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Decision–making process for purchasing organic vegetable products through electronic commerce systems and multi–channel marketing

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Abstract

This research aims to: 1) study the decision-making process to purchase organic vegetable products through electronic commerce systems and multi–channel marketing; and 2) compare the decision–making processes for purchasing organic vegetable products through electronic commerce and multi–channel marketing when classified by personal factors and consumer behavior. The researcher collected data from 750 customers who have purchased organic vegetable products through electronic commerce derived by convenient sampling. Additionally, the statistics used for data analysis consisted of percentage, independent t–test, one–way ANOVA, confirmatory factor analysis, and path analysis using structural equation model (SEM).

The results found that: (1) the behavior after deciding to purchase organic vegetables products through multi–channel marketing caused by the combined influence of purchasing decision (TE = 0.95), alternative evaluation (TE = 0.94), searching for information (TE = 0.85), and recognizing the needs of the problem (TE = 0.82) respectively with 91% of predictive value (2) the decision to purchase organic vegetable products through electronic commerce and multi-channel marketing classified by consuming behavior of the respondents, was different in factors such as status, education, income, occupation, media channels, and purchase time with statistical significance at the .01 level, while age showed statistically significant difference at the .05 level.

Keywords: Decision–making process, organic vegetables, electronic commerce systems, multi–channel marketing

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1. Introduction

The advantage in terms of geography and fertility makes Thailand a leading country in the world to produce quality agricultural products, and can be updated to be the kitchen of the world. For this reason, the governments of every era give importance to policies related to agriculture. However, the final result was not as successful as it should be, considering the income of Thai farmers which is still at a low level. According to the survey result from the Office of Agricultural Economics, the net income of agricultural households was 269,449bath/household/year in 2019 while agricultural household debt was 221,490bath/household/year in 2019. In addition, 55% of the debt is borrowed for agriculture [1]. It is a good sign that the current government's policies have taken more care of agriculture, resulting in the income of Thai farmers tending to expand better.

The popular trend of the world in this era is "health–loving" which has reflected in widespread attention to exercise doing, daily use of natural or chemical-free products, and decision to purchase organic vegetables. Vegetables are considered an important healthful food that Thai people like to eat. Vegetables are rich in both vitamins and minerals and are highly beneficial to the body [2] Consumers tend to choose to consume vegetables that are beautiful without signs of worm infestation and insect pests. Therefore, vegetable farmers use chemicals to prevent and kill insects spraying in large quantities in order to get beautiful vegetables according to the needs of consumers in the market When buyers consume them, they may be harmed by toxic substances that remain in the vegetable. Therefore, a new market segment, "Safe vegetables", that is not harmful to the environment and consumers was born. The safe growing of vegetables improves the production system in accordance with nature. The gain products are safe for both farmers and consumers. The main principle of safe vegetable products is to focus on reducing the use of chemicals in production by using the factors of production available in the area for maximum benefit to reduce the cost of production [3]. Regarding the results of the market survey of safe vegetable products in Thailand in 2019, the value is not

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less than 3,000 million baht, the export value is about 2.1 billion baht, and the growth rate is about 10% per year. The cultivated area of Thailand from the original 357,091 rai increased by 83%, or equivalent to 0.65 million rai. In ASEAN, Thailand is the 3rd after Indonesia and the Philippines [4]

Furthermore, the pandemic of COVID–19 has driven consumers to work from home and use a mobile phone for purchasing online, having more time with technology. These also include the push from the government to use financial transactions via mobile phones that can cause the change of the consumer behavior to buy products and services using more technology. The purchasing decisions through electronic commerce and multi-channel marketing began to play an essential role in making the business successful [5–7].

Additionally, the success factors in multi–channel marketing are understanding consumer behavior and designing appropriate multi–channel marketing channels with digital or modern media; designing a database system to manage information in multiple marketing channels effectively; and having a good partner in marketing [8]. The main objective of the research on the decision-making process for purchasing organic vegetable products through electronic commerce and multi–channel marketing is to study the behavior of consumers. It had been expected that the research results will be a helpful case study for organic vegetable traders in adapting to a new world of technology in marketing, scholars, and those who are interested.

2. Research Objectives

1. To study the decision-making process for purchasing organic vegetable products through electronic commerce and multi–channel marketing.

2. To compare the decision-making process for purchasing organic vegetable products through electronic commerce and multi–channel marketing, as classifies by personal factors and consumer behavior.

3. Literature Review

For the literature review, this research focuses on key variables including:

3.1 Purchase decision making process

It refers to the process of choosing to do something from a variety of options under the information and the constraints of the situation. In the minds of consumers, [9] it is the process of choosing a product from two or more options by consumer behavior. It will consider in connection with the decision–making process in both metals (feelings) and physical behaviors. The decision–making process is a sequence step in consumer decision making with a sequence of 5 steps as follows: [10] 1) problem of Need Recognition, 2) search for Information, 3) evaluation of alternative, 4) decision making, and 5) post–purchase behavior. For online shopping decision theory, it focuses on consumer response or consumer decision. As follows [11] 1) product choice, 2) brand choice, 3) dealer choice, 4) purchase timing, 5) purchase amount, and 6) Criteria.

3.2 Multi–Channel Marketing

Multi–channel marketing is a new marketing concept that enters a highly competitive business by focusing on reaching customers first to create a competitive advantage, merging multiple marketing channels, communicating and delivering various information to reach customers, and attracting them to buy products [12]. Multi–channel marketing will play a role as part of a strategy to generate sales and profits with the objective that customers can choose a channel to purchase products according to their convenience. It helps develop a supply chain system by selecting the appropriate channels which may be considered based on the return of investment in each channel or based on customer feedback compared to sales [6]. Multi–channel marketing strategy has developed rapidly in many businesses. It has seen the need to compete for market share to reach customers and attract and maintain a good relationship with customers by defining a marketing channel structure with more than one channel to reach customers [13]. The main elements of multi–channel marketing consist of: 1) exist of Omni–channel marketing which helps to connect by emphasizing the consistency of products across marketing channels, and marketing promotion in marketing channels; 2) design of efficient information systems; 3) order and delivery processes through all marketing channels; and 4) finding partners in marketing channels in this digital era which has changed due to modern media. The integration of media roles will be a channel that makes consumers more likely to adjust the platform to purchase products appropriately. If it is convenient to access, use and have an easy way to use, it will cause a chance to buy the product [14]. The results of the study on the development of such concepts over the past 10 years found that the development of information systems has evolved greatly. The concept of multi–channel marketing systems has continually developed until there is a research in the marketing that mentioned multi–channel marketing develops the market beginning from a single channel to multi–channel at the moment. However, the current trend of electronic commerce has started to have entrepreneurs stepping over to the market through cross-channel and including marketing through Omni–channel. The development of information technology will make it possible to bring information from all channels and all scattered parties to be consolidated and processed together [7], [15], [16], [17]

The results of the literature review led the research team to formulate the conceptual framework as follows:

4. Research Methodology

4.1 Sample population

The researcher collected data using a questionnaire from 750 consumers who have purchased organic vegetable products through electronic commerce. The sample size criterion of Hair et al. [18], which defines 20–50 samples per observed variable, was used in this research. Since this research has 14 observed variables, the researcher defined the criteria for 50 samples per one observed variable and used a convenient sample selection method.

4.2 Research tool

The tool used for this research was a questionnaire that passed the content validity test from 3 experts. The reliability of Alpha Cronbach was tested in a non–sample group of 30 and got an alpha coefficient value between 0.79–0.94. This assumed that the tool is of sufficient quality to store data.

4.3 Data analysis

Percentage, independent t–test, One–Way ANOVA, confirmatory factor analysis and path analysis of structural equation model (SEM) were used for data analysis.

5. Research Results

The results demonstrated that most of the respondents were female (68.00%), aged 21–30 years old (70.67%), single (59.47%), bachelor's degree (60.13%), and income less than 20,000 baths per month (81.60%), Student/scholar (53.07%). Regarding the consuming behavior of the respondents, it was found the platform to purchase organic vegetables through electronic commerce. The first three were caused by advertising media (41.20%). Time spent per day to buy organic vegetables was average less than an hour (56.73%). The frequency of buying organic vegetables was 1–2 times per month (45.87%). The time to purchase organic vegetables was mostly 12:01 pm–4:00 pm (33.07%). The average price for purchasing organic vegetables per time was between 100–300 baths (55.87%). The main application to buy organic vegetables was Facebook (66.33%). In addition, the payment selection was paying cash to a delivery man when receiving the product (Cash on Delivery) (61.47%). The most popular product purchasing through electronic commerce, except organic vegetables, was clothing/accessories (38.00%). More than one in three consumers (37.87%) agrees that the electronic commerce system is suitable for Thai customers who buy organic vegetables such as multi–channel marketing.

Table 1. Descriptive statistical analysis results

	Mean	SD.	Skewness	Kurtosis
NEED01	4.02	0.79	-0.35	-0.56
NEED02	3.98	0.81	-0.36	-0.52
NEED03	3.98	0.80	-0.25	-0.76
INFS01	4.00	0.79	-0.38	-0.32
INFS02	3.95	0.82	-0.45	-0.10
INFS03	3.94	0.82	-0.37	-0.46
EVAL01	3.99	0.81	-0.37	-0.52
EVAL02	3.98	0.80	-0.41	-0.35
EVAL03	4.00	0.81	-0.41	-0.44
DECI01	4.01	0.79	-0.38	-0.46
DECI02	3.96	0.80	-0.39	-0.30
DECI03	3.99	0.80	-0.42	-0.19
POST01	3.97	0.78	-0.36	-0.25
POST02	3.98	0.80	-0.32	-0.59

The results showed that the decision process to purchase organic vegetables through electronic commerce is safe with an average of 3.95–4.02. As for consideration benefit distribution of variables was found between –0.25 to –0.45, not more than ±2. It is considered acceptable at the 0.05 level of confidence. The kurtosis of variables found between –0.10 and 0.76, not more than ±2, which is considered acceptable [19], [20]

The decision process to purchase organic vegetable products through electronic commerce and multi–channel marketing

In this research, the researcher used path analysis of the structural equation. The model was adjusted to be consistent with the empirical data. The results of an index analysis were used to verify the consistency and harmony of the model with the empirical data. The results of the harmonization assessment were x^2 = 242.90, df = 65, x^2/df = 3.74, RMSEA = 0.050, NFI = 0.97, CFI = 0.98, GFI = 0.96, SRMR = 0.02 and can be presented the results as follows

The post–purchase behavior to buy organic vegetables through multi-channel marketing caused by the combined influence of purchasing decision (TE = 0.95), evaluation of alternative (TE = 0.94), information search (TE = 0.85), and problem or need recognition (TE = 0.82) respectively, with the predictive power of 91%.

The decision–making to purchase organic vegetables through multi–channel marketing is caused by the combined influence of alternative evaluation (TE = 0.99), information search (TE = 0.89), and problem or need recognition (TE = 0.86), with the predictive power of 98%

The alternative evaluation of decision–making to purchase organic vegetables through multi–channel marketing is caused by the combined influence of information search (TE = 0.90) and problem or need recognition (TE = 0.87), with a predictive power value

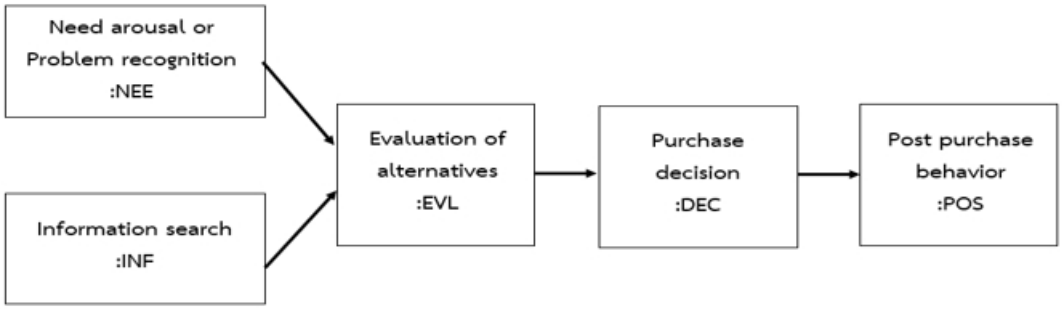

Figure 1: Conceptual Framework.

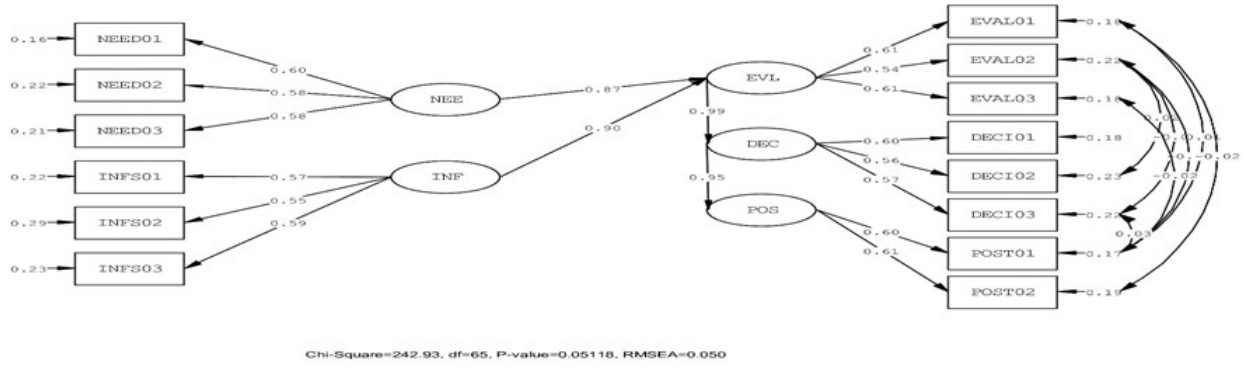

Figure 2: Decision–making process for purchasing organic vegetable products through electronic commerce and multi–channel marketing (after adjustment).

Table 2. Analysis of the e–commerce marketing mix model path analysis in the decision to purchase organic vegetable products through multi–channel marketing.

	Evaluation of Alternative: EVL $R^2 = 0.79$			Decision–making: DEC $R^2 = 0.98$			Post Purchase Behavior: POS $R^2 = 0.91$		
	DE	IE	TE	DE	IE	TE	DE	IE	TE
The problem or	0.87	-	0.87	-	0.86	0.86	-	0.82	0.82
need recogni	0.07	-	0.07	-	0.07	0.86	-	0.06	0.06
tion: NEE	14.59	-	14.59	-	17.54	17.54	-	14.54	14.54
Search for	0.90	-	0.90	-	0.89	0.89	-	0.85	0.85
information:	0.08	-	0.08	-	0.07	0.07	-	0.04	0.04
INF	14.52	-	14.52	-	16.12	16.12	-	14.48	14.48
Evaluation of	-	-	-	0.99	-	0.99	-	0.94	0.94
Alternative:	-	-	-	0.04	-	0.04	-	0.03	0.03
EVL	-	-	-	26.12	-	26.12	-	24.79	24.79
Decision–	-	-	-	-	-	-	0.95	-	0.95
making:	-	-	-	-	-	-	0.04	-	0.04
DEC	-	-	-	-	-	-	24.68	-	24.68

Value offered EP = Estimation Parameter, (SE = Standard Error), t-value (get **<.01 all value)
DE=Direct Effect / IE = Indirect Effect/ TE = Total Effect.

of 79%. The results also showed that before deciding to purchase organic vegetables through various marketing channels, consumers spend most of their time on evaluating options. However, such factors will continue to affect the post–purchase behavior to buy organic vegetables as well. The most influential factor in evaluating choice was consumer search.

The confirmatory factor analysis of the model of the decision–making process for purchasing organic vegetable products through electronic commerce and multi–channel marketing revealed that the problem or need recognition is caused by the weight of the decision–making awareness factor (λX_4). A part of searching information is based on the weight of the

Table 3. Confirmative component analysis model of the decision-making process for purchasing organic vegetable products through electronic commerce and multi–channel marketing.

Matrix LAMDA–Y	**AVE=**	**0.67**	**CR=**	**0.80**
Post Purchase Behavior: POS		λ**y**	**t–value**	$\mathbf{R^2}$
After deciding to buy organic vegetables, consumers feel good, impressed until coming back to repeat purchases: POST01.		0.60	-	0.59
Willing to recommend purchasing organic vegetables through various marketing channels to friends to become customers as well: POST02.		0.61	24.97	0.74
Decision Making: DEC	**AVE=**	**0.59**	**CR=**	**0.81**
Decision making by considering the suitability in all aspects that it is worth it: DECI01.		0.60	-	0.72
Decision making because of reliability, ensuring quality and safety: DECI02.		0.56	23.79	0.68
Decision making to purchase organic vegetables through various marketing channels because of their preferences and personal satisfaction: DECI03.		0.57	24.44	0.71
Evaluation of Alternative: EVL	**AVE=**	**0.64**	**CR=**	**0.84**
Compare details of organic vegetables from multiple providers: EVAL01.		0.61	-	0.62
Trust in quality of organic vegetables that will provide a worthwhile return: EVAL02.		0.54	23.80	0.56
Evaluation of alternatives for the cost before making a purchase: EVAL03.		0.61	26.86	0.65
Matrix LAMDA–X	**AVE=**	**0.57**	**CR=**	**0.80**
Search for Information: INF		λ**y**	**t–value**	$\mathbf{R^2}$
Searching for information from many sources before making a purchase decision: INFS01.		0.57	24.77	0.56
Inquiries from close people who have bought: INFS02.		0.55	24.62	0.55
See reviews or purchaser's opinion who have bought: INFS03.		0.59	25.01	0.53
Matrix LAMDA–X	**AVE=**	**0.64**	**CR=**	**0.84**
Problem or Need Recognition: NEE		λ**y**	**t–value**	$\mathbf{R^2}$
Realize the importance of decision making: NEED01.		0.60	26.08	0.50
Multi–channel marketing application can encourage you to come and shop: NEED02.		0.58	24.97	0.49
Having a feel to purchase organic vegetables when opened to view in the application: NEED03.		0.58	24.87	0.47

review or opinions of previous buyers (λX_3).

The evaluation of alternative is dependent on the weight of detailed comparison factors of organic vegetables across multiple service providers (λY_7) and the alternative evaluation for the cost before making a purchase (λY_9).

The decision Making is caused by the weight of purchasing decision factors by considering appropriateness in all aspects as being worthwhile (λY_4) and post–purchase behavior caused by the weight of readiness factor to recommend buying organic vegetables through various marketing channels to friends (λY_1).

The results of comparison of the decision–making processes for purchasing organic vegetable products through electronic commerce and multi–channel marketing when classified by personal factors and consumer behavior

The research results showed that the decision-making process for purchasing organic vegetables through multi–channel marketing. When classified by personal

factors, it was found the differences in both overall and many aspects, age, status, education, income, and occupation.

Decision–making for purchasing organic vegetable products when classified by consumer behavior was found different in media channels time spent in purchasing organic vegetables through an electronic commerce system on average.

6. Conclusion, Discussion of the Results and Recommendations

6.1 Conclusion and discussion of the results

1. The research results demonstrated that consumers pay attention to the decision-making processes for purchasing organic vegetables through multi–channel marketing. Consumers spend the most time and focus on the evaluation of alternatives the most (by comparing the details of organic vegetable products from various providers and alternative evaluation for the cost before making a purchase), Such factors will continually affect the behavior after deciding to purchase organic vegetables as well. Consumers who have already decided to purchase, will not change their purchasing channels and are willing to recommend buying organic vegetables through various marketing channels to their friends. The consistent with the proposed idea that alternative evaluation is important as such a process. It makes consumers make the next decision easier by considering the relationship between

Table 4. The decision–making process for purchasing organic vegetables through multi–channel marketing classified by personal factors.

Decision making processes for purchasing organic vegetables	Gender	Age	Status	Education	Income	Occupation
The problem or need recognition	0.95	0.01**	0.00**	0.00**	0.00**	0.00**
Search for information	0.77	0.42	0.00**	0.00**	0.00**	0.00**
Evaluation of alternative	0.46	0.03*	0.00**	0.00**	0.00**	0.00**
Decision making	0.68	0.05*	0.00**	0.00**	0.00**	0.00**
Post purchase behavior	0.95	0.09	0.00**	0.00**	0.00**	0.00**
The decision making to purchase organic vegetables	**0.76**	**0.05***	**0.00****	**0.00****	**0.00****	**0.00****

Table 5. The decision–making process for purchasing organic vegetables through multi-channel marketing when classified by consumer behavior.

Decision making processes for purchasing organic vegetables	Media channels	Time period	Frequency	Time period	Average price	Applications	Payment method	Other products	Multi-channel marketing
The problem or need recognition	0.02*	0.03*	0.71	0.56	0.79	0.19	0.50	0.29	0.03*
Search for information	0.01**	0.01**	0.78	0.16	0.47	0.14	0.80	0.09	0.03*
Evaluation of alternative	0.01**	0.01**	0.94	0.11	0.76	0.15	0.66	0.14	0.01**
Decision–making	0.03*	0.02*	0.33	0.67	0.40	0.15	0.58	0.16	0.05*
Post purchase behavior	0.12	0.01**	0.68	0.32	0.04*	0.05*	0.71	0.09	0.18
The decision–making for purchasing organic vegetables	**0.01****	**0.01****	**0.78**	**0.28**	**0.44**	**0.11**	**0.84**	**0.11**	**0.02***

Attributes, Degree of Importance, Brand Beliefs, Utility Function, and Evaluation Procedure [10].

2. Finding strategies will make customers ready to make a purchase decision. Entrepreneurs must have the facility to search for customer information through various channels. In today's trade, the development of multi–channel marketing is becoming more and more important whether multiple channels marketing through channel combination or integration of all channels. This marketing can help customers to access information, and make them more likely to make purchasing decisions easier than single–channel marketing. Entrepreneurs need access the to adapt to modern commerce that tends to be easier to access [5], [16], [21].

3. The difference in age, status, education, income, and occupation affect the decision–making process for purchasing organic vegetables through multi–channel marketing. The results of this research are consistent with the study of the organic vegetable purchasing decision process through both online [22] and traditional trade [23].

4. Regarding channels for receiving media and the time of purchasing organic vegetables through electronic commerce, on average, it will be affected the decision–making process for purchasing organic vegetables in multi–channel marketing. This is because the media receiving channels have the objective is to keep the existing audience and to expand the new audience base [24]. Furthermore, new customers tend to use social media for selecting reliable, accurate, and systematic information [25].

6.2 Suggestions for use in this research

1. The results showed that consumers value the decision–making process for purchasing organic vegetables through multi–channel marketing. The result of the alternative evaluation process is quite high. Due to the short life of organic vegetable products, entrepreneurs who pay attention to consumers needs with an understanding of consumer behavior and different needs between age, status, education, and occu-

pation, will encourage to have a better chance of being chosen.

2. The research results demonstrated that when consumers made a decision to purchase organic vegetables, the products have passed the evaluation of alternatives. The products are likely to remain in the consumer's next decision and trend to create desirable post–purchase behaviors, that is consumers are ready to recommend buying organic vegetables through various marketing channels to friends. With regard to this matter, the seller will get customers who are ready to be good partners in word of mouth and have loyalty in the next order. It is the seller's duty to pay attention to laying out the right strategies to drive buying decisions and impress customers through the evaluation of alternatives.

3. The results of the component analysis have the least effect in the aspects of the reliability and quality of organic vegetables. That will provide a worthwhile return which is an element in the process of alternative evaluation. Furthermore, this is a point that entrepreneurs should focus on and promote customers trust in such elements. If entrepreneurs can do it, they will build strength and create a competitive advantage in the organic vegetable product market.

6.3 Suggestions for further research

1. The research studied a group of retail customers in the country only. Those who are interested may modify the study area to big buyers of customers abroad which may have different research results.

2. The research focuses only on quantitative research which makes it ineffective in depth. Those who are interested can be continued to do more qualitative research.

3. The research is collected data only from the perspective of customers. Those who are interested can study more on the operator side to get information covering both demand and supply aspects.

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