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Scalable Information Systems for Agribusiness: Developing Farmers' Digital Capabilities for E-commerce Platform Adoption

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Abstract

INTRODUCTION: Digital transformation is considered as challenging yet imperative in Vietnam recently. In the agriculture sector, one of the directions to comprehensively promote digital transformation is to encourage and support farmers to promote their agribusiness on e-commerce platforms.
OBJECTIVES: This study aims to exploratorily develop a framework for farmers' digital capabilities for e-commerce agribusines and empirically examine how the dimensions of such a developed framework impact farmers' adoption of e-commerce platforms for promoting their agriculture products.
METHODS: A mixed method study design is employed, conducting a literature review of recognized databases and focus group technique to develop a framework for farmers' digital capabilities for e-commerce agribusiness. A field survey is designed to collect empirical data of farmers' perceptions on adopting e-commerce agribusiness and to quantitatively determine how dimensions of farmers' digital capabilities could impact their adoption of e-commerce platforms. EFA (Exploratory Factor Analysis) and multiple regression are used for data analysis.
RESULTS: Study findings show that the four dimensions of farmers' digital capabilities for e-commerce agribusiness (Attitude toward e-commerce agribusiness, Basic ICT capabilities, E-commerce digital marketing capabilities, and Digital learning capabilities) positively contribute to their adoption of e-commerce platforms.
CONCLUSION: This study proposes a framework for farmers' digital capabilities and verifies that the four dimensions of the framework could significantly enhance farmers' e-commerce platform adoption. We recommend several practical means to boost farmers' adoption. Future research could apply our proposed framework to examine the formation of farmers' e-commerce adoption in social platforms and offer solutions to enhanced agribusiness.

Keywords: E-commerce, Agribusiness, Farmers, Digital Capabilities, Mixed Method.

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1. Introduction

Digital transformation has been rising as a focus that attracts both academic and practical attention in Vietnam recently [1]. Vietnam government consider digital transformation as challenging yet imperative approach for the socio-economic development for Vietnam future [1]. In Vietnam, digital transformation is placed as priority for agriculture development as enhancing efficiency, productivity, and sustainability [2], in which e-commerce agribusiness should be a focus [2].

Actually, the Vietnamese government have been developing and implementing series of legal framework and policies, aiming to promote digital transformation in Vietnam

in general and in agriculture sector in particular [2]. For instance, Loi (2022) listed out and discussed the Decision of the Prime Minister approving the National Digital Transformation Program until 2025 (#749/2020/QD-TTg); the Decision of the Prime Minister approving the e-Government development strategy towards digital government in the period of 2021-2025, with orientation to 2030 (#942/2021/QD-TTg); and the Decision of the Ministry of Agriculture on the establishment of a Steering Committee for Digital Transformation in the agricultural sector (#2588/2021/QD-BNNTCCB) [2]. Moreover, digital technologies and applications have been widely applied in agriculture production and agribusiness in Vietnam, such as IoT sensors (applied in Loc Troi Group rice production areas, VinEco's safe vegetable production areas, Da Lat GAP company farming areas) [2], LED technology with smart indoor farming systems (applied in dragon fruit farms in Binh Thuan and Tien Giang, mushroom and flower farms in Ha Noi, Vung Tau) [2], and specialised e-commerce platforms developed by Vietnam government for agri-business (e-commerce platforms such as Voso.vn, Post-mart.com.vn) [3-4].

However, farmers' agribusiness on e-commerce platforms has been experiencing immature development and the Vietnamese government are struggling in finding feasible means to effectively support and motivate their farmers to promote and trade their agriculture products via e-commerce platforms. To date there is no applicable and valid framework for farmers' digital capabilities for e-commerce agribusiness, which indicates a research gap. It is unknown to what extent farmers' digital capabilities could determine farmers' e-commerce platform adoption, posing another potential research gap.

Thus, this paper aims to exploratorily develop a framework for farmers' digital capabilities for e-commerce agribusines and empirically examine how the dimensions of such developed framework impact farmers' adoption of e-commerce platforms for promoting their agriculture products. Our research is expected to provide insights about farmers' digital capabilities and provide useful suggestions for supporting farmers to increase their digital capabilities and thus engage more actively in e-commerce platforms to effectively promote their agriculture products.

2. Methodology Approach

This paper adopted a mixed methodology approach to study design. First, we reviewed the literature to provide insights for associated issues of digital capabilities. Second, we approached several suitable papers as key references to develop our own framework for further digital capabilities for farmers' e-commerce engagement. Third, we conducted a focus group discussion to initially propose farmers' digital capabilities. Finally, we conducted an empirical survey to collect farmers' perceptions about adopting e-commerce platforms for their agribusiness and quantitatively determined how dimensions of farmers' digital capabilities could impact their adoption of e-commerce platforms. Figure 1 illustrates research design with a mixed methodology approach.

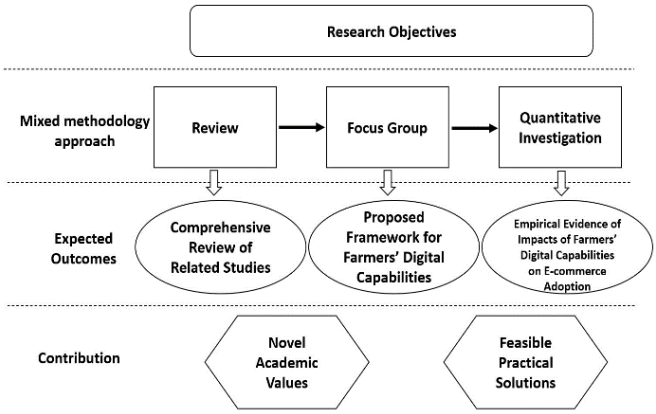

Figure 1. Research design

3. Results

3.1. Review Protocol

3.1.1. Database, search strategy and selection criteria for literature review

This paper accessed multiple recognized databases to search for scientific papers potentially related to farmers' digital capability to engage in e-commerce. The databases were ScienceDirect, JSTOR, Scopus, Web of Science (WoS), and Directory of Open Access Journals (DOAJ).

Several keywords were used to search and access suitable papers for review. These keywords included: DIGITAL CAPABILITIES, DIGITAL FRAMEWORK, DIGITAL FARMING, DIGITAL AGRICULTURE, DIGITAL AGRIBUSINESS, ELECTRONIC COMMERCE, E-COMMERCE, FULL-TEXT, FULL-PAPER. Keywords were inserted to search machines either one-by-one or in combination.

We set the simultaneous criteria for the paper selection as below:

(1) The papers must include issues of digital capabilities and e-commerce
(2) Paper must be in English
(3) Papers must not be duplicates of one another
(4) The paper must be a full-text version

This paper designs the review protocol as presented in Figure 2. Specifically, Figure 2 shows the reviewing protocol for literature review. First, 113 papers were collected from the selected database, of which 5 papers were from other sources. Second, 108 papers were screened for their abstracts, resulting in the exclusion of 86 papers. Third, the eligibility of the remaining 22 papers we was evaluated, revealing that 10 non full-text papers should be excluded. Finally, 12 papers were found that fully met the selection criteria.

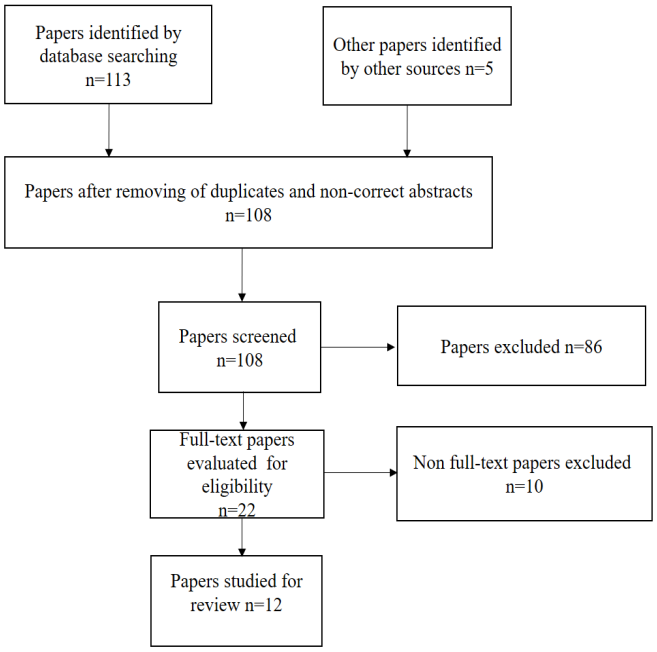

Figure 2. Review protocol

3.1.2. Review of Related Studies

Farmers' E-commerce Engagement

Farmers' e-commerce engagement has been rising as a research focus recently [5-7]. Specifically, Li et al. (2020) employed a household survey with propensity score matching methods to examine the impact of e-commerce engagement on farmers' income in China and found that such e-commerce engagement could positively improve farmers' income, via enhanced profit margin and increased agriculture product sales [8].

Ma *et al*. (2020) [9] indicated that Internet use could enhance farmers' willingness to adopt e-commerce by 20%. Farmers' intention to use the Internet could be determined by age, education, family labor, logistic service, and improved infrastructure. Their study also affirmed that age, risk preference, remittance status, and e-commerce training could significantly affect farmers' willingness to adopt e-commerce. Specifically, their findings showed that the religion and gender of the household head could differently moderate the impact of Internet use on farmers' willingness to adopt e-commerce.

In a study aiming to explore farmers' e-commerce from a perspective of the buyers of agriculture input, Fecke *et al*. (2018) [10] found that lower price, risk attitudes, delivery time, and prior online shopping experiences could significantly increase farmers' willingness to switch to an e-commerce merchant, whilst age, farm size, word-of-mouth reputation and consultation from traditional media were not significantly related to farmers' willingness to switch [10].

Wei and Ruan (2022) employed the theory of planned behavior and a survey study to test the impact of government policies and farmers' cognition on the willingness to engage in e-commerce. Their findings show that engagement in e-commerce is the optimal choice for farmers in a farmer–enterprise cooperative game. Moreover, farmers' basic characteristics and experiences could significantly impact their opinion of e-commerce, which in its turn, could positively influence farmers' willingness to engage and their subsequent behavioral engagement in e-commerce [11].

Farmer Digital Capabilities

In the era of digital transformation and digitalization, developing digital capabilities is critical to farmers, who are mainly distributed in rural, remote or under-developed areas [12-13]. A well-developed farmer digital capability could serve as supporting evidence to help mainly in two manners: (1) measuring the current digital capabilities of farmers for e-commerce engagement, and (2) proposing feasible means for enhancing such farmers' digital capabilities for more active and effective e-commerce engagement.

This paper reviewed the pertinent literature and approaches in various scholarly documents related to digital capabilities. Specifically, Chen *et al*. (2015) [14] proposed an Instrument for Information and Communication Technologies, which can be considered as the reference for developing the digital capabilities. Their instrument is generally presented in Table 1.

Table 1. Measurement for Information and Communication Technologies

Dimension	Competencies
Basic ICT competencies	Knowledge of Computer Systems
	Use of the Operating System
	Internet Search
	Communication & Networking
	Word Processing
	Use of Spreadsheets
Advanced ICT competencies	Image Processing
	Use of Database
	Technological Platforms
	Web 2.0 tools
Multimedia and Attitudes Toward ICT	Entertainment and Learning with ICT
	Online Procedures
	General Attitudes towards ICT

Source: Chen et al. (2015) [14]

Table 2. Measurement for e-commerce marketing capabilities

Dimension	Capabilities
E-commerce resources	Budget for e-commerce export development
	Subjects in charge of e-commerce export development
	E-commerce team in export marketing development
	Services to support e-commerce export sales activities
E-commerce marketing capabilities	Provide online product/service catalogue to customers Promote and advertise company's products, services and capabilities
	Online ordering of products/services
	Presenting and paying bills online (e.g. paying bills, being payed)
	Enable salespeople online access to product/price/performance information
	Ordering supplies online (e-procurement)
	Participating in an electronic market place
	Fulfilling and/or delivering online e-fulfilment (e.g. software)
Distribution efficiency	Realize efficiencies in the logistics process (e.g. electronic booking of transport, inspections, online tracking of shipment etc.)
	Be able to reduce the number of distribution channels (middlemen) necessary for export market
Communication Efficiency	Realize efficiencies in communication with customers/partners
	Realize efficiencies in information exchange between customers/partners
	Realize efficiencies in after-sales support
Export venture e-commerce performance	Provide lower cost channel for transactions with customers
	Maintain relationship with the overseas customers
	Exploit new sources of revenue
	Offer new services to your existing customer base
	Reduce operating costs
	Develop stronger relationships with suppliers and buyers
	Access new international markets
	Bring new services and products to international market more quickly
	Objectives for utilizing e-commerce in the export venture market

Source: Gregory et al. (2019) [15]

3.2. Focus group

We conducted a focus group to initially propose the framework for farmers' digital capabilities for e-commerce agribusiness. In order to validate the proposed digital capabilities, we targeted the areas with the biggest numbers of farming households producing green tea and its products in Thai Nguyen city, Vietnam. We used green tea households as our target sample for several reasons. First, green tea and its products are a famous specialty in Thai Nguyen city (our research settings). Second, green tea and its products were suitable for current e-commerce agribusiness context in Vietnam (with storage time from six months to one year).

We identified three categories of participants:

(1) Agriculture and rural development personnel from city government
(2) Agriculture and rural development personnel from local government (commune level)
(3) Green tea farming household heads

First, we obtained the entire list of farmers in Thai Nguyen city, Vietnam. Second, we approached farmers in the three communes which had the largest numbers of tea farmers, including Tan Cuong, Phuc Triu and Phuc Xuan. For each commune, we invited one agriculture and rural development personnel from local government (commune level) and three green tea farming household heads. We also invited two agriculture and rural development personnel from city-level government. In total, 14 participants were included in the focus group.

Profile of participants is presented in Table 3.

Table 3. Focus group participant profile

Category	Participant	Position - Expertise	Experience
Agriculture and rural development personnel from city government (2 participants)	Participant 1	Agriculture, rural development	11 years
	Participant 2	ICT, Digital transformation in agriculture	7 years
Agriculture and rural development personnel from local government (commune level) (3 participants)	Participant 3	Agriculture, rural development, tea farming	7 years
	Participant 4	Agriculture, rural development, tea farming	5 years
	Participant 5	Agriculture, rural development, tea farming	6 years
Green tea farming household heads (9 participants)	Participant 6	Tea farming (Tan Cuong commune)	15 years
	Participant 7	Tea farming (Tan Cuong commune)	12 years
	Participant 8	Tea farming (Tan Cuong commune)	5 years
	Participant 9	Tea farming (Phuc Triu commune)	12 years
	Participant 10	Tea farming (Phuc Triu commune)	13 years
	Participant 11	Tea farming (Phuc Triu commune)	5 years
	Participant 12	Tea farming (Phuc Xuan commune)	15 years
	Participant 13	Tea farming (Phuc Xuan commune)	12 years
	Participant 14	Tea farming (Phuc Xuan commune)	8 years

3.2.1. Proposed digital capability framework

Based on the key references of Chen *et al.* (2015) and Gregory *et al.* (2019) and the focus group discussion, our study designed and recommended a novel framework for farmers' digital capabilities for e-commerce agribusiness as shown in Table 4.

Table 4. Farmers' Digital Capabilities for E-commerce Engagement for Agribusiness

Dimensions	Capabilities
Attitude to e-commerce agribusiness	Attitude about general e-commerce business
	Attitude toward application of ICT/Digital technologies in agribusiness
	Attitude toward agribusiness on e-commerce platforms
Basic ICT Capabilities	Knowledge of Computer Systems
	Use of the Operating System
	Internet Search
	Communication and Networking
	Use of Database
	Word Processing
	Image Processing
	Security and Privacy
E-commerce digital marketing capabilities	Digital content creation
	Promote and advertise company's products, services
	Develop customer database
	Fulfilling and/or delivering online e-fulfilment
	Market information exploit
	Communication with customers/partners
	After-sales support
Digital learning capabilities	Self-training for e-commerce agribusiness
	Participation in training programs for advanced e-commerce agribusiness
	Continuous learning for e-commerce agribusiness

The framework of farmers' digital capabilities for e-commerce agribusiness proposed in this research has four dimension including (1) Attitude toward e-commerce agribusiness, (2) Basic ICT capabilities, (3) E-commerce digital marketing capabilities, and (4) Digital learning capabilities. For each dimension, we proposed several specific capabilities.

3.3. Quantitative investigation with survey

After the focus group discussion, we had a framework of farmers' digital capabilities for e-commerce agribusiness. It is still questionable, however, if this framework with four dimensions (Attitude toward e-commerce agribusiness, Basic ICT capabilities, E-commerce digital marketing capabilities, and Digital learning capabilities) could have any significant impact on farmers' e-commerce platform adoption, motivating us to conduct an empirical study to answer such a question. We chose a correlational study design with an accompanying survey, which was consistent with the pertinent literature [16-18]

To find the rationale for our approach, we revisited related literature. Previous studies indicated that attitude is important in determining human behavioral intention and behavior itself [19]. Moreover, attitude has been recognized as among the significant factors impacting farmers' e-commerce adoption [20,21]. Thus, we hypothesized:

H1: Attitude positively impacts farmers' e-commerce adoption

Literature also acknowledges the impact of relevant capabilities in determining adoption of innovation or technology [22-24], indicating the rationale of our argument that farmers' specific digital capabilities (basic ICT capabilities, digital marketing capabilities and digital learning capabilities) could influence their e-commerce adoption. Hence, we also hypothesized:

H2: Basic ICT capabilities positively impact farmers' e-commerce adoption.

H3: Digital marketing capabilities positively impact farmers' e-commerce adoption.

H4: Digital learning capabilities positively impact farmers' e-commerce adoption.

Figure 3 captures our quantitative research model, which aims to examine the impact of four dimensions of framework of farmers' digital capabilities on farmers' adoption of e-commerce platforms.

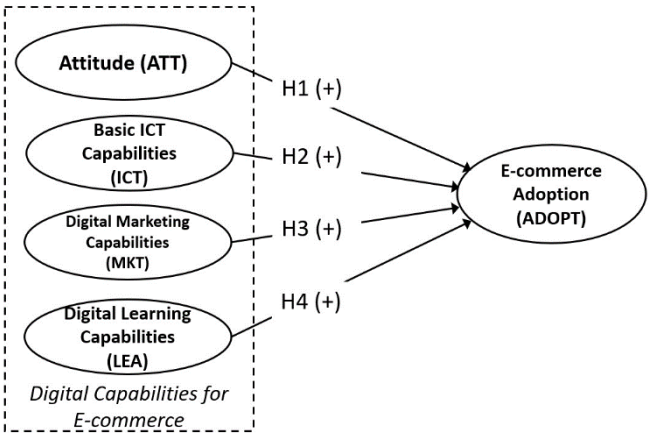

Figure 3. Quantitative research model

3.3.1. Sample and Data collection

We collected data from farmers producing green tea and its products in Thai Nguyen province, Vietnam, which is the most famous in the country for its green tea products. The reasons for choosing farmers in team farming areas as our targeted sample is given early in this paper (Section 3.2. Focus group).

We applied Yamane formula to determine sample size, which was equivalent to 385 [25]. Specifically approaching 400 farmers in Thai Nguyen city (Tan Cuong, Phuc Triu, Phuc Xuan communes), Dong Hy district, and Dai Tu district, where are the biggest tea farming areas in Thai Nguyen province. Research assistants distributed the self-administrative questionnaires, briefed our research purpose, and obtained consent from 400 participants. After removing invalid response questionnaires, we obtained 392 valid responses (equivalent to a rate of 98%).

3.3.2. Measurement

The measurement used for the four dimensions of farmers' digital capabilities (Attitude toward e-commerce agribusiness, Basic ICT capabilities, E-commerce digital marketing capabilities, and Digital learning capabilities) was proposed following group discussion, summarized in Table 4. The scale introduced by Mamonov and Benbunan-Fich (2020) [26] was used for farmers' adoption intention, which included three items as follows: (1) I intend to adopt e-commerce platforms for my agribusiness; (2) I predict that I will adopt e-commerce platforms for my agribusiness; and (3) I expect to adopt e-commerce platforms in the near future.

3.3.3. Analysis techniques

Our study employed EFA (Exploratory Factor Analysis) to investigate the reliability of the measurement and multiple regression analysis to estimate the impacts of the independent variables (Attitude toward e-commerce agribusiness, Basic ICT capabilities, E-commerce digital marketing capabilities, and Digital learning capabilities) on the dependent variable (farmers' adoption of e-commerce platforms). These are consistent and widely used by the relevant literature [27,28].

3.3.4. Quantitative Findings

Our study tested the Cronbach's Alpha of the constructs in the research model. Findings showed that all the constructs had Cronbach's Alpha greater than 0.7 (ATT = 0.803, ICT = 0.787, MKT = 0.792, LEA = 0.822, ADOPT = 0.824), the item-total correlation all items was greater than 0.3, exhibiting an acceptable level of reliability and thus satisfying conditions for EFA.

We used EFA for identifying underlying dimensions in multivariate data analysis (Hair *et al.*, 1998) [29]. For independent variables, findings showed that KMO value = 0.667 > 0.5 and Sig. value of Bartlett's test = 0.000 < 0.05. Moreover, findings indicated a total variance of 76.783% > 50% and all four extracted factors had Eigenvalue value greater than 1, exhibiting that the four extracted factors can explain 76.783% of the data variation in the 21 observed variables used in the EFA for independent variables. The 21 observed variables were categorized into four factors, as captured by the results of the rotation matrix (in Table 5).

For dependent variable, findings showed that KMO value = 0.762 > 0.5 and Sig. value of Bartlett's test = 0.000 < 0.05. Moreover, findings indicated a total variance of 74.691% > 50% and Eigenvalue value = 3.241 > 1. These results indicated that the scale of the dependent variable was accepted as unidirectional and the observed variables of the dependent variable converge acceptably.

All factor loadings of study constructs (shown in Table 5) were greater than 0.5, supporting that collinearity, separation, or factor aggregation were not remarkable concerns in our study.

Table 5 captures scale items, Cronbach's Alpha, and factor loading of study constructs.

Table 5. Scale items, Cronbach's Alpha, Factor loading

Constructs /Items	Scale items	Cronbach's Alpha/Item-total correlation	Factor loading
ATT	**Attitude toward e-commerce agribusiness**	**0.803**	
ATT1	Attitude about general e-commerce business	0.568	0.779
ATT2	Attitude toward application of ICT/Digital technologies in agribusiness	0.727	0.782
ATT3	Attitude toward agribusiness on e-commerce platforms	0.675	0.774
ICT	**Basic ICT capabilities**	**0.787**	
ICT1	Knowledge of Computer Systems	0.713	0.782
ICT2	Use of the Operating System	0.688	0.771
ICT3	Internet Search	0.686	0.769
ICT4	Communication and Networking	0.728	0.712
ICT5	Use of Database	0.764	0.702
ICT6	Word Processing	0.729	0.713
ICT7	Image Processing	0.720	0.763
ICT8	Security and Privacy	0.783	0.784
MKT	**E-commerce digital marketing capabilities**	**0.792**	
MKT1	Digital content creation	0.687	0.790
MKT2	Promote and advertise company's products, services	0.714	0.757
MKT3	Develop customer database	0.692	0.764
MKT4	Fulfilling and/or delivering online e-fulfilment	0.725	0.742
MKT5	Market information exploit	0.741	0.735
MKT6	Communication with customers/partners	0.732	0.705
MKT7	After-sales support	0.742	0.811
LEA	**Digital learning capabilities**	**0.822**	
LEA1	Self-training for e-commerce agribusiness	0.698	0.818
LEA2	Participation in training programs for advanced e-commerce agribusiness	0.695	0.823
LEA3	Continuous learning for e-commerce agribusiness	0.772	0.812
ADOPT	**E-commerce adoption**	**0.824**	
ADOPT1	I intend to adopt e-commerce platforms for my agribusiness	0.718	0.878

OPT2	I predict that I will adopt e-commerce platforms for my agribusiness	0.712	0.796
ADOPT3	I expect to adopt the agricultural information system in the near future	0.764	0.883

We used Multiple regression analysis to estimate the impacts of independent variables on dependent variable. Findings showed that F-test value = 16.793 (Sig. = 0.000 < 0.05), adjusted R-square = 0.684, indicating that the independent variables explained 68.4% of the variance in the dependent variable. Moreover, the Durbin-Watson statistics were used to examine first-order serial correlation. Findings indicated Durbin-Watson value = 1.963 (1.5 < 1.963 < 2.5), suggested the study suffers no deviation from the assumption of first-order autocorrelation.

Table 6 summarizes the t-test results, regression coefficients, and Variance Inflation Factor (VIF) index for evaluating multicollinearity. According to Table 6, hypothesis H1 ($t = 3.643$, $p < 0.05$), H2 ($t = 2.715$, $p < 0.05$), H3 ($t = 2.816$, $p < 0.05$), H4 ($t = 4.793$, $p < 0.05$) were all supported. Moreover, all the dependent variables had VIF coefficients below 2, signaling that multicollinearity was not a concern in our study [29].

4. Discussion

Our study found that the 'Attitude toward e-commerce agribusiness' positively contribute to farmers' adoption of e-commerce platforms for agribusiness. Therefore, governments should design and implement strategy to boost farmers' positive attitude toward e-commerce. For instance, real stories/cases about successful farmers with e-commerce agribusiness should be communicated to farmers via farmers' club activities, information desks, and other types of media. Information about financial and non-financial benefits brought by e-commerce should be frequently disseminated to farmers, which helps boost their positive attitude toward e-commerce. These could, according to our study findings, enhance famers' e-commerce platform adoption.

We found that Basic ICT capabilities and Digital marketing capabilities could positively impact farmers' e-commerce adoption. Therefore, training programs should be considerately designed for farmers about how to improve their basic ICT capabilities, or marketing experts and KOLs (Key Opinion Leaders) invited who have mastered digital marketing knowledge and skills. Their participation in such training programs could help enhance farmers' basic ICT capabilities and digital marketing capabilities, thus facilitating their e-commerce platform adoption.

Moreover, our study found that Digital learning capabilities could positively determine farmers' e-commerce adoption. Hence, providing opportunities and support for farmers' learning via offline channels and online channels should be regularly provided, so that farmers can increase their digital learning capabilities. This could boost their e-commerce platform adoption, as found by our study.

5. Research limitation and future research direction

Our study setting was limited to the Thai Nguyen province, Vietnam. Such an approach could help restrain the confounding effect of factors such as region and culture, yet might not provide a comprehensive understanding about farmers' e-commerce adoption across different locations or cultures. Future research may consider replicating our study with comparison design, to further consolidate the findings of our study and offer more comprehensive knowledge about farmers' e-commerce adoption.

Our sample focuses on farmers whose farming and agribusiness activities are related to green tea and its associated products. Future works could target more diverse samples of farmers with alterative kinds of agriculture products to examine farmers' e-commerce adoption. Such research works could reveal rich information about farmers' e-commerce adoption that can be generalized to further kinds of agriculture products.

Our study focus is on farmers' adoption of e-commerce platforms. However, alternative social platforms for agribusiness such as WeChat or Tiktok, etc. are currently prevalent [30,31]. Future research should consult our study to examine farmers' adoption of such social platforms for their agribusiness, providing novel insights about farmers' adoption of digital technology to promote their agriculture products.

6. Conclusion

Our study aims to develop a framework of farmers' digital capabilities and examines how the four dimensions of the framework impact farmers' e-commerce platform adoption. We used a mixed-methodology approach including review, focus group and quantitative design to answer research questions. The study proposes a framework for farmers' digital capabilities including four dimensions (Attitude toward e-commerce agribusiness, Basic ICT capabilities, E-commerce digital marketing capabilities, and Digital learning capabilities) and verifies that such four dimensions could significantly enhance farmers' e-commerce platform adoption. We recommend several practical means, according to the study findings, to boost farmers' adoption. Future research is encouraged to apply our proposed framework of farmers' digital capabilities to examine the formation of farmers' e-commerce adoption in social platforms (WeChat or Tiktok) to recommend further solutions to improved agribusiness.

Table 6. Multiple regression analysis and hypothesis testing results

Hypothesis		*β*	*t*	*p*	VIF	Interpretation
H1	ATT -> ADOPT	0.104	3.643	0.004	1.002	Supported
H2	ICT -> ADOPT	0.326	2.715	0.000	1.142	Supported
H4	MKT -> ADOPT	0.494	2.816	0.000	1.136	Supported
H4	LEA -> ADOPT	0.213	4.793	0.006	1.202	Supported

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