# The Effect of Financial Incentives on U.S. Consumers' Intention to Adopt NFC Mobile Payment

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## Introduction

While Near Field Communication (NFC) mobile payments have been widely used across the world from Japan in 2006 to South Korea in 2010, the adoption of NFC payment is still generally low (Hamblen, 2012; Olsen, 2007). By mode of transaction, Short Messaging Service payment (a text-based mobile payment) accounted for about 54% of the global mobile payment market share in 2015, followed by Wireless Application Protocol payment (an Internet-based mobile payment), and NFC payment transaction volumes remain relatively lowest (Boden, 2017a). In the U.S., credit card companies have been incorporating NFC chips into their cards since about 2003 when MasterCard launched cards enabled with PayPass, but the technology has not taken off. U.S. consumers, who are accustomed to swiping their credit cards and then entering their PIN numbers or signatures, remain wary of the touch-payment practice.

It is interesting to note that with such low adoption, few studies have been conducted on how to improve NFC mobile payment adoption. Consumer-focused mobile payment adoption research has suggested some possible factors. For example, a study using survey data collected in developed countries that included Germany and Australia showed that perceived usefulness and perceived ease of use have significant positive relationships with consumers' intentions to adopt mobile payment (Schierz, Schilke, & Wirtz, 2010). Prior research has also found a positive impact of trust on consumers' intentions to adopt mobile payment (Liebana-Cabanillas, Sanchez-Fernandez, & Munoz-Leiva, 2014). Social influence also has been found to influence mobile payment adoption intention and behavior (Chitungo & Munongo, 2013).

To motivate consumers to adopt NFC mobile payment, attractive incentives such as cash back or discount rewards have been used in recent years (Sharma, 2017). In the U.S., those who received an incentive increased their mobile payment transaction frequency by 50% compared to those who were not offered a financial incentive (Boden, 2017b). While factors such as perceived usefulness, perceived ease of use, trust, and social influence have been shown to affect consumers' intention to adopt NFC mobile payment, less is known about how financial incentives influence consumers' intention to adopt NFC mobile payment.

The purpose of this study is to provide a better understanding of the impact of financial incentives on trust and perceived risk in adopting NFC mobile payment and on consumers' intention and continuance intention to use NFC mobile payment. Specifically, this study examines 1) whether the availability, amount, and promotion period of financial incentives increase consumers' trust in adopting NFC mobile payment; 2) whether the availability, amount, and promotion period of financial incentives decrease consumers' perceived risk in adopting NFC mobile payment; 3) whether the availability, amount, and promotion period of financial incentives increase consumers' intention to adopt NFC mobile payment; and 4) whether different financial incentives influence consumers' continuance intention to use NFC mobile payment after the promotion period.

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## Theoretical Framework

Diffusion of Innovation Theory (DOI) provides a basis for studying consumers' adoption of NFC mobile payment. Innovations are any ideas, products, services, or practices perceived as new. Diffusion is a distribution process by which an innovation, in this study adoption of NFC mobile payment, is communicated over time within a social system. Rogers (2003) posited five stages that consumers undergo when making decisions to accept or reject a technological innovation. The first three stages are operationalized in the research.

The first stage is the knowledge stage, when consumers learn about an innovation and its functions. Financial incentives may be strong motivators for consumers to explore the new features and functions of NFC innovation in this stage and help to shape beliefs about innovations in the next stage. In the second stage, the persuasion stage, as consumers know more about the innovations, they are interested in the innovations and their belief structures are tested and developed based on the knowledge they get from the first stage. Trust and perceived risk are two important components in one's belief system that could affect their adoption of NFC mobile payment. In the third stage, the decision stage, consumers decide whether to try the innovation. Consumers' intention to adopt NFC mobile payment becomes apparent at this stage. If consumers' intention to adopt NFC mobile payment has been motivated by financial incentives, it is also important to determine whether consumers intend to continue to use NFC mobile payment after the promotional period ends. In the fourth stage, the implementation stage, consumers perform their decision made in the third stage. The last stage, the confirmation stage, is where consumers continue to use the adopted innovation for the long term.

## Methodology

The work was performed through an online experiment conducted among U.S. adults aged between 18 and 35. The simple randomized research design was adopted, in which participants were randomly assigned to one of the eight treatment groups or the control group. Using the services provided by the Qualtrics Online Research Panels & Sample, a final sample of 463 respondents was collected, with 47 to 54 participants in each experimental group.

Confirmatory factor analysis (CFA) was conducted to assess the factor structure of the constructs for trust, perceived risk, intention, and continuance intention. Two structural equation models (SEM) were developed to examine the impact of financial incentives on NFC mobile payment adoption. Financial incentives were operationalized by whether or not they were offered, and if so by type (cash back vs. discount), amount (5% vs. 10%), and promotion period (1 month vs. 3 months).

## Results

The findings showed that the availability of financial incentives had a significant impact on NFC mobile payment adoption. More specifically, consistent with the hypotheses, consumers who were offered financial incentives had a higher level of trust in using NFC mobile payment compared to consumers who had not been offered financial incentives. Consumers who were offered financial incentives had a lower level of perceived risk in using NFC mobile payment compared to consumers who had not been offered financial incentives. Also, consumers who were offered financial incentives had a higher intention to adopt NFC mobile payment compared to consumers who had not been offered financial incentives. Further investigation also indicated that the type, amount, and promotion period of financial incentives did not have significant impacts on NFC mobile payment adoption. That is, no significant differences were found in trust, perceived risk, intention and continuance intention to adopt NFC mobile payment between consumers who had cash back rewards versus those offered discounts, between consumers who had 5% and 10% financial incentives, and between consumers who had 1-month and 3-month promotion periods. The results of this study provide service providers and researchers a better understanding of the impact of financial incentives on NFC mobile payment adoption and also give insight to providers in the mobile payment systems channel as well as retailers offering this payment option.

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# An Empirical Analysis of Thai Consumers' Preferences for Fresh Mushrooms

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## Abstract

This study intends to find the potential market of Thailand for the delicate fresh mushroom products through investigate the preference and willingness to pay for the value-added fresh mushroom products. Conjoint analysis was used to find the preference of customer on the attributes of fresh mushroom which include quality, country of origin, usage, packaging material, label information, and price. The data was collected from interviewees from Bangkok, the capital of Thailand and Udon Thani which locate in the northeastern part of Thailand. The result shown that the supermarket is the dominant distribution channel for fresh mushroom product. Customer values quality, country of origin, and label information. The other important finding from this study is Udon Thani represents the similar socio-economic characteristics of the consumer to those in Bangkok. And there is less competition to export fresh mushroom to Udon Thani instead of Bangkok. The strategies for fresh mushroom product development were also discussed. The empirical results of this study provide a reference for the development of other value-added agricultural.

## Introduction

In recent years, in response to extreme economic competition, many countries have placed great emphasis on the application of specialized agricultural product to support the construction of agro-industries. The Thai government is also vigorously promoting value-added agriculture. With the basic objective of stabilizing the domestic demand for fruits and vegetables, it is also expected to combine with the *Thailand 4.0 (smart agriculture)* policy to open new markets for delicate agricultural product which has a potential to command higher price. Since Thailand is a target country with both internationalization, specialization and highly development in the target market, is a transportation hub of Southeast Asia. Its climate and topography are suitable for many types of crop cultivation. There is tremendous opportunity for the country to pursue this goal.

One of the potential crops in Thailand is various kind of mushroom. Not only benefit as healthy diet and a common food among Thais and Asians but also the production required small initial capital and possible to produce all year round. There are still gaps to fill such as some variety are hard to grow due to specific weather requirement, primitive production method and facility, lack of supporting infrastructure and most importantly only 5% of production are exported but the remaining 95% is consumed domestically. Despite over 2,500 mushroom farms established in Thailand the production capacity is not enough, and mushroom must be import from other countries to meet domestic demand. According to Food and Agricultural Organization of the United Nations (FAO), the total imports of mushrooms in Thailand in 2015 were 2,774 tons. The importing countries were mainly China (2,482 tons), Malaysia (288 tons), and other importing countries including New Zealand, Japan, France, Australia and Pakistan. In 2015, the production area and annual output of various mushrooms in Thailand (Table 1) showed that the annual output of Pleurotus ostreatus (Black mushroom) was about 10,700 tons, followed by straw mushrooms (3,510.94 tons) and fungus (2,965.80 tons) Its production area is dominated by White mushroom by 2,452.68 hectare, which is mainly grown in northeastern Thailand, followed by 1,674.49 hectares of Black mushroom, mainly grown in the eastern and northeastern Thailand.

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Table 1 Thailand's mushroom production area and annual output (2015)

| Product | Area (hectare) | Annual production (tons) |
|---|---|---|
| Pleurotus Butan (Black mushroom) | 1,674.49 | 10,700.04 |
| Straw mushroom | 234.08 | 3,510.94 |
| Wood ear | 70.40 | 2,965.80 |
| Black poplar mushroom | 14.76 | 556.31 |
| Lentinus squarrosulus (White mushroom) | 2,452.68 | 90.14 |
| Oyster mushroom | 24.80 | 89.44 |
| Abalone mushroom | 6.08 | 70.86 |
| Shitake | 27.04 | 30.61 |
| Others | 84.12 | 970.26 |
| Total | 4,588.45 | 18,984.40 |

Source: Thailand's Ministry of Agriculture and Cooperation (MOAC).

As can be seen, mushroom growers have strong demand for product development to compete with the wave of imported product. The new product development strategy is needed to compensate for the disadvantage impose by the importing of agricultural product, mainly from China. This study intends to find out the potential market for the delicate agricultural products through investigate the preference and willingness to pay for the value-added agricultural products in Thailand. The empirical results of this study provide a reference for the development of other value-added agricultural. In the following part the background literatures will be discuss then the theoretical framework and method are presented followed by the empirical result and finally the conclusion and discussion about the finding are provided.

## Literatures Review

What attributes contribute for the chance of consumer to pay for that product? Scholars widely applie Conjoint Analysis to measure potential consumer preferences and select products. Since 1964, many researches explored the aspect of theoretical and algorithm development of conjoint analysis (Green & Srinivasan, 1978). The basic idea of Conjoint analysis comes from the theory of demand that utility consumption of consumer goods does not come directly from the product but from the satisfaction. These theories assume that a product consists of a variety of characteristics. And consumer is satisfied and responsive to the number of characteristic or attributes of that product. Products or groups of goods and services are assessed on an indirect basis, with values determined by the consumer. In short, the conjoint analysis can describe the characteristics of the goods and services that consumers want. Satisfactory of the variety of attributes in the product and can be used to improve the products and services to meet the needs of consumers such as agricultural products, tourism and leisure activities and other product attributes preferences. Morrison, Blamey, Bennett, and Louviere (1997) pointed out that in the case of conjoint analysis, collection of preference data of respondents through specific measures of preference can be used to measure the economic value of product. There are four ways to categorize respondents' preference scores; Contingent Rating, Contingency Ranking, Paired Comparisons, and Choice Experiments, which are more commonly used because of the rigorous methodology of the economic valuation theory.

Hinson and Bruchhaus (2005) investigated four consumer preferences for strawberry in Louisiana, USA, and listed four facets of container, pesticide program, origin, and price. The order of importance for the study is that of origin, price, container and pesticide program, where the attribute rating with the highest average score are the combination of *Plastic Box*, *Flag of Louisiana Production*, *Pesticide Reduction* and *$ 1.99*. Darby, Batte, Ernst, and Roe (2008) explored the consumer willingness of to pay for strawberries in Ohio, empirically estimated the willingness of local people to pay for different attributes using a combination of degree, price and freshness guaranteed and other attributes. The study found that respondents were not able to distinguish between the two attributes *local product* and *product of Ohio*, but there was indeed a certain demand for freshness and locally produced foods. (Cranfield, Henson, Northey, & Masakure, 2010) applied co-analytic approach to investigate consumer preferences on Fair Trade coffee in Toronto and Vancouver and found that consumers in both regions placed a premium on price and labeling. Wann et al. (2016) explored the preferences of domestic consumers of fruits and vegetables by using a combination of analysis methods mentioned in the beginning of literature review on raw and processed fruits and vegetables attributes include *priority concern*, *environmental awareness* and *intellectual culture*. According to the results, Taiwanese tend to pay a higher price for fresh and safe domestic fruits and vegetables, as well as domestic vegetables and fruits that are introduced in cultural area and ethnic origin. Education also influence willingness to

pay, those who have high education are willing to pay for fruits and vegetables that is safe, pollution reduction and specialty cultural packaging and labeling; those with lower education levels are more likely to have freshness, ecological balance and endemic life presentation.

Wann et al. (2013) explored the empirical analysis of the metropolitan consumer purchasing characteristics of domestic bananas by means of conjoint analysis. The result shows that consumers are more willing to pay more for bananas with marked geographical region than ordinary bananas, nutrients and freshness also increase their willingness to pay. In the study, the respondents that is of ethnic group with a preference for *eating habits* was willing to pay for the product attribute with *nutritional content*, *food mileage reduction*, *local life introduction* and *postprandial fruits*. Kao et al. (2013) explored consumer preferences for domestic premium coffee also using a conjoint analysis. The study found that respondents were negative (-461 yuan / lb) willing to pay for coffee with acidity, and the aroma of coffee. The was no significant different from the respondents that was willing to pay a higher price for providing creative and personalized architecture (206 yuan/lb) and packaging in local culture (224 yuan/lb) and hand-painted creation (276 yuan/lb).

## Theoretical Model

After reviewing the above literature, this study will use a selection test in a joint analysis to assess the willingness of consumers in Thailand to value attributes of fresh mushrooms. In recent years, the choice of test method has been widely used to measure the monetary value of commodity goods. Under the assumption that consumers' preferences are rational, the people are pursuing utility maximization to make consumption decisions with limited budget. The choice trial method uses stochastic utility theory to imply that the probability that a consumer will pick a product from each selection set depends on the utility of the product relative to other products (Morrison et al., 1997), and refers to consumer choice. The probability of this product increases as its utility increases, so consumers pick and choose the most effective alternatives in their choice of set (Burton, Rigby, Young, & James, 2001). When a certain attribute of a product is increased, consumers who prefer this attribute will increase their utility, and the probability of selecting this product will also increase.

According to the theory of stochastic utility proposed by Hanemann (1984), the principle of co-analytic method is to first set the i-th utility function ($U_{ij}$) of product i to product j, including observable and unobservable parts as follows:

$$U_{ij} = V_i(Z_j) + \varepsilon_{ij} = V_{ij} + \varepsilon_{ij} \quad (1)$$
$$i = 1, 2, \dots, N;\ j = 1, 2, \dots, J$$

Where, $U_{ij}$ is the utility of the attribute combination ($Z_j$) of the product i on the subject i, $V_{ij}$ is the observable part, which is the determinant of the subject itself, namely the indirect utility function of the subject; the attribute vector is $Z_j$; and $\varepsilon_{ij}$ is unobservable random term and obeys independent and same distribution. Furthermore, suppose that the indirect utility function of the i-th subject on the attribute combination $Z_j$ of product j is a linear additive model, and let one of the k attributes of $Z_j$ be the price variable $P_j$, so that the i indirect utility function can be expressed as (2):

$$V_{ij} = V_i(Z_j) = \sum_{k=1}^{K} \beta_k X_{jk} + \gamma P_j \quad (2)$$

The utility function of the measured person i is as shown in equation (3)

$$U_{ij} = V_{ij} + \varepsilon_{ij} = \sum_{k=1}^{K} \beta_k X_{jk} + \gamma P_j + \varepsilon_{ij} \quad (3)$$

$P_j$ is the monetary evaluation variable of product j; $X_{jk}$ is the k-th attribute of product j; and $ß_k$ and γ are the coefficients of the attribute variable.

Next, the selection probability model is set so that the product selection set of the consumer is C, and when the utility of the measured object i for the product alternative j is higher than that of the alternative h, the subject i. The probability of selecting product j from the selection set C can be expressed as (4)

$$\begin{aligned} P_{ij}(j|j, h \in C) &= P\left(U_{ij} > U_{ih}; j \neq h \in C\right) \\ &= P\left[\left(V_{ij} + \varepsilon_{ij}\right) > \left(V_{ih} + \varepsilon_{ih}\right); j \neq h \in C\right] \\ &= P\left[\varepsilon_{ih} < \left(\varepsilon_{ij} + V_{ih} - V_{ih}\right); j \neq h \in C\right] \end{aligned} \quad (4)$$

If we make two different assumptions about the random term $\varepsilon_{ij}$ of (4), we can derive a specific probability of selection (Louviere, Hensher, & Swait, 2000):
1. If the random term $\varepsilon_{ij}$ is assumed to be a multivariate normal distribution, a Multivariate Probit model (MPM)
2. The Multinomial logit model (MLM) can be derived if the random term $\varepsilon_{ij}$ is assumed to be a multivariate extreme distribution and follows the same and independent Gumbel distribution.

To express the probability function of (4), the random item $\varepsilon_{ij}$ is used as the simplest and common assumption that the random item $\varepsilon_{ij}$ is subject to independent and identical Gumbel assignments or Type I extreme value distribution. The Cumulative distribution function (CDF) is:

$$F(\varepsilon_{ij} < \varepsilon) = \exp(-e^{-\varepsilon_{ij}}) \tag{5}$$

The probability density function (PDF) is:

$$f(\varepsilon_{ij}) = \exp\left(-\varepsilon_{ij} - e^{-\varepsilon_{ij}}\right) \tag{6}$$

Similarly, we can see that when the random item $\varepsilon_{ij}$ in (4) obeys the same and independent Gumbel allocation, the CDF can be expressed as:

$$\begin{aligned} &P[\varepsilon_{ih} < (\varepsilon_{ij} + V_{ij} - V_{ih})] \text{ for all } h \neq j \\ &= \int_{-\infty}^{\infty} \prod_{j=1}^{J} F\left(\varepsilon_{ij} + V_{ij} - V_{ih}\right) f\left(\varepsilon_{ij}\right) d\varepsilon_{ij} \\ &= \int_{-\infty}^{\infty} \prod_{j=1}^{J} \prod_{h \neq j} \exp\left(e^{-\left(\varepsilon_{ij} + V_{ij} - V_{ih}\right)}\right) \exp\left(\varepsilon_{ij} + e^{-\varepsilon_{ij}}\right) d\varepsilon_{ij} \\ &= \int_{-\infty}^{\infty} \exp\left[\varepsilon_{ij} - e^{-\varepsilon_{ij}} \left(1 + \sum_{j=1}^{J} \frac{e^{V_{ih}}}{e^{V_{ij}}}\right)\right] \end{aligned} \tag{7}$$

If

$$\lambda_i = \log\left(1 + \sum_{j=1}^{J} \frac{e^{V_{ih}}}{e^{V_{ij}}}\right) = \log \sum_{j=1}^{J} \frac{e^{V_{ih}}}{e^{V_{ij}}} \tag{8}$$

Then (8) can be rewritten as:

$$\begin{aligned} &\int_{-\infty}^{\infty} \exp\left[-\varepsilon_{ij} - \exp\left(-\left(\varepsilon_{ij} - \lambda_i\right)\right)\right] d\varepsilon_{ij} \\ &= \exp(\lambda_i) \int_{-\infty}^{\infty} \exp\left(-\varepsilon_{ij}^{*} - e^{-\varepsilon_{ij}^{*}}\right) d\varepsilon_{ij}^{*} \\ &= \exp(-\lambda_i) \\ &= \frac{\exp(V_{ih})}{\sum_{j=1}^{J} \exp(V_{ij})} \end{aligned} \tag{9}$$

It is deduced from (5) to (8) that the probability of selection of the i-th subject in the face of J different alternatives can be expressed as (10), which is referred to as the Multivariate Logit Model (MLN). When subject i faces S selection sets C and from each of m selection alternatives for each selection set (there are J total product alternatives m < J for attribute combinations), each is selected Like most of the products, then the multiple models can be expressed as:

$$P_{ij}^{C} = \prod_{C=1}^{S} \frac{\exp(V_{ij})}{\sum_{h=1}^{m} \exp(V_{ih})} \tag{10}$$

The above model implies that the respondent must comply with *Independence from Irrelevant Alternatives* (IIA), which means that the probability of the candidate selecting an alternative is only the same as that of the alternative which is not related to the existence of other alternatives; the inclusion or removal of an alternative option will not affect the probability that other alternatives will be selected.

In measuring Willingness-to-Pay (WTP), we need to differentiate (3). Assuming the same utility, we can get first-order conditional:

$$dU_{ij} = \sum_{k=1}^{K} \beta_k dX_{jk} + \gamma dP_j = 0 \tag{11}$$

where γ is the coefficient of monetary evaluation variable of product j, that is, γ <0 means that the marginal utility of monetary evaluation variable is negative, that is, when the price of product j is higher, the lower the attribute combination of j is. The sign depends on the nature of the product attribute. If >

0, the marginal utility of the attribute is positive, indicating that the higher utility of attribute i is for consumer i (Dellaert, Borgers, & Timmermans, 1995).

In the case of other attribute variables, the value of the willingness to pay for all $X_{jk}$ attributes of the product j to all tests can be obtained from (12), that is, the price change of each attribute is:

$$WTP_k = \frac{dP_j}{dX_{ij}} = \frac{-\beta_k}{\gamma} \quad (12)$$

## Method

### The Questionnaire Design

The socio-economic characteristics include gender, age, education level and average monthly household income. To understand whether the social background of the interviewees in the two districts is similar. The finding from Hinson and Bruchhaus (2005) show that consumers who have a higher household income pay more attention to the origin of the ingredients, indicating a positive causal relationship between the importance of origin and household income. In addition, to understand the respondent's habits in the consumption of fruits and vegetables, the respondents were asked about the most commonly purchased major items. Since raw mushrooms are common ingredients for home cooking in Thai consumers, eating habits are also one of the focuses of this study.

To explore the potential of China's export of fresh mushrooms to Thailand's consumer market, we must first understand whether the source countries that are labeled on the packaging will affect the purchasers' willingness to purchase and understanding of respondent purchase of imported products to facilitate the entry of future agricultural products into the Thai consumer market.

Finally, to understand the importance of interviewees on the different considerations of imported fruits and vegetables, nine aspects are listed separately as factors to be considered. The characteristics of the products themselves include nutritional value, origin label and food safety certification. According to Wann et al. (2016) concluded that most consumers in current countries consider food safety into account. To compare the differences between imported fruits and vegetables, Degree, appearance and production process description for the respondents expressed their attention. The latter lists the characteristics of the general imported food, including the supply in the off-season, and the rare domestic product, which will be included in the selection as most of imported goods will fill up the lack of domestic product diversity and diversify their choices

To understand Thai consumers' preference and willingness to pay for fresh mushrooms, several hypothetical alternative combinations of different attribute combinations are listed at the end as sources of subsequent positivistic estimates. First, the property level should be set to more representative of the purchase of consumer properties, namely *quality*, *country of origin*, *usage*, *packaging material*, *information* and *price* a total of six attributes, Table 2 shows the detail of attributes.

Table 2 Fresh mushroom consumption preferences and attributes

| Attributes | The number of levels | Attribute level |
|---|---|---|
| Quality | 4 | freshness, taste, nutritional content, high-tech production |
| Country of Origin | 4 | China, Malaysia, Taiwan, Japan |
| Usage | 3 | food, health conditioning, holiday gifts |
| Packaging materials | 4 | aluminum foil boxes, plastic bags, plastic boxes, cartons |
| Information | 3 | no labeling, nutrition information, food safety certification |
| Price | 4 | 0%、25%、50%、100% |

In the quality attribute freshness, taste preference and nutritional content of most agricultural products are of interest. In addition, mushrooms are mostly planted in facilities and adopt high-tech hardware to produce them. Therefore, they are especially included in the attribute of high-tech production. According to the FAO data, China is the largest exporter of mushrooms to Thailand, followed by Malaysia. Japan is one of the most common exporters of high-end agricultural products in Thailand's consumer market. Since mushrooms are one of the most common foods known locally in Thai cuisine, in addition to incorporating the attributes of this property, due to the special nutritional value of the

mushroom itself and the perception of its high price, health conditioning and holiday gifts are also including. Packaging materials by the actual investigation of the local retail market includes aluminum foil boxes, plastic bags, plastic boxes, cartons. In labeling information attribute, there are three variables; no labeling nutritional information and food safety certification. Based on the large number of market-oriented fresh mushroom products and their wide range of specifications, the assessment criteria are based on the concept of relative degree. The prices are divided into 0% and then 25%, 50% and 100%.

Finally, to combine these levels from the above six attributes, the number of products assembled is as high as 2,304 (4 × 4 × 3 × 4 × 3 × 4), far exceeding the standard that respondents can choose. To reduce the number of product combinations under test and to avoid excessive length of the questionnaire for the respondents, Experimental Design in Fractional Factorial Design was adopted to reduce the number of products by Orthogonal Experimental Design The number of combinations.

**Intentional Sampling**

There is a need to collect information on the current situation of Thai agricultural products consumer market. The author of this paper went to Thailand to visit the retail outlets of fruits and vegetables and conduct a questionnaire survey. The questionnaire is designed in advance originally in Chinese and then was translate to Thai. Pre-questionnaires are also conducted to successfully complete the questionnaire design. At the beginning of August 2016, a field survey was conducted in Thailand. During this period, the authors could conduct customer surveys in retail stores include Gourmet Market, Big C and Central Food Hall in downtown Bangkok, and Tesco Lotus and Tops Supermarket outlets in Udon Thani. 30 customers are interviewed in Udon Thani and 50 customers in Bangkok result in total of 80 consumer's sample. The detail of sample description and statistical analysis was shown in appendix.

## Results

**Empirical results analysis**

This study empirically estimated using statistical software and included 80 sample data from the questionnaire to test the preference of consumers in Thailand based on the MNL model. As can be seen from Table 3, the coefficient values and the willingness-to-pay values of the level variables of various attributes are estimated through the multivariate Logit model. The estimated ratio of the results to the overall explanatory power is 27.991, which is 95% Quasi-level chi-square test ($\chi 2$ (0.05,14) = 23.6848), indicating that the overall model explanatory power is fit. However, the "price" variable is negative after empirical estimation and its coefficient is statistically significant, indicating that the respondent is a rational consumer. When the mushroom price is higher, the consumer willing to pay less.

According to the stochastic utility function theory, the difference of preferences of Thai urban consumers in fresh mushrooms can be identify by using the attribute level coefficient value. Table 3 shows the significant coefficient in each of the attribute. In the case of quality attribute there are two variables; taste preferences (Q1) and high-tech production (Q3). For the country of origin attributes there are Malaysia (C1), Taiwan (C2), and Japan (C3). The usage attribute has only one coefficient which is festival giving or holiday gift (F2). In the part of information attribute there are nutrition information (I1) and food safety certification (I2). The last one was price (P) attribute. Among them, the taste preferences (Q1), Japan (C3), food safety certification (I2) and price (P) were significantly different from those under 99% confidence level. The other variable all reach the 95% level of statistical trustworthiness.

Table 3 Multivariate Logit model estimates

| Attribute argument | | Coefficient estimates | t statistics | WTP (%) |
|---|---|---|---|---|
| Quality | Taste preferences (Q1) | -1.215 | -3.86*** | -37.8 |
| | Nutritional ingredient (Q2) | 0.159 | 0.65 | 0 |
| | High-tech production (Q3) | 0.702 | 2.78** | 21.8 |
| Country of origin | Malaysia (C1) | -0.671 | -2.65** | -20.9 |
| | Taiwan (C2) | 0.597 | | 18.6 |

| | | | | |
|---|---|---|---|---|
| | | | 2.67** | |
| | Japan (C3) | 1.752 | 6.47*** | 54.5 |
| Usage | Regimen (F1) | -0.0133 | -0.06 | 0 |
| | Holiday Gift (F2) | -0.557 | -2.58** | -17.3 |
| Packaging materials | Plastic bag (K1) | -0.342 | -1.87 | 0 |
| | Plastic box (K2) | 0.193 | 0.57 | 0 |
| | Carton (K3) | 0.112 | 0.39 | 0 |
| Information | Nutrition Information (I1) | 0.642 | 2.89** | 20.0 |
| | Food Safety Certification (I2) | 1.391 | 5.73*** | 43.3 |
| Price | | -3.216 | -6.21*** | |
| | $\ln L_R$ | -249.40264 | | |
| | $\ln L_L$ | -235.40677 | | |
| | LR | 27.99174** | | |
| | N | 560 | | |

Source: This study is organized.

Note: *** indicates that t statistic is significant at a significant level of α = 1%

** indicates that t statistic is significant at a significant level of α = 5%

$\chi^2$ (0.01,14) ＝29.1412

$\chi^2$(0.05,14) ＝23.6848

The quality attribute, freshness is the benchmark for attribute levels. The result shown that the coefficient value of high-tech production (Q3) is a positive value (0.702), which indicates that this level of quality will increase consumer's utility for fresh mushrooms. Conversely, taste preference (Q1) compared to freshness as reference variable has a negative value (-1.215) which reduce consumers utility of fresh mushrooms. If fresh mushrooms are adopt high-tech production, they will bring about relatively high utility for consumers and indicate that consumers have a good preference for high-tech production.

In the country of origin, China is the benchmark for attribute levels. The results show that Malaysia (C1), Taiwan (C2) and Japan (C3) all showed significant results. However, Japan (1.752) and Taiwan (0.597) showed positive values, it indicates that consumers in Thailand have higher purchasing power for fresh mushrooms from Japan and Taiwan than those for Chinese products. On the other hand, Malaysia (C1) coefficient shows a negative value (-0.671), indicating relative benchmark (China) reduce the purchasing power of consumers for every additional unit.

In the Usage attribute, the original set reference value is used as ingredient. The result found that the holiday gift (F2) whose coefficient value is negative and indicates the relative reference value. The effectiveness of the purchase also said that consumers are currently buying Thai fresh mushrooms as main ingredient.

The result of the packaging material shows that there is no statistically significant difference among respondents in the four types of foil boxes, plastic bags, plastic boxes and cartons, meaning that the packaging materials for imported retail mushrooms do not contribute to consumer preferences.

Finally, positive correlations between nutritional information (I1) and food safety certification (I2) were found in the marked information attribute, indicating that both two types of information tag have a higher preference for Thai consumer than untagged product, Food safety certification (1.391) is slightly higher than nutrition information (0.642). It also indicated that if the above two kinds of labeling are added to fresh mushroom product, it will increase consumer’s willingness to purchase.

In Table 3, WTP estimation results of each attribute level are also listed. Among them, the willingness value paid by Japan (C3) from the source country is the highest, compared with China. If the source country is adjusted as Japan, Thai consumer willing to pay an extra 54.5%, if the source country is Taiwan, they are willing to pay 18.6% more to buy their fresh mushrooms. In labeling information, respondents are willing to pay 43.3% more food safety certification (I2) compared with unlabeled fresh mushrooms. Consumers are also willing to pay an additional 20.0% if nutritional information is increased. To pay the value of negative attributes at the level of taste preferences relative to the freshness the consumer choose to pay less for 37.8%, in terms of usage, compared with the use for food, consumer willing to pay less for 17.3% for the use as holiday gift.

## Conclusions and Recommendations

1. The supermarket for the Thai consumers will be the main distribution channel for fruits, vegetables and imported food product.

According to the findings of this study, consumers in Thailand would purchase fruits and vegetables at supermarkets over 50% of the time and up to 90% of respondents also purchased imported products from supermarkets. From farm to retail outlets in Thailand, such as large-scale fresh chain supermarkets, common points are found that there is agricultural products from China Japan Malaysia. As for Taiwan despite high technology production of mushroom but the export to Thai land is still low. From consumers survey, the existing chain supermarkets should be the potential access to future agricultural facilities in Taiwan. As can be seen, Thai farmer will also benefit on the use of technology for mushroom cultivation. On the other hand, we can see from the survey results that the consumption of mushroom in the surveyed region account for about 5% – 6% of the overall cooking ingredients, though the mushrooms are commonly found in home-cooked meals in Thailand. They also indicate that the consumption of mushrooms in the Thai consumer market in the future still have potential. From the empirical analysis, in terms of usage, the holiday gifting attribute is significantly lower than that on the benchmark compared with the usage for food, while the usage for medicine is of no significant.

2. The consumer mostly emphasis on freshness and nutritional value of imported fruit and vegetable.

Thai consumers will choose to buy imported fruits and vegetables emphasis on the freshness factors as the highest priority result in a score of 9.09 points, followed by nutritional value of 8.66 points. On the other hand, when the quality of fresh mushroom was investigated by the conjoint analysis, the preference of taste for respondents was significantly lower than the freshness as benchmark value. This also shows that consumers pay more attention to the freshness of the ingredients. Secondly, consumers pay more attention to the nutritional value of imported fruits and vegetables. However, in the preference attributes of fresh mushrooms, the relative freshness is not a significant factor compare to the nutritional value.

3. Thai consumer prefers goods with high-tech production.

There are not many items of agricultural products locally produced in Thailand. Therefore, most of them still need to rely on the imported ingredients to make up for the consumer market gap. Therefore, the study chose to use fresh mushrooms produced by on-farm facilities. From the result obtained from conjoint analysis, the high-tech production is one of the variables in quality attribute. By using freshness as a reference value, consumers in Thailand tend to place higher utility on the product with high-tech production and willing to pay more for 21.8%. Therefore, the production of fresh mushrooms in the production process needs to be accompanied by high-tech production to achieve good quality and stability as the result shown that consumers have potential preferences for products with this attribute.

4. Imported agricultural products from Japan and Taiwan result in higher urban consumer preferences

In the retail market in Thailand, there are agricultural products from various countries in the world, mainly fresh mushrooms. Currently, the main exporters are China and Malaysia. In this study, countries of origin are included in the attribute to figure out whether there is any difference in customer preference according to various countries of origin. The result of the analysis is that if China is taken as the benchmark, it is emphasized that imported mushrooms from Japan and Taiwan have high consumer utility, while Malaysia is less than China. The field visit also found that the agricultural products from Japan in the retail shelves in Thailand are significantly higher in price and superior in quality to those from other countries, indicating that not only consumers are more interested, but also can enjoy higher quality by emphasizing their country of origin.

5. Increase packaging labeling information to increase the value added of agricultural products

As consumers pay more attention to the safety of food information and ingredients, the more agricultural products will display their safety certification on the packaging or even indicate the nutritional information of their agricultural products to provide a more complete consumer experience. According to the results of this study, providing nutritional information and food safety certification information can bring higher utility to consumers compare to non-labeled products result in the higher value of their willingness to pay. Adding such information can bring about 20% to 43% of the selling price. The food safety certification is also one of the many factors that have attracted consumer's attention which earn a score of 8.39. Therefore, the value added of fresh mushrooms can be enhanced by the provision of labeling information.

6. Udon Thani can serve as the primary market for Taiwan's agricultural products entering Thailand

Based on the statistical results of this study, the socio-economic characteristics of the consumer groups in Udon Thani are similar to those in Bangkok, and from the empirical analysis, it can also be known that the source country of the label is Taiwan, which can increase the value added for the products. Taking the fresh mushrooms discussed in this study as an example, if we want to import Taiwanese fresh mushrooms into Thailand, we can take Udon Thani as the primary market. Not only because Bangkok is already the main battleground for the competition of fruits and vegetables in various countries, Taiwan will face many competitors if it wants to enter Bangkok, while Udon Thani is comparable to Bangkok because of its consumption level and degree of internationalization.

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## Appendix

Table A1 Thailand Metropolitan Consumer Market Social Statistics

| Area project | | Udon Thani (nu=30) | | Bangkok (nb=50) | | total (N=80) | |
|---|---|---|---|---|---|---|---|
| | | frequency | % | frequency | % | frequency | % |
| gender | male | 11 | 36.67 | 5 | 10.00 | 16 | 20.00 |
| | Female | 19 | 63.33 | 45 | 90.00 | 64 | 80.00 |
| age | Under 30 years old | 16 | 53.34 | 14 | 28.00 | 30 | 37.50 |
| | 31-40 years old | 7 | 23.33 | 21 | 42.00 | 28 | 35.00 |
| | 41-50 years old | 4 | 13.33 | 7 | 14.00 | 11 | 13.75 |
| | 51 years old and above | 3 | 10.00 | 8 | 16.00 | 11 | 13.75 |
| average | | 32.50 | | 36.80 | | 35.19 | |
| education level | Under junior | 3 | 10.00 | 5 | 10.00 | 8 | 10.00 |
| | senior | 2 | 6.67 | 5 | 10.00 | 7 | 8.75 |
| | College | 15 | 50.00 | 23 | 46.00 | 38 | 47.50 |
| | Institute above | 10 | 33.33 | 17 | 34.00 | 27 | 33.75 |
| Family monthly income (THB) | Under 1 Million | 4 | 13.33 | 2 | 4.00 | 6 | 7.50 |
| | 1~1.5 Million | 2 | 6.67 | 4 | 8.00 | 6 | 7.50 |
| | 1.5~3 Million | 6 | 20.00 | 12 | 24.00 | 18 | 22.50 |
| | 3~5 Million | 8 | 26.67 | 13 | 26.00 | 21 | 26.25 |
| | 5~10 Million | 6 | 20.00 | 11 | 22.00 | 17 | 21.25 |
| | 10 Million | 4 | 13.33 | 8 | 16.00 | 12 | 15.00 |

Table A2 Thai consumers purchasing and eating behavior of fruits vegetables and imported ingredients

| Area / project | | Udon (nu=30) | | Bangkok(nb=50) | | total (N=80) | |
|---|---|---|---|---|---|---|---|
| | | frequency | % | frequency | % | frequency | % |
| Purchasing channel | Discount / supermarket | 14 | 46.67 | 28 | 56.00 | 42 | 52.50 |
| | Traditional Market (Morning Market) | 5 | 16.67 | 10 | 20.00 | 15 | 18.75 |
| | Twilight market | 7 | 23.33 | 3 | 6.00 | 10 | 12.50 |
| | Convenience stores | 2 | 6.67 | 3 | 6.00 | 5 | 6.25 |
| | other | 2 | 6.66 | 6 | 52.00 | 8 | 10.00 |
| Eating habits | Convenient ready to eat | 1 | 3.33 | 6 | 12.00 | 7 | 8.75 |
| | Local dish | 21 | 70.00 | 31 | 62.00 | 52 | 65.00 |
| | Seasonal fresh food | 7 | 23.33 | 12 | 24.00 | 19 | 23.75 |
| | Western restaurant | 1 | 3.33 | 1 | 2.00 | 2 | 2.50 |
| Source countries affect purchase intention | Yes | 28 | 93.33 | 49 | 98.00 | 77 | 96.25 |
| | No | 2 | 6.67 | 1 | 2.00 | 3 | 3.75 |
| Imported product channel | Supermarket | 30 | 100.00 | 44 | 88.00 | 74 | 92.50 |
| | Convenience stores | 4 | 13.33 | 11 | 22.00 | 15 | 18.75 |
| | Traditional Market (Morning Market) | 1 | 3.33 | 5 | 10.00 | 6 | 7.50 |
| | Wholesale market | 3 | 10.00 | 2 | 4.00 | 5 | 6.25 |
| | other | 0 | 0.00 | 10 | 20.00 | 10 | 17.00 |

# Impact of Input Attributes on Consumers' Information Adoption Behavior Mediated by eWOM Message Characteristics

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## Abstract

Traditional conversation related to the products and services changed into the new form of electronic media which influence the consumer's purchasing behavior. Electronic word of mouth (eWOM) has taken significant importance in online communities, which is a more influential source for instant information on the internet. This study purposed an integrated model to examine the input attributes linked to consumers' information adoption behavior in the context of eWOM message characteristics. To measure the instrument, confirmatory factor analyses, SPSS Cronbach's alpha and structural equation modeling for model fitness was used through non-probability purposive samples of 395 participants through questionnaire from the Republic of China. It revealed that eWOM input attributes have positively influenced on source credibility, whereas valence has an adverse impact on information usefulness. Source credibility, argument quality, and information usefulness are the key eWOM message characteristics related to information adoption on the internet. Companies need to develop the strategies dynamically according to consumers' behavioral concerns using comparative and contextual online platforms that will help the consumers in decision making.

Keywords: Argument quality, information usefulness, online opinions, purchasing behavior, source credibility

## Introduction

In general, information technology and internet are marketing tools that offer an opportunity for customers to share the ideas and opinions about products and services. The importance of the internet cannot be taken lightly because internet users participate in online communities directly or indirectly which is a vital form of electronic word of mouth (eWOM). Internet user population in December 2017 estimated 41.57 billion of the total population, which is 54.4% of total World's population (Albors, Ramos, & Hervas, 2008; Hennig-Thurau, Walsh, & Walsh, 2003; Internet & Statistics, 2018). Because of the internet technology, the communication of word of mouth (WOM) has been prolonged to the electronic word of mouth, such as electronic bulletins, newsgroups, blogs, online discussion forums, review, and networking sites. On these forums, everyone can share their experiences and knowledge about products and services with others, which provide the information more influentially to the consumers. That's why, traditional conversation related to products and services with colleagues, friends and family members changed into the new form of electronic media called electronic word of mouth, which influence the consumer's purchasing behavior. Now, the customers consulted online discussion forums before making the right decision about product or service(Hennig-Thurau, Gwinner, Walsh, & Gremler, 2004; Weinberg & Davis, 2005). Since 2004, word of mouth (WOM) expanded the marvelous development in marketing, while eWOM began more attractive for practitioners and researchers because of the advancement in e-commerce with significant growth. People's behavior during online decision-making process has been changing because of tremendous spreads of internet usage and prefers to seek the information and opinions from social networking media to make the right decision about the product or service (Bickart & Schindler, 2001; Hennig-Thurau et al., 2004). Hennig-Thurau et al. (2004) have defined the eWOM as "any positive or negative statement made by potential, actual, or former customers about a product or company, which is made available to a multitude of people and institutions via the internet".

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**eWOM input attributes**

eWOM input attributes belong to reader's or writer's motivations such as opinion leader, opinion seeker, risk, information need, social tie and eWOM involvement etc. In online communication, opinion leaders provide the information to others consumption related advice. Opinion leaders are considered more influential and credible than commercial a source, that's why marketers are much interested to know how traditional WOM may differ from eWOM communication, how to develop new strategies that can influence in opinion seeking, and how to hire the influencing opinion leaders that may positive spokespeople for them (Hennig-Thurau et al., 2004; Tsang & Zhou, 2005). In a virtual community, opinion leaders are considered as public bulletin boards which may influence the consumer behavior (Kotler, 2000). In online opinion leadership, people consider themselves as a leader and think people regard them as a good source of information, many people give high weight about their opinions on the internet (Sun, Youn, Wu, & Kuntaraporn, 2006). Information need is a motivator for eWOM engagement also considered the notion of advice seeking that influence on consumer's buying behavior. Opinion seekers tend to seek the advice or information from others to make a decision. Perceiving the risk in a different situation because of not experience or familiarity of the product, they prefer to seek the advice or information from others for better decision (Hennig-Thurau et al., 2003; Khammash & Griffiths, 2011). Generally, perceived risk is about consumer's feeling about unpleasant consequence and uncertainty because of a number of alternatives available toward the purchase, so that, consumers seek the information from different source to reduce the risk when decision making (Kim, Kim, & Leong, 2005). (Hussain, Ahmed, Jafar, Rabnawaz, & Jianzhou, 2017) considered the risk as a subjective judgment of consequences and uncertainty that influence on consumer behavior.

**Table 1,** Influential eWOM input attributes

| eWOM input attributes | References |
|---|---|
| Reader's motivation (cost, uncertainty, risk, information need, experience, involvement and prior knowledge) | (Goldsmith & Horowitz, 2006; Hennig-Thurau et al., 2004; Hussain, Ahmed, Jafar, Rabnawaz, & Yang, 2017; Jones, Aiken, & Boush, 2009; D.-H. Park & Lee, 2008; Sohn, 2009; Yang, Mai, & Ben-Ur, 2012) |
| Writer's motivation (social tie) | (Hennig-Thurau, Wiertz, & Feldhaus, 2015; Klein & Ford, 2003; Kulviwat, Guo, & Engchanil, 2004; Wang, Wang, & Wang, 2018) |
| Writer's and reader's motivation (information giving, information seeking, social tie, opinion leader and opinion seeker) | (Brown, Broderick, & Lee, 2007; Dellarocas, 2006; Fong & Burton, 2006; López & Sicilia, 2014; Sun et al., 2006; Thorson & Rodgers, 2006; Toder-Alon, Brunel, & Fournier, 2014) |

**eWOM message characteristics**

Source credibility belongs to the perceived trust of receivers' information among information source. Expertise and trustworthiness are two major sources to evaluate the source credibility, however, objectivity and homophily are also dimensions that can influence consumers' purchasing behavior (Wiener & Mowen, 1986). Ohanian (1990) validated that information given by the experts has more influential and indicate positively on receivers' attitude with the extent of authoritativeness, specific knowledge, competence, website reputation, skillfulness and qualification which reduce the risk of reviewers. C. Park and Lee (2009) demonstrated that information from reliable review sites influence on receivers' attitude and reduce reviewers' perceived risk. Information receivers believe that popular online forums or review sites, number of reviews, registered reviewers provide them helpful information. Another important determinant of eWOM source credibility is trustworthiness which may affect positively on receivers' trust. Information seekers devote from active participants who share the information fast and

frequently on online forum resulted in trust increase. Consumers believe that actual level of the information, reviewer's experience, reviewer's effort, honest reviews and length of contents validate the trust (Xie, Miao, Kuo, & Lee, 2011). Objectivity refers to receiver's perception about quality of the product affected by reviewers' emotions, less biased and unusual events such as labor strike or natural disaster, whereas, reviews are written by the same gender, with same age, same social class, same interest, and buying in same way leads to homophily which reduces the uncertainty and risk information during decision-making process (Hussain, Ahmed, Jafar, Rabnawaz, & Jianzhou, 2017).

eWOM valence is a potential factor that has an essential role in customers' purchase decisions in eWOM communication. In positive eWOM valence people recommend the companies as speaking good, feel proud to be a customer of those companies, recommend other customers to buy a product from those companies, as well as always say something about positives things and speak favorably. Whereas, in case of negative eWOM valence, people speak negative things and speak adversely about the companies to others, which influence more negatively on customers' decision making (See-To & Ho, 2014).

Argument quality has been emphasized in many studies (Davy, 2006; Sundar, Knobloch-Westerwick, & Hastall, 2007) on information seeking from the perspective of information systems. Argument quality or information quality states the persuasive strength of information provided in the message as perceived by the user and produce output value by a system. In computer mediation, consumers perceive the quality of information while purchasing decision about product or services. Comprehensiveness, relevancy, necessary values, applicability, reliability, consistency, up-to-date information, timeliness, and accuracy are the major dimensions of argument quality that perceived higher message concerns (Cheung, Lee, & Rabjohn, 2008).

Individual's perception enhance the performance of product or services referred by perceived usefulness which is an essential predictor of adoption (Cheung et al., 2008). Online opinions and ideas expressed within computer-generated platforms could be helpful to make a better decision. Sussman and Siegal (2003) argued that information usefulness is a useful predictor of intention or adoption because consumers take part in online communities to get useful information. In fact, consumers' confidence has greater influence to adopt the comments when the information found useful. People encounter the substantial degree of eWOM information probably to adopt the ideas as provided by virtual communities (Erkan & Evans, 2016).

**Information adoption, theories, and models**

Consumers' engagement in eWOM information is more likely to have a great impact on information adoption behavior. In virtual communities, consumers tend to seek the opinions posted by others before making the right decision (Cheung & Thadani, 2012). Information adoption is explicit information of knowledge transfer that can influence on people's behavior consider the nature of argument quality and source credibility as centrally or peripherally (Sussman & Siegal, 2003).

Acceptance of new technologies, as purposed by Davis (1989) demonstrated that technology acceptance model (TAM) identify the acceptance of new technologies related to behavioral issues of users, derived from the theory of reasoned action (TRA) focuses on behavioral theories as purposed by (Fishbein & Ajzen, 1975). In the context of eWOM, TAM is more specific supported by perceived ease of use and usefulness constructs to predict individual attitude and intention that explain the information adoption (Elwalda, Lü, & Ali, 2016). However, Tarhini, Hone, and Liu (2013) criticized that TAM is a restricted by explanatory power, external factors and neglect the association between actual behavior and intention. The revised version of TAM as proposed by Venkatesh and Davis (2000) detected the processing factors such as cognitive instrumental and social influence. These factors are related to subjective norms, images, experiences, voluntariness, job relevance, result demonstrability and output quality that influence on decision process and adoption decision. Venkatesh and Bala (2008) also extended the version of TAM with continuous development that focuses on eWOM antecedents factors relate to adjustment and anchoring for internal and external control such as emotion, intrinsic motivation, perceived usefulness and ease of use.

Information adoption model (IAM) is usually used for four components of information transfer, such as argument quality (central route) source credibility (peripheral route), information usefulness and adoption. Sussman and Siegal (2003) extended the knowledge of IAM by the information adoption process integrated with the dual process of elaboration likelihood model (ELM). Directly or indirectly on

computer-mediated forums, argument quality and source credibility get more attention to tend and determine the information whether is useful or not (Cheung et al., 2008). TRA used to explain the relationship between eWOM behavioral intentions, subjective norms and attitude that influence purchase intention, whereas the theory of planned behavior (TPB) is considered to explore the antecedents of buying behavior influenced by unexpected promotions and income shifts factors (Ajzen, 1985, 1991; Fishbein & Ajzen, 1975). Likewise, heuristic-systematic model (HSM) has heuristic and systematic information processing modes to evaluate message that refers to involve comprehensively that affect cognitive and resources efforts to understand and analyze the information. Heuristic and systematic information processing based on attitude likely to be volatile and permanent incorporate knowledge, time, opportunity and lack of motivation (Chen & Chaiken, 1999; Griffin, Neuwirth, Giese, & Dunwoody, 2002).
Recently, eWOM communication has received notable attention; however, most of the studies have examined eWOM communication effectiveness and purchasing decision process to influence the consumers. It has been observed that there is a limited literature available that has received consumers' eWOM intention, and need to know why customer spread positive eWOM or read messages via online communities and platforms. The present study tries to emphasize the gap, whether consumers depend on the exchange the information on the internet positively or not, as well as to evaluate the perspectives of input attributes that can influence on the consumer's information adoption behavior. Furthermore, this study focuses on eWOM message characteristics that explain the social phenomenon of eWOM behavior, adopted from the study of Sussman and Siegal (2003). Many of the studies have been focused on the industries of automobiles, hospitality, tourism, DVDs, movies computers software, books, digital cameras etc., however, very few studies have been examined the food product's information adoption behavior through eWOM communication (Hussain et al., 2018). So far, the current study was proposed to evaluate the input attributes on consumer's information adoption behavior for food products mediated by eWOM message characteristics from the Republic of China. Based on the literature, this study was proposed with the following objectives:-

- To analyze the key elements of consumers' intention associated with eWOM input attributes.
- To address the consumer's information adoption behavior for eWOM in online platforms.
- To examine the characteristics involved in eWOM for food product information adoption.

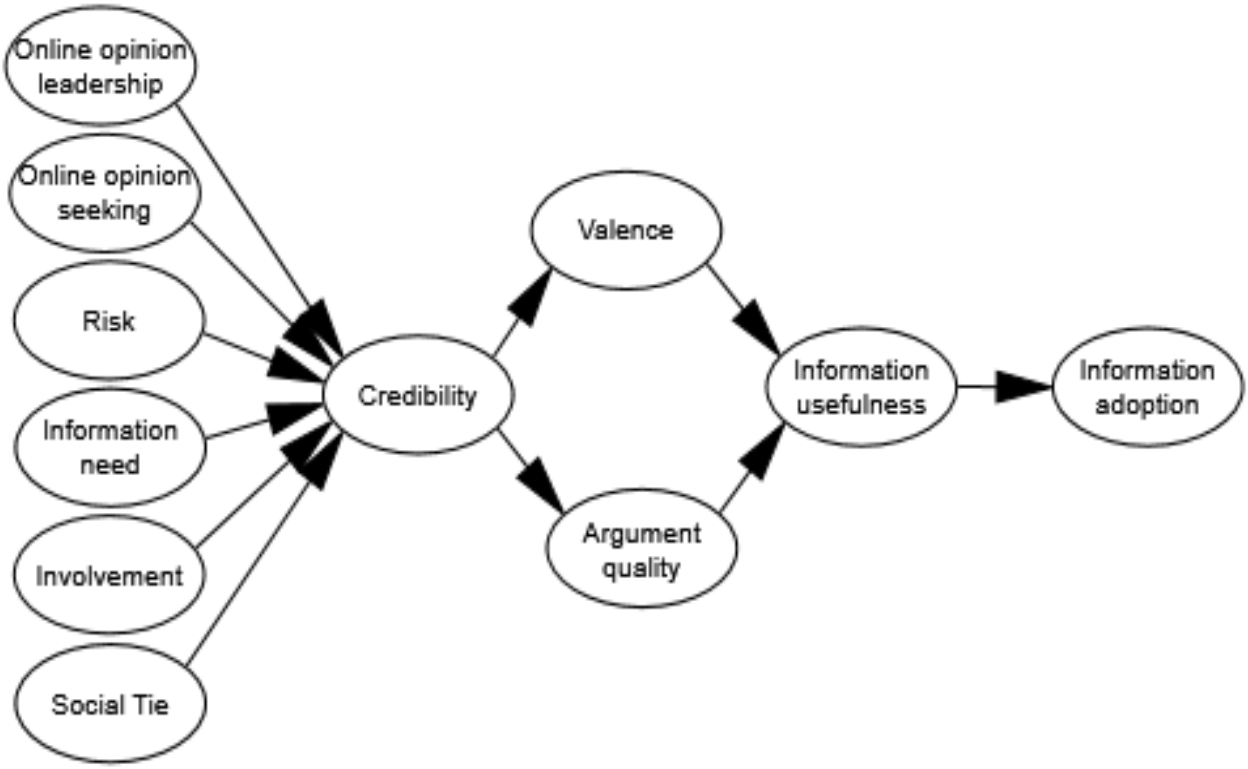


**Fig.1.** The Conceptual Model

## Methods

This study plans to examine the factors involved in eWOM input attributes that influence on consumers' information adoption behavior mediated by eWOM message characteristics for food products. The study was investigated by casual study, settled in non-contrived to minimize the interference extent. The active participants were carefully chosen from the Republic of China to examine the hypotheses of 395 samples through questionnaire method and tested nonprobability purposive technique as sample design. For the accumulation level of data, individual participants were selected as the unit of analysis, collected cross-sectional data from internet users who used online platforms to adopt the information for food products to analyze the results. The data reliability and validity were checked through SPSS Cronbach's alpha, and confirmatory factor analysis for the appropriation of multivariate data, as purposed by Thompson (2004). In this study, structural equation modeling (SEM) was used for model fitness because, SEM is being used as a technique to combine and measure complex paths models in social work research recently (Ullman & Bentler, 2003).

The eWOM input attributes variables, such as opinion leader, opinion seeker, risk, information need, social tie and eWOM involvement were measured using paradigms of Hennig-Thurau et al. (2004), Toder-Alon et al. (2014), Chu and Kim (2011), Bettman (1973), Kim et al. (2005), Sun et al. (2006), Wang et al. (2018), Khammash and Griffiths (2011), and D.-H. Park and Lee (2008). eWOM message characteristics, such as eWOM source credibility, eWOM valance, argument quality and information were measured using paradigms of Wu and Shaffer (1987), Babić Rosario, Sotgiu, De Valck, and Bijmolt (2016), Yang et al. (2012), Dellarocas, Zhang, and Awad (2007), Bailey and Pearson (1983), and Erkan and Evans (2016), whereas, information adoption was adopted from the studies of Wu and Shaffer (1987), Citrin (2002), Sussman and Siegal (2003), Erkan and Evans (2016), and Hussain et al. (2018) by using Elaboration Likelihood Model (ELM), as presented by Sussman and Siegal (2003) to analyze the consumers' engagement in food products.

## Results

To identify the demographics' information adoption behavior of internet users who read the reviews or comments before purchasing food products, descriptive analysis was directed for this research. Out of 395 respondents, forty-seven percent (185) were male, while fifty-three (210) female, 68% participants were between the age of 18 to 40 years with the highest frequency of 268 respondents. Respondents' education level from diploma/certificate to bachelor degree holders comprised 72% and totaled 284, whereas, 47 percent participants were between the monthly income of 3001-5000 RMB. A total of 91% of participants used the internet before and 09% respondents did not, whereas 89% respondents shopped online before. The monthly average of online shopping of the respondents was 1 to 5 times with the highest frequency of 252. A total of 79% of participants shopped food products online, such as baby food, grain and grain products, meat, fish, poultry, dairy products, tea, coffee, fruits and fruit products, juices, beverages, vegetables, beans, herbs, sauces, spices, vegetable oils, seasoning and others. It has been witnessed that most of the Chinese consumers prefer to read online comments or reviews before purchase.

**Table 2,** Respondents' demographic information (n=395)

| Categories | | Frequency (n) | Percentage (%) |
|---|---|---|---|
| Gender | Male | 185 | 46.8 |
| | Female | 210 | 53.2 |
| Age | 18-30 | 162 | 41.0 |
| | 31-40 | 106 | 26.9 |
| | 41-50 | 87 | 22.0 |
| | 51 and above | 40 | 10.1 |
| Education level | Higher secondary school or lower | 43 | 10.9 |
| | Diploma/Certification | 167 | 42.3 |
| | Bachelor degree holder | 117 | 29.7 |
| | Postgraduate degree holder | 83 | 21.1 |
| Monthly income | 3000 RMB or lower | 66 | 16.7 |

| | | | |
|---|---|---|---|
| | 3001-5000 RMB | 185 | 46.8 |
| | 5001- 8000 RMB | 97 | 24.6 |
| | 8001 RMB or above | 47 | 11.9 |
| Have you used the internet? | Yes | 361 | 91.4 |
| | No | 34 | 08.6 |
| Shopped online before? | Yes | 352 | 89.1 |
| | No | 43 | 10.9 |
| Monthly average | 1-5 times | 252 | 63.8 |
| | 6-10 times | 105 | 26.6 |
| | More than 10 times | 38 | 09.6 |
| Shopped online food products? | Yes | 314 | 79.4 |
| | No | 81 | 20.6 |
| Read reviews or comments | Yes | 347 | 87.8 |
| | No | 48 | 12.2 |

The psychometric properties of constructs explain the validity and reliability of the instrument. SPSS Cronbach's alpha was used to characterize the reliability of the data, used conformity factor analysis (CFA) to verify the instrument validity. The values of Cronbach's alpha (α) and variance extracted (VE) are considered acceptable with the ranges of each hypothesis such as online opinion learning (α = .964, VE= .80), online opinion seeking (α = .888, VE= .59), risk (α = .919, VE= .74), social tie (α = .921, VE= .76), information need (α = .843, VE= .58), eWOM source credibility (α = .941, VE= .72), argument quality (α = .939, VE= .70), eWOM valence (α = .932, VE= .82), information usefulness (α = .845, VE= .65), and information adoption (α = .792, VE= .65). The factor loading values of fifty-three research items indicate the instrument validity of each construct.

**Table 3,** Psychometric properties of constructs (n=395)

| Construct | Item | Factor loading | Construct | Item | Factor loading |
|---|---|---|---|---|---|
| Online opinion learning | OOL1 | .964 | Information need | IN1 | .812 |
| α = .964, AVE= .80 | OOL2 | .911 | α = .843, AVE= .58 | IN2 | .878 |
| | OOL3 | .852 | | IN3 | .689 |
| | OOL4 | .741 | | IN4 | .640 |
| | OOL5 | .951 | Credibility | CR1 | .884 |
| | OOL6 | .898 | α = .941, AVE= .72 | CR2 | .856 |
| | OOL7 | .916 | | CR3 | .967 |
| Online opinion seeking | OOS1 | .821 | | CR4 | .838 |
| α = .888, AVE= .59 | OOS2 | .906 | | CR5 | .878 |
| | OOS3 | .548 | | CR6 | .651 |
| | OOS4 | .761 | | CR7 | .819 |
| | OOS5 | .680 | Argument Quality | AQ1 | .936 |
| | OOS6 | .856 | α = .939, AVE= .70 | AQ2 | .809 |
| Risk | RIS1 | .975 | | AQ3 | .969 |
| α = .919, AVE= .74 | RIS2 | .822 | | AQ4 | .773 |
| | RIS3 | .918 | | AQ5 | .807 |
| | RIS4 | .709 | | AQ6 | .821 |
| Involvement | INV1 | .850 | | AQ7 | .696 |
| α = .917, AVE= .67 | INV2 | .945 | Valence | VAL1 | .880 |
| | INV3 | .688 | α = .932, AVE= .82 | VAL2 | .934 |
| | INV4 | .808 | | VAL3 | .906 |
| | INV5 | .755 | Information usefulness | IU1 | .820 |
| | INV6 | .853 | α = .845, AVE= .65 | IU2 | .758 |
| Social tie | ST1 | .920 | | IU3 | .833 |
| α = .921, AVE= .76 | ST2 | .937 | Information adoption | IA1 | .872 |
| | ST3 | .855 | α = .792, AVE= .65 | IA2 | .763 |
| | ST4 | .767 | | | |

Note: α-Cronbach's alpha, VE-Variance extracted

The structural model shows the relationship among the variables. The *p*-value indicated .000, because *p*-value present the appropriate assumptions for model fitness in the population perfectly (Jöreskog, 1969). The values of chi-square/*df* ranging 1 to 3 are considered acceptable, recommended by McIver and Carmines (1981), and according to fit model indices, the chi-square/*df* for this model was 2.387, which indicated better fit for the conceptual model. The benchmark values of comparative fit index (CFI) and Tucker-Lewis index (TLI) were .901and .896 are accepted, whereas, the values of goodness of fit index (GFI), and goodness of fit index (AGFI) are .778 and .757, which are slightly acceptable , additionally, the value of root mean square of approximation (RMSEA) is .059 which is accepted.

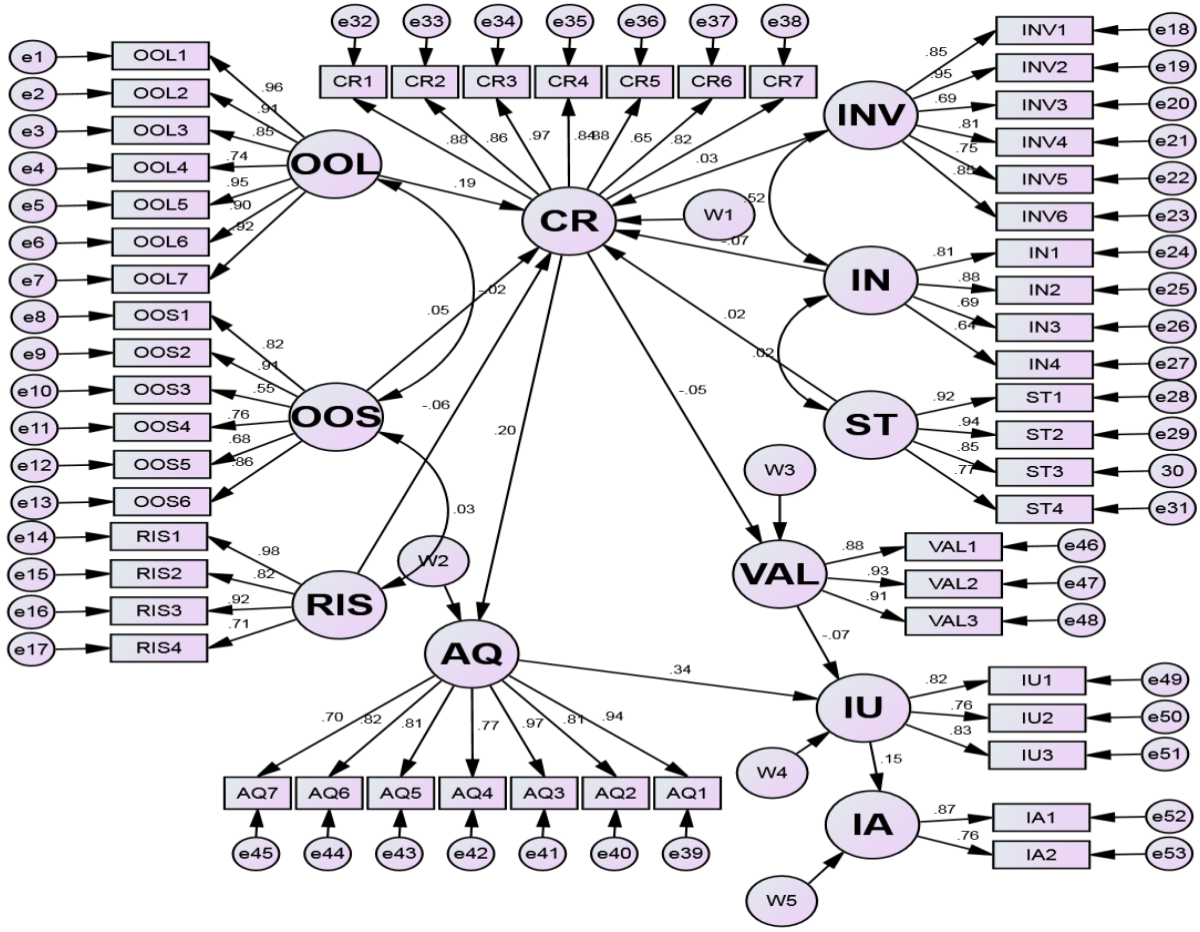


**Fig. 2.** Structural Equation Model: OOL (Online opinion leadership), OOS (Online opinion seeking), RIS (Risk), IN (Involvement), ST (Social tie), CR (Credibility), AQ (Argument quality), VAL (Valence), IU (Information Usefulness), IA (Information adoption)

The estimated weights of regression coefficient of different casual paths indicated that online opinion leadership, online opinion seeking, eWOM involvement and social tie supported eWOM source credibility with estimated value ranges of .155, .058, .045, and .021, whereas, information need and perceived risk did not support the eWOM source credibility with estimated value ranges of -.094 and -.075. eWOM source credibility hypothesis has positive influence on argument quality and negative affect on eWOM valance with estimated value ranges of .156 and -.065. Information usefulness has not been supported by eWOM valance, while, supported by argument quality, the estimated value ranges of these casual paths were -.044 and .380, information usefulness with estimated value range of .153 was supported with information adoption accordingly.

**Table 4,** The regression coefficient weights of casual paths (n=395).

| Casual Paths | | | Estimate | S.E. | C.R. | Results |
|---|---|---|---|---|---|---|
| Credibility | <--- | Online Opinion Leadership | .155 | .043 | 3.638 | Supported |
| Credibility | <--- | Online Opinion Seeking | .058 | .064 | .905 | Supported |
| Credibility | <--- | Risk | -.075 | .060 | -1.259 | Not Supported |
| Credibility | <--- | Involvement | .045 | .097 | .468 | Supported |
| Credibility | <--- | Information Need | -.094 | .085 | -1.107 | Not Supported |
| Credibility | <--- | Social Tie | .021 | .052 | .415 | Supported |
| Argument Quality | <--- | Credibility | .156 | .039 | 3.961 | Supported |
| Valence | <--- | Credibility | -.065 | .073 | -.893 | Not Supported |
| Information Usefulness | <--- | Valence | -.044 | .034 | -1.298 | Not Supported |
| Information Usefulness | <--- | Argument Quality | .380 | .061 | 6.178 | Supported |
| Information Adoption | <--- | Information Usefulness | .153 | .071 | 2.164 | Supported |

Note: S.E- Standard Errors, C.R- Critical Ratio

**Discussions**

This study revealed that the hypotheses online opinion leadership, online opinion seeking, eWOM involvement and social tie have a positive impact on eWOM source credibility are accepted, whereas, perceived risk and information need have a negative influence on eWOM source credibility. Online opinion leadership is an essential variable in an online community that consumers consider them as the first person to try food product and people regard them as a leader. Opinion leaders believe that their friends think about them as a source of information, previously, they told to their friend about food products on the internet. Comparing with another circle of friends, they feel themselves as a good online source of information for others in advice giving. Their friends tend to them influence consumers' opinions online and via emails about food products on the internet. In this study, online opinion seeking refers to tend to search for others' comments, opinions, and latest online information, seek the advice from friends through chat rooms, web reviews and via emails. Online opinion seekers consider consulting other people opinions, feel more comfortable with buying decision, seeking out positive or negative reviews about food products on websites before making the right decision. eWOM involvement supported eWOM source credibility positively because of the perspectives of the brand, product, social, economic and self-involvement. Social tie developed the strong and weak mechanism that influence on eWOM source credibility which affects consumer purchase intentions. Consumers feel that reading the reviews do not help to reduce the ambiguity, decrease the unpleasant experiences concerns, and increase the confidence while choosing the food products. In case of information need, consumers do not trust on others opinion because they consider that the desired information is not credible, accurate, convincing or strong.

The hypothesis eWOM source credibility has a negative impact on valence, whereas negative influence on argument quality. Valence varies the degree of reviews and extremity that has an adverse relationship with credibility due to negative reviews extremely or moderately towards retailers or brand websites. eWOM source credibility is an observation of receiver that believes that a number of reviews provided by popular forums and review sites are helpful in providing information, knowledge, registered reviews, evaluating the experience and usefulness. Receivers believe that trustworthiness confirms the actual level of reviews, reviewer's experience, honest reviews and reviewer's effort. eWOM source credibility refers to consumers' believe on reviewers' emotions, perception, unusual events, as well rely on reviews written by those people who are in their same gender, age, interest and the same way to buy food products.

The hypothesis valence has an adverse effect on information usefulness is not supported; whereas argument quality has a positive impact on information usefulness is supported. People prefer argument quality related to useful information because of the relevancy, appropriate, reliability, updated, necessary valued, sufficiently fulfill the desires of the reviews or comments. The degree of reviews and extremity has a weak relationship with information usefulness because people consider that the information provided by other is not informative, valuable and helpful for decision making. Lastly, the variable information adoption has positively affected by information usefulness, the reason that consumers follow the suggested opinions positively, as well as agree with suggestions as given in comments related to food products on the internet.

## Conclusion

Electronic word of mouth plays an essential role in online communities and influence on consumer's information adoption behavior. The notion of this study was to develop a theoretical framework and provide new insights into the prevailing literature on online communication. It has been observed that eWOM input attributes have influence during purchasing decisions. eWOM message characteristics contribute within the context of comments and reviews that lead to adopting the online information because of eWOM valence provided by the online communities. Based on results, it has been determined that online opinion leaders, online opinion seekers, and eWOM involvement are key elements of consumers' intention associated with eWOM input attributes. By addressing the gap, this study found that eWOM source credibility is an important characteristic of the eWOM message that involved in eWOM for online information adoption. To increase the perception of information need and social tie, marketers need to focus explicitly to develop an appropriate websites features, activities and function to attract the customers. Relevant information can increase the consumers' interest, and enhance the preferences to read the reviews effectively. The limitations are associated subject to the population used homogeneous sample from the Republic of China, and online perception about food products that can target from other products and countries as well, investigated some eWOM input attributes because of limited time and sources, while other eWOM input attributes such as uncertainty, experience, prior knowledge, information giving and information seeking can be focused on future. Furthermore, only eWOM message characteristics were focused in this study, however, eWOM information processing, eWOM system, and eWOM platforms need to compare as eWOM process attributes in future.

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