

**THE FACTORS THAT INFLUENCE BANGKOKIAN
CONSUMERS TO PURCHASE CONSUMPTION PRODUCT
FROM SMART VENDING MACHINE**



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**THE FACTORS THAT INFLUENCE BANGKOKIAN
CONSUMERS TO PURCHASE CONSUMPTION PRODUCT
FROM SMART VENDING MACHINE**

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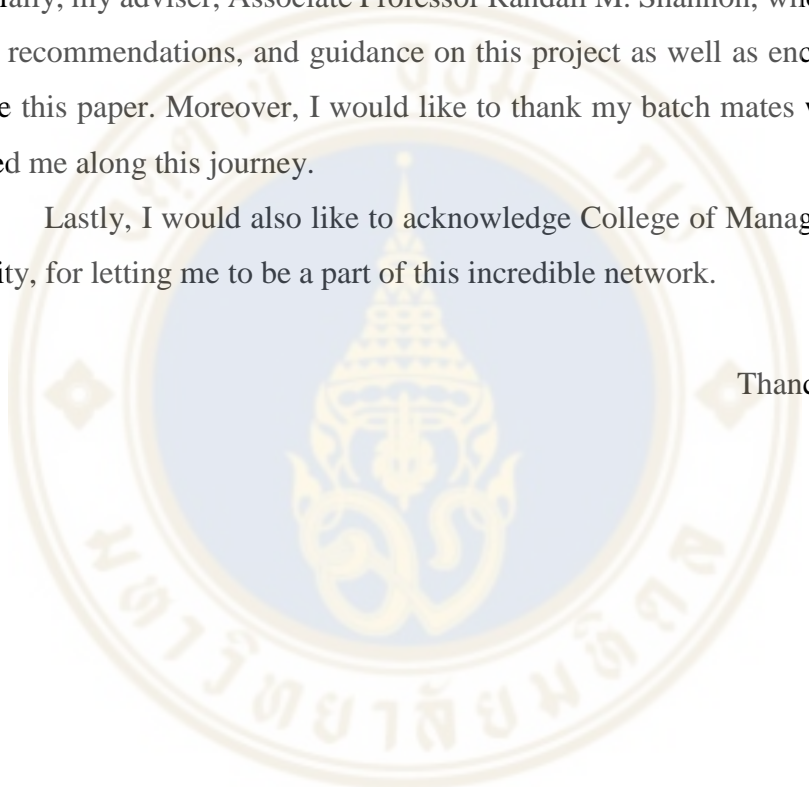
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Thanchanok Talphun

A large, faint watermark of the Mahidol University logo is centered on the page. The logo is circular with a blue background and a gold border. It features a central golden emblem of a traditional Thai stupa or chedi. The Thai text 'มหาวิทยาลัยมหิดล' (Mahidol University) is written in a circular path around the emblem.

THE FACTORS THAT INFLUENCE BANGKOKIAN CONSUMERS TO PURCHASE CONSUMPTION PRODUCT FROM SMART VENDING MACHINE

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ABSTRACT

A vending machine is an automated system that dispenses products to customers once customers input a certain amount of money into the machine. A system for vending machines using the Internet of Things (IoT) has recently been implemented. The transformation of the vending machine into a smart device is being driven by the automation of service exchange. Its digitization, which provides customers with an ever more extensive and complete service. The vending market is therefore going through an oversea change, adopting intelligent systems technology to deploy technologies to extend beyond simply dispensing food and beverages. Currently, the number of smart vending machines in Bangkok currently than there were before the pandemic, and most of them are located near workplaces, public transportation centers, and residential areas. This study aims to explore the factors that influence customers' purchasing intention in the context of perceived risk, convenience, satisfaction, and trust towards smart vending machines in Bangkok. As a result, satisfaction and trust shows an important impact on customers' purchase intention to purchase consumption product by smart vending machine. Satisfaction also displays a significant and positive influence on trust. However, convenience has the highest mean score among other variables. This research suggests stakeholders need to pay critical attention to improving the key feature of customers' satisfaction and trust from various perspectives.

KEY WORDS: Smart Vending Machine / Purchase Intention / Convenience / Consumption Product / Trust / Perceived Risk / Satisfaction

42 pages

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CHAPTER I

INTRODUCTION

1.1 Definition of smart vending machine

Vending machine is known as an electronic machine used to dispense a product to the customer once a specified amount of money has been input into the machine (Ratnasri & Sharmilan, 2021). In contrast, IJSREM Journal (2021) reported that automated machines known as vending machines distribute goods like beverages, snacks, lottery tickets, and other items. These vending machines were developed using both non-IoT and IoT approaches (Solano et al., 2017). Recently, an Internet of Things (IoT) system for vending machines has been implemented (Sai et al., 2021). The automation of service exchange is driving the evolution of the vending machine into a smart device. The obvious next stage is its digitalization, where it offers customers an even more comprehensive and extensive service. The vending market is therefore going through an overseas change, adopting intelligent systems technology to deploy technologies to extend beyond simply dispensing food and beverages (Intel Corporation, 2014).

1.2 Problem Statement

Due to the increased number of smart vending machines in Bangkok during and post the pandemic, there are smart vending machines placed close to residential areas, public transportation, or the workplace. Consequently, this could be a buffer between the marketplace and the house for the consumers to minimize the time and effort needed to purchase the consumption product. I found that there are many research studies conducting about the factors that influence customers' purchasing intention in the context of convenience, satisfaction, and trust on traditional vending machines.

However, some research was conducted a long time ago and some research was conducted in other countries. Therefore, I would like to stimulate the increase of

frequency of purchasing consumption products and perceived risk from smart vending machines among Bangkokian consumers.

1.3 Research questions

- What factors influence customers' intention to purchase consumption product in the context of smart vending machine in Bangkok?
- To what extent perceived risk and convenience to purchase consumption product in the context of smart vending machine in Bangkok?
- To what extent does customer satisfaction explain trust to purchase consumption product in the context of smart vending machine in Bangkok?

1.4 Research objectives

- To identify the significant factors for customers' intention to purchase consumption product in the context of smart vending machine in Bangkok.
- To analyze the role of perceived risk and convenience to purchase consumption product in the context of smart vending machine in Bangkok.
- To investigate the relationship between customer satisfaction and trust to purchase consumption product in the context of smart vending machine in Bangkok.

CHAPTER II

LITERATURE REVIEW

2.1 Purchase intention

Purchase intention refers to the willingness of a consumer to purchase a specific item under specific situations (Mirabi et al., 2015). Purchase intention is the possibility that consumers might make a purchase of one service or product momentarily (Ajzen et al., 1980). Purchase intention is the consequence of personal judgments made by a certain person after analyzing a product or service (Shao et al., 2004). The consumer's intention while selecting a product is influenced by a variety of elements, and the final decision is influenced by significant external influences as well. Purchase intention may be used to evaluate a customer's possibility of completing a transaction, the higher of the purchase intention, the more probably a customer became to make a purchase (Dodds et al., 1991, Schiffman et al., 2000; Malau, 2020). This illustrates why purchase intention investigates customer willingness, future intention, and repurchase intention (Rahman et al., 2012).

2.2 Perceived risk

In general, consumers do not know who the seller is (Finch, 2007), which is a concern and customers have insecurities about the product (Dunn et al., 1986). According to Adnan (2014), perceived risk has a significant negative impact on purchasing. Another study by Dash and Saji (2007) also said that an increased level of perceived risk leads to a reduced purchase intention of consumers. Additionally, there are research classification for the types of risk including with performance risk, time risk, and privacy risk as perceived risks; the risk is achievement can be the delivered products failed as providing information; the concern of time risk relates to the fact that the process of finding a product takes a lot of time; and the concern of privacy risk linked to the out of personal information drop to retailers (Driediger & Bhatiasevi, 2019).

H1: Perceived risk of smart vending machine has negatively influence on purchase intention.

2.3 Convenience

Vending machine connections have often been made for telemetry and online cashless transactions as refilling the machine on a regular basis is more efficient due to telemetry, and sales are boosted by the convenience of cashless payments for consumers (Solano et al., 2017). Also, the study of Caruso et al., (2014) reported that on a college campus, vending purchases by young adults, mainly students, were motivated solely by hunger and convenience. Importantly, many aspects of service convenience, including decision, access, transaction, benefit, and post-benefit conveniences, have been demonstrated to have a significant impact on consumers' post-purchase intentions (Mathuret al., 2016).

H2: Convenience of smart vending machine has positively influence on purchase intention.

2.4 Satisfaction

According to Lin and Lekhawipat (2014), Consumer satisfaction is a primary factor of achieving business goals due to its significant impact on customer retention. Moreover, customers expect satisfaction because it reflects a positive use of available resources and the sense of accomplishment of unfulfilled needs and wants (William et al., 1983). Furthermore, it is also stated by Oliver (1980) that customer satisfaction is defined as the fulfillment reaction from the customer when a decision has been made as to whether the good or service offers a satisfying level of consumption-related fulfillment, including levels of under- or over fulfillment.

H3: Satisfaction of smart vending machine has positively influence on trust

H4: Satisfaction of smart vending machine has positively influence on purchase intention.

2.5 Trust

Research from Aren et al., (2013) reported that trust is an important factor in both traditional and online purchasing, and it has a significant impact on consumers' purchase intentions. Because it enables customers to avoid any actions on the part of vendors, trust is essential in internet purchases. As a result, it boosts consumers' willingness to engage in purchase intention. Moreover, positive word-of-mouth has a mediating impact between both the influences of trust on consumer purchase intention. Trust has a considerably positive impact on customer purchase intention (Lin & Lu, 2010). Online transactions are more likely to be successful when there is trust involved (Lee & Turban, 2001). Likewise, Dash and Saji (2007) said, rising customers' trust generates stronger intentions to purchase.

H5: Trust of smart vending machine has positively influence on purchase intention.

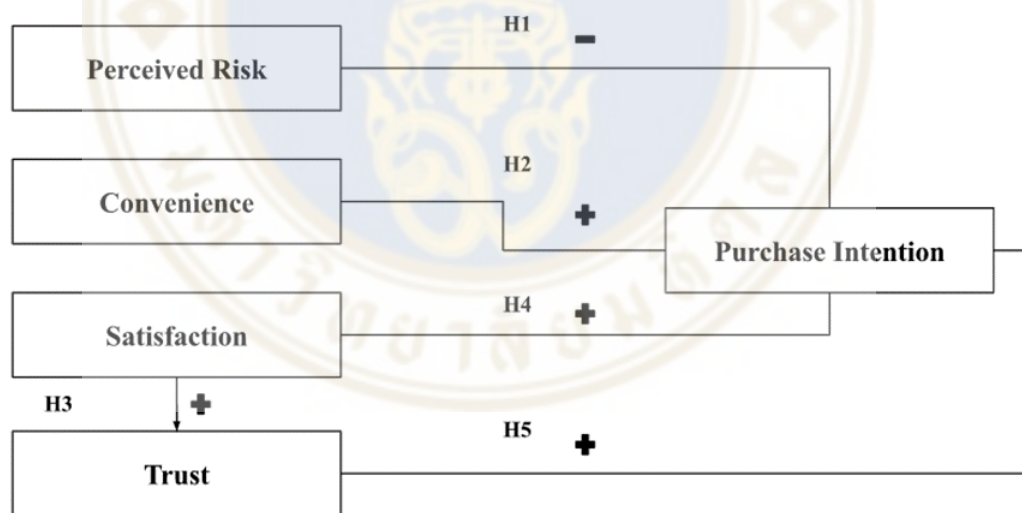


Figure 2.1 Theoretical Framework

Based on the previous studies, the figure 2.1 illustrates the constructs of each variable which the independent variables are created to be as driver (+) or barrier (-) to the one independent variable “purchase intention” of consumption products toward smart vending machine among Bangkokians.

CHAPTER III

METHODOLOGY

In this research, most of the questions are designed to obtain an analysis of the factors that influence Bangkokian consumers to purchase consumption products from smart vending machines. Therefore, the study employs quantitative methods in order to obtain the information that will make the most sense for this research project.

3.1 Quantitative approach

The quantitative information of the survey should help and understand variable relations. Also, the outcome should be useful information to the smart vending machine and retail industry to understand the factors that influence people to purchase the consumption products from smart vending machines. There are five factors in this study, namely Perceived risk, Convenience, Satisfaction, Trust, and Purchase intention. In this study, researcher plans to test two models: first, causal relationship between Perceived risk, Convenience, Satisfaction, Trust, and Purchase intention; second, causal relationship between Satisfaction and Trust.

3.2 Sampling plan

The questionnaire will be distributed to collect the samples via an online channel: Google Form, in which 100 respondents participated in the survey. The sample are people who have lived in Bangkok since last year (2021). In addition, the respondents must use any smart vending machines to ensure the purchase intention incentive; those who are over 18 years old to be considered mature enough to purchase consumption products from smart vending machines. This study screens the respondents to capture the right targets which filter out those who have not reached 18 years old yet and the people who live outside Bangkok. Another significant criterion is that this study

captures only people who are familiar with smart vending machines. After completing the screening section, then allow respondents to start the survey. In contrast, if the respondents are not match to the criteria, they are not allowed to go through this questionnaire and its end.

3.3 Questionnaire

This questionnaire survey is designed in two languages which are Thai and English. There is used as the data collection method as the questionnaire will be distributed to collect the samples via an online channel: Google Form, in which 100 respondents participated in the survey. The questionnaire is divided into four main parts: screening questions, general questions, specific questions, and demographic questions respectively. The screening section are created to screens the respondents to capture the right targets which filter out those who have not reached 18 years old yet and the people who live outside Bangkok. Another significant criterion is that this study captures only people who are familiar with smart vending machines. In other words, this study would not opt for the consumers who have not shopped through smart vending machines before. For the general section, the respondents would provide the answers of their use behaviors in smart vending machine in this part, then the survey will allow the respondents to go through the main quantitative questionnaire. In this section, the respondent can score the level for their purchase intention based on the variable from theoretical framework in the second chapter. Lastly, the demographic questions are designed for acquiring respondents' demographic information. Therefore, this quantitative information could help to understand variable relations. Also, the outcome should be useful information to the smart vending machine industry to understand the factors that influence people to purchase the consumption products from smart vending machines.

3.4 Analysis and interpretation

For data analysis, the valid sample from respondents would be decoded as a numerical data and transferred into Statistical Package for the Social Sciences Program

(SPSS) which provide the results of correlation, multiple regression, reliabilities, the statistical T-Test method, One-way ANOVA method in order to equivalence means and analyze causal relationships among each factor as well as the significant differences between variables according to the theoretical framework and testing the theoretical framework's reliability. The data then will proceed to the interpretation stage once the software had generated the quantitative results, with the objective of answering the research question and consequently defining the recommendation based on the degree of purchasing intention compared with the general use dimension.



CHAPTER IV

FINDINGS & ANALYSIS

4.1 Data collection

According to the online survey by Google form, a total of 111 samples were collected. A total of 111 samples went to the amount of 100 samples responding to the survey questions due to the screening questions filtering out the improbable targeted respondents on this study by 11 samples. The next paragraph indicates the frequency information in each demographic (gender, age range, marital status, education degree and income range) aspects.

The figure 4.1 indicates the demographic profile of respondents among 100 respondents, which 32% of the respondents were male and 68% were female.

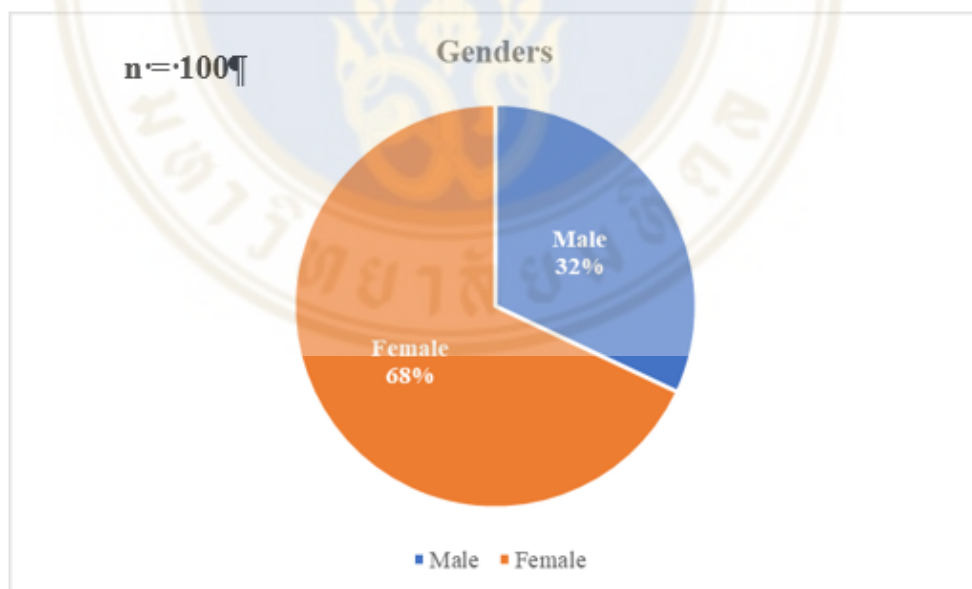


Figure 4.1 Ratio of Gender

According to the education aspect, there are four groups of education levels in this study. There is no respondent who has education level less than high school shown in this study and only 1% of respondents (1 respondent) is in the high school or

equivalent level. While the group of respondents who have bachelor degree is 77% (77 respondents), and 22% (22 respondents) of respondents is postgraduate degree.

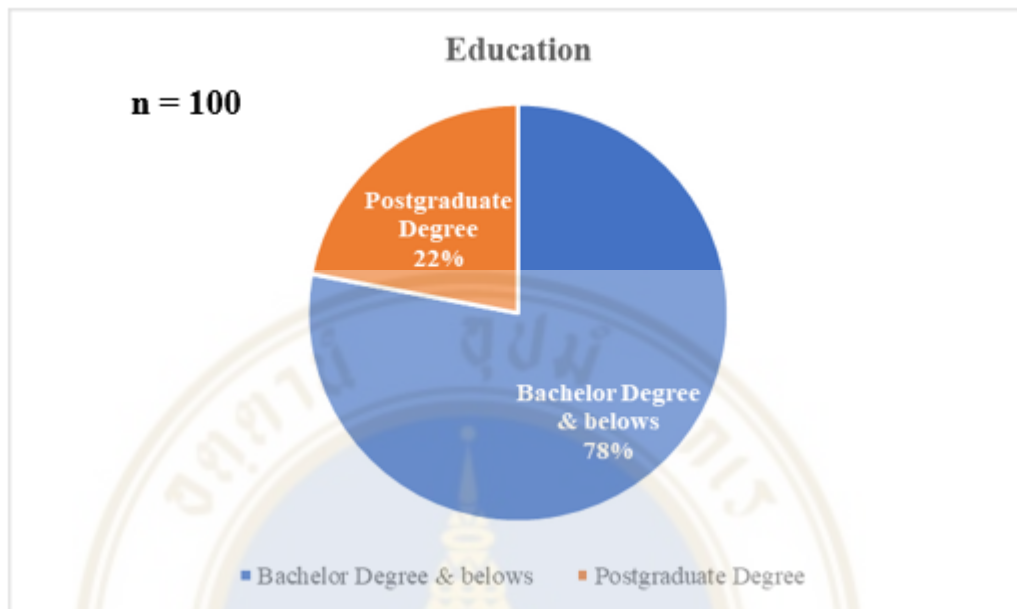


Figure 4.2 Ratio of Education Level

As the figure 4.2 illustrates the ratio of education level of respondents, it shows that the group of respondents who have bachelor degree is the largest group among others at 77% contrast with the group of less than high school and high school or equivalent which combined together as 1% of all respondents; therefore, combining these groups is necessary in order to use the data in the analysis section. The percentage of respondents that fall into bachelor degree and below category increased a from 77% to 78% (78 respondents), and 22% (22 respondents) have postgraduate degrees.

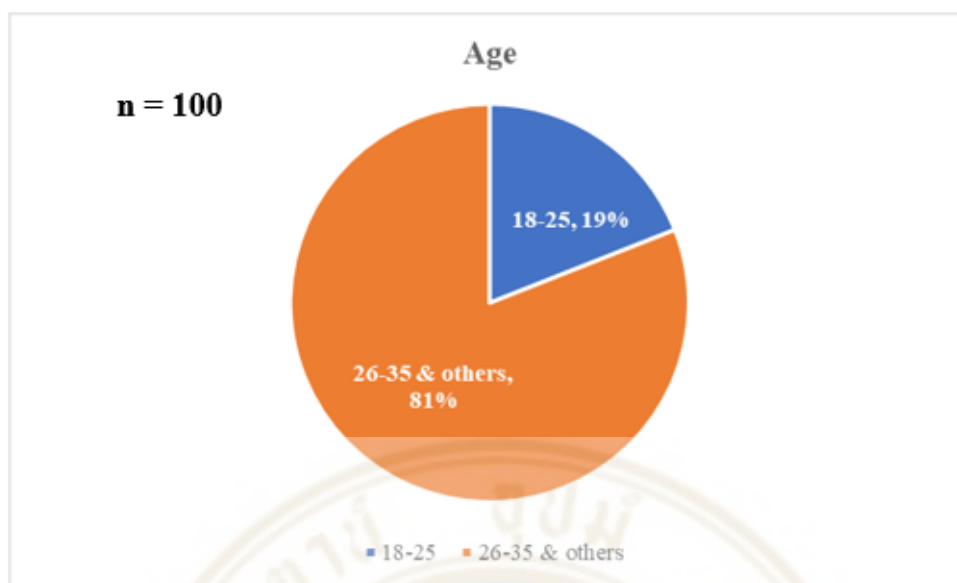


Figure 4.3 Ratio of Age

There are five groups of age range in this study, the age range begins with 18-25 years with is 19% (19 respondents), group of 26-35 years is counted by 81% (81 respondents), group of 36-45 years is only 2% (2 respondents). While the group of 46-55 years and over 55 years has no respondent shown in this study.

The ratio of age range is illustrated in the above pie chart shows that the group of respondents who have the age range between 18 to 25 years is 19% (19 respondents) while the group of 26 to 35 years is the major group among other group at 81% contrastingly with the group of 36 to 45 years which is only at 2%. As there is no respondent among the group of age range between 46 to 55 years and over 55 years; therefore, combining these groups with the majority is necessary in order to use the data in the analysis section and there is no change of percentage indicated after combining as it no respondents from those group of age range.

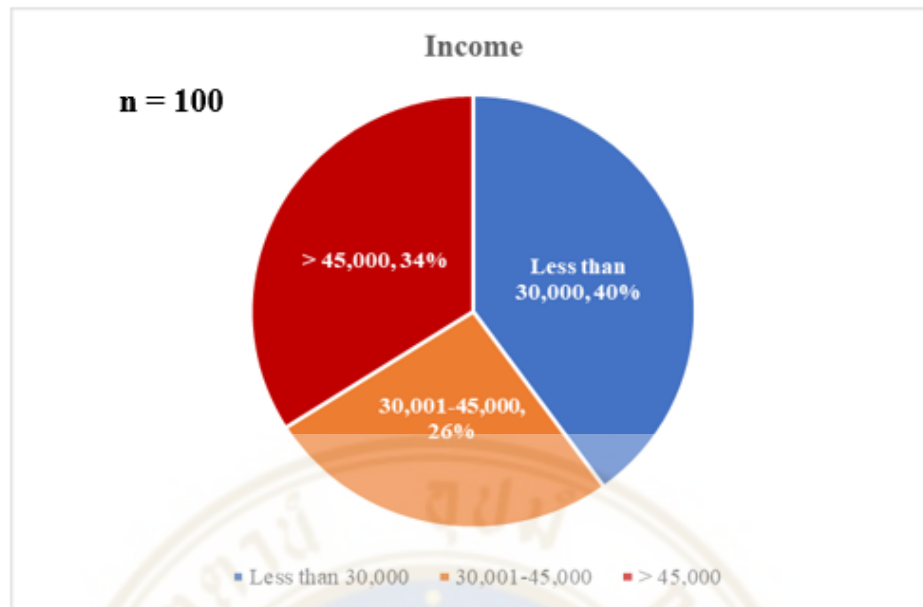


Figure 4.4 Ratio of Income

According to the figure 4.4, the pie chart presents the respondents' income levels separated into several groups: those making less than 15,000 Baht are counted at 12% (12 respondents), those making between 15,001 and 30,000 Baht are counted at 28% (28 respondents), those making between 30,001 to 45,000 Baht are counted at 26% (26 respondents), and those making more than 45,000 Baht are counted at 34%. (34 respondents).

In order to use the data in the analysis section, merging the group of less than 15,000 Baht and 15,001 and 30,000 Baht together; therefore, the group of than 15,000 Baht and 15,001 and 30,000 Baht becomes as less than 30,000 Baht which increase to 40% of respondents which is the major group in this study, followed by the group of income whose income more than 45,000 Baht which is 34% and the minor group is the income range between 30,001 to 45,000 which is 26% of respondents.

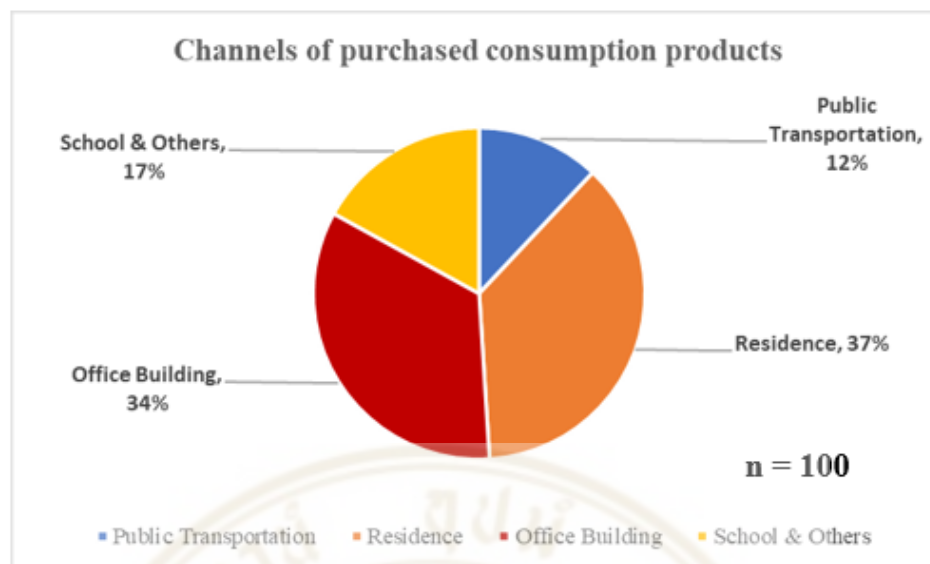


Figure 4.5 Ratio of Channels of Purchased Consumption Products by Smart Vending Machine

According to the channels of purchased consumption products by smart vending machine, there are five groups of education levels in this study. The first group is public transportation which is 12% of all respondents (12 respondents) while the group of respondents who purchased consumption products by smart vending machine at the office building is counted at 34% (34 respondents). Similarly with the group of respondents who purchased consumption products by smart vending machine at the residence is counted at 37% (37 respondents). Where school or university is at 10% (10 respondents) and other channels is at 7% (7 respondents).

As the figure 4.5 indicates the ratio of channels of purchased consumption products by smart vending machine of respondents, it shows that the group of respondents who purchased consumption products by smart vending machine at the residence is the largest group among others at 37%, following by the group of respondents who purchased consumption products by smart vending machine at the office building is counted at 34% (34 respondents). Contrastingly, the group of school or university and other channels which combined as 17% (17 respondents) of all respondents; therefore, combining these groups is necessary in order to use the data in the analysis section. The percentage of respondents that fall into the group of

respondents who purchased consumption products by smart vending machine at is public transportation is at 12% of all respondents (12 respondents).

This paragraph indicates the pie charts from general questions comprise with 2 factors which are the frequency of using of smart vending machine in a week and the brands of smart vending machine that respondents purchased consumption products.

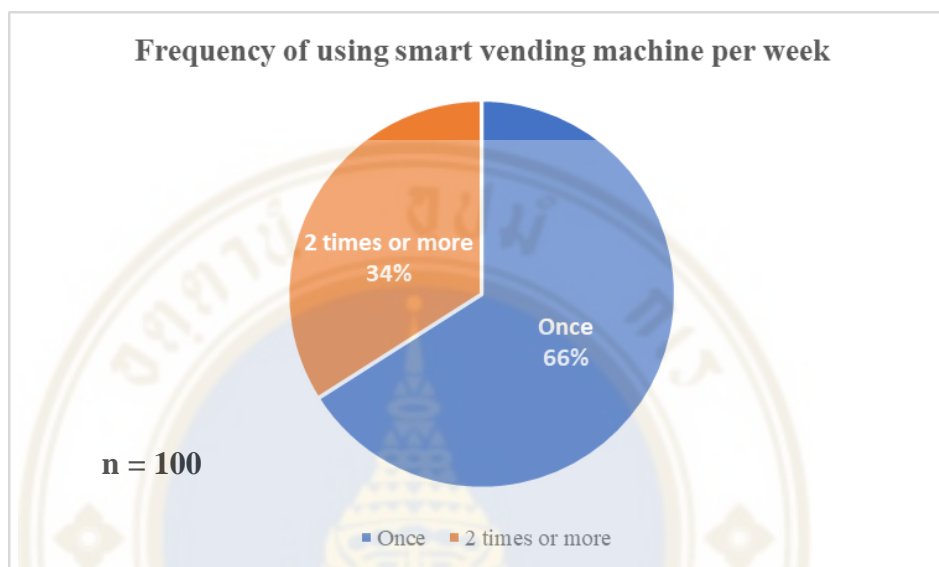


Figure 4.6 Ratio of Income

The figure 4.6 illustrates the frequency of using of smart vending machine in a week of respondents among 100 respondents, which 66% (66 respondents) of the respondents were used only once a week while and 34% (34 respondents) were used at least two times a week.

According to this aspect, there are three groups of frequency of using of smart vending machine in a week in this study. The group of respondents who purchased consumption products by smart vending machine once in a week is 66% (66 respondents), and 29% (29 respondents) of respondents used smart vending machine two or three times a week. While the group of respondents who used smart vending machine more than four time a week has only 5% (5 respondents); therefore, combining the groups of two or three time with the group of four time a week is necessary in order to use the data in the analysis section. The percentage of respondents that fall into two times or more category increased from 29% to 34% (34 respondents).

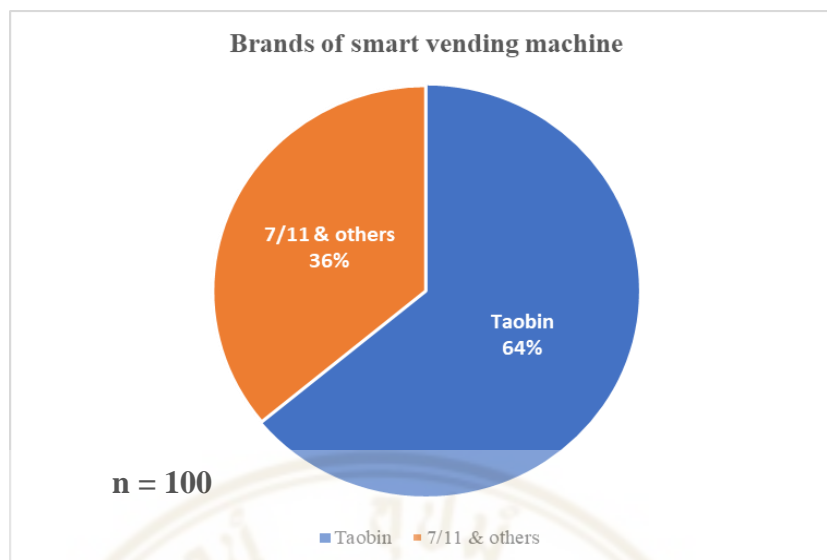


Figure 4.7 Ratio of Income

According to the brands of smart vending machine that respondents purchased consumption products, there are four groups in this study. The first group Tao Bin which is 64% of all respondents (64 respondents) while 7/11 is counted at 31% (31 respondents), and other brands is counted at 5% of the respondents (5 respondents).

According to figure 4.7, Tao Bin is the majority that respondents used to purchase consumption products which is 64% of all respondents (64 respondents). Following by 7/11 which is 11% while other brands is counted at 5% of the respondents (5 respondents). Additionally, Lotus has no respondent used to purchase consumption products; therefore, combining the groups who purchase from 7/11 with other brands is necessary in order to use the data in the analysis section. The percentage of respondents that fall into 7/11 and others category increased to 36% (36 respondents).

4.2 Questionnaire

This survey was designed to explain the purchase intention of consumers to use smart vending machine purchase consumption products in Bangkok by using both independent and dependent constructs. The independent construct consists of four constructs: Perceived risk (PR), Convenience (CN), Satisfaction (ST), and Trust (TR). The total number of questionnaires from all constructs is twenty-one questions.

Table 4.1 Questionnaire in each construct

| Construct | Items |
|---------------------------|---|
| Perceived Risk | <p>PR1: I am concerned about the error of payment transactions from smart vending machines.</p> <p>PR2: I am concerned about the quality of consumption products from smart vending machines.</p> <p>PR3: I am concerned about the wrong consumption product of dispensed products not the same as you ordered. .</p> <p>PR4: I was persuaded by surrounding people (friends, family members or closed person) to not use smart vending machines.</p> <p>PR5: I prefer to purchase consumption products from retailers rather than smart vending machine.</p> |
| Convenience | <p>CN1: I prefer to purchase consumption products from smart vending machines because it is convenient.</p> <p>CN2: The available placement of smart vending machines makes my life more convenient.</p> <p>CN3: I can get what I would like to buy impulsively from smart vending machines.</p> <p>CN4: I prefer to make the payment for smart vending machines via QR code, e-wallet, or credit card.</p> <p>CN5: Purchasing consumption products from smart vending machines helps me save time.</p> |
| Satisfaction | <p>ST1: I am satisfied with the service design of smart vending machines.</p> <p>ST2: The products provided by smart vending machines meet my expectation.</p> <p>ST3: In general, I am satisfied with the features which smart vending machines offer.</p> <p>ST4: I receive a better experience when purchasing consumption products via smart vending machine.</p> |
| Trust | <p>TR1: I always trust the accuracy of smart vending machines.</p> <p>TR2: I trust the payment system offered by smart vending machines.</p> <p>TR3: If a problem occurs, I can expect to be treated fairly by smart vending machines such as claims of damaged goods.</p> <p>TR4: I always trust the accuracy of smart vending machines.</p> |
| Purchase Intention | <p>PI1: I will use smart vending machines whenever I want to buy consumption products.</p> <p>PI2: I will encourage friends, neighbors, and family members to buy consumption products from smart vending machines.</p> <p>PI3: I will keep purchasing consumption products from smart vending machines.</p> |

4.3 Reliability test

Cronbach's Alpha is a measure of internal consistency which shows the relation of a set of items as a group that considered to be a measure of scale reliability. A Cronbach's Alpha of 0.70 and above is considered good, 0.80 and above is better, and 0.90 and above is considered best.

The data of reliabilities of all dependent constructs which aim to test the research instruments consistency, the test output displays as the table below.

According to the reliability test in the table 4.2, all dependent constructs have the Cronbach's Alpha above than 0.70 which considered as good level (Moran, 2021).

Table 4.2 Cronbach's Alpha scores of all constructs in the study

| Construct | Number of Items | Cronbach's Alpha |
|--------------------|-----------------|------------------|
| Purchase Intention | 3 | 0.78 |
| Trust | 4 | 0.75 |
| Satisfaction | 4 | 0.74 |
| Perceived Risk | 5 | 0.71 |
| Convenience | 5 | 0.71 |

4.4 Mean score of questionnaires

4.4.1 Questions

According to the study of theoretical framework, there are four independent variables which are perceived risk (PR), convenience (CN), satisfaction (ST), trust (TR), and one dependent variable which is purchase intention (PI). Table 4.3 displays the mean scores of all constructs from 100 respondents in this study.

From the total indicated questions in table 4.3, the research found that "I prefer to make the payment for smart vending machines via QR code, e-wallet, or credit card?" in terms of convenience (CN) has the highest mean score of 3.55 following by "I

prefer to purchase consumption products from smart vending machines because it is convenient?” in the same term has the mean score at 3.41.

Contrastingly, in terms of perceived risk (PR), all the questions in this term have the mean score lower than 3.00 and the lowest mean score is at 1.75 for “I was persuaded by surrounding people (friends, family members or closed person) to not use smart vending machines?”.

Table 4.3 Descriptive results of each item in every variable studied.

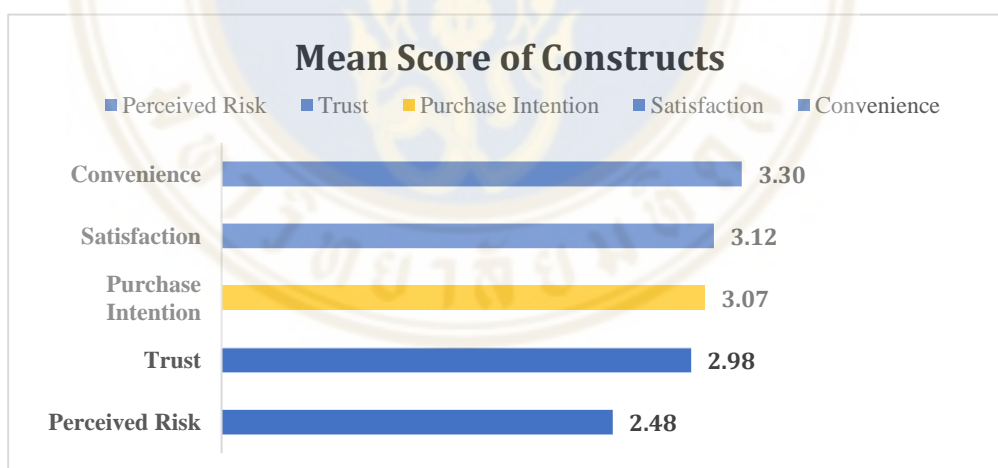
| Construct | Indicator | Mean | Std. Deviation |
|------------------|---|-------------|-----------------------|
| CN4 | I prefer to make the payment for smart vending machines via QR code, e-wallet, or credit card? | 3.55 | 0.56 |
| CN1 | I prefer to purchase consumption products from smart vending machines because it is convenient? | 3.41 | 0.60 |
| CN5 | Purchasing consumption products from smart vending machines helps me save time? | 3.36 | 0.64 |
| CN2 | The available placement of smart vending machines makes my life more convenient? | 3.34 | 0.64 |
| ST1 | I am satisfied with the service design of smart vending machines? | 3.25 | 0.48 |
| ST3 | In general, I am satisfied with the features which smart vending machines offer? | 3.24 | 0.47 |
| PI3 | I will keep purchasing consumption products from smart vending machines? | 3.20 | 0.57 |
| TR2 | I trust the payment system offered by smart vending machines? | 3.07 | 0.61 |
| PI2 | I will encourage friends, neighbors, and family members to buy consumption products from smart vending machines? | 3.05 | 0.56 |
| TR1 | I always trust the accuracy of smart vending machines? | 3.04 | 0.49 |
| ST2 | The products provided by smart vending machines meet my expectation? | 3.02 | 0.60 |
| TR4 | The smart vending machines provide safe product quality? | 3.00 | 0.53 |
| ST4 | I receive a better experience when purchasing consumption products via smart vending machine? | 2.98 | 0.64 |
| PI1 | I will use smart vending machines whenever I want to buy consumption products? | 2.95 | 0.76 |
| PR5 | I prefer to purchase consumption products from retailers rather than smart vending machine? | 2.89 | 0.87 |
| CN3 | I can get what I would like to buy impulsively from smart vending machines? | 2.84 | 0.76 |
| TR3 | If a problem occurs, I can expect to be treated fairly by smart vending machines such as claims of damaged goods? | 2.80 | 0.86 |

Table 4.3 Descriptive results of each item in every variable studied (cont.)

| Construct | Indicator | Mean | Std. Deviation |
|------------|---|------|----------------|
| PR2 | I am concerned about the quality of consumption products from smart vending machines? | 2.69 | 0.86 |
| PR3 | I am concerned about the wrong consumption product of dispensed products not the same as you ordered? | 2.62 | 0.87 |
| PR1 | I am concerned about the error of payment transactions from smart vending machines? | 2.46 | 0.81 |
| PR4 | I was persuaded by surrounding people (friends, family members or closed person) to not use smart vending machines? | 1.75 | 0.83 |

4.4.2 Factors

The below bar chart in figure 4.8, all constructs have the mean scores exceed 2.00. Convenience has the highest mean score at 3.30, following with satisfaction which the mean score is at 3.12. The dependent variable, purchase intention has the mean score at 3.07. There are two constructs that having mean score lower than 3.00 which are trust, 2.98 and perceived risk is at 2.48.

**Figure 4.8 Mean score of constructs**

4.5 T-Test analysis

The independent-samples t-test compares the means of the two groups which comparing the means of two unrelated groups on the same continuous dependent variable (Laerd Research, 2018). It is frequently used in hypothesis testing to discover whether a method or treatment legitimately has an influence on the group of interest or whether two groups are distinguishable from one another (Bevans, 2022).

4.5.1 Education

According to table 4.4, one construct of purchase intention (the statement of I will use smart vending machines whenever I want to buy consumption products) shows the difference (sig.< 0.05 in the column of Sig. (2 tailed)) between the group of respondents who has the education level at bachelor degree & below and postgraduate degree. The group of education level at postgraduate degree think that they will use smart vending machines whenever they want to buy consumption products by having a mean of 3.27 over the mean a group of bachelor degree & below which is 2.86.

Table 4.4 Education in T-Test analysis

| Variable | Attribute | Descriptive | | t-test for Equality of Means | |
|--------------------|--|---------------------------------|------|------------------------------|-----------------|
| | | What is your educational level? | Mean | F | Sig. (2-tailed) |
| Purchase Intention | I will use smart vending machines whenever I want to buy consumption products? | Bachelor degree & below | 2.86 | 0.24 | 0.02 |
| | | Postgraduate degree | 3.27 | | |

4.5.2 Frequency of purchase

As the table 4.5 shows the construct of perceived risk for the statement of concerning about the wrong consumption product of dispensed products not the same as ordered, there is the significant difference between the group of respondents who has used smart vending machine once a week and two times or more. The group who has used smart vending machine once a week having more concerned about the wrong consumption product of dispensed products not the same as they ordered which the mean is 2.76 while the group who used two times or more is 2.35. Moreover, these

groups also have a significant difference in the construct of perceived risk for the statement of preferring to purchase consumption products from retailers rather than smart vending machine. As the mean of the group who used once a week is 3.05 and the group of two times or more is 2.59.

These groups also have a significant difference in the construct of trust for the statement of trust about the accuracy of smart vending machines and the smart vending machines provide safe product quality. As the mean of the group who used two times or more is 3.24 and 3.15 while the group of once a week is 2.94 and 2.92 respectively.

Another significant difference is in the construct of Trust for the statement of purchase intention in terms of encouraging people to buy consumption products from smart vending machines and keeping purchase consumption products from smart vending machines. As the mean of the group who used two times or more is 3.26 and 3.53 while the group of once a week is 2.94 and 3.03 respectively.

Table 4.5 Frequency of purchase in T-Test analysis

| Variable | Attribute | Descriptive | | t-test for Equality of Means | |
|----------------|---|---|------|------------------------------|-----------------|
| | | How many times per week do you use a smart vending machine to buy consumption products? | Mean | F | Sig. (2-tailed) |
| Perceived Risk | I am concerned about the wrong consumption product of dispensed products not the same as you ordered? | Once | 2.76 | 1.07 | 0.03 |
| | | 2 times or more | 2.35 | | |
| | I prefer to purchase consumption products from retailers rather than smart vending machine? | Once | 3.05 | 5.65 | 0.02 |
| | | 2 times or more | 2.59 | | |
| | | 2 times or more | 3.53 | | |

Table 4.5 Frequency of purchase in T-Test analysis (cont.)

| Variable | Attribute | Descriptive | | t-test for Equality of Means | |
|--------------------|--|---|-------------|------------------------------|-----------------|
| | | How many times per week do you use a smart vending machine to buy consumption products? | Mean | F | Sig. (2-tailed) |
| Trust | I always trust the accuracy of smart vending machines? | Once | 2.94 | 4.06 | 0.01 |
| | | 2 times or more | 3.24 | | |
| | The smart vending machines provide safe product quality? | Once | 2.92 | 0.22 | 0.05 |
| | | 2 times or more | 3.15 | | |
| Purchase Intention | I will encourage friends, neighbors, and family members to buy consumption products from smart vending machines? | Once | 2.94 | 4.09 | 0.01 |
| | | 2 times or more | 3.26 | | |
| | I will keep purchasing consumption products from smart vending machines? | Once | 3.03 | 12.14 | 0.00 |
| | | 2 times or more | 3.53 | | |

4.6 One-way ANOVA analysis

In order to determine if there is statistical evidence that the relevant population means are significantly different, one-way ANOVA analyzes the means of two or more independent groups (Kent State University, 2022). According to the findings of this study, there is one statistically significant difference in the aspect of income range of respondents (less than 30,000 baht, 30,001 - 45,000 baht and more than 45,000 baht). While there is no significant difference between groups in the aspect of gender, education level, age, and channels of purchasing.

4.6.1 Income

According to the table 4.6, it indicates the significant difference (sig.<0.05 in the column of Post Hoc Tests) between the income range groups, which the result relates to two constructs of theoretical framework which are perceived risk (two attributes) and Purchase Intention (two attributes).

As the table 4.6 illustrates, the result from perceived risk shown by the group of less than 30,000 baht has higher mean scores than the group of 30,001-45,000 baht and over 45,000 baht. The mean scores of the group of less than 30,000 baht is 2.73 in the statement of concerning about the error of payment transactions from smart vending machines, while other groups have the mean scores at 2.31 and 2.26 respectively. Another result from perceived risk also has significant difference the group of less than 30,000 baht has higher mean scores than the group of 30,001-45,000 baht and over 45,000 baht as well. Due to the mean scores of the group of less than 30,000 baht is 2.13 which is the highest one when comparing with other groups in the statement of persuaded by surrounding people (friends, family members or closed person) to not use smart vending machines.

Additionally, the result from purchase intention displayed by the group of has higher mean scores than the group of less than 30,000 baht and 30,001-45,000 baht. The mean scores of the group of over 45,000 baht is 3.26 in the statement of encouraging people to buy consumption products from smart vending machines, while the group of less than 30,000 baht has the mean scores at 2.95 and the group of 30,001-45,000 baht is 2.92.

Table 4.6 Income in ANOVA analysis

| Construct | Income | | Descriptive | ANOVA | | Post Hoc Tests | |
|----------------|---|------------------|-------------|-------|------|-----------------|------|
| | | | Mean | F | Sig | Mean Difference | Sig. |
| Perceived Risk | I am concerned about the error of payment transactions from smart vending machines? | Less than 30,000 | 2.73 | 3.80 | 0.03 | 0.46029* | 0.04 |
| | | 30,001-45,000 | 2.31 | | | | |
| | | Over 45,000 | 2.26 | | | | |
| | I was persuaded by surrounding people (friends, family members or closed person) to not use smart vending machines? | Less than 30,000 | 2.13 | 7.92 | 0.00 | 0.54808* | 0.02 |
| | | 30,001-45,000 | 1.58 | | | | |
| | | Over 45,000 | 1.44 | | | | |

Table 4.6 Income in ANOVA analysis (cont.)

| Construct | Income | | Descriptive | ANOVA | | Post Hoc Tests | |
|--------------------|--|------------------|-------------|-------|------|-----------------|------|
| | | | Mean | F | Sig | Mean Difference | Sig. |
| Purchase Intention | I will encourage friends, neighbors, and family members to buy consumption products from smart vending machines? | Less than 30,000 | 2.95 | 4.08 | 0.02 | 0.31471* | 0.04 |
| | | 30,001-45,000 | 2.92 | | | | |
| | | Over 45,000 | 3.26 | | | | |

4.7 Correlation analysis

Correlation analysis is a statistical technique used in research to determine the connection between the two variables and measure the strength of their linear relationship. The amount of change in one variable as a result of the other's change is determined through correlation analysis. A high correlation indicates a strong relation between two variables, whereas a low correlation indicates a weak correlation between the two variables.

Table 4.7 The Pearson Correlation Coefficient between Independent Variables and Dependent Variable

| | | Perceived Risk | Convenience | Satisfaction | Trust | Purchase Intention |
|--------------------|---------------------|----------------|-------------|--------------|---------|--------------------|
| Perceived Risk | Pearson Correlation | 1.00 | -0.14 | -0.33** | -0.34** | -0.21* |
| | Sig. (2-tailed) | | 0.17 | 0.00 | 0.00 | 0.03 |
| | N | 100 | 100 | 100 | 100 | 100 |
| Convenience | Pearson Correlation | -0.14 | 1.00 | 0.42** | 0.28** | 0.31** |
| | Sig. (2-tailed) | 0.17 | | 0.00 | 0.01 | 0.00 |
| | N | 100 | 100 | 100 | 100 | 100 |
| Satisfaction | Pearson Correlation | -0.33** | 0.42** | 1.00 | 0.54** | 0.51** |
| | Sig. (2-tailed) | 0.00 | 0.00 | | 0.00 | 0.00 |
| | N | 100 | 100 | 100 | 100 | 100 |
| Trust | Pearson Correlation | -0.34** | 0.28** | 0.54** | 1.00 | 0.46** |
| | Sig. (2-tailed) | 0.00 | 0.01 | 0.00 | | 0.00 |
| | N | 100 | 100 | 100 | 100 | 100 |
| Purchase Intention | Pearson Correlation | -0.21* | 0.31** | 0.51** | 0.46** | 1.00 |
| | Sig. (2-tailed) | 0.03 | 0.00 | 0.00 | 0.00 | |
| | N | 100 | 100 | 100 | 100 | 100 |

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

According to the table 4.7, it shows that perceived risk has correlation with purchase intention by 0.03 which the correlation is significant at the 0.05 level whereas convenience, satisfaction, and trust has correlation with purchase intention which the correlation is significant less than 0.01 level.

Therefore, if two variables move in the same direction, there is a positive correlation between them. An increase in one variable causes the other to increase, and vice versa. However, the direction of the two variables' changes is indicated by a negative correlation between them. In both directions, as one variable increases, the other one decreases and when one variable has no impact on the other, there is no connection (weak/zero correlation).

4.8 Regression analysis

Regression analysis is running to test the causal relationships among factors. According to the conceptual framework of this study, there are a total of two models tested. The analysis refers to the theoretical framework in the second chapter which illustrates the relationship of all independent variables (perceived risk, convenience, satisfaction, and trust) to the dependent variable (purchase intention).

Model 1: Causal relationship between perceived risk, convenience, satisfaction, trust, and purchase intention.

According to the ANOVA analysis in table 4.8, the significant difference is below 0.05 (sig.=0.00), F=11.07; therefore, the model is usable, there is the casual relationship between perceived risk, convenience, satisfaction, and trust to purchase intention.

Table 4.8 ANOVA table in regression analysis (perceived risk, convenience, satisfaction, and trust)

ANOVA

| | Sum of Squares | df | Mean Square | F | Sig. |
|------------|----------------|----|-------------|-------|-------------------------|
| Regression | 8.83 | 4 | 2.21 | 11.07 | 0.00^a |
| Residual | 18.95 | 95 | 0.20 | | |

a. Predictors: (Constant), Trust, Convenience, Perceived Risk, Satisfaction

b. Dependent Variable: Purchase Intention

According to the model summary in table 4.9, it shows that all independent variables could explain the changes in overall purchase intention by 31.78% ($R^2=0.32$).

Table 4.9 Model summary in regression analysis (perceived risk, convenience, satisfaction, and trust)

Model Summary

| R | R Square | Adjusted R Square | Std. Error of the Estimate |
|----------|-----------------|--------------------------|-----------------------------------|
| 0.56 | 0.32 | 0.29 | 0.45 |

a. Predictors: (Constant), Trust, Convenience, Perceived Risk, Satisfaction

Based on the coefficient table, four factors are represented as independent variables for purchase intention, namely, perceived risk, convenience, satisfaction, and trust. The result of finding in table 4.10 shows that satisfaction is the most important factor affect the customers' purchase intention to purchase consumption products by smart vending machine which the Beta score is 0.33. In addition, trust and convenience have important factors to customers' purchase intention to purchase consumption products by smart vending machine as well which the Beta scores are 0.25 and 0.10 respectively.

Table 4.10 Coefficients Table in regression analysis (perceived risk, convenience, satisfaction, and trust)

| | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|-----------------------|------------------------------------|-------------------|----------------------------------|----------|-------------|
| | B | Std. Error | Beta | | |
| (Constant) | 0.54 | 0.54 | | 0.99 | 0.32 |
| Perceived Risk | 0.00 | 0.08 | 0.00 | -0.05 | 0.96 |
| Convenience | 0.12 | 0.11 | 0.10 | 1.04 | 0.30 |
| Satisfaction | 0.43 | 0.14 | 0.33 | 3.06 | 0.00 |
| Trust | 0.28 | 0.11 | 0.25 | 2.45 | 0.02 |

*Note: $p < 0.001$ (significant), $R^2 = 0.32$, $Adjusted R^2 = 0.29$, $F(4, 95) = 11.07$, $Sig. = 0.00$

a. Dependent Variable: Purchase Intention

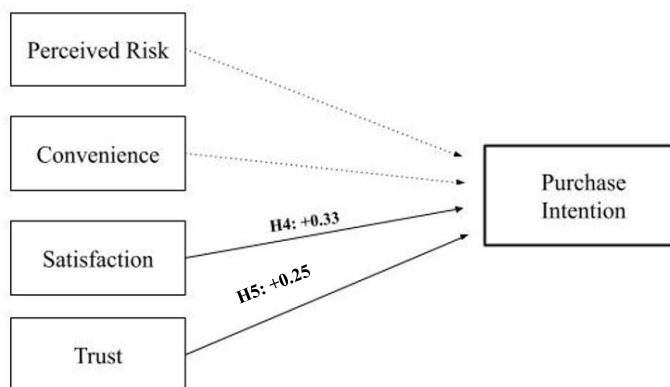


Figure 4.9 Regression model result (Purchase Intention)

Model 2: Causal relationship between satisfaction and trust

According to the ANOVA analysis in table 4.11, the significant difference is below 0.05 (sig.=0.00), $F=39.98$; therefore, the model is usable, there is the casual relationship between satisfaction and trust

Table 4.11 ANOVA table in regression analysis

| ANOVA | | | | | |
|------------|----------------|----|-------------|-------|-------------------------|
| | Sum of Squares | df | Mean Square | F | Sig. |
| Regression | 6.78 | 1 | 6.78 | 39.98 | 0.00^a |
| Residual | 16.61 | 98 | 0.17 | | |

a. Predictors: (Constant), Satisfaction

b. Dependent Variable: Trust

According to table 4.12, it shows that all independent variables could explain the changes in overall purchase intention by 28.98% ($R^2 = 0.29$).

Table 4.12 Model summary in regression analysis (perceived risk, convenience, satisfaction, and trust)

Model Summary

| R | R Square | Adjusted R Square | Std. Error of the Estimate |
|------|-------------|-------------------|----------------------------|
| 0.54 | 0.29 | 0.28 | 0.41 |

a. Predictors: (Constant), Satisfaction

As the table 4.13 displays, trust is the only factor is taken as the independent variable, which is satisfaction. The result indicates that satisfaction has a positive impact on trust (Beta=0.538; Sig.=0.000).

Table 4.13 Coefficients Table in regression analysis (satisfaction and trust)

| | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---------------------|-----------------------------|------------|---------------------------|------|------|
| | B | Std. Error | Beta | | |
| (Constant) | 1.00 | 0.32 | | 3.18 | 0.00 |
| Satisfaction | 0.63 | 0.10 | 0.54 | 6.32 | 0.00 |

*Note: $p < 0.001$ (significant), $R^2 = 0.29$, Adjusted $R^2 = 0.28$, $F(1, 98) = 39.98$, $Sig. = 0.00$

a. Dependent Variable: Trust

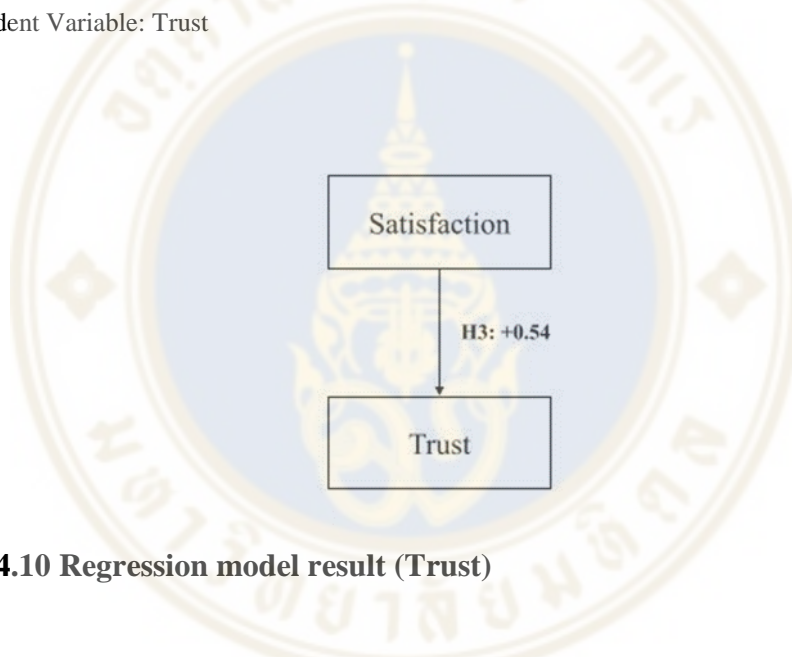


Figure 4.10 Regression model result (Trust)

As regards the figure 4.11, two independent variables (satisfaction and trust) have positive relationships on the purchase intention which satisfaction to purchase intention has Beta score at 0.33 while trust is 0.25. Also, a positive relation between satisfaction to trust which the satisfaction has the Beta score with 0.54.

Therefore, as a result from this study, satisfaction has both the most significant impact on purchase intention and trust. While perceived risk and convenience did not find the significant relationship with purchase intention.

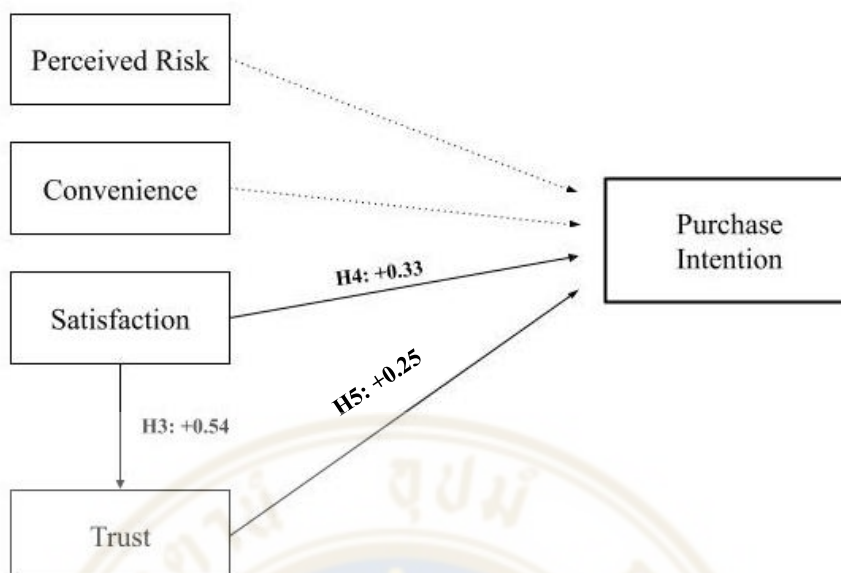


Figure 4.11 Regression model result in theoretical framework

CHAPTER V

CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusions

The three objectives of this study are to identify the significant factors for customers' intention to purchase consumption product in the context of smart vending machine in Bangkok, to analyze the role of perceived risk and convenience to purchase consumption product in the context of smart vending machine in Bangkok, and to investigate the relationship between customer satisfaction and trust to purchase consumption product in the context of smart vending machine in Bangkok. In order to develop better customer experience, which the researcher apply the quantitative method to answer the research objectives.

For the first objective, the result from regression analysis demonstrates the positive relationship between independent variables and purchase intention that satisfaction and trust have the impact on the customers' purchase intention to purchase consumption products by smart vending machine.

Perceived risk and convenience do not have the significant effect on the customers' purchase intention to purchase consumption products by smart vending machine based on regression analysis in this study. However, based on the mean scores, convenience has the highest score among other variables. As well as perceived risk, for the statement of concerning about the wrong consumption product of dispensed products not the same as ordered, there is the significant difference between the group of respondents who has used smart vending machine once a week and two times or more. Moreover, these groups also have a significant difference in the construct of perceived risk for the statement of preferring to purchase consumption products from retailers rather than smart vending machine.

According to the last objective, the relationship between satisfaction on trust, a positive relation between satisfaction to trust occurs in this study based on regression analysis. Additionally, the regression analysis indicates that satisfaction is

the most important factor affect the customers' purchase intention to purchase consumption products by smart vending machine while trust is the second important on purchase consumption products by smart vending machine respectively.

5.2 Recommendations

The researcher findings have practical implications for smart vending machine producers, retailers, suppliers, and researchers whose interested in exploring the smart vending machine market in Bangkok. The findings indicate that satisfaction positively impacts trust, also satisfaction and trust are the factors that positively impacts purchase intention. Therefore, stakeholders need to pay critical attention to improving the key feature of customers' satisfaction and trust from various perspectives.

Primarily, smart vending machine producer should take care of payment systems, accuracy of dispensed products as well as the quality of the products. The consumers have concerns when using the smart vending machine for online payment transaction, so a dependable payment system may alleviate the concerns. Besides, perhaps a reliable system can influence consumers to have more frequency of using smart vending machine to buy consumption products as now the majority group of respondents use only once a week. Furthermore, more optional of products plus with a well checking for the products inside the machine may increase the satisfaction and trust of customers when using smart vending machine. Additionally, improving the accessibility of smart vending machine also can increase the purchase intention towards consumers at the last point. Then, quick response to the flawed and problematic product is another issue that requires the smart vending machine producer to consider improving the customers' satisfaction.

Furthermore, the retailers have to offer quality products to the customers, and the products should be aligned with the visual version from the advertisement and the one that was placed in retail market. The consistency of the product between visual product and physical version impacts customer satisfaction significantly.

The suppliers which are the origin of production line by manufacturing consumption products and transport these consumption products for retailers and smart vending machine producers. Hence, the suppliers need to maintain the production

quality, and excellence transportation. These reasons aim to maintain the quality products which need to be delivered for the retailers and smart vending machine producers, the process could help smart vending machine producers and retailers to avoid the risk such as faulty products which reduce the aspect of product quality concerns and significantly impacts customer satisfaction.

Significantly, based on the academic perspective, satisfaction is the most significant factor that impact on customers' intention to purchase consumption product in the context of smart vending machine in Bangkok. The researcher can explicitly explore the factors of satisfaction in the future by expanding the location a crossing Thailand which it could indicate more significant impact on customers' intention to purchase consumption product in the context of smart vending machine among people who live in Thailand, or re-test the model's constructs with a bigger sample size.

5.3 Limitation and future research

Even the recommendations were dedicatedly developed, there are some limitations in this study and a gap of knowledge that further research can be conducted. Firstly, the researcher encountered unexpected survey errors during online fielding. As a result, instead of having more samples which will make the conclusion firmer, few samples can be used to draw an analysis which reduces the degree of reliability of this research.

Additionally, this research is conducted in a limit of time which causes the researcher to be able to launch the survey in an online format only which the researcher cannot have large sample size. Therefore, it has the potential to increase some biases which the researcher suspect that the results can be contrasting to a certain extent when the sample size of respondents is larger.

In terms of future research, to expand the sample size and location of respondents to be larger would be more benefit for smart vending machine producers, retailers, suppliers, and researchers whose interested in exploring the smart vending machine market in Thailand. As well as, specifically in one certain product category that selling in smart vending machine might impact on a certain result such as the significant

factors for customers' intention to purchase household remedy product in the context of smart vending machine in Thailand.



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APPENDIX A: Questionnaire

This questionnaire survey is a part of my postgraduate degree study from Marketing Management, College of Management Mahidol University. The purpose of this study is to examine the factors that influence Bangkokian consumers to purchase consumption products from smart vending machines. Your responses will be anonymous and will be confidential for this study only. Your participation is greatly appreciated, thank you for your time and responses.

*** This survey would take time to complete approximately 5 minutes.

Section 1: Screening Questions

1. Have you lived in Bangkok in the last year (2021)?
 - Yes (please go to 2)
 - No (you can stop doing this questionnaire)
2. Are you 18 years old or above?
 - Yes (please go to 3)
 - No (you can stop doing this questionnaire)
3. Have you ever used a smart vending machine to purchase consumption products?
 - Yes (please go to 4)
 - No (you can stop doing this questionnaire)

Section 2: General Questions

1. How many times per week do you use a smart vending machine to buy consumption products? (Please select one answer)
 - Once a week
 - 2-3 times a week
 - More than 4 times a week
2. Which smart vending machine have you used to buy consumption products the most in the past 6 months? (Please select one answer)
 - 7/11
 - Lotus
 - Tao Bin
 - Others, please specify.....

Section 3: The factors that influence Bangkokian consumers to purchase consumption products from smart vending machines.

Please indicate your level of agreement on each of the following statements.

- 4 means Strongly Agree
- 3 means Agree
- 2 means Disagree
- 1 means Strongly Disagree

| 1. Perceived Risk | Strongly Agree 4 | Agree 3 | Disagree 2 | Strongly Disagree 1 |
|---|-----------------------------|--------------------|-----------------------|--------------------------------|
| 1.1 I am concerned about the error of payment transactions from smart vending machines. | | | | |
| 1.2 I am concerned about the quality of consumption products from smart vending machines. | | | | |
| 1.3 I am concerned about the wrong consumption product of dispensed products not the same as you ordered. | | | | |
| 1.4 I was persuaded by surrounding people (friends, family members or closed person) to not use smart vending machines. | | | | |
| 1.5 I prefer to purchase consumption products from retailers rather than smart vending machine | | | | |
| 2. Convenience | | | | |
| 2.1 I prefer to purchase consumption products from smart vending machines because it is convenient. | | | | |
| 2.2 The available placement of smart vending machines makes my life more convenient. | | | | |
| 2.3 I can get what I would like to buy impulsively from smart vending machines. | | | | |
| 2.4 I prefer to make the payment for smart vending machines via QR code, e-wallet or credit card. | | | | |
| 2.5 Purchasing consumption products from smart vending machines helps me save time. | | | | |

| | Strongly Agree 4 | Agree 3 | Disagree 2 | Strongly Disagree 1 |
|---|---------------------------------|--------------------|-----------------------|------------------------------------|
| 3. Satisfaction | | | | |
| 3.1 I am satisfied with the service design of smart vending machines. | | | | |
| 3.2 The products provided by smart vending machines meet my expectation. | | | | |
| 3.3 In general, I am satisfied with the features which smart vending machines offer. | | | | |
| 3.4 I receive a better experience when purchasing consumption products via smart vending machine. | | | | |
| 4. Trust | | | | |
| 4.1 I always trust the accuracy of smart vending machines. | | | | |
| 4.2 I trust the payment system offered by smart vending machines. | | | | |
| 4.3 If a problem occurs, I can expect to be treated fairly by smart vending machines such as claims of damaged goods. | | | | |
| 4.4 The smart vending machines provide safe product quality. | | | | |
| 5. Purchase Intention | | | | |
| 5.1 I will use smart vending machines whenever I want to buy consumption products. | | | | |
| 5.2 I will encourage friends, neighbors and family members to buy consumption products from smart vending machines. | | | | |
| 5.3 I will keep purchasing consumption products from smart vending machines. | | | | |

Section 4: Demographic Questions

1. What is your gender?

- Male
- Female
- Others

2. What is your educational level?

- Less than high school
- High School or equivalent
- Bachelor Degree
- Postgraduate Degree

3. How old are you?

- 18-25
- 26-35
- 36-45
- 46-55
- Over 55

4. What is your monthly income?

- lower than 15,000 THB
- 15,001 - 30,000 THB
- 30,001 - 45,000 THB
- More than 45,000 THB

5. Channels of purchased consumption products from smart vending machines?

- Public Transportation (BTS, MRT, Airport Link, Airport)
- Office Building
- School or University
- Residence
- Others, please specify.....