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Digitally transforming agricultural and food market through E-Commerce: an exploratory study in the Malaysian context

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Abstract: E-Commerce has seen a noticeable increase in favor as a practical avenue for exchanging goods and services, both locally and internationally, because of its rapid growth. Not all products, however, are appropriate for internet sales. One of the examples are fresh vegetables, which present a challenge due to the need to maintain their freshness. Factors such as lengthy shipping times and inconsistent temperature conditions during transportation can result in spoilage, reducing consumer interest. The purpose of this study is to pinpoint the variables affecting customers' online purchases of fresh agricultural goods. A total of 300 sets of data were gathered by questionnaire surveys, and Smart-PLS was used for quantitative analysis. Using SPSS, Pearson Correlation Analysis and Multiple Linear Regression were performed on the gathered data. Out of seven hypotheses, three are accepted. This research facilitates meaningful discussions and communication to encourage greater participation and acceptance of all fresh agricultural products. By gaining a better understanding of the balance between supply and demand for fresh agricultural products through E-Commerce, it will be possible to reduce food wastage caused by spoilage and analyze consumption and production patterns. In conclusion, the study's findings show that most respondents concur that they are aware of the possibility of buying fresh agricultural products online. Furthermore, most of the respondents have a positive impression of the fresh agricultural products E-Commerce platform. Additionally, a significant number of respondents express their experiences in purchasing fresh agricultural products online. Throughout the analysis, out of seven hypotheses, three are accepted.

Keywords: E-Commerce; fresh agricultural goods; Pearson correlation analysis; multiple linear regression

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1. Introduction

Social distancing, restrictions, and other actions taken in reaction to the COVID-19 pandemic have prompted individuals to escalate their online shopping, engagement with social media, utilization of Internet calls, participation in conference calls, and engagement in video and movie streaming. As a result, this tendency has promoted growth in both business-to-business (B2B) and business-to-consumer (B2C) e-commerce. Notably, the increase in B2C sales is particularly noticeable in sectors including food products, basic household goods, and medical supplies [1]. This emphasises the demand for information and communication technology (ICT) services, such as computers, telephones, other IT services, and emerging technologies, to be effective and reasonably priced [1,2]. Due to these technologies, most commercial sectors, including agriculture and the food supply, have lately undergone considerable change [3].

Previous studies have shown that a lack of understanding and information about e-commerce might impede the expansion of agri-food e-commerce (AE). This is because, in contrast to other industries that have successfully adopted e-commerce, the agriculture sector is conventional and has a unique value chain [4,5]. Farmers find it difficult to implement AE since it has created a new ecosystem that includes digital marketing, website development, smart logistics, processing, and agricultural production [6].

One important metric for assessing the efficacy of AE is the degree to which customers are happy and inclined to buy. Studies and current research can forecast future purchase intentions [7]. It has been established that one of the key elements affecting how quickly farmers adopt agri-food e-commerce is purchasing intent. Identification of consumer preferences and wants that will result in their being completely satisfied, which will then lead to repeat purchases and advocacy, is essential to increasing purchasing intention [8]. With the established problem statement in mind, the goal of this research is to pinpoint the issue consumers (purchasers) encounter while buying fresh agricultural products online from a marketing standpoint.

2. Literature review

The theoretical model, 5As Model is explored, which aims to enhance understanding of the capabilities of the respective theory. Proposed by Philip Kotler, the 5As Model presents a novel framework that considers the influence of technology-driven changes [9]. This framework, known as the 5As Model (Aware, Appeal, Ask, Act, Advocate), offers insights into the stages of consumer engagement [9]. In the context of consumers' intentions to make purchases through an E-Commerce platform, several factors come into play, including perceived experience and system experience. These elements significantly influence how customers make decisions [10]. A critical analysis of prior research investigations was carried out to create the hypothesis and build the conceptual framework for this study, guiding the creation of a strong framework for the current investigation.

Philip Kotler introduces a novel framework, referred to as the 5As Model (Aware, Appeal, Ask, Act, Advocate), which adapts to the transformations brought about by

technology [9]. This framework, illustrated in Figure 1, encompasses the stages of Aware, Appeal, Ask, Act, and Advocate [9]. The 5As Model offers a valuable revision to the traditional AIDA framework, and it plays a pivotal role in fostering a comprehensive full-funnel strategy. This article provides a concise overview of the 5As and delves deeper into the touchpoints that hold significant importance for consumers, as well as for categories such as lifestyle and business-to-business interactions. The details of the 5As are further discussed as follows,

Figure 1. 5As Model [9].

Aware: During the "Aware" stage, consumers passively encounter brands, advertisements, and advocacy from influencers, friends, and family. The consumer's point of entry is this initial exposure. Through a variety of channels, such as conventional advertising, social media, one-on-one interactions, recalling prior meetings, and word-of-mouth referrals, they learn about the company and its offers. For instance, online produce suppliers can utilize their website or social media accounts to share visually appealing content like photographs and videos showcasing recipes incorporating fresh fruits and vegetables. They can also provide cooking tips and complete recipes through blog posts and e-books [11].

Appeal: In the "Appeal" stage, consumers process the brand messages they have encountered, leading to the formation of memory. In this stage, consumers create a shortlist of brands that leave a lasting impression. In contrast to the conventional AIDA model, which focuses on the individual, the appeal stage heavily involves the influence of the community. Designing an AE platform that resonates with consumers' minds is crucial at this stage. For example, an AE platform may employ a slogan such as "Service tools and dishes: Food introduction is very important." Displaying fruits and vegetables in attractive bowls or plates enhances their visual appeal. Collaborating with service parts manufacturers allows grocers and suppliers to present their food in an enticing manner, capturing consumer attention [11].

Ask: In the "Ask" stage, consumers actively seek out more information about the brands they have shortlisted. They conduct research through various sources, including media, personal connections, and the brands themselves [12]. Consumers interact with brands in this phase through ask-and-advocate interactions, exchanging information that either enhances or detracts from a brand's appeal. Consumers can inquire about attractive solutions through product reviews online or offline, reaching out to suppliers or sales staff, and seeking recommendations from friends, family, and acquaintances.

Act: The "Act" stage includes after-sales services in addition to the actual purchase. Customers move on with action by making a purchase if they are satisfied by the data acquired during the inquiry phase. This stage involves adding items to the cart, checking out, and completing the payment process. Consumers indicate their interest and intention to buy by making a payment through the AE platform. Providing an easy-to-navigate user interface

and ensuring a smooth payment system operation are crucial for facilitating a seamless shopping experience [13].

Advocate: The "Advocate" phase includes ideas such as keeping customers loyal, making repeat purchases, and promoting the good or service to others. If consumers have a positive experience with a brand and its offerings, they may develop strong loyalty and become brand advocates. These avid customers have a reputation for standing up for the company in the face of unfair criticism. Those who have made purchases through the AE platform are considered loyal customers in this study. They exhibit repeat purchases, product usage, engagement through various communication channels, and actively support the brand by referring others and providing positive feedback. Loyal customers become valuable advocates, contributing to the success and growth of the brand [14].

Purchase intention is the potential and desire of consumers to buy a specific good [15]. Additionally, it also applied to plans that a customer made before buying a certain item that is required moving forward [16]. Seah *et al.* carried out research that mentioned that purchase intention is a possibility of consumers purchasing a certain product, in which higher purchase intention would bring a higher probability of consumers making the purchase [16]. An individual's alternative assessment while making a purchasing decision depends on his or her favourability, understanding some external influences [17]. In other words, purchase intention also is a purchase decision after taking into consideration several reasons.

3. Proposed framework

Figure 2 illustrates the proposed framework for this research. The suggested framework is an extension of the 5As Model, which incorporates Purchase Intention and consequently establishes the system's practical application for AE.

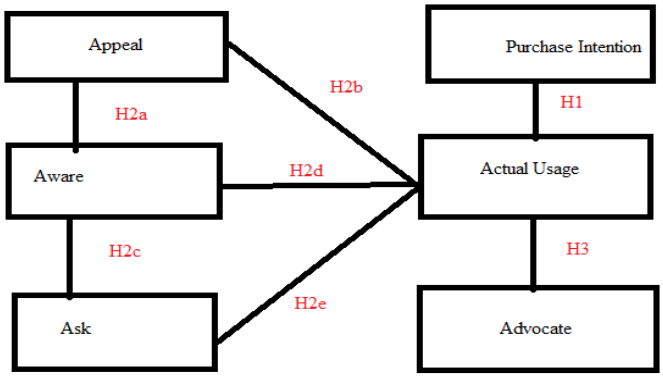

Figure 2. Proposed conceptual framework.

The hypotheses are formulated as follows:
H1: There is a relationship between purchase intention and actual usage of the AE.
H2a: There is a relationship between appeal and awareness about the AE.
H2b: There is a relationship between appeal and actual usage of the AE.
H2c: There is a relationship between aware and ask about the AE.
H2d: There is a relationship between aware and actual usage the AE.

H2e: There is a relationship between ask and the actual usage the AE.
H3: There is a relationship between actual usage and advocate about the AE.

4. Methodology

This research employed a quantitative research approach, specifically utilizing a survey strategy based on the 5As Model. The choice of this approach facilitated faster computation results and provided increased flexibility and convenience. However, due to time limitations, the study was conducted as a cross-sectional study rather than a longitudinal one. This research targeted 300 respondents who live in Peninsular Malaysia and do have experiences in purchasing agriculturally based products online and pilot or reliability test will be conducted with a pool of 30 responders.

The survey questionnaire, which was produced using online survey tools like Google Form, will be distributed via community groups on social media platforms like Facebook Vegetable Groups. This club unites all online crop buyers who enjoy gardening and growing vegetables. Descriptive analysis and inferential analysis were used to evaluate the strength and direction of correlations between various variables to test the conceptual model and hypotheses developed. A two-step procedure will be used to evaluate the hypotheses: (1) the measurement model is analyzed; (2) the structural model is examined.

5. Result and discussion

A total of 300 sets of questionnaires were disseminated and gathered through an online methodology. The collected data underwent analysis using the Smart - Partial Least Squares (SmartPLS). Descriptive analysis and inferential analysis were conducted to further analyse the collected data. Filtering questions were set to identify the qualified respondents, it includes the awareness impression and experienced in purchasing fresh agricultural products through internet.

Table 1. Descriptive analysis of collected data.

Questions	Valid	Frequency	Percentage (%)
Gender	Male	79	26.3
	Female	221	73.7
	Total	**300**	**100**
Age Group	20-29	78	26.0
	30-39	141	47.0
	40-49	73	24.3
	50 and above	8	2.7
	Total	**300**	**100**
Aware about the capability to purchase fresh agricultural products through internet.	Strongly Disagree	1	0.3
	Disagree	1	0.3
	Neutral	99	33.0
	Agree	187	62.3
	Strongly Agree	12	12.0

Table 1. *Cont.*

	Total	**300**	**100**
Good impression on the fresh agricultural products on E-Commerce platform	Strongly Disagree	0	0
	Disagree	2	0.7
	Neutral	76	25.3
	Agree	188	62.7
	Strongly Agree	34	11.3
	Total	**500**	**100**
Purchased fresh agricultural products on E-Commerce platform	Yes	300	100
	No	0	0
	Total	**500**	**100**

Table 1 offers a summary of the survey participants, indicating a total of 221 female respondents and 79 male respondents. Females accounted for 73.7% of the total respondents, while males comprised 26.3%. The respondents were further categorized into different age groups: 20 to 29, 30 to 39, 40 to 49, and 50 years old and above. The age group with the highest representation in the survey was adults aged between 30 to 39, contributing 47% of the total respondents. The second highest group was the 20 to 29 age group, accounting for 26% of the 300 respondents. The 40 to 49 age group constituted the third highest proportion, comprising 24.3% of the total respondents. Additionally, there were 8 respondents (0.3%) who were 50 years old and above.

In general, the survey results show that most participants concur that they are aware of the option to buy fresh agricultural goods online. Furthermore, most of the respondents have a positive impression of the fresh AE platform. Additionally, most of the respondents express their past experiences in purchasing fresh agricultural products online.

Table 2 illustrates the outcome of the structural assessment and the outcomes for hypotheses H1 to H3. To assess collinearity, the Variance Inflation Factor (VIF) values for each item should be below 5, and the results suggest that no collinearity issues are present. Moreover, the R2 value, which indicates the percentage of variance explained by the construct in the model, is 0.473. This suggests that the tested model has a moderate level of explanatory power, as it approaches the threshold of 0.5 for substantial explanatory capability.

The findings of the structural model provide support for H1, H2a, and H2b, indicating that the 5As Model has a significant influence on purchase intention. Specifically, the results show that Purchase intention & Actual Use is the strongest predictor ($\beta = 0.433$, $p < 0.001$). Additionally, Appeal & Aware ($\beta = 0.188$, $p < 0.05$) and Appeal & Actual Use ($\beta=0.184$, $p < 0.001$) also demonstrate a significant influence. However, the results do not support H2c, H2d, H2e, and H3. This means that there is no significant relationship found between Aware & Ask, Aware & Actual Use, Ask & Actual Use, and Advocate & Actual Use. These specific hypotheses did not have statistically significant results in the analysis.

Table 2. Result of PLS-SEM for H1 to H3.

Relationship	β	t-value	p-value	VIF	Result
H1: PI& Actual Use	0.433	6.915	0.000	2.677	Significant
H2a: Appeal & Aware	0.188	3.297	0.001	2.206	Significant
H2b: Appeal & Actual Use	0.184	3.591	0.000	1.802	Significant
H2c: Aware & Ask	0.054	0.996	0.160	2.54	Not Significant
H2d: Aware & Actual Use	0.062	0.880	0.189	2.064	Not Significant
H2e: Ask & Actual Use	0.069	1.409	0.080	1.742	Not Significant
H3: Advocate & Actual Use	0.029	0.531	0.298	2.411	Not Significant

Within Table 3, the investigation evaluates discriminant validity through the utilization of the Heterotrait-monotrait (HTMT) ratio of correlations. The results indicate that the HTMT ratios of correlations are lower than the recommended threshold level of 0.9. This suggests that the variables in the study exhibit discriminant validity, meaning that they measure distinct constructs and are not highly correlated with each other. The lower HTMT ratios indicate that the variables are adequately differentiated. The study furnishes evidence supporting the discriminant validity of the utilized measures.

Table 3. Heterotrait-monotrait ratio (HTMT)–Matrix.

	Actual Usage	Advocate	Appeal	Ask	Aware	Purchase Intention
Actual Usage						
Advocate	0.522					
Appeal	0.433	0.453				
Ask	0.510	0.521	0.353			
Aware	0.553	0.543	0.425	0.393		
Purchase Intention	0.705	0.755	0.643	0.701	0.755	

6. Conclusion

This study's main goal was to learn more about AE from the perspective of the consumer. The study explicitly sought to evaluate the association between consumer acceptability levels, perception, and behavior regarding the intention to acquire agricultural goods through AE, in accordance with the suggested framework. Additionally, it improved the 5As model in relation to e-commerce for agri-food.

To summarize, the study's results suggest that a significant majority of respondents concur with the notion of being informed about the ability to buy fresh agricultural products via the internet. Furthermore, most of the respondents have a positive impression of the fresh agricultural products E-Commerce platform. Additionally, a significant number of respondents express their experiences in purchasing fresh agricultural products online. Throughout the analysis, out of seven hypotheses, three are accepted. The result of analysis could be utilized in strategies development which can be further in marketing implementation. This is helping the business to growth and increase the confident level of SMEs in digital transformation especially small-scale farmers [18,19].

Although the research has been completed and the study's objectives have been achieved, there are several limitations that should be acknowledged. Firstly, the time allocated for this research was limited to approximately 20 weeks. This restricted the researchers from conducting a more comprehensive and in-depth study. More time would have allowed for a more thorough investigation, including a larger sample size and more diverse geographical coverage. Secondly, the research was focused on a specific geographic region, namely the Klang Valley. This limited scope may affect the generalizability of the findings to the entire population of Malaysia. Conducting the research in other regions of Malaysia would have provided a more representative sample and a broader understanding of the topic. Recognizing these limitations is crucial as they create avenues for future research to rectify these deficiencies and advance the comprehension of AE in Malaysia.

Future researchers are indeed encouraged to expand the geographical coverage of their studies to obtain more representative and reliable results. By including a broader range of locations, including both urban and rural areas, the research can capture a more diverse sample and provide a more significant insight about AE. By doing so, the validity of the findings can be extended to a broader population, thereby enhancing the overall generalizability of the outcomes. In terms of literature review and references, considering research conducted in Asian countries that share similar cultural attributes and beliefs with Malaysia would be beneficial. This approach can provide relevant supporting journals and studies that are applicable to the local context. It can also contribute to building a stronger theoretical framework and knowledge base for the research topic.

To bolster both the reliability and depth of the study, future researchers may consider employing both qualitative and quantitative methods in data collection. This approach facilitates a more holistic comprehension of consumer viewpoints, as qualitative methods provide in-depth insights while quantitative methods offer broader statistical analysis. The combination of these methods can yield more robust and reliable information. By incorporating these recommendations, upcoming researchers can improve the quality and dependability of their studies, consequently advancing the comprehension of Agri-food E-Commerce in Malaysia and fostering the progression of this field.

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Conflicts of interest

The authors declare no conflict of interest.

References

[1] World Trade Organization. E-commerce, trade and the covid-19 pandemic. 2020 May.

[2] Seah CS, Loh YX, Aman Lew Ka Lock BLKK, Chin MX, Lio GC, Lee MK, *et al.* The Significance of Technology in Digitalising Malaysia Industries. In *Conference on Management, Business, Innovation, Education and Social Sciences*. 2021, 1(1).
[3] Cheong YS, Seah CS, Loh YX, Loh LH. Artificial Intelligence (Ai) in the Food and Beverage Industry: Improves the Customer Experience. In: *2021 2nd International Conference on Artificial Intelligence and Data Sciences, AiDAS 2021*. 2021.
[4] Liu H, Wang Y, Xie K. AE Sites Evaluation Research. *Int J Bus Soc Sci*. 2013, 4(17).
[5] Loh YX, Hamid NAA, Seah CS, Yo JJ, Law YC, Tan SY, *et al.* The Factors and Challenges affecting Digital Economy in Malaysia. In *CoMBInES - Conference on Management, Business, Innovation, Education and Social Sciences*. 2021, 1(1).
[6] Liu X, Walsh J. Study on Development Strategies of Fresh Agricultural Products E-commerce in China. *Int Bus Res*. 2019, 12(8).
[7] Yang L, Mao M. Antecendents of online group buying behavior: From price leverage and crowd effect perspectives. In: *Proceedings - Pacific Asia Conference on Information Systems, PACIS 2014*. 2014.
[8] Hadi AHIA, Selamat J, Shamsudin MN, Radam A. Demand for food safety attributes for vegetables in Malaysia. *EnvironmentAsia*. 2010;3(SPECIAL ISSUE).
[9] Kotler P, Kartajaya H, Setiawan I. *Marketing 4.0 Moving: Moving from Traditional to Digital*. John Wiley & Sons, Inc. 2017.
[10] Montanari R. Cold chain tracking: a managerial perspective. *Trends Food Sci Technol*. 2008, 19(8).
[11] Hen KW, Seah CS, Witarsyah D, Shaharudin SM, Loh YX. The study on Malaysia Agricultural E-Commerce (AE): Customer Purchase Intention. *JOIV: Int J Inform Vis*. 2023, 7(3).
[12] Dwyer FR, Schurr PH, Oh S. Developing Buyer-Seller Relationships. *J Mark*. 1987, 51(2).
[13] Thackston K, Says KH, Says KT. Understanding the online buying process can increase your sales. 2021. Available from: https://www.marketingwords.com/blog/online-buying-process/ (accessed on 2023 Aug 17)
[14] Oracle. What is customer loyalty. 2021. Available from: https://www.oracle.com/cx/marketing/customer-loyalty/what-is-customer-loyalty/ (accessed 2022 Sep 26)
[15] Nasution MDTP, Rossanty Y, Ariffin KHK, Zaini NIBM. An empirical examination of the factors influencing consumer's purchase intention toward online shopping. *J Bus Retail Manag Res*. 2019, 13(04).
[16] Seah CS, Loh YX, Wong YS, Jalaludin FW, Loh LH. The Influence of COVID-19 Pandemic on Malaysian E-Commerce Landscape: The case of Shopee and Lazada. In: *ACM International Conference Proceeding Series*. 2022.
[17] Yeo SF, Tan CL, Kumar A, Tan KH, Wong JK. Investigating the impact of AI-powered technologies on Instagrammers' purchase decisions in digitalization era–A study of the fashion and apparel industry. *Technol Forecast Soc Change*. 2022, 177.
[18] Low MP, Seah CS, Cham TH, Teoh SH. Digitalization adoption for digital economy: an examination of Malaysian small medium-sized enterprises through the technology–organization–environment framework. *Bus Process Manag J*. 2022, 28(7).
[19] Low MP, Hengky Latan, Charbel J Chiappetta Jabbour. Digitalization Adoption among Malaysian SMEs: The Drivers and its' Industry Based Heterogeneity. *Asia Proc Soc Sci*. 2021, 7(1).