Utilization of Digital Marketing in Food Agricultural Business

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Abstract. Advances in information technology, especially the internetinternet, have affected all economic activities in Indonesia, including business activities and trade in agricultural products. Previous digital marketing research has mainly highlighted its practice in developed countries for non-agricultural commodities and using the point of view of businesses and sellers. In contrast, digital marketing research in developing countries, especially for agricultural products, using the consumer-side perspective still needs to be improved. This research is here to fill the research gap. This study analyzes the factors influencing consumer decisions in using digital marketing to purchase agricultural products. Data collection was carried out by surveying 200 consumers of food agriculture businesses spread across all regencies/cities in West Sumatra, Indonesia. Data were analyzed using logit regression. The results showed that digital marketing was significantly influenced by education level and digital lifestyle, while gender, income, number of families, age, and reference group had no significant effect. The higher the level of consumer education and the more intensive and digital living culture it has, the more significant the proportion of consumers using e-marketing to purchase agricultural products. This study recommends targeting highly educated consumers with a digital culture by intensifying the use of websites, social media, and viral marketing as marketing media for agricultural products.

Keywords: Digital Marketing, Agricultural Online Marketing, Purchasing Decision.

1 Introduction

The development of information technology has brought fundamental changes in the activities of human life. One of the advances in information technology is essential to internet use. Information technology is quickly developing and advancing, completely changing our lives and business activities [1]. Based on Susenas data, internet use in Indonesia continues to increase yearly (Figure 1) and has impacted changes in community activities, especially in business and trade. The use of the internetinternet for sales and marketing purposes has been on the rise over the past decade. This trend has accelerated since the start of the COVID-19 pandemic [2]. Consumers increasingly use the internetinternet to find information or buy products. In many economic sectors, online information and communication technology is becoming a prerequisite for participating in our rapidly modernizing society [3] . The early stages of the COVID -

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19 pandemic saw farmers' increased reliance on direct market sales and online marketing [4]. Adopting Internet services by businesses can significantly impact their performance and introduce new business models and new directions through innovation [5].

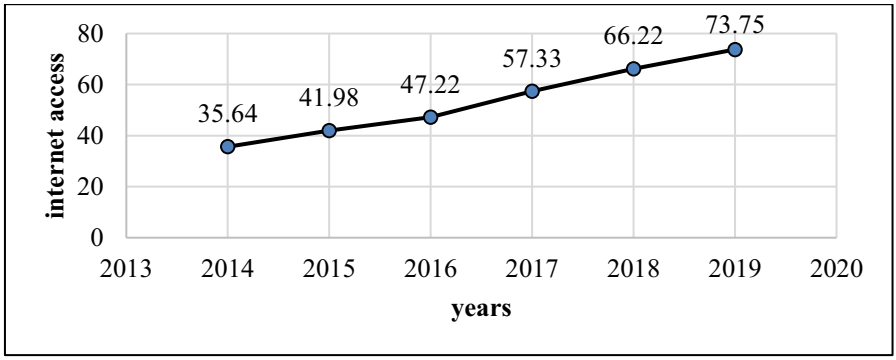

Fig 1. The percentage of households accessing the internet.

internetinternet can be used of the internetinternet can be applied in marketing strategies, especially digital marketingcanns, to build businesses that can reach markets in a wider geographical area [6]. As the industry grows, digital advertising strategies must be developed to ensure businesses remain competitive [7]. Companies today have to rely on digital channels to reach potential customers. Digital marketing has become essential for businesses to reach and attract customers. Currently, the use of e-marketing still dominates apparel buying [8], handicrafts, furniture [5], and services [9].

Along with changes in consumer buying trends, the use of the internetinternet for other business sectors also has the potential to be developed, including the digital marketing of agricultural products. This condition opens up new opportunities for marketing agricultural products and challenges that must be faced, considering the character of agricultural products that are perishable and not durable. Prices of agricultural products also tend to fluctuate, so this condition can affect consumer decisions to purchase agricultural products. Information and communication technology applications in agriculture, especially in Indonesia, are critical to disrupting and transforming the sector into more climate-smart and sustainable.

The application of digital marketing for agricultural products is largely determined by the availability of technology infrastructure in each region [10], especially the internet network. Regional digital infrastructure is critical infrastructure in the digital economy [11]. Unlike any other resource, the Internet has become the most vulnerable resource over the past few decades. With high-speed internet connections, transactions become faster and more accurate, and e-commerce platforms grow rapidly. People from developing countries like Indonesia must catch up in adopting technology, including digital marketing technology [12]. Previous research has pointed out that there needs to be more knowledge about the factors that act as barriers to adopting online shopping technology in developing countries [13]. Susenas data (2020) shows that internet use in Indonesia still needs to be evenly distributed. Of the 19 regencies/cities, there are ten regencies/cities whose level of internet usage is still below the average for the province of West Sumatra. It is suspected that the use of digital mar-

keting to purchase agricultural products in West Sumatra, Indonesia, is dominated by consumers in areas with high internet use.

Additionally, it is believed that individual characteristics [14], socio-demographic characteristics [12], and cultural characteristics [15] have a significant influence on consumer decisions when it comes to using digital marketing to purchase agricultural products. The previous studies found that the proportion of Internet users buying and selling fresh agricultural products online is still low than the size of the fresh agricultural market and the large number of Internet users (Cang & Wang, 2021). Moreover, while several studies have highlighted digital marketing from the enterprise [9] and marketer side [7] in developed countries [3], there still needs to be more research from the customer side and developing countries. This study addresses three potential segments often ignored in digital marketing studies. First, most digital marketing studies are conducted in developed countries, but more studies in developing countries still need to be conducted. Second, most digital marketing studies are highlighted on manufacturing industrial products and services, still limited to agricultural products, and third, most digital marketing studies are carried out based on the company or seller side and are still limited from the consumer side. So, this research was conducted to fill the research gap.

2 Methods

The research was conducted in a qualitative descriptive manner. Data collection is carried out by surveying consumers of agricultural products. The surveyed consumers are spread across all regencies/cities in West Sumatra, Indonesia. Consumers are divided into two regional groups, namely consumers in areas with high levels of internet usage and consumers in regions with low internet usage.

Areas with a high level of internet use are all regencies/cities whose internet usage level is above the provincial average of 46.43 percent, while areas with low internet usage are all regencies/cities whose internet usage level is below the provincial average. Based on this classification, ten districts/cities have low internet usage, and nine districts/cities have high internet usage. The classification of the observation area can be seen in Table 1. This study surveyed 200 respondents who were taken using quota and accidental sampling techniques. Data collection techniques are carried out by distributing questionnaires and in-depth interviews.

Table 1. Classification of consumer observation areas based on internet use.

No	Regions with internet usage below the provincial average (under 46.43%)	Regions with internet usage above the provincial average (above 46.35%)
1	Mentawai Island (20.88%)	Agam (48.74%)
2	Pesisir Selatan (36.03%)	Dharmasraya (48.50%)
3	Solok Regency (37.67%)	Padang (63.61%)
4	Sijunjung (40.46%)	Solok City (62.27%)
5	Tanah Datar (43.45%)	Sawahlunto (55.30%)
6	Padang Pariaman (39.87%)	Padang Panjang (71.48%)
7	Lima Puluh Kota (36.22%)	Bukittinggi (73.84%)

8	Pasaman (35.43%)	Payakumbuh (62.13%)
9	Solok Selatan (41.07%)	Pariaman City (62.29%)
10	Pasaman Barat (34.24%)	

The variables used in this study refer to the factors that influence consumer decisions in using digital marketing to purchase agricultural products: individual, social, demographic, and cultural factors. The selection of research variables was carried out by referring to several variables in previous studies, namely based on the results of research by [16], [17], [18], [19], [20], and [21]

Table 2. Research variables and their measurements.

Variable	Sub variable		noted
		Dependent Variable	
	Y	Consumers of agricultural products	Y=1 if consumers have purchased agricultural products through e-marketing; 0 others
		Independent Variable	
Individual Factor	X1	gender	=1 female; 0 male
	X2	age	=1 gen Y and Z; 0 others
	X3	job	=1 have a fixed job; 0 others
	X4	income	=1 have a fixed income; 0 others
	X5	Working time	=1 work 8 hours per day; 0 others
	X6	education	=1 high education; 0= others
	X7	Confidence/trust	=1 based on testimonials; 0 others
Socio-demographic factors	X8	Reference group	1= life partner 2= primary family 3= friend 4= neighbor 5= others
	X9	Family member	Family number
Cultural factors	X10	Digital lifestyle	1= digital lifestyle; 0 others

The first objective is to analyze the mean difference test of two independent samples using an *independent sample t-test*. The second objective is analyzed using the Logit approach using the following equation:

$$Y_i = \frac{e^{(\alpha + \beta gender \ + \beta x_{age} + \beta_{job} + \cdots\cdots\cdots\cdots \beta_{digital\ life\ style}}}{1 + e^{(\alpha + gender + \beta_{age} + \beta_{job} + \cdots\cdots + \beta\ digital\ life\ style)}} \quad (1)$$

Noted:

Y	=	if consumers have purchased agricultural
products through	=	digital marketing; 0 others
X1, gender	=	female=1 ; 0 male
X2, age	=	Y+Z generation =1 ; 0 others
X3, job	=	have a fixed job=1; 0 others
X4, income	=	have a fixed income=1; 0 others
X5, Working time	=	equal 8 hours per day =1; 0 others

X6, education = high education =1; 0 others
X7, confident/trust = based on testimonials =1; 0 others
X8, reference group = life partner (1)
= primary family (2),
= friend (3),
= neighbour (4),
= others (5)
X9, family numbers = family numbers
X10, digital lifestyle = digital lifestyle (internetinternet asks more than 3 hours per day =1; =0 others
μ = *error term*

3 Results and Discussion

This study shows that female consumers are more dominant in both observation areas than male consumers. The number of consumers in Generation Y and Generation Z are more dominant than consumers of Generation X. The majority of consumers have a high education level. They are also actively seeking information on agricultural products from previous consumer testimonials.

Table 3 Characteristics of consumers in the two observation areas.

Karakteristik		Regions with internet usage below the provincial average (< 46.43 percent)		Regions with internet usage above the provincial average (> 46.43 percent)	
Individual Factor		number	percent	number	Percent
X1	gender				
	female	64	32.0%	85	42.5%
	male	1	0.5%	50	25.0%
X2	age				
	Y generation (born 1980-1995)	11	5.5%	19	9.5%
	Z generation (born 1995-2010)	46	23.0%	95	47.5%
	X generation (born 1965-1980)	8	4.0%	21	10.5%
X3	job				
	Have a Fixed job	11	5.5%	33	16.5%
	others	54	27.0%	102	51.0%
X4	income				
	Have a fixed income	15	7.5%	49	24.5%
	others	50	25.0%	86	43.0%
X5	Working time				
	Equal 8 hours per day	21	10.5%	61	30.5%
	others	44	22.0%	74	37.0%

X6	education				
	Highly educated	64	32.0%	127	63.5%
	Poorly educated	1	0.5%	8	4.0%
X7	trust				
	Based on testimonials	48	24.0%	87	43.5%
	others	17	8.5%	48	24.0%
Social demografi factors					
X8	Reference group				
	Life partner	0	0.0%	0	0.0%
	Primary family	6	3.0%	10	5.0%
	friend	29	14.5%	51	25.5%
	neighbour	2	1.0%	8	4.0%
	others	28	14.0%	66	33.0%
X9	Family numbers				
	Small family (1-4 number)	31	15.5%	59	29.5%
	others	34	17.0%	76	38.0%
Cultural factors					
X10	Digital lifestyle				
	Have a digital lifestyle (internet access > 3 hours /day)	61	30.5%	110	55.0%
	others	4	2.0%	25	12.5%

The analysis of the difference in the second sample shows that there are statistically significant differences in individual and cultural factors. In contrast, there are no statistically significant differences in social demographic factors. Female consumers are more dominant in areas with low internet use, but income and working time are relatively lower compared to areas with high internet usage. The digital lifestyle is more dominant in the two observation areas.

Female consumers dominate the online purchase of agricultural products, both in areas with high and low internet usage. According to previous research, gender significantly affects consumer behavior in online shopping [19]. Alfan (2019) also states that gender significantly affects consumer buying behavior online. The results of the statistical comparison test show that there is a significant difference at the one percent significance level.

There is a different trend in the types of products purchased online between female consumers and male consumers [22]. This study found that male consumers were more interested in online shopping for ready-to-eat food and plant seeds. In contrast, female consumers were more varied in buying agricultural products, not only ready-to-eat food but also fresh food, fruit, flowers, and so on.

Table 4. Differences in characteristics between consumers in areas with low levels of internet use and consumers in areas with high levels of internet usage.

Consumer characteristics	Regions with internet usage below the provincial average (< 46.43 percent)	Regions with internet usage above the provincial average (> 46.43 percent)	p-value	
Individual factors				
gender	0.753	0.630	0.080*	significant
age	26.7	28.1	0.399	
job	0.169	0.244	0.210	
income	0.231	0.363	0.051*	significant
Working time	0.323	0.452	0.081*	significant
education	0.985	0.941	0.087*	significant
Trust/believe	0.738	0.644	0.174	
Social demografi factors				
Reference group	3.80	3.96	0.328	
Family numbers	0.477	0.437	0.599	
Cultural factors				
Digital lifestyle	0.938	0.815	0.007**	significant

Note: Significance at level 10% (*); 5% (**) and 1% (***)

About 85 percent of consumers who buy agricultural products online are consumers who are in the millennial age or Generation Y and Generation Z. The average consumer is 26-28 years old in the two observation areas. The outcomes of this investigation are consistent with [22] that millennials in urban areas tend to make purchases online, and millennials are satisfied with their previous online shopping experience. They consider it more profitable and practical than buying in traditional shops but also very risky.

This logit analysis observed ten variables that were expected to influence customer choice while utilizing e-marketing to purchase agricultural products. These variables consist of individual factors (gender, age, occupation, income, working time, education, and beliefs), socio-demographic factors (reference group and number of family members), and cultural factors (digital living culture).

The logit analysis results that individual factors (i.e., consumer education) and cultural factors (digital living culture) influence consumer decisions in using digital marketing to purchase agricultural products. In contrast, socio-demographic factors have no significant effect. The education level factor (X_6) is a characteristic that significantly influences customer decisions while using digital marketing to buy agricultural products. The logit analysis results show that the education level is statistically significant at the 10% level with a positive coefficient value. This indicates that the higher the level of consumer education, the greater the probability of using digital marketing in purchasing agricultural products. This is consistent with earlier study findings that

young, highly educated women residing in modest households with stable financial circumstances tend to purchase food online. [21]. The Odds ratio results for the X_6 variable (consumer education) obtained a value of 46.30, which means that the probability of highly educated consumers using e-marketing in purchasing agricultural products is 46.30. The likelihood that a consumer will utilize e-marketing to buy agricultural products increases with consumer education levels.

Opportunities for using e-marketing in purchasing agricultural products by educated consumers can still be increased because it is supported by the increasingly rapid development of information technology. In addition, consumers with higher education tend to have better internet access than consumers with middle and low education. Consumer education can also influence how he uses the internetinternet to support his activities, including purchasing the products he needs.

Cultural factors that influence consumer decisions in the use of e-marketing to purchase agricultural products are digital living culture. This is indicated by the intensity of internet use by consumers in their daily activities. The logit analysis's findings indicate that the digital culture of life (X_{10}) on consumers has a statistically significant effect at the five percent significance level with a positive coefficient value. This indicates that consumers in the digital age are more likely to buy agricultural products through e-marketing. This is in accordance with the results of research conducted by [23] that the development of information technology and internet use also influences online buying behavior by customers. Advances in information and communication technology have moved people to actively obtain information on agricultural products they want by visiting websites, social media, and other communication channels.

The emergence of digital culture in community life has facilitated the purchase of agricultural products and allowed consumers to track the products' locations and delivery to their location, as well as to keep an eye on the producers of those products [24]. Currently, consumers often share content in the form of products they like on social media pages so that it becomes viral content and provokes reactions from potential consumers to find the seller's link or website [25]. Viral marketing is one of the current consumer lifestyles, which causes the proportion of people who use digital marketing to increase. The development of social media as a lifestyle also affects the use of digital marketing by consumers.

4 Conclusion

There are differences in characteristics between consumers who shop online in areas with high levels of internet usage and consumers in areas with low levels of internet usage. Significant differences in characteristics are seen in individual factors (gender, income, working time, and education) and cultural factors (digital living culture), while socio-demographic factors are not significantly different. Consumers who live in areas with high levels of internet use tend to be dominated by female consumers who are highly educated, have a fixed income, and have a digital culture.

Consumer education and adopting a digital lifestyle impact consumers' decisions to acquire agricultural products through e-marketing. The percentage of customers who use e-marketing to buy agricultural products increases with consumer education and the intensity and digitality of the living culture. Practicality: Customers choose digital marketing because it is time and energy-efficient and offers a variety of distribution advantages.

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References

[1] N. Rezaee, S. M. Zanjirchi, N. Jalilian, and S. M. H. Bamakan, "Internet of things empowering operations management; A systematic review based on bibliometric and content analysis," *Telematics and Informatics Reports*, vol. 11, p. 100096, Sep. 2023, doi: 10.1016/j.teler.2023.100096.

[2] O. Tyrväinen and H. Karjaluoto, "Online grocery shopping before and during the COVID-19 pandemic: A meta-analytical review," *Telematics and Informatics*, vol. 71, p. 101839, Jul. 2022, doi: 10.1016/j.tele.2022.101839.

[3] S. Pesci, R. E. Galt, J. L. Durant, G. M. Manser, L. Asprooth, and N. Pinzón, "A digital divide in direct market farmers' online sales and marketing: Early pandemic evidence from California," *J Rural Stud*, vol. 101, p. 103038, Jul. 2023, doi: 10.1016/j.jrurstud.2023.103038.

[4] A. Csordás, J. Pancsira, P. Lengyel, I. Füzesi, and J. Felföldi, "The Potential of Digital Marketing Tools to Develop the Innovative SFSC Players' Business Models," *Journal of Open Innovation: Technology, Market, and Complexity*, vol. 8, no. 3, p. 122, Sep. 2022, doi 10.3390/joitmc8030122.

[5] A. L. Kilay, B. H. Simamora, and D. P. Putra, "The Influence of E-Payment and E-Commerce Services on Supply Chain Performance: Implications of Open Innovation and Solutions for the Digitalization of Micro, Small, and Medium Enterprises (MSMEs) in Indonesia," *Journal of Open Innovation: Technology, Market, and Complexity*, vol. 8, no. 3, p. 119, Sep. 2022, doi: 10.3390/joitmc8030119.

[6] C. Yaiprasert and A. N. Hidayanto, "AI-driven ensemble three machine learning to enhance digital marketing strategies in the food delivery business," *Intelligent Systems with Applications*, vol. 18, p. 200235, May 2023, doi: 10.1016/j.iswa.2023.200235.

[7] Z. Zhang, D. Ren, Y. Lan, and S. Yang, "Price competition and blockchain adoption in retailing markets," *Eur J Oper Res*, vol. 300, no. 2, pp. 647–660, Jul. 2022, doi: 10.1016/J.EJOR.2021.08.027.

[8] C. Chrimes, R. Boardman, G. Vignali, and H. McCormick, "Investigating how online fashion product page design affects the consumer's clothing fit appraisal," *Journal of Consumer Behaviour*, vol. 21, no. 6, pp. 1478–1493, Nov. 2022, doi: 10.1002/cb.2100.

[9] I. Trinugroho, P. Pamungkas, J. Wiwoho, S. M. Damayanti, and T. Pramono, "Adoption of digital technologies for micro and small business in Indonesia," *Financ Res Lett*, vol. 45, p. 102156, Mar. 2022, doi: 10.1016/j.frl.2021.102156.

[10] W. Wu, S. Wang, X. Jiang, and J. Zhou, "Regional digital infrastructure, enterprise digital transformation and entrepreneurial orientation: Empirical evidence based on the broadband china strategy," *Inf Process Manag*, vol. 60, no. 5, p. 103419, Sep. 2023, doi: 10.1016/j.ipm.2023.103419.

[11] P. Schade and M. C. Schuhmacher, "Digital infrastructure and entrepreneurial action-formation: A multilevel study," *J Bus Ventur*, vol. 37, no. 5, p. 106232, Sep. 2022, doi: 10.1016/j.jbusvent.2022.106232.

[12] R. Amirtha, V. J. Sivakumar, and Y. Hwang, "Influence of Perceived Risk Dimensions on e-Shopping Behavioural Intention among Women—A Family Life Cycle Stage Perspective," *Journal of Theoretical and Applied Electronic Commerce Research*, vol. 16, no. 3, pp. 320–355, Nov. 2020, doi: 10.3390/jtaer16030022.

[13] T. Natarajan, S. A. Balasubramanian, and D. L. Kasilingam, "The moderating role of device type and age of users on the intention to use mobile shopping applications," *Technol Soc*, vol. 53, pp. 79–90, May 2018, doi: 10.1016/j.techsoc.2018.01.003.

[14] P. Alreck and R. B. Settle, "Gender effects on Internet, catalogue and store shopping," *Journal of Database Marketing & Customer Strategy Management*, vol. 9, no. 2, pp. 150–162, Jan. 2002, doi: 10.1057/palgrave.jdm.3240071.

[15] Y. Cang and D. Wang, "A comparative study on the online shopping willingness of fresh agricultural products between experienced consumers and potential consumers," *Sustainable Computing: Informatics and Systems*, vol. 30, p. 100493, Jun. 2021, doi: 10.1016/j.suscom.2020.100493.

[16] L. Zhou, L. Dai, and D. Zhang, "Online shopping acceptance model - A critical survey of consumer factors in online shopping," *Journal of Electronic Commerce Research*, vol. 8, no. 1, 2007.

[17] Hashim A, E. Ghani, and J. Said, "Does Consumers' Demographic Profile Influence Online Shopping?: An Examination Using Fishbein's Theory ," *Canadian Social Science*, vol. 5, no. 6, 2009.

[18] J. Paul and J. Rana, "Consumer behavior and purchase intention for organic food," *Journal of Consumer Marketing*, vol. 29, no. 6, pp. 412–422, Sep. 2012, doi: 10.1108/07363761211259223.

[19] M. Afshardost, S. Farahmandian, and S. M. S. Eshaghi, "Linking trust, perceived website quality, privacy protection, gender and online purchase intentions," *IOSR Journal of Business and Management*, vol. 13, no. 4, 2013.

[20] N. Chen and Y. Yang, "The impact of customer experience on consumer purchase intention in cross-border E-commerce——Taking network structural embeddedness as mediator variable," *Journal of Retailing and Consumer Services*, vol. 59, p. 102344, Mar. 2021, doi: 10.1016/j.jretconser.2020.102344.

[21] A. Dominici, F. Boncinelli, F. Gerini, and E. Marone, "Determinants of online food purchasing: The impact of socio-demographic and situational factors," *Journal of Retailing and Consumer Services*, vol. 60, p. 102473, May 2021, doi: 10.1016/j.jretconser.2021.102473.

[22] B. Melović, D. Šehović, V. Karadžić, M. Dabić, and D. Ćirović, "Determinants of Millennials' behavior in online shopping – Implications on consumers' satisfaction and e-business development," *Technol Soc*, vol. 65, p. 101561, May 2021, doi: 10.1016/j.techsoc.2021.101561.

[23] S. Dong, L. Yang, X. Shao, Y. Zhong, Y. Li, and P. Qiao, "How can channel information strategy promote sales by combining ICT and blockchain? Evidence from the agricultural sector," *J Clean Prod*, vol. 299, p. 126857, May 2021, doi: 10.1016/j.jclepro.2021.126857.

[24] S. S. Kamble, A. Gunasekaran, and S. A. Gawankar, "Achieving sustainable performance in a data-driven agriculture supply chain: A review for research and applications," *Int J Prod Econ*, vol. 219, pp. 179–194, Jan. 2020, doi: 10.1016/j.ijpe.2019.05.022.

[25] K. Motoki, S. Suzuki, R. Kawashima, and M. Sugiura, "A Combination of Self-Reported Data and Social-Related Neural Measures Forecasts Viral Marketing Success

on Social Media," *Journal of Interactive Marketing*, vol. 52, pp. 99–117, Nov. 2020, doi: 10.1016/j.intmar.2020.06.003.