“The impact of sustainable marketing practices on digital entrepreneurial intention: An empirical study of small-scale cocoa producers in Indonesia”

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THE IMPACT OF SUSTAINABLE MARKETING PRACTICES ON DIGITAL ENTREPRENEURIAL INTENTION: AN EMPIRICAL STUDY OF SMALL-SCALE COCOA PRODUCERS IN INDONESIA

Abstract

The Indonesian cocoa sector faces a significant gap between traditional sustainability practices and the necessity of digital transformation. This study aims to analyze the extent to which multidimensional sustainable marketing practices catalyze digital entrepreneurial intentions among small-scale cocoa producers in Indonesia through the mediating role of perceived usefulness. Utilizing a quantitative cross-sectional design, empirical data were collected between January and August 2025 from a purposive sample of 420 small-scale cocoa producers in the central production of West Sulawesi, Indonesia. This sample was selected because these individuals are direct targets of national sustainability programs and have basic digital literacy. Through Partial Least Squares Structural Equation Modeling (PLS-SEM) using SmartPLS 4, the analysis substantiates that sustainable marketing significantly influences perceived usefulness 0.582 and digital entrepreneurial intention 0.253. Furthermore, perceived usefulness was found to be a robust mediator 0.274. The model explains 51.2% of the variance in digital entrepreneurial intention $R^2 = 0.512$. Practically, these results demonstrate that sustainability programs serve as a strategic catalyst that reframes digital technology as a useful tool for economic gain, rather than just an ethical obligation. Consequently, fostering digital transformation in agriculture requires holistic interventions that combine socioeconomic empowerment with targeted digital literacy.

Keywords sustainability, marketing, digitalization, entrepreneurship, cocoa, Indonesia

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INTRODUCTION

The Indonesian cocoa sector occupies a central, yet profoundly paradoxical, position within the global agricultural landscape. While its substantial contribution to the agricultural Gross Domestic Product (GDP) underscores its role as a strategic pillar of the national economy (Tothmihaly & Ingram, 2019), the sector is predominantly sustained by smallholder plantations that remain ensnared in a cycle of low productivity, inefficient supply chains, and marketing methodologies. Despite Indonesia's status as a major global producer, these small-scale entrepreneurs face extreme price volatility and significant discrepancies between local production costs and international market values (Adha et al., 2024). The fundamental challenge lies in the inability of these producers to modernize their operations, leaving them marginalized within an increasingly competitive global market. In the context of international trade, this affects the competitiveness of specific markets, such as the cocoa market (Zikria et al., 2019). In

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Indonesia, marketing sustainability is often recognized as a catalyst for expansion through digitalization. To compete globally, businesses are encouraged to adapt and innovate by expanding their marketing networks through digital entrepreneurship and online sales.

The growth of information technology, especially digital marketing, has profoundly affected the long-term viability of marketing and sales for traditional products. Sustainability is no longer merely an endeavor but has become a strategic necessity for market access, while digital technology offers a transformative potential to streamline operations and bridge the gap between producers and consumers. However, there is a theoretical and empirical gap at the interface where sustainability initiatives and digital adoption intersect. This gap requires that Indonesian cocoa producers develop a competitive edge in technology, which serves as the external support needed to implement digital marketing strategies as a form of sustainable marketing practice. Digital technology has the potential to revolutionize small-scale enterprises, promising increased operational efficiency and more direct market access, which has traditionally been closed to individual cocoa producers.

The core of this scientific problem is rooted in the entrepreneurial mindset within agrarian developing economies. There is a lack of conceptual clarity regarding how multidimensional sustainability efforts encompassing economic viability, social empowerment, and environmental stewardship function as psychological precursors to technology acceptance. Traditionally, digital adoption is viewed as a separate technical process, whereas sustainability is framed as an ethical obligation; this fragmented perspective fails to account for how sustainability can recalibrate an entrepreneur's perception of technological utility. Current approaches often fail to account for how specific sustainability gains such as improved market access, fundamentally reshape an entrepreneur's perception of a digital tool's practical value. Consequently, without a clear relationship between these domains, interventions aimed at fostering digital transformation will likely remain superficial, as they overlook the intrinsic motivational power of sustainability in validating the perceived usefulness of new digital systems.

1. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

The convergence of sustainability and digitalization has fundamentally redefined the strategic landscape of modern agribusiness. This paradigm shift requires a transition from traditional market-driven consumption toward a more responsible, market-driving approach that prioritizes long-term societal and ecological value. Within this context, understanding the psychological and strategic pathways that lead small-scale producers to embrace digital transformation is essential for sectorial resilience (Annosi et al., 2024; Hrustek, 2020). The transformation of the agricultural sector in Indonesia through digital entrepreneurship represents a critical strategic shift, particularly for cocoa producers facing significant market volatility (Adha et al., 2024). To navigate the complexity of this transition, this study integrates three complementary theoretical frameworks. The Triple Bottom Line (TBL) serves as the foundational lens for defining sustainability beyond mere environmentalism, encompassing economic viability, social equity, and ecological preservation (Elkington, 1994). To explain the strategic necessity of these practices, the Resource-Based View (RBV) posits that sustainable actions generate intangible assets such as reputation, trust, and market legitimacy which are critical for long-term survival (Acheampong et al., 2023; Paul et al., 2016; Tate & Bals, 2018). Thus, RBV frames the variables in this study as strategic assets that can enhance cocoa producers' competitiveness. Finally, the Technology Acceptance Model (TAM) postulates that perceived usefulness is the primary predictor of adoption. The relevance of this model in the context of modern digital technology continues to be confirmed by recent studies (Wei et al., 2025). This study conceptualizes digital entrepreneurial intention as a specific and proactive form of behavioral intention to use within TAM. This is a crucial conceptual step, as it views adoption not as passive use but as an active intention to leverage technology for economic value creation (Paul et al., 2016).

Sustainable Marketing as a strategic resource in this study, Sustainable Marketing (SM) is operationalized as a multidimensional construct that integrates economic, social, and environmental practices to create long-term value (Sheth & Parvatiyar, 2021). Within the Indonesian cocoa sector, these dimensions manifest through specific industrial practices (Trojanowski, 2022). The Economic Dimension involves fair trade schemes and premium pricing for fermented beans, which directly address the financial instability of farmers. The Social Dimension focuses on capacity building through technical assistance and cooperative strengthening, while the Environmental Dimension promotes agroforestry and ecological preservation. The research indicates that these practices serve as strategic resources that enhance business intelligence and customer value perceptions (Bashir, 2022; Zia & Alzahrani, 2022). By providing tangible resources such as microfinancing and access to premium markets, sustainable marketing acts as a precursor that shifts the entrepreneurial focus from subsistence farming to value-driven business management. Digital Entrepreneurial Intention (DEI) represents a proactive readiness to utilize technological innovations such as big data, e-marketing, and financial apps for economic value creation (Al Koliby et al., 2024; Sharma, 2024; Shwawreh et al., 2025). Unlike passive technology adoption, DEI is characterized by a digital growth mindset, where entrepreneurs view digital tools as pragmatic solutions to supply chain inefficiencies and barriers to market access (Hasan et al., 2025; Yang et al., 2024). Within the TAM framework, this mindset is closely linked to Perceived Usefulness, defined as the extent to which an individual believes that using a particular system will improve their job performance (Davis, 1989). For a cocoa producer, job performance translates directly into measurable outcomes such as increased business income. Recent scholarship suggests that this mindset is not innate but cultivated (Bannor et al., 2022; Rayuddin et al., 2021). Synthesizing findings from various contexts, researchers argue that exposure to modern business practices fosters self-efficacy (Novandari et al., 2021), enhances the perception of value creation (Pagnanelli et al., 2025), and clarifies efficiency gains (Shen et al., 2021; Wibowo et al., 2024). Sustainable marketing practices can directly cultivate a more innovative and proactive mindset among entrepreneurs (Jäger & Weber, 2020). Previous research confirmed that sustainable activities can directly predict purchase intentions (Soam et al., 2023; Rajendra & Mohanasundaram, 2023; Soeharso, 2024; Xu et al., 2022). By extending this logic from consumers to producers, it can be assumed that a positive experience with SM programs can directly stimulate the interest of cocoa producers to take a more active entrepreneurial role using digital tools.

The mediating role of Perceived Usefulness (PU) as a critical bridge connecting sustainability efforts and entrepreneurial action is found in the perceived usefulness of digital tools. In agrarian settings, perceived usefulness functions as a pragmatic filter it is the assessment of how technology can directly enhance yield quality and income (Venkatesh & Davis, 2000). Sustainability initiatives make this utility explicit by demonstrating how business applications can monitor sales, track quality certifications, and connect producers directly to premium markets (Schilling & Seuring, 2024). When sustainable marketing programs validate technology as a tangible asset for achieving economic goals, they effectively demystify digital complexity (Böttcher et al., 2024; Mas'ud & Tenriyola, 2025; Xia et al., 2024). Thus, sustainability is not only a goal but also a powerful antecedent that frames technology as an indispensable tool for competitiveness, thereby triggering the necessary entrepreneurial impulse (Arora et al., 2023; Plečko et al., 2023; Vrontis et al., 2022). In summary, current literature suggests that while sustainability provides the strategic resources (RBV) and digitalization offers the tools for efficiency (TAM), the synergistic relationship between these domains remains underexplored in emerging economies. Existing studies often treat green strategies and digital adoption as distinct phenomena, failing to explain how grassroots empowerment programs specifically catalyze technological readiness (El-Kassar & Singh, 2019; Omrani et al., 2024; Tashenova et al., 2025). Therefore, this research addresses this theoretical gap by investigating the causal pathway connecting these two major fields.

This study aims to analyze the extent to which multidimensional sustainable marketing practices catalyze digital entrepreneurial intention

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Source: Authors' elaboration.

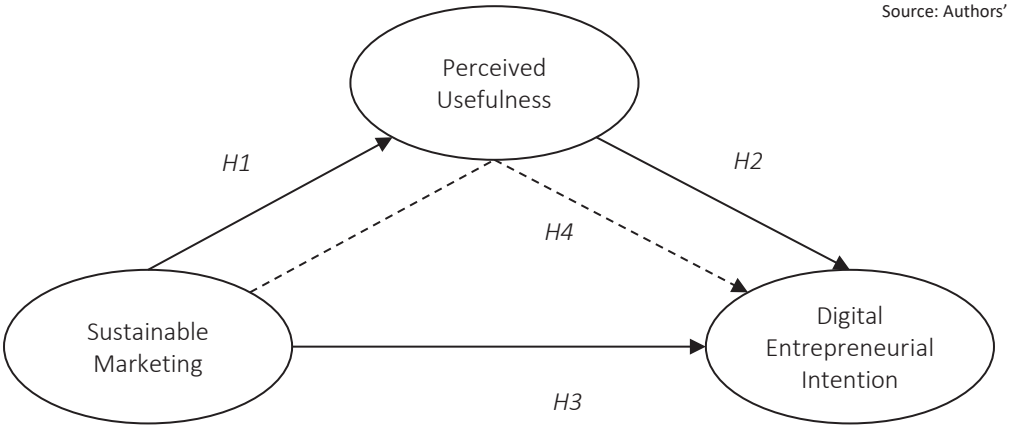

Figure 1. Research model

among small-scale cocoa producers in Indonesia through the mediating role of perceived usefulness.

Synthesizing the preceding literature with this theoretical framework, the study proposes the following hypotheses:

H1: Sustainable Marketing has a positive and significant influence on the Perceived Usefulness of digital technology.

H2: Perceived Usefulness has a positive and significant influence on Digital Entrepreneurial Intention.

H3: Sustainable Marketing has a positive and significant influence on Digital Entrepreneurial Intention.

H4: Perceived Usefulness mediates the relationship between Sustainable Marketing and Digital Entrepreneurial Intention.

2. METHODOLOGY

2.1. Research design and procedure

This study employed a quantitative, cross-sectional design to investigate the causal pathways between variables. The research followed a systematic five-stage procedure, as illustrated in Figure 2:

1) identification of the conceptual gap and formulation of hypotheses based on TBL and TAM frameworks;

2) development of the research instrument by adapting validated scales from existing litera-

Source: Authors' elaboration.

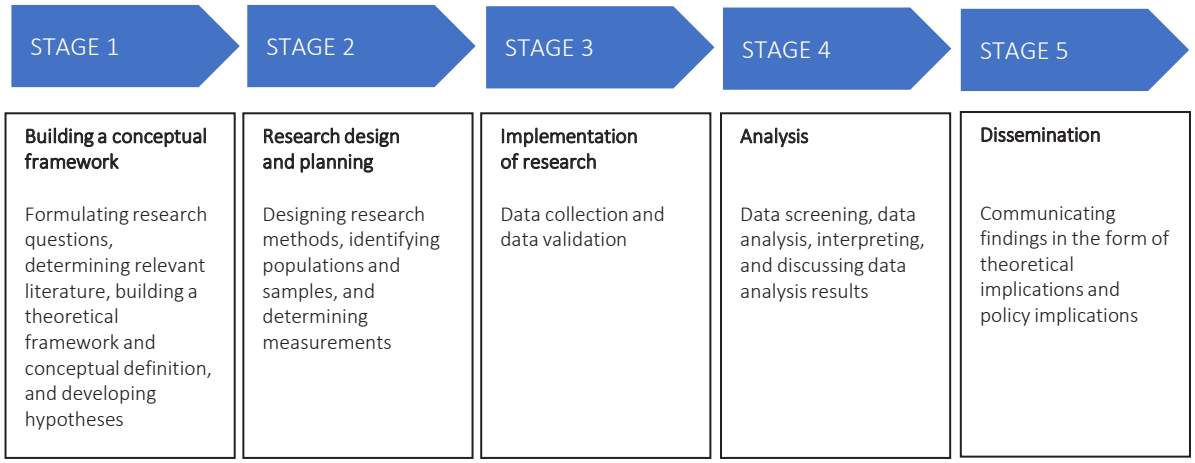

Figure 2. Research stages

ture and identifying the target population in West Sulawesi Province, Indonesia;

3) implementing data collection and ensuring field validation through enumerators;

4) primary data collection using a purposive sampling technique in the field;

5) comprehensive data analysis using Partial Least Squares Structural Equation Modeling (PLS-SEM); and disseminating theoretical and policy implications.

This algorithm ensures that the findings are rooted in established theoretical foundations and empirical verification.

2.2. Sample and data collection

The field research was conducted between January and August 2025 in West Sulawesi Province, Indonesia. This location and timeframe were selected because West Sulawesi is a central cocoa production hub targeted by national sustainability programs, providing an ideal context to observe the transition toward digital entrepreneurship. A purposive sampling technique was utilized to select 420 small-scale cocoa producers. Participants were chosen based on specific inclusion criteria:

1) the respondent is a small-scale business owner who manages their own business;

2) the respondents are domiciled in the West Sulawesi Province, Indonesia; and

3) prior experience with business applications and digital training.

These criteria are important to ensure sufficient variation in the digital sustainable marketing variable. A team of local enumerators coordinated the field data collection process. The questionnaire, originally drafted in English, underwent a process of translation into Indonesian and back-translation to ensure semantic equivalence. Respondents completed the questionnaire independently, with enumerator assistance available for clarification if needed. This sample size (N = 420) provides sufficient statistical power to detect significant mediation effects.

2.3. Demographic profile

A descriptive analysis of the valid responses reveals a diverse sample representative of the cocoa producer population in the study area. 420 completed questionnaires were collected. The majority of respondents were male (66.7%), with the largest age group being 41-50 years (42.9%). Most entrepreneurs had more than 7 years of business experience (59.5%), and the majority had prior entrepreneurial experience (83.3%). In terms of education, the highest level achieved by most respondents was high school (47.6%). Regarding digital marketing, social media (47.6%) was the most used tool, followed by marketplace platforms (35.7%). The demographic profiles of these respondents are summarized in Table 1.

Table 1. Respondent information (N = 420)

Source: Authors' elaboration.

Description	Characteristic	Frequency	Percentage (%)
Gender	Female	140	33.3
	Male	280	66.7
Age	20-30	40	9.5
	31-40	120	28.6
	41-50	180	42.9
	> 50	80	19.0
Level of education	Junior high school	150	35.7
	High school	200	47.6
	Undergraduate	60	14.3
	Postgraduate	10	2.4
Length of business	1-3	50	11.9
	4-6	120	28.6
	> 7	250	59.5
Based on region	Mamuju	90	21.4
	Majene	80	19.0
	Polewali Mandar	100	23.8
	Mamasa	70	16.7
	Pasangkayu	80	19.0
Entrepreneurial experience	Yes	350	83.3
	No	70	16.7
Digital marketing tools	Marketplace	150	35.7
	Social media	200	47.6
	Website marketing	40	9.5
	Influencer marketing	30	7.1

2.4. Ethical approval

Research procedures involving human participants strictly adhered to ethical standards and the principles of the Declaration of Helsinki. This

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study received formal ethical approval from the Research and Quality Assurance Institute of the University of West Sulawesi, number 229/UN55. L1/DT.05.00/2025. Confidentiality and anonymity were fully guaranteed, with no personal identifiers recorded during analysis. Before the survey, each respondent provided written informed consent after receiving a detailed explanation of the research goals and their rights as participants. The data used in this study are original and have not been utilized for any other prior publications.

2.5. Instrument and measurement

The primary research instrument was a structured questionnaire developed through a multistage process, including the adaptation of validated scales from previous literature, translation, and pilot testing to ensure linguistic equivalence and validity. All items used a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), to measure the respondent's level of agreement with each statement. The questionnaire was intentionally limited to these core variables to mitigate respondent fatigue and ensure higher response quality, particularly given the busy operational schedules of small-scale cocoa producers. Sustainable Marketing (SM): The scale for this construct was developed by adapting scales from the research of Lučić (2020) and a validated Triple Bottom Line (TBL) scale. This adaptation ensures that the scale covers the three fundamental dimensions of TBL: economic, social, and environmental. The SM variable was measured using three indicators adapted from Lučić (2020):

1) strategic integration of sustainability into core business activities;

2) societal engagement through community-based cocoa programs; and

3) ethical capabilities in maintaining transparent marketing practices.

The use of Lučić's (2020) scale is justified as it is specifically designed to measure sustainable marketing orientation across various industrial contexts. Perceived Usefulness (PU): the scale for this construct was adapted from the original validated scale by Davis (1989) in the development of the Technology Acceptance Model (TAM). The items were specifically reformulated and contextually adjusted to accurately reflect the utility of digital technology within the Indonesian cocoa business landscape. The PU variable was measured using three indicators based on Davis (1989):

1) improvement in job performance through digital tools;

2) increased business productivity in cocoa sales; and

3) enhanced effectiveness in managing entrepreneurial tasks.

Digital Entrepreneurship Intention (DEI): the scale for this construct was adapted from the well-established Entrepreneurial Intention Questionnaire (EIQ) by Nambisan (2017) and enriched with dimensions specifically designed for digital entrepreneurship. This construct was operationalized through three indicators:

1) intention to utilize digital platforms for market access;

2) readiness to adopt digital innovations in business processes; and

3) planning to establish a digital-based entrepreneurial presence.

This selection is justified by Nambisan's (2017) focus on the transformative nature of digital technologies in shaping entrepreneurial processes.

2.6. Data analysis

This research uses a quantitative approach, which is confirmatory and involves the evaluation of existing hypotheses. This research will verify the relationship between theoretical facts and empirical facts of three variables, including Sustainable Marketing (X), Digital Entrepreneurial Intention (Y), and Perceived Usefulness (Z). To empirically test the proposed framework, this research employed Partial Least Squares Structural Equation Modeling (PLS-SEM) utilizing SmartPLS 4. The rationale for selecting this variance-based approach is threefold: it aligns with the study's pri-

mary objective of predicting the variance in digital entrepreneurial intention, it exhibits high resilience against non-normal data distributions, and it possesses superior capability in handling complex models with multiple mediation paths. The analytical procedure follows a systematic two-stage evaluation. Initially, the measurement model undergoes rigorous psychometric scrutiny, assessing internal consistency via Cronbach's Alpha and Composite Reliability, while establishing convergent and discriminant validity through Average Variance Extracted (AVE) and the Fornell-Larcker criterion, respectively. Subsequently, the structural model is examined to verify the hypotheses. This phase relies on a bootstrapping procedure to generate t-statistics and p-values, determining the significance of path coefficients (β) and specific indirect effects. Furthermore, the dataset comprising 420 respondents serves as a robust foundation for this analysis. This sample magnitude comfortably exceeds the minimum threshold mandated by the '10-times rule' (Hair et al., 2020), ensuring sufficient statistical power to detect significant effects within the model structure.

3. RESULTS

3.1. Measurement model

The quality of the measurement model was rigorously evaluated to ensure the validity and reliability of the instruments used. The results, as summarized in Table 2, show that all recommended criteria were met. Reliability: Cronbach's Alpha values for all constructs were above the 0.7 threshold, ranging from 0.885 to 0.921. The Composite Reliability (CR) values also showed excellent results, ranging from 0.918 to 0.942, well above the 0.7 threshold. The assessment confirmed the instrument's strong psychometric properties. High internal consistency was demonstrated for the items measuring each construct. Convergent validity was established, as the Average Variance Extracted (AVE) for all constructs (ranging from 0.692 to 0.765) exceeded the 0.5 minimum. Moreover, all factor loadings were above 0.7, indicating that each construct explained more than half of its indicators' variance. Discriminant validity was also supported, with the Fornell-Larcker criterion being met; the square root of each construct's AVE was higher than its correlations with other constructs, confirming that the constructs are empirically distinct (Hair et al., 2020). Collectively, these results validate the measurement model and provide a solid foundation for the structural model analysis.

Subsequently, an assessment of discriminant validity was conducted utilizing both the Cross Loading and Fornell-Larcker criteria, with the results presented in Table 3. The cross-loading analysis revealed that each indicator loaded more strongly on its designated construct than on any other, affirming that the items are specific to their intended latent variables. Furthermore, the Fornell-Larcker criterion was satisfied, as the square root of the Average Variance Extracted (AVE) for each construct exceeded its correlations with all other constructs. Collectively, this evidence provides robust support for the model's discriminant validity, ensuring that each construct is empirically distinct.

Table 2. Convergent validity and reliability

Source: Authors' elaboration.

Construct	Item	Convergent validity		Reliability	
		Loading factor	AVE	Cronbach's Alpha	Rho_C
Sustainable Marketing (SM)	SM1	0.753	0.692	0.935	0.911
	SM2	0.789			
	SM3	0.787			
Perceived Usefulness (PU)	PU1	0.829	0.738	0.918	0.921
	PU2	0.884			
	PU3	0.851			
Digital Entrepreneurial Intention (DEI)	DEI1	0.864	0.765	0.942	0.934
	DEI2	0.859			
	DEI3	0.877			

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Table 3. Discriminant validity

Source: Authors' elaboration.

Construct	Item	Cross-loading			Fornell-Larcker		
		SM	PU	DEI	SM	PU	DEI
SM	SM1	0.753	0.789	0.713	0.815	–	–
	SM2	0.741	0.703	0.729			
	SM3	0.749	0.723	0.754			
PU	PU1	0.853	0.891	0.842	0.821	0.837	–
	PU2	0.813	0.824	0.867			
	PU3	0.795	0.793	0.865			
DEI	DEI1	0.851	0.853	0.923	0.831	0.815	0.831
	DEI2	0.893	0.883	0.911			
	DEI3	0.904	0.863	0.897			

The assessment of the structural model began with a multicollinearity test to ensure that the independent variables did not exhibit excessive correlation, which could bias the regression results. Multicollinearity was evaluated using the Variance Inflation Factor (VIF) and Tolerance values. According to established psychometric standards, a VIF value below 5.0 (or Tolerance value > 0.10) indicates the absence of multicollinearity issues. As shown in Table 4, all VIF values are significantly below the threshold of 5.0, and Tolerance values are well above 0.10, confirming that the structural model is free from collinearity problems and providing a robust basis for hypothesis testing.

Table 4. Collinearity test (VIF)

Source: Authors' elaboration.

Path	Tolerance	VIF
SM → PU	1.000	1.000
PU → DEI	0.661	1.512
SM → DEI	0.661	1.512

Based on the collinearity test, all latent constructs demonstrate a high degree of independence, as evidenced by Variance Inflation Factor (VIF) values ranging from 1.000 to 1.512, which are significantly below the conservative threshold of 5.0. Correspondingly, the Tolerance values, ranging from 0.661 to 1.000, are well above the 0.10 benchmark, confirming the absence of multicollinearity issues within the structural model. The next phase of the analysis involved evaluating the explanatory power of the model by examining the R-square (R^2) values for the endogenous constructs. The R^2 value indicates the proportion of variance in the dependent variable that can be explained by the exogenous variables. The closer R-square is to the value of 1, the better the model. Normally, if R-square > 0.5, the model is declared good (Hair et al., 2020).

Table 5. Results of R-square (R^2)

Source: Authors' elaboration.

Construct	R-square
Perceived Usefulness	0.505
Digital Entrepreneurial Intention	0.512

Based on the R-square analysis presented in Table 5, both endogenous constructs demonstrate a moderate level of predictive accuracy. The Perceived Usefulness construct achieved an R^2 value of 0.505, indicating that 50.5% of its variance is effectively explained by Sustainable Marketing practices. Furthermore, the primary target construct, digital entrepreneurial intention, yielded an R^2 value of 0.512. This signifies that 51.2% of the variance in cocoa producers' intention to engage in digital business is accounted for by the synergistic influence of Sustainable Marketing and Perceived Usefulness.

3.2. Structural model and hypotheses testing

Upon confirming the validity and reliability of the measurement model, the structural model was analyzed to test the research hypotheses. Beyond the coefficient of determination, this study performed an exhaustive assessment of effect sizes (F-square) and predictive relevance (Q-square). The F-square effect size measures the contribution of an exogenous construct to the R^2 value of an endogenous construct. The results show that Sustainable Marketing (SM) has a large effect on Perceived Usefulness (PU) F-square = 1.020. Notably,

Table 6. Hypotheses results

Source: Authors' elaboration.

Hypothesis testing results	Hypothesis	Std. β	t-statistics	p-values	Results
Direct effect	SM → PU	0.582	7.231	0.000	Supported
	PU → DEI	0.471	7.894	0.000	Supported
	SM → DEI	0.253	5.762	0.001	Supported
Indirect effect	SM → PU → DEI	0.274	6.855	0.001	Supported

Sustainable Marketing (SM) exerts a medium effect on Digital Entrepreneurial Intention (DEI) with an F-square value of 0.185, while Perceived Usefulness (PU) demonstrates a stronger medium-to-large effect on DEI with an F-square value of 0.284. Furthermore, the Q-square values for PU (0.355) and DEI (0.382) are significantly above zero, confirming the substantial predictive relevance of the model. Table 6 presents the results of testing hypotheses *H1*, *H2*, *H3*, and *H4*, which examine the relationships between Sustainable Marketing (SM), Digital Entrepreneurial Intention (DEI), and the mediating role of Perceived Usefulness (PU).

The results of the path coefficient test are as follows:

1. Sustainable Marketing has a positive and statistically significant effect on Perceived Usefulness ($\beta = 0.582$, $t = 7.231$, $p < 0.000$). Thus, *H1* is supported.

2. Perceived Usefulness demonstrates a positive and significant influence on Digital Entrepreneurial Intention ($\beta = 0.471$, $t = 7.894$, $p < 0.000$). Thus, *H2* is supported.

3. Sustainable Marketing exerts a significant direct positive effect on Digital Entrepreneurial Intention ($\beta = 0.253$, $t = 5.762$, $p < 0.001$). Therefore, *H3* is supported.

4. Perceived Usefulness significantly mediates the relationship between Sustainable Marketing and Digital Entrepreneurial Intention ($\beta = 0.274$, $t = 6.855$, $p < 0.001$). Therefore, *H4* is supported.

4. DISCUSSION

This inquiry has successfully elucidated the pivotal function of Perceived Usefulness (PU) as a mediating mechanism that translates Sustainable Marketing (SM) efforts into tangible Digital Entrepreneurial Intention (DEI) within the Indonesian cocoa landscape. By integrating the TBL, RBV, and Technology Acceptance Model (TAM) theories, a comprehensive model was developed where TBL defines sustainable practices, RBV explains the strategic value of the assets involved, and TAM clarifies the psychological processes driving digital entrepreneurial intention. The research findings provide deep insights into the mechanisms by which sustainability initiatives can trigger digital transformation at the grassroots level.

The first finding explains Sustainable Marketing as a driver of Perceived Usefulness. This relationship confirms that SM is a very strong antecedent of PU for digital technology. This suggests that when cocoa producers engage in sustainable marketing practices such as fair trade or organic certification they perceive digital tools as more useful for communicating this value to global markets. This occurs because SM programs transform technology from an abstract and risky concept into a concrete and relevant tool (Acheampong et al., 2023). Comparing this with previous research, our findings confirm the study by Lučić (2020) regarding sustainable value, yet we extend the previous literature by proving that in the agricultural sector, sustainability acts as a cognitive catalyst that simplifies the perceived utility of complex digital platforms. Unlike earlier research that conceptualized technology adoption as purely economic, focusing solely on operational monitoring and profit maximization, this study indicates that such a perspective fails to drive a significant perception of usefulness among entrepreneurs (Wang & Butkouskaya, 2023). Specifically, our findings reveal that in West Sulawesi, the concept of usefulness is fundamentally inseparable from long-term environmental and social sustainability. Furthermore, this research expands the theoretical boundaries of

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TAM by positioning Sustainable Marketing as a contextually pertinent external antecedent for Perceived Usefulness in developing markets. This aligns with recent scholarship utilizing the TAM lens, which suggests that sustainable marketing serves as a bridge effectively translating abstract technological potential into comprehensible and achievable economic value (Bashir, 2022; Yang et al., 2022; Zia & Alzahrani, 2022). Thus, for cocoa producers in Indonesia, sustainable marketing is not merely an end goal, but an empowerment process that facilitates the adoption of innovation.

The second finding reveals that perceived usefulness has a profound impact on digital entrepreneurial intention. This relationship exists because the shift toward digital entrepreneurship is motivated less by technological curiosity and more by a pragmatic assessment of functional value. For Indonesian cocoa producers, whose livelihoods are contingent upon harvest yields and market price fluctuations, the investment of time and resources required to master new digital tools must yield tangible returns. This finding is particularly relevant for the entrepreneurial context, where the decision to invest in new digital tools is invariably grounded in a pragmatic calculation of their contribution to revenue and efficiency. This aligns with recent scholarship utilizing the TAM lens, which suggests that sustainable marketing serves as a bridge effectively translating abstract technological potential into comprehensible and achievable economic value (Qin et al., 2025; Zia & Alzahrani, 2022). Thus, within the Indonesian cocoa sector, sustainable marketing functions not simply as a final objective, but as a dynamic empowerment process that catalyzes innovation adoption. According to related literature, individual intention to use technology is further determined by beliefs regarding digital information quality and digital infrastructure governance (Pagnanelli et al., 2025). Concerning the significant impact of perceived usefulness on entrepreneurial intention observed in this study, these results are corroborated by prior research (El-Kassar & Singh, 2019; Kalogiannidis et al., 2024), which found that entrepreneurs who perceive big data-related technologies as useful and easy to use are significantly more inclined to adopt such systems. This finding is particularly relevant for the entrepreneurial context, where the decision to invest in new digital tools is invariably grounded in a pragmatic calculation of their contribution to revenue and efficiency.

The third finding reveals that sustainable marketing exerts a significant and positive impact on digital entrepreneurial intention. This direct pathway implies that the adoption of sustainable practices such as eco-friendly branding, social empowerment, and ethical sourcing acts as an autonomous catalyst for entrepreneurial transformation, independent of the cognitive assessment of technology's usefulness. This result elucidates that for cocoa producers in West Sulawesi, sustainable marketing functions not merely as a promotional instrument, but as a fundamental confidence-building mechanism. By aligning operations with global sustainability standards, entrepreneurs cultivate a proactive mindset that compels them to leverage digital platforms for competitive advantage. This aligns with the notion that digital presence is a critical determinant of brand legitimacy, which allows small-scale enterprises to transcend local boundaries and gain recognition in broader markets (Vila-Boix et al., 2024). In contrast to prior research (Mas'ud & Tenriyola, 2025; Soeharso, 2024), which posits that marketing efforts influence intention solely through the mediation of brand image or utility, our results offer a novel perspective: sustainable marketing generates the intrinsic motivation necessary to surmount the initial barriers to digital entrepreneurship. While scholars such as Wang and Butkouskaya (2023) have predominantly conceptualized sustainability as an external environmental factor, this study reframes it as a core driver of entrepreneurial action. Conceptually, this research aligns with the framework established by Hasan et al. (2025), which positions a digital growth mindset as a key prerequisite for entrepreneurial interest among younger demographics. Theoretically, this mechanism is grounded in the Technology Acceptance Model (TAM), asserting that the propensity to adopt business technology is contingent upon its perceived functional value. Furthermore, the SM-DEI relationship observed here is corroborated by extensive prior research, which indicates that positive exposure to sustainability programs directly catalyzes the entrepreneurial impulse to assume an active digital role (Shen et al., 2021; Xu et al., 2022).

The influence of sustainable marketing on digital entrepreneurial intention as mediated by perceived usefulness, proves to be more potent than the direct influence of sustainable marketing alone. This indicates that while sustainable practices have a significant impact on cocoa producers in West Sulawesi, their efficacy is amplified when entrepreneurs perceive digital tools as highly instrumental to their business operations. This fourth finding reveals that cocoa producers implementing sustainable practices such as eco-friendly farming and ethical branding possess elevated confidence in the effectiveness of digital tools for accessing global markets. This finding aligns with Triple Bottom Line (TBL) values, which directly trigger digital readiness by encouraging active participation in digital ecosystems to communicate environmental impact to international buyers (Trojanowski, 2022). Consequently, the drive to build resilience and strengthen positive product perceptions on digital platforms enhances the cocoa producers' propensity to transition toward digital entrepreneurship. Overall, the data reveal a genuine enthusiasm for the digital future, propelling entrepreneurs toward digital transformation. These results are consistent with findings by Nadila et al. (2024), confirming that Perceived Usefulness plays a crucial mediating role in the relationship between sustainable values and entrepreneurial readiness. By leveraging sustainable marketing to enhance the perceived usefulness of digital tools among small-scale producers, the critical question regarding the mechanism of this transformation is resolved. Prior literature further indicates that entrepreneurial intention is profoundly influenced by the synergy between sustainability-driven branding and perceived usefulness (Hasan et al., 2025; Nambisan, 2017; Plečko et al., 2023). This implies that sustainable marketing fundamentally reshapes how entrepreneurs conceptualize the utility of digital platforms, which in turn catalyzes their intention to adopt digital business models. Ultimately, this study confirms that sustainable marketing acts as a fundamental driver of digital entrepreneurship, particularly among small-scale cocoa producers.

CONCLUSION

This study aims to investigate the mechanism through which sustainable marketing drives digital entrepreneurial intention among cocoa producers in West Sulawesi, Indonesia by utilizing the Technology Acceptance Model (TAM) framework. The findings reveal that sustainable marketing practices possess substantial explanatory power in determining both the perceived utility of digital tools and the ultimate intention to adopt digital business models. Specifically, findings reveal that the indirect influence through perceived usefulness is more potent than the direct pathway, proving that sustainability-driven values serve as a primary cognitive driver for technology adoption.

The study concludes that integrating sustainability into marketing strategies acts as a confidence booster that transforms digital tools from abstract concepts into pragmatic business assets for small-scale producers. Theoretically, this research enriches TAM by establishing sustainable marketing as a contextually significant external antecedent in emerging economies. Practically, it suggests that policymakers and program designers should integrate digital literacy components within sustainability certification programs to foster a holistic digital evolution in the agribusiness sector. Future research should expand this model by incorporating longitudinal data or examining the moderating role of digital infrastructure readiness to provide a more comprehensive view of long-term digital transformation.

AUTHOR CONTRIBUTIONS

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