

E-COMMERCE MARKETING MIX FACTORS FOR SAFE VEGETABLE PURCHASE DECISION: THE SECOND ORDER CONFIRMATORY FACTOR ANALYSIS

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ABSTRACT

The purpose of this research was to study the e-commerce marketing mix factors in the purchase decision of safe vegetable products by using the second order confirmatory factor analysis. The data of 750 consumers and their safe vegetable consumption were collected on the electronic system based on convenience sampling. The collected data consist of questionnaires with validity and reliability. In terms of product, after-sales service has the highest weighting value if the seller is willing to refund for poor product quality ($\lambda_{y18} = 0.63$). In terms of price, offering lower price than other channels have the highest weighting value ($\lambda_{y25} = 0.63$). In terms of place, ease of use has the highest weighting value ($\lambda_{y31} = 0.61$). In terms of promotion, consistent after-sales follow-up has the highest weighting value ($\lambda_{y44} = 0.62$). In terms of personalization, prompt communication with customers when there is a problem has the highest weighting value ($\lambda_{y56} = 0.63$). Also, in terms of privacy factor, allowing customers to revoke their consent to be tracked and their data to be retained at any time has the highest weighting value: PRIV04 ($\lambda_{y64} = 0.63$). After being tested by convergent validity: AVE and Construct reliability: CR, the weighting values must not be lower than 0.50 and more than 0.60 respectively.

Keywords: E-commerce marketing mix factors, Safe vegetable purchase decision, Second order confirmatory factor analysis

Introduction

Sustainability in agriculture is the strength of Thailand. With the advantages of topography and fertility, Thailand is the world's leading country in terms of producing quality agricultural products and can be upgraded to be the kitchen of the world. Despite the fact that agricultural policy is an important policy that previous Thai governments paid attention to, the policy was not successful, and the income of Thai farmers was low compared to farmers of other nations. However, with the

attentive care of the current government, the income of Thai farmers tends to increase.

Farmers are the largest group of people in Thai society. The well-being of farmers reflects the stability and sustainability of the country. Applying modern knowledge, and principles in farming is necessary that farmers understand agriculture, business administration, and the use of marketing mix factors which would bring success to them in the future. Nowadays, "Healthy Trend" is one of the popular trends in the world. People pay more attention to exercise, natural products, non-chemical products, especially safe vegetables.

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Due to COVID-19 epidemic, consumers have to work from home, and the government support on the use of financial transactions via mobile phones to purchase products using their phones. Thus, consumer behavior tends to purchase goods and services by using more technology. The key element of success in the new era is to create marketing proposals through individual customers, together with the harmonization of the use of e-commerce marketing mix factors in purchasing decisions.

Life Style of people in this era using technology through mobile applications is constantly increasing. According to the National Statistical Office, there are 62.8 million people over 6 years old in Thailand. 31.7 million or 50.5% of them are smartphone users, while there were only 5 million users or 8% in 2012. The majority of activities done via smartphones are social networks (91.5%), download movies, music (88.0%), upload data. (55.9%) and follow the news (46.5%). According to the survey, digital technology has become part of everyone's daily life (National Statistical Office, 2021). Studying the growing online market is useful for marketers to understand the purchasing behavior of modern consumers whose purchasing power tends to continuously grow. In addition, internet usage behavior of Thais has also increased with an average weekly online time of 16.6 hours, which is more than time spent on TV. They spend more time on interesting online VDOs, and online marketing videos or advertisements, as well as viral clips of certain brands had more than 1 million views in 2012. Facebook is the most popular internet service with 18 million social network users or 85%, while 10% of users use twitters, and 5% use Instagram. Thais are active on Facebook with likes, comments, and shares 31 million posts per day, or an average of 624,000 times a day. 60 percent of Facebook users in Thailand use mobile phones, and other mobile gadgets. Besides building awareness of the product, it is necessary that digital media strategies need to be adjusted to attract consumers, and build word of mouth and loyalty to the brand. The value in digital

media has grown at least 30 percent or 3,000 million baht (Positioningmag, 2019).

It is necessary to develop online channels for agricultural products in this era. Furthermore, lifestyles of Thais have been changed during the COVID-19 crisis. Thus, there must be ones of the e-commerce marketing mix factors that allow conducting business transactions via the Internet, such as selling and purchasing, providing information of products and services, and financial transaction (Tassabehji, 2003). Marketing mix factors consist of product, price, place and promotion, personalization, and privacy. from the process of buying goods, selling goods, delivering goods, exchanging goods and services on the Internet (Iamsiriwong, 2013), all of them must be consistent with the behavior of consumers who tend to buy products through electronic commerce systems. The research on e-commerce marketing mix factors for safe vegetable purchase decision through the second confirmatory factor analysis aims to elevate farmers to become middle-class farmers with sustainability and understanding the behavior of customers in Bangkok and surrounding provinces. This research is expected to be a case study for those who are interested in producing safe vegetable products.

Research Objectives

To study e-commerce marketing mix factors for safe vegetable purchase decision through the second confirmatory factor analysis.

Literature Review

E-commerce marketing mix factors

Marketing mix is a group of activities in an organization's marketing program. Each organization can have different marketing mix factors (Tangchakwaranon & Makhasiranon, 2013)

Kotler (2003, p. 68) suggested that effective marketing combines the fundamentals of the marketing mix factors to achieve an entity's marketing goals, and deliver value to consumers. Thus, the marketing mix factors consists of materials, and business strategies to build a strong position in the target market.

Sereerat (2009, pp. 80-82) explained the principles of marketing mix factors as follows:

1. Products include tangible and intangible goods offered in the market. They must be valuable in the view of consumers.
2. Price is the total value that customers perceive from using the product. High price does not reduce the number of purchases.
3. Place emphasizes on comprehensive and distribution channels.
4. Promotion, such as advertising public relations, sales promotion and direct marketing, is a communication tool to create brand satisfaction.

Bleier, De Keyser, and Verleye (2018) stated that 6Ps of marketing mixes factors consist of product, price, place, promotion, privacy, and personalization. They are all interrelated and crucial in digital marketing.

Department of Industrial Promotion (2008, p. 40) also explained that e-commerce marketing relies on the marketing power to manage and promote marketing. To achieve this goal, it is necessary to apply the traditional 4Ps, as well as the additional 2Ps which are the results of information technology. The details of 6Ps are related to marketing promotion in online commerce, while the new marketing elements: 2Ps focus on

1. Privacy refers to policies imposed by entrepreneurs or organizations to protect personal data, and build credibility. The reason is that, to purchase products online, consumers need to disclose their personal information, such as full name, address, telephone number, e-mail, credit card number, etc. The seller shall keep customer's personal information confidentially, and shall not disclose their information without consent. Thus, customer's privacy and system stability are vital factors which affect the trust of customers, and leads to purchasing decisions.
2. Personalization refers to the nature of interactive services between entrepreneurs and customers in order to meet the needs of customers. Technology constantly leads to the development of online channels. Entrepreneurs can provide personalized customer services which allow sellers to directly interact with

customers (Pogorelova, Yakhneeva, Agafonova, & Prokubovskaya, 2016).

According to the concepts and theories about e-commerce marketing mix factors, it can be concluded that marketing mix factors include 4 marketing management tools which are product, price, place, and promotion. There are also 2 additional tools which are personalization and privacy to build trust among consumers. Channels to respond to customers promptly and the security have been created and developed to meet the needs of customers while shopping online.

Digital marketing

Digital channel, a new form of marketing, is used to communicate with consumers. Digital marketing is still based on the marketing principles, but the method regarding communication channels with consumers and collecting consumer data are changed. Wertime and Fenwick (2008) defined digital marketing as "the development of future market which occurs when companies do most of their marketing activities through digital communication channels. Digital media can identify users, which enabling marketers to continuously communicate with their customers individually. The information obtained from communicating with each customer is mutual learning which is beneficial when providing services to the next customers. Marketing is similar to a neuron network since marketers can obtain real-time information and opinions from customers to improve for the consumer's best benefits in the future" or methods of promoting products and services by using online database to respond consumers promptly to meet the demand of consumers while protecting their privacy, as well as remaining a cost-effective manner.

Digital media and digital marketing

The Internet allows users to quickly access information and communicate directly with consumers. In fact, consumers interested in the product gather, discuss various related issues, and communication through the provided digital channels as a One-to-One communication. In addition, consumer's personal data is saved in a database. At

present, there are several popular digital media and channels to find consumers.

Digital marketing is completely changing the world and the fundamentals of business operations with these five key points (Chonsirungsakul, 2019).

1. Connections: digital channels are rapidly changing communication in business. Globalization allows people to communicate at all times and borderless. With a video conferencing system, it is possible to hold meetings around the world which means working in different places is no longer a hindrance. Digital tools also help sales team to service their customers in terms of ordering, inventory management and create an efficient promotional system. Thus, digital channels have a huge influence in changing the work system and investment.

2. Conversations: digital has changed the way brands interact with their target consumers. One-way communication from producers to consumers has been replaced by instant and continuous conversations between the brand and the consumer. In addition, internet has become the world's largest focus group research that allows conducting online research, reading research papers on websites, and social networking. Thus, it is possible to learn and understand consumers widely by obtaining information from the internet.

3. Co-Creation: digital channels support creation of collaborative marketing content, or co-creation. Innovation and new ideas can be created by collaboration within the organization

or with external agencies, such as institutes, scientists, and entrepreneurs. In addition, the original marketing content can be replaced by user-generate content, the contents created by the ideas of consumers. Consumers are able to express their opinions or present products on digital platforms.

4. Commerce: the rising trend of e-commerce comes from the popularity of AppStore, such as iTunes, and an e-commerce website, such as Amazon.com, and Rakuten. Due to this trend, leading brands have become interested in e-commerce, and websites.

5. Community: The definition of the word 'community' has been changed due to the influence of social network which builds relationships and social responsibility-sustainability programs by effectively connecting brands and organizations. Social network focuses on five factors: connection, conversation, co-creation, commerce, and community, which makes marketing communication technology with consumers becomes successful. In addition, understanding customer demand can also promote effective marketing communication. E-commerce marketing becomes an alternative to modern consumers who have changed their behavior to use a variety of digital media. Modern media plays an important role since it is a convenient and easy channel for consumers to shop and get more information. Thus, consumers tend to buy more products if there are more available marketing channels (Baran, Galka, & Struk, 2008).

Conceptual Framework

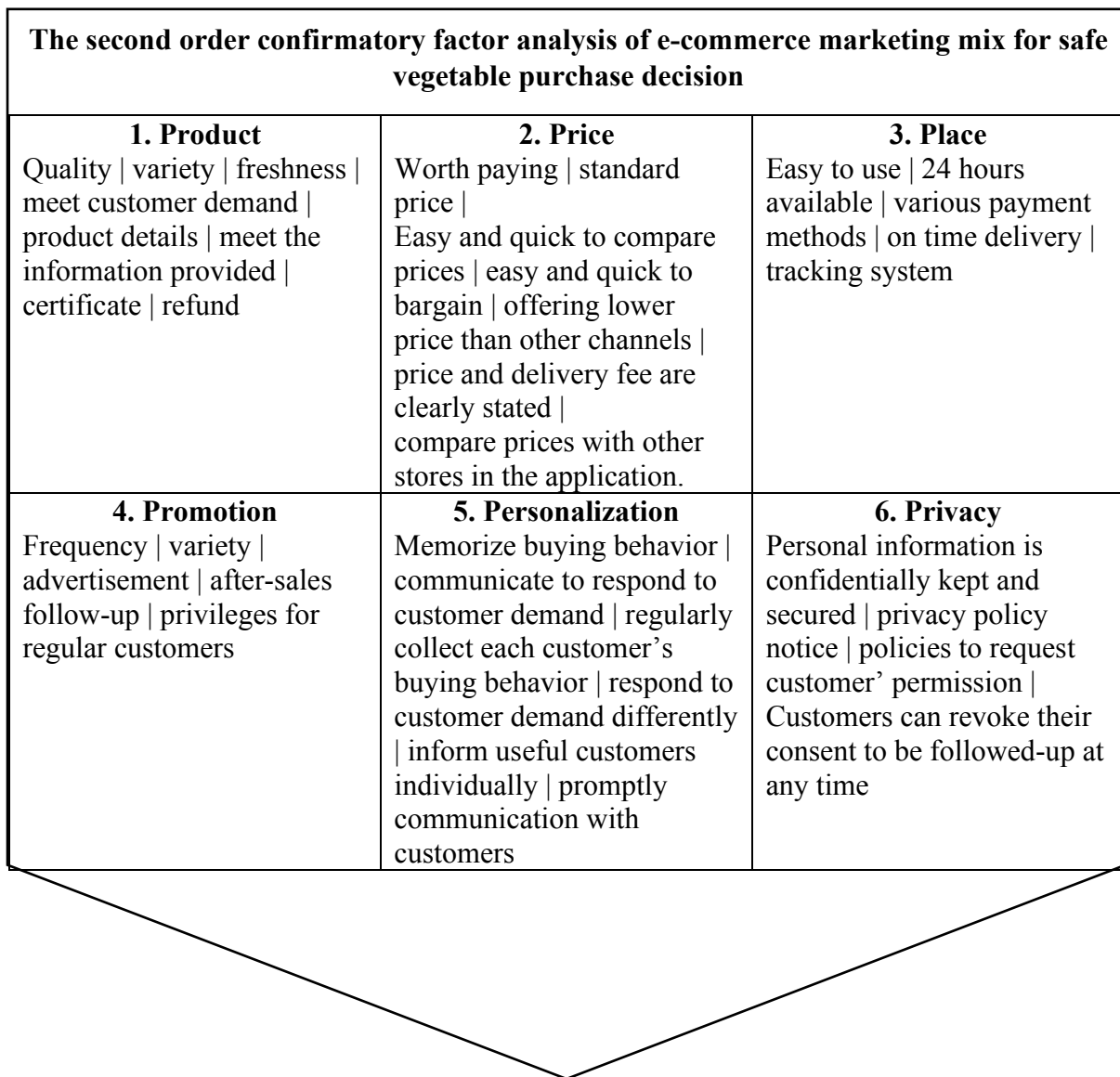


Figure 1 Conceptual framework

Data and Methodology

This is quantitative research. The data were collected from 750 consumers of safe vegetable products on e-commerce system in Bangkok and its vicinity. The sample size was calculated based on the formula of Hair, Black, Babin, and Anderson (2010, pp. 100-102), who suggested that the appropriate ratio between the sample to the number of parameters or variables should be at least 20-50 samples per observable variable. In this study, there are 35 observable variables;

therefore, the maximum threshold of 21 samples per observable variable was used. Convenience sampling was applied in this research to distribute questionnaires online and onsite to customers who used to purchase safe vegetables. The collected data consist of questionnaires with validity and reliability. For the second order confirmatory factor analysis, frequency, percentage, mean, standard deviation, and structural equation modeling (SEM) were used.

Empirical Result

Most of the respondents or 68% are female, 70.67% of them are between 21-30 years old, 59.47% are single, 60.13% hold bachelor's degree, and the salary of 81.60% of the

respondents is less than 20,000 baht per month. 53.07% are students.

The result of e-commerce marketing mix factors for safe vegetable purchase decision: the second order confirmatory factor analysis are shown in the figures and tables as follows:

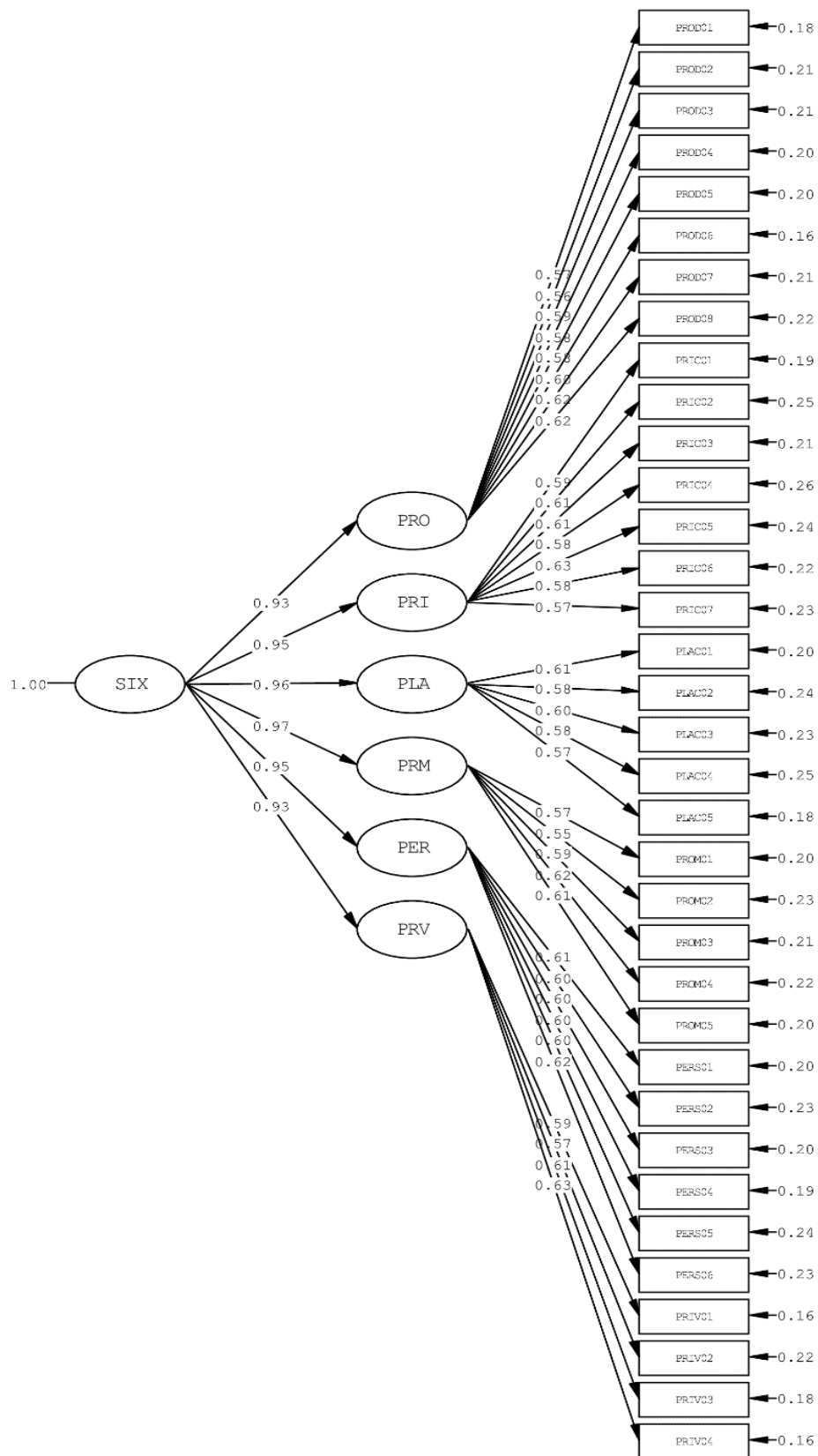
Table 1 Empirical proof of data coherence

Value	Criteria	Values before adjustment	Results	Values after adjustment	Results
χ^2/df	Less than 5	3.71	√	1.93	√
RMSEA	0.03-0.08	0.060	√	0.042	√
NFI	More than 0.9	0.98	√	0.99	√
CFI	More than 0.9	0.98	√	0.99	√
GFI	More than 0.9	0.86	×	0.90	√
SRMR	Less than .05	0.03	√	0.02	√

Remark √ means the value meets the index test results criteria used to verify the coherence of the model with the empirical data

The results of the index analysis used to verify the coherence of the model with the empirical data showed that $\chi^2 = 1,003.18$, $df = 534$, $\chi^2/df = 1.93$, RMSEA = 0.042, NFI = 0.99, CFI = 0.99, GFI = 0.90, SRMR = 0.02. The index shows that the new model has better empirical

consistency with sufficient empirical data. The results of the analysis can be explained from the internal latent variables to the internal observable variables, and from external latent variables to external observable variables.



χ^2 -Square=2053.21, df=554, P-value=0.00000, RMSEA=0.060

Figure 2 E-commerce marketing mix factors for safe vegetable purchase decision through the second order confirmatory factor analysis before adjustment

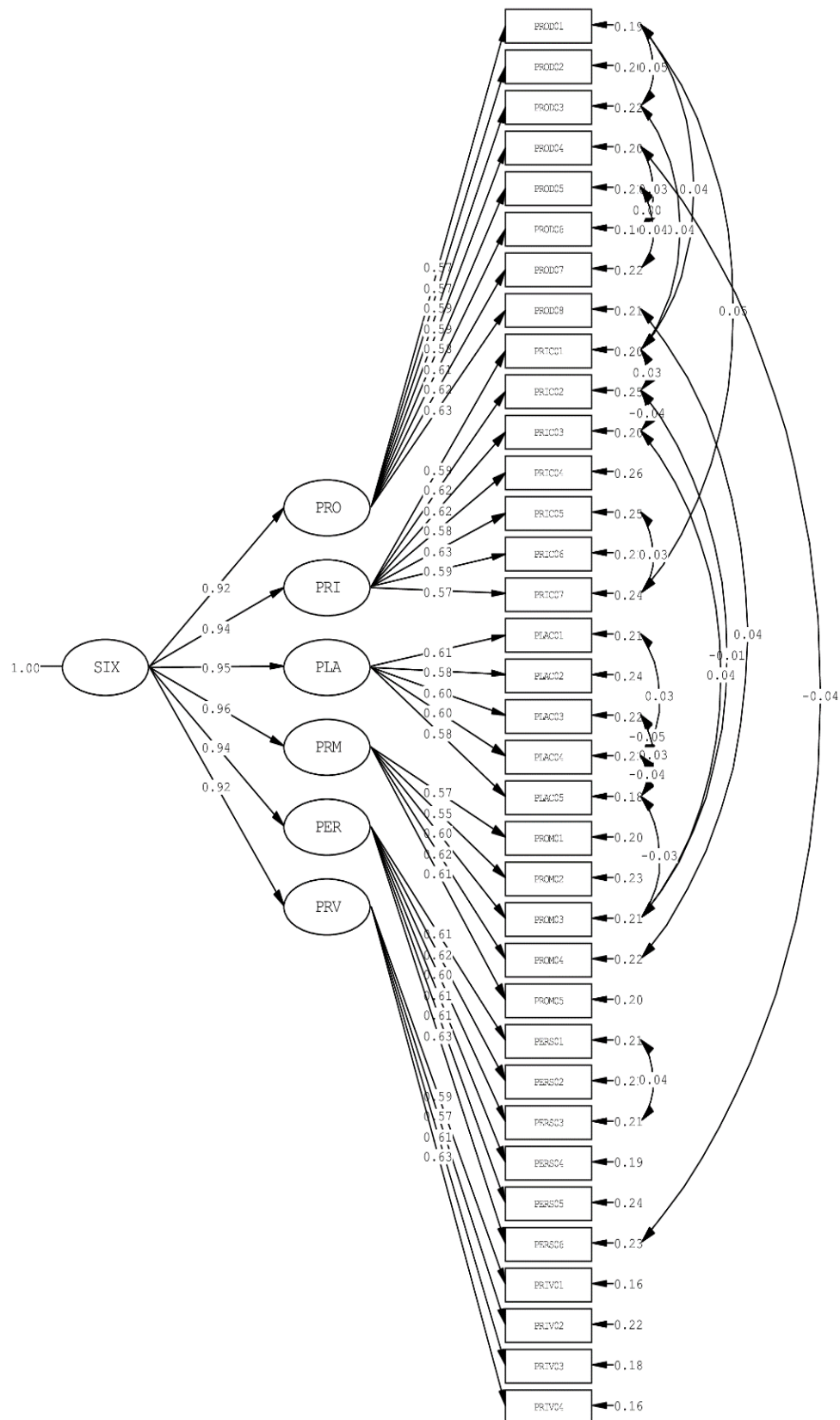


Figure 3 E-commerce marketing mix factors for safe vegetable purchase decision through the second order confirmatory factor analysis after adjustment

Table 2 E-commerce marketing mix factors for safe vegetable purchase decision through the first order confirmatory factor analysis

Matrix LAMDA-Y	AVE =	0.90	CR =	0.98
E-commerce marketing mix factors: SIX		λ_y	t-value	R²
Product: PRO		0.92	23.87	0.87
Price: PRI		0.94	24.33	0.89
Place: PLA		0.95	24.69	0.92
Promotion: PRM		<u>0.96</u>	24.35	0.93
Personalization: PER		0.94	24.65	0.92
Privacy: PRV		0.92	24.97	0.86

The results of this research on e-commerce marketing mix factors for safe vegetable purchase decision through the first order confirmatory factor analysis showed that the product factor has the highest weighting value ($\lambda_{y4} = 0.96$).

Table 3 E-commerce marketing mix factors for safe vegetable purchase decision through the second order confirmatory factor analysis

Matrix LAMDA-Y	AVE =	0.64	CR =	0.93
Product: PRO		λ_y	t-value	R²
Quality of safe vegetable: PROD01		0.57	-	0.62
Variety of safe vegetable: PROD02		0.57	23.79	0.61
Freshness of safe vegetable: PROD03		0.59	26.86	0.61
Meets customer demand: PROD04		0.59	24.05	0.62
Product details are provided: PROD05		0.58	23.50	0.60
Safe vegetable meets the information provided: PROD06		0.61	25.54	0.69
Certificate to guarantee safe vegetable: PROD07		0.62	24.26	0.63
Refund policy: PROD08		<u>0.63</u>	24.72	0.65
Matrix LAMDA-Y	AVE =	0.61	CR =	0.92
Price: PRI		λ_y	t-value	R²
Worth paying: PRIC01		0.59	-	0.63
Standard price: PRIC02		0.62	25.51	0.60
Easy and quick to compare prices: PRIC03		0.62	24.74	0.65
Easy and quick to bargain: PRIC04		0.58	22.54	0.56
Offering lower price than other channels: PRIC05		<u>0.63</u>	23.74	0.61
Price and delivery fee are clearly stated: PRIC06		0.59	23.83	0.61
Compare prices with other stores in the application: PRIC07		0.57	22.85	0.57

Table 3 (Continued)

Matrix LAMDA-Y	AVE =	0.62	CR =	0.89
Place: PLA		λ_y	t-value	R²
Easy to use: PLAC01		<u>0.61</u>	-	0.64
24 hours available: PLAC02		0.58	23.22	0.59
Various payment methods: PLAC03		0.60	23.78	0.62
On time delivery: PLAC04		0.60	25.28	0.61
Tracking system: PLAC05		0.58	24.67	0.65
Promotion: PRM		λ_y	t-value	R²
Offering discounts on special days or festivals: PROM01		0.57	-	0.61
Sale, collect points, free shipping: PROM02		0.55	22.43	0.57
Marketing promotion through other advertising media: PROM03		0.60	23.93	0.63
Regular after-sales follow-up: PROM04		<u>0.62</u>	24.14	0.64
Privileges for regular customers: PROM05		0.61	24.40	0.65
Privacy: PRV		λ_y	t-value	R²
Personal information is confidentially kept and secured: PRIV01		0.59	-	0.68
Privacy policy is clearly informed: PRIV02		0.57	24.24	0.59
Policies to request customer's permission: PRIV03		0.61	26.53	0.67
Customers can revoke their consent to be followed-up at any time: PRIV04		<u>0.63</u>	27.57	0.71
Matrix LAMDA-Y	AVE =	0.63	CR =	0.91
Personalization: PER		λ_y	t-value	R²
Memorize buying behavior: PERS01		0.61	-	0.63
Communicate to respond to customer demand: PERS02		0.62	24.01	0.62
Regularly collect each customer's buying behavior: PERS03		0.60	27.07	0.63
Respond to customer demand differently: PERS04		0.61	25.10	0.66
Inform useful customers individually: PERS05		0.61	23.63	0.60
Promptly communicate with customers when there is an issue: PERS06		<u>0.63</u>	24.15	0.62

The results of e-commerce marketing mix factors for safe vegetable purchase decision through the second order confirmatory factor analysis show that in terms of product, refund policy has the highest weighting value ($\lambda_{y18} = 0.63$). In terms of price, offering lower price than other channels have the highest weighting value ($\lambda_{y25} = 0.63$). In terms of place, ease of use has the highest weighting value ($\lambda_{y31} = 0.61$). In terms of promotion,

consistent after-sales follow-up has the highest weighting value ($\lambda_{y44} = 0.62$). In terms of personalization, prompt communication with customers when there is a problem has the highest weighting value ($\lambda_{y56} = 0.63$). Also, in terms of privacy factor, allowing customers to revoke their consent to be tracked and their data to be retained at any time has the highest weighting value: PRIV04 ($\lambda_{y64} = 0.63$). After being tested by convergent

validity: AVE and Construct reliability: CR, the weighting values must not be lower than 0.50 and more than 0.60 respectively.

Conclusion

When e-commerce marketing mix factors for safe vegetable purchase decision through the first order confirmatory factor analysis was taken into consideration, all of the weighting values had similar high (from 0.92-0.96) which shows that all factors need to be in focus. However, the factor that gives the best effect is promotion. The result is consistent with Wattanachaitham (2014), who studied the effect of e-commerce in promoting local community enterprise products and found that the sample group realized the importance of e-commerce to promote their products at a high level. Hoang, Sansom, and Charoenchai (2019) conducted a study on factors affecting decision-making behavior on e-commerce of the people in Muang Maha Sarakham, Maha Sarakham Province. They found that promotion, personalization, and product are the first three factors affecting decision-making behavior on e-commerce. In addition, Siripipat and Chaiwan (2016) studied marketing mix factors affecting online shopping decision of Thai senior citizens, and found that the sample group prioritize place, promotion, place, product/ services, and price respectively. However, tracking system that allows customer to track their product is the most important in terms of sub-factors.

When the first order confirmatory factor analysis is applied, it is found that entrepreneurs should focus on providing refund policy if the quality of the product is low, lower price than other channels, easy-to-use steps, regular after-sales follow-up, prompt communication with customers when there is a problem, and allowing customers to revoke their consent to be tracked and their personal data to be retained at any time. This is in line with Vongchavalitkul et al. (2017), who studied Purchasing Behaviors and Analysis of Marketing Factor Affecting Consumer's E-Business transactions in Nakhonratchasima Municipality, Nakhonratchasima Province,

and found that consumers are able to find products or services easily and quickly which is the key reason why they tend to shop online. The factors affecting the purchase of goods through the e-commerce system consist of those focusing on privacy, one of the marketing mix factors. Moreover, Deelers and Rattanapongpun (2018), who studied the Factors that Influence Consumer with Purchasing Decisions Process of E-Commerce Market Niches, the most important factors affecting purchasing decision are privacy, place, and price respectively. However, Donkwa, Pomahad, and Pitsuwan (2019), who studied marketing mix factors affecting consumer behavior in purchasing the organic vegetables in Nakhon Ratchasima Province, found that marketing mix factors from the perspective of cost consumers and the convenience of purchasing affect consumer behavior in purchasing the organic vegetables with coefficients of 0.32 and 0.33, respectively. Furthermore, Sisi and Visitnitikija (2019) studied distribution of processed fruits through e-commerce with the purpose of studying the behavior and marketing mix factors affecting the behavior of purchasing processed fruit through e-commerce. The results indicated that product, and promotion have a statistically significant effect on fruit purchasing behavior through e-commerce at .05. It is suggested that suppliers should pay attention to product standards, such as having the products inspected by relevant government authorities, or certificates granted by food-related agencies. It is also necessary that they produce their own high-quality products at lower cost to compete with other suppliers in the market. Moreover, social media, such as Facebook, and Line, should be used to present products.

Suggestions

Suggestions for contribution

1. In the era of globalization, entrepreneurs are unable to avoid transactions made through e-commerce. Traditional business is replaced by online business. With paradigm shift, if entrepreneurs are able to understand and

operate their business through e-commerce, they can create a competitive advantage.

2. To sell safe vegetable products, it is important to focus on all the 6Ps. However, the factor that gives the best results is promotion. Thus, entrepreneurs must focus on continuity of marketing promotion due to e-commerce creates a close relationship between entrepreneurs and buyers. Moreover, the continuity of conveying the message to consumers is essential. Since vegetables are rather delicate, regular after-sales follow-ups, refund policies, and freshness guarantee lead to product loyalty. In addition, loyal customers will also recommend the products to their relatives, which strengthens business operations.

Suggestions for future research

1. This qualitative research focuses on customers, not entrepreneurs. The research can be more complete if demand side and the supply side are together studied. Thus, it is recommended that future research should conduct quantitative research as aforementioned, together with qualitative data collection, as well as a focus group. The details from the focus group among customers, entrepreneurs, and farmers would provide a more in-depth view.

2. In this study, the data were collected at the end of 2020, during the first wave of COVID-19 outbreak. The trend of purchasing through e-commerce sharply increased due to government orders, and lockdown that changed "consumer behavior". In case this research is studied again in the future, the result may completely differ.

3. The products studied in this research were safe vegetables. Obviously, the shelf life of such products is rate short; therefore, the delivery process should also be studied in the future. In fact, delivery process is the limitation and uncontrollable variable in this research. However, it can be assumed that a fast delivery process can maintain product quality and increase sales.

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