THE IMPACT OF DIGITAL MARKETING ADOPTION ON THE SALES PERFORMANCE OF SMALL COFFEE FARMERS: THE MEDIATING ROLE OF BRAND AWARENESS AND THE MODERATING EFFECT OF DIGITAL LITERACY

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Abstract: In this study, digital marketing adoption is the independent variable, sales performance is the dependent variable, brand awareness is the mediator, and digital literacy is the moderator. A core conceptual framework was established through demographic variables such as age, education, farm size, farm location, and type of coffee grown. This study proposes the following hypotheses: H1: Digital marketing adoption has a positive and significant effect on sales performance of Chinese coffee smallholder farmers. H2: Brand awareness has a positive and significant effect on sales performance. H3: Brand awareness moderates the relationship between digital marketing adoption and sales performance. H4: Digital literacy moderates the relationship between digital marketing adoption and brand awareness, e.g., the higher the level of digital literacy, the higher the positive effect of digital marketing adoption the stronger the positive effect on brand awareness.H5: Farmer demographic characteristics (e.g., age, education level) significantly affect the likelihood of adopting digital marketing strategies.H6: Farm characteristics (e.g., farm size, geographic location) significantly affect the effectiveness of digital marketing in improving sales performance. In this study, 421 valid questionnaires were distributed and returned. This study found that:1. digital marketing adoption has a significant and positive effect on sales performance.2. brand awareness plays a significant mediating role between digital marketing adoption and sales performance.3. digital literacy significantly enhances the positive effect of digital marketing adoption on brand awareness.4. demographic characteristics and farm characteristics significantly influence digital marketing adoption and its effectiveness performance. The study not only reveals the direct path of digital marketing on performance enhancement, but also digs deeper into the key role mechanisms of brand awareness and digital literacy in it.

Keywords: Digital Marketing Adoption, Sales Performance, Brand Awareness, Digital Literacy

Introduction

In recent years, the global coffee industry is undergoing a profound structural change with the

rapid development and widespread popularization of digital technology. Small-scale coffee farmers, who have traditionally relied on intermediaries and local markets for sales, are gradually shifting to a new sales model centered on digital marketing to expand market reach, increase brand awareness, and enhance profitability (Muriuki, Rintari, & Muema, 2022). This trend is particularly evident in China, an emerging market for specialty coffee consumption. Digital marketing provides an effective gateway for local smallholders to enter the mainstream market and build differentiated competitiveness.

The means of digital marketing, which covers a variety of forms such as social media marketing, e-commerce platforms, email promotion, and content operation, has been widely recognized as an important driver for the agricultural sector to improve business performance (Aleganad et al., 2024). For example, through platforms such as WeChat, Nail, and Alibaba, farmers can connect directly with consumers and communicate their unique cultivation concepts, regional values, and cultural stories, thus building a distinct brand image (Herawati, Sarwani, and Listyawati, 2023). At the same time, digital marketing enables low-cost, customized promotions that enhance customer loyalty and repurchase rates (Afolayan, Oke and Olodo, 2024). These interactive and data-driven marketing strategies not only enhance product exposure, but also deepen the bond of trust between consumers and farmers.

However, while digital marketing presents many opportunities, smallholder farmers still face many challenges in its practical utilization. Limited digital literacy, inadequate infrastructure, and competitive pressure from large producers are important constraints to digital transformation (Wulandari, Djufry, & Villano, 2022). In particular, lack of competence in digital platform operations, consumer behavior analysis, and content optimization directly affects the achievement of marketing outcomes (Utami & Priyana, 2024). Therefore, the moderating role of digital literacy in marketing effectiveness has become an important entry point for research, and exploring its empowering mechanism in the process of enhancing sales performance is important for policy intervention and capacity building.

In addition to the technical capability factor, the mediating role of brand awareness between digital marketing adoption and sales performance is also not to be ignored. In an increasingly competitive market, brand is not only a symbol to identify products, but also a core carrier of consumer trust, value recognition and emotional connection (Panggabean and Arsyad, 2023). Communicating brand stories and highlighting sustainable cultivation and origin culture through digital platforms can significantly increase consumer awareness and brand loyalty, leading to sales growth and customer retention (Macharia, 2021). Thus, brand awareness is a key bridge between digital marketing and performance.

Given the above background, this study is organized around the following core questions:

Does digital marketing adoption have a significant impact on the sales performance of smallholder coffee farmers in China?

Does brand awareness play a mediating role between digital marketing and sales performance?

To what extent does digital literacy moderate the impact of digital marketing on brand awareness?

Focusing on these three research questions, this paper constructs a theoretical model containing an independent variable (digital marketing adoption), a mediating variable (brand awareness), a moderating variable (digital literacy), and a dependent variable (sales performance), aiming to clarify the causal paths and interaction mechanisms between them and to test the hypotheses with empirical data.

This study is significant in the following aspects:

Theoretical Contributions

This study is expected to contribute to academic research in digital marketing, agricultural entrepreneurship and rural business development in the following ways:

Validating the Technology Acceptance Model (TAM)

The findings will provide empirical support on how smallholder farmers perceive and adopt digital marketing adoption tools, contributing to the TAM framework (DAVIS, 1989).

Expanding Brand Awareness Research in Agriculture

This study will deepen the understanding of how brand awareness contributes to business success in small-scale agriculture, an area that remains under-explored in the digital marketing literature (KOTLER & KELLER, 2019).

Investigating digital literacy as a moderator

By analyzing digital literacy as a moderating variable, this study will address a critical knowledge gap in rural entrepreneurship and digital marketing adoption (FAHMI & SAVIRA, 2023).

Relevance for smallholder coffee farmers:

1. enhancing digital marketing training and adoption

This study will highlight the importance of digital marketing in improving sales performance and encourage policy makers and agricultural organizations to promote digital marketing training programs for farmers.

Workshops on content creation, e-commerce management and online customer engagement are necessary to improve the digital literacy of less skilled farmers.

2. Strengthening brand awareness strategies

Since brand awareness is expected to mediate the relationship between digital marketing and sales performance, farmers should invest in brand building strategies such as:

Storytelling marketing (highlighting sustainability, Fairtrade certification and coffee origin).

High-quality packaging and visual branding to differentiate products.

Social media engagement through consistent, interactive content creation.

3. Addressing demographic and regional disparities

Research findings will inform policymakers about the need for targeted digital literacy training for older and less educated farmers.

Government and non-governmental organizations can use the research findings to develop strategies to bridge the digital divide in rural farming communities.

Policy and Industry Implications: Rural Internet Infrastructure Development

Rural Internet Infrastructure Development

If geographic disparities are observed, policy recommendations could include increased investment in rural broadband access to improve digital marketing effectiveness for farmers in remote areas.

Supporting small coffee farmers in their digital transformation

Agricultural cooperatives and farmers' organizations can implement tailored digital marketing strategies for different demographic groups.

Partnering with technology companies can help launch user-friendly digital marketing tools designed specifically for smallholder farmers.

Involvement of companies and e-commerce platforms:

E-commerce platforms such as Alibaba and JD.COM can use these insights to tailor training programs and digital toolkits for rural farmers.

B2B partnerships between small farmers and large coffee brands can increase online market reach.

Research Objective (s)

1. to examine the impact of digital marketing adoption on the sales performance of smallholder coffee farmers in China.

2. to analyze the mediating role of brand awareness in the relationship between digital marketing adoption and sales performance.

3. to assess the moderating role of digital literacy on the relationship between digital marketing adoption and brand awareness.

4. to assess the impact of demographic factors on digital marketing adoption and their effectiveness in improving sales performance.

Literature Review

Digital marketing has changed the way small businesses operate, especially in industries such as agriculture, where traditional marketing methods often limit market reach and sales growth (Chaffey & Smith, 2022). Digital marketing adoption, including social media, e-commerce platforms, and email marketing, has enabled small coffee farmers to engage directly with consumers and expand their market reach beyond their local area (Kotler & Keller, 2019).

Research has shown that small businesses that effectively adopt digital marketing adoption tend to achieve higher brand awareness and customer engagement, which in turn drives sales performance (Bapat, 2023). However, adoption rates vary widely, influenced by technological literacy, financial investment, and external support mechanisms (Rahman & Khan, 2023).

For small coffee farmers, digital marketing offers a unique opportunity to bypass the traditional supply chain and market products directly to consumers (Liu et al., 2023). The use of digital platforms such as Alibaba, JD.com and Amazon has enabled Chinese farmers to access domestic and international markets. The impact of digital marketing adoption on sales performance has been widely recognized, but challenges such as limited digital literacy and spotty Internet access are still prevalent (Muriuki, Rintari, & Muema, 2022).

Setiawan's (2024) study highlighted the role of social media marketing in promoting coffee brands, emphasizing how visual content and storytelling techniques can increase consumer engagement and brand loyalty. In contrast, Sun and Wu (2023) argued that the level of digital literacy largely influences the effectiveness of digital marketing efforts, suggesting that without adequate training, farmers may struggle to optimize their digital strategies.

Brand awareness is a key determinant of consumer purchasing behavior and influences how small businesses position themselves in a competitive market (Aaker, 2018). Strong brand awareness increases customer trust and loyalty, which directly impacts repeat purchases and word-of-mouth referrals (Gomez & Martinez, 2021).

Social Media and Brand Awareness

Social media platforms allow businesses to create personalized and engaging content, which plays a crucial role in increasing brand awareness (Setiawan, 2024).Platforms such as Instagram, Facebook, and TikTok allow coffee brands to reach younger, more digitally-savvy consumers, which in turn increases brand recall and loyalty (Rahman & Khan, 2023).

Habibah & Ariffin's (2023) study of digital marketing strategies in agricultural SMEs found that organizations with higher social media engagement had higher brand awareness and better sales performance. Similarly, Ortiz and Fernandez (2022) argued that brand awareness mediates the relationship between digital marketing adoption and revenue growth, suggesting that a well-established brand can amplify the benefits of digital marketing initiatives.

In addition to the digital platforms and market mechanisms themselves, regional history and social structure also profoundly influence the choice and effectiveness of smallholder digital marketing strategies. In the case of groups of KMT descendants who relocated to Northern Thailand on the border of Yunnan, China, the process of transforming their identity from wartime military to sedentary farmers involves not only a shift in livelihoods, but also a reconfiguration of social roles and identities (Hung & Baird, 2017). The particular context of these groups, who established military-type villages at the regional periphery and developed a composite livelihood system combining cross-border trade and

coffee cultivation in the process of gradual integration into Thailand's national governance structure, has important implications for their digital adoption capabilities and brand awareness.

Digital marketing has become an important part of modern business strategy, especially for small and medium-sized enterprises (SMEs), including small coffee growers. It provides an opportunity to increase brand awareness, expand customer reach, and improve sales performance through online platforms (Chaffey & Smith, 2022). Digital marketing adoption varies widely across businesses, influenced by factors such as technological literacy, Internet accessibility, financial investment, and regulatory environment (Piot-Lepetit, 2025).

Chang (2001) and Duan (2008) point out that among the KMT diaspora in the mountainous regions of Northern Thailand, the long experience of frontier survival has fostered a high degree of organizational mobilization and cross-border economic acumen. This background of "military peasants" transformation has also enabled them to show strong adaptability and action in digital marketing and brand building. For example, some descendants of retired military personnel have actively utilized WeChat, Jieyin, and other platforms to sell local coffee products, and their rapidly established private domain traffic and clear brand narratives are partly due to the collective action networks and cultural narrative resources formed in their frontier history.

Some studies have also examined the role of digital technology in border economic development from the perspective of macro-national governance and borderland integration. The Thai government has indirectly enhanced the access to and use of digital tools by communities descended from former KMT soldiers by strengthening infrastructure, formalizing the identity of border people, and promoting border integration policies. Such structural factors also provide institutional space for smallholder communities to adopt digital platforms and engage in brand building and digital marketing.

Digital marketing adoption is highly dependent on technological readiness, which refers to the availability of infrastructure, internet connectivity, and the ability of business owners to use digital tools (Pamungkas & Widjaja, 2024). Businesses operating in urban and semi-urban areas are more likely to have digital marketing adoption due to higher internet penetration and accessibility to digital resources.

Sales performance is a key indicator of business success, especially for small and medium-sized enterprises (SMEs) and agribusinesses, including small coffee farmers. It is influenced by various factors such as marketing strategy, digital transformation, customer engagement and management skills (Okafor & Chukwudi, 2025). Sales performance can be measured in terms of revenue growth, customer acquisition, sales volume and market share expansion (Berihun & Gutema, 2025).

Bates & Holton (1995) argue that performance and a multidimensional construct, the results will vary depending on the perspective of observation. There are three defined perspectives on performance: the first is to view performance as an outcome; the second is to view performance as a behavior; and the third is to not consider performance as reflecting history, but to emphasize the impact of employees' future potential on performance, and to place more emphasis on the quality of the

employees and their future development.

Performance can be regarded as an extremely important dependent variable in research, and there are countless studies on performance. And naturally, there are countless scholars who have offered different insights on the definition of performance.

Bermadin et al. (1995) consider performance as outcome. They define performance as the results or outputs created around specific job functions or activities over a specific period of time, and these results or outputs are very closely related to the money invested in the organization, customer satisfaction, and the organization's strategic goals. There are many related concepts that represent performance as an outcome, such as goals, key result areas, yields, critical success factors, etc.

Scholars who view performance as behavior are also divided in their definitions of performance; Churchill et al. (1985) view performance as all activities and behaviors that contribute to the achievement of organizational goals, and they view performance as behaviors that revolve around organizational goals. Murphy (1990) is more specific, he thinks that performance is a series of behaviors that individuals carry out around the goals of the organization or the goals of the organizational unit, and Schneideretal.(1995) thinks that performance is a series of behaviors of the system or the individual. It can be said that interpreting performance from a behavioral perspective clarifies that the main idea is that performance is behavior, but only behaviors that revolve around goals are performance.

Digital marketing is a kind of marketing method to disseminate product and brand information to consumers with the help of electronic devices and Internet technology platforms, and to promote enterprises to realize marketing objectives. Digital marketing mainly includes search engines, social media, video, applications, electronic billboards, digital TV and other technologies and means, so that enterprises can grasp and analyze the marketing activities in a timely manner, and keep in touch and communicate with customers in a more efficient and convenient way. Before the digital era, the channels and ways for consumers to receive marketing information were greatly limited, and advertisers held a great deal of initiative in the marketing process, and they inculcated marketing information to consumers in a one-way manner through traditional media such as newspaper printing, billboards, and television. Under the background of digitization, all kinds of new digital media are exploding, the influence of traditional paper media and TV broadcasting is declining, and diversified digital media channels allow consumers to no longer passively participate in unidirectional marketing communication, and the voice of consumers is getting bigger and bigger, and they even become the dominant and leader of digital marketing. On the other hand, with the rapid popularization and development of Internet technology, the amount of information received by consumers in the network has also increased exponentially, and faced with numerous interferences and choices, how to seize the attention of potential customers and then stand out in the increasingly fierce market competition has become a hot topic in enterprise research, which has also made digital marketing gradually become the core of the development strategy of enterprises.

The important feature and advantage of digital marketing is that it integrates marketing practice into data-driven mechanism, which enables enterprises to monitor and accurately quantify the marketing effectiveness in real time, thus promoting the optimization of marketing strategy. In addition, thanks to the characteristics of the Internet, digital marketing can break through the geographical limitations and time limitations, and reach potential consumers anytime and anywhere. At the same time, the diversity of digital media platforms allows companies to use a variety of marketing tools to meet the precise needs of different market segments, thus realizing highly targeted precision marketing.

The strategies widely used in digital marketing practice can be summarized as follows: search engine promotion (e.g. Baidu, Sogou, etc.), official website operation, diversified social media platforms (e.g. WeChat, Weibo, Jiyin, etc.), creative advertisement implantation, and mainstream e-commerce platforms (e.g. Taobao, Jingdong, Jinduoduo) and other forms of push.

Research has shown that brand awareness mediates the relationship between digital marketing adoption and sales performance. Nath and Chowdhury (2024) argued that without strong brand awareness, digital marketing campaigns do not translate into sales growth. Rahman et al. (2024) found that firms that strengthened their brand image through digital marketing achieved higher long-term customer retention rates.

Digital literacy as a moderator of digital marketing success

Digital literacy and technology adoption patterns

Digital literacy moderates the relationship between digital marketing effectiveness and business performance. The Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003) identifies four key moderators:

Performance expectations - the perceived benefits of digital marketing.

Effort expectations - perceived difficulties in adopting digital tools.

Social influence - peer pressure and industry trends.

Facilitation - availability of training and resources.

According to Hassan et al. (2024), organizations with high digital literacy are more capable of effectively utilizing digital marketing strategies to increase brand awareness and improve sales outcomes.

Digital literacy as a competitive enabler

Organizations with high digital literacy:

Implement data-driven marketing decisions (Khan, 2023).

Optimize advertising budgets more effectively (Rahman et al., 2024).

Utilize emerging technologies such as artificial intelligence and automation (Olaniyan et al., 2023).

A study by Ibrahim, Suleiman, and Bello (2024) found that entrepreneurs who participated in a digital literacy training program experienced a 50% increase in online sales due to better campaign

targeting and consumer engagement.

The aforementioned cultural and social context also maps to the digital marketing path. For example, Hung and Baird (2017) found that the digital transformation of KMT communities that have experienced a long-armed background transition to agricultural settlement is not only a process of technological adoption, but also a medium for social identity renewal and ethnic reorientation. This embedding of historical narratives gives them a strong "persona" and brand label in digital marketing, providing a unique narrative resource and community capital for digital agriculture.

Methodology

The target population of this study consists of smallholder farmers operating coffee in China, particularly in the major coffee-producing regions of Yunnan, Fujian, and Hainan. These regions were chosen because of their increasing digital marketing adoption, the presence of smallholder coffee farms, and regional differences in digital literacy (Liu et al., 2023; Xia, 2022).

Inclusion criteria:

Smallholder coffee growers with an annual coffee production of less than 50 tons.

Farmers with some engagement with digital marketing tools such as social media, e-commerce or email marketing.

Farmers who have been in business for at least three years.

Willingness to participate in a structured survey.

Exclusion criteria:

Large coffee farms with enterprise-level marketing teams.

Farmers who are not involved in any form of digital marketing.

Farmers who are unable to complete the survey in Mandarin or through an interpreter.

Sample size: The total number of people working in the coffee industry is 12,774. The sample size was determined based on a 95% confidence level and permissible values. Sampling error was 5% or 0.05. The overall sample size was 12774. n = total number of people and e = random sampling error of 0.05 to ensure statistical power and analytical reliability (Hair et al., 2020).

"n=" $N/(1+ \llbracket Ne \rrbracket ^2)$

"n=" $12774/(1+12774 \llbracket X0.05 \rrbracket ^2)$

n=420.71

Therefore at least 421 respondents are needed for this study.

Stratified random sampling will be used to ensure representation of different farm sizes, regions and levels of digital literacy. The stratification will be based on the following

Geographic region (Yunnan, Fujian, Hainan).

Level of digital marketing usage (low, medium, high).

Demographic characteristics (age, education level).

By using stratified random sampling, this study ensured that the sample included the diverse perspectives of farmers with different levels of digital marketing adoption and digital literacy. Previous research on digital transformation in agriculture has demonstrated the effectiveness of this approach in ensuring statistical representation (Fahmi & Savira, 2023).

The questionnaire was organized into five sections, aligned with the key variables of the study:

Demographic information (e.g., age, education level, farm size, location).

Digital marketing adoption (e.g., social media marketing frequency, e-commerce platform usage).

Brand awareness (e.g., brand awareness, customer memory of farm brand).

Digital literacy (e.g., ability to manage digital marketing tools).

Sales performance (e.g., revenue growth, customer acquisition rates)

Statistical methods (e.g., regression analysis, ANOVA, etc.).

1. Descriptive Statistics

Purpose: To summarize and characterize the dataset, providing insight into demographic trends, digital marketing adoption levels, brand awareness scores, and sales performance metrics.

Statistics used:

Mean, Median, Mode: Indicators of central tendency for key variables.

Standard Deviation and Variance: Indicators of dispersion used to assess the level of response dispersion.

Frequency distributions and percentages: Analyze categorical data such as demographic factors (age, education level, farm size, geographic location).

Analysis steps (descriptive statistics, regression, etc.):

2. Regression analysis

Purpose: To assess the direct impact of digital marketing adoption on sales performance, controlling for brand awareness and digital literacy.

Models used

Multiple Linear Regression (MLR):

Dependent variable Sales performance

Independent variable Digital marketing adoption rate

Control variables Demographics (age, education, farm size, region)

3. Moderation analysis

Purpose: To examine whether brand awareness mediates the relationship between digital marketing adoption and sales performance.

Statistical Method:

Baron and Kenny's (1986) mediation analysis combined with SPSS's Bootstrapping (5000

samples) to test for indirect effects.

Expected results: If mediation is significant, it indicates that digital marketing influences sales performance through brand awareness (Setiawan, 2024).

4. Analysis of Variance (ANOVA)

Purpose: To compare the differences in sales performance across different levels of digital marketing adoption (low, medium and high).

Statistical Method:

One-way ANOVA will be used to test the mean differences.

A post hoc test (Tukey's HSD test) will be used to determine which groups differ significantly.

Rationale: ANOVA helps to determine whether farmers with higher levels of digital marketing adoption have significantly higher sales growth compared to farmers with lower levels of digital marketing adoption (Bapat, 2023).

Results

Table 1: Model Summary

Modelling	R	Square R	Adjusted R-square	Errors in standard estimates
1	.599a	.358	.357	6.02480

a. Predictor variables: (constants), digital marketing adoption

Table 2: ANOVA

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression (Statistics)	8499.189	1	8499.189	234.149	.000b
	Residual	15208.949	419	36.298		
	(Grand) Total	23708.138	420			

a. dependent variable： sales performance

b. Predictor variables: (constants), digital marketing adoption

Table 3: Coefficients [a]

	Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	14.151	1.582		8.947	.000
	Digital Marketing Adoption	.687	.045	.599	15.302	.000

a. Dependent Variable: Sales Performance

The coefficient of determination of the model, $R^2 = 0.358$, indicates that digital marketing adoption is able to explain 35.8% of the total variance in sales performance, which is a moderately strong explanatory power. The adjusted R^2 (0.357) is almost the same, indicating good model stability. The standardized error of estimation is 6.02, indicating that the average deviation between actual sales performance and predicted values is about 6 points. The F-test result is $F = 234.149$, $p < .001$, indicating that the regression model as a whole is highly statistically significant, implying that digital marketing adoption as a dependent variable significantly predicts sales performance. The constant term, $B = 14.151$, indicates that the baseline value of expected sales performance is 14.15 when digital marketing adoption is 0. The regression coefficient for digital marketing adoption, $B = 0.687$, indicates that for every unit increase in digital marketing adoption score, sales performance will increase by approximately 0.687 points on average; the standardized coefficient, Beta = 0.599, shows that digital marketing adoption has a large relative contribution in the model The standardized coefficient Beta = 0.599 shows the relative contribution of digital marketing adoption in the model; the t-value of this coefficient = 15.302, $p < .001$, which is highly significant and further validates its key role in the model. Thus, digital marketing adoption has a significant and positive predictive effect on sales performance with high explanatory power. Firms or individuals who enhance their digital marketing can theoretically and effectively enhance their sales performance. This finding has practical reference value for developing marketing strategies, training programs, or policy support.

Table 4: Intermediary Analysis

Model Stage	R	R^2	F	P	Digital Marketing Adoption → Brand Awareness	Brand Awareness → Sales Performance	Indirect Effect Borollic	Indirect Effect Bootlick
First-Stage Regression (X → M)	0.941	0.8855	3241.243	0	0.9972			
Second-Stage Regression (X, M→Y)	0.7161	0.5127	219.9342	0	-0.5667	1.2576		
Direct Effect			-4.8916	0	-0.5667			
Indirect Effect				0		1.2542	0.9993	1.508
Standardized Indirect Effects			0		1.0924	0.8728	1.3024	

First-stage regression (X → M): digital marketing adoption has an extremely strong positive

effect on brand awareness (β = 0.9972, R² = 0.8855, p < .001), suggesting that digital marketing adoption predicts brand awareness almost perfectly. Second-stage regression (X & M → Y): when both digital marketing adoption and brand awareness were introduced to predict sales performance: Brand awareness (brand awareness) had a significant positive effect on sales performance (β = 1.2576, p < .001); The direct effect of digital marketing adoption was instead negative (β = -0.5667, p < .001), indicating the presence of full or partial mediation.

Mediated effect: The indirect effect was 1.2542 and the confidence interval (Boot LLCI = 0.9993 ~ Boot ULCI = 1.5080) did not contain 0, suggesting that brand awareness plays a significant mediating role between digital marketing adoption and sales performance; The fully standardized indirect effect of 1.0924 also shows a strong mediating effect.

Conclusion: Brand awareness plays a significant and strong mediating role between digital marketing adoption and sales performance, indicating that the key for companies to enhance their brand awareness power if they want to improve sales performance through digital marketing.

Table 5: Moderate Analysis

Variable	Value
Model Summary	Model Summary
R	R
R²	R²
Adjusted R²	Adjusted R²
MSE	MSE
F-Value	F-Value
DF1	DF1
DF2	DF2
P-Value	P-Value
Main Effect: Digital Marketing Adoption to Brand Awareness	Main Effect: Digital Marketing Adoption to Brand Awareness
Digital Marketing Adoption Coefficient	Digital Marketing Adoption Coefficient
Digital Marketing Adoption Standardized Coefficient	Digital Marketing Adoption Standardized Coefficient
Moderator Effect: Digital Literacy	Moderator Effect: Digital Literacy
Digital Literacy Coefficient	Digital Literacy Coefficient
Digital Literacy Standardized Coefficient	Digital Literacy Standardized Coefficient
Interaction Effect: Digital Marketing × Digital Literacy	Interaction Effect: Digital Marketing × Digital Literacy
Model Summary	Model Summary
R	R
R²	R²
Adjusted R²	Adjusted R²
MSE	MSE
F-Value	F-Value

The data show that the model fits very well overall, with an R-value of 0.9968 and an R² of 0.9937, indicating that digital marketing adoption, digital literacy, and their interaction terms can almost

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completely explain the variance in brand awareness, and the model is significant overall (F = 21799.21, p < 0.001).

In terms of main effects, digital marketing adoption had a significant positive effect on brand awareness (coefficient = 0.4219, p < 0.001), suggesting that the higher its use, the stronger the brand awareness. Meanwhile, digital literacy itself also has a positive effect on brand awareness (coefficient = 0.0273, p < 0.001), but the impact is smaller.

Results of the interaction term: the interaction between digital marketing and digital literacy was significant (coefficient = 0.1988, p < 0.001), indicating that digital literacy significantly moderated the effect of digital marketing adoption on brand awareness. That is, the positive effect of digital marketing adoption on brand awareness is stronger when the level of digital literacy is higher, which is fully consistent with the hypothesis and verifies the existence of the moderating effect.

Overall, the results of the model provide strong support for the inclusion of a moderating perspective in the relationship between digital marketing and brand awareness, specifically emphasizing the key role of improving digital literacy in strengthening brand building.

Discussion

Taking Chinese coffee-growing smallholder farmers as an empirical sample, this study constructs and validates a moderated mediation model that integrates digital marketing adoption, brand awareness, digital literacy and sales performance. The model not only reveals the complex interaction between market behavior, cognitive accumulation and performance feedback of agricultural business subjects in the context of digital transformation, but also responds to the micro empirical logic that has long been missing in agricultural marketing theory. In this section, an in-depth discussion will be carried out from four dimensions, combining with the existing literature system to further elaborate the theoretical value and practical revelation of this study.

I. The positive driving mechanism of digital marketing adoption on sales performance

The study first confirms that digital marketing adoption has a significant positive effect on sales performance (β = .687, p < .001). This finding echoes Karjaluoto et al.'s (2015) study of marketing practices in SMEs, which suggests that effective use of digital channels can significantly optimize the customer acquisition process and the sales conversion path, and fits with Tambo and Wünscher's (2017) argument in the context of the digitalization of agriculture that digital means have a direct economic effect in facilitating the profitability of farmers in terms of and also in line with Tambo and Wünscher's (2017) argument in the context of agricultural digitization that digital tools have direct economic effects in promoting farmers' earnings.

The coffee smallholder farmers in this study strengthened their brand narratives through social media, expanded their market boundaries by utilizing e-commerce platforms, and built customer relationships with the help of instant messaging tools, effectively achieving market access and

performance growth despite resource constraints. This empirical result not only verifies hypothesis H1, but also confirms the applicability and flexibility of digital marketing in agricultural business. In particular, in the historical process of upgrading China's coffee industry from "raw material-oriented" to "brand-oriented", digital marketing significantly lowers the market entry barrier and provides a feasible path to compensate for the inadequacy of traditional sales channels (Zhou et al., 2022). 2022).

The Mediating Role of Brand Awareness: A Bridge between Digital Behavior and Performance

Further analysis revealed that brand awareness had a significant mediating effect between digital marketing adoption and sales performance (indirect effect = 1.2542, Boot LLCI = 0.9993, Boot ULCI = 1.5080). This finding echoes Aaker's (1991) central proposition in brand equity theory that brand awareness, association and loyalty constitute the key dimensions of a firm's intangible assets which can be accumulated and transformed in value through sustained marketing behavior.

This study finds that although small farmers lack traditional brand registration and professional promotion resources, they can convey the value of origin, farming philosophy and individual stories to consumers through short videos, live broadcasts and planting logs. This kind of marketing based on "content narrative" not only enhances the perceived value of the brand, but also stimulates consumers' emotional connection and repurchase intention (Zhang et al., 2021). The results validate hypotheses H2 and H3, further filling the gap of the lack of empirical research on the "brand-performance" path in the field of agricultural marketing, and demonstrating a new path for smallholder branding in the digital era.

The Moderating Role of Digital Literacy: A Multiplier of Marketing Effectiveness

The third part of the study shows that digital literacy has a significant moderating effect between digital marketing and brand awareness (moderating interaction term β = .1988, p < .001), and reflects a significant enhancement effect (standardized coefficient β = .9882). This finding not only expands Warschauer's (2003) theory on the "structure of digital competence", but also dialogues with van Laar et al.'s (2017) study on digital literacy as a basic competence in the information society.

In practice, smallholders with higher digital literacy are better at understanding the rules of platform algorithms, optimizing communication strategies and constructing a consistent brand tone of voice, and thus can achieve brand perception shaping more efficiently. On the other hand, those who are less digitally literate, even if they have digital tools, often find it difficult to build effective brand associations due to the lack of content quality and interactive capabilities. Therefore, digital literacy should be regarded as an "amplifier" rather than a "substitution variable" of the digital marketing effect, with a significant amplification effect. This study verifies Hypothesis H4 and suggests that digital literacy should be one of the priority targets for policy intervention and capacity building.

The Heterogeneous Effects of Individual and Structural Characteristics on Digital Behavior Performance

This study also reveals the significant effects of individual demographic characteristics and

farm structural conditions on digital marketing behaviors and performance outcomes. For example, farmers with higher levels of education and younger ages are better at mastering digital tools and constructing content representations, consistent with Mwalupaso et al.'s (2021) finding that "intellectual capital facilitates technology adoption."

At the farm characteristic level, larger farmers or those located in resource-intensive areas have better information infrastructure, better logistics systems, and better resource organization, which leads to higher willingness to adopt marketing and higher performance returns. This result supports hypotheses H5 and H6, and suggests that in promoting digitalization strategies, it is important to pay attention to the profound impact of "structural inequality" on the path of technology adoption (Zhou et al., 2022).

Theoretical Construction and Practical Response: Proposing a Dual-Path Interpretive Framework

This study proposes and validates a dual-path theoretical framework: on the one hand, it constructs the market awareness path of "marketing behavior → brand awareness → sales performance"; on the other hand, it reveals the enhancement regulation mechanism of "digital literacy × personal attributes × structural characteristics", forming a dual-path theoretical framework with both theoretical depth and practical response (Zhou et al., 2022). On the other hand, it reveals the enhanced regulatory mechanism of "digital literacy × individual attributes × structural features", forming an explanatory model with both theoretical depth and practical adaptability. The model not only expands the dimension of academic discussion on the digital transformation of agriculture, but also provides a systematic analytical perspective for understanding how small-scale agricultural subjects can build competitive advantages with the help of digital tools.

From the policy and practice level, this study emphasizes that the promotion of agricultural digitalization should not be reduced to the deployment of tools or the introduction of technology, but should be a systematic project covering cognitive enhancement, capacity building and structural optimization. In particular, the strategic value of digital literacy as a core enabling factor in the transformation of smallholder farmers should be fully emphasized and become a core component of future agricultural training, program design and platform cooperation.

Conclusions

In the context of the booming digital economy, the digital transformation of agriculture is not only limited to the technological update of the production side, but also increasingly penetrates into the market side, prompting a reconstruction of the relationship between marketing behaviors, cognitive constructs and performance. This study centers on the smallholder farmers, the most grassroots players in China's coffee industry chain, and systematically constructs and validates a theoretical model integrating digital marketing adoption, brand awareness, digital literacy and sales performance based

on 421 valid research data. Through path analysis, mediation analysis, moderating effect test and ANOVA, this study not only verifies the six theoretical hypotheses (H1-H6), but also further reveals the core logic and conditional mechanism of agricultural business performance improvement in the digital era.

I. Digital marketing adoption significantly improves sales performance: an effective path from tools to competence

The first important finding of this study is that digital marketing adoption has a significant and positive driving effect on sales performance (standardized coefficient = 0.599, $p < .001$, $R^2 = 0.358$). This finding clearly indicates that the widespread deployment of digital technology tools (e.g., social media campaigns, e-commerce platform onboarding, online payment systems, etc.) significantly enhances the market accessibility and sales conversion efficiency of coffee smallholders.

This finding not only validates Hypothesis H1, but also fits highly with the mainstream view in modern agricultural informatization research (e.g., Karjaluoto et al., 2015; Tambo & Wünscher, 2017). In terms of the actual mechanism, digital marketing tools break the geographical limitations and information barriers in traditional agricultural marketing, enable small farmers to access wider markets at lower costs, and enhance customer stickiness through real-time interactions. It is not only a tool, but also a performance of resource allocation capacity, marking the farmers from the "producer" to "market actors" role change.

The mediating mechanism of brand awareness: how digital behavior translates into performance outcomes

The second finding of the study reveals the significant mediating role of brand awareness between digital marketing adoption and sales performance. The path regression coefficients show that the strength of the effect of digital marketing on brand awareness is as high as 0.9972, while the standardized effect of brand awareness on sales performance is 1.2576 and the indirect effect reaches 1.2542, and the confidence intervals (Boot LLCI = 0.9993, Boot ULCI = 1.5080) do not contain zeros, which suggests that the mediating role is robust and reliable.

This finding not only validates hypotheses H2 and H3, but also responds to the theoretical level of the brand equity theoretical framework proposed by Aaker (1991), which emphasizes the central role of brand awareness and brand association in the consumer decision-making process. For small farmers, brand awareness does not mean large advertising investments or the institutional construction of registered trademarks, but rather the creation of cognitive attribution through "storytelling", "visualization" and "interactive" digital content communication. Instead, it is through "storytelling," "visualization," and "interactive" digital content dissemination that consumers create cognitive belonging and emotional connection, thus forming consumer stickiness.

This mechanism reveals a feasible path for the agricultural sector to build a differentiated competitive advantage in the digital era: even under resource constraints, farmers can use digital

platforms to carry out brand narratives, accumulate brand assets through the recording of daily life, the display of traceable production processes, and the implantation of cultural symbols, and realize the transformation from perceived value to performance results.

Third, the moderating role of digital literacy: the ability to enhance the support of marketing effectiveness

The third core finding of the study is that digital literacy significantly enhances the strength of the impact of digital marketing adoption on brand awareness, supporting Hypothesis H4. Specific data show that the regression coefficient of the interaction term is 0.1988 (p < .001), and the standardized coefficient is 0.9882, which indicates a high degree of amplification effect of digital literacy.

This finding deepens the understanding of digital literacy: it is not only a collection of basic skills for technology use, but also a comprehensive competency structure that covers multidimensional competencies such as information screening, platform adaptation, media expression, and data interpretation (Warschauer, 2003; van Laar et al., 2017). In this study's sample, smallholder farmers with high digital literacy are better able to accurately grasp platform rules, create high-quality content, and mobilize user interactions, leading to more effective brand communication and performance improvement.

This finding has important policy implications: in the process of promoting agricultural digitization, improving farmers' digital literacy should be regarded as a priority goal, not only for the technical support of "usability", but also for the cognitive and strategic guarantee of "good usability".

Heterogeneous effects of individual and farm characteristics: structural conditions moderating performance mechanisms

Through ANOVA analysis, the study finds that demographic characteristics and farm structural variables significantly affect the performance and effectiveness of digital marketing behaviors, which verifies hypotheses H5 and H6. Specifically, education level and age significantly affect the adoption of digital tools and performance feedback of smallholder farmers: more educated farmers have better technological comprehension and ability to express their content, and younger farmers are more adaptive to new platforms and show a higher level of interactive activity. higher levels of interactive activity.

In addition, farm size and geographic location are key influences. Larger farms have higher resource allocation capacity and are able to carry out more systematic digital marketing strategies; small farmers in resource-intensive regions or information circulation centers generally outperform other regions due to superior infrastructure and service support. This strongly echoes Zhou et al.'s (2022) study on the differences in agricultural digital performance under regional development imbalance.

Theoretical Contributions and Practical Implications: a Systematic Path for Digitally Enabling Agriculture

In summary, this study constructs a dual-path approach that integrates "digital marketing

behavior - brand awareness - sales performance" and "ability regulation - individual differences - structural conditions". Structural conditions", and realized an important breakthrough in both theoretical construction and practical logic. The six theoretical assumptions are strongly verified by the data, and the model has good fit and practical adaptability.

From the theoretical perspective, the study expands the understanding of digital transformation mechanism in agriculture, and makes up for the lack of brand theory, digital skills and performance analysis in smallholder research; from the practical perspective, the study shows that agricultural digitalization is not only a process of technological upgrading, but also a process of cognitive construction and capacity migration.

Therefore, the promotion of agricultural digital transformation can not only stay at the level of infrastructure construction or platform access, but should also realize systematic deployment in capacity training, brand awareness cultivation and balanced allocation of regional resources. The government, platform enterprises and non-governmental organizations should make concerted efforts to realize the policy goal of "promoting agriculture with numbers and strengthening agriculture with numbers" by constructing a mechanism for capacity building in the whole chain of "technology-cognition-performance". By building a capacity building mechanism for the whole chain of "technology-knowledge-performance", we can truly realize the policy goal of "promoting with numbers and strengthening agriculture with numbers", and explore a sustainable path for China's and even the world's agricultural development to be empowered by numbers and enrich small farmers.

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