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Use of Information Technology in the Marketing of Agricultural Products with the UTAUT Approach

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ABSTRACT

The fast advancement of information technology is reported to have a profound impact on various aspects of the community, including the agriculture sector. On the other hand, the millennial generation who are sensitive to technological advances are reportedly less interested in agriculture. Apart from that, millennial farmers also have not optimized the use of information technology to market their agricultural products. Hence, the purpose of this study is to investigate the factors that encourage millennial farmers in Central Java to use information technology in marketing agricultural products using a Unified Theory of Acceptance and Use of Technology (UTAUT) approach. The location and samples were purposively determined in Central Java. A total of 120 millennial farmers were included in the sample population, and data analysis was conducted using the Structural Equation Modeling-Partial Least Square (SEM-PLS) method. The findings indicated that behavior intention to use information technology were influenced by performance expectancy, effort expectancy, and facilitating conditions, then, behavior intention would influence use behavior. Based on these findings, motivation and self-confidence need to be instilled to accelerate the adoption of innovation and technology towards modern agriculture. This research will be useful for the government in creating a program or policy.

Keywords: Adoption of technology, Behavior intention, Millennial farmers, Structural Equation Modeling.

INTRODUCTION

Agriculture holds a significant position within Indonesian society and is deeply ingrained in the lives of the people (Rozaki, 2020). According to the Central Bereau of Statistics of Indonesia (BPS) in 2021, among the 131,050,523 workers aged ≥ 15, a total of 28.33% are employed in the forestry, fisheries, and agriculture sectors. However, a concerning trend has appeared because the younger generation exhibits a declining interest in pursuing a career in agriculture (Widiyanti *et al*., 2020; Riptanti *et al*., 2022). A recent report has also shown that the number of farmers aged 15 to 39 in the agricultural, forestry and fisheries sectors has decreased by 10.07% between 2017 and 2021 (BPS, 2022a). The low adoption of technology has been reported to be one of the prominent factors contributing to this decline (Effendy *et al*., 2022).

The reluctance of young people, including those with agricultural education, to pursue a career in the sector, has adverse effects on agricultural and agro-industrial enterprises, the labor market, and regional development (Bednaříková *et al*., 2016). Therefore, it is important to address this declining interest to prevent future shortages of farmers, which can negatively impact various aspects of life. On the other hand, the millennial generation is a generation that is aware of technology. This should be an opportunity for Indonesia, which in 2022 will have a millennial population of 88,268,937 people or 32% of

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Indonesia's population (BPS, 2022a). The Indonesian government, through the Ministry of Agriculture, has taken steps to accelerate farmer regeneration by implementing the millennial farmer program throughout the country. This initiative serves as a ray of hope for the younger generation, showing the potential for them to become successful in the sector (Kusnandar *et al*., 2023). It also aims to facilitate the younger generation's interest in working in the agricultural sector (Riptanti *et al*., 2022). The term "millennial farmer" has been introduced to sustain the Indonesian agricultural system and expedite the adoption of information technology in the field (Harisudin *et al*., 2023). Millennial farmers are hoped to play a pivotal role as catalysts for change because they adapt to a technology-driven world with readily available information (Hasibuan and Nasution, 2022).

The internet and global connectivity hold tremendous potential in accelerating the livelihoods of farmers through technological innovations. However, many of them are yet to fully capitalize on these opportunities (Diaz *et al*., 2021). For example, there remains a considerable number of older farmers in Indonesia who prefer to sell their products to middlemen to quickly obtain funds to meet their family's needs (Haryoso *et al*., 2020). Mgale and Yunxian (2020) also stated that in traditional marketing channels, farmers often relied on middlemen or village collectors to sell their products. Although these middlemen provide access to the market (Truong and Sidique, 2022), the prices offered are often significantly lower compared to the real market prices (Utomo *et al*., 2022).

Millennial farmers, who possess forward-thinking characteristics and great curiosity, are actively utilizing information technology, particularly social media, to enhance their agricultural businesses (Khaerunnisa *et al*., 2022). Based on the purpose of internet use in Indonesia, 74.02% of the internet use aims to access social media and 4.63% is for selling goods or services (BPS, 2022b). This approach offers an alternative for marketing agricultural products by addressing limitations in the sales process and enhancing effectiveness and efficiency (Widiyanti *et al*., 2022). The problem is that, in 2023, only 42.23% of the millennial farmers used information technology for their business activities (Katadata, 2023).

Central Java is a region with significant agricultural potential, as evidenced by the presence of a workforce under the age of 40, commonly referred to as millennials, in the agriculture, forestry, and fisheries sectors. Previous reports showed that they accounted for 7.19% of the total workforce in 2021 (BPS Central Java, 2021). Millennial farmers in Central Java operate in various subsectors, such as horticulture, plantations, food, fisheries and animal husbandry. The substantial number of millennial farmers is expected to bring agricultural success in the future due to their higher propensity for adopting innovative technologies than older groups (Effendy *et al*., 2022). However, internet use by residents of Central Java whose main business fields are agriculture, fisheries and forestry has only reached 10.18% of the total population (BPS, 2022b).

Various factors influence the adoption of information technology, especially social media and ecommerce among millennial farmers in Central Java. The Unified Theory of Acceptance and Use of Technology (UTAUT), created by Venkatesh *et al*. (2003), is one contemporary theory that describe a technology acceptance model. The model comprises multiple constructs, including the following:

performance expectancy, which gauges an individual’s belief in the ability to use ICT to improve their performance;

effort expectancy, which evaluates an individual's perception of the ease of using information technology;

social influence, which pertains to the support received from others regarding the use of information technology;

facilitating conditions, which encompass factors such as infrastructure and equipment availability as well as the ability to use ICT (Scur *et al*., 2023).

Previous studies demonstrated the influential role of constructs such as effort expectancy, performance expectancy, and social influence in shaping behavior intention, while the presence of facilitating conditions and behavior intention can affect use behavior (Venkatesh *et al*., 2016). Using these determinants, Han *et al*. (2022) found that all direct relationships between variables were significant. However, Widodo *et al*. (2019), Abdullah *et al*. (2020), Maita *et al*. (2022), and Scur *et al*. (2023) found that facilitating conditions had a significant effect on behavior intention. This result in inconsistent with Esawe (2022) that facilitating conditions variable did not significantly influence behavior intention. Based on these findings, future reports are advised to focus on the influence of facilitating conditions on behavior intention.

The novelty of this study is attributed to the incorporation of the facilitating conditions variable in the UTAUT approach, which is directly associated with behavior intention. In addition, no previous research has examined the use of information technology in marketing agricultural products by millennial farmers in Central Java. Therefore, the purpose of this study was to investigate the factors affecting the use of information technology in marketing agricultural products by millennial farmers in Central Java using the UTAUT model approach.

This research model is depicted in the following figure.

The research hypothesis in Figure 1 is:

The relationship between behavioral intentions to use information technology and performance expectancy

The study results of Horas *et al*. (2023) show that performance expectancy has a positive influence on intentions to use information technology. Chua *et al*. (2018) showed similar results. Users who can find more value and innovation from a technology application will be willing to purchase and continue using the technology.

H1: It is suspected that performance expectancy have a positive effect on behavioral intentions to use information technology.

2. The relationship between behavioral intentions to use information technology and effort expectancy:
The study results of Hung *et al*. (2019) show that effort expectancy has a significant effect on intention to use information technology. This is also supported by research from Chao (2019) which shows that effort expectancy has a positive effect on behavioral intentions in using mobile learning.

H2: It is suspected that effort expectancy

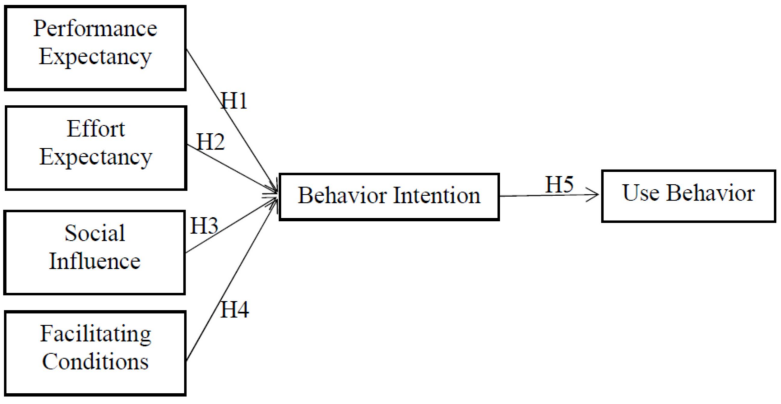

Figure 1. Research model.

has a positive effect on behavioral intentions to use information technology.

3. The relationship between behavioral intentions to use information technology and social influence:

The study results of Hwang and Mulyana (2022) show that social influence variables have a positive influence on the intention to use information technology. This is also in line with research by Abed (2018), which shows that social influence has a positive relationship with behavioral intentions to use e-commerce.

H3: It is suspected that social influence has a positive effect on behavioral intentions to use information technology.

4. Relationship between information technology use behavior and facility conditions:

The study results of Putri dan Suardikha (2020) show that facilitating condition variables influence the use of e-money. This is supported by Diniyah (2021) who state that the condition of the facilities has a positive effect on the use of information technology.

H4: It is suspected that facility conditions have a positive effect on intentions to use information technology.

5. The relationship between use behavior and behavior intention to use information technology:

The study results of Abbad (2021) show that the behavioral variable has a significant effect on the intention of behavior in order to use information technology. This is supported by Kadim dan Sunardi (2023) who stated that behavioral intention has positive effect on the use behavior of users of information technology.

H5: It is suspected that behavior intention has a positive influence on information technology use behavior.

MATERIALS AND METHODS

This was a quantitative study, which used a descriptive-correlational method (Ebrahimi Sarcheshmeh *et al*., 2018). Central Java province was purposively selected as the study location, taking into account 10 regencies with the highest number of millennial farmer ambassadors based on the Decree of the Minister of Agriculture No. 434/KPTS/SM 020/M/8/2021. These regencies included Magelang, Sukoharjo, Klaten, Wonosobo, Tegal, Purbalingga, Temanggung, Semarang, Purworejo, and Banyumas. Primary data were gathered through interviews utilizing a questionnaire that included respondent identities and attitude statements measured on a Likert scale. Meanwhile, secondary data were obtained from relevant agencies, such as the Central Statistics Agency and the Ministry of Agriculture.

The research was conducted in 2022 after the Covid-19 pandemic. The samples were determined purposively, with criteria that the millennial farmers resided in Central Java, aged between 19 and 39 years, and had been engaged in agricultural activities in the fields of food crops, horticulture, animal husbandry, fisheries, and plantations for a minimum of 2 years. The aim was to ensure that respondents were truly experienced farmers, so they can make decisions regarding the use of information technology based on that experience. Another criterion was that the respondents had used information technology, especially social media, in the last 3 months for communication, seeking information, or promoting and selling agricultural products. The sampling in each regency was conducted proportionally. The sample size was decided by allotting 5-10 respondents for each parameter (indicator) of the variables under examination (Kadim and Sunardi, 2023). The minimum size was 95 respondents, but we chose to include a total of 120 respondents to obtain more representative and robust data. Table 1 presents the latent variables and the corresponding indicators used in the study. Indicator measurement uses a Likert scale from 1-5.

The reliability and validity test results of the questionnaire administered to 30

Table 1. Latent variables and indicators in the model.

Variable	Indicator	Code
Performance Expectancy (PE)	1. Perceived usefulness	PE1
	2. Job-fit	PE2
	3. Extrinsic motivation	PE3
	4. Outcome expectation	PE4
	5. Relative advantage	PE5
Effort Expectancy (EE)	1. Perceived ease of use	EE1
	2. Ease of use	EE2
	3. Complexity	EE3
Social Influence (SI)	1. Subjective norm	SI1
	2. Social factor	SI2
	3. Image	SI3
Facilitating Conditions (FC)	1. Facilitating condition	FC1
	2. Perceived behavioral control	FC2
	3. Compatibility	FC3
Behavior Intention (BI)	1. Desire	BI1
	2. Intention	BI2
	3. Plan	BI3
Use Behavior (UB)	1. Intensity	UB1
	2. Behavior to be automatic	UB2
	3. Addiction	UB3

Source: Vankatesh *et al*. (2003); Han *et al*. (2022); Maita *et al*. (2022); Esawe (2022); Scur (2023).

millennial farmers revealed a loading factor of UB3< 0.7, indicating that UB3 statement could not be used further in the study. An AVE (Average Variance Extracted) value of > 0.5 indicated the validity of the questionnaire (Chen *et al*., 2023). Furthermore, Cronbach's Alpha (CA) of > 0.6 and Composite Reliability (CR) value of > 0.7 were considered the cut-off values (Al-Sharafi *et al*., 2023). These findings demonstrated that all variables were reliable, providing consistent and stable answers, and could be used for data collection. The collected data were then analyzed using SEM-PLS (Structural Equation Modeling-Partial Least Squares) with the assistance of SmartPLS version 3.0 software, that includes measurement model analysis, structural model analysis, and hypothesis testing (Farida and Sutopo, 2023). The study model was formulated as follows:

$BI = \gamma_1 PE + \gamma_2 EE + \gamma_3 SI + \gamma_4 FC + \epsilon_1$ ……. (1)

BI: Behavior Intention
PE: Performance Expectancy
EE: Effort Expectancy
SI: Social Influence
FC: Facilitating Conditions
γ_1: Parameter of Performance Expectancy
γ_2: Parameter of Effort Expectancy
γ_3: Parameter of Social Influence
γ_4: Parameter of Facilitating Conditions
ε_1: Error Term

$UB = \beta_1 BI + \epsilon_1$ (2)

The relationship between exogenous and endogenous variables was examined by testing the hypotheses below:

$BI = \beta_1 PE + \varepsilon_1$ (3)

Hypothesis 1 (H1): Performance expectancy positively and significantly influences behavior intention.

$BI = \beta_2 EE + \varepsilon_2$ (4)

Hypothesis 2 (H2): Effort expectancy positively and significantly influences behavior intention.

$BI = \beta_3 SI + \varepsilon_3$ (5)

Hypothesis 3 (H3): Social influence positively and significantly influences behavior intention.

$BI = \beta_4 FC + \varepsilon_4$ (6)

Hypothesis 4 (H4): Facilitating conditions positively and significantly influence behavior intention.

$UB = \beta_5 BI + \varepsilon$ (7)

Hypothesis 5 (H5): Behavior intention positively influences use behavior.

The H1, H2, H3, H4, and H5 were tested using a bootstrapping method, where H_0: $\beta_i = 0$ and H_i : $\beta_i \neq 0$. Furthermore, the hypothesis was deemed accepted when the t-statistic value was > 1.96 and the P-value was <0.05.

RESULTS

Respondent Characteristics

Respondents can be classified into several categories. In this research, characteristic respondents were grouped based on gender, age, education level, business field, turnover, marketing methods and marketing reach, see Table 2. The respondents had an average age of 31 years and an education duration of 13 years.

These results suggested that the respondents were relatively young and had a significant opportunity to embrace new technologies (Olufunmilola *et al*., 2017). The results also demonstrated that the samples had a high level of education, as they had completed high school. Gebresilassie and Bekele (2015) stated that farmers with a higher level of formal education tended to analyze information and adopt technology faster compared to those without education.

Some respondents were involved in multiple business fields and subsectors. They were active in the horticulture, plantation, food crops, livestock, fisheries, horticulture, and livestock, horticulture and plantation, horticulture, food crops, and plantation, fisheries, livestock, and food crops, and fisheries and food crops subsectors, . The participants engaged in the processing of various items, including palm sugar, fertilizer, coffee powder, mocaf flour, bread, banana chips, and salted eggs. Furthermore, those who engaged in marketing were sellers of agricultural products and others in both production and processing were farmers and livestock keepers who processed their products into semi-finished and finished goods. For example, roasted coffee, chili powder, crystal guava *jenang* (jam-like snack), shredded tobacco, satay, and milk were some of the goods produced. The respondents involved in both production and marketing cultivated ornamental plants and had livestock feed stalls.

The participants in this study had been running their businesses for more than 5 years with an average monthly turnover of IDR 25 million (USD 1,562/month – Exchange rate USD 1= IDR 16,000). This indicated that millennial farmers tended to have a strong customer base (Adeyanju *et al*., 2023). This finding was inconsistent with Thephavanh, *et al*. (2023), where 52.7% of young farmers had been running their businesses for less than 4 years. Furthermore, they utilized information technology, such as social media (WhatsApp, Instagram, Facebook), websites, and YouTube to market their agricultural products. Durant *et al*. (2023) also revealed that 42% of farmers experienced an increase in online marketing and sales during the pandemic.

Outer Model Test

To ensure the validity and reliability of the instrument, a measurement model analysis was conducted to confirm the suitability of the survey items in measuring the intended constructs (Bakri *et al*., 2023). Convergent Validity (CV) testing (Table 3) indicated that the model met the criteria, as the loading factors were above 0.7, and the AVE values exceeded 0.5 (Dong *et al*., 2023a). These results suggest that all indicators effectively represent the latent variables used in this study.

The discriminant validity test results in Table 4 showed that the model fulfilled the criteria. The Fornell-Larcker criterion stated that a model had discriminant validity when the square root of the AVE for each variable surpassed the correlation coefficient between rows and columns (Dong *et al*., 2023b).

Table 2. Respondent characteristics. [a]

Description	Quantity (Person)	Percentage (%)
Gender		
Man	110	91.67
Woman	10	8.33
Age (Years)		
20-24	18	15.00
25-29	39	32.25
30-34	27	22.50
35-39	36	30.00
Education		
Elementary School	8	6.67
Junior High School	5	4.17
Senior High School	53	44.17
Diploma	7	5.83
Bachelor	43	35.83
Master	4	3.30
Business field		
Production	99	82.50
Processing	9	7.50
Marketing	1	0.83
Production and Processing	10	8.30
Production and Marketing	1	0.83
Omzet (Million IDR)		
Omzet≤ 5	45	37.50
5< Omzet≤ 10	31	25.83
10< Omzet≤ 15	12	10.00
15< Omzet≤ 20	8	6.67
20< Omzet≤ 25	5	4.17
25≤ Omzet	19	15.83
Use of ICT		
WhatsApp	120	100.00
Facebook	35	29.16
Instagram	24	20.00
Youtube	4	3.33
Website	2	1.67
Shopee	5	4.16
Tokopedia	5	4.16
Purpose of using ICT		
Communication and get information	35	29.16
Marketing agricultural product	85	70.83
Marketing method		
Online	85	70.83
Offline	35	29.16
Marketing area		
Local	37	30.83
Regional	50	41.67
National	30	25.00
International	3	2.50

[a] Source: Processed primary data, 2023.

The reliability test results in Table 5 showed that each variable had a CA and CR value above 0.7. This indicated that all variables were deemed reliable and capable of providing stable and consistent responses (Zheng *et al*., 2023).

Inner Model Test

The inner model test was performed to examine the relationship of latent variables. An R^2 of 0.75 was considered substantial, 0.5 was moderate, 0.25 was weak, and 0.9 or

Table 3. Convergent validity test results. [a]

Loading factor	PE	EE	SI	FC	BI	UB
PE1	0.752					
PE2	0.825					
PE3	0.806					
PE4	0.835					
PE5	0.802					
EE1		0.777				
EE2		0.866				
EE3		0.760				
SI1			0.802			
SI2			0.802			
SI3			0.788			
FC1				0.823		
FC2				0.820		
FC3				0.771		
BI1					0.870	
BI2					0.847	
BI3					0.791	
UB1						0.979
UB2						0.981
AVE	PE	EE	SI	FC	BI	UB
	0.648	0.644	0.636	0.648	0.700	0.961

[a] Source: Processed primary data, 2023.

Table 4. Discriminant validity test results. [a]

Fornell-Larcker	PE	EE	SI	FC	BI	**UB**
PE	**0.805**					
EE	0.507	**0.802**				
SI	0.573	0.587	**0.798**			
FC	0.195	0.344	0.388	**0.805**		
BI	0.536	0.536	0.485	0.363	**0.836**	
UB	0.271	0.390	0.479	0.295	0.501	**0.980**
Cross Loading	PE	EE	SI	FC	BI	UB
PE1	**0.752**	0.492	0.581	0.216	0.418	0.361
PE2	**0.825**	0.367	0.331	0.054	0.413	0.129
PE3	**0.806**	0.395	0.461	0.180	0.485	0.257
PE4	**0.835**	0.344	0.497	0.178	0.475	0.227
PE5	**0.802**	0.466	0.422	0.149	0.332	0.080
EE1	0.379	**0.777**	0.440	0.370	0.379	0.208
EE2	0.435	**0.866**	0.559	0.279	0.498	0.475
EE3	0.404	**0.760**	0.397	0.188	0.400	0.214
SI1	0.406	0.539	**0.802**	0.313	0.435	0.467
SI2	0.411	0.416	**0.802**	0.282	0.360	0.300
SI3	0.567	0.435	**0.788**	0.333	0.354	0.362
FC1	0.244	0.393	0.398	**0.823**	0.378	0.283
FC2	0.096	0.185	0.254	**0.820**	0.258	0.209
FC3	0.040	0.146	0.202	**0.771**	0.136	0.175
BI1	0.427	0.444	0.369	0.287	**0.870**	0.485
BI2	0.499	0.450	0.524	0.360	**0.847**	0.479
BI3	0.412	0.457	0.293	0.251	**0.791**	0.256
UB1	0.269	0.393	0.472	0.272	0.481	**0.979**
UB2	0.263	0.371	0.466	0.305	0.500	**0.981**

[a] Source: Processed primary data, 2023.

Table 5. Model reliability test results. [a]

Variable	Cronbach Alpha	Composite Reliability
Performance Expectancy	0.864	0.902
Effort Expectancy	0.723	0.844
Social Influence	0.716	0.840
Facilitating Conditions	0.765	0.847
Behavior Intention	0.787	0.875
Use Behavior	0.959	0.980

[a] Source: Processed primary data, 2023.

Table 6. Inner model test results. [a]

Variable	R^2	Q^2
Behavior Intention (BI)	0.417	0.272
Use Behavior (UB)	0.251	0.237

[a] Source: Processed primary data, 2023.

Table 7. Hypothesis test results.[a]

Relationship	Path coefficient	t-Statistic	P-value
PE → BI	0.324	3.534	0.000^{***}
EE → BI	0.267	2.861	0.004^{***}
SI → BI	0.073	0.700	0.484^{ns}
FC → BI	0.180	2.253	0.025^{**}
BI → UB	0.501	7.067	0.000^{***}

[a] Source: Processed Primary Data, 2023; Ns: Insignificant, ***: Significant at $\alpha \leq$ 1%, **: Significant at $\alpha \leq$ 5%, *: Significant at $\alpha \leq$ 10%.

higher indicated overfitting. A Q^2 value> 0 indicated predictive relevance, while a Q^2 value< 0 showed no predictive relevance.

Furthermore, Q^2 values above 0, 0.25, and 0.50 denoted small, moderate, and large levels of predictive accuracy for the PLS path model, respectively (Hair *et al*., 2019). Table 5 showed that the variable behavior intention had an R^2 value of0.417, which was in the moderate category, while its Q^2 value was 0.272, indicating moderate predictive relevance (Tan and Antonio, 2022). This shows that the variables performance expectancy, effort expectancy, social influence, and facilitating conditions together influence behavior intention by 41.7%, while the rest is influenced by variables not examined in the research. The variable use behavior had an R^2 value of 0.251, which was in the weak category, while its Q^2 value was 0.237, indicating small predictive relevance. This shows that the behavior intention variable influences use behavior by 23.7%, while the rest is influenced by variables not examined in the research.

Hypothesis Test

The hypothesis test was carried out using the bootstrapping method with a confidence level of 95%. The criteria for hypotheses included Ha was accepted and H0 was rejected when the t-statistic value was > 1.96 and the p-value was below 0.05 (Fitri *et al*., 2021). Ha was rejected and H0 was accepted when the t-statistic value was < 1.96 and the p-value was above 0.05.

DISCUSSION

The result demonstrated that the respondents were relatively young and had a high level of education, as they had

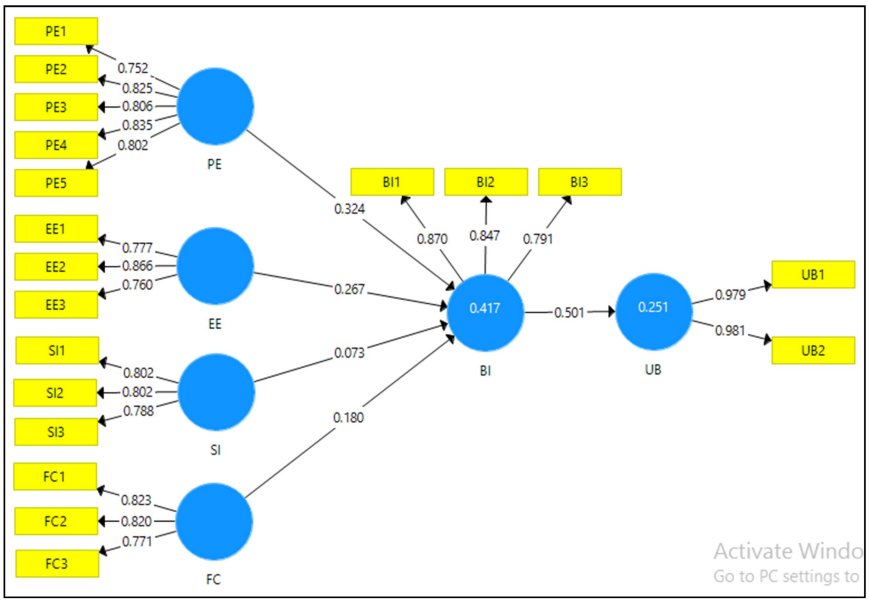

Figure 2. Hypothesis test result.

completed high school. They had a significant opportunity to embrace new technologies (Olufunmilola *et al*., 2017). Besides that, Gebresilassie and Bekele (2015) stated that farmers with a higher level of formal education tended to analyze information and adopt technology faster compared to those without education. Respondents were dominated by those who worked in the horticulture subsector, in contrast with Thephavanh *et al*. (2023), where 40.7% of the young farmer respondents were coffee producers (in the plantation subsector). The average income received by the farmers was quite large and indicated that millennial farmers tended to have a strong customer base (Adeyanju *et al*., 2023). The large number of farmers who used information technology to market their products is in line with Durant *et al*. (2023) who stated that 42% of farmers experienced an increase in online marketing and sales during the pandemic. The results of this study are greater than the research of Durant *et al*. (2023) of 70.83%.

According to the test results, Hypothesis 1 (H1) was accepted, indicating that performance expectancy significantly and positively influenced behavior intention. Otter and Deutsch (2023) similarly concluded that performance expectancy exerted a statistically significant positive influence on behavior intention. Furthermore, farmers expected that the use of information technology could be an effective solution for marketing their agricultural products (Hashem *et al*., 2021). Advanced information technology was expected to serve as a means to expand market reach, thereby increasing sales volume and market share. It was also expected to enhance the experience and skills of farmers, as online marketing had become a promising alternative (Khomah *et al*., 2021). This finding was consistent with Hassaro and Chailom (2023), that online marketers gained satisfaction from the marketing process, leading to increased sales, revenue, and profits through the acquisition of new customers.

Based on the test results, Hypothesis 2 (H2) was accepted, indicating that effort expectancy had a significant positive influence on behavior intention. This finding was consistent with Yuniarty *et al*. (2023) that business expectations significantly

impacted behavior intention to utilize web applications. The feeling of being freed from the effort or difficulty involved with the use of technology often helped individuals to derive maximum benefits (Kamble *et al*., 2019). Furthermore, the expectations of ease of use, supported by the absence of difficulties or errors in its practical use could encourage individuals to continue using the technology.

Hypothesis 3 (H3) test results showed that social influence did not significantly positively influence behavior intention, indicating the rejection of H3. This finding was inconsistent with Xie *et al*. (2022) that social influence significantly impacted behavior intention. According to Erjavec and Manfreda (2022), social influence became a less relevant factor in the UTAUT model due to social isolation caused by Covid-19, leading to reduced interaction with the closest social circles.

Hypothesis 4 (H4) test results revealed that facilitating conditions had a significant positive influence on behavior intention, indicating the acceptance of H4. This finding was consistent with Gunawan *et al*. (2019) that facilitating conditions positively impacted the habit and desire to use technology. This confirmed that the novelty of the study was acceptable because it aligned with the conditions of millennial farmers in Central Java.

Hypothesis 5 (H5) test results showed that behavior intention had a significant positive influence on use behavior, indicating the acceptance of H5. Based on the findings, farmers who had the intention to use information technology to market their agricultural products were more likely to achieve it. This was consistent with Alkhowaiter (2022) that intention had a strong relationship with final behavior. The use of ICT by millennial farmers in their business endeavors made them more determined to achieve their marketing goals.

The results indicated that the use of information technology on agricultural product marketing could save time and energy for farmers. This research was conducted after the Covid-19 pandemic, during which various economic and social activities were restricted. Farmers could easily promote and attract customers by creating product posts anytime and anywhere. Information technology had provided an effective solution for many businesses facing Covid-19 lockdowns, as technology had become the only means of communication between business partners (Alalwan *et al*., 2021). Moreover, the use of technological innovations could also cut out intermediaries in the marketing chain, enabling farmers to directly sell their products to consumers. Information and Communication Technology (ICT) for agricultural product marketing significantly helped in minimizing intermediaries, reducing transaction costs, and identifying potential customers (Hoang, 2020). ICT was not only an essential tool for smart agriculture, but also for strengthening communication among the government, business owners, consumers, consultants, and farmers (Hashem *et al*., 2021).

Findings in this field state that information and communication technology has been used in daily life, especially for businesses such as using WhatsApp and Facebook. Furthermore, respondents utilized ICT in marketing their agricultural products (Durant *et al*., 2023). This existing experience made farmers optimistic about their ability to use information technology in selling their goods. According to Ulhaq *et al*. (2022), respondents who were confident about learning new technology tended to believe that it was easier to use compared to those without confidence. The social distancing policy during the pandemic encouraged the acceleration of online marketing, which was easier to implement (Khomah *et al*., 2021).

This study revealed that millennial farmers already had experience in using information technology in their daily lives, thereby providing motivation and optimism (Badsar and Karami, 2021). Furthermore, this was the driving force behind the millennial farmers' use of information technology in

marketing their agricultural products. The strong motivation made the respondents resilient in their beliefs and difficult to influence. According to Chang *et al*. (2007), experienced and confident individuals were found to be less susceptible to the influence of their social environment. In the case of millennial farmers, their decisions to adopt information technology for marketing purposes were not impacted by their social environment.

Based on the observation results, farmers who had facilities, knowledge, and skills were more interested in adopting technology and were more active in marketing using ICT. This was proven by their ability to create more structured content or posts compared to those with fewer supportive facilities. According to Ndubuisi *et al*. (2022), facilities, such as reliable internet access could facilitate task completion, knowledge and information acquisition, exchange, and collaboration through online channels. Furthermore, respondents living in highland areas experienced difficulties in getting internet signals, making it challenging to engage in online marketing.

This study showed that millennial farmers need to be more aware of the benefits of online marketing using information technology for the advancement of their businesses. Additionally, it was expected that the government would develop policies or programs that promoted the realization of this objective by taking into account the extent of influence of each variable. The motivation and self-confidence of farmers need to be instilled to accelerate the adoption of innovation and technology towards modern agriculture. The availability of supportive facilities could also facilitate the implementation of innovation and technology, including the use of ICT for online marketing.

CONCLUSIONS

In conclusion, behavior intention was directly impacted by performance expectancy, effort expectancy, and facilitating conditions, while social influence had no influence. The results also showed that behavior intention positively influenced use behavior. Expectations that served as motivation for farmers and the availability of facilities could provide strong encouragement to utilize information technology in their businesses. Based on the results, the government needs to maximize information or success stories of farmers who have marketed using information technology to encourage and motivate other farmers who have not used it. Apart from that, this also needs to be done to maintain the enthusiasm of farmers who already use information technology for marketing. This can be done by holding workshops and inviting motivators. The government also needs to increase the provision of digital marketing training activities so that farmers find it easy to operate applications for online marketing. Apart from that, it is necessary to procure and improve the condition of facilities that support the implementation of digital marketing. One thing that needs to be done is equal distribution of internet access. This is necessary so that farmers in each region can more easily use technological information for marketing activities so that the marketing system is more effective and can increase profits for farmers.

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استفاده از فناوری اطلاعات در بازاریابی محصولات کشاورزی با رویکرد UTAUT

پوجی رهایو، کوسناندار، ارلینا ویدا ریپتانتی، و ایستی خومه

چکیده

گزارش شده است که پیشرفت سریع فناوری اطلاعات تأثیر عمیقی بر جنبه های مختلف جامعه از جمله بخش کشاورزی دارد. از سوی دیگر، نسل هزاره‌ای (millennial generation) که نسبت به پیشرفت‌های فناوری حساس هستند، ظاهراً کمتر به کشاورزی علاقه‌مند هستند. جدای از آن، کشاورزان هزاره نیز استفاده از فناوری اطلاعات را برای بازاریابی محصولات کشاورزی خود بهینه نکرده اند. از این رو، هدف این پژوهش بررسی عواملی است که کشاورزان هزاره در جاوه مرکزی را (Central Java) به استفاده از فناوری اطلاعات در بازاریابی محصولات کشاورزی با استفاده از رویکرد تئوری یکپارچه پذیرش (Unified Theory of Acceptance) و استفاده از فناوری UTAUT تشویق می‌کند. مکان و نمونه ها به طور هدفمند در جاوای مرکزی تعیین شدند. در مجموع ۱۲۰ کشاورز هزاره در جامعه نمونه قرار گرفتند و تجزیه و تحلیل داده ها با استفاده از روش مدل سازی معادلات ساختاری - حداقل مربعات جزئی (SEM-PLS) انجام شد. یافته‌ها نشان داد که قصد رفتار برای استفاده از فناوری اطلاعات تحت تأثیر انتظار عملکرد (performance expectancy)، امید به تلاش (effort expectancy) و شرایط تسهیل‌کننده (facilitating conditions) است، سپس، قصد رفتار بر رفتار استفاده تأثیر می‌گذارد. بر اساس این یافته ها، برای تسریع پذیرش نوآوری و فناوری به سمت کشاورزی مدرن، باید انگیزه و اعتماد به نفس ایجاد شود. این تحقیق برای دولت در ایجاد برنامه یا سیاست مفید خواهد بود.