions) and Community Building (5 questions). Two dependent variables include Customer Acquisition (6 questions) and Brand Equity (6 questions).

In order to make sure that the quality of the measuring tool satisfies all the required criteria, the Cronbach's alpha test will be used to measure the reliability, whereas Composite Reliability (CR) and Average Variance Extracted (AVE) will be used to estimate the construct validity of the instrument. Descriptive statistics and correlation analysis will be used to examine the relationship between the variables. Regression analysis and PLS-SEM technique will be used to test hypotheses and mediating effect. SPSS and SmartPLS computer programs, which are very common in entrepreneurship and marketing research, will be used for data analysis.

5. Results and Analysis

Respondent Profile

There was a total of 312 valid questionnaires returned from the founders, marketing managers, and executives of digital native startups. Concerning the age of the start-ups, 28.2% of companies had been established for less than two years, 41.7% of companies had been operating for 2-5 years, while 30.1% of companies had been operating for more than five years. Regarding the industry profile, e-commerce was the dominant industry with 26.3%, followed by software as a service with 22.4%, FinTech with 17.6%, EdTech with 14.7%, HealthTech with 9.9%, and other industries with 9.1%. Most of the start-up companies had fewer than 50 employees (63.8%), while 24.7% of companies had 51-100 employees, and 11.5% of companies had more than 100 employees. Concerning the founders' experience, 37.5% of founders had less than five years of entrepreneurial experience, 44.2% of founders had 5-10 years of entrepreneurial experience, and 18.

Reliability and Validity Analysis

Table 1: Reliability and validity assessment

Construct	Cronbach's Alpha	CR	AVE
Content Quality	0.874	0.903	0.652
Customer Engagement	0.891	0.918	0.692
Influencer Marketing	0.856	0.887	0.663
Social Media Advertising	0.842	0.879	0.644
Community Building	0.882	0.912	0.675
Customer Acquisition	0.903	0.926	0.705
Brand Equity	0.918	0.939	0.721

The required cutoff for Cronbach's Alpha and Composite Reliability is ≥ 0.70 , and for AVE ≥ 0.50 , constructs fulfilled these criteria, thus indicating acceptable reliability and convergent validity are shown in table 1.

Descriptive Statistics

Table 2: Descriptive statistics

Variable	Mean	SD
Social Media Marketing Strategies	4.08	0.61
Customer Acquisition	3.96	0.67
Brand Equity	4.02	0.64

Table 2 shows respondents believe there is high level of effectiveness in social media marketing and its ability to grow customer base as well as build brand equity.

Correlation Analysis

Table 3: Correlation matrix

Variables	SMMS	CA	BE
Social Media Marketing Strategies (SMMS)	1.000	0.721**	0.683**
Customer Acquisition (CA)	0.721**	1.000	0.756**
Brand Equity (BE)	0.683**	0.756**	1.000

$p < 0.01$

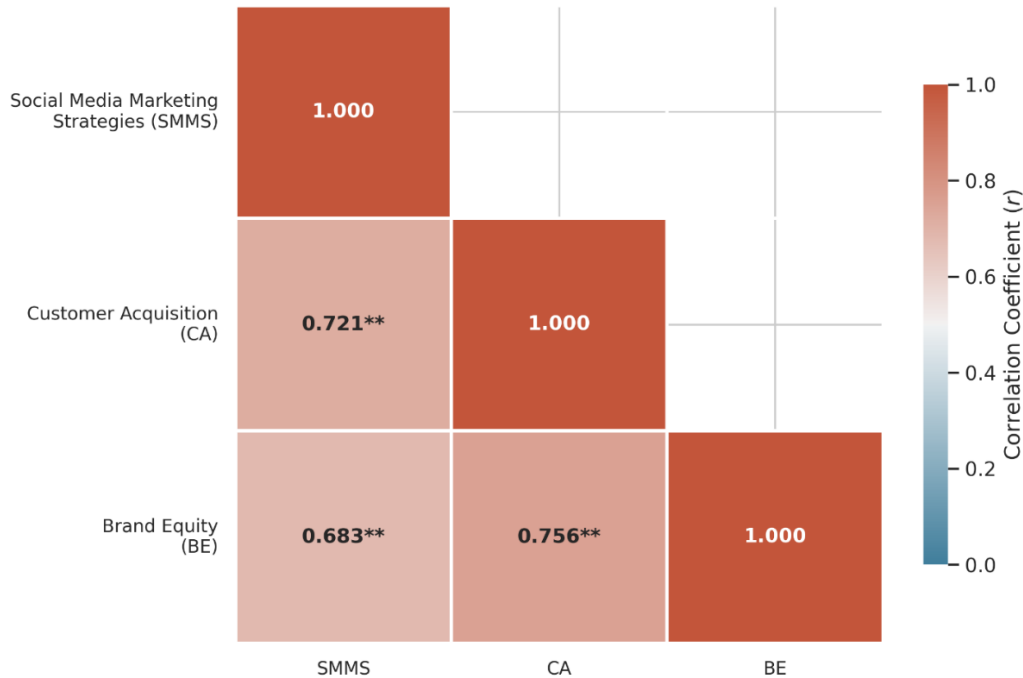


Fig. 2: Correlation matrix of social media marketing strategies, customer acquisition, and brand equity

The results of the analysis displayed strong positive relationship between the Social Media Marketing Strategies (SMMS), and both Customer Acquisition (CA) and Brand Equity (BE) are shown in table 3. It appeared that customer acquisition had a more pronounced positive impact on brand equity ($r = 0.756$), than SMMS and customer acquisition ($r = 0.721$). And SMMS and brand equity ($r = 0.683$), with the latter being strongest of them all as can be seen in fig. 2. From this, it could be gathered that adequate SMMS can foster and boost customer acquisition and consequently positively contribute to the company's brand equity as well in digital-native startups.

There were statistically significant positive correlations across all variables of the study indicating a positive relationship between customer acquisition and social media marketing; the positive relationship between customer acquisition and social media marketing; and brand equity and social media marketing.

Hypothesis Testing

Table 4: Direct effects and hypothesis testing

Hypothesis	Relationship	β	t-value	p-value	Decision
H1	SMMS $\rightarrow$ Customer Acquisition	0.721	15.284	<0.001	Supported
H2	SMMS $\rightarrow$ Brand Equity	0.438	7.921	<0.001	Supported
H3	Customer Acquisition $\rightarrow$ Brand Equity	0.487	8.614	<0.001	Supported

Table 4 indicate that social media marketing strategies significantly influence customer acquisition and brand equity. Customer acquisition also exerts a significant positive effect on brand equity.

H4: Mediation Effect

Table 5: Mediation analysis

Path	Indirect Effect (β)	t-value	p-value	Result
SMMS $\rightarrow$ CA $\rightarrow$ BE	0.351	6.537	<0.001	Supported

The indirect effect is significant, confirming that customer acquisition partially mediates the relationship between social media marketing strategies and brand equity are illustrated by table 5.

Structural Model Results

Table 6: Structural model assessment

Relationship	Path Coefficient (β)	t-value	p-value	Effect Size (f^2)
SMMS $\rightarrow$ Customer Acquisition	0.721	15.284	<0.001	0.612
SMMS $\rightarrow$ Brand Equity	0.438	7.921	<0.001	0.244
Customer Acquisition $\rightarrow$ Brand Equity	0.487	8.614	<0.001	0.301

Table 7: Coefficient of determination (R^2)

Endogenous Variable	R^2
Customer Acquisition	0.520
Brand Equity	0.694

Table 6 and 7 shows that there is a very high level of explanatory power, as seen from the 52.0% of the variance in customer acquisition explained by social media marketing strategies. The two constructs combined can explain 69.4% of the variance in brand equity. The above empirical results are very strong to indicate the important role played by social media marketing in driving customer acquisition and brand equity.

6. Discussion, Implications, and Recommendations

It becomes obvious from the results obtained that the strategies used for social media marketing play a very important role in the success of customer acquisition and brand equity development within digital-born startups. As there is a positive correlation between social media marketing and customer acquisition, it is possible to state that through the creation of quality content, customer interaction, influencer collaboration, social media advertisement and community development, startups will be able to attract and acquire new customers. In addition, due to social media marketing, brand equity may be increased in startups by such components as brand awareness, brand quality and customer loyalty. The considerable mediation effect of customer acquisition shows that brand value may be increased through customer acquisition.

From a theoretical perspective, these outcomes prove the validity of Resource-Based View and Dynamic Capability Theory because social media capabilities serve as valuable strategic assets that contribute to the competitiveness and entrepreneurial development of startups. Practically speaking, the owners of startups and marketing managers are expected to pay attention to analytics-driven social media marketing that involves the development of customer communities, and not only promotions. Incubators and accelerators can also be helpful for startups by teaching them how to perform digital marketing and analytics.

Based on the above information, it is recommended that the startups born within digital generations should pay special attention to content generation, advertisements, influencer marketing, and engagement with their customers. It is essential to keep track of social media metrics and feedback from customers in order to maximize marketing efficiency. The success of future entrepreneurs will rely upon the use of social media channels for both acquiring customers as well as building brand equity and market competitiveness.

7. Conclusion

The objective of this research was to determine the impact of using social media marketing strategy on customer acquisition and brand equity of the digital native enterprises. There is a lot of empirical evidence provided in this research that proves the point that social media marketing strategy can be considered as one of the drivers for entrepreneurship in digital settings. Social media marketing strategy was theoretically conceptualized into five dimensions: Content, customer engagement, influencer marketing, social media advertising, and community building. Statistical results revealed a strong relationship among the studied variables. It has been found out that the application of social media marketing strategy had a significant effect on customers' acquisition ($\beta = 0.721$, $p < 0.001$) and its significant direct effect on the brand equity ($\beta = 0.438$, $p < 0.001$). The customers' acquisition has been observed to have a significant effect on the creation of brand equity ($\beta = 0.487$, $p < 0.001$). Mediation analysis revealed that customers' acquisition plays a mediating role between the application of social media marketing strategy and brand equity and has a significant indirect effect ($\beta = 0.351$, $p < 0.001$). Structural model demonstrated significant explanatory power by explaining 52.0% variance in customers' acquisition ($R^2 = 0.520$) and 69.4% in brand equity ($R^2 = 0.694$). The findings generated by the study indicate the importance of social media marketing strategy in the ability of startups to obtain customers and build brand equity to achieve sustainable growth despite resource constraints. The research adds to the entrepreneurship and digital marketing literature by providing a holistic approach to studying the impact of social media marketing on customer acquisition and brand equity among digital-native startups. Future research might consider examining the effects of social media marketing strategy over time, cross-country/cross-industry analysis and the effect of novel technology solutions such as artificial intelligence, social commerce and predictive analytics on startup marketing.

References

- [1] Almousa, M. (2023). Apparel mass customization digital natives: New insights into development and technology implementation. *International Journal of Marketing Studies*, 15(2), 61. <https://doi.org/10.5539/ijms.v15n2p61>
- [2] Baidya, R., Lal, R., & Rena, R. (2024). Digital Competency Assessment and Data-Driven Performance Management for Start-Ups. In *Data-Driven Modelling and Predictive Analytics in Business and Finance* (pp. 203-234). Auerbach Publications. <https://doi.org/10.1201/9781032618845-13>
- [3] Buschow, C. (2020). Why do digital native news media fail? An investigation of failure in the early start-up phase. *Media and communication*, 8(2), 51-61. <https://doi.org/10.17645/mac.v8i2.2677>
- [4] Iqbal, A., Khan, S. A., Abbasi, M. T., Ismail, F., & Khan, J. (2024). The Digital Echo: The Influence of Digital Marketing Channels on Brand Awareness and Consumer Purchase Decisions. *Research Journal for Societal Issues*, 6(3), 134-155. <https://doi.org/10.56976/rjsi.v6i3.2>
- [5] Johnson, D. S., Muzellec, L., Sihi, D., & Zahay, D. (2019). The marketing organization's journey to become data-driven. *Journal of Research in Interactive Marketing*, 13(2), 162-178. <https://doi.org/10.1108/JRIM-12-2018-0157>
- [6] Kopalle, P. K., Kumar, V., & Subramaniam, M. (2020). How legacy firms can embrace the digital ecosystem via digital customer orientation. *Journal of the Academy of Marketing Science*, 48(1), 114-131. <https://doi.org/10.1007/s11747-019-00694-2>
- [7] Naidu, N. S., & Aithal, R. (2025). 14. Sustainable Development Goals and marketing at the bottom of the pyramid. *The Elgar Companion to Marketing and the Sustainable Development Goals*, 235-249. <https://doi.org/10.4337/9781035328208.00024>
- [8] Nathaniel Carr, B. (2008). Paths to marketing's future: a sub-first tier GATORE principle perspective. *European Journal of Marketing*, 42(11-12), 1145-1155. <https://doi.org/10.1108/03090560810903592>

- [9] Pisoni, G. (2021). Going digital: case study of an Italian insurance company. *Journal of Business Strategy*, 42(2), 106-115. <https://doi.org/10.1108/JBS-11-2019-0225>
- [10] Prabowo, B. A., Satato, Y. R., Nurmeidy, A. R., Bernike, E., & Sugiarto, K. E. (2024). English Language Hegemony in Digital Marketing Contents in Indonesia. *E-Structural (English Studies on Translation, Culture, Literature, and Linguistics)*, 7(02), 95-111. <https://doi.org/10.33633/es.v7i02.11518>
- [11] Ribeiro, L., & Maués, A. (2023, April). Traditional brands vs. born-digital brands: The case of the fashion industry. In *Digital Marketing & eCommerce Conference* (pp. 298-304). Cham: Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-31836-8_29
- [12] Rizaldi, F. M., Suryono, H. G. P., Pradana, M., & Suprayogi, Y. (2025, July). Exploring the Interplay between Social Media Marketing, Entrepreneurial Self-efficacy, and Gen Z Business Performance: An Evidence-based Review. In *2025 5th International Conference on Electrical, Computer and Energy Technologies (ICECET)* (pp. 1-6). IEEE. <https://doi.org/10.1109/ICECET63943.2025.11472451>
- [13] Saleh, Y., & Nurhilalia, N. (2025). Thriving Through Turbulence: How Young Entrepreneurs Leverage Marketing Strategies to Navigate Crises and Digital Disruption. *Golden Ratio of Mapping Idea and Literature Format*, 5(2), 132-140. <https://doi.org/10.52970/grmilf.v5i2.1536>
- [14] Sautel, A., & Pookulangara, S. (2023). Direct-to-Consumer Fashion Brands: The Digitally Native Start-Ups in the Retail Industry. In *Digital Fashion Innovations* (pp. 147-162). CRC Press. <https://doi.org/10.1201/9781003264958-12>
- [15] Silveira, S. C. D., & Ramos, A. N. C. (2022). Sustainability of entrepreneurial journalistic arrangements in Brazil: a study of seven digital-native ones. *Brazilian Journalism Research*, 18, 290-315. <https://doi.org/10.25200/BJR.v18n2.2022.1496>
- [16] Simbolon, F. P., & Yanti, L. (2021). Customer engagement in higher education: How important the role of social media marketing, e-service quality, and e-satisfaction for generation Z students. *The Winners*, 22(1), 15-23. <https://doi.org/10.21512/tw.v22i1.6970>
- [17] Van Crombrugge, M., Breugelmans, E., Breiner, F., & Scheiner, C. W. (2024). Assessing the multichannel impact of brand store entry by a digital-native grocery brand. *Journal of Marketing*, 88(3), 88-109. <https://doi.org/10.1177/00222429231193371>
- [18] Yudhistira, P. G. A., Kurniasari, N. M. D. R., & Setyo, S. P. (2023). The Mediating Role of Social Media Use and Perceived Value between Tourist Knowledge and Tourist Attitudes: A Study on the Digital Native Generation. *Jurnal Manajemen Teori dan Terapan*, 16(3), 491–505. <https://doi.org/10.20473/jmtt.v16i3.46909>