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DIGITAL MARKETING CAPABILITIES AND MARKETING PERFORMANCE OF BIOPRODUCT MSMES IN SOUTH SULAWESI, INDONESIA

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Abstract

Local bioproduct MSMEs play an important role in transforming regional biological resources and local knowledge into economic value and distinctive market offerings. However, their competitiveness increasingly depends on their ability to utilize digital technologies to expand market reach, communicate product value, and differentiate products in increasingly competitive markets. This study aimed to examine the effects of Digital Platform Utilization, Digital Content Management, and Local Value Integration on Marketing Performance and to develop a context-specific digital marketing strategy framework for local bioproduct MSMEs. An exploratory sequential mixed-methods design was employed. The qualitative phase involved 21 MSME actors through in-depth interviews, observation, and document analysis, with data analyzed thematically. The qualitative findings were subsequently used to develop the quantitative instrument, which was administered to 348 MSME respondents. Quantitative data were analyzed using descriptive statistics and multiple linear regression, followed by integration of qualitative and quantitative findings to develop the digital marketing strategy framework. The findings indicate that Digital Platform Utilization, Digital Content Management, and Local Value Integration have positive effects on Marketing Performance, with Digital Content Management emerging as the strongest predictor (β = 0.326), followed by Local Value Integration (β = 0.287) and Digital Platform Utilization (β = 0.214). The regression model explained 48.0% of the variance in Marketing Performance (R^2 = 0.480). The integrated findings resulted in a framework linking digital access, content capability, local-value differentiation, consumer engagement, and performance improvement through continuous improvement. The study contributes to digital marketing research by positioning local biological resources and local values as strategic sources of differentiation in digital marketing and provides an actionable framework for strengthening the competitiveness of bioproduct MSMEs

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INTRODUCTION

Local bioproduct MSMEs play an important role in transforming regional biological resources and local knowledge into economic value and distinctive market offerings (Chauhan et al., 2023). Their products may provide not only economic benefits

but also reflect the biological, ecological, and cultural characteristics of the regions in which they are produced. These characteristics create opportunities for MSMEs to differentiate their products and respond to growing consumer interest in authenticity, local identity, and sustainability. However, the existence of distinctive local resources does not automatically generate market advantage. MSMEs need appropriate capabilities to communicate product value, reach consumers, and maintain meaningful market relationships, particularly as consumer behavior and market competition increasingly shift toward digital environments (Novitasari et al., 2025; N. P. N. P. Wijaya & Padmanegara, 2021).

Digital transformation has fundamentally reshaped how Micro, Small, and Medium-sized Enterprises (MSMEs) reach, interact with, and create value for consumers (Barman & Mahanta, 2025; Novitasari et al., 2025). The rapid expansion of social media, online marketplaces, and diverse e-commerce platforms has created new opportunities for MSMEs to extend their market reach, establish two-way communication with consumers, and enhance marketing performance (N. P. N. P. Wijaya & Padmanegara, 2021). Digital marketing has evolved beyond its role as a supplementary promotional channel and has increasingly become an integral component of MSMEs' business strategies in responding to changing consumer behavior and increasingly dynamic market competition (Hashim et al., 2024; Hernita & Ginanjar, 2021; Ravindran et al., 2023). However, disparities in digital capabilities and competencies mean that many MSME actors continue to adopt digital platforms in an adaptive and limited manner, while the management of digital content, utilization of consumer information, and measurement of marketing effectiveness remain suboptimal (Buaprommee et al., 2025; Christian et al., 2024; Pradhan et al., 2020) .

MSMEs producing bioproducts based on local potential have distinctive characteristics that differentiate them from conventional MSMEs, as their products not only possess economic value but also represent the biological resources, ecological characteristics, and local knowledge of a particular region (Chauhan et al., 2023). In this study, local bioproducts refer to MSME products whose raw materials, production processes, product identity, or value propositions are substantially derived from biological resources and knowledge associated with a particular region. These products may include food products, natural-based cosmetics, and simple biotechnology products that utilize local biological resources as part of their production processes or inputs. Such potential provides MSMEs with opportunities to establish distinctive product identities and develop unique market appeal, particularly as consumers increasingly consider authenticity, local identity, and sustainability when making purchasing decisions (Gao et al., 2023). However, local potential does not automatically translate into competitive advantage unless it can be communicated effectively to consumers. In the context of digital marketing, the characteristics of local raw materials, production processes, ecological values, and cultural narratives embedded in these products need to be transformed into information and narratives that are accessible, meaningful, and appealing to consumers (Ahmad, 2024; Megat et al., 2024; Nasution et al., 2025; Wang, 2019) .

From a strategic management perspective, the Resource-Based View (RBV) provides a relevant theoretical lens for understanding how these characteristics may contribute to MSME competitiveness. RBV emphasizes that resources can become sources of sustained competitive advantage when they are valuable, distinctive, and strategically leveraged (Cuijten et al., 2024). In the context of local bioproduct MSMEs, biological resources, local knowledge, ecological characteristics, and cultural identity

can represent context-specific resources that are difficult to replicate when effectively embedded in product development and market communication (Alamsjah et al., 2017; Feitosa et al., 2021; Laurens et al., 2015; Tkachuk et al., 2025). However, resources alone are insufficient to create competitive value; MSMEs also require capabilities to mobilize, combine, and communicate these resources in ways that are meaningful to consumers(Puspita et al., 2021). Digital marketing therefore provides an important mechanism through which local resources can be transformed into visible product value and market differentiation.

Despite these opportunities, digital marketing adoption among local bioproduct MSMEs remains uneven. The challenge is not simply whether MSMEs use social media, marketplaces, or other digital platforms, but whether they possess the capabilities to manage digital content, understand consumer responses, and translate product characteristics into persuasive digital communication. Existing studies indicate that some MSMEs continue to treat digital marketing primarily as a promotional activity, while the strategic use of digital content, consumer information, and digital data remains limited (Haryanto & Sultoni, 2024; Novitasari et al., 2025; Sudirman et al., 2025). For local bioproducts, this challenge is particularly important because product differentiation may depend on communicating the origin of biological resources, production practices, ecological attributes, and local cultural meanings. When these characteristics are not translated into informative, engaging, and authentic digital narratives, the distinctive value of local bioproducts may remain invisible to consumers (Cuijten et al., 2024).

Although research on digital marketing among MSMEs has expanded substantially, three important gaps remain. First, a contextual gap exists because many studies examine MSMEs as a general business category (Purba et al., 2021; Puspita et al., 2021), providing limited attention to MSMEs whose products are rooted in local biological resources and knowledge. Second, an integrative gap remains because previous studies have often examined digital platform adoption or digital promotion separately (Fareed & Tantawi, 2022; Kosasi & Yuliani, 2017), while the combined roles of platform utilization, digital content management, and local value integration in bioproduct marketing remain insufficiently examined. Third, a methodological gap persists because predominantly quantitative studies (Gao et al., 2023; Puspita et al., 2021) provide limited insight into how MSME actors actually develop digital marketing practices and translate local biological and cultural characteristics into digital value propositions. Addressing these gaps requires an approach that connects the lived practices of MSME actors with quantitative evidence of the relationships between digital marketing capabilities and marketing performance.

Based on this research gap, the present study proposes an integrated perspective that conceptualizes digital platform utilization, digital content management, and local value integration as three dimensions of digital marketing strategy for explaining marketing performance among local bioproduct MSMEs. Unlike previous studies that have predominantly examined digital marketing among MSMEs in general, this study specifically focuses on bioproducts rooted in local potential, thereby incorporating the characteristics of biological resources, ecological values, and local identity as integral elements of digital marketing communication strategies. Accordingly, this study aims to: (1) identify and analyze digital marketing practices adopted by local bioproduct MSMEs (2) examine the relationships of Digital Platform Utilization, Digital Content Management, and Local Value Integration with Marketing Performance, both individually and simultaneously and (3) integrate qualitative and quantitative findings

to develop an empirical, context-specific, and actionable framework for digital marketing among local bioproduct MSMEs.

RESEARCH METHODS

Research Design

This study employed a mixed-methods approach using an exploratory sequential design, in which qualitative and quantitative phases were conducted sequentially and complementarily (Cohen et al., 2018). The first phase adopted a qualitative approach to explore in depth the digital marketing strategies employed by MSMEs producing and marketing bioproducts based on local potential, including digital platform utilization, marketing content management, integration of local potential values, and the challenges encountered in implementing digital marketing. The qualitative findings subsequently served as the basis for developing the indicators and research instrument for the quantitative phase. The second phase employed a quantitative survey to examine the effects of digital platform utilization, digital content management, and local value integration on marketing performance. Quantitative data were analyzed using descriptive statistics and multiple linear regression to assess the partial and simultaneous effects among the variables. Finally, the qualitative and quantitative findings were integrated to provide a more comprehensive understanding and to inform the development of an empirical, context-specific, and actionable digital marketing strategy framework for local bioproduct MSMEs.

Research Context, Population, and Participants

This study was conducted among MSMEs producing and/or marketing local bioproducts based on regional biological resources in South Sulawesi, Indonesia. The quantitative participants were selected using purposive sampling based on predefined inclusion criteria. The criteria were: (1) the participant was an owner, manager, or operator of an MSME; (2) the MSME produced and/or marketed bioproducts based on local biological resources or regional potential; and (3) the participant had experience using digital media or digital platforms for marketing activities. The quantitative population comprised 2,677 MSMEs producing and/or marketing local bioproducts in South Sulawesi. The sample size was determined using the Slovin formula with a 5% margin of error, resulting in 348 respondents [$n, = 2677/(1, +2677(0.05)^2) = 347.98 \approx 348$]. Participants were selected purposively based on three criteria: MSME owner/manager/operator status, involvement in producing or marketing local bioproducts, and experience using digital platforms for marketing. The qualitative phase involved 21 MSME actors selected for in-depth interviews, observation, and document analysis.

Qualitative Phase: Data Collection and Analysis

The qualitative phase was conducted as the initial exploratory stage of the exploratory sequential mixed-methods design to obtain an in-depth understanding of digital marketing practices among local bioproduct MSMEs. A total of 21 MSME actors were selected as participants based on their relevance to the study and their involvement in producing and/or marketing bioproducts derived from local potential. Data were collected through in-depth interviews, observation, and document analysis. In-depth interviews explored the participants' experiences and strategies in utilizing digital platforms, managing marketing content, engaging with consumers, and integrating local potential into product communication. Observations focused on

digital marketing activities, including the use of social media and online marketplaces, while document analysis was conducted to examine the forms and characteristics of marketing content published by the MSMEs. Qualitative data were analyzed using thematic analysis through data reduction, coding and categorization, theme identification, data presentation, and conclusion drawing to identify patterns in digital marketing strategies, implementation challenges, and forms of local-potential integration in bioproduct marketing. The exploration of the 21 participants generated empirical themes and indicators that subsequently served as the basis for developing the quantitative research instrument.

The credibility of the qualitative findings was strengthened through methodological triangulation by comparing information obtained from in-depth interviews, observations, and document analysis. Interview findings were compared with observed digital marketing practices and the marketing materials produced by the participating MSMEs. The consistency of information across these sources was examined during the thematic analysis to strengthen the credibility of the identified themes.

Development of the Quantitative Instrument

The quantitative instrument was developed based on the findings from the qualitative exploration to ensure that the indicators adequately represented the empirical conditions of digital marketing among local bioproduct MSMEs. Instrument development involved identifying themes and categories emerging from interviews, observations, and document analysis involving 21 participants and subsequently translating these findings into measurement indicators for the study constructs. The instrument comprised three independent variables: digital platform utilization, digital content management, and local value integration, and one dependent variable: marketing performance. Marketing performance was assessed through the dimensions of market reach, consumer engagement, and sales improvement (Supriaddin et al., 2025), Before being administered in the main data collection, the instrument underwent validity and reliability testing to ensure adequate measurement quality for each construct.

Quantitative Phase: Survey and Data Analysis

The quantitative phase was conducted to empirically examine the effects of digital marketing strategies on marketing performance among local bioproduct MSMEs. Data were collected through a structured questionnaire survey administered to 348 MSME actors who met the study criteria. The questionnaire measured three dimensions of digital marketing strategy as independent variables: digital platform utilization (X1), digital content management (X2), and local value integration (X3), with marketing performance (Y) as the dependent variable, represented by market reach, consumer engagement, and sales improvement. The collected data were first analyzed using descriptive statistics to characterize each research variable, followed by instrument quality assessment through validity and reliability testing prior to inferential analysis. Subsequently, multiple linear regression was employed to examine the effects of X1, X2, and X3 on Y. The regression model was used to determine the contribution of each digital marketing strategy dimension to marketing performance, while statistical significance was assessed using t-tests for partial effects, an F-test for simultaneous effects, and the coefficient of determination (R^2) to determine the model's explanatory power for variations in marketing performance.

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The quantitative findings were subsequently integrated with the qualitative results as a key step in formulating an empirical, context-specific, and actionable digital marketing strategy framework for local bioproduct MSMEs.

Hypothesis Testing

Hypothesis testing was conducted to examine the effects of each digital marketing strategy dimension on *marketing performance* among local bioproduct MSMEs. Inferential analysis employed multiple linear regression, with *digital platform utilization* (X1), *digital content management* (X2), and *local value integration* (X3) as the independent variables and *marketing performance* (Y) as the dependent variable. The partial effects of each independent variable on *marketing performance* were assessed using t-tests, with H1 examining the effect of *digital platform utilization*, H2 examining the effect of *digital content management*, and H3 examining the effect of *local value integration*. Subsequently, an F-test was used to assess H4, namely whether the three dimensions of digital marketing strategy jointly have a significant effect on *marketing performance*. The coefficient of determination (R^2) was used to determine the proportion of variance in *marketing performance* explained by the three digital marketing strategy dimensions included in the model. Hypothesis decisions were based on a 5% significance level ($\alpha = 0.05$), with a hypothesis considered supported when the significance value was below 0.05 and the regression coefficient was consistent with the hypothesized direction of the relationship. The proposed hypothesis framework is presented in Figure 1.

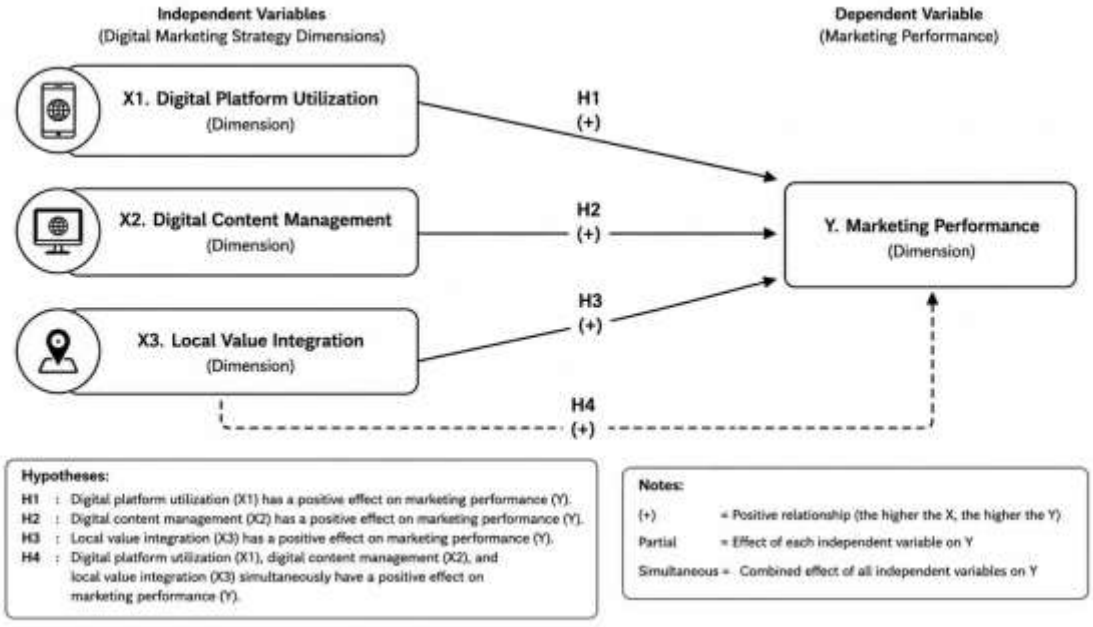


Figure 1. Framework Hypothesis

Mixed-Methods Integration and Framework Development

The qualitative and quantitative findings were integrated to develop a comprehensive understanding of digital marketing strategies among *local bioproduct MSMEs*. Findings from 21 qualitative participants provided contextual insights into actual practices involving digital platform utilization, marketing content management, and the integration of local potential values into marketing activities. These findings were subsequently triangulated with quantitative evidence from 348 respondents, particularly the empirical relationships between *digital platform utilization, digital*

content management, and *local value integration* and *marketing performance*. The integration process involved systematically comparing qualitative themes with quantitative patterns to contextualize the statistical findings within the actual marketing practices of MSMEs. This integration served as the basis for developing a digital marketing strategy framework that captures the key strategic components, their interrelationships, and their implications for *marketing performance*. The resulting framework is intended to provide an empirically grounded, context-specific, and actionableapproach for strengthening market reach, consumer engagement, and sales improvement among local bioproduct MSMEs.

RESULTS

Characteristics of Respondents

Berdasarkan Based on the distribution of the 348 respondents, the sample demonstrated considerable diversity in both demographic and business characteristics. Female respondents constituted a slightly larger proportion of the sample, while most respondents were within the productive age range, particularly 25–44 years. In terms of educational attainment, senior secondary and bachelor's degree holders represented the largest groups. Regarding business experience, most respondents had operated their businesses for more than five years, with the 6–10-year category representing the largest proportion. This profile indicates that the sample predominantly comprised experienced MSME actors with sufficient exposure to business operations and market development.

In terms of business scale, the sample was dominated by micro-scale enterprises employing 1–4 workers, followed by enterprises with 5–9 employees. The distribution of business locations was relatively balanced between urban and rural areas, providing variation in the operating contexts of the participating MSMEs. This balance is particularly relevant for examining digital marketing practices because access to markets, consumers, and digital infrastructure may differ across geographical settings. The relatively high representation of experienced business owners also provides an appropriate context for assessing how digital marketing strategies are incorporated into established business activities.

Regarding digital marketing experience, most respondents had used digital marketing for more than one year, with the largest group reporting 4–6 years of experience, followed by those with 1–3 years of experience. Only a relatively small proportion had less than one year of digital marketing experience. Overall, the respondent profile indicates a heterogeneous sample in terms of demographic characteristics, business maturity, workforce size, geographical location, and digital marketing experience. This diversity provides a useful empirical context for examining how Digital Platform Utilization, Digital Content Management, and Local Value Integration relate to the Marketing Performance of local bioproduct MSMEs.

Table 1. Demographic Characteristics of Respondents (n = 348)

Characteristics	Category	n	%
Gender	Male	157	45.1
	Female	191	54.9
Age	<25 years	38	10.9
	25–34 years	96	27.6
	35–44 years	108	31.0
	45–54 years	72	20.7
	≥55 years	34	9.8
Education	Primary/Junior Secondary	42	12.1

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Characteristics	Category	n	%
	Senior Secondary	126	36.2
	Diploma	38	10.9
	Bachelor's Degree	118	33.9
	Postgraduate	24	6.9
Business Experience	<3 years	62	17.8
	3–5 years	83	23.9
	6–10 years	109	31.3
	>10 years	94	27.0
Number of Employees	1–4	213	61.2
	5–9	91	26.1
	10–19	32	9.2
	≥20	12	3.4
Business Location	Urban	181	52.0
	Rural	167	48.0
Digital Marketing Experience	<1 year	51	14.7
	1–3 years	104	29.9
	4–6 years	113	32.5
	>6 years	80	23.0
Total		**348**	**100.0**

Qualitative Findings

The qualitative analysis was conducted systematically to ensure traceability between the empirical data and the research constructs (Table 2). Interview data were initially subjected to initial coding to identify meaningful units related to participants' experiences and digital marketing practices. Codes with similar meanings were then compared and grouped through focused coding to develop more conceptually meaningful categories. These categories were subsequently examined to identify overarching themes representing the digital marketing strategies of MSMEs. The analysis generated three main themes: Digital Platform Utilization, Digital Content Management, and Local Value Integration. These themes were subsequently operationalized into the quantitative constructs X1, X2, and X3. Thus, the coding process served not merely to describe participants' experiences but also as an empirical bridge between qualitative exploration and quantitative instrument development, consistent with the principles of an exploratory sequential mixed-methods design.

The first theme, Digital Platform Utilization (X1), reflects how MSME actors employ multiple digital channels to support their marketing activities. P03 stated, *"We do not only use WhatsApp, but also Instagram and marketplaces..."*, which generated the initial code using multiple platforms, followed by the focused code multi-platform use and the category platform diversification. This finding indicates a tendency among MSMEs to employ multiple platforms as part of their digital marketing strategy. Similarly, P07 explained, *"Instagram is very helpful because we can display product photos and videos..."*, generating the codes using Instagram, social media use, and social media utilization. This demonstrates the role of social media in communicating product information through visual content. Marketplace utilization was reflected in P12's statement, *"After joining the marketplace, customers from outside the region began to purchase..."*, which was categorized as marketplace utilization. P18 further reported, *"Orders started coming from outside the region after using social media,"* supporting the category digital market expansion. Overall, this theme indicates

that digital platforms function as channels for marketing diversification, product communication, marketplace access, and market expansion.

The second theme, Digital Content Management (X2), captures the ability of MSMEs to organize and communicate product-related information through digital content. P05 stated, *"We try to explain the materials used and the benefits of the product..."*, generating the initial code explaining product information, focused code informative content, and category product information. This finding indicates that product characteristics and benefits constitute important elements of digital marketing communication. P11 emphasized the importance of visual presentation by stating, *"Photos and videos need to be made more attractive..."*, resulting in the codes attractive visual content, visual attractiveness, and content attractiveness. However, maintaining content consistency remains a challenge, as reflected in P09's statement, *"We do not always have time to create content regularly..."*, which generated the category content consistency. In addition, P16 explained, *"We usually tell the story of how the product is made and where the raw materials come from..."*, reflecting story-based content and the use of product storytelling. Collectively, these findings indicate that Digital Content Management encompasses product information, visual appeal, content consistency, and storytelling.

The third theme, Local Value Integration (X3), demonstrates how local values are incorporated into the digital marketing communication of bioproducts. P02 stated, *"The main ingredients of our products come from plants that are widely found in this area..."*, generating the codes local biological materials, local resource utilization, and local biological resources. This finding suggests that local biological resources function not only as production inputs but also as elements of product identity communicated to consumers. P14 stated, *"We always mention the origin of the product..."*, generating the category local identity, indicating that geographical origin is used to strengthen product identity. Cultural value was reflected in P20's statement, *"The processing method still follows the method taught by our parents..."*, which generated the category cultural value. Ecological value emerged from P06's emphasis on locally sourced materials, while P19 highlighted the role of local narratives by stating, *"The story of the product's origin becomes part of the promotion..."*, generating the category local storytelling. These findings demonstrate that biological resources, geographical identity, cultural heritage, ecological values, and local stories can collectively function as distinctive elements in digital marketing communication.

Overall, the coding process demonstrates that the three themes are conceptually distinct yet complementary. Digital Platform Utilization addresses *where and through which channels* products are marketed, Digital Content Management explains *how product information and value are communicated*, while Local Value Integration captures *which distinctive local values are embedded in the communication*. These three themes were subsequently transformed into the quantitative constructs X1, X2, and X3, which were examined in relation to Marketing Performance (Y) in the quantitative phase. The qualitative findings therefore provided an empirical foundation for instrument development while establishing a conceptual link between the exploration of actual digital marketing practices and subsequent hypothesis testing. This integration is consistent with the exploratory sequential design, in which qualitative findings inform the development and empirical testing of the subsequent quantitative phase.

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Table 2. Thematic Coding of the Qualitative Phase

Statements	Initial Code	Focused Code	Category	Main Theme	Quantitative Construct
"We do not only use WhatsApp, but also Instagram and marketplaces..." (P03)	Using multiple platforms	Multi-platform use	Platform diversification	Digital Platform Utilization	X1
"Instagram is very helpful because we can display product photos and videos..." (P07)	Using Instagram	Social media use	Social media utilization	Digital Platform Utilization	X1
"After joining the marketplace, customers from outside the region began to make purchases..." (P12)	Marketplace expands customers	Marketplace use	Marketplace utilization	Digital Platform Utilization	X1
"Orders started coming from outside the region after using social media." (P18)	Customers outside region	Market expansion	Digital market expansion	Digital Platform Utilization	X1
"We try to explain the materials used and the benefits of the product..." (P05)	Explaining product information	Informative content	Product information	Digital Content Management	X2
"Photos and videos need to be made more attractive..." (P11)	Attractive visual content	Visual attractiveness	Content attractiveness	Digital Content Management	X2
"We do not always have time to create content regularly..." (P09)	Irregular content creation	Content consistency challenge	Content consistency	Digital Content Management	X2
"We usually tell the story of how the product is made and where its raw materials come from..." (P16)	Telling product story	Product storytelling	Story-based content	Digital Content Management	X2
"The main ingredients of our products come from plants that are widely found in this area..." (P02)	Local biological materials	Local resource utilization	Local biological resources	Local Value Integration	X3
"We always mention the origin of the product..." (P14)	Communicating local origin	Local identity communication	Local identity	Local Value Integration	X3
"The processing method still follows the method taught by our parents..." (P20)	Traditional production	Cultural heritage	Cultural value	Local Value Integration	X3
"We also explain that the materials used come from local sources..." (P06)	Environmental responsibility	Ecological value communication	Ecological value	Local Value Integration	X3
"The story of the product's origin becomes part of our promotion..." (P19)	Product origin story	Local storytelling	Local storytelling	Local Value Integration	X3

Development and Validation of the Quantitative Instrument

Based on the qualitative exploration of 21 participants, a quantitative instrument was developed to measure three dimensions of digital marketing strategy: Digital Platform Utilization (X1), Digital Content Management (X2), and Local Value Integration (X3), along with Marketing Performance (Y) as the dependent construct. The instrument comprised 18 items, including five indicators for each of the X1, X2, and X3 constructs and three indicators for Y. The instrument was subsequently tested using data from 348 respondents to evaluate item characteristics and the internal consistency of each construct (Table 3).

The results showed that the mean scores across all items ranged from 3.698 to 3.902, while the standard deviations ranged from 0.918 to 1.145. For Digital Platform Utilization (X1), mean scores ranged from 3.698 to 3.848, with corrected item–total correlations ranging from 0.328 to 0.637. Item X1.4 demonstrated the highest item–

total correlation, whereas X1.5 showed the lowest. The Cronbach's alpha of 0.812 indicated good internal consistency across the five X1 indicators.

For Digital Content Management (X2), mean scores ranged from 3.733 to 3.897, while corrected item–total correlations ranged from 0.546 to 0.844. X2.1 exhibited the highest item–total correlation, whereas X2.2 had the lowest. The construct yielded a Cronbach's alpha of 0.716, indicating an acceptable level of internal consistency for an exploratory study. Although lower than that of X1, all items demonstrated positive correlations with the construct being measured.

For Local Value Integration (X3), mean scores ranged from 3.701 to 3.902, with corrected item–total correlations ranging from 0.332 to 0.853. X3.1 demonstrated the highest item–total correlation, while X3.2 showed the lowest. The Cronbach's alpha of 0.684 indicated adequate internal consistency. These findings suggest that the indicators derived from the themes of local biological resources, local identity, cultural value, ecological value, and local storytelling were sufficiently related to the Local Value Integration construct.

Meanwhile, Marketing Performance (Y) comprised three indicators, with mean scores ranging from 3.822 to 3.882 and standard deviations ranging from 0.918 to 0.974. Corrected item–total correlations ranged from 0.335 to 0.590, with Y1 showing the highest correlation and Y3 the lowest. The construct yielded a Cronbach's alpha of 0.734, indicating good internal consistency and supporting the use of the three indicators to measure Marketing Performance.

Table 3. Validity and Reliability Instrumen

Construct	Item	Mean	SD	Corrected Item–Total Correlation	Cronbach's α
Digital Platform Utilization (X1)	X1.1	3.845	1.024	0.462	0.812
	X1.2	3.810	1.115	0.545	
	X1.3	3.848	1.101	0.532	
	X1.4	3.764	1.145	0.637	
	X1.5	3.698	1.138	0.328	
Digital Content Management (X2)	X2.1	3.897	1.030	0.844	0.716
	X2.2	3.776	1.090	0.546	
	X2.3	3.845	1.105	0.653	
	X2.4	3.799	1.113	0.613	
	X2.5	3.733	1.079	0.736	
Local Value Integration (X3)	X3.1	3.764	1.117	0.853	0.684
	X3.2	3.701	1.109	0.332	
	X3.3	3.902	0.952	0.550	
	X3.4	3.853	0.926	0.353	
	X3.5	3.876	0.923	0.469	
Marketing Performance (Y)	Y1	3.871	0.962	0.590	0.734
	Y2	3.882	0.918	0.480	
	Y3	3.822	0.974	0.335	

Note. *n* = 348. SD = standard deviation. Corrected item–total correlations were calculated against the remaining items within each construct.

Quantitative Findings

The results indicate that all three dimensions of digital marketing strategy are positively associated with Marketing Performance (Table 4). Digital Platform Utilization demonstrated a positive correlation with Marketing Performance ($r = 0.512$) and a significant positive regression coefficient ($\beta = 0.214$, $p < 0.001$), supporting H1. Digital Content Management exhibited the strongest correlation with Marketing Performance ($r = 0.624$) and the largest regression coefficient in the model ($\beta = 0.326$, $p < 0.001$),

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supporting H2. Local Value Integration also showed a positive correlation with Marketing Performance (r = 0.583) and a significant positive regression coefficient (β = 0.287, p < 0.001), supporting H3.

Collectively, the three predictors produced a statistically significant regression model (F (3, 344) = 97.68, p < 0.001), with R^2 = 0.480 and Adjusted R^2 = 0.455. The model therefore explained 4.0% of the variance in Marketing Performance. Thus, H4 was supported. Among the three predictors, Digital Content Management had the strongest regression coefficient, followed by Local Value Integration and Digital Platform Utilizatioen.

Tabel 4. Descriptive Statistics, Correlations, Regression Results, and Hypothesis Testing

Hypothesis / Variable	Mean	SD	r with Y	β	t / F	p-value	Decision
Digital Platform Utilization (X1)	3.793	0.518	0.512***	0.214	4.183	<0.001	H1 Supported
Digital Content Management (X2)	3.810	0.482	0.624***	0.326	6.217	<0.001	H2 Supported
Local Value Integration (X3)	3.820	0.437	0.583***	0.287	5.493	<0.001	H3 Supported
Marketing Performance (Y)	3.858	0.576	—	—	—	—	—
Overall model	—	—	—	—	F (3, 344) = 97.68	<0.001	H4 Supported

Model summary: R = 0.678; R^2 = 0.480; Adjusted R^2 = 0.455; n = 348.
Note. r = Pearson correlation; β = standardized regression coefficient; ***p < 0.001.*

DISCUSSION

The findings demonstrate that Digital Platform Utilization plays an important role in enhancing the *Marketing Performance* of local bioproduct MSMEs. The use of diverse digital platforms, including social media and online marketplaces, provides MSMEs with opportunities to expand their market reach, improve access to consumers, and establish more flexible marketing communication than conventional channels (Herari & Marlina, 2024; N. P. N. P. Wijaya & Padmanegara, 2021). The qualitative findings further support this result through the themes of *multi-platform use, social media utilization, marketplace utilization,* and *digital market expansion*, indicating that digital platforms have evolved from merely promotional channels into strategic infrastructure for expanding market access. In the context of local bioproducts, presence across multiple platforms also enables MSMEs to communicate the characteristics and distinctiveness of their products to consumers beyond their geographic areas of origin, thereby increasing opportunities for market penetration (Rizkita et al., 2025). Accordingly, digital platform utilization can be regarded as a foundational digital marketing capability, particularly when MSMEs are able to integrate multiple channels to broaden consumer reach, enhance product visibility, and establish sustainable market relationships.

Digital Content Management is an important determinant of Marketing Performance among local bioproduct MSMEs. Effective content management enables MSMEs to communicate product characteristics, benefits, ingredients, and competitive attributes more clearly to consumers while enhancing product appeal through the use of photographs, videos, and product storytelling (Walhidayat et al., 2024). The qualitative findings further substantiate this relationship through the categories of *product information, content attractiveness, content consistency,* and *story-based content*, indicating that establishing a digital presence needs to be accompanied by the

ability to deliver marketing messages that are informative, engaging, consistent, and relevant. This capability becomes particularly important because the characteristics of bioproducts and the resources used in their production often require contextual information to help consumers understand their value and benefits (Yiridoe et al., 2015). Therefore, digital content management extends beyond a communication function and represents a strategic capability for translating product characteristics into compelling marketing messages that capture consumer attention.

The relatively lower Cronbach's alpha for Digital Content Management (α = 0.616) should be interpreted in the context of the exploratory nature of this study. The construct was developed from qualitative findings and represents several related aspects of digital content practices, including product information, visual attractiveness, content consistency, and storytelling. The multidimensional characteristics of these practices may contribute to moderate internal consistency while still reflecting theoretically relevant aspects of the construct. Therefore, the reliability result was considered acceptable for the exploratory stage of construct development and should be interpreted together with the item-level validity results and the qualitative evidence supporting the construct.

The findings indicate that Local Value Integration constitutes a strategic component in enhancing the *Marketing Performance* of local bioproduct MSMEs. The integration of local biological resources, regional identity, cultural values, ecological values, and *local storytelling* gives products a more distinctive character while strengthening differentiation in marketing communication. The qualitative findings further reinforce this perspective through the categories of *local biological resources, local identity, cultural value, ecological value,* and *local storytelling*, demonstrating that local potential serves not only as a source of raw materials but can also be transformed into meaningful communication value for consumers. Narratives surrounding product origins and local practices enable MSMEs to develop more authentic brand stories, while emphasizing local resources and ecological values can strengthen consumers' perceptions of product uniqueness and distinctiveness (Chauhan et al., 2023).

The findings indicate that Digital Platform Utilization, Digital Content Management, and Local Value Integration should be understood as complementary components in building the marketing performance of local bioproduct MSMEs. Digital platform utilization provides access to markets and opportunities for consumer interaction, content management translates product characteristics and benefits into messages that are accessible and understandable to consumers, while local value integration provides distinctive identity and differentiation that strengthens product positioning (Ali et al., 2024). The qualitative findings support the interrelationship among these three components through the emergence of *multi-platform use, informative content, product storytelling, local biological resources, local identity,* and *local storytelling*. An effective digital marketing strategy therefore requires more than simply increasing an MSME's presence across multiple platforms; it also requires the capability to manage digital communication while leveraging local potential as a source of differentiation. The integration of these three dimensions provides a more context-specific marketing approach for bioproduct MSMEs, in which digital technology functions as a mechanism for market expansion, content serves as an instrument for communicating product value, and local potential constitutes a strategic source of differentiation. This perspective suggests that improving marketing performance is more effectively pursued through an integrated digital marketing

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strategy that combines digital access, content capability, and local-value-based differentiation.

The integration of qualitative and quantitative findings indicates that an effective digital marketing strategy for local bioproduct MSMEs is presented in Figure 2.



Figure 2. Framework Solution for Digital Marketing of Local Bioproduct MSMEs

The findings indicate that *Digital Platform Utilization, Digital Content Management,* and *Local Value Integration* should not be viewed as isolated marketing elements but rather as complementary capabilities for improving the marketing performance of local bioproduct MSMEs. Digital resources and local biological potential can become sources of competitive advantage when they provide value and are strategically leveraged (Chauhan et al., 2023), while MSMEs also need the capability to combine, develop, and adapt these resources in response to changes in digital markets (S. F. Wijaya et al., 2024). The qualitative findings further demonstrate that the use of multiple digital platforms needs to be supported by the ability to produce informative, engaging, and consistent content. Accordingly, the resulting framework emphasizes that an effective digital marketing strategy for local bioproduct MSMEs extends beyond mere *digital presence* and instead represents an integrated process of digital access → content capability → local-value differentiation → consumer engagement → performance improvement, supported by continuous improvement based on consumer needs and relevant digital data.

CONCLUSION

This study concludes that Digital Platform Utilization, Digital Content Management, and Local Value Integration are important components of digital marketing strategy for local bioproduct MSMEs. The findings indicate that these three dimensions are positively associated with Marketing Performance, with Digital Content Management emerging as the strongest predictor, followed by Local Value Integration and Digital Platform Utilization. The findings highlight that improving MSME marketing performance requires not only broader digital platform use but also the ability to communicate product value effectively and integrate local biological, cultural, and ecological characteristics into digital marketing.

From a managerial and policy perspective, MSME associations and government agencies can support this process through practical training in digital content management, platform utilization, and local-value-based branding, as well as through programs that facilitate digital market access and business mentoring. However, the cross-sectional design limits the ability of this study to measure the long-term effects of digital marketing strategies on sales performance. Future studies should therefore employ longitudinal designs and broader samples, while incorporating objective indicators such as actual sales records and digital analytics to examine changes in

marketing performance over time.

Statement on the Use of Artificial Intelligence.

Artificial intelligence (AI) tools were used in the preparation of this manuscript solely to assist with language improvement, grammar checking, manuscript organization, and editing for clarity and readability. The authors remain fully responsible for the accuracy, originality, integrity, interpretation of the research findings, and academic content of the manuscript. All AI-assisted content was critically reviewed, revised, and verified by the authors before submission.

Conflicts of interest

The authors declare no conflict of interest.

Author contributions

Conceptualization, M.; methodology, M. and SH; data collection, AWS and AA; data validation, SH and H; formal analysis, M. and AWS; qualitative analysis, SH and AA; writing—original draft preparation, M. and H; writing—review and editing, SH, AWS, and AA; visualization, M.; supervision, H. All authors have read and approved the final version of the manuscript..

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REFERENCE

Ahmad, K. (2024). The Influence of Financial Literacy, Risk Orientation and Qualified Accountants on Performance in Micro, Small and Medium Enterprises: The Mediating Role of Management Accounting. *International Review of Management and Marketing*, *14*(6), 317–324. https://doi.org/10.32479/irmm.17044

Alamsjah, M. A., Sulmartiwi, L., Pursetyo, K. T., Amin, M. N. G., Wardani, K. A. K., & Arifianto, M. D. (2017). Modifying bioproduct technology of Medium Density Fibreboard from the seaweed waste Kappaphycus alvarezii and Gracilaria verrucosa. *Journal of the Indian Academy of Wood Science*, *14*(1), 32–45. https://doi.org/10.1007/s13196-017-0185-y

Ali, A., Manogaran, S., Selvarajan, K., Ismarau Tajuddin, N. I., Mohd Johan, M. R., & Munikrishnan, U. (2024). Digital marketing: consumers' purchase intention towards e-commerce platform for urban region. *International Journal of Human Capital in Urban Management*, *9*(3), 473–488. https://doi.org/10.22034/IJHCUM.2024.03.08

Barman, A., & Mahanta, M. (2025). Digital Marketing Adoption among MSMEs in Assam. *International Research Journal of Multidisciplinary Scope*, *6*(1), 361–372. https://doi.org/10.47857/irjms.2025.v06i01.02406

Buaprommee, N., Cuijten, N., Inmor, S., Suwannahong, R., & Wongpun, S. (2025). FACTORS INFLUENCING TECHNICAL COMPETENCIES IN DIGITAL MARKETING OF

MSMEs IN WHOLESALE AND RETAIL SECTORS: THE MEDIATING ROLE OF CORE COMPETENCIES. *Business: Theory and Practice*, *26*(1), 141–152. https://doi.org/10.3846/btp.2025.21233

Chauhan, S., Jhilta, P., & Bhatia, R. K. (2023). *Bioproduct marketing strategies* (pp. 471–484). Elsevier. https://doi.org/10.1016/B978-0-12-816109-8.00032-5

Christian, M., Rembulan, G. D., Sugiyanto, L. B., Yulita, H., Sunarno, S., & Leonardo, M. C. (2024). SWOT Analysis for Small-Scale Business Sustainability: Proposing a Digital Marketing Approach for a Flower Market Center in Indonesia. In *Studies in Systems, Decision and Control* (Vol. 537, pp. 47–58). Springer Science and Business Media Deutschland GmbH. https://doi.org/10.1007/978-3-031-62106-2_4

Cohen, L., Manion, L., & Morrison, K. (2018). Research methods in education. In *Nucl. Phys.* (8th ed., Vol. 13, Number 1). Taylor& Francis.

Cuijten, N., Wongpun, S., Buaprommee, N., Suwannahong, R., & Inmor, S. (2024). EXPLORING THE DIGITAL MARKETING POTENTIAL AND NEEDS FOR DIGITAL MARKETING CAPABILITIES OF SERVICE SECTOR MSMES IN THAILAND. *Journal of Business Economics and Management*, *25*(5), 1052–1074. https://doi.org/10.3846/jbem.2024.22470

Fareed, G., & Tantawi, P. (2022). Digital Marketing Adoption Framework for Small Businesses in Egypt: A Grounded Theory Approach. In *Eurasian Studies in Business and Economics* (Vol. 21, pp. 251–268). Springer Science and Business Media B.V. https://doi.org/10.1007/978-3-030-94036-2_14

Feitosa, J. M., Silva, T. S. A., de Xavier, A. E. F., Rodrigues, W. C. S., da Silva, A. C. E., Corrêa, C. V. P., de Aguiar, F. S., Mourão, R. H. V, de Oliveira, E. G., & Nunes, K. M. (2021). Evaluation of the quality of amazonian butters as sustainable raw materials for applications in bioproducts. *Revista de Ciencias Farmaceuticas Basica e Aplicada*, *42*. https://doi.org/10.4322/2179-443X.0708

Gao, J., Siddik, A. B., Abbas, S., Hamayun, M., Masukujjaman, M., & Alam, S. S. (2023). Impact of E-Commerce and Digital Marketing Adoption on the Financial and Sustainability Performance of MSMEs during the COVID-19 Pandemic: An Empirical Study. *Sustainability (Switzerland)*, *15*(2). https://doi.org/10.3390/su15021594

Haryanto, R., & Sultoni, M. H. (2024). Marketing and IT capability as mediators: The role of digital marketing and orientation on SMEs marketing performance. *International Journal of Management and Sustainability*, *13*(4), 808–817. https://doi.org/10.18488/11.v13i4.3899

Hashim, N., Taleb, T. S. T., & Faudzi, M. S. M. (2024). Entrepreneurial bricolage and micro-business performance: A moderated mediation of innovation capability and digital marketing capabilities. *Journal of Strategic Marketing*, *32*(8), 1274–1289. https://doi.org/10.1080/0965254X.2023.2216203

Herari, N., & Marlina, S. E. (2024). *Digital Marketing Transformation of Local MSME Through Instagram Account of Community: A Case Study of Paguyuban UMKM Kecamatan Bekasi Timur* (pp. 23–59). IGI Global. https://doi.org/10.4018/979-8-3373-0086-3.ch002

Hernita, N., & Ginanjar, Y. (2021). Managerial Aspect and Digital Marketing of Micro, Small and Medium Enterprises in West Java. *IOP Conference Series: Earth and Environmental Science*, *748*(1). https://doi.org/10.1088/1755-1315/748/1/012035

Kosasi, S., & Yuliani, I. D. A. E. (2017). *Improving organizational agility of micro, small, and medium enterprises through digital marketing strategy*. *2018-January*, 68–72. https://doi.org/10.1109/ICITISEE.2017.8285561

Laurens, L. M. L., Slaby, E. F., Clapper, G. M., Howell, S., & Scott, D. (2015). Algal Biomass for Biofuels and Bioproducts: Overview of Boundary Conditions and Regulatory Landscape to Define Future Algal Biorefineries. *Industrial Biotechnology*, *11*(4), 221–228. https://doi.org/10.1089/ind.2015.0007

Megat, P. A., Al-Shaghdari, F., Bin Ngah, B., & Abdelfattah, S. S. (2024). Assessing the predictive benefits of Waqftech smart contracts on corporate waqf crowdfunding among Malaysian enterprises. *Journal of Islamic Marketing*, *15*(5), 1303–1325. https://doi.org/10.1108/JIMA-08-2023-0262

Nasution, S., Kersapati, M. I., Lekakis, S., Geros, C. L., Aswandi, A., Farid, M., Sarah, P. N., Rais, H., Nadia, Z., Faturohman, F., Avicenna, M., Atqa, M., Sihite, B., & Taqyuddin, T. (2025). The Maluku archipelagic landscape: Exploring and evaluating the outstanding universal value towards World Heritage nomination. *Journal of Tourism, Heritage and Services Marketing*, *11*(2), 54–71. https://doi.org/10.5281/zenodo.17609613

Novitasari, D., Goestjahjanti, F. S., Rahardja, U., Santoso, S., Visiana Sihotang, S. V, Santoso, N., & Cesna, G. P. (2025). *Optimizing MSME Performance through Marketing Capabilities and Digital Marketing Adoption*. https://doi.org/10.1109/ICCIT65724.2025.11167878

Pradhan, P., Nigam, D., & Tiwari, C. K. (2020). Partial least square method-structural equation model for assessment of drivers of digital marketing adoption by Indian SMEs. *International Journal of Advanced Science and Technology*, *29*(5 Special Issue), 1286–1296. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85084439914&partnerID=40&md5=74631b634ea9eddd214f69f07d005cde

Purba, M. I., Simanjuntak, D. C. Y., Malau, Y. N., Sholihat, W., & Ahmadi, E. A. (2021). The effect of digital marketing and e-commerce on financial performance and business sustainability of MSMEs during COVID-19 pandemic in Indonesia. *International Journal of Data and Network Science*, *5*(3), 275–282. https://doi.org/10.5267/j.ijdns.2021.6.006

Puspita, V., Safrianti, S., Donovan, I., Sari, P. M., Hidayati, A., Akhir, A. F. P., & Hayadi, B. (2021). *Optimization of Digital Marketing Integration Through the Role of the Millenial Generation as MSMEs Effort to Survive during the Covid-19 Pandemic*. https://doi.org/10.1109/CITSM52892.2021.9588857

Ravindran, D., Jaheer Mukthar, K. P., Zarzosa-Marquez, E., Pérez-Falcón, J., Jamanca-Anaya, R., & Silva-Gonzales, L. (2023). Impact of Digital Marketing and IoT Tools on MSME's Sales Performance and Business Sustainability. In *Internet of Things: Part F1270* (pp. 65–77). Springer Science and Business Media Deutschland GmbH. https://doi.org/10.1007/978-3-031-35525-7_5

Rizkita, M. A., Winarno, A., Suwono, H., & Malek, N. A. N. N. (2025). Integrating cultural adaptation in digital marketing strategies: Enhancing competitiveness and sustainability in MSMEs of Java, Indonesia. *Journal of Open Innovation: Technology, Market, and Complexity*, *11*(3). https://doi.org/10.1016/j.joitmc.2025.100609

Sudirman, S., Musa, M., Harun, S., Nasir, N., & Henri, H. (2025). PENINGKATAN KOMPETENSI SISWA SMAN 1 GOWA MELALUI PELATIHAN PEMASARAN DIGITAL BERBASIS TEKNOLOGI. *Amare*, *4*(1), 9–14.

Supriaddin, N., Roslan, A. H., Hamida, L. O., & Almana, L. O. (2025). The Moderating Role of Agricultural Product Categories in the Relationship Between Digital Marketing Competencies and Marketing Performance. *Journal of Global Innovations in Agricultural Sciences*, *13*(3), 1199–1208. https://doi.org/10.22194/JGIAS/25.1654

Tkachuk, O., Pantsyreva, H., Zelenchuk, N., Bondaruk, N., & Mostovenko, V. (2025).

Resistance of sunflower crops to harmful objects when using growth-stimulating bioproducts in their crops. *Journal of Ecological Engineering*, *26*(4), 98–110. https://doi.org/10.12911/22998993/199816

Walhidayat, W., Sadar, M., Yuhelmi, Y., & Samsidar, R. (2024). Enactment of Opinion Mining for Medium and Small Medium Enterprises in the Face of Digital Marketing Era. In M. Aziz, M. R. P. Sakti, I. Purnama, & T. Derin (Eds.), *E3S Web of Conferences* (Vol. 593). EDP Sciences. https://doi.org/10.1051/e3sconf/202459306001

Wang, L. (2019). A review of the challenges and application of public-private partnership model in Chinese garbage disposal industry. *Journal of Cleaner Production*, *230*, 219–229. https://doi.org/10.1016/j.jclepro.2019.05.028

Wijaya, N. P. N. P., & Padmanegara, O. H. (2021). Digital Marketing education as a Strategy to Get New Opportunities: A Geographical Case Study on Indogarment MSMEs, Indonesia. *Review of International Geographical Education Online*, *11*(1), 741–745. https://doi.org/10.33403/rigeo.800614

Wijaya, S. F., Wiratama, J., Sanjaya, S. A., Pomalingo, S., & Halim, F. A. (2024). Developing a User-Centered Design Model for Digital Marketing Adoption in Village MSMEs. *Journal of Logistics, Informatics and Service Science*, *11*(6), 368–378. https://doi.org/10.33168/JLISS.2024.0621

Yiridoe, E. K., Chen, Q., Fry, R., Lynch, D., & Price, G. (2015). Cost Analysis and Life-Cycle Environmental Impacts of Three Value-Added Novel Bioproducts: Processing and Production. *Natural Resources Research*, *24*(1), 65–84. https://doi.org/10.1007/s11053-014-9237-9