

CAUSAL MODEL OF FACTORS INFLUENCING ONLINE FOOD
ORDERING IN THAILAND



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แบบจำลองเชิงสาเหตุของปัจจัยที่มีอิทธิพลต่อการสั่งอาหารออนไลน์
ในประเทศไทย



นางสาวชิตชนก อินทอง

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิศวกรรมศาสตรดุษฎีบัณฑิต
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ชิตชนก อินทอง : แบบจำลองเชิงสาเหตุของปัจจัยที่มีอิทธิพลต่อการสั่งอาหารออนไลน์
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คำสำคัญ: ความตั้งใจเชิงพฤติกรรม/ทัศนคติของผู้บริโภค/แอปพลิเคชันสั่งอาหาร/ความเหมาะสม
ระหว่างงานและเทคโนโลยี/การวิเคราะห์โมเดลสมการโครงสร้าง/การวิเคราะห์ทุกกลุ่ม/
แบบจำลองทางเลือกเรียงลำดับ/การศึกษาความแตกต่างของปัจจัย

ปัจจุบันปฏิเสธไม่ได้ว่าการสั่งอาหารออนไลน์เป็นหนึ่งในบริการหลักสำหรับผู้ใช้งานจำนวนมาก โดยเฉพาะช่วงโควิด-19 ทำให้ผู้บริโภคหันมาใช้บริการสั่งอาหารออนไลน์มากขึ้น เพราะพฤติกรรมต้องปรับให้เข้ากับสถานการณ์ปัจจุบัน จึงเน้นศึกษาปัจจัยที่จะทำให้ผู้บริโภคมีแนวโน้มใช้บริการสั่งอาหารออนไลน์มากขึ้น และทำให้ผู้ประกอบการตระหนักถึงปัจจัยที่จะส่งเสริมให้ผู้บริโภคใช้บริการมากขึ้น การทบทวนวรรณกรรมเพิ่มเติม พบว่า มีติสำคัญที่เกี่ยวข้องกับการสั่งอาหารออนไลน์ผ่านแพลตฟอร์มหากศึกษาจะส่งผลให้รับรู้ถึงปัจจัยที่จะส่งผลต่อพฤติกรรมผู้บริโภคไม่อาจจะเป็นปัจจัยใดที่มีความสำคัญต่อการใช้บริการผู้บริโภค นอกจากนี้ ยังได้ศึกษาความแตกต่างในการใช้บริการระหว่างชายและหญิง รวมทั้งการศึกษาความแตกต่างระหว่าง Generation X และ Y และประเด็นสุดท้ายมีการศึกษาปัจจัยที่ส่งผลต่อแรงจูงใจในการใช้บริการ ผลการศึกษาเผยให้เห็นมิติที่สำคัญห้าประการของการศึกษารังนี้ ดังนั้น จึงแบ่งการศึกษาออกเป็น 5 ข้อสรุป ดังนี้

การศึกษาที่ 1: เพื่อวิเคราะห์พฤติกรรมผู้บริโภคต่อการสั่งอาหารออนไลน์ วัดโดยผู้ใช้สั่งอาหารออนไลน์ในรูปแบบของตัวแปรแฝง และใช้แบบจำลองสมการโครงสร้างเพื่อวิเคราะห์ความสัมพันธ์ เช่น ผู้ใช้บริการเพศหญิง ผู้ใช้บริการอายุ 21-30 ปี อาชีพพนักงานบริษัท ทัศนคติของผู้ใช้บริการ บรรทัดฐานส่วนตัว การรับรู้ถึงความสะดวกในการใช้งาน การรับรู้ถึงประโยชน์ความเหมาะสมกับงานและเทคโนโลยี ซึ่งอาจส่งผลให้ผู้ที่มีแนวโน้มที่จะสั่งอาหารออนไลน์มากขึ้น

การศึกษาที่ 2: เพื่อใช้ Multi Group Analysis เพื่อศึกษาความแตกต่างระหว่างกลุ่มชายและหญิง อันเป็นผลมาจากลักษณะพฤติกรรมที่ต่างกัน การศึกษานี้มีวัตถุประสงค์เพื่อศึกษาความแตกต่างระหว่างพฤติกรรมผู้บริโภคชายและหญิงให้มั่นใจนโยบาย กลยุทธ์การส่งเสริมการตลาดที่แตกต่างกัน ในการศึกษานี้ใช้การวัดความแปรปรวนเพื่อเปรียบเทียบความแตกต่างระหว่างผู้ใช้งานชายและหญิง ผลปรากฏว่าทั้งสองเพศมีความแตกต่างกัน

การศึกษาที่ 3: การวิเคราะห์ปัจจัยที่ส่งผลต่อแรงจูงใจในการสั่งอาหารนำไปสู่การกำหนดกลยุทธ์ที่มีประสิทธิภาพเพื่อเพิ่มผู้ใช้ แอปพลิเคชันสั่งอาหารออนไลน์คือการกำหนดขีดจำกัดของขีดจำกัด ขีดจำกัดคงที่ของแบบจำลองความน่าจะเป็นที่สั่งแบบเดิม ดังนั้น เกณฑ์สุ่มแบบลำดับชั้น

โพรบิตส์อาหารพร้อมพารามิเตอร์สุ่มจึงถูกนำมาใช้ในการวิเคราะห์ข้อมูล ผลการศึกษาพบว่าทัศนคติ ความเพลิดเพลิน ความไว้วางใจ และการรับรู้ถึงความสะดวกในการทำงานสามารถสรุปได้เป็น ข้อเสนอแนะเชิงนโยบายและกลยุทธ์เพื่อเพิ่มแรงจูงใจให้ผู้บริโภคใช้แอปสั่งอาหาร

การศึกษาที่ 4: เพื่อใช้ Multi Group Analysis เพื่อศึกษาความแตกต่างระหว่างกลุ่ม Generation X และ Y อันเป็นผลมาจากลักษณะพฤติกรรมที่ต่างกัน การศึกษานี้มีวัตถุประสงค์ เพื่อศึกษาความแตกต่างระหว่างพฤติกรรมผู้บริโภค Generation X และ Y ให้มีนโยบาย กลยุทธ์การส่งเสริมการตลาดที่แตกต่างกัน ในการศึกษาครั้งนี้ใช้การวัดความแปรปรวนเพื่อเปรียบเทียบความแตกต่างระหว่างผู้ใช้ Generation X และ Y ผลการวิจัยพบว่าทั้งสองรุ่นมีความแตกต่างกัน

การศึกษาที่ 5: เพื่อวิเคราะห์ปัจจัยที่มีอิทธิพลต่อพฤติกรรมผู้บริโภคต่อการสั่งอาหารออนไลน์ วัดโดยผู้ใช้สั่งอาหารออนไลน์ในรูปแบบของตัวแปรแฝง และใช้แบบจำลองสมการโครงสร้าง เพื่อวิเคราะห์ความสัมพันธ์ เช่น ผู้ใช้บริการเพศหญิง ผู้ใช้บริการมีอายุ 21-30 ปี อาชีพพนักงานบริษัท ความคาดหวังด้านประสิทธิภาพ ความคาดหวังของความพยายาม ความเคยชิน แรงจูงใจด้านอารมณ์ และปัจจัยความสนุกสนาน ซึ่งอาจส่งผลให้ผู้บริโภคมีแนวโน้มที่จะสั่งอาหารออนไลน์มากขึ้น



มหาวิทยาลัยเทคโนโลยีสุรนารี

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ปีการศึกษา 2565

ลายมือชื่อนักศึกษา จิราภรณ์ อินทวง

ลายมือชื่ออาจารย์ที่ปรึกษา ✓

CHIDCHANOK INTHONG : CAUSAL MODEL OF FACTORS INFLUENCING ONLINE
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Presently, it is undeniable that online food ordering is one of the primary services for many users, especially during Covid-19; it has led more consumers to turn to online food ordering services because their behavior needs to be adjusted in line with the current situation. Therefore, the focus is to study the factors that will make consumers more likely to use online food ordering services and make entrepreneurs aware of the factors that will encourage consumers to use more services. More the literature review found that the important dimensions related to online food ordering through the platform, if studied will result in recognizing factors that will affect consumer behavior, whether any factors are important to the use of consumer services. In addition, the difference in service usage among males and females was studied. Including the study of differences between Generation X and Y, and the last point, there was a study of factors affecting motivation for using the service. The study's results revealed five important dimensions of this study. Therefore, the study was divided into five conclusions as follows:

Case Study No.1: To analyze consumer behavior toward online food ordering. It was measured by online food ordering users in the form of latent variables, and Structural Equation Modeling was used to analyze the relationship, for example, female service users. The service users are 21-30 years old-occupation of company employees. Service user attitude, subjective norms, perceived ease of use, perceived usefulness, task-technology fit. This may result in users being more likely to order food online.

Case Study No.2: To use Multi Group Analysis to study the differences between male and female groups. as a result of different behavioral characteristics. This study

aims to study the differences between male and female consumer behavior to have a policy. Different Marketing Promotion Strategies The variance measure was used in this study to compare the differences between male and female users. The results showed that the two sexes were different.

Case Study No.3: To analyze the factors affecting motivation for ordering food, which leads to an effective strategy formulation to add users. An online food ordering application was to determine the fixed limits of the fixed thresholds limitation of the traditional ordered probability models, so a random thresholds hierarchical ordered probit model with random parameters was used for data analysis. The study found that attitude, enjoyment, trust, and perceived ease of use can be summarized as policy recommendations and strategies to increase motivation for people to use food-ordering apps.

Case Study No.4: To use Multi Group Analysis to study the differences between Generation X and Y groups. as a result of different behavioral characteristics. This study aims to study the differences between Generation X and Y consumer behavior to have a policy. Different Marketing Promotion Strategies The variance measure was used in this study to compare the differences between Generation X and Y users. The results showed that the two generations were different.

Case Study No.5: To analyze the factors influencing consumer behavior toward online food ordering. It was measured by online food ordering users in the form of latent variables, and Structural Equation Modeling was used to analyze the relationship, for example, female service users. The service users are 21-30 years old. -occupation of company employees. Performance expectancy, effort expectancy, habit, hedonic motivation, and playfulness factor. This may result in users being more likely to order food online.

School of Mechanical Engineering
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Student's Signature Farhan Othman
Advisor's Signature [Signature]

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CHAPTER 1

INTRODUCTION

1.1 The rationale for the research

1.1.1 Background

In an era where the Internet uses an increasingly important role in daily life (Internet World Stats, 2021), our current world has become an online world. Alternatively, The Internet has brought many things to life, while it is rapidly gaining acceptance from the general public for its convenience and speed (Akroush and Al-Debei, 2015, Jiang et al., 2013, Verkijika, 2018) for Thailand, it found that in 2018, Thais used the Internet on average for 10 hours and 5 minutes per day, an increase of 3 hours and 30 minutes from the last year. Social Media (96.3%), email receiving-sending (74.2%), searching for information (70.8%), watching TV, and video clips, 60.7% listening to music online, and shopping online (51.3 percent), respectively. It found that Thai people have changed through various activities. More online systems include hotel reservations, ticket purchase payment of goods and services, and food ordering services. 69.1% of Thais order food online, compared to 30.9% offline, compared to 2017, where the proportion was 52.5% online versus 47.5% offline, demonstrating the popularity of deli food. Very rising As a result, the food delivery business in the past five years has grown continuously at an average rate of 7.7% per year, increasing in value from 23,640 million baht in 2014 to 31,814 million baht in 2018. (Food Intelligence Center Thailand, 2019)

Electronic Transactions Development Agency (ETDA), Ministry of Digital Economy and Society, a survey of online behavior on the use of online food ordering services of Thai people to study customers' behaviors. Moreover, reasons for ordering food online found that Gen-Y used the service the most at 51.09%, followed by Gen-X, Baby Boomer, and Gen-Z, respectively, and the reason for using food ordering services through the platform. (Electronic Transactions Development Agency, 2020)

Covid-19 virus outbreak and the need for the Thai government to take drastic measures to temporarily lock down or limit business services. Including the restaurant business that is left with only take-home channels and food delivery to the accommodation via apps. It has become an essential channel for both restaurant business operators and customers. As a result, in the first half of 2020, the quantity of food orders to accommodation via apps has grown by approximately 150% compared to last year. For the direction of the food delivery business to the accommodation market for the remainder of this year, 2020, after the Covid-19 outbreak has resolved and the restaurant business is back open for business. As a result, the density of food orders to accommodation is lower than during the COVID-19 outbreak. However still higher than before the outbreak of COVID-19 (But if the situation of COVID-19 In the country, there has been an outbreak again. there is a chance that the transaction will increase). As a result, for the whole year 2020, Kasikorn Research Center views the number of food delivery times will be 66- 68 million times, or a high growth of 78.0-84.0% compared to the last year, it is a rapid growth rate (Kasikorn Research Center, 2020). This corresponds to the Bank of Thailand's information that many people must change their behavior to work from home. to avoid the spread of the epidemic. Many people change their shopping habits. The shift towards more digital services business In-app purchases are quick and easy. Operators are also increasing their services through these platforms. It is an opportunity to grow digital service businesses such as e-commerce, parcel and online food delivery, especially it has grown more than 3 times compared to the same period last year. This exponential growth is shown in google's trend for e-commerce and logistic search queries, including parcel and online food delivery. (Bank of Thailand, 2020)

Kasikorn Research Center survey found that 63% of the respondents thought that having food ordering through an app made them it more and eat out less, with 88% ordering food through an app. The main contributing factor is promotions and discounts. However, the survey shows that some consumers still prefer dining at restaurants. A third of the respondents thought the restaurant still needed to expand for speed and support for a more significant number of customers.

In addition to online shopping expanding rapidly, Ordering food online or food delivery has a high growth trend. According to the report of "Kasikorn Research Center" estimates that "Food Delivery" in 2019 is worth about 33,000 - 35,000 billion baht, growing 14% from the previous year, which accounts for about 8% of the value of Thailand's restaurant business in 2019, Over the past five years, there has a growth of about 10%, which is more than the restaurant business that has grown 3-4%.

Ray et al. (2019) Food delivery application is an emerging online mobile technology. Which divides the pattern into two types The first type of restaurant is KFC, Domino's, and Pizza hut, among others. The second type has intermediaries or third parties forming apps such as Uber Eats, Zomato, and Baidu Waimai, which are popular and widely recognized. Roh and Park (2019), Yeo et al. (2017) A study was conducted on customers' experiences, attitudes, and behavioral intentions toward online food ordering services. The results showed that customers have a positive attitude towards ordering food online through food ordering platforms, making them more likely to continue using the service. Zhao and Bacao (2020) Studied factors contributing to customers' continued use of food ordering apps during the COVID-19 pandemic. The results showed that satisfaction is the most important factor, followed by task-technology fit, trust, performance expectancy, and social influence, it affects the use of food-ordering platforms. Troise et al. (2020) Studied investigated online food delivery services and behavioral intentions using TAM and TPB theories. Subjective norms have a more significant impact on behavioral purposes than attitudes. The credibility and perceived risks associated with COVID-19 have different effects.

In addition, sustainable development is designed to meet the needs of today's generations without compromising the ability to respond to the needs of the next generation. There are 3 main components: economic growth, social inclusion, and environmental protection. This research responds to the Sustainable Development Goals: Decent Work and Economic Growth– The market for online food ordering is growing. Moreover, as a result, the economy continues to grow. Responsible consumption and production—Online production— Online food ordering is highly responsive to consumers because they can order anywhere, anytime. As a result, the

business is sustainable, following the SDGs and master plans under the national strategy.

This study examines the factors affecting the use of online food ordering services via a collaborative study based on Technology Acceptance Model, Theory of Planned Behavior, and Task-Technology Fit, as well as studies on the behavior of differences in male and female groups. A study of factors affecting motivation for using a food ordering app based on Random thresholds random parameters hierarchical ordered probit, a study of differences in the behavior of Generation X and Generation Y groups, and a study of factors influencing online food ordering behavior. These previous research reviews have not looked at these issues, and the Human Research Ethics Committee has approved this research at Suranaree University of Technology (COE No.81/2563).

From the research results, platform business owners can use the results to develop a food ordering platform to meet the needs of service users. Whether developing applications to be accessible or not complicated will make consumers use the service even more. In addition, service providers can use the results to develop a marketing plan and improve the platform following the service usage behavior of both male and female consumers, including Generation X and Generation Y. The behavior of most customers prefers to ordering food via the Internet. Therefore, government agencies or relevant agencies should bring. The results of this research will be used to formulate policies to facilitate the purchase of goods in the digital marketing system.

1.1.2 Factor affecting customer behavioral intentions toward online food ordering

Tandon et al. (2021) Explore consumer perspectives on why they use an online food ordering service via platform. The study found that there are supporting factors related to consumer value theory, Visibility factors, and consumer attitude factors. Troise et al. (2020) Studied the behavior of customers using online food ordering services. The supporting factors were attitude, perceived behavioral control, subjective norms, perceived usefulness, perceived ease of use, convenience, diversity, and trust. Yeo et al. (2017) Studied the behavior of consumers using online food ordering services. The supporting factors were attitude, comfort, and benefits after the

use. Lee et al. (2017) Studied the factors influencing behavioral intentions in using food delivery apps. The supporting factors were attitude, perceived usefulness, and perceived ease of use. Zhao and Bacao (2020) Studied the factors contributing to customers' continued use of food delivery apps during the COVID-19 pandemic. Supporting factors include performance expectancy, effort expectancy, social influence, trust, task-technology fit, and satisfaction. This study the factors affecting the use of online food ordering services via the apps by studying the theory of technology acceptance, theory of planned behavior, and task-technology fit. The research resulted in business owners using the results to develop the platform to meet users' needs. Whether developing applications to be accessible and not complicated to use will make consumers turn to use more services.

1.1.3 Differential between male and female

Study of factors affecting behavioral intention in online food ordering in Thailand. The data on the factors affecting the use of consumer services will be analyzed by using Multi Group Analysis to study gender differences as the central theme of this research. To examine the differences between males and females contributed to the different online food ordering behaviors of various factors. The researchers found no studies on online food ordering via food ordering platforms using Multi Group Analysis. Many previous studies have used Multi Group Analysis to analyze consumer behavior. The masculine and feminine aspects found that the two societies differed. For example, Uttra et al. (2020) Studied explaining gender differences in motorcycling behavior. Chawla and Joshi (2020) Studied the adoption of mobile wallets to study the part of sex and age. McLaughlin et al. (2020) Studied gender differences using online auctions. This affects the understanding of user behavior of online food ordering apps. This study examined the behavioral differences among males and females who used online food ordering services. Based on previous research reviews, no studies have been conducted on this subject. The research results have led business owners to develop a platform to meet the needs of both male and female consumer groups.

1.1.4 Influencing behavior intention of ordering food online

Study the factors affecting behavioral intention in ordering food online in Thailand by analyzing the factors affecting the service consumption of consumers using Unobserved Heterogeneity Modeling to study the difference of factors affecting the consumers' behavioral intentions in ordering food online. For this reason, the researchers used random parameters formulation to identify criteria differences and unobserved variations. Which, if considered, may lead to consistency. Biased and ineffective predictors and the probabilistic outcome estimation are only correct for some. In particular, at the intermediate category level, (Greene and Hensher, 2010) assess the statistical benefit of a presented approach to the results of a hierarchical probit model random parameter stochastic parameter. Compared to traditional hierarchical probit and random parameters and random thresholds ordered probit, Many previous studies have found that using the random parameter principle makes reserved predictions more accurate than fixed parameters. It can also analyze the complexity of parameter estimation (Fountas and Anastasopoulos, 2017, Jin et al., 2021) that affects the understanding of user behavior of online food ordering apps. This study examines factors affecting motivation to use food ordering apps by using random parameter principles to examine factors affecting motivation to use the service. Based on previous research reviews, no studies have been conducted on this subject. This research has enabled operators to develop a platform that is easy to use and prevents crashes during use. Moreover, it protects the personal information of users.

1.1.5 Differential between Generation-X and Generation-Y

Study factors affecting behavioral intention in ordering food online in Thailand by using the data in the section on factors affecting the service consumption of consumers by using Multi Group Analysis to study differences in generations as an issue. This research aims to examine the differences between Generation X and Generation Y support to various factors' different online food ordering behavior. The researchers found no studies on online food ordering via food ordering platforms using Multi Group Analysis. Many previous studies have used Multi Group Analysis to analyze consumer behavior. Previous research has suggested that generation differences arise

as people develop their social identities regarding technological developments and other important social events. (Canova et al., 2020) Although every generation has different shopping objectives, every generation looks for payment security, easy interaction, and transparent promotions. Moreover, customer service is always the most important thing for every customer. This study examined the different behaviors of Generation X and Generation Y groups using online food ordering services. Based on previous research reviews, no studies have been conducted on this subject. The results of this research have enabled platform business owners to develop platforms to meet the needs of both groups of users.

1.1.6 Factor affecting consumer behavioral intentions toward online food ordering: An extension of the UTAUT2 framework with a playfulness factor

Alalwan (2020) Studied the factors that continuously affect customer satisfaction and service use. The study found that there are supporting factors: performance expectancy, facilitation conditions, hedonic motivation, habit, online review, online status notification, and satisfaction. Zhao and Bacao (2020) Studied the factors contributing to consumers' continued use of food ordering apps during the COVID-19 pandemic. Supporting factors include performance expectancy, effort expectancy, social influence, trust, task-technology fit, and satisfaction. Agarwal and Sahu (2021) Continue to study the forecast of intention to use online food ordering services. The contributing factor is the delivery experience, time-saving, performance expectancy, effort expectancy, facilitation conditions, economy, habit, hedonic motivation, and satisfaction factors. Study the factors influencing the behavior of customers using online food ordering services using Modified Unified Theory of Acceptance and Use of Technology (UTAUT2) with the addition of fun factor. No studies have been done on this subject from the previous research review. The research results have enabled the platform owner to develop the platform according to the users' needs, whether the food received should be precise as stated. Including food prices should be reasonable, causing consumers to perceive that it is not worth the amount they have to pay.

1.2 Purpose of the research

1.2.1 To study the factors influencing the behavioral intentions of Thai people in using online food delivery platforms

1.2.2 To study the factors affecting consumer behavior in ordering food online (Male and Female)

1.2.3 To study the factors affecting the motivation to order food using the app

1.2.4 To study the factors affecting consumer behavior in ordering food online (Generation-X and Generation-Y)

1.2.5 To study the influence on behavioral intentions of Thai people in using an online food ordering platform

1.3 Scope of the research

1.3.1 Study only for people who use food ordering apps Food panda and Grab Food in Thailand

1.3.2 Study of the behavior of consumers using a gender-based food ordering application

1.3.3 Study the appropriate statistical models to identify factors affecting motivation for ordering food using the app.

1.3.4 A study of the behavior of consumers using a generation-based food ordering application

1.4 Research questions

1.4.1 What factors affect the behavioral intentions of Thai people to use online food delivery platforms?

1.4.2 Are there different factors affecting the behavioral intentions of males and females to use online food delivery platforms? What factors affect user behavior? Moreover, are there any differences between males and females?

1.4.3 What factors influence your motivation to order food using the app?

1.4.4 Are there different factors affecting the behavioral intentions of Generation X and Generation Y to use online food ordering platforms? What factors

affect user behavior? Moreover, are there any differences between Generation X and Generation Y?

1.4.5 What factors influence the behavioral intentions of Thai people to use online food delivery platforms?

1.5 Contribution of the research

1.5.1 The discovery of factors affecting the behavior of consumers using online food ordering services.

1.5.2 This policy is designed to address the factors affecting the behavior of male and female consumers using online food ordering services.

1.5.3 The results of the study can be used to motivate them in a positive direction to use the app., which consists of Developing a food ordering app that is easy to understand or may need to be promoted for use guarantee ease with just a few clicks. The operator should have a policy to prevent errors arising from the use and conceal the user's personal information.

1.5.4 This policy is designed to address the factors affecting the behavior of Generation X and Generation Y consumers using online food ordering services.

1.5.5 The discovery of factors influencing the behavioral intentions of Thai people to use online food delivery platforms

1.6 Organization of the research

This research examines factors affecting behavioral intentions in using online food ordering services. It consists of a total of 7 chapters, with details as follows.

Chapter I: Mentioned about the background of the study, research objectives, research boundary, and the expected benefits.

Chapter II: Study factors that affect the behavioral intention to use online food ordering services were analyzed using a structural equation model.

Chapter III: Study factors affecting behavioral intention in using online food ordering service using Multi Group Analysis to compare different types of factors affecting males and females

Chapter IV: Study factors that affect motivation to order food online

Chapter V: Study factors affecting behavioral intention in using online food ordering service using Multi Group Analysis to compare different types of factors affecting Generation X และ Generation Y.

Chapter VI: Study factors influencing the behavioral intentions of Thai people in using online food delivery platforms.

Chapter VII: A summary of the study as well as propose guidelines for entrepreneurs and related agencies.

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CHAPTER 2

EXPLORING FACTORS AFFECTING CONSUMER BEHAVIORAL INTENTIONS TOWARD ONLINE FOOD ORDERING IN THAILAND

2.1 Abstract

Due to the COVID-19 epidemic, ordering food online has become very popular. This study used a structural equation model to analyze the indicators that influence the decision to order food through a food-delivery platform. The theory of planned behavior and the technology acceptance model were both used, along with a new factor, the task-technology fit (TTF) model, to study platform suitability. Data were collected using a questionnaire given to a group of 1320 consumers. The results showed that attitudes toward on-line delivery most significantly affected the behavioral intentions of the consumers, followed by subjective norms. Among attitudes, perceived ease of use was the most significant, followed by perceived usefulness and trust. The study's results revealed that TTF had the most significant impact on perceived ease of use, followed by perceived usefulness. This means that, if a food-ordering platform is deemed appropriate, consumers will continue to use it, and business sustainability will be enhanced.

2.2 Introduction

The Internet has generated such convenience and speed (Internet World Stats, 2021) to our lives that our world has become an online world. In other words, the acceptance and use of the Internet is pervasive (Martínez-Domínguez & Mora-Rivera, 2020; Schehl, Leukel, & Sugumaran, 2019; Verkijika, 2018). In 2018, Thais used the Internet on average 10 h and 5 min per day, an increase of 3 h and 30 min over the previous year. The five most popular Internet features were social media (96.3%), email (74.2%), information searching (70.8%), TV, other video entertainment, and music (60.7%) access, and shopping (51.3%). In addition, Thais completed more tasks online

(69.1%), such as reserving hotel rooms, purchasing tickets, and paying for goods and services—including food delivery—compared to completing just 30.9% of these tasks offline. In 2017, the proportions were 52.5 and 47.5%, respectively. From 2014 to 2018, the Thai food-delivery business experienced average an annual growth of 7.7%, rising in value from THB 23,640 million to THB 31,814 million (Food Intelligence Center Thailand, 2019).

After the COVID-19 outbreak, Thai authorities imposed drastic measures, that included temporarily shutting down or restricting businesses. Restaurants were only allowed to sell food for takeout or delivery. In the first half of 2020, home delivery via on-line platforms increased by about 150% over the previous year. After the pandemic abated and restaurant dining resumed, the volume of home delivery food was not as high, but still higher than before the pandemic—66–68 million deliveries—for an annual growth of 78.0–84.0% (Kasikorn Research Center, 2020a). Because the purchase of goods through apps is so fast and easy, online purchases also represent a growth opportunity for digital service businesses, such as food and parcel delivery. In particular, online food delivery increased more than three times compared to the same period of the previous year, a trend that is reflected in the use of Google to search for e-commerce and logistics, parcel delivery, and online food delivery (Bank of Thailand, 2020).

Additionally, the food-service industry experienced growth amid the pandemic and associated lockdowns. In Thailand and elsewhere, the number of restaurants, couriers, and customers joining these platforms in 2020 increased dramatically. As a result, food-delivery platforms worldwide became more profitable (Economic Intelligence Center, 2021).

From a review of the literature, most studies on online food delivery through applications focused on marketing mix, service satisfaction, and application selection factors: drone food delivery (Hwang & Kim, 2019), channels that affect the intent to use food-delivery platforms (Taiwan) (Yen, 2022), consumer innovation motivations in drone food delivery before and after the outbreak (Choe, Kim, & Hwang, 2021), online food delivery (Bangladesh) (Saad, 2020), psychological advantages of using greener drone food-delivery services (Hwang, Cho, & Kim, 2019), customer satisfaction and continued

intention to order online (Alalwan, 2020), predicting online food-delivery satisfaction and intention (Annaraud & Berezina, 2020), comparison of food-delivery services and customer preferences (Chandrasekhar, Gupta, & Nanda, 2019), gaps in behavioral control, trust, and satisfaction in organic food consumption (Sultan, Tarafder, Pearson, & Henryks, 2020), risks of drone food delivery before and after the pandemic (Choe et al., 2021), anti-innovation perspectives related to food-ordering apps (Kaur, Dhir, Ray, Bala, & Khalil, 2020), the use of drone food delivery services (Hwang, Kim, & Kim, 2019), food ordering from fast-food restaurants (China) (Akram, Ansari, Fu, & Junaid, 2020), sustainable digital food purchasing (Fuentes, Cegrell, & Vesterinen, 2021), web mining to evaluate the effect of food-delivery ordering on the consumer (Correa et al., 2019), eco-friendly and value-model drone food-delivery service, scrutinizing product involvement (Hwang, Kim, & Kim, 2020), application aesthetics in the use of a food-ordering application (Kumar, Jain, & Hsieh, 2021), the role of a food-ordering application in developing satisfaction and brand loyalty during the pandemic (Dirsehan & Cankat, 2021), and the behavioral intent of using food-delivery apps (Muangmee, Kot, Meekaewkunchorn, Kassakorn, & Khalid, 2021) and food delivery during the pandemic (Kumar & Shah, 2021).

There have also been studies on the technology adoption model (TAM) examining customer attitudes regarding ordering food online (Song, Ruan, & Jeon, 2021), factors influencing the intent to use food delivery apps (Lee, Lee, & Jeon, 2017), reasons why consumers purchase food through a food-delivery application (Tandon, Kaur, Bhatt, Mäntymäki, & Dhir, 2021), acceptance of purchasing clothing via mobile devices (China) (Chi, 2018), attitudes and intentions of customers using smartphone chatbots for shopping (Kasilingam, 2020), the TAM for mobile health care (Rajak & Shaw, 2021), online shopping behaviors of middle-aged adults (Law, Kwok, & Ng, 2016), willingness of young consumers to purchase environmentally friendly products in developing countries (Yadav & Pathak, 2016), consumer attitudes and intentions toward healthy food (Norway) (Nystrand & Olsen, 2020), healthy food purchase intentions (Korea), including the behavior of consumers toward buying organic milk (Carfora et al., 2019), online food delivery using the TAM and the technology process and business (TPB) theory (Troise, O'Driscoll, Tani, & Prisco, 2020), the differences between

Generation Y males and females regarding online auctions by applying TPB theory (McLaughlin, Bradley, Prentice, Verner, & Loane, 2020), and the role of social distancing in mobile shopping acceptance (Lhuillier, 2022) using both the TAM and TPB.

This study used TPB, TAM, and TTF theories to evaluate consumers using online food ordering services. From the review of the past research, it was found that no re-researchers have conducted studies using all three theories; TPB and TAM have been studied together, but both of these methods only study consumer behavior. Therefore, this research further studies the TTF theory to determine whether or not the online food ordering application is suitable for online food ordering services. In this regard, entrepreneurs can use the research results to develop strategies to continuously encourage consumers to use the service. No research had been conducted on the use of TTF with the TAM and TPB. Research related to TTF for ordering food through apps has been concerned with the repeated use of food-delivery apps (Zhao & Bacao, 2020), consumers' attitudes and behavior toward Internet-enabled TV shopping (Wagner, Schramm-Klein, & Steinmann, 2017), and extending the TAM-TTF theory through the application of telematics (Chen, 2019). The three studies found that the TTF factor provided positive research results. Companies that operate a food-ordering application platform can apply our results to develop policies related to consumer demand. If more consumers turn to online food-ordering, such companies will generate more sales. A review of the research into food delivery and sustainable development goals found that consumer behavior studies are still in the early stages (e.g., there was not much use for drone food delivery. As a result, business owners were required to do a significant amount of marketing (Lin, Marjerison, Choi, & Chae, 2022). The article "Supply Chain Sustainability During COVID-19: Last Mile Food Delivery in China" analyzed factors affecting consumer acceptance for sustainability in business operations (Filippini, 2021), specifically, the last mile of online food delivery on the Glovo platform.

The research question for this study concerned factors affecting consumer behavioral intention of online food ordering in Thailand. For this evaluation, we used data collection and statistical model development. Section 2 is a literature review. Section 3 describes the research and methodology. Section 4 presents our findings.

Section 5 is the discussion. Section 6 outlines our conclusion. Section 7 describes the limitations of our research.

2.3 Literature Review

2.3.1 Definitions about Food Delivery through Apps

Food-delivery apps are a part of a technology change known as “digital disruption.” They not only change consumer behavior, but also change restaurant business operations. In addition, they play an important role in expanding the food-delivery business. From 2014 to 2018, the average annual growth rate was around 10%, which is only 3–4% higher than the overall average annual restaurant growth rate (Kasikorn Research Center, 2020b).

Food-delivery apps (FDAs) are an emerging online to offline (O2O) mobile technology that mediates between catering organizations and customers through online ordering and offline delivery services. FDAs are classified into two types (Ray, Dhir, Bala, & Kaur, 2019): chain restaurants, such as KFC, Domino’s, and Pizza Hut, where customers can order online; and third-party platforms, such as Uber Eats, Zomato, and Baidu Waimai. (Roh & Park, 2019).

According to Wang (Wang, Ou, & Chen, 2019), “Mobile food ordering apps are mobile apps that users can download and use as a convenient way to access restaurants, view menus, order and pay without interacting with restaurant staff.”

2.3.2 Theory of Planned Behavior (TPB)

TPB is a behavioral science theory that predicts and analyzes individual behavior (Ajzen, 1991). It was developed from the theory of reasoned action (TRA) by Fishbein and Ajzen. It describes human behavior based on the premise that human beings are logical, use information systematically, and consider consequences before deciding to perform an action (Ajzen, 1980).

However, Ajzen (1991) found that the TRA is of limited use for predicting behaviors over which an individual has incomplete volitional control. He or she is unable to decide whether to perform an action that requires other opportunities or resources, such as money, time, skills, or cooperation from others. In 1985, Ajzen proposed the TPB, which differed from the TRA by adding perceived behavior control.

The theory further explained that individuals plan their behaviors, and that successful achievement results from the intent to control factors that obstruct behavior. Most behaviors are under volitional control, which consists of three factors: attitude, subjective norms, and perceived behavioral control.

Tandon, Kaur, Bhatt, Mäntymäki, and Dhir (Tandon et al., 2021), and Troise, O'Driscoll, Tani, and Prisco (Troise et al., 2020) confirmed the studies which showed that the main predictor of a customer's attitude toward online food delivery was behavioral intention toward online shopping. Several studies highlighted the use of apps to buy food and the importance of attitude (ATT) in explaining behavioral intention (BI) (Al Amin, Arefin, Alam, Ahammad, & Hoque, 2021; Cho, Bonn, & Li, 2019; Gárdan et al., 2021; Hwang, Choe, Choi, & Kim, 2021; Hwang & Kim, 2019; Hwang, Kim, et al., 2019; Kang & Namkung, 2019). These factors were used to develop the following hypothesis:

Hypothesis 1 (H1). Attitude positively influences the behavioral intention to order food online.

The subjective norm (SN) is "the perception of social pressure to act or not to take action" (Ajzen, 1991). It is also a factor related to using FDAs (Roh & Park, 2019). The researchers found a significant positive correlation between SN and BI in food-delivery services and online shopping (Kim & Hwang, 2020; Roh & Park, 2019; Troise et al., 2020). Thus, the second hypothesis is stated as follows:

Hypothesis 2 (H2). The subjective norm positively influences the behavioral intention to order food online.

According to the TPB model, perceived behavioral control (PBC) may also influence BI (Ajzen, 2002). PBC is defined as "a subjective level of control over the effectiveness of behavior itself." Various studies have confirmed that PBC is a relevant factor in BI to order food online. For example, one study revealed the importance of considering PBC in BI analysis to buy food online (Troise et al., 2020). Thus, the third hypothesis is stated as follows:

Hypothesis 3 (H3). Perceived behavioral control positively influences the behavioral intention to order food online.

In TPB, SN is the primary factor of ATT. When customers recognize that

their friends, family, and other related parties have a positive attitude toward online food ordering, they will be more willing to receive such food. Several studies have found that this relationship is important for the acceptance of online or mobile food purchases (Kim & Hwang, 2020; Troise et al., 2020). Thus, the fourth hypothesis is stated as follows:

Hypothesis 4 (H4). Subjective norms positively influence attitude toward ordering food online.

2.3.3 Technology Acceptance Model

Customers accept emerging technologies in a variety of ways (Gössling, 2021). The TAM, adapted from the TRA, is a well-known theory that researchers use to describe behavioral intention, and it can be used to study information technology acceptance.

The TAM is a factor that determines each individual's perception of how information and communications technology (ICT) helps contribute to improving operational efficiency and directly affects the BI for repeated use. The TAM can provide in-sight into the acceptance of technology for its functions and the usefulness of ICT. Many previous studies considered the factors influencing consumers' attitudes toward ordering food online. For example, the authors of (Song et al., 2021) analyzed customer attitudes in the process of food-delivery application, and Davis (Davis, 1985) identified two principles of cognitive response for predicting ATT: perceived ease of use (PEOU) and perceived usefulness (PU). According to Davis (1989), PEOU is "the degree to which an individual believes the use of a particular system will be effortless." For FDAs, this refers to factors influencing behavioral intentions to use a food-ordering app, and to choose an FDA (Gârdan et al., 2021; Lee et al., 2017). PU, in this case, refers to the perceived usefulness of apps for food ordering (Gârdan et al., 2021; Troise et al., 2020). Therefore, we proposed the following hypotheses:

Hypothesis 5 (H5). Perceived ease of use positively influences the attitude toward ordering food online.

Hypothesis 6 (H6). Perceived usefulness positively influences the attitude toward ordering food online.

Several scholars have shown that trust (TR) influences ATT, and trust in the mobile app is a crucial factor in O2O commercialization in food delivery (Kang & Namkung, 2019). It showed that TR influenced ATT in the same way that the study in (Troise et al., 2020) confirmed these results. In addition, TR has a great influence on ATT. Thus, the seventh hypothesis is stated as follows:

Hypothesis 7 (H7). Trust positively influences the attitude toward ordering food online.

Many scholars (Roh & Park, 2019; Troise et al., 2020) have studied how PEOU influences PU; therefore, the eighth hypothesis is stated as follows:

Hypothesis 8 (H8). Perceived ease of use positively influences the perceived usefulness of ordering food online.

In addition, this research added the TTF theory and technology characteristics to determine if the food-ordering platform was suitable. TTF theory is used to assess technology effectiveness, (Goodhue & Thompson, 1995) its impact on work operations, and its matching of job requirements to technology characteristics. If it is insufficiently useful, it will not be used (Rahi, Khan, & Alghizzawi, 2020). Consistent with the research of (Cheng, 2020), extending the TAM–TTF theory with telematics (Chen, 2019) confirmed that TTF affected PEOU and PU. Therefore, we proposed the following hypotheses:

Hypothesis 9 (H9). Task–Technology Fit positively influences the perceived ease of ordering food online.

Hypothesis 10 (H10). Task–Technology Fit positively influences the perceived usefulness of ordering food online.

Based on the H1–H10 hypotheses, we established a conceptual framework of relevant studies on factors affecting behavioral intentions to order food delivery, as shown in Figure 2.1.

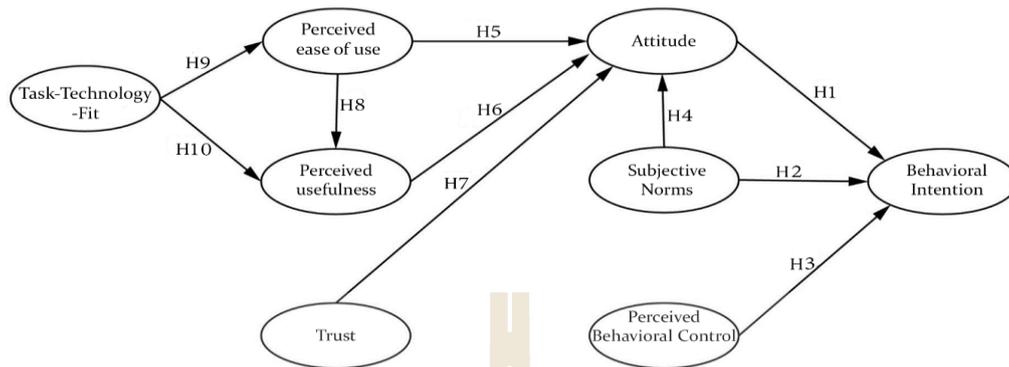


Figure 2.1 The conceptual framework.

From a review of related research to test the structural correlation between factors related to attitudes and consumer behavior and other related studies, most articles focused on consumer attitudes and behaviors. The details of these factors are related to the TAM theory and the TPB, as shown in Table 2.1, which presents a review of research related to the structural relationship between factors related to consumer attitudes and behaviors using analytical methods. These methods are confirmatory factor analysis (CFA), structural equation modeling (SEM), analysis of variance (ANOVA), partial least square SEM (PLS-SEM), and the covariance-based approach (CB-SEM).

2.3.4 Sustainable Development Goals (SDGs)

Sustainable development is designed to meet the needs of the current generation without sacrificing the ability to respond to the needs of the next. It has three key components: economic growth, social inclusion, and environmental protection.

This research responds to the SDGs: decent work and economic growth—the online food-ordering market is growing, and as a result, the economy continues to grow; and responsible consumption and production—online food ordering is highly responsive to consumers because they can order anywhere, anytime. This results in business sustainability in line with the SDGs and the master plan under the country's national strategy (Office of the National Economic and Social Development Council, 2020).

Table 2.1 Types of relationships found in studies of the technology acceptance model (TAM) theory, the theory of planned behavior (TPB), and other related topics.

Author	Method	Perceived Task-Technology Fit	Trust	Perceived Usefulness	Perceived Ease of Use	Perceived Behavioral Control	Subjective Norms	Attitude toward Online Food	Behavioral Intention
(Song et al., 2021)	CFA			✓	✓			✓	✓
(Hwang, Kim, et al., 2019)	CFA, SEM							✓	✓
(Kim & Hwang, 2020; Troise et al., 2020)	SEM					✓	✓	✓	✓
(Al Amin et al., 2021; Cho et al., 2019; Gârdan et al., 2021; Hwang et al., 2021; Hwang & Kim, 2019; Hwang, Kim, et al., 2019; Kang & Namkung, 2019)	CFA, SEM		✓	✓	✓			✓	✓
(Roh & Park, 2019)	SEM			✓	✓		✓		✓
(Cho et al., 2019)	CFA, SEM							✓	✓
(Rahi et al., 2020)	PLS-SEM	✓		✓	✓				
(Troise et al., 2020)	PLS-SEM		✓	✓	✓	✓	✓	✓	✓
This Study		✓	✓	✓	✓	✓	✓	✓	✓

CFA, confirmatory factor analysis; SEM, structural equation modeling; ANOVA, analysis of variance; PLS-SEM, partial least squares SEM.

2.4 Research and Methodology

This research studied consumer behavior to suggest guidelines for developing a food-ordering application. There are nine steps in the operation process, as shown in Figure 2.2.

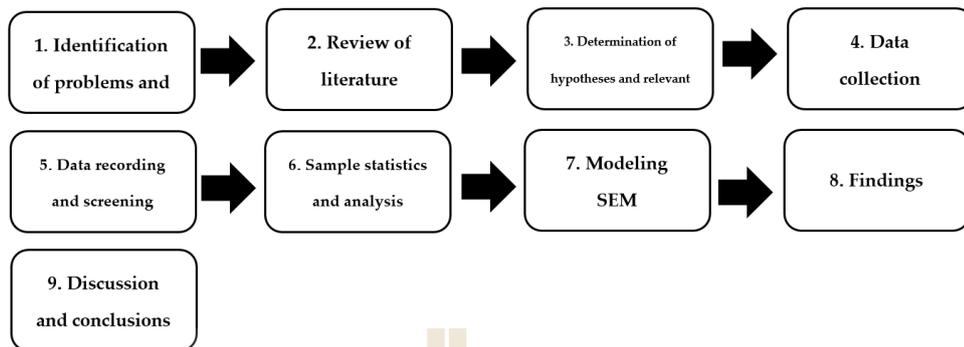


Figure 2.2 Operational process.

2.4.1 Data Collections

- Questionnaire design: The questionnaire was divided into 3 parts. Part 1 concerned personal and household characteristics of the respondents (sex, age, highest education level, occupation, average income) and their experience with using food-ordering services apps. Part 2 concerned the behavior of users ordering food through food-ordering apps. Part 3 involved other suggestions related to the use of food-ordering apps.

- Scale: Part 2 consisted of 22 items, assessed on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Although these are ordinal variables, these can also be estimated using maximum likelihood (ML), according to [66], who described it as “the second option for the ordinal variable in which the parcel is being analyzed.” A parcel is a total score across a set of homogeneous items, each with a Likert-type scale. Parcels are generally treated as continuous variables, and their score reliability tends to be for the collective, rather than for individual, items. If the distribution of all parcels is normal, then the default ML estimate could be used to analyze the data.

- Sample size: This study analyzed data with CFA in a SEM model; the optimal sample size was 20 times the number of variables (Kline, 2011). With 22 variables, the sample size was 440.

- Participants: The respondents were service users who ordered food online through the apps. The survey was conducted from January to February 2021 in the six regional economic provinces of Thailand: Central, Northern, Northeastern, Eastern, Western, and Southern. The total sample size was 1320 people, comprising 220 from each region.

- Table 2.2 shows the frequency and percentage analysis of basic data from all the samples, such as service users ordering online food delivery, task characteristics, and service frequency. The samples of respondents had the following characteristics—gender: 805 females (61%) and 515 males (39%); age: most were 21–30 (556, 42.1%) and 31–40 (358, 27.1%); education: most had a bachelor’s degree (817: 61.9%), followed by high school (299: 22.7%); occupation: most respondents were students (395: 29.9%), followed by company employees (366: 27.7%); income per month: most earned TBH 10,001–20,000 (413: 31.3%), followed by TBH 5000–10,000 (266: 20.2%). The highest frequency of online food ordering was less than 4 times a month (683: 51.7%), followed by 5–10 times per month (405: 30.7%)

Table 2.2 Characteristics of the sample.

Characteristics	Types	Frequency	Percentage
Sex	Male	515	39
	Female	805	61
Age (years)	<20	149	11.3
	21–30	556	42.1
	31–40	358	27.1
	41–50	169	12.8
	51–60	83	6.3
	>60	5	0.4
	Education		37
	Lower than junior high school	64	4.8
	Junior high school	299	22.7
	Senior high school	817	61.9

Table 2.2 Characteristics of the sample. (Continued)

Characteristics	Types	Frequency	Percentage	
Occupation	Bachelor's degree	103	7.8	
	Higher than bachelor's degree	395	29.9	
	Student/College student	162	12.3	
	General contractor	174	13.2	
	Government employee/State enterprises	366	27.7	
	Company employee	184	13.9	
	Business owner	39	3.0	
	Other	221	16.7	
	Income	<5,000	266	20.2
		THB 5,000–10,000	413	31.3
THB 10,001–20,000		241	18.3	
THB 20,001–30,000		89	6.7	
THB 30,001–40,000		90	6.8	
THB < 40,001		683	51.7	
Use frequency	Less than 4 times/month	405	30.7	
	5–10 times/month	219	16.6	
	More than 10 times/month	13	1.0	
	Other			

2.4.2 Reliability

To validate the quality of the research tool, five specialists validated the content and determined the consistency of each question by analyzing and scoring the questions against item-objective congruence (IOC). An IOC index above 0.5 meant that the validity of the inquiries was within the acceptable range. A pilot study was subsequently conducted with 30 respondents, not included in this research, using Cronbach's alpha coefficient to analyze the reliability of the questionnaire. The details indicated an alpha value of 0.784–0.965, and these values were higher than the suggested value of 0.7 (Tavakol & Dennick, 2011).

2.4.3 Structural Equation Modeling

SEM is a statistical method that measures the relationship between observed and latent or unobserved variables, or the relationship between two or more latent variables. The important characteristic of SEM is that it is a linear equation. In addition, finding the relationship between variables can uncover causal variables. The interaction between variables or between variable groups occurs simultaneously.

SEM comprises a measurement and a structural model. The measurement model builds candidates, including measured variables and sub-variables, and indicates whether or not the candidate is a good one. In this model, the variable coefficients are called factor loadings. The structural model is the causal model consisting of independent and dependent variables, together with latent variables. It indicates whether the independent variable caused the dependent variable or not. In this model, the variable coefficients are called regression weight and factor loadings. The details of SEM were included in the study by the authors of (Hair, Black, Babin, & Anderson, 2010; Kline, 2011).

Therefore, SEM was the method used to build a structural model to determine the relationship between the attitudes, subjective norms, and behavioral control that affect consumer behavior toward online food ordering. Each measurement model was analyzed to determine which factors had the greatest loading for use in further policy recommendations.

2.5 Findings

2.5.1 Descriptive Statistics

The analyses of mean, standard deviation, and R-squared values of the basic data from 1,320 samples are shown as in Table 3.

2.5.2 Structural Equation Model

2.5.2.1 Goodness-of-Fit Statistics

The results showed that the model was quite consistent with the empirical data: $\chi^2 = 551.898$; $df = 189$; $p < 0.000$; $\chi^2/df = 2.920$; RMSEA = 0.038; CFI = 0.984; TLI = 0.981; and SRMR = 0.034. When comparing the appropriate criteria, it was recommended that χ^2/df be 2–5 (Marsh & Hocevar, 1985); (2) RMSEA less than 0.07 (Steiger, 2007); CFI equal to or greater than 0.90 (Hu & Bentler, 1999); (4) TLI equal to or greater than 0.80 (Hooper, Coughlan, & Mullen, 2008); and SRMR equal to or less than 0.70 (Hu & Bentler, 1999).

2.5.2.2 Measurement Model

The statistical values were based on empirical data comprising 8 latent variables and 22 indicators. Considering the standardized loading values, they were in the range of 0.739–0.922, whereas the threshold should be greater than 0.4. Thus, the model was a statistically significant method ($p < 0.001$), and the standard loading values for each item are as follows:

Based on the relative weighting assessment of BI from the three observed variables I1–3), I3 showed a maximum loading score of 0.894, followed by I1 with 0.890. Of the three observed variables, attitudes toward FDAs (I4–6), I5 and I6 had an equal loading score of 0.761, followed by I4 with 0.740. Of the two subjective norm variants, I7 had the higher loading score of 0.853, whereas I8 had 0.742. Of the three PBC variables (I9–11), I10 had the maximum loading score of 0.922, followed by I9 with 0.890. Of the 3 PEOU variables (I12–14), I12 had the highest loading score of 0.883, followed by I13 with 0.878. Of the 3 perceived usefulness variables (I15–17) I17 had the maximum loading score of 0.896, followed by I15 with 0.871. Of the two trust variables (I18–19), I18 had a score of 0.861, followed by I19 with 0.829. Out of three TTF variables (I20–22), I21 had the maximum loading score of 0.886, followed by I22 with 0.863.

From the above data, I10 had the highest loading score of 0.922, followed by I3 with 0.894. The lowest indicator was I11 with 0.739. The results of the measurement model are shown in Table 2.3.

Table 2.3 Descriptive statistics.

Construct	Variables	Mean	SD	R ²
Behavioral Intention (Cho et al., 2019)	I1: I intend to use the food delivery app.	3.82	0.839	0.792
	I2: If I have an opportunity, I will order food through the delivery app.	3.85	0.814	0.790
	I3: I intend to keep ordering food through the delivery app.	3.80	0.845	0.799
Attitude (Cho et al., 2019)	I4: Using the food delivery app is useful.	4.11	0.823	0.548
	I5: I am strongly in favor of ordering food through the delivery app.	3.69	0.927	0.579
	I6: I desire to use the delivery app when I purchase food.	3.77	0.870	0.579
Subjective Norms (Roh & Park, 2019)	I7: How do you think your friends would respond if they thought you had used a food delivery application?	3.72	0.803	0.728
	I8: How do you think your parents would respond if they thought you had used a food delivery application?	3.50	0.917	0.550
Perceived Behavioral Control (Hansen, 2008)	I9: In general, ordering food online is very complex.	3.04	1.033	0.793
	I10: With ordering food online via application creates anxiety for you.	2.94	1.083	0.850
Perceived Ease of Use (Roh & Park, 2019)	I11: In general, ordering food online yields (will yield) few problems for me.	3.10	1.048	0.546
	I12: I would find it easy to order food using a food delivery application.	3.93	0.784	0.779
	I13: My operation of a food delivery application would be clear and understandable.	3.91	0.788	0.770
	I14: Using a food delivery application would not require a lot of mental effort.	3.84	0.807	0.693
Perceived Usefulness (Roh & Park, 2019)	I15: Using a food delivery application would enable me to better check the ordering and receiving process of delivery food.	3.93	0.797	0.758
	I16: Using a food delivery application would make it more convenient to order and receive delivery food.	3.97	0.783	0.754
	I17: Food delivery application would be useful for ordering and receiving delivery food.	3.95	0.787	0.803
Trust (Cho et al., 2019)	I18: I trust the food delivery app.	3.85	0.760	0.742
	I19: The information provided by the food delivery app is reliable.	3.85	0.758	0.687
Task-Technology Fit (Zhao & Bacao, 2020)	I20: The functions of FDAs are enough for me to order and receive the delivery food.	3.85	0.760	0.741
	I21: The functions of FDAs are appropriate to help manage the ordering and receiving the delivery of food.	3.87	0.780	0.784
	I22: The functions of FDAs fully meet my requirements of ordering and receiving the delivery of food.	3.88	0.772	0.774

2.5.2.3 Structural Model and Hypothesis Testing

The composite reliability (Hair et al., 2010; Kline, 2011) and average variance extracted (Glavee-Geo, Shaikh, & Karjaluoto) were calculated, respectively, using Equations (1) and (2):

$$CR = \frac{(\sum_{i=1}^n L_i)^2}{(\sum_{i=1}^n L_i)^2 + (\sum_{i=1}^n e_i)} \quad (2.1)$$

$$AvE = \frac{\sum_{i=1}^n L_i^2}{n} \quad (2.2)$$

where L_i is the standardized factor loadings obtained by CFA, i is the number of observed variables in each variable factor, and e_i is the error variance terms of measurement models under the condition $CR \geq 0.7$ (Hair et al., 2010; Kline, 2011). The CR was 0.779–0.920 for TPB analysis with $AVE \geq 0.5$ (Hair et al., 2010; Kline, 2011).

SEM using maximum probability showed that the levels of conformity index were $\chi^2 = 551.898$; $df = 189$; ($p < 0.000$); $\chi^2/df = 2.920$; $RMSEA = 0.038$; $CFI = 0.984$; $TLI = 0.981$; and $SRMR = 0.034$. The conformity index value indicated that they were sufficient. Thus, it could be concluded that the SEM was based on empirical data. In addition, when examining the 10 hypotheses in Table 2.4, we found that they influenced behavioral intentions in ordering food online in the following ways:

Table 2.4 Measurement model results.

Construct	Variables	Standardized Loadings *	Standard Error	t-Value	CR	AVE	Cronbach's Alpha
Behavioral Intention	I1	0.89	0.007	122.101	0.92	0.794	0.92
	I2	0.889	0.007	121.894			
	I3	0.894	0.007	125.624			
Attitude	I4	0.74	0.015	50.053	0.798	0.569	0.836
	I5	0.761	0.014	53.954			
	I6	0.761	0.014	53.599			
Subjective Norms	I7	0.853	0.015	58.774	0.779	0.639	0.771
	I8	0.742	0.016	45.165			
Perceived Behavioral Control	I9	0.89	0.009	94.027	0.889	0.729	0.885
	I10	0.922	0.009	104.494			
	I11	0.739	0.014	52.546			
Perceived Ease of Use	I12	0.883	0.008	111.383	0.899	0.748	0.898
	I13	0.878	0.008	108.423			
	I14	0.833	0.01	83.748			
Perceived Usefulness	I15	0.871	0.008	104.782	0.91	0.772	0.91
	I16	0.868	0.008	103.582			
	I17	0.896	0.007	122.945			
Trust	I18	0.861	0.011	75.631	0.833	0.714	0.833
	I19	0.829	0.012	68.189			
Task-Technology Fit	I20	0.861	0.009	94.467	0.903	0.757	0.903
	I21	0.886	0.008	108.25			
	I22	0.863	0.009	95.084			

Note: Regression * significant at $\alpha = 0.05$.

Table 2.4 presents the SEM results for a structural model that explores the relationship between the three variables influencing the behavioral intention to order food through online apps. The standard regression coefficient (coef.) indicated that the attitude factor had the greatest influence on behavioral intentions (0.720), followed by subjective norms (0.236) and PBC factors (-0.018). The standard regression coefficient (coef.) indicated that the PEOU factor had the greatest influence on attitude (0.625), followed by the perceived benefit factor (0.258), credibility factor (0.197), and subjective norms (-0.045), and that the correlation analysis results between the two exogenous variables influenced the perceived usefulness of ordering food through apps. A coef. indicated that the PEOU had the greatest influence on perceived usefulness (0.751), followed by the TTF factor (0.252). The results regarding the task and technology suitability analysis influencing PEOU in work operations had a coef. of

1.185. The results of factors affecting behavioral intentions to order online food delivery and the analytical results of the hypothesis testing are shown in Table 2.5.

Table 2.5 Standardized path coefficient and t-value for the structural model.

Hypotheses	Description	Standardized Path Coefficient	t-Value	Result
H1	ATT→BI	0.720	24.005	Supported
H2	SN→BI	0.236	6.437	Supported
H3	PBC→BI	-0.018	-0.881	Not Supported
H4	SN→ATT	-0.045	-1.062	Not Supported
H5	PEOU→ATT	0.625	8.734	Supported
H6	PU→ATT	0.258	5.506	Supported
H7	TR→ATT	0.197	3.484	Supported
H8	PEOU→PU	0.751	23.923	Supported
H9	TTF→PEOU	0.252	7.283	Supported
H10	TTF→PU	1.185	39.604	Supported

The conclusion of the investigation based on the proposed research hypotheses (H1-H10) found that the hypotheses had a significant effect on the correlation, as indicated and shown in Figure 2.3.

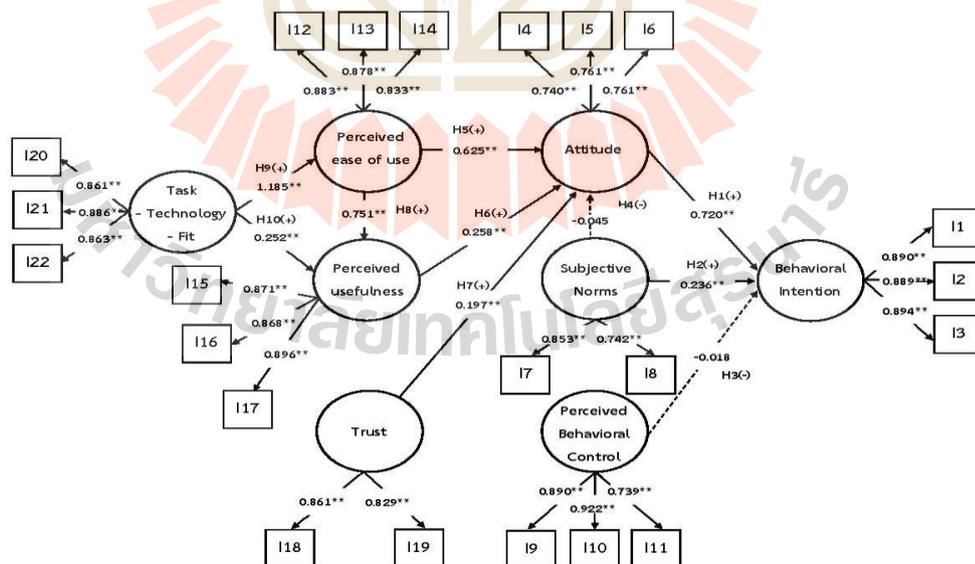


Figure 2.3 Results of main-test research model.

Notes: → result is supported; --- result is not supported.

2.6 Discussion

The key objective of this research was to develop an SEM to examine the structural relationships of online food ordering through food-ordering apps. The factors studied in the TAM theory consist of credibility, PEOU, PU, ATT, and BI. For TPB, the factors included SN and PBC. One additional factor was also explored: TTF and technology characteristics. The study method used a CFA index consisting of 10 hypotheses for structural equation analysis to examine the correlation among the various factors. The CFA assessment results showed that we certified the model components as statistically significant. Moreover, from SEM analysis, we found that the model consistency index was quite consistent with 8 out of 10 hypotheses. The factors were significantly related to the hypotheses as follows:

According to SEM, the factors that directly influenced the intention to order food online through the food-delivery application were ATT, SN, and PBC. While testing the standardized path coefficients, we found that ATT had the greatest influence on BI at 0.720, meaning that shopping attitudes had a direct, positive influence on the BI to use the food-ordering apps. Therefore, if users are satisfied or have a good experience, they will have a positive attitude toward the app and a tendency to use it. Consistent with research by the authors of (Al Amin et al., 2021; Gârdan et al., 2021; Hwang et al., 2021; Hwang, Kim, et al., 2019; Kang & Namkung, 2019; Kim & Hwang, 2020; Troise et al., 2020; Yeo, Goh, & Rezaei, 2017), results showed that ATT positively affected BI to order food online, followed by SN influencing a continued intention to use equal to 0.236, meaning that when consumers receive advertisements about online food ordering from subjective norms, such as close friends or parents, they will be interested in ordering food through apps and express their behavior by using them, as found in the studies by the authors of (Kim & Hwang, 2020; Roh & Park, 2019; Troise et al., 2020). The factors that directly influenced ATT toward online food ordering through apps are PEOU, PU, and credibility. While examining standardized path coefficients, we found that PEOU had an influence on ATT toward ordering food through apps equal to 0.625, meaning that when consumers perceive an ease of use, they have a positive attitude toward ordering online food through these apps. In addition, the PU influence on ATT to use food-ordering apps was equal to 0.258,

meaning that, when consumers recognize the usefulness of the application for both ordering and receiving food, and checking the details of the food from the app, they have positive attitudes toward online food ordering, which is consistent with the studies by the authors of (Gârdan et al., 2021; Song et al., 2021; Troise et al., 2020). The credibility influence on attitudes toward ordering food through apps had a value of 0.197, meaning that when consumers consider the apps to be trustworthy, they are likely to order food through them, which is consistent with research from the authors of (Kang & Namkung, 2019; Song et al., 2021; Troise et al., 2020). The factors directly influencing PU include PEOU and TTF. Examining standardized path coefficients, we found that the value of the PEOU influence on PU was equal to 0.751, meaning that when consumers perceived that apps were easy to use, they perceived food-ordering apps to be highly beneficial, which agrees with research from the authors of (Lee et al., 2017; Roh & Park, 2019; Troise et al., 2020).

The TTF factor influenced perceived usefulness at 0.252 and PEOU at 1.185, indicating that consumers saw the app functions as suitable for either ordering or receiving food. In addition, when consumers encounter problems using the apps, channels should be provided so that consumers can contact someone for help, or solve the problem themselves. If the apps provide solutions, consumers will be more satisfied with the apps, which is in line with the research of the authors of (Chen, 2019; Wagner et al., 2017; Wu & Chen, 2017). In addition, two hypotheses were proven false: PBC influences BI and SN influences ATT. In other words, the analysis of PBC data did not influence BI toward online food ordering and had an effect value of -0.018, demonstrating that consumers are still concerned about ordering food through the apps because they are worried about complicated apps. The analysis result showed that SN did not influence ATT, with an effect value of -0.045. This means that when consumers receive online food-ordering advertisements from subjective norms, such as close friends or parents, they are not interested in using food-ordering apps at all. For example, consumers may have received information from subjective norms that the apps are not practical or that the food is not as specified in the apps. In the short term, we believe that the demand for online food ordering services continues to be popular because consumers want convenience in daily life, but for the long run,

entrepreneurs must create a strategy to convince consumers to continue to use the service. This may be conducted using a marketing mix to motivate and retain customers to use the service continuously.

2.7 Conclusions

The authors used an SEM method due to its compatibility and efficiency for measuring complicated phenomena. Serving a similar purpose to multiple regression, SEM is more efficient for considering the following issues: the interaction model, non-linearity, correlated independent variables, measurement errors, corresponding error conditions, multiple latent independent variables, and one or more latent dependent variables (Kline, 2011). The data collected in Thailand was from six regions: Central, North, Eastern, Northeastern, Western, and Southern.

The research results allowed us to rank the exogenous variables by the strength of their influence on BI, which is influenced by ATT. If the consumers have a positive attitude toward using apps, they will have a positive tendency to use FDAs. They may consider or look through them before choosing to use one, particularly, if they have a positive attitude toward PEOU, PU, and credibility.

Since consumers want to order food conveniently through the apps, the entrepreneurs should establish promotions to attract consumers and use the app attributes as a medium. This procedure allows immediate communication between apps and consumers, such as obtaining product information for decision making about using the service and facilitating processes such as payment and food delivery. In addition, if consumers find that apps are suitable, either for ordering or receiving food, consumers will decide to use them. Moreover, subjective norms, such as friends, close friends, and parents, will affect consideration before ordering via the apps or making an immediate purchase decision. Consumers who order food or buy goods through online apps do not choose them without seeing the actual products. If an incentive stimulates their demand,

sharing information or advertising products through social norms about offering the food to consumers may build consumer attention, or if they depend on these groups, an immediate purchase decision may be possible. The analysis results showed that PBC did not influence behavioral intentions toward online food ordering. The reason is that some consumers still have anxiety about ordering food through complicated apps. Thus, if a business owner develops a practical food-ordering app, the consumers will increasingly use it to order food. Moreover, most consumers tend to order food via apps. Therefore, governmental or other relevant agencies should adopt these research results to formulate policies that facilitate the purchase of goods in the digital marketing system.

The results found that the attitude factor (H1) affected consumers' online food-ordering behavior the most, followed by subjective norms (H2). Responding to the needs of users will affect the frequency of use. It was also found that the ease-of-use factor (H5) affected the attitude toward app use the most, followed by perceived usefulness (H6) and trust (H7), respectively. The next factor, perceived ease of use, affected perceived usefulness (H8). Therefore, if the platform is easy to use, it will enhance the users' positive attitudes, resulting in repeated use and referrals to others. In addition, this research included additional studies in the task–technology fit section; the study's results revealed that TTF had the most significant impact on perceived ease of use (H9), followed by perceived usefulness (H10). This meant that if a food-ordering platform is appropriate for use, consumers will continue to use it, leading to sustainable business operations. According to the research, this was consistent with the SDGs: responsible consumption and production. It will allow consumers to use more services, thereby improving profits and employment. Most importantly, it will help businesses achieve sustainability. This is in line with the research by the authors of (Jasim, Kasim, & Mahmoud, 2022), which studied the behavior of consumers in the early stages of drone food delivery and found that there was not much use for the service.

2.8 Limitations and Future Work

This study highlighted the guidelines for studying users' behavioral intention to use food-delivery services via online apps. However, there were some limitations. There was a slight difference in the question items used in our research because we used questions from various researchers who studied food ordering online to determine behavioral intention. Future research should study theories beyond just TAM and TPB to obtain more diverse attitudes of the service users. Another limitation was the scope of the study. As the results were acquired from questioning only online food-delivery users via apps in the provinces representing each region, the results or levels of significance may vary in other countries. Future studies should examine attitudes toward a wide variety of apps using other theories that affect user behavior to understand users' opinions on FDAs.

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CHAPTER 3

EXPLAINING GENDER DIFFERENCES IN ONLINE FOOD-ORDERING BEHAVIOR: AN APPLICATION OF MULTIGROUP STRUCTURAL EQUATION MODELING

3.1 Abstract

Due to the current COVID-19 pandemic, many people are increasingly utilizing online food-ordering services, and an individual's gender is a key factor influencing online food-ordering behavior. This study aimed to apply structural equation modeling and the theory of planned behavior (TPB) to a multigroup analysis of males and females. Across Thailand, data was gathered from two online food-service platforms: Grab Food and Foodpanda. The research findings, consisting of 1,320 questionnaires, indicated that the behavioral norms and intentions were similar between the two groups except that perceived behavioral control only influenced the male group. The attitude factor was different between the groups. For example, the male group valued trust, while the female group valued perceived ease of use. The perceived benefit factor found that both groups had similar perceptions: primarily the perceived ease of use followed by the perceived task-technology fit. Moreover, this research examined perceived task-technology fit due to the increasing importance of online food-ordering platforms. The research results will help business owners develop uncomplicated platforms to potentially attract more consumers to their services.

3.2 Introduction

3.2.1 Background

In the modern era, the internet plays an increasingly important role in daily life (Internet World Stats, 2021) and many aspects of our lives take place online. The internet has been used to create many things and is widely utilized by the public for its convenience and efficiency (Hansen, Saridakis, & Benson, 2018; Verkijika, 2018).

In Thailand, the 2021 Internet Usage Survey found that most people (85.1%) used the internet for an average of 6–10 hours per day for work and online trading of goods and services (The Government Public Relations Department, 2022). Additionally, the widespread transition to online learning and working from home due to the Coronavirus outbreak has resulted in increased use of the internet. This trend is reflected in the top 10 online activity surveys compared between 2021 and 2020, which revealed that in 2021, online food ordering and online work activities were different from those in 2020 (Electronic Transactions Development Agency, 2021)

This change in online consumer behavior amidst the spread of COVID-19 has led to a shift toward more e-commerce use, and the consumers have had to adjust to buying more products online. Due to the COVID-19 outbreak resulting in lockdowns and social distancing, online shopping becomes a daily routine for customers and makes them open to making payments via mobile banking. As a result, traditional entrepreneurs have had to adapt to this demand owing to the progressive shift in e-commerce growth. Business owners and investors feel confident that the demand for online goods and services will continue to serve as a key consumer channel. Even in the post-pandemic era, we are seeing a “new normal” (Electronic Transactions Development Agency, 2022) as it relates to consumerism. In Thailand, for example, people are now more likely to carry digital payment forms as their primary form of payment. Digital payment is an important tool that enhances transaction convenience, speed, and safety enabling consumers to pay for and access goods and services in a variety of ways, such as through food delivery and online shopping. This behavior change in Thailand has resulted in the exponential growth of the country’s digital payments (Thailand, 2021).

Additionally, the food-service industry is also experiencing growth amid the COVID-19 pandemic and associated lockdowns with the rise of popular food-delivery platforms. The number of restaurants, couriers, and customers joining these platforms in 2020 increased exponentially not only in Thailand but also around the world. As a result, food-delivery platforms have experienced revenue increases globally (Economic Intelligence Center, 2021).

From the literature on online food ordering, we determined that most studies have focused on the following areas: fast-food ordering in China (Akram, Ansari, Fu, & Junaid, 2020); factors affecting satisfaction and intention for ongoing service use (Alalwan, 2020); role of food-ordering application toward satisfaction development and brand loyalty during the major epidemic (Dirsehan & Cankat, 2021); theory against innovation in food ordering apps (Kaur, Dhir, Ray, Bala, & Khalil, 2020); the impact of food-delivery platforms on aesthetics (Kumar, Jain, & Hsieh, 2021); food-delivery platforms in India and the Philippines (Pandey, Chawla, & Puri, 2021); online food-delivery in Bangladesh (Saad, 2020); Customers using online or offline food delivery services in China and New Zealand (Wang & Scrimgeour, 2021); and study customers' intentions to use food delivery platform (Wen, Pookulangara, & Josiam, 2021). Of these previous studies, none have applied multigroup analysis to the study of online food-ordering behavior differences between males and females.

In addition, researches have been conducted on the TAM (Lee, Lee, & Jeon, 2017; Nguyen et al., 2019; Song, Ruan, & Jeon, 2021; Tandon, Kaur, Bhatt, Mäntymäki, & Dhir, 2021) and TPB (Al Amin, Arefin, Alam, Ahammad, & Hoque, 2021; Bouarar, Mouloudj, & Mouloudj, 2021; Choe, Kim, & Hwang, 2021; Troise, O'Driscoll, Tani, & Prisco, 2020); both focusing on consumer behavior. We decided to take this further by studying the behavior of customers ordering food through online platforms. Since online food ordering is so popular, the research results can be used to develop new food-ordering platforms that can more effectively respond to consumer needs. Considering the importance of food-ordering platforms, the researchers further studied the theory of task-technology fit (TTF) as no previous research has examined task-technology fit variables alongside TAM or TPB.

The present research presents a table detailing findings related to online food ordering through the application of TAM, TPB, and TTF (Table 1). Additionally, according to the research review on the TTF factor with food ordering through platforms, the research (Zhao & Bacao, 2020) study factors affecting the ongoing use of food-delivery platform during the Coronavirus pandemic. Further, (Wagner, Schramm-Klein, & Steinmann, 2017) studied the consumer intentions and attitudes toward purchasing televisions via the internet. The results of both studies revealed that the TTF factor provided positive research results indicating that the TTF

factor is useful and suitable for studying whether the functions of food-ordering platforms can satisfy consumers. A review of research related to online food ordering through food-ordering platforms revealed that a multigroup analysis has never been used to study gender differences. As individuals' gender is a key factor affecting online food-ordering behavior, the present research focuses on gender differences to test and examine how the difference between males and females contributes to different online food-ordering behaviors.

Table 3.1 Comparison of applying technology acceptance model, theory of planned behavior and task-technology-fit used in research related to online food ordering

Author	Title	TAM	TPB	TIF
Lee et al. (2017)	Factors influencing the behavioral intention to use food delivery apps	√		
Kang and Namkung (2019)	The information quality and source credibility matter in customers' evaluation toward food O2O commerce	√		
Kim and Hwang (2020)	Merging the norm activation model and the theory of planned behavior in the context of drone food delivery services: Does the level of product knowledge really matter?		√	
Nguyen et al. (2019)	Investigating consumer attitude and intention towards online food purchasing in an emerging economy: An extended tam approach	√		
Troise et al. (2020)	Online food delivery services and behavioral intention—a test of an integrated TAM and TPB framework	√	√	
Al Amin et al. (2020)	Evaluating the customers' dining attitudes, e-satisfaction and continuance intention toward mobile food ordering apps (MFOAs): evidence from Bangladesh	√		
Song et al. (2021)	An integrated approach to the purchase decision-making process of food-delivery apps: Focusing on the TAM and AIDA models	√		
Pandey et al. (2021)	Food delivery apps (FDAs) in Asia: an exploratory study across India and the Philippines	√	√	
Bouarar et al. (2021)	Extending the theory of planned behavior to explain intention to use online food delivery services in the context of COVID-19 pandemic		√	
Al Amin et al. (2021)	Using mobile food delivery applications during COVID-19 pandemic: an extended model of planned behavior		√	
Wen et al. (2021)	A comprehensive examination of consumers' intentions to use food delivery apps	√	√	
Choe et al. (2021)	Innovative marketing strategies for the successful construction of drone food delivery services: Merging TAM with TPB	√	√	
	This Study	√	√	√

Note: TAM = Technology Acceptance Model, TPB = Theory of Planned Behavior, TIF=Task-Technology-Fit

3.3 Literature review

3.3.1 Concept of Theory of Planned Behavior

The TPB is a behavioral science theory used to forecast and understand individual behavior (Ajzen, 1991). It was developed by Fishby and Ajzen (Ajzen, 1991) from the TRA, which is used to describe human behavior through the idea that humans are rational, use systematic data, and consider consequences before performing or not performing a behavior (Ajzen, 1980).

However, Ajzen (Ajzen, 1991) found that TRA was limited in predicting social behaviors that an individual is unable to control due to the influence of their attitudes (incomplete volitional control). These behaviors compromise their decision making. They must depend on an opportunity or other resources. Later in 1985, Ajzen proposed the TPB, which is different from the TRA, PBC. The TPB further explained that individuals will perform interesting behaviors by planning to achieve their objectives. The behaviors that individuals show arises from the intention to control various factors impeding behavior. The majority of individuals' behavior is governed by volitional control, which is an immediate behavior determinant and potential predictor by determining the intention of the behavior.

Troise and O'Driscoll (Troise *et al.*, 2020) confirmed the studies (Yeo, Goh, & Rezaei, 2017) by showing that customers' ATT toward ordering food delivery was the BI's most key predictor of online food ordering. The other research focused on using platforms to buy food and highlighted the importance of ATT in describing BI (Al Amin *et al.*, 2021; Bouarar *et al.*, 2021; Cho, Bonn, & Li, 2019; Choe *et al.*, 2021; Hwang & Kim, 2019; Hwang, Kim, & Kim, 2019; Hwang & Kim, 2021; Hwang, Lee, & Kim, 2019; Kang & Namkung, 2019; Kim & Hwang, 2020; Lee *et al.*, 2017; Nguyen *et al.*, 2019; Tandon *et al.*, 2021; Wang & Scrimgeour, 2021; Wen *et al.*, 2021). The following factors were used to develop the hypothesis:

H1: ATT positively influences consumers' BI to use online food-ordering services. Subjective norm (SN) (i.e., "perceived social pressure to take or not to take action" (Ajzen, 1991) is a relevant factor in food-delivery app use as well (Roh & Park, 2019). Several researchers have found a significant positive correlation between SN, BI, and ATT in food-delivery services and online purchases (Al Amin *et al.*, 2021; Bouarar

et al., 2021; Cho *et al.*, 2019; Troise *et al.*, 2020; Wen *et al.*, 2021). Thus, the following factors were used to develop the hypothesis:

H2: SN positively influences consumers' BI to use online food-ordering services.

According to the TPB model, PBC may influence BI (Ajzen, 2002). PBC is defined as "the subjective level of control over the performance of behavior itself." Different studies have confirmed that PBC is involved in BI in ordering food online. For example, the scholars presented the importance of considering PBC in analyzing BI to buy food online (Al Amin *et al.*, 2021; Bouarar *et al.*, 2021; Choe *et al.*, 2021; Kim & Hwang, 2020; Roh & Park, 2019; Troise *et al.*, 2020; Wen *et al.*, 2021). Thus, the following factors were used to develop the hypothesis:

H3: PBC positively influences consumers' BI to use online food-ordering services.

However, in TPB, SN is the primary determinant of ATT when the customer recognizes that their friends, families, and other related parties have positive attitudes toward online food ordering and will be more empathetic in receiving such food. Several studies have found that these relationships are significant in the adoption of online or mobile food-purchase behaviors (Kim & Hwang, 2020; Troise *et al.*, 2020). Therefore, the following factors were used to develop the hypothesis:

H4: SN positively influences consumers' ATT the use of online food-ordering services.

3.3.2 Concept of Technology Acceptance Model

ICT plays a role in all sectors of modern society. However, consumers accept emerging technologies in different ways (Ukpabi & Karjaluoto, 2017). TAM is a theory researchers use to describe the intention in using technology, which customizes the TRA to develop into TAM and study the context of adopting information system use.

TAM is a factor in determining an individual's perception that ICT partially contributes to task performance improvement and directly affects the BI to continuously use technology. Using TAM to study the behavior of consumers or online food-service users sheds light on the acceptance and perceived usefulness of TAM.

Davis (Davis, 1985) identified two principles of cognitive response that predict ATT: PEOU and PU. Davis (Davis, 1989) defined PEOU as “the degree to which an individual believes it will be easy to implement a specific system”. In FDAs, PEOU refers to the factors influencing BI to use food-ordering platforms for the sake of convenience.

In line with the previous studies of factors influencing consumer attitudes toward online food-service use (Choe et al., 2021; Kang & Namkung, 2019; Lee et al., 2017; Nguyen et al., 2019; Song et al., 2021; Troise et al., 2020), Therefore, we following factors were used to developing the hypotheses:

H5: PEOU positively influences consumers’ ATT to use ordering food online.

H6: PU positively influences consumers’ ATT to use ordering food online.

Several researchers have studied how TR influences ATT (Kang & Namkung, 2019; Troise et al., 2020), and therefore, the following factors were used to develop the hypothesis:

H7: TR positively influences consumers’ ATT to use ordering food online.

Additionally, several researchers (Choe et al., 2021; Lee et al., 2017; Roh & Park, 2019; Troise et al., 2020) have studied how PEOU influences PU, therefore, the following factors were used to develop the hypothesis:

H8: PEOU positively influences the PU to use ordering food online.

This research further added a discussion on TTF. TTF is used to assess the efficiency of technology (Goodhue & Thompson, 1995), impact on work implementation, and match job requirements and technology characteristics as individuals utilize technologies when their functions efficiently suit and support their activities maximizing benefit (Vanduhe, Nat, & Hasan, 2020; Wagner et al., 2017; Wu & Chen, 2017). Users have confirmed that TTF has an impact on PEOU and PU. Therefore, we following factors were used to developing the hypotheses:

H9: TTF positively influences the PEOU to use ordering food online.

H10: TTF positively influences the PU to use ordering food online.

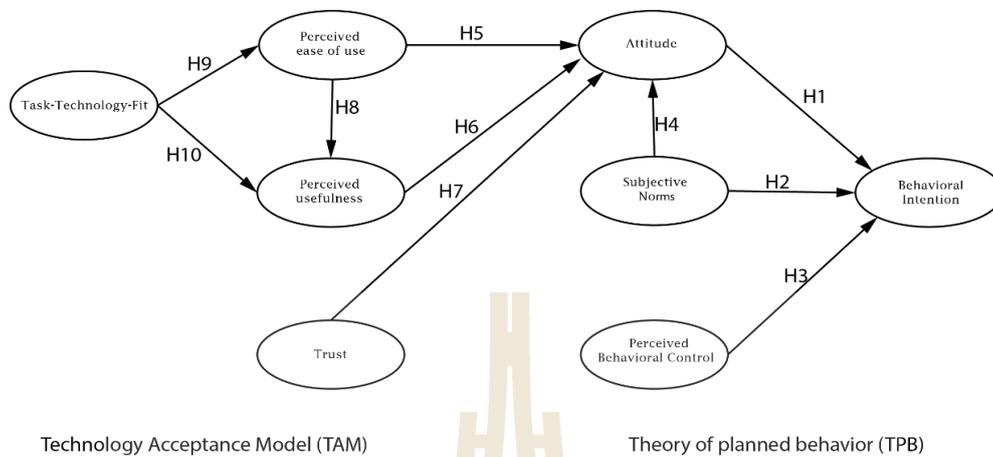


Figure 3.1 Research Framework

Based on the H1-H10 hypotheses, this study established a relevant framework on the factors affecting behavioral intentions in ordering food online, as shown in Figure 3.1. As can also be seen in Figure 3.1, the study hypotheses are divided into 2 theories: 1) TPB with variables including behavioral intention, attitude, subjective norms, and PBC; and 2) TAM with variables including attitude, PEOU, PU, and trust. This research has also added a section about TTF.

3.3.3 A review of research related to consumer attitudes and behaviors.

From literature, the structural correlation between factors related to attitudes and consumer behavior as well as other related studies. Most of the articles focus on the study of consumer attitudes and behaviors. The factors studied are related to TAM and TPB, as presented in Table 3.2.

Table 3.2 Types of relationships found in the study of Theory of technology acceptance model (TAM), Theory of planned behavior (TPB), and other related topics

Author	Analytical Method	Perceived Task-technology fit	Trust	Perceived usefulness	Perceived ease of use	Perceived Behavioral Control	Subjective Norms	Attitude toward online food	Behavioral Intention
Wang and Scrimgeour (2021)	CFA, SEM							✓	✓
Wen et al. (2021)	PLS-SEM					✓	✓	✓	✓
Hwang and Kim (2019)	CFA, SEM							✓	✓
Al Amin et al. (2021)	SEM					✓	✓	✓	✓
Choe et al. (2021)	CFA, SEM			✓	✓	✓	✓	✓	✓
Bouarar et al. (2021)	SEM					✓	✓	✓	✓
Lee et al. (2017)	CFA, SEM			✓	✓			✓	✓
Al Amin et al. (2020)	PLS-SEM			✓				✓	
Hwang, Lee, et al. (2019)	CFA, SEM							✓	✓
Nguyen et al. (2019)	CFA, SEM			✓	✓			✓	✓
Troise et al. (2020)	PLS-SEM		✓	✓	✓	✓	✓	✓	✓
Cho et al. (2019)	CFA, SEM							✓	✓
Kang and Namkung (2019)	CFA, SEM		✓					✓	✓
Song et al. (2021)	CFA, SEM			✓	✓			✓	
Roh and Park (2019)	CFA, SEM						✓		✓
Kim and Hwang (2020)	CFA, SEM					✓	✓	✓	✓
Hwang, Kim, et al. (2019)	CFA, SEM							✓	✓
Tandon et al. (2021)	CB-SEM							✓	✓
Yeo et al. (2017)	SEM							✓	✓
This Study		✓	✓	✓	✓	✓	✓	✓	✓

CFA, Confirmatory Factor Analysis; SEM, Structural equation modeling; PLS-SEM, Partial Least Square SEM; MGA, Multi-group analysis

Table 3.2 presents a review of research testing the structural relationship between factors related to consumer attitudes and behaviors. Different analytical methods are applied, such as confirmatory factor analysis (CFA), SEM, partial least square SEM, and multigroup analysis.

3.4 Method

3.4.1 Data collection

Questionnaire Design: The questionnaire was divided into 3 parts. The first part gathered information regarding respondents' personal and household characteristics (gender, age, highest education level, occupation, average income) and their experience of using food-ordering services through food-ordering platforms. The second part gathered information about the users' food-ordering behavior through food-ordering platforms, and the third part is the other recommendations related to the use of food ordering through platforms.

Scale: The second part consisted of 22 questions assessed on a Likert scale of 5 on a scale of 1 (strongly disagree) to 5 (strongly agree). Even if it is a sequence variable, but it is possible to estimate the maximum likelihood (ML) by (Kline, 2011), who said, 'The second option is for the sequence variable in which the parcel is being analyzed. A parcel is an aggregate score from a set of homogeneous items, each with a Likert-type scale. Typically, parcels are treated as continuous variables. Parcel reliability scores tend to be more aggregated for individual items. If the distribution of all parcels is normal, the initial ML estimate can be used to analyze the data.'

Sample size: Due to this study analyzed data with CFA in SEM, the best sample size was 20 times the number of variables (Kline, 2011). With 22 variables, the sample size must be at least 440 samples (22×20).

Participants: The respondents were users who order food online through food-ordering platforms. The survey was conducted from January to February 2021 in each of Thailand's six economic regions: Central, North, Northeast, Eastern, Western, and Southern. The total sample size was 1,320 people, divided into 6 regions, and 220 people in each region sampled for data collection.

Table 3.3 illustrates the frequency analysis and percentage of basic data from 1,320 samples, including users ordering food online, function usage, and frequency of service use. The respondent data are as follows: There were 805 females (61%), and 515 males (39%). The male group was aged 21–30 years (7%), and the female group was aged 21–30 years (45.0%). The income of the male group was 10,001–20,000 baht (34.0%), and for the female group was 10,001–20,000 baht (29.6%).

Education levels for the male group were indicated as bachelor's degree (54.8%), and for the female group, bachelor's degree holders made up (66.5%). In terms of occupation, the male group consisted of private company employees/employees (27.2%), and the female group consisted of students/college students (32.7%). Regarding online food-ordering frequency, males partook less than 4 times per month (57.5%), while females also partook less than 4 times per month (48.1%).

Table 3.3 Characteristics of the sample

Characteristics	Men (n=515)		Women (n=805)	
	Frequency	Percent	Frequency	Percent
Age				
<20	61	11.8	88	10.9
21-30	194	37.7	362	45.0
31-40	138	26.8	220	27.3
41-50	76	14.8	93	11.6
51-60	44	8.5	39	4.8
>60	2	0.4	3	0.4
Revenue				
<5,000 Baht	68	13.2	153	19.0
5,000-10,000 Baht	90	17.5	176	21.9
10,001-20,000 Baht	175	34.0	238	29.6
20,001-30,000 Baht	86	16.7	155	19.3
30,001-40,000 Baht	51	9.9	38	4.7
>40,001 Baht	45	8.7	45	5.6
Education level				
Lower than junior high school	13	2.5	24	3.0
Junior High School	36	7.0	28	3.5
Senior High School	149	28.9	150	18.6
Bachelor's degree	282	54.8	535	66.5
Higher than the bachelor's degree	35	6.8	68	8.4
Occupation				
Student/college student	132	25.6	263	32.7
General contractor	79	15.3	83	10.3
Government employee/State Enterprises	75	14.6	99	12.3
Company employee				
Business owner	140	27.2	226	28.1
Others	77	15.0	107	13.3
Frequency use				
Less than 4 times/month	12	2.3	27	3.4
5-10 times/month	296	57.5	387	48.1
More than 10 times/month	143	27.8	262	32.5
Others	69	13.4	150	18.6
	7	1.4	6	7

3.4.2 Reliability and Validity

To validate the quality of the study tool, 5 experts reviewed the content and determined the consistency of each question by analyzing and scoring the questions against the Index of Item Objective Congruence (IOC). A pilot study was subsequently conducted with 30 respondents who were not included in the study. Cronbach's alpha coefficient was used to analyze the reliability of the questionnaire. The details indicate an alpha value of 0.784–0.965, and these values were higher than the suggested value of 0.7 (Tavakol & Dennick, 2011). The question is within the acceptable range. This study was approved by the Human Research Ethics Committee, Suranaree University of Technology (COE No.81/2563).

3.4.3 Multigroup Structural Equation Model Analysis

Multigroup structural equation model analysis involves sharing the model with respondents with disparate characteristics, such as gender or other socio-cultural factors, and comparing it with a model with a similar structure. The purpose of the first part was to test the equality of the 2 groups, or the constant value measurement Hair, Black (Hair, Black, Babin, & Anderson, 2010). The purpose of the second part is to use model measurements or cross validation to compare parameters such as the number of constructs, factor loadings of indicators, and covariance. The statistical values used for comparison were the chi-square difference (Delta- χ^2) and the difference between degrees of freedom (Delta-df) by the CFA test, which reported the sensitivity of several constant measurements. Results used for significant differences testing may indicate differences. If the χ^2 difference is statistically significant This may mean that both models are unchanged (Hair et al., 2010; Jomnonkwao, Ratanavaraha, Khampirat, Meeyai, & Watthanaklang, 2015; Raju, Laffitte, & Byrne, 2002; Uttra, Laddawan, Ratanavaraha, & Jomnonkwao, 2020). The application of the multigroup analysis in the study of online food-ordering intentions can identify differences using the same model but in different groups (male and female). Therefore, this study compared two pairs based on TPB and TAM using the Mplus program for data analysis.

3.5 Results

3.5.1 Results

The details of the mean analysis, standard deviation, skewness, and kurtosis of the basic data from 1,320 samples are shown in Table 3.4. Analysis for the TPB variable in this study indicated that the mean for males and females was 3.00-3.97 and 2.91-4.20, respectively, while SD was 0.753-1.092 and 0.748-1.077 for males and females, respectively. The skewness was between -0.491 and 0.112 and -0.771 to 0.078 in males and females, respectively. The kurtosis was between -0.547 to 0.153 and -0.690 and 0.194 in males and females, respectively. It states that the skewness should be less than 3.0, and the kurtosis should be less than 10.0 (Kline, 2011).

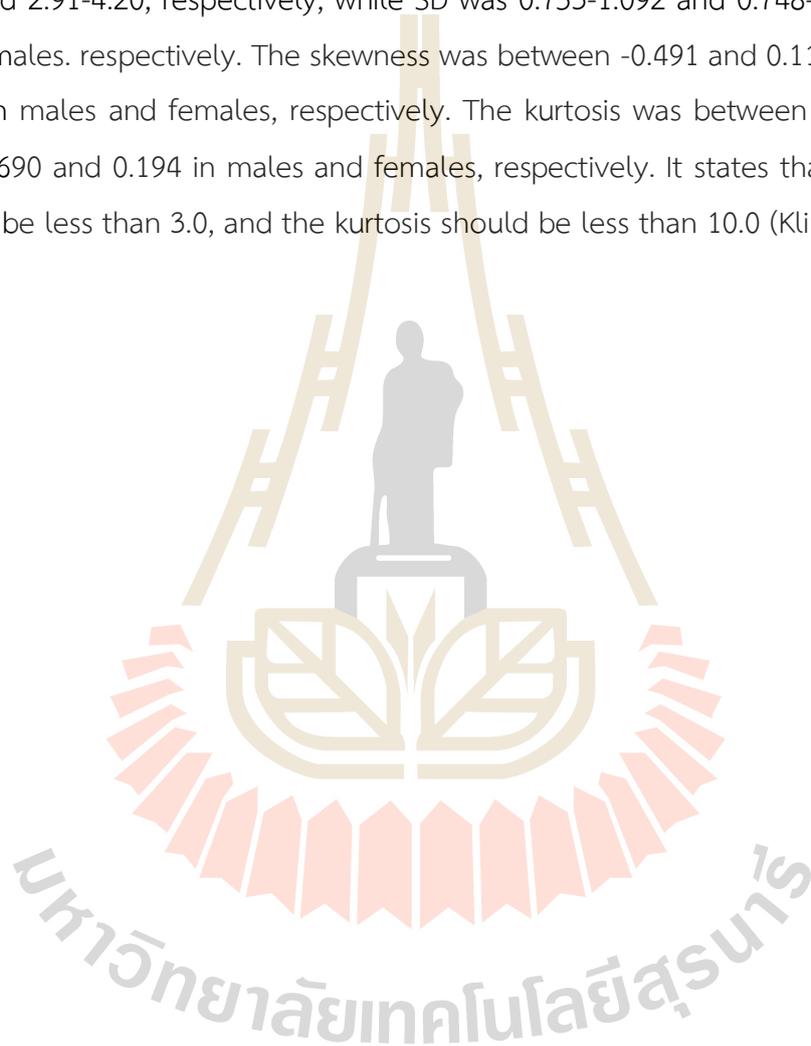


Table 3.4 Descriptive variables

Item	Latent variable/Questionnaire	Men (n=515)				women (n=805)			
		M	SD	SK	KU	M	SD	SK	KU
I1	I intend to use the food delivery app	3.71	0.879	-0.394	0.153	3.88	0.806	-0.359	-0.120
I2	If I have an opportunity, I will order food through the delivery app	3.76	0.834	-0.382	0.068	3.90	0.797	-0.339	-0.137
I3	I intend to keep ordering food through the delivery app	3.73	0.874	-0.281	-0.254	3.85	0.824	-0.315	-0.249
I4	Using the food delivery app is useful	3.97	0.838	-0.491	-0.152	4.20	0.803	-0.771	0.194
I5	I am strongly in favor of ordering food through the delivery app	3.60	0.925	-0.275	-0.306	3.75	0.924	-0.376	-0.292
I6	I desire to use the delivery app when I purchase food	3.70	0.877	-0.321	-0.147	3.81	0.864	-0.308	-0.408
I7	How do you think your friends would respond if they thought you had used a food delivery application?	3.67	0.844	-0.219	-0.331	3.75	0.773	-0.087	-0.391
I8	How do you think your parents would respond if they thought you had used a food delivery application?	3.48	0.924	-0.122	-0.327	3.50	0.914	-0.204	-0.114
I9	In general, ordering food online is very complex.	3.12	1.035	-0.021	-0.342	2.99	1.029	0.075	-0.324
I10	With ordering food online via application creates anxiety for you.	3.00	1.092	0.112	-0.547	2.91	1.077	0.078	-0.520

Table 3.4 Descriptive variables (Continued)

Item	Latent variable/Questionnaire	Men (n=515)				women (n=805)			
		M	SD	M	SD	M	SD	M	SD
I11	In general, ordering food online yields (will yield) few problems for me	3.12	1.055	0.000	-0.521	3.09	1.045	-0.002	-0.396
I12	I would find it easy to order food using a food delivery application	3.88	0.783	-0.208	-0.269	3.96	0.783	-0.340	-0.242
I13	My operation of a food delivery application would be clear and understandable.	3.83	0.813	-0.296	-0.086	3.96	0.768	-0.298	-0.247
I14	Using a food delivery application would not require a lot of mental effort.	3.78	0.795	-0.096	-0.457	3.87	0.813	-0.252	-0.410
I15	Using a food delivery application would enable me to better check the ordering and receiving process of delivery food.	3.86	0.809	-0.267	-0.369	3.98	0.785	-0.248	-0.690
I16	Using a food delivery application would make it more convenient to order and receive delivery food.	3.89	0.810	-0.310	-0.236	4.02	0.761	-0.335	-0.258
I17	Food delivery application would be useful for ordering and receiving delivery food.	3.89	0.806	-0.337	-0.159	3.99	0.773	-0.401	-0.006

Table 3.4 Descriptive variables (Continued)

Item	Latent variable/Questionnaire	Men (n=515)				women (n=805)			
		M	SD	M	SD	M	SD	M	SD
I18	I trust the food delivery app	3.79	0.757	-0.244	0.064	3.90	0.759	-0.272	-0.222
I19	The information provided by the food delivery app is reliable	3.80	0.753	-0.182	-0.173	3.88	0.760	-0.325	-0.002
I20	The functions of FDAs are enough for me to order and receive the delivery food	3.81	0.778	-0.183	-0.297	3.88	0.748	-0.152	-0.371
I21	The functions of FDAs are appropriate to help manage the ordering and receiving the delivery of food	3.79	0.797	-0.223	-0.295	3.92	0.764	-0.205	-0.441
I22	The functions of FDAs fully meet my requirements of ordering and receiving the delivery of food	3.83	0.790	-0.352	0.024	3.92	0.759	-0.219	-0.371

Note: M = mean, SD = standard deviation, SK = skewness, KU = Kurtosis.

3.5.2 Factor Analysis Results

The above statistics are based on empirical data consisting of 8 latent variables and 22 indicators. Table 3.5 presents the confirmatory analysis results of both the indicators and factors in males. The values of the standardized loadings were in the range of 0.744–0.915, which is consistent with the threshold greater than 0.4. Therefore, it was concluded that the model served as a statistically significant method ($p < 0.001$) with a standardized loading value described by each item as follows. From the above data, I3 had the highest loadings (0.915), followed by I9 (loadings = 0.903). The indicator I4 had the lowest loadings (0.744). Table 5 shows the analysis results to confirm both the indicators and the factors in the female group. Here the standardized loading values were in the range of 0.712–0.947, which satisfies a threshold of greater than 0.4. Therefore, it was concluded that the model served as a statistically significant method ($p < 0.001$) for the female group and a standardized loading value of each item was as follows: I10 had the highest loadings (0.947), followed by I2 (0.905), and indicator I11 had the lowest loadings (0.712).

Table 3.5 Factor Analysis for men and women (n=1,320)

Construct	Variables	Men (n=515)					Women (n=805)				
		Loadings	Standard Error	t-Value	CR	AVE	Loadings	Standard Error	t-Value	CR	AVE
Behavioral Intention	I1	0.881	0.012	71.857			0.893	0.009	98.615		
	I2	0.867	0.013	65.999	0.918	0.790	0.906	0.008	107.872	0.921	0.796
	I3	0.917	0.010	91.735			0.878	0.010	88.605		
Attitude	I4	0.718	0.025	28.261			0.677	0.022	30.895		
	I5	0.843	0.018	47.953	0.842	0.641	0.863	0.012	69.571	0.848	0.654
	I6	0.835	0.018	46.261			0.871	0.012	71.941		
Subjective Norms	I7	0.834	0.023	36.616	0.781	0.641	0.865	0.019	45.195	0.779	0.640
	I8	0.766	0.025	30.776			0.729	0.022	33.385		
Perceived Behavioral Control	I9	0.904	0.014	64.638			0.878	0.013	68.339		
	I10	0.889	0.015	60.852	0.895	0.740	0.947	0.011	84.094	0.886	0.724
	I11	0.783	0.020	39.339			0.711	0.019	37.126		
Perceived ease of use	I12	0.859	0.015	56.437			0.897	0.009	100.760		
	I13	0.850	0.016	54.045	0.879	0.708	0.897	0.009	100.908	0.910	0.772
	I14	0.815	0.018	45.488			0.841	0.012	70.556		
Perceived usefulness	I15	0.879	0.013	67.395			0.867	0.011	80.601		
	I16	0.845	0.015	55.503	0.906	0.763	0.881	0.010	88.721	0.913	0.777
	I17	0.895	0.012	74.265			0.897	0.009	97.962		
Trust	I18	0.843	0.021	39.826	0.801	0.669	0.872	0.013	64.903	0.852	0.741
	I19	0.792	0.023	34.660			0.850	0.014	60.244		
Task-technology-fit	I20	0.872	0.014	61.115			0.855	0.012	72.577		
	I21	0.885	0.014	65.548	0.897	0.744	0.888	0.010	87.578	0.908	0.766
	I22	0.829	0.017	48.689			0.883	0.010	85.208		

Note: Regression. * significant at $\alpha = 0.05$

3.5.3 Reliability Statistics

Prior to the SEM results being interpreted, the statistical values used for the estimation must be validated, as appropriate, as follows: (1) χ^2/df should be 2–5 (Marsh & Hocevar, 1985); (2) RMSEA should be less than 0.07 (Steiger, 2007); (3) CFI should be equal to or greater than 0.90 (Hu & Bentler, 1999); (4) TLI or NNFI should be equal to or greater than 0.80 (Hooper, Coughlan, & Mullen, 2008); and (5) SRMR should be equal to or less than 0.70 (Hu & Bentler, 1999).

As presented in Table 6, the model fit index values for the male group were $\chi^2 = 420.971$, $df = 191$, $\chi^2/df = 2.204$, RMSEA = 0.053, CFI = 0.967, TLI = 0.96, and SRMR = 0.040, which is acceptable. The values for the model fit index for the female group were $\chi^2 = 494.002$, $df = 191$, $\chi^2/df = 2.586$, RMSEA = 0.044, CFI = 0.979, TLI = 0.975, and SRMR = 0.041. According to the criteria, both models are acceptable.

Table 3.6 compares parametric estimation between measurement models and path analysis for the same features as in SEM but with different population characteristics (male and female). The model for measuring the variance found that the data fit the model. The data for Model 1 were as follows: $\chi^2 = 914.973$; $\chi^2/df = 2.395$; CFI = 0.975; TLI = 0.969; RMSEA = 0.048 [90%CI = 0.044–0.052]; and SRMR = 0.040. For Model 2, the factor loadings, intercept, and path factor of the constructs were $\chi^2 = 1100.169$ ($\chi^2/df = 2.764$), CFI = 0.969, TLI = 0.964, RMSEA = 0.052 [90% CI = 0.048-0.055], and SRMR = 0.047, respectively, Delta- $\chi^2 = 185.196$. These values were validated for statistical significance at the 0.05 level ($p < 0.05$), rejecting the null hypothesis. After considering the importance of the model, it was concluded that the populations (male and female) are different.

Table 3.6 Model of fit and statistical and multi-group analyses.

Description	χ^2	df	χ^2/df	CFI	TLI	RMSEA (90% CI)	SRMR	Delta- χ^2	Delta- df	p- value
TPB Individual										
group	420.971	191	2.20	0.967	0.961	0.053	0.040			
Model 1: Male	494.002	191	2.58	0.979	0.975	(0.042-	0.041			
Model 2:						0.055)				
Female						0.044				
TPB	914.973	382	2.39	0.975	0.969	(0.040-	0.040			
Measurement						0.049)				
invariance	1100.169	398	2.76	0.969	0.964	0.048	0.047	185.196	16	0.000
Model 1:						(0.044-				
Simultaneous						0.052)				
Model 2:						0.052				
Factor loading,						(0.048-				
intercept,						0.055)				
structural path										
held equal										
group										

3.5.4 Model Estimation

The results of the SEM analysis for TPB can describe and show the factor loadings of each indicator as shown in Table 3.7.

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Table 3.7 Theory of planned measurement model parameters

Construct	Men				Women			
	Standardized estimate	Standard Error	p-value	R ²	Standardized estimate	Standard Error	p-value	R ²
Behavioral Intention								
I1	0.882	0.012	<0.001	0.778	0.893	0.009	<0.001	0.797
I2	0.865	0.013	<0.001	0.749	0.905	0.008	<0.001	0.820
I3	0.915	0.010	<0.001	0.838	0.877	0.010	<0.001	0.769
Attitude								
I4	0.744	0.024	<0.001	0.554	0.725	0.020	<0.001	0.526
I5	0.760	0.023	<0.001	0.578	0.756	0.018	<0.001	0.572
I6	0.753	0.024	<0.001	0.566	0.764	0.018	<0.001	0.584
Subjective Norms								
I7								
I8	0.828	0.023	<0.001	0.685	0.864	0.019	<0.001	0.747
	0.773	0.025	<0.001	0.598	0.730	0.022	<0.001	0.533
Perceived Behavioral Control								
I9	0.903	0.014	<0.001	0.816	0.878	0.013	<0.001	0.771
I10	0.889	0.015	<0.001	0.791	0.947	0.011	<0.001	0.897
I11	0.783	0.020	<0.001	0.614	0.712	0.019	<0.001	0.506
Perceived ease of use								
I12	0.853	0.015	<0.001	0.728	0.895	0.009	<0.001	0.801
I13	0.846	0.016	<0.001	0.715	0.892	0.009	<0.001	0.796
I14	0.811	0.018	<0.001	0.658	0.839	0.012	<0.001	0.704
Perceived usefulness								
I15	0.878	0.013	<0.001	0.771	0.865	0.011	<0.001	0.748
I16	0.847	0.015	<0.001	0.718	0.881	0.010	<0.001	0.775
I17	0.893	0.012	<0.001	0.797	0.899	0.009	<0.001	0.808
Trust								
I18	0.836	0.021	<0.001	0.698	0.873	0.013	<0.001	0.762
I19	0.793	0.023	<0.001	0.629	0.848	0.014	<0.001	0.719
Task-technology-fit								
I20	0.871	0.014	<0.001	0.759	0.854	0.012	<0.001	0.729
I21	0.885	0.014	<0.001	0.783	0.887	0.010	<0.001	0.787
I22	0.829	0.017	<0.001	0.687	0.883	0.010	<0.001	0.780
Behavioral Intention								
ATT	0.677	0.047	<0.001	-	0.749	0.037	<0.001	-
SN	0.284	0.059	<0.001	-	0.203	0.045	<0.001	-
PBC	0.001	0.034	<0.001	-	-0.067	0.025	<0.001	-
Attitude								
SN	0.132	0.061	<0.001	-	0.039	0.045	<0.001	-
PEOU	0.104	0.090	<0.001	-	0.421	0.069	<0.001	-
PU	0.264	0.067	<0.001	-	0.149	0.057	<0.001	-
TR	0.502	0.067	<0.001	-	0.376	0.050	<0.001	-
Perceived usefulness								
PEOU	0.667	0.048	<0.001	-	0.699	0.038	<0.001	-
TIF	0.201	0.053	<0.001	-	0.202	0.042	<0.001	-
Perceived ease of use								
TIF	1.195	0.052	<0.001	-	1.178	0.034	<0.001	-

Note: ATT = Attitude, SN = Subjective Norms, PBC = Perceived Behavioral Control, PEOU = Perceived ease of use, PU = Perceived usefulness, TR = Trust, TIF = Task-technology-fit

3.5.4.1 TPB Model Estimation for Male

The SEM for TPB (Figure 1) in males showed that H1 and H2 (ATT and SN positively influence BI to use online food-ordering services) ($=0.677$ and 0.284 , respectively, $p < 0.05$) were supported, while H3 (PBC positively influences BI to use online food-ordering services) did not effect online food-ordering behaviors. H4, H5, H6, and H7 (SN, PEOU, PU, and TR positively influence ATT) ($=0.104$, 0.132 , 0.264 and 0.502 , respectively, $p < 0.05$) were supported. H8 and H9 (PEOU, TTF positively influence PU) ($=0.677$ and 0.201 , respectively, $p < 0.05$) were also supported. Lastly, H10 (TTF positively influences PEOU) ($=1.195$ respectively, $p < 0.05$) was supported as well, as shown in Figure 3.2 and Table 3.7.

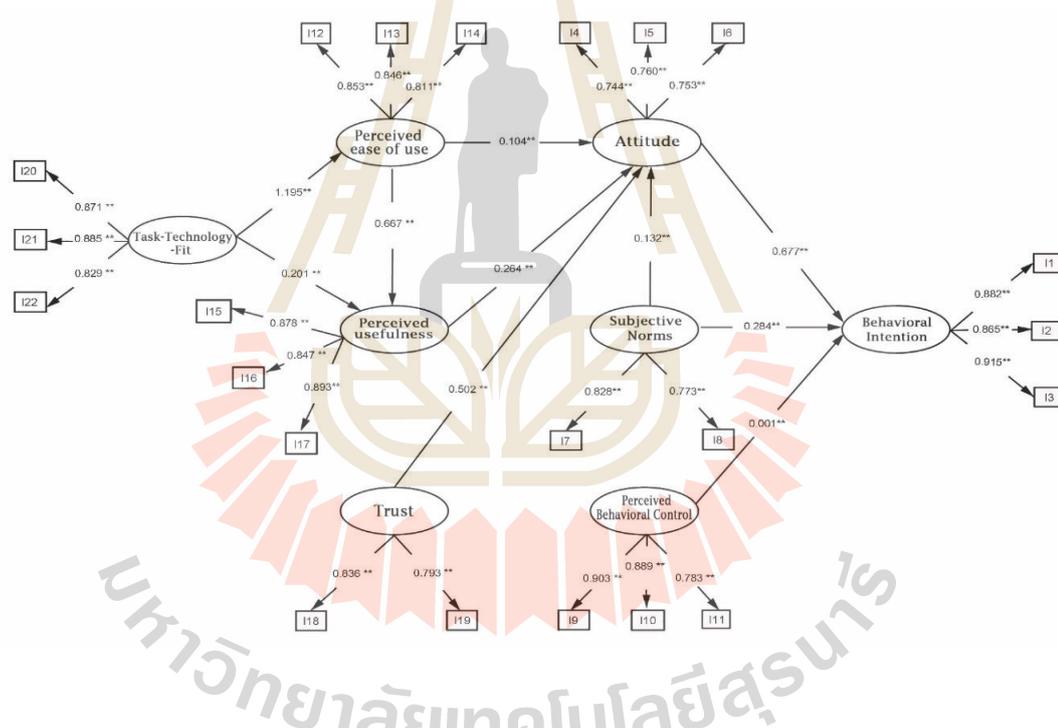


Figure 3.2 The theory of planned behavior model for male

3.5.4.2 TPB Model Estimation for Female

The SEM for TPB (Figure 3.3) in females shows that H1 and H2 (ATT and SN positively influence BI to use online food-ordering services) ($=0.749$, 0.203 , and -0.067 respectively, $p < 0.05$) were supported. Further, H4, H5, H6, and H7 (SN, PEOU, PU and TR positively influence ATT) ($=0.039$, 0.421 , 0.149 and 0.376 ,

respectively, $p < 0.05$) were also supported. H8 and H9 (PEOU and TTF positively influence PU) ($=0.699$ and 0.202 , respectively, $p < 0.05$) were supported as well. Finally, H10 (TTF positively influences PEOU) ($=1.178$ respectively, $p < 0.05$), as shown in Figure 3.3 and Table 3.7.

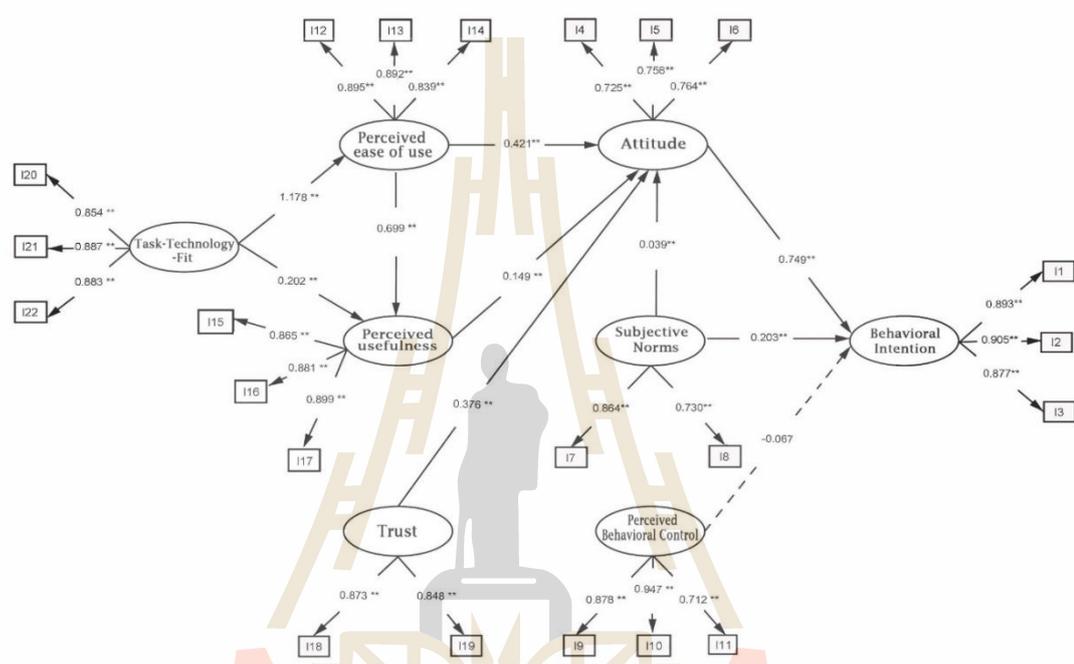


Figure 3.3 The theory of planned behavior model for female

3.5.4.3 Structural Model and Hypothesis Testing

According to the analysis results of the SEM for males and females, which explores the relationship between three external variables influencing behavioral intention to order food through online platforms, the standard regression coefficient (Coef.) indicated the following. The attitude factor had the greatest influence on behavioral intention (0.677, 0.749), followed by the SN factor (0.284, 0.203) and PBC factor (0.001–0.067). For the correlation analysis results between the four external variables, the standard regression coefficient (Coef.) indicated that the PEOU factor had the greatest influence on attitudes (0.104, 0.421), followed by the PU factor (0.264, 0.149), trust factor (0.502, 0.376), and SN factor (0.132, 0.039). For the correlation analysis between the two external variables influencing PU of ordering food through

online platforms, the standard regression coefficients (Coef.) indicated that the PEOU factor had the greatest influence on the perceived usefulness (0.667, 0.699), followed by the TTF factor (0.201,0.202). Further, the results of the analysis of TTF influencing PEOU showed a standard regression coefficient (Coef.) equal to 1.195,1.178. The effect of factors affecting BI in online food ordering and the results of the hypotheses test analysis are presented in Table 3.8.

The conclusive investigation according to research hypotheses (H1-H10) found that the stated hypotheses significantly influence the relationship as indicated and shown in Figure 3.1.

Table 3.8 Results of the hypotheses Testing

Hypothesis	Men			Women		
	Standardized Path Coefficient	t-Value	Result	Standardized Path Coefficient	t-Value	Result
H1: ATT → BI	0.677	14.313	Supported	0.749	20.299	Supported
H2: SN → BI	0.284	4.797	Supported	0.203	4.483	Supported
H3: PBC → BI	0.001	0.042	Not Supported	-0.067	-2.659	Supported
H4: SN → ATT	0.132	2.150	Supported	0.039	0.871	Supported
H5: PEOU → ATT	0.104	1.160	Supported	0.421	6.066	Supported
H6: PU → ATT	0.264	3.939	Supported	0.149	2.631	Supported
H7: TR → ATT	0.502	7.457	Supported	0.376	7.456	Supported
H8: PEOU → PU	0.667	13.843	Supported	0.699	18.272	Supported
H9: TIF → PU	0.201	3.799	Supported	0.202	4.816	Supported
H10: TIF → PEOU	1.195	23.075	Supported	1.178	34.228	Supported

Note: ATT = Attitude, SN = Subjective Norms, PBC = Perceived Behavioral Control, PEOU = Perceived ease of use, PU = Perceived usefulness, TR = Trust, TIF = Task-technology-fit

3.6 Discussion

This research employed SEM by conducting multigroup analysis between males and females applying the TPB and TAM theories. The results found that males and females had different intentions in their use of online food-ordering platforms. Specifically, females are more interested in adopting innovations than males (Hwang, Lee, et al., 2019). The research supporting this result came from (Hwang & Kim, 2019) who studied drone delivery services and revealed that female were more likely to engage in environmentally friendly behaviors than male. The research using multigroup analysis to analyze different attitudes in males and females indicated differences

between the two gender groups. These differences are related to the use of mobile banking services (Glavee-Geo, Shaikh, & Karjaluo, 2017), the effects of culture, behavior, and gender on intentions in purchasing eco-friendly products (Sreen, Purbey, & Sadarangani, 2018), and the use of online auctions. McLaughlin and Bradley (McLaughlin, Bradley, Prentice, Verner, & Loane, 2017) studied consumer intention in food consumption through food-delivery platforms (Wen *et al.*, 2021), yielding results that potentially confirm different attitudes between men and women regarding intention in online food ordering.

3.6.1 Based on Theory of Planned Behavior

For the male and female TPB models, a positive ATT mostly increases intention to order food online through the food-ordering platforms. According to the measurement model, the two groups exhibited similar behavior regarding the attitude toward online food-ordering platforms. This is consistent with several studies on online food-ordering behaviors through food-ordering platforms (Al Amin *et al.*, 2021; Bouarar *et al.*, 2021; Hwang & Kim, 2021; Troise *et al.*, 2020; Wen *et al.*, 2021). If consumers have a positive attitude toward the platforms, they will be more likely to use these platforms. Therefore, marketing strategies can influence consumers to use these services (Choe *et al.*, 2021).

Subjective norms, especially as expressed by close friends and parents, greatly affect the consumer's decision-making process regarding online food ordering. This is steady with the study of (Al Amin *et al.*, 2021), whose results found that when consumers saw that the priority group ordered food online, they would correspondingly order food online. Additionally, the study results of (Troise *et al.*, 2020) found that SN positively influence BI in online food ordering. Overall, much research has shown that SN of consumers positively influence online food-ordering behavior (Bouarar *et al.*, 2021; Choe *et al.*, 2021; Kim & Hwang, 2020; Roh & Park, 2019; Wen *et al.*, 2021).

In terms of the distinguished difference, the PBC factor influenced only the male group, steady with the research of (Al Amin *et al.*, 2021), whose results showed that PBC had a positive influence on consumer behavior. The results of (Troise *et al.*, 2020) also showed that PBC had a positive influence on consumer behavior.

Further, many research results are showing that PBC had a positive influence on online food-ordering behaviors (Bouarar et al., 2021; Choe et al., 2021; Kim & Hwang, 2020; Roh & Park, 2019; Wen et al., 2021). In contrast, the study participants in the female group were worried about ordering food through online platforms due to anxieties about the use of complicated applications.

3.6.2 Based on Technology Acceptance Model

According to the male and female TAM models on the factors positively influencing attitudes toward online food-ordering platforms, the male group placed the most importance on trust. This is consistent with the research of (Kang & Namkung, 2019), which examined the data quality and credibility of online food-service customers. Conversely, the female group placed greater focus on the PEOU of food-ordering platforms. This is in line with prior study (Nguyen *et al.*, 2019), which studied the quality of information and the credibility of online food-ordering customers. However, regarding subjective norms, both males and females agreed that it was the last factor affecting consumer attitudes.

The next factor considered by this study was PU. It was found that both groups' PEOU is important, which is consistent with research by (Lee *et al.*, 2017; Nguyen *et al.*, 2019; Troise *et al.*, 2020). If consumers find the platform obvious and easy to use, this translates to PU, followed by the TTF.

The PEOU is the last examined factor, and the present study found that both groups had similar perceptions (considered by the weight values). Both groups expressed views that if the platform is properly used as its function (e.g., clear order information or platform function relevant to its acknowledged purpose), this will result in practical consumer use of the platform. This is consistent with the research of (Vanduhe *et al.*, 2020), which integrated TAM and TIF with gamification training through the use of MOOCs in under graduation (Wu & Chen, 2017). The research results found that TTF positively influenced PEOU. As no extant research has examined TTF with online food ordering, it requires citing other relevant research findings to study the behavior difference between male and female groups.

3.7 Conclusions and Implication

This study examines the factors or perceptions that result in food ordering through online platforms using TPB (Ajzen, 1991). This theory is extensively used in research studying motivation and behavior, and the present study statistically analyzed TPB using multigroup analysis of male and female samples to compare parameter estimates.

The research results can be utilized as follows. The study was able to rank external variables in terms of strength of influence on intention to order food online through food-ordering platforms. For example, attitude influences intention to order food online through food-ordering platforms. If consumers have a positive attitude toward a food-ordering platform, this will result in a positive tendency to use the platform, though consumers will deliberate before making a decision. In particular, positive attitudes will result in further consideration for individuals ordering food through online platforms. Creating promotions to attract consumers, using platform attributes, which are the media, of which the work processes are on the internet allowing immediate interaction between the platform and the consumers, obtaining product information from the food ordering platform to decide to use the service as well as facilitate the work process such as payment systems and food-delivery systems. In addition, if consumers find that platform functions are suitable for both ordering and receiving food, this will facilitate consumer decisions to use the platform. Moreover, subject norm, especially as it relates to close friends and parents, can have a significant impact on predecision of consumers ordering food through online platforms, or making a purchase decision immediately upon seeing them. Consumers who shop or order food online do not select products by seeing them in person. Instead, they choose their desired products based on their perception of how they will serve their needs. As incentives to stimulate consumer demand, advertising products or sharing information about food with consumers may generate purchase contemplation or even stimulate immediate purchase decisions for sensitive consumer groups. Since the analysis results revealed that PBC among females had no influence on behavioral intentions in ordering food online due to anxieties about complicated platforms, owners of food-ordering platforms could develop uncomplicated platforms

to increase the likelihood of consumer use and purchase through the platforms. Therefore, government or other relevant agencies should use this research to formulate policies facilitating the purchase of goods in the digital marketing system by, for example, developing a variety of payment options and alternative point payment providers (National Innovation Agency, 2021).

3.8 Limitations and Future Work

This study highlights the guidelines for studying user behavioral intention in online food-ordering platforms. However, it has some limitations. Overall, in future research, other theories than TAM and TPB should be studied to gain more insight into service user attitudes. Studies should also be conducted to compare consumer attitudes and behaviors between urban and rural areas. The scope of the study also presents a limitation. The SEM results were obtained only by questioning users of online food-ordering platforms in the province representing each region. In other countries, results or weight of significance may vary. Future research should examine attitudes toward a variety of platforms by applying other theories to determine factors and perspectives influencing the behavior of online food-ordering platform users.

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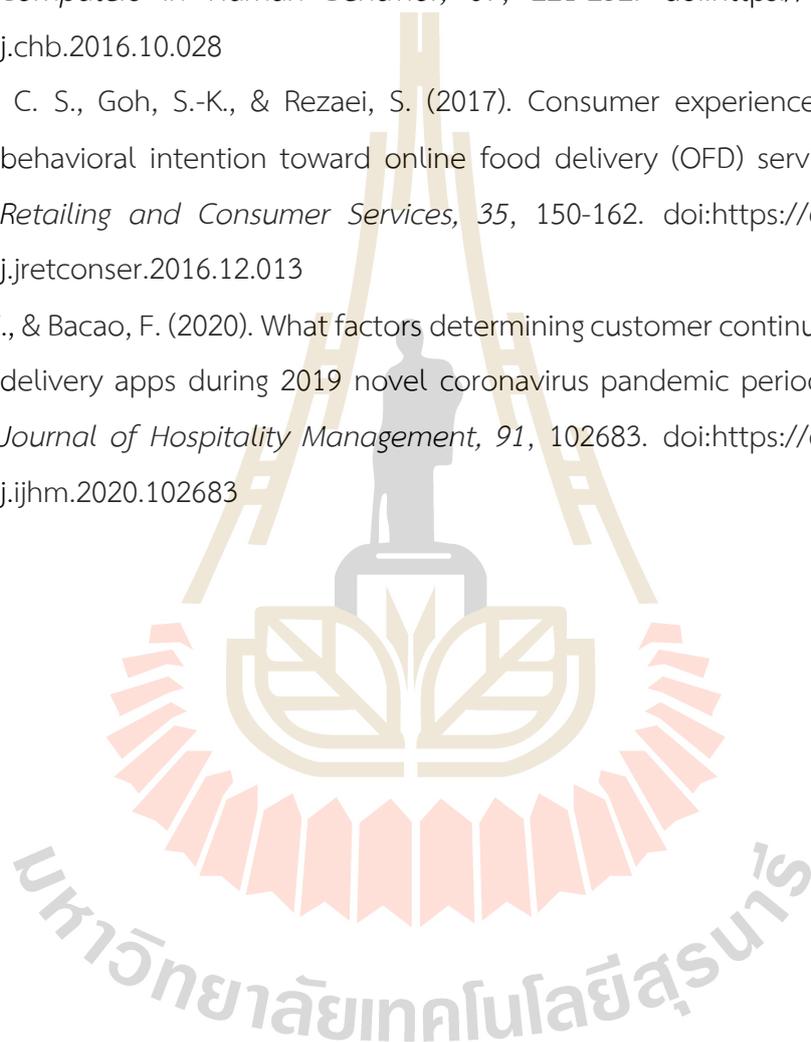
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CHAPTER 4

INFLUENCING BEHAVIOR INTENTION OF ORDERING FOOD ONLINE: A RANDOM THRESHOLDS RANDOM PARAMETERS HIERARCHICAL ORDERED PROBIT

4.1 Abstract

We cannot deny that concept of online food order is one of the main services that is used by many people, especially during COVID-19 epidemic. In addition, online food order helps to prevent people to meet several people and it is well responded to customer's demand. So this study focuses on analyzing factors influencing to intention to order food, leading to methods of determining effective strategy, in order to increase users of online food order application. This study utilizes data from questionnaire answering by users who order food online via application platform in Thailand. The data consists of 1,320 sets of questionnaire in order to consider fixed limitation of the fixed thresholds limitation of the traditional ordered probability models. So method of a random thresholds hierarchical ordered probit model with random parameters is used for data analysis. The Model result found that variance of Behavior intention toward food order of samples is significantly unequal. Moreover, factor most influencing to intention to order food via application is Positive attitude on application. Second is Enjoyment. Refer to factors that are significant for BI, in terms of random parameter, they consist of 3 factors that are Subjective Norm, Trust, and Perceived ease of use. This study has found in-depth details on different viewpoints of samples. Furthermore, this article still recommends method on strategy making to increase number of users of online food order platform.

4.2 Introduction

4.2.1 Background

The past research had studied different factors affecting to consumer attitude and behavior toward service use of food order via application. Refer to literature review related to online food order, it found that there were researchers who studied about online food order as follow: Study on online food order via application that mostly study about survey on fast food order in China (Akram, Ansari, Fu, & Junaid, 2020), Study on factors affecting to satisfaction and continuous intention to use the service (Alalwan, 2020), Roles of mobile food order platform on the development of satisfaction and loyalty during the epidemic (Dirsehan & Cankat, 2021), Innovation resistance theory perspective on the use of food delivery applications (Kaur, Dhir, Ray, Bala, & Khalil, 2020), Impact of aesthetics on food delivery applications (Kumar, Jain, & Hsieh, 2021), An exploratory study across India and the Philippines (Pandey, Chawla, & Puri, 2021), Factors affecting to online food delivery service in Bangladesh (Saad, 2020), Adoption of online-to-offline food delivery services in China and New Zealand (Wang & Scrimgeour, 2021), And examination of consumers' intentions to use food delivery applications (Wen, Pookulangara, & Josiam, 2021). These are conformed to consumer behavior that turns to use more e-Commerce. Also, due to the COVID-19 epidemic that affected to the lockdown and social distancing, online purchase is necessary for consumer. It affects to a skipping growth of e-Commerce value and to be ensured that online product and service demands will become a main channel for consumer. Even though during Post COVID-19 epidemic, it will become a New Normal (Electronic Transactions Development Agency, 2022). So that measures of epidemic control and lock down, as well as Food delivery platform which facilitates with various restaurants for selection affect to a skipping growth of online food order, number of restaurants and riders who joined the platform in year 2020, including Thailand. Also, it resulted in the multiple increase on income of global Food delivery platform (Economic Intelligence Center, 2021). From overall previous research review, there is none of researcher who used the Unobserved Heterogeneity model to study the difference of parameter that influenced to Behavioral intention to order food via online.

Considering the Sustainable development which is designed to generate a developed economy and environmental prevention, concept of online food order is a part of Responsible Consumption and Production. That is online food order is responding to consumer demand at anytime and anywhere (Inthong, Champahom, Jomnonkwao, Chatpattananan, & Ratanavaraha, 2022; UN, 2022)

This research analyzes the studied data of factors influencing to Behavioral intention to order food online in Thailand by taking data of factor influencing to consumer's service use to analyze by using Unobserved Heterogeneity Modeling, to study the difference of factors influencing to Behavioral intention to order food online. For this reason, researcher has used Random parameters formulation to identify difference of criteria and diversity that are not observed. It meant if they are ignored and not considered, it may lead to the inconsistency, bias and inefficient predictors, and incorrect estimation for everyone, especially in the group of intermediate level (Greene & Hensher, 2010). To evaluate statistical benefit of the offered method, the results of the random thresholds random parameters hierarchical ordered probit model are compared with the traditional hierarchical ordered probit and the fixed- and random-parameters ordered probit model counterparts. Many previous research results found that reliance on Random parameter doctrine will correctly predict the model rather than Fixed parameter. Moreover, we can analyze complexity of parameter estimation (Fountas & Anastasopoulos, 2017; Jin, Chowdhury, Salek, Khan, & Gerard, 2021). Which will affect to understanding on user behavior of online food order application.

This research would like to understand factors influencing to intention to order food by applying the complex parameter estimation technique that has absolutely not been studied or analyzed with in-depth random parameter technique before. So this study result will help to confirm if the Model need to be analyzed by random parameter method. Also analysis result of factor loadings will be presented as recommendation on policy and strategy for online food order application companies.

The rest of article consists of the following structure. Section 2: Summarized factors affecting to intention to use food order application. Section 3: Mentioning about data used for research process. Section 4: Presenting analysis result

and discussion. And Section 5: Explaining the summary and suggestion in terms of strategy and policy to increase number of application users.

4.3 Literature review and conceptual framework

The study has created a study conceptual framework in relevant to factors influencing to Behavioral intention to order food via online platform as showed in Figure 4.1, including 7 variables. Each variable can be set as hypothesis by using study results of the previous research.

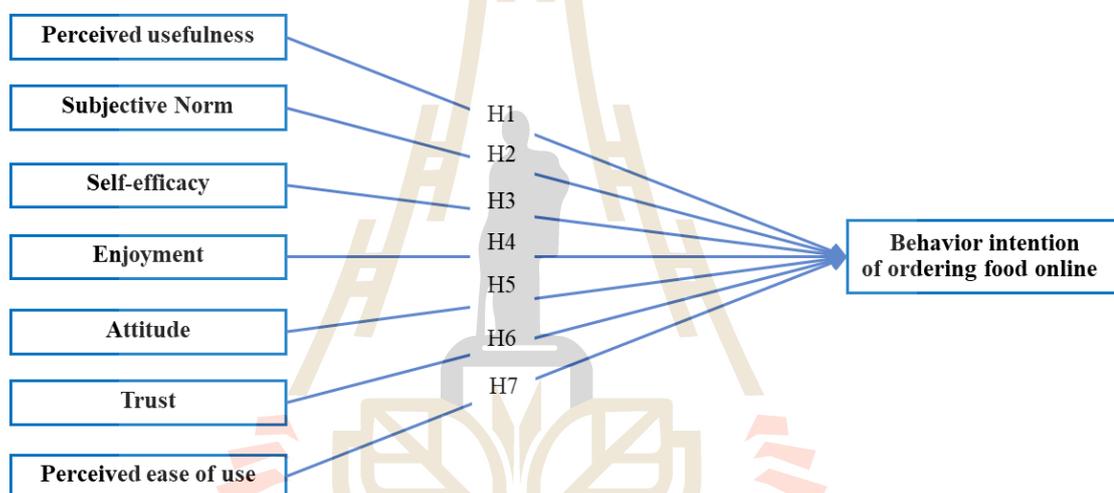


Figure 4.1 Conceptual Framework

Perceived usefulness: is a viewpoint of user's usefulness. Mostly, the online food order will be asked about order process that impacts to daily living such as no need to walk to restaurant, and save traveling time, for example: "Using food order application helps you to well-examine order process and food delivery", or View of delivery e.g. "Food order application is useful to order and get it delivered well". Most study results found that there is positive aspect toward intention to order food via online (Akram et al., 2020). So the hypothesis is:

H1: Perceived usefulness is positively significant toward intention to online food order via application.

Subjective Norm: is a behavior causes by following actions of surrounding

people such as parents or friends. It is an example presenting that to order food online is convenient and able to do on mobile phone right away. There are questions e.g. “In your opinion, how will your friends respond if they think you use food order application?”, and “In your opinion, how will your parents respond if they think you use food order application?” Considering these questions, it found that these kinds of question impact to an increase of intention to order food via application (Al Amin, Arefin, Alam, Ahammad, & Hoque, 2021). So the hypothesis is:

H2: Subjective Norm is positively significant toward intention to online food order via application.

Self-efficacy: is an attitude about how convenient the application is such as “You see yourself using application to find information about food if you used to use a similar application before”, or to utilize application in real situation e.g. “You see yourself using application to find information about food if you can afford it”. The previous study results found that these variables tend to be positive toward intention to order food via application (Choe, Kim, & Hwang, 2021). So the hypothesis is:

H3: Self-efficacy is positively significant toward intention to online food order via application.

Enjoyment: is an attitude about flow of online food order e.g. there is no error while using application, ease of user interference that causes non-complexity during food order. There are questions e.g. “In general, online food order is less complicated”, and “Online food order via application make you worry”. These variables were found that they are positively significant to the intention (Yeo, Goh, & Rezaei, 2017). So the hypothesis is:

H4: Enjoyment is positively significant toward intention to online food order via application.

Attitude: is a positive attitude measured by overall viewpoint in different dimensions, including convenience: a non-complicated character comparing to walking to eat at the restaurant, “Use of food order application is convenient for you”, Ease of food order: food order process and payment, “You like to order food via application because it is easy”, and Time convenience: able to order at any time and everywhere, “You want to use application when you need to order food”. Previous research found

that these variables positively impacted to the intention (Hwang & Kim, 2021; Hwang, Lee, & Kim, 2019). So the hypothesis is:

H5: Attitude is positively significant toward intention to online food order via application.

Trust: is to measure about Trust in the use of food order application such as Trust in security of credit card, money transfer, guarantee on getting right product, or safety of personal data. Questions are, “You trust in food order application”, and “Food application data is trustable”. Refer to previous research articles, it found that Trust is positively significant to BI (Kasilingam, 2020; Troise, O'Driscoll, Tani, & Prisco, 2020). So the hypothesis is:

H6: Trust is positively significant toward intention to online food order via application.

Perceived ease of use: is easy character in the use of online food order application e.g. Content or button is clear, and Not complicated so users rarely need to read a guideline or give a try then they can order food right away. There are many questions for these issues, “You find that it is easy to order food via food application”, and “Application function is clear and understandable”. Refer to previous research, it found that Perceived ease of use is often positively significant to BI (Lee, Lee, & Jeon, 2017). So the hypothesis is:

H7: Perceived ease of use is positively significant toward intention to online food order via application.

4.4 Methodology

To study probability on force of factors influencing to Behavioral intention to order food via online to setup the ordered probit model, it is defined as follow (Washington, Karlaftis, Mannering, & Anastasopoulos, 2020):

$$z_i = \beta X_i + \varepsilon_i, y_i = j \text{ if } \mu_{j-1} < y_i < \mu_j, j = 1, \dots, J \quad (4.1)$$

y_i is number that is conformed to sequence of factors influencing to Behavioral intention to order food via online. β is parameter vector that can be estimated. X is

variable vector. μ is threshold parameters that determined and estimated the y . β_j is ordered integer of factors influencing to Behavioral intention to order food via online. And \mathcal{E} is randomly mistaking condition that is considered as a normal distribution with values of average = zero, and variance = one.

Under a draft of the hierarchical ordered probit modeling, the criteria might be different by function of parameter explanation set (Greene & Hensher, 2010),

$$\mu_{ij} = \mu_{ij-1} + \exp(t_j + d_j s_i) \quad (4.2)$$

t is a blockage of each criterion. S is variable vector influencing to the thresholds. d is parameter vector that can estimate for the s , and to make the thresholds vary by all observations. So equation (2) can be re-written as follow (Greene & Hensher, 2010),

$$\mu_{ij} = \mu_{ij-1} + \exp(t_j + \gamma_j u_{ij} + d_j s_i) \quad (4.3)$$

u_{ij} is a term with normal distribution while average = zero, and standard deviation = one. While t_j is average and standard deviation for blockage range of the thresholds in order.

To explain the difference of factors influencing to Behavioral intention to order food via online in probability process of the results, parameter explanation can be altered from the observation that can be operated by using the estimated parameter (Anastasopoulos & Mannering, 2016; Kang & Fricker, 2016; Washington et al., 2020) which will become:

$$\beta_i = \beta + \Gamma w_i \quad (4.4)$$

β is average of random parameter vector. Γ is diagonal matrix of standard deviation. And w_i is a normal distribution term with average = zero, variance = one, in order to improve capacity for estimation process of the maximum modeled probability that is used for ordered method, Halton (Halton, 1960), and to obtain

random value of $\boldsymbol{\beta}$ from parameter's density function, $(\boldsymbol{\beta}/\boldsymbol{\varphi})$, while $\boldsymbol{\varphi}$ means parameter vector of density distribution (e.g. average and standard deviation in case of normal distribution),

Comparing to (3) and (4), it presented that threshold becomes unlimited to vary by the observation. And the explanation parameter still let it vary by the observation. So there is concurrent accounting for both threshold and unobserved differences.

For this context, ordered probability of the different levels of various factors j of each crashing observation can be calculated in reference to formula of (Washington et al., 2020) as follow.

$$P(y = 1) = \Phi(\mu_j - \beta_i X_i) - \Phi(\mu_{j+1} - \beta_i X_i) \quad (4.5)$$

$P(y=j)$ is probability for difference level of each factor of j . Φ presents collective function of normal distribution equation. μ means additional criteria for result of j . And all other criteria are conformed to what were previously determined. We should notice that result for difference level of each factor at first time ($j = 1$), the accordance of criteria (μ_0) is determined as zero by not losing the thoroughness (Washington et al., 2020), – that means only $j - 2$ thresholds is estimated.

Marginal effect is analyzed to estimate impact of explained variables toward probability for each difference level of factor – especially in terms of random parameter with unobserved heterogeneity (Washington et al., 2020).

$$\frac{P(y=j)}{\partial X} = \Phi[(\mu_{j-1} - \beta X) - \Phi(\mu_j - \beta X)]\beta \quad (4.6)$$

Minor impact will measure change on the ordered result probability of each list. Due to one unit change (or change from "0" to "1" in case of indicated variable) of explained variables, we should notice the additional impact estimation on sample average of explained variable.

4.5 Data

In order to express the random parameter application of hierarchy criteria, create Hierarchical Probit Model, and analyze consumer behavior influencing to Behavioral intention to order food via online application of service provider, the data is collected from participants' questionnaire on the use of food order via online platform in provinces that are economic centers of 6 regions in Thailand, including Central, Northern, Northeastern, Eastern, Western, and Southern regions. Sample scale is 1,320 people in total, divided into 6 regions with 220 people per region.

Questionnaire is divided into 3 part. Part 1 is personal and household characteristics of participants (gender, age, highest education level, occupation, average income), as well as experience of using online food order service via food order platform. Part 2 is about user behavior of online food order service via food order platform. Part 3 is other recommendations related to a use of online food order service via food order platform.

Part 2 of the questionnaire is evaluated by five-point Likert scale, ranking from 1-Strongly disagree to 5-Strongly agree. Even though it is an ordinal variable, it can be estimated by Maximum likelihood (ML).

Table 4.1 expressed frequency and percentage analysis of basic data obtained from 1,320 samples such as users of online food order, function characteristics, and frequency of use. Participants consist of 805 females (61%) and 515 males (39%). Age: Most of them are 21-30 years old (42.1%). Second is 31-40 years old (27.1%); Income: Most of them earned 10,001-20,000 Baht (31.3%). Second is 5,000-10,000 Baht (20.2%); Education: Most of them finished Bachelor degree (61.9%). Second is Senior High School (22.7%). Career: Most of them are Student/College Student (29.9%). Second is Company Employee (27.7%). The highest number of online food order is less than 4 times a month (51.7%). Second is 5-10 times/month (30.7%).

Table 4.1 Characteristics of the sample

Characteristics		Frequency	Percent
Gender	Male	515	39.0
	Female	805	61.0
Age	<20	149	11.3
	21-30	556	42.1
	31-40	358	27.1
	41-50	169	12.8
	51-60	83	6.3
	>60	5	0.4
	Education	Lower than junior high school	37
Junior High School		64	4.8
Senior High School		299	22.7
The bachelor's degree		817	61.9
higher than a bachelor's degree		103	7.8
Occupation	Student/College student	395	29.9
	General contractor	162	12.3
	Government employee/State Enterprises	174	13.2
	Company Employee	366	27.7
	Business owner	184	13.9
	Others	39	3.0
Revenue	> 5,000 Baht	221	16.7
	5,000-10,000 Baht	266	20.2
	10,001-20,000 Baht	413	31.3
	20,001-30,000 Baht	241	18.3
	30,001-40,000 Baht	89	6.7
	< 40,001 Baht	90	6.8
Used Frequency	Less than 4 times / month	683	51.7
	5-10 times / month	405	30.7
	more than 10 times / month	219	16.6
	others	13	1.0

4.6 Results and discussion

Refer to impact on result's probability of factors influencing to Behavioral intention to order food via platform, several variables consist of PU (Perceived usefulness); SN (Subjective norm); SELF (Self-efficacy); ENJOY (Enjoyment); ATT (Attitudes towards food delivery apps); TR (Trust); and PEOU (Perceived ease of use). Questions of each group are as presented in Table A1. Questions are classified by

Exploratory Factor Analysis, and the analysis results are as showed in Table A2 (Champahom et al., 2019).

Table 4.2 presented result of model development, including 2 models that are Ordered Probability Model (OP), and Random Parameters and Random Thresholds Ordered Probit (RPRTOP). Model accuracy which is considered by McFadden Pseudo R2 found that RPRTOP is more suitable. That is conformed to a study of (Fountas & Anastasopoulos, 2017). It found that overall parameter values of both models tend to be in the same way which is positive. Also whichever parameter is significant, it will be the same in both models. While considering μ_j of RPRTOP model, it found the characters of the first and second Fixed parameter. That means intentions for users of online food order application at low level of 0, 1, and 2 are not different. However, it found that μ_3 is random parameter. That means users who have more intention are still not sure, or they don't have the same thought. It probably depends on frequency of online food order. Users who often order food via online application may be more confident and have more intention than others who rarely order food via application. For variables significantly influencing to BI, there are 4 out of 7 factors, including Enjoyment, Attitude, Trust, and Perceived ease of use. It found that they are all positive which support H4 - H7. While H1 - H3 results found that they do not support the hypotheses (Figure 4.2). The discussion can be explained by each hypothesis as below.

H1 is variable of Perceived usefulness (PU) (it is called Performance expectancy in several research) which is found that it does not support the hypothesis due to it has no significant to BI. This result is not conformed to several research which mostly found that PU is often significant to the intention (Agarwal & Sahu, 2021; Carranza, Díaz, Martín-Consuegra, & Fernández-Ferrín, 2020; Zhao & Bacao, 2020). However, when we consider in-depth, questions of this group that are to ask about convenience, it is possible that many participants have the different ways of answering so that it is not significant to BI. The cause might be from different abilities to use technology of each person. This result is similar to a study of (Changchit, Cutshall, Lonkani, Pholwan, & Pongwiritthon, 2019), who found that PU is not significant to the attitude of online shopping.

H2 is question about Subjective Norm (SN). Analysis result found that it does not support the hypothesis so it is not significant to BI. This result is not conformed to several research which found that SN is significant to BI (Asif, Xuhui, Nasiri, & Ayyub, 2018; Belanche, Flavián, & Pérez-Rueda, 2020). However, it found that this variable is in a form of Random parameter which presents the difference in each group. It is possible that some participants who order food more often via application, for starter, they let friends order food then download the application for self-use later. Nevertheless, it does not guarantee when some people see their friends use the application, they will use the food application. It maybe because they do not want to download more applications, and do not want to learn how to use new food application. That is similar to a study of (Glavee-Geo, Shaikh, & Karjaluoto, 2017), who found that SN is not significant to a use of Mobile banking services.

H3 Self-efficacy (SE) found that it is not significant to the Model so it can be concluded that H3 is not supported and not conformed to a study of (Phong, Khoi, & Le, 2018) who found that SE is significant to Mobile shopping. However, we must accept that this question is rather a wide picture by interpreting self-ability to use online food application which is similar to H1 in terms of Trust in use of new technology. Some users who are not familiar with technology will have no intention to use it. That is similar to a study of (Belanche et al., 2020) who found that SE or Perceived Control is not significant to Mobile Apps Use.

H4 is Enjoyment factor that means there are enjoyment and convenience while using application (On the other hand, there are variety of food for selection). It implies that online food order is not complicated, no concern, or there is no error. Analysis result found that it is positively significant. So that it supports this hypothesis. It is considered as a key of application use for this factor which requires a quick order time. It is conformed to a study of (Hwang & Kim, 2021) who found that Enjoyment is indicated by emotion factor which significantly influences to attitude towards drone food delivery while its loading is at a second rank after the Compatibility.

H5 is positive attitude factor influencing to food order, including dimensions of convenient to order, to use application is very easy, and there is no error while using food application. This hypothesis is supported. While considering Marginal Effect (Table

3), it is the highest, especially an intention that is at level 5 (7.609). It is clear that in case we consider the application in this way, the intention will be very high. This result is quite valid since technology use, especially using mobile application, it is needed for easy understanding e.g. non-complicated process, meaningful User interface, and system stability. The result is conformed to many studies, (Hwang, Kim, & Kim, 2019; Maichum, Parichatnon, & Peng, 2016).

H6 is Trust in food order. Model result found that it is positively significant. That is it can increase intention to order food via application. So this hypothesis is supported. While the Trust in food order is not to leak the proceeding data, including a key point of users' trust in receiving what they want after making payment, and ready to pay upon delivery. The interest of this factor is to find out that it is random parameter which presents that the Trust is different among samples. Some people have high trust so the BI is high. While others have medium trust but the BI is still high. The cause might be from each person has different perceived Trust while some people have trust in quality rather than safety (Loketkrawee & Bhatiasevi, 2018; Nguyen et al., 2019; Phong et al., 2018).

H7, Perceived ease of use (PEOU) support the hypothesis since it is positively significant. It is clear that the ease of food application use highly influences to intention to use. It is conformed to may research. found that PEOU is positively significant to Consumers' Use of social media for Transactions. Moreover, (Law, Kwok, & Ng, 2016) also found that PEOU is significant to online purchase intention for middle-aged online users.

Table 4.2 Model estimation result

Variable	Ordered Probability Model		Random Parameters HOPIT	
	Coefficient	t-stat	Coefficient	t-stat
Constant	-4.192	-15.99	-15.304	-2.73
PU	0.091	1.27	0.160	0.71
SN	0.065	1.15	0.169	0.93
<i>S.D. of SN</i>			<i>0.317</i>	<i>2.03**</i>
SELF	0.115	1.84	0.359	1.58
ENJOY	0.329	5.65**	1.180	2.55**
ATT	1.067	15.57**	3.815	2.77**
TR	0.257	3.62**	1.194	2.41**

Table 4.2 Model estimation result (Continued)

Variable	Ordered Probability Model		Random Parameters HOPIT	
	Coefficient	t-stat	Coefficient	t-stat
<i>S.D. of TR</i>			0.854	2.34**
PEOU	0.280	3.66**	1.033	2.23**
<i>S.E. of PEOU</i>			0.999	2.16**
Thresholds parameters				
Mu(01)	1.609	18.65**	1.676	4.59**
Mu(02)	3.564	58.74**	1.914	5.31**
Mu(03)	5.630	72.07**	1.807	5.13**
<i>S.D. of Alpha-03</i>			0.760	5.25**
Latent Heterogeneity in Variance of Epsilon				
Tau(v)			0.690	2.93**
Model statistics				
Number of observations N	1320		1320	
LL(0)	-1662.547		-1662.547	
LL(b)	-1061.213		-1040.628	
McFadden Pseudo R-squared	0.3617		0.3741	

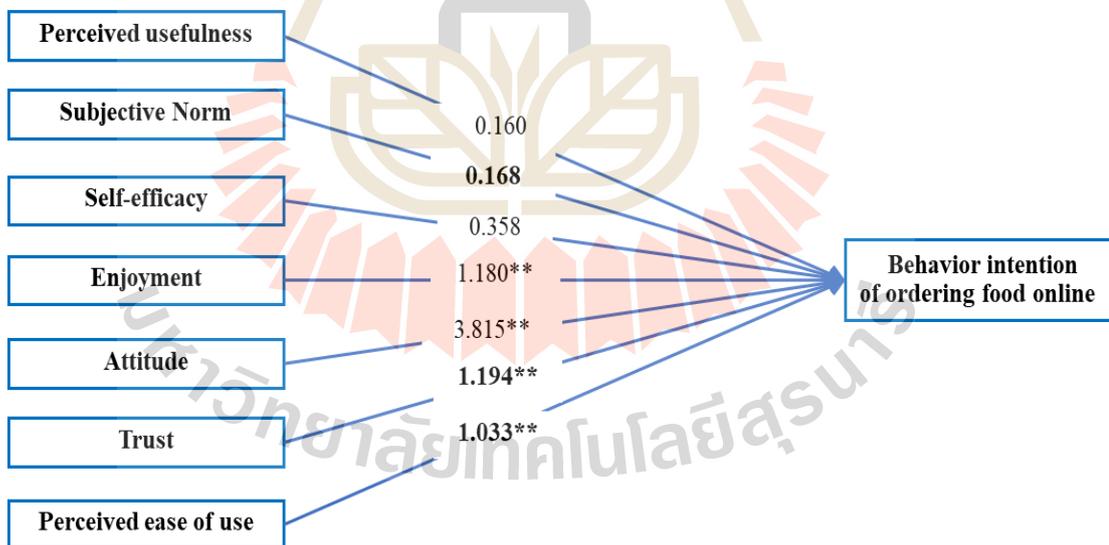


Figure 4.2 Random Parameters and Random Thresholds Ordered Probit Results

Note: ** P-value < 0.05, Bold text determined an estimation as random parameter

Table 4.3 Marginal Effects

Variable	Partial effects on Prob[Y _i] at means									
	[Y=01]		[Y=02]		[Y=03]		[Y=04]		[Y=05]	
	Elasticity	t-stat	Elasticity	t-stat	Elasticity	t-stat	Elasticity	t-stat	Elasticity	t-stat
PU	-1.594	-1.21	-1.051	-1.25	-0.444	-1.27	0.090	1.26	0.662	1.27
SN	-1.044	-1.11	-0.688	-1.14	-0.291	-1.15	0.059	1.14	0.434	1.15
SELF	-1.907	-1.67	-1.257	-1.77	-0.531	-1.83	0.107	1.79	0.792	1.82
ENJOY	-5.393	-3.28	-3.556	-4.31	-1.502	-5.5	0.304	4.68	2.240	5.16
ATT	-18.317	-3.89	-12.076	-6.1	-5.102	-12.79	1.032	7.22	7.609	9.93
TR	-4.403	-2.69	-2.903	-3.18	-1.226	-3.61	0.248	3.35	1.829	3.49
PEOU	-4.852	-2.7	-3.199	-3.2	-1.351	-3.6	0.273	3.33	2.016	3.5

4.7 Conclusions and Implementations

The study aims to identify factors influencing to intention to order food via application. There are many research that used this idea. However, it relies on a more complicated statistical model which means analysis of random parameter principle while there is no one had studied before. This study responses to its objectives. It also found that random parameter model is more suitable than fixed parameter. Moreover, models of Random Parameters and Random Thresholds Ordered Probit found that variance of 3rd fixed value is significant. Also variances of factor consist of Trust, Perceived ease of use, and Subjective Norm. It reflects that this data set is estimated by random parameter. This study fulfills body of knowledge on attitude of food order application users. It also gives recommendations on policy, application technique, and strategy, in order to increase intention to order food via application besides having only price promotion.

Refer to the highest factors that influence to intention to order food via application by considering marginal effect (Table 4.3), they are Attitude, Enjoyment, Trust and Perceived ease of use respectively. It can be summarized into policy suggestion and strategy to increase intention for people to use food order application more often. Firstly, we should consider to create positive intention to use application, including to develop an easily understandable application, or a promotion of application use by guarantee its ease with few clicks. Secondly, factor of enjoyment to order food is a character of non-disruption Fuentes, Cegrell, and Vesterinen (2021) by

error of application, including types of restaurant or food that can attract and increase demand to order food. Thirdly, Trust in application factor which is found that it is a random parameter. While there are some people who have high trust but do not want to use application, this point can be a topic to promote that there is a guarantee of non-leaked information or the ordered items will be delivered. Application may present an infographic, statistic, an accurately delivered food, or satisfaction score to encourage users and non-users to have trust. Lastly, ease of use is a question similar to positive attitude by promoting the ease of use. In addition, we can promote the application's clarity e.g. types of restaurant and food, food price category etc.

Future research can be about the thresholds heterogeneity by studying impacts of threshold-related variables that are different by the observation. Considering it as a trend but also complicated like this, it has a potential to present new in-depth data – about criteria's difference – to create a general probability model, and for the analysis on factors influencing to online food order via platform. Furthermore, understanding about loyalty will help to have people use the service more often (Chanpariyavatevong et al., 2021).

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Table A1 Questionnaire Item

Code	Variables	Mean	S.D.
	<i>Behavior intention</i>		
	You intend to use food order app.	3.794	0.881
	<i>Perceived usefulness</i>		
PU1	Using food order app helps you to well-check on food order and delivery process.	3.934	0.797
PU2	Using food order app is very convenient to order and receive the delivered food.	3.969	0.783
PU3	Food order app is very useful to order and receive the delivered food.	3.951	0.787
	<i>Subjective Norm</i>		
SN1	In your opinion, how will your friends respond if they think you use food order application?	3.717	0.803
SN2	In your opinion, how will your parents respond if they think you use food order application?	3.496	0.917
	<i>Self-efficacy</i>		
SE1	You see yourself using app to find information about food if you used to use a similar app before.	3.719	0.833
SE2	You see yourself using application to find information about food if you can afford it.	3.711	0.813
	<i>Enjoyment</i>		
ENJ1	In general, to order food via online is very complicated.	3.728	0.870
ENJ2	To order food online via food app make you worry.	3.571	0.954
ENJ3	In general, to order food via online causes you a little problem.	3.75	0.872
	<i>Attitude</i>		

Table A1 Questionnaire Item (Continued)

Code	Variables	Mean	S.D.
ATT1	Using application to order food is convenient for you.	4.109	0.823
ATT2	You like to order food via food app.	3.691	0.927
ATT3	You want to use food app when you want to buy food.	3.768	0.870
<i>Trust</i>			
TR1	You trust in food app.	3.783	0.885
TR2	Food app's information is trustable.	3.855	0.760
<i>Perceived ease of use</i>			
PEOU1	You found that it is easy to order food via food app.	3.932	0.784
PEOU2	App function is clear and understandable.	3.911	0.788
PEOU3	There is not much attempt to use food app.	3.836	0.807

Table A2 Exploratory Factor Analysis Result

	Component						
	1	2	3	4	5	6	7
PU1	0.759						
PU2	0.785						
PU3	0.782						
SN1		0.720					
SN2		0.840					
SE1			0.774				
SE2			0.780				
ENJ1				0.79			
ENJ2				0.816			
ENJ3				0.764			
ATT1					0.534		
ATT2					0.775		
ATT3					0.810		
TR1						0.735	
TR2						0.767	
PEOU1							0.727
PEOU2							0.721
PEOU3							0.754

Note: Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.945, Bartlett's Test of Sphericity $\chi^2=18088.22$, $df=153$, $P\text{-value} < 0.00$.

CHAPTER 5

GENERATIONAL DIFFERENCES IN ORDERING FOOD ONLINE BEHAVIOR: COMPARING GENERATION X AND Y: AN APPLICATION OF MULTI-GROUP STRUCTURAL EQUATION MODELING

5.1 Abstract

Due to the current situation of the COVID-19 epidemic, people are increasingly turning to ordering food online services through applications. An individual's gender is a key factor affecting their food ordering online behavior. This research aimed to use a structural equation model (SEM) using multi-group analysis between Gen X and Gen Y and using theory of planned behavioral (TPB). The datasets used in the research were collected from applications, comprising Grab Food and Foodpanda across Thailand. The research instrument, which consisted of 1,166 questionnaires, found that the behavioral intention to order food online in both groups was similar, followed by subjective norms. However, they were different in terms of their perceived behavioral control because it only influenced the Gen X group. As for the attitude factor, the two groups had similar behaviors, with most putting an importance on trust when ordering food online, and they had the identical opinion that subjective norm was the last factor influencing attitudes. Regarding perceived usefulness, both groups had similar perceptions. To explain, both groups placed an importance on perceived ease of using the applications, followed by perceived task-technology-fit. For the perceived ease of using the application, both groups had similar perceptions close to each other. To conclude, for business owners, making the application and the policy simple and uncomplicated is the way to encourage more consumers to use the service.

5.2 Introduction

5.2.1 Background

Technology has come in the era of the Fourth Industrial Revolution (The Fourth Industrial Revolution). It plays a massive role in people's work and daily life.

The government, therefore, plays an essential role in stimulating and encouraging all sectors to accept and accelerate the adoption of electronic commerce (e-Commerce) for benefits. This is one of the fundamental mechanisms driving the country's economic growth both now and in the future (Electronic Transactions Development Agency, 2021b).

The epidemic of coronavirus disease (COVID-19) has led to consumer behavior change. As consumers face the COVID-19 epidemic, which results in lockdowns and social distancing, e-commerce becomes more and more rapid. They are forced to get used to and adjust to buying daily necessities and other goods online instead. When shopping online becomes a part of the consumers' daily routine, increasing their willingness to spend through e-Commerce, it forces traditional entrepreneurs to promptly adapt themselves by turning to e-commerce to meet customer demands. This causes the value of e-commerce to grow exponentially. The demand for online purchases of goods and services is believed to be an increasingly important purchasing channel for consumers. Even in the post-pandemic era of COVID-19, it has become the New Normal (Electronic Transactions Development Agency, 2022).

The food delivery business is another business that is growing amid the COVID-19 outbreak. Both lockdown measures as well as working from home are coupled with a food delivery platform that facilitates and offers a greater variety of restaurants to choose from. The important catalyst is that both the quantity of food orders online, the number of restaurants, and riders who joined the platform in 2020 increased by leaps and bounds around the world, including Thailand, resulting in an increase in the income of the food delivery platform several times (Economic Intelligence Center, 2021). Compiling data from LINE MAN's cooperation, Wongnai expects that the volume of food ordered through the food delivery platform may continue to increase, driven by customer demand amid hybrid work. The entrepreneurs' adjusting strategies by expanding the income base in new areas and the cumulative customer base of both consumers and restaurants have been accelerated as a result of the severe coronavirus outbreak. However, the increase is likely to slow down compared to 2021 (Kasikorn Research Center, 2021). In addition,

the food delivery market's direction in 2022 is expected to increase due to service providers' applications, which deliver food to customers' places, and their continuous promotions, organized to stimulate the market, in addition to the readiness to expand the store base and new customer groups to provincial areas and build consumer familiarity (Kasikorn Research Center, 2021).

The Electronic Transactions Development Agency (ETDA) of the Ministry of Digital Economy and Society has conducted a survey of the top 10 popular online activities, comparing 2021 and 2020, and found that in 2021, ordering food online and online work activities differed from 2020 (Electronic Transactions Development Agency, 2021a). This is consistent with online behavior in using the online food delivery service for Thai people. To study the behavior, channels, and reasons for ordering food online, it was found that Gen Y (19–38 years old) used the service the most, at 51.09%, followed by the Gen X group (39–54 years), Baby Boomers (55–73), and Gen Z (below 19 years), respectively. The researchers are interested in the behaviors of people who ordered food online through an application by conducting a comparative study between Gen-X and Gen-Y consumers to determine whether they are different or not. This is because Gen-X and Gen-Y have different characteristics due to different times of upbringing, contrasting views and experiences in using technology etc., (Calvo-Porrá & Pesqueira-Sanchez, 2020; Eger, Komárková, Egerová, & Mičík, 2021).

According to a review of related research, the majority of the research on ordering food through the apps has focused on marketing mix factors, service satisfaction, factors affecting application selection, such as the prediction of using online food delivery with the theory of UTAUT2 (Agarwal & Sahu, 2021), the study on perceived innovation in building customer behavior in food delivery services (Ahn, 2021), the factors affecting customer satisfaction and intention to use online food ordering (Alalwan, 2020), the fast food ordering mobile commerce in China (Akram, Ansari, Fu, & Junaid, 2020), the role of food ordering apps in developing restaurants' brand satisfaction and loyalty in the pandemic period (Dirsehan & Cankat, 2021), the factors affecting online food ordering in Bangladesh (Saad, 2020), the study on predictors of continuance intention of online food ordering service (Francioni, Curina, Hegner, & Cioppi, 2022), the innovation resistance perspective in the use of food

ordering apps (Kaur, Dhir, Ray, Bala, & Khalil, 2020), the consumers' intention on using online food delivery systems in the United States (Gunden, Morosan, & DeFranco, 2020), the impact of apps aesthetics on food ordering (Kumar, Jain, & Hsieh, 2021), the food delivery use during COVID-19 range (Kumar & Shah, 2021), using drones to order food (Hwang, Kim, & Kim, 2019), the study on food delivery apps in India and the Philippines (Pandey, Chawla, & Puri, 2021), the study on consumers using food delivery services in China and New Zealand (Wang & Scrimgeour, 2021), and the investigation on customers' intentions to use food delivery apps (Wen, Pookulangara, & Josiam, 2021), Moreover, there are also research on the theory of Technology Acceptance Model (TAM), the study of a consumer value perspective in buy food from food delivery apps (Tandon, Kaur, Bhatt, Mäntymäki, & Dhir, 2021), the Innovation of using food ordering and delivery platforms in Romania during the COVID-19 outbreak (Türkeş, Stăncioiu, Băltescu, & Marinescu, 2021), the integrated approach to the purchase decision making process of food delivery apps (Song, Ruan, & Jeon, 2021), the investigation on consumers' attitudes and intentions toward buying food online (Nguyen et al., 2019), In addition, there are also research studying on the theory of planned behavior (TPB): the study on ordering food online behavior by applying technology acceptance theory and theory of planned behavior (Troise, O'Driscoll, Tani, & Prisco, 2020), the study on the intention of using online food delivery services during the COVID-19 pandemic (Bouarar, Mouloudj, & Mouloudj, 2021), the study on using mobile food delivery applications during the COVID-19 pandemic (Al Amin, Arefin, Alam, Ahammad, & Hoque, 2021), the use of mobile apps in the food delivery sector of the customer lifestyle (Belanche, Flavián, & Pérez-Rueda, 2020), the study on behavioral intention to order food and beverage items using e-commerce during COVID-19 (Hamid & Azhar, 2022), and the study on innovative marketing strategies for successful drone food delivery services (Choe, Kim, & Hwang, 2021), These two theories studied consumer behavior. Therefore, it is interesting to study the consumer behavior in ordering food online through food ordering apps. Moreover, in today's era, online food ordering through applications is very popular. The research results can benefit the food ordering application platform development to respond to the customer need. Previously, the researchers studied the factors affecting the behavior of people

ordering food online through food ordering platforms by supplementing with the Task-Technology-Fit factor, which has never been used in any research. From the review of research related to factors Task-Technology-Fit related to food ordering through the app (Inthong, Champahom, Jomnonkwao, Chatpattananan, & Ratanavaraha, 2022; Wagner, Schramm-Klein, & Steinmann, 2017; Zhao & Bacao, 2020) the two research findings reinforced that the Task-Technology-Fit factor, providing positive research results is considered to be useful and very suitable for being studied because it is a factor studying the function of the food ordering application and whether it can satisfy consumers or not.

From the review of research related to online food ordering through food ordering applications, a multi-group structural equation model has never been used to study the differences between generation groups. As each generation is an important factor affecting online food ordering behavior through food ordering applications, the researcher in this research focuses on the differences between generations as the main issue by testing and examining the differences between Generation X and Generation Y, resulting in different online food ordering behaviors.

Table 5.1 Comparison of applying technology acceptance, theory of Planned Behavior Theory and Task-Technology-Fit used in research related to food ordering

Author	Title	TAM	TPB	TIF
(Kang & Namkung, 2019)	The information quality and source credibility matter in customers' evaluation toward food O2O commerce			√
(Hamid & Azhar, 2022)	Behavioral intention to order food and beverage items using e-commerce during COVID-19: an integration of theory of planned behavior (TPB) with trust		√	
Nguyen et al. (2019)	Investigating consumer attitude and intention towards online food purchasing in an emerging economy: An extended tam approach	√		

Table 5.1 Comparison of applying technology acceptance, theory of Planned Behavior Theory and Task-Technology-Fit used in research related to food ordering (Continued)

Author	Title	TAM	TPB	TIF
Troise et al. (2020)	Online food delivery services and behavioural intention—a test of an integrated TAM and TPB framework	√	√	
Al Amin et al. (2020)	Evaluating the customers' dining attitudes, e-satisfaction and continuance intention toward mobile food ordering apps (MFOAs): evidence from Bangladesh	√		
Song et al. (2021)	An integrated approach to the purchase decision making process of food-delivery apps: Focusing on the TAM and AIDA models	√		
Pandey et al. (2021)	Food delivery apps (FDAs) in Asia: an exploratory study across India and the Philippines	√	√	
Bouarar et al. (2021)	Extending the theory of planned behavior to explain intention to use online food delivery services in the context of COVID-19 pandemic		√	
Al Amin et al. (2021)	Using mobile food delivery applications during COVID-19 pandemic: an extended model of planned behavior		√	
Wen et al. (2021)	A comprehensive examination of consumers' intentions to use food delivery apps	√	√	
Choe et al. (2021)	Innovative marketing strategies for the successful construction of drone food delivery services: Merging TAM with TPB	√	√	
Belanche et al. (2020)	Mobile Apps Use and WOM in the Food Delivery Sector: The Role of Planned Behavior, Perceived Security and Customer Lifestyle Compatibility		√	
	This Study	√	√	√

Note: TAM = Technology Acceptance Model, TPB = Theory of Planned Behavior, TIF=Task-Technology-Fit

5.3 Literature Review

5.3.1 Generations X and Y

Generation X, also known as Baby Busters, was born between 1965 and 1980 (Calvo-Porrall & Pesqueira-Sanchez, 2020; Messarra, Karkoulian, & El-Kassar, 2016; Tutar, Erdem, & Karademir, 2021), Aged between 35 and 50 years, it's the first generation to deal with the dramatic shift in the workplace paradigm caused by the technological revolution. They were the first to own a personal computer and modernize it. This generation has seen many crises during that time. They are "familiar with the economic recession again and again" and "familiar with the oil shortage, terrorist attacks, and rising inflation."

Generation Y, aged 15–34, was born between 1981–2000 (Calvo-Porrall & Pesqueira-Sanchez, 2020; Tutar et al., 2021). Differing from pre-school children, Millennials were already born into a high-tech environment. Their time has experienced a fair amount of violence. The Gen Y "work in my own way" can be seen as a result of the career-driven personalities that are the characteristics of the next generation. Millennials are considered "special people, having sheltered, confident, team-oriented, traditional, pressured, and successful".

Previous research has shown that generation differences arise as people develop their social identities in relation to technological developments and other important social events (Calvo-Porrall & Pesqueira-Sanchez, 2020). Although every generation has a different purpose for shopping, every era is looking for payment security, easy interaction and transparent promotions. It is certain that good customer service is always the most important thing for every customer (Eger et al., 2021; Lewy & Weitz, 2008).

5.3.2 Theory of Planned Behavior

The theory of planned behavior is a behavioral theory used to predict individuals' behavior and help them understand their behavior (Ajzen, 1991). It was developed from Fishby and Eisen's Theory of Reasoned Action, which was used to describe the occurrence of human behavior under the basic idea that humans are rational and use information systematically as well as consider the consequences that are thought to be caused by one's own practice before doing it or not doing it (Ajzen, 1980).

Ajzen (Ajzen, 1991) found that the Theory of Reasoned Action is limited in predicting other social behaviors in which a person is unable to completely control the behavior resulting from an attitude to practice behavior. Later, in 1985, Ajzen proposed the theory of planned behavior as perceived behavioral control. The theory of planned behavior explains further that individuals will engage in interesting behaviors by planning to achieve their purposes. Successful behaviors are caused by the intention to control various factors that impede behavior. However, a person's behavior is mostly under the control of the intention to perform the behavior. In this research, the study examined the behavior of service users when ordering food online through an application to be used in strategic planning. From the study of the theory of planned behavior, it was found that consumers' purchasing intentions when ordering food online will lead to consumer behavior in using the service. The factors influencing consumer purchase intention are behavioral attitudes, subjective norms, and perceived behavioral control.

Hamid and Azhar (2022) confirm the previous study (Troise et al., 2020) showing that the ATT of customers toward ordering food online is the most important predictor of BI in ordering food online. Other studies focusing on the use of apps to buy food also highlight the importance of ATT in explaining BI (Al Amin et al., 2021; Bouarar et al., 2021; Cho, Bonn, & Li, 2019; Choe et al., 2021; Hwang & Kim, 2019; Hwang, Kim, et al., 2019; Hwang, Lee, & Kim, 2019; Kang & Namkung, 2019; Kim & Hwang, 2020; Nguyen et al., 2019; Tandon et al., 2021; Wang & Scrimgeour, 2021; Wen et al., 2021). These factors were used to establish the following hypothesis:

H1: Attitude positively influences the behavioral intention to ordering food online.

Subjective norm, in other words, "perceived social pressure to act or not to take action" (Ajzen, 1991) is also a relevant factor in using food delivery apps (Roh & Park, 2019). Several scholars have found significant positive correlations among subjective norm, behavioral intention, and attitude in food delivery services and online shopping (Al Amin et al., 2021; Bouarar et al., 2021; Cho et al., 2019; Troise et al., 2020; Wen et al., 2021). Therefore, we proposed the hypothesis as follows:

H2: Subjective Norm positively influences the behavioral intention to use ordering food online

At the same time, according to the TPB model, perceived behavioral control (PBC) may influence BI (Ajzen, 2002) defines PBC as "the subjective level of control over the performance of behavior itself. Many studies have confirmed that PBC is a factor involved in BI in online food. For example, scholars have shown the importance of considering PBC in analyzing BI to buy food online (Al Amin et al., 2021; Bouarar et al., 2021; Choe et al., 2021; Kim & Hwang, 2020; Roh & Park, 2019; Troise et al., 2020; Wen et al., 2021). We therefore proposed the following hypothesis:

H3: Perceived behavioral control positively influences the behavioral intention to use ordering food online

However, in TPB, SN is the primary determinant of ATT when the customer recognizes that their friends, family, and other related people have a positive attitude towards online food ordering. They will be more empathetic when receiving such food. Several studies have found that this relationship is important in the acceptance of food purchases online or through mobile phones (Kim & Hwang, 2020; Troise et al., 2020). Therefore, we proposed the following hypothesis:

H4: Subjective norm positively influences the Attitude to use ordering food online

5.3.3 Technology Acceptance Model: TAM

Information and communication technologies (ICT) play a role in all sectors. However, consumers accept emerging technologies in a variety of ways (Ukpabi & Karjaluoto, 2017). The theory of technology acceptance is one of the accepted theories at present. The researchers used the theory to describe the intention of using technology, which was adapted from the theory of reasoned action (TRA) to develop into a Technology Acceptance Model (TAM) and used to study the context of information system acceptance.

The theory of the technology acceptance model (TAM) is a factor that determines the perception of an individual that information technology contributes to the improvement of operational efficiency and is a factor that directly affects the

willingness to demonstrate the continuous use of technology. The theory of technology acceptance has been applied in research to investigate the behavior of consumers or service users who order food online. It can shed light on how to explain the adoption and usefulness of information technology. In TAM Davis (1985), identified two principles of cognitive response, which predicted ATT: perceived ease of use. (PEOU) and (PU) perceived usefulness in researching attitudes among online food ordering consumers. Davis (1989) defines PEOU as "the degree to which an individual believes the use of a particular system will be effortless." In FDAs, PEOU refers to the factors influencing the behavioral intention to use food-ordering apps to conveniently order food online.

From the recent studies on factors influencing consumer attitudes towards ordering food online (Choe et al., 2021; Kang & Namkung, 2019; Lee, Lee, & Jeon, 2017; Nguyen et al., 2019; Song et al., 2021; Troise et al., 2020), we proposed the following hypotheses:

H5: Perceived ease of use positively influences the Attitude to use ordering food online

H6: Perceived usefulness positively influences the Attitude to use ordering food online

Many scholars have studied that TR influences ATT (Kang & Namkung, 2019; Troise et al., 2020), so we proposed the following hypothesis:

H7: Trust positively influences the Attitude to use ordering food online

In addition, several scholars (Choe et al., 2021; Roh & Park, 2019; Troise et al., 2020) have studied that PEOU influences PU, so we propose the following hypotheses:

H8: Perceived ease of use positively influences the perceived usefulness to use ordering food online

In addition, this research has been complemented with the section on Task-Technology-Fit (TTF), which is a theory used for evaluating the effectiveness of technology (Goodhue & Thompson, 1995), studying the impact on usability and matching between job requirements and the nature of technology. The user will use the technology with the appropriate functions and support the users' activities in order

to work efficiently and achieve the maximum benefits (Inthong et al., 2022; Vanduhe, Nat, & Hasan, 2020; Zhao & Bacao, 2020), which has confirmed that task-technology-fit: TTF affects PEOU and PU. Therefore, we proposed the following hypotheses:

H9: Task-Technology Fit positively influences the Perceived ease of use to use ordering food online

H10: Task-Technology Fit positively influences the Perceived usefulness to use ordering food online

Based on the H1-H10 hypotheses, we established a conceptual framework relevant to factors affecting behavioral intentions in online food ordering between Gen X and Y consumers to test the differences in the behaviors of these two groups as shown in Figure 5.1 and 5.2

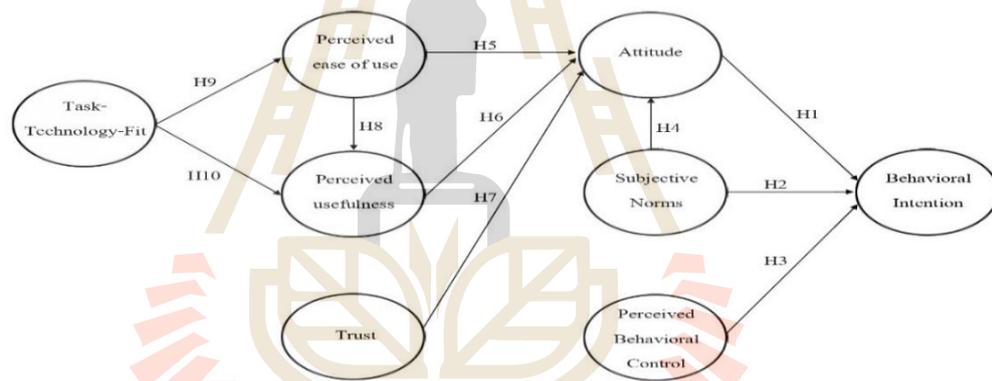


Figure 5.1 Conceptual framework for researching Generation X customer behavior of online food ordering service

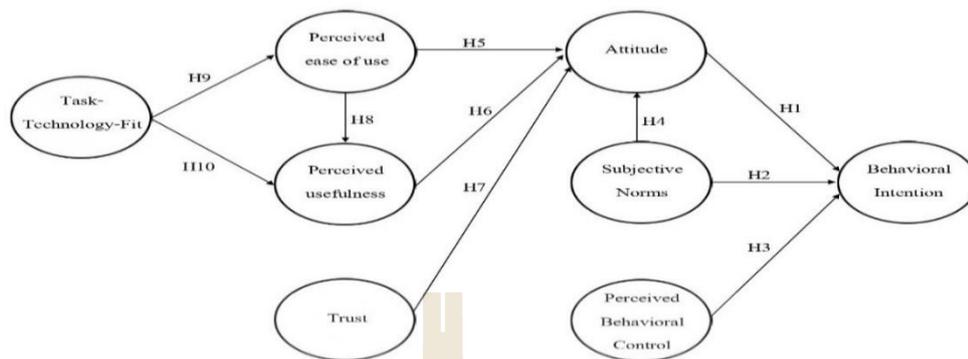


Figure 5.2 Conceptual framework for researching Generation Y customer behavior of online food ordering service

From a review of research related to testing the structural correlation between factors related to attitudes and consumer behavior as well as other related studies, most of the articles focused on the study of consumer attitudes and behaviors. The details of the factors to be studied are those related to Technology Acceptance Model Theory (TAM) and the Theory of Planned Behavior (TPB), as shown in Table 5.2.



Table 5.2 Types of relationships found in the study of Theory of technology acceptance model (TAM), Theory of planned behavior (TPB), and other related topics

Authors	Method	Perceived Task-technology fit	Trust	Perceived usefulness	Perceived ease of use	Perceived Behavioral Control	Subjective Norms	Attitude toward online food	Behavioral Intention
Wang and Scrimgeour (2021)	CFA, SEM							√	√
Wen et al. (2021)	PLS-SEM					√	√	√	√
Hwang and Kim (2019)	CFA, SEM							√	√
Al Amin et al. (2021)	SEM					√	√	√	√
Choe et al. (2021)	CFA, SEM			√	√	√	√	√	√
Bouarar et al. (2021)	SEM					√	√	√	√
Al Amin et al. (2020)	PLS-SEM			√				√	
Hwang, Lee, et al. (2019)	CFA, SEM							√	√
Nguyen et al. (2019)	CFA, SEM			√	√			√	√
Troise et al. (2020)	PLS-SEM		√	√	√	√	√	√	√
Cho et al. (2019)	CFA, SEM							√	√
Kang and Namkung (2019)	CFA, SEM		√					√	√

Table 5.2 Types of relationships found in the study of Theory of technology acceptance model (TAM), Theory of planned behavior (TPB), and other related topics (Continued)

Authors	Method	Perceived Task-technology fit	Trust	Perceived usefulness	Perceived ease of use	Perceived Behavioral Control	Subjective Norms	Attitude toward online food	Behavioral Intention
Song et al. (2021)	CFA, SEM			√	√			√	
Roh and Park (2019)	CFA, SEM						√		√
Kim and Hwang (2020)	CFA, SEM					√	√	√	√
Hwang, Kim, et al. (2019)	CFA, SEM							√	√
Tandon et al. (2021)	CB-SEM							√	√
Pitchay, Ganesan, Zulkifli, and Khaliq (2021)	SEM							√	√
Francioni et al. (2022)	SEM							√	√
Hamid and Azhar (2022)	CFA, SEM		√			√	√	√	√
Zhao and Bacao (2020)	EFA, CFA, SEM	√	√						√
This Study		√	√	√	√	√	√	√	√

CFA, Confirmatory Factor Analysis; SEM, Structural equation modeling; PLS-SEM, Partial Least. Square SEM

Table 5.2, it presents a review of research related to the structural relationship testing between factors related to consumer attitudes and behaviors. There are different analytical methods such as CFA analysis, Confirmatory Factor Analysis, SEM, Structural Equation Modeling, Partial Least, and Square SEM.

5.4 Research and methodology

5.4.1 Data collection

Questionnaire Design: The questionnaire has three parts, with the first part being personal and household characteristics of the respondents (gender, age, highest education level, occupation, average income) and their experience of using food ordering services via food ordering applications; Part 2, concerning the behavior of consumers using food ordering applications; and Part 3, another suggestion related to the use of food ordering services through food ordering applications.

Scale: Part 2 consists of 22 question items, assessed by a five-point Likert scale ranging from 1—strongly disagree to 5—strongly agree. Although it is an ordinal variable, it can be estimated with maximum likelihood (ML) (Kline, 2011) stating that "The second option for the ordinal variable which analyzed the group is the total score in a set of homogeneous items, each item with a Likert-scale type. Groups are generally considered to be continuous variables. The reliability of scores (total scores) is more likely to be gathered than for individual items. The initial ML estimation can be used to analyze the data if the distribution of all clusters is normal.

Sample size: Since this study analyzed data by CFA in a SEM model, the optimal sample size must be more than 10 times the number of variables (Kline, 2011). With 22 variables, the sample size must be at least $22 \times 10 = 220$ examples.

Participants: The respondents were users who ordered food online through the application. The survey was conducted from January to February 2021 in the six regional economic center provinces, divided into 6 regions in each region.

Table 5.3 shows the frequency analysis and percentage of basic data from 1,166 respondents, divided into 252 of Gen X and 914 of Gen Y. The general details are as follows:

In the Gen X group, the majority of respondents are female (72.62%), most earn 5,000–10,000 baht (24.6%), for educational level, most have a Bachelor's degree (64.3%), most are business owners (29.4%), and the frequency of food ordering via the app is less than 4 times/month (58.7%).

In the Gen Y group, the majority of respondents are female (58.97%), with the majority of respondents' income of 10,001–20,000 baht (37.2%), most of the educational level is bachelor's degree (63.7%), most of them are company employees (32.5%), and the frequency of ordering food through the application is less than 4 times/month (49.6%).

Table 5.3 Characteristics of the sample

Characteristics	Generation X (n=252)		Generation Y (n=914)	
	Frequency	Percent	Frequency	Percent
Gender				
Male	69	27.38	375	41.03
Female	183	72.62	539	58.97
Revenue				
<5,000 Baht	29	11.5	101	11.1
5,000-10,000 Baht	62	24.6	158	17.3
10,001-20,000 Baht	60	23.8	340	37.2
20,001-30,000 Baht	52	20.6	187	20.5
30,001-40,000 Baht	26	10.3	63	6.9
>40,001 Baht	23	9.2	65	7.1
Education level				
Lower than junior high school	13	5.2	20	2.2
Junior High School	8	3.2	44	4.8
Senior High School	49	19.4	188	20.6
Bachelor's degree	162	64.3	582	63.7
Higher than the bachelor's degree	20	7.9	80	8.8
Occupation				

Table 5.3 Characteristics of the sample (Continued)

Characteristics	Generation X (n=252)		Generation Y (n=914)	
	Frequency	Percent	Frequency	Percent
Student/College Student	51	20.2	181	19.8
General contractor	31	12.3	126	13.8
Government employee/State Enterprises	27	10.7	147	16.1
Company Employee	66	26.2	297	32.5
Business owner	74	29.4	127	13.9
Others	3	1.2	36	3.9
Used Frequency				
Less than 4 times/month	148	58.7	453	49.6
5-10 times/month	64	25.3	284	31.1
More than 10 times/month	38	15.1	167	18.3
Other	2	0.9	10	1.1

5.4.2 Reliability and Validity

To check the research tool quality, five experts validated the content and determined the consistency of each question by analyzing and scoring the questions against the "Item-Objective Congruence" index (IOC) according to the objective of items. The IOC index was above 0.5, meaning that the validity of the content of the questions is within the acceptable range. A pilot study was then conducted with 30 respondents who were not included in the research. For reliability analysis, Cronbach's alpha coefficient was used. The results indicated a Cronbach's alpha value of 0.784–0.965, which was greater than 0.7 (Tavakol & Dennick, 2011). The question is within the acceptable range. This study was approved by the Human Research Ethics Committee, Suranaree University of Technology (COE No.81/2563).

5.4.3 Multi Group Analysis

Multi-group structural equation model analysis is the application of a model with respondents having different characteristics whether gender, social, or

cultural, and comparing them with similar structured models. The objective of the first part of the questionnaire was to test the equality of two groups or constant measures Hair, Black, Babin, and Anderson (2010). The purpose of the second part was to compare the measurement between models or cross validation to compare different SEM parameters, for example, the number of constructs, factor loadings of indicators, referring to covariance. The statistical values used for comparison were the chi-squared difference (Delta- χ^2) and the difference between degrees of freedom (Delta-df) using multiple confirmation factor analysis (CFA) tests, which have been reported several times to be sensitive to the detection of measurement consistency. The results were used to test for significant differences and identify differences. If the chi-square difference is statistically significant, it will be interpreted that the two models are invariant (Hair et al., 2010; Jomnonkwao, Ratanavaraha, Khampirat, Meeyai, & Watthanaklang, 2015; Raju, Laffitte, & Byrne, 2002; Uttra, Laddawan, Ratanavaraha, & Jomnonkwao, 2020). The application of multi-group analysis for studying online food ordering intentions can be identified by using the same model but in different populations (Gen X and Gen Y societies) to determine whether there is a difference or not. Therefore, two pairs were compared based on TPB and TAM. This study used the Mplus program to analyze the data.

5.5 Finding

5.5.1 Descriptive Statistics

According to the analysis for mean, standard deviation, skewness, and kurtosis values of the fundamental data of 1,166 samples, the details can be shown in Table 3.

Table 5.4 Descriptive variables

Item variable/Questionnaire	Laten	Gen X (n=252)				Gen Y (n=914)			
		M	SD	SK	KU	M	SD	SK	KU
11	I intend to use the food delivery app	3.41	0.930	-	-	3.92	0.793	-	-
				0.181	0.164			0.338	0.113
12	If I have an opportunity, I will order food through the delivery app	3.48	0.904	-	-	3.92	0.767	-	-
				0.251	0.057			0.236	0.381
13	I intend to keep ordering food through the delivery app	3.41	0.912	-	-	3.89	0.806	-	-
				0.108	0.162			0.270	0.448
14	Using the food delivery app is useful	3.66	0.929	-	-	4.25	0.751	-	-
				0.321	0.322			0.669	0.107
15	I am strongly in favor of ordering food through the delivery app	3.28	0.991	-	-	3.79	0.875	-	-
				0.061	0.351			0.348	0.316
16	I desire to use the delivery app when I purchase food	3.37	0.907	-	-	3.87	0.826	-	-
				0.013	0.129			0.326	0.347
17	How do you think your friends would respond if they thought you had used a food delivery application?	3.48	0.844	-	-	3.76	0.792	-	-
				0.030	0.393			0.143	0.345
18	How do you think your parents would respond if they thought you had used a food delivery application?	3.27	0.915	-	-	3.54	0.913	-	-
				0.035	0.192			0.227	0.090
19	In general, ordering food online is very complex.	2.99	0.915	0.016	0.007	3.05	1.067	-	-
								0.015	0.394
110	With ordering food online via application creates anxiety for you.	2.92	0.947	0.253	-	2.94	1.105	0.066	-
					0.080				0.584
111	In general, ordering food online yields (will yield) few problems for me	2.96	0.946	0.059	0.006	3.13	1.072	-	-
								0.051	0.499
112	I would find it easy to order food using a food delivery application	3.58	0.878	-	-	4.01	0.742	-	-
				0.102	0.178			0.225	0.517

Table 5.4 Descriptive variables (Continued)

Item variable/Questionnaire	Laten	Gen X (n=252)				Gen Y (n=914)			
		M	SD	M	SD	M	SD	M	SD
I13 My operation of a food delivery application would be clear and understandable.		3.60	0.867	-	-	3.97	0.755	-0.257	-
				0.161	0.093				0.312
I14 Using a food delivery application would not require a lot of mental effort.		3.52	0.868	0.080	-	3.92	0.765	-0.165	-
					0.317				0.528
I15 Using a food delivery application would enable me to better check the ordering and receiving process of delivery food.		3.66	0.848	-	-	3.99	0.782	-0.282	-
				0.006	0.684				0.536
I16 Using a food delivery application would make it more convenient to order and receive delivery food.		3.72	0.857	-	-	4.02	0.762	-0.317	-
				0.234	0.197				0.345
I17 Food delivery application would be useful for ordering and receiving delivery food.		3.67	0.902	-	-	4.01	0.752	-0.291	-
				0.278	0.211				0.313
I18 I trust the food delivery app		3.49	0.835	0.067	-	3.93	0.722	-0.265	0.003
					0.350				0.155
I19 The information provided by the food delivery app is reliable		3.58	0.817	0.086	-	3.91	0.735	-0.356	
					0.331				
I20 The functions of FDAs are enough for me to order and receive the delivery food		3.54	0.780	0.032	-	3.93	0.736	-0.241	-
					0.137				0.240
I21 The functions of FDAs are appropriate to help manage the ordering and receiving the delivery of food		3.57	0.837	-	-	3.93	0.753	-0.200	-
				0.112	0.340				0.434
I22 The functions of FDAs fully meet my requirements of ordering and receiving the delivery of food		3.56	0.865	-	-	3.97	0.725	-0.225	-
				0.142	0.097				0.380

Note: M = mean, SD = standard deviation, SK = skewness, KU = Kurtosis.

From the analysis for mean, standard deviation skewness, and kurtosis of the basic data from 1,166 samples, the details can be shown in Table 3. It can be analyzed that for the TPB variable groups, we found that the mean for Gen X and Gen Y groups were 2.92–3.73 and 2.91–4.20, respectively; SD in Gen X is 0.779–0.984 and 0.722–1.105 for Gen Y; skewness is between -0.318 and 0.267 in Gen X and -0.669 to 0.066 in Gen Y; kurtosis is between -0.696 and 0.021 in Gen X, and -0.584 and 0.155 in Gen Y. We found these results have passed the criteria as it states that the skewness should be less than 3.0 and the kurtosis should be less than 10.0 (Kline, 2011).

5.5.2 Factor Analysis Results

Such statistics are based on overall empirical data, comprising 8 latent variables and 22 indicators. Table 5.5 shows the analysis results to confirm both the indicators and factors in Gen X. While considering standard loading values, we found that the standard loading values were in the range of 0.792–0.936, which met a threshold greater than 0.4. Thus, it was concluded that this model was composed of a statistically significant ($p < 0.001$) method and a statistically significant ($p < 0.001$) loading value. The standard loadings for each item were as follows: Based on the above data, I16 had the highest loadings at 0.936, followed by I3 with loadings of 0.930, and the lowest indicator was I8 with loadings of 0.792 in the Gen Y group. Table 5.6 shows the analysis results to confirm both the indicators and the factors in the Gen Y group. While considering the standard loadings, their values were in the range of 0.627–0.935, which satisfied the threshold greater than 0.4. Thus, it was concluded that the model was composed of a statistically significant ($p < 0.001$) method and a statistically significant ($p < 0.001$) loading value. The standard loadings for each item were as follows: Based on the above data, I10 had the highest loadings at 0.935, followed by I17, with loadings of 0.897, and the lowest indicator was I4, with loadings of 0.627.

Table 5.5 Factor Analysis for Generation X (n=252)

Construct	Variables	Loadings	Standard Error	t-Value	CR	AVE
Behavioral Intention	I1	0.929	0.011	82.048	0.945	0.851
	I2	0.909	0.013	68.753		
Attitude	I3	0.930	0.011	82.285	0.898	0.746
	I4	0.826	0.024	34.335		
	I5	0.868	0.020	43.621		
Subjective Norms	I6	0.895	0.017	51.351	0.818	0.692
	I7	0.870	0.027	32.535		
Perceived Behavioral Control	I8	0.792	0.031	25.755	0.902	0.755
	I9	0.899	0.020	45.013		
Perceived ease of use	I10	0.901	0.020	45.500	0.925	0.805
	I11	0.803	0.026	30.372		
	I12	0.912	0.014	67.187		
Perceived usefulness	I13	0.922	0.013	72.953	0.942	0.844
	I14	0.857	0.019	44.864		
	I15	0.895	0.015	59.789		
Trust	I16	0.936	0.011	85.640	0.885	0.793
	I17	0.924	0.012	76.868		
Task-technology-fit	I18	0.897	0.019	46.998	0.916	0.784
	I19	0.884	0.020	44.414		
	I20	0.876	0.018	47.530		
	I21	0.895	0.017	53.794		
	I22	0.885	0.018	49.858		

Note: Regression. * significant at $\alpha = 0.05$

Table 5.6 Factor Analysis for Generation Y (n=914)

Construct	Variables	Loadings	Standard Error	t-Value	CR	AVE
Behavioral Intention	I1	0.867	0.010	85.014	0.908	0.767
	I2	0.880	0.010	91.626		
	I3	0.881	0.010	91.975		
Attitude	I4	0.627	0.023	27.011	0.816	0.600
	I5	0.837	0.014	60.406		
	I6	0.841	0.014	61.411		
Subjective Norms	I7	0.865	0.018	48.551	0.776	0.636
	I8	0.724	0.021	35.253		
Perceived Behavioral Control	I9	0.883	0.011	77.155	0.891	0.733
	I10	0.935	0.010	92.196		
	I11	0.738	0.017	43.853		
Perceived ease of use	I12	0.861	0.011	78.720	0.888	0.726
	I13	0.866	0.011	80.893		
	I14	0.828	0.013	65.974		
Perceived usefulness	I15	0.863	0.011	81.424	0.904	0.758
	I16	0.852	0.011	76.867		
	I17	0.897	0.009	99.373		
Trust	I18	0.844	0.016	52.870	0.810	0.680
	I19	0.805	0.017	47.742		
Task-technology-fit	I20	0.850	0.012	72.079	0.896	0.742
	I21	0.882	0.010	84.738		
	I22	0.852	0.012	72.835		

Note: Regression. * significant at $\alpha = 0.05$

5.5.3 Reliability analysis

Before interpreting the SEM results, they must be validated. The statistical values used for the assessment are as follows: (1) χ^2/df should be 2-5 to be suitable (Marsh & Hocevar, 1985); (2) RMSEA should be less than 0.07 (Steiger, 2007); (3) CFI should be equal to or greater than 0.90 (Hu & Bentler, 1999); (4) TLI or NNFI should be equal to or greater than 0.80 (Hooper, Coughlan, & Mullen, 2008); and (5) SRMR should be equal to or less than 0.70 (Hu & Bentler, 1999).

From Table 5.7, the values for the model fit index for the Gen X model were $\chi^2 = 358.305$, $df = 191$, $\chi^2/df = 1.87$, RMSEA = 0.059, CFI = 0.969, TLI = 0.963 and SRMR = 0.044. mockup can be accepted The values for the model fit index for the Gen Y model were $\chi^2 = 521.432$, $df = 191$, $\chi^2/df = 2.73$, RMSEA = 0.044, CFI = 0.977, TLI = 0.973 and SRMR = 0.038. According to the criteria, the model is still acceptable.

Table 5.7 presents a detailed comparison of parameter estimates between measurement models and path analysis for the same two characteristics as in the structural equation model but includes special characteristics of population groups (Gen X and Gen Y). The model for measuring variance found that the data fit the model for the simultaneous model in Model 1 are as follows: $\chi^2 = 1015.292$, $df = 384$, $\chi^2/df = 2.64$, CFI = 0.968, TLI = 0.962, RMSEA = 0.053 [90%CI = 0.049-0.057] and SRMR = 0.044. For Model 2, the load factor, intercept, and path structure were $\chi^2 = 1045.508$, $df = 396$, $\chi^2/df = 2.64$, CFI = 0.968, TLI = 0.963, RMSEA = 0.053 [90% CI = 0.049-0.057] and SRMR = 0.048, respectively, Delta- $\chi^2 = 13.702$. These values were examined using the 0.05 level of statistical significance ($P < .05$), which rejected the null hypothesis. After considering the significance level of the model, it was clearly concluded that the population groups (Gen X and Gen Y) were different.

Table 5.7 Model of fit and statistical and multi-group analyses.

Description	χ^2	df	χ^2/df	CFI	TLI	RMSEA (90% CI)	SRMR	Delta- χ^2	Delta-df	p-value
TPB Individual group	358.305	191	1.87	0.969	0.963	0.059 (0.049-0.057)	0.044			
Model 1: Gen X	521.432	191	2.73	0.977	0.973	0.044 (0.039-0.048)	0.038			
Model 2: Gen Y										
TPB Measurement invariance	1015.292	384	2.64	0.968	0.962	0.053 (0.049-0.057)	0.044			
Model 1: Simultaneous	1045.508	396	2.64	0.968	0.963	0.053 (0.049-0.057)	0.048	30.216	12	0.002
Model 2: Factor loading, intercept, structural path held equal group										

Note: χ^2 = Chi-square statistics, df = degree of freedom, RMSEA = root mean square error of approximation, SRMR = standardized root mean square residual, TLI = Tucker–Lewis Index, CFI Comparative Fit Index.

5.5.4 Model Estimate

The SEM analysis results for the TPB can describe and show the factor loadings of each indicator as shown in Table 8.

5.5.4.1 TPB Model Estimate for Generation X

The SEM for TPB (Fig. 3) in the Gen X group showed that H1 and H2 (attitudes and social norms positively influences behavioral intention to use ordering food online) (= 0.577 and 0.377, respectively, $p < 0.05$) were supported. Regarding H3, (perceived behavioral control positively influences the behavioral intention to use ordering food online), it had no effect on ordering food online behavior. H4, H5, H6, and H7 (subjective norm, perceived ease of use, perceived usefulness, and reliability positively affect attitudes) (= 0.159, 0.258, 0.136, and 0.414, respectively, $p < 0.05$), were supported. H8 and H9 (perceived ease of use and task-technology-fit positively influences the perceived usefulness) (= 0.587 and 0.314, respectively, $p < 0.05$) were supported. H10 (Task-technology-fit positively influences the perceived usefulness to use ordering food online) (=1.148, $p < 0.05$), as shown in Figure 5.3 and Table 5.8.

Table 5.8 Theory of planned measurement model parameters

Construct	Gen X				Gen Y			
	Standardized estimate	Standard Error	p-value	R ²	Standardized estimate	Standard Error	p-value	R ²
Behavioral Intention								
I1	0.928	0.011	<0.001	0.862	0.867	0.010	<0.001	0.752
I2	0.908	0.013	<0.001	0.825	0.877	0.010	<0.001	0.768
I3	0.930	0.011	<0.001	0.866	0.882	0.010	<0.001	0.778
Attitude								
I4	0.830	0.023	<0.001	0.688	0.643	0.022	<0.001	0.414
I5	0.860	0.020	<0.001	0.740	0.816	0.014	<0.001	0.666
I6	0.890	0.017	<0.001	0.793	0.821	0.014	<0.001	0.675
Subjective Norms								
I7	0.866	0.026	<0.001	0.750	0.849	0.018	<0.001	0.721
I8	0.792	0.031	<0.001	0.627	0.725	0.020	<0.001	0.525
Perceived Behavioral Control								
I9	0.898	0.020	<0.001	0.806	0.881	0.011	<0.001	0.776
I10	0.902	0.020	<0.001	0.814	0.937	0.010	<0.001	0.877
I11	0.803	0.026	<0.001	0.645	0.738	0.017	<0.001	0.544
Perceived ease of use								
I12	0.912	0.013	<0.001	0.831	0.855	0.011	<0.001	0.730
I13	0.918	0.013	<0.001	0.842	0.860	0.011	<0.001	0.740
I14	0.857	0.019	<0.001	0.735	0.825	0.013	<0.001	0.681
Perceived usefulness								
I15								
I16	0.896	0.015	<0.001	0.802	0.861	0.011	<0.001	0.742
I17	0.934	0.011	<0.001	0.873	0.853	0.011	<0.001	0.728
	0.925	0.012	<0.001	0.855	0.898	0.009	<0.001	0.806
Trust								
I18	0.890	0.019	<0.001	0.793	0.842	0.016	<0.001	0.709
I19	0.889	0.019	<0.001	0.789	0.805	0.017	<0.001	0.648
Task-technology-fit								
I20	0.873	0.019	<0.001	0.762	0.849	0.012	<0.001	0.721
I21	0.897	0.016	<0.001	0.805	0.880	0.011	<0.001	0.775
I22	0.885	0.017	<0.001	0.784	0.853	0.012	<0.001	0.727
Behavioral Intention								
ATT	0.577	0.066	<0.001	-	0.642	0.031	<0.001	-
SN	0.377	0.070	<0.001	-	0.351	0.037	<0.001	-
PBC	-0.027	0.039	<0.001	-	-0.087	0.026	<0.001	-
Attitude								
SN	0.159	0.074	<0.001	-	0.039	0.043	<0.001	-
PEOU	0.258	0.113	<0.001	-	0.337	0.072	<0.001	-
PU	0.136	0.080	<0.001	-	0.155	0.054	<0.001	-
TR	0.414	0.087	<0.001	-	0.376	0.048	<0.001	-
Perceived usefulness								
PEOU	0.587	0.069	<0.001	-	0.685	0.035	<0.001	-
TIF	0.314	0.072	<0.001	-	0.189	0.039	<0.001	-
Perceived ease of use								
TIF	1.148	0.048	<0.001	-	1.208	0.039	<0.001	-

Note: ATT = Attitude, SN = Subjective Norms, PBC = Perceived Behavioral Control, PEOU = Perceived ease of use, PU = Perceived usefulness, TR = Trust, TIF = Task-technology-fit

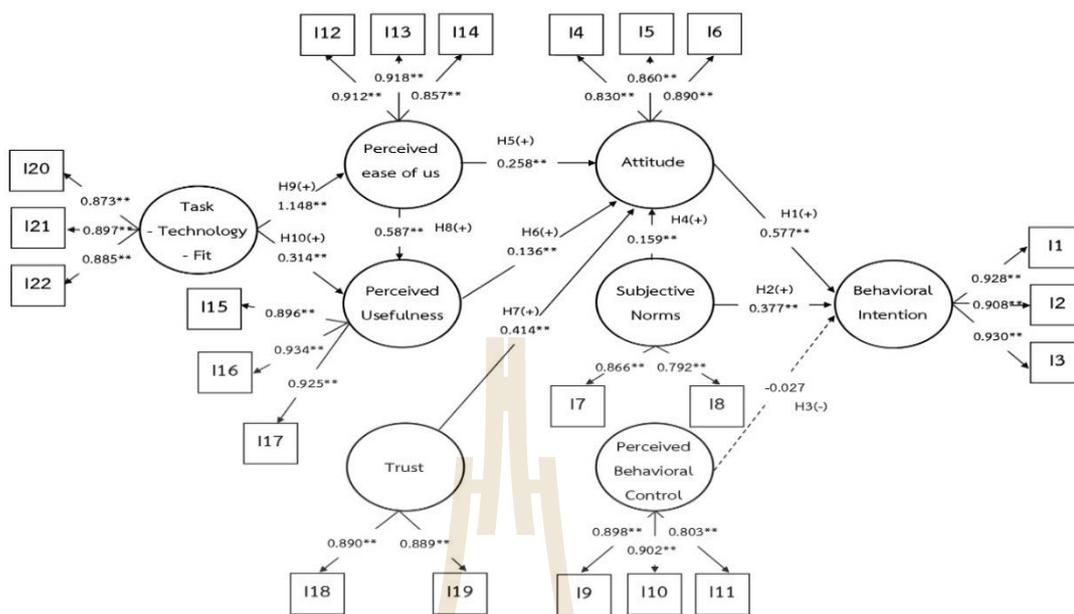


Figure 5.3 The theory of planned behavior model for Gen X

5.5.4.2 TPB Model Estimate for Generation Y

The SEM for TPB (Fig. 4) in the Gen Y group showed that H1, H2 (attitudes and subjective norm positively influence the behavioral intention to use ordering food online) (= 0.642 and 0.351, respectively, $p < 0.05$). were supported. While H3 (perceived behavioral control positively influences the behavioral intention to use ordering food online) had no effect on online food ordering behavior (= 0.039, 0.337, 0.155, and 0.376, respectively), the results were supported. H8 and H9 (perceived ease of use and task-technology- fit positively influence the perceived usefulness) (= 0.685 and 0.189, respectively, $p < 0.05$) were supported. H 10 (task-technology-fit positively influences the perceived usefulness) (=1.208, $p < 0.05$), as shown in Figure 5.4 and Table 5.8.

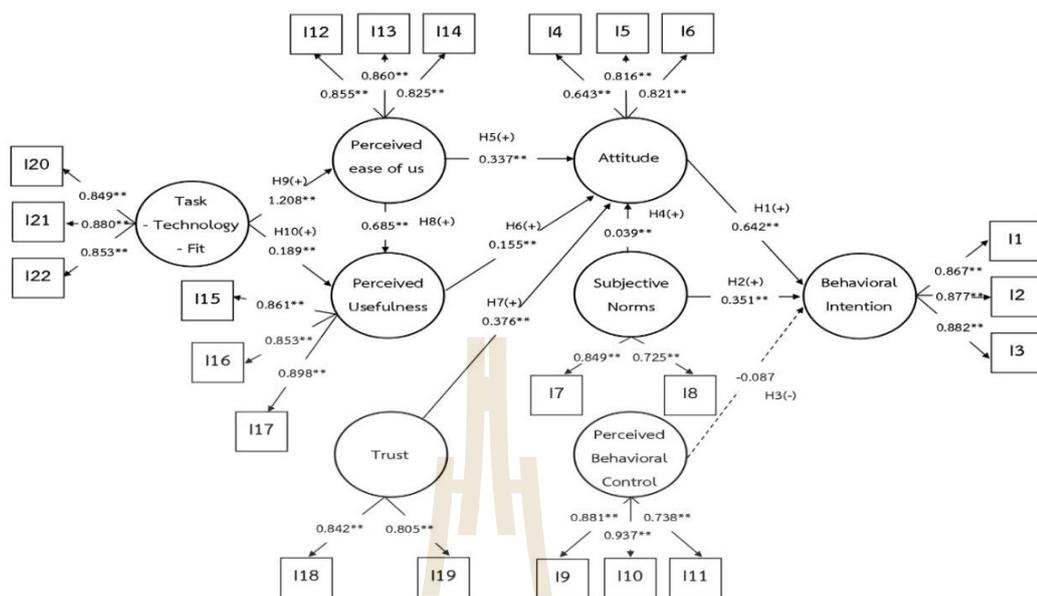


Figure 5.4 The theory of planned behavior model for Gen Y

5.5.4.3 Structural Model and Hypothesis Testing

The results of the Structural Equation Modeling analysis for the structural models of Gen X and Gen Y groups, which explored the relationship between three external variables influencing behavioral intention to order food through the platform, indicated that the standard regression coefficient (Coef.) values of the attitude factor had the greatest influence on behavioral intention (0.577, 0.642), followed by the subjective norm factor (0.377, 0.351) and perceived behavioral control factor (-0.027,-0.087). The results of correlation analysis among the four external variables influencing attitudes in ordering food through the platform indicated that reliability factors had the greatest influence on attitudes (Coef. 0.414, 0.376), followed by the perceived ease of use factor (0.258, 0.337). The next factor of Gen X was the subjective norm factor, followed by the perceived usefulness factor, with a standard regression coefficient (Coef.) of 0.159, 0.136, unlike those of Gen Y, which was the perceived usefulness, followed by the subjective norm with a standard regression coefficient (Coef.) of 0.155, 0.039. The analysis results of the relationship between the two external variables influencing the perceived usefulness of using ordering food online with the standard coefficients of 0.155, 0.039 and the analysis results of two

external variables influencing the perceived usefulness of ordering food through platforms indicated that the perceived ease of use factor had the greatest influence on perceived usefulness (0.587, 0.685), followed by the task-technology-fit (0.314, 0.189). The analysis results of task-and-technology-fit influenced the perceived ease of use had a standard regression coefficient (Coef.) (1.148, 1.208). The results of the analysis showed the factors influencing the behavioral intention to use ordering food online and the analytical results of the hypothesis testing in Table 5.9.

Table 5.9 Results of the hypothesis Testing

Hypothesis	Gen X			Gen Y		
	Standardized Path Coefficient	t-Value	Result	Standardized Path Coefficient	t-Value	Result
H1: ATT → BI	0.577	8.808	Supported	0.642	20.834	Supported
H2: SN → BI	0.377	5.352	Supported	0.351	9.440	Supported
H3: PBC → BI	-0.027	-0.679	Not	-0.087	-3.410	Supported
H4: SN → ATT	0.159	2.139	Supported	0.039	0.910	Supported
H5: PEOU → ATT	0.258	2.274	Supported	0.337	4.683	Supported
H6: PU → ATT	0.136	1.709	Supported	0.155	2.877	Supported
H7: TR → ATT	0.414	4.755	Supported	0.376	7.818	Supported
H8: PEOU → PU	0.587	8.561	Supported	0.685	19.369	Supported
H9: TIF → PEOU	1.148	23.769	Supported	1.208	30.753	Supported
H10: TIF → PU	0.314	4.368	Supported	0.189	4.858	Supported

Note: ATT = Attitude, SN = Subjective Norms, PBC = Perceived Behavioral Control, PEOU = Perceived ease of use, PU = Perceived usefulness, TR = Trust, TIF = Task-technology-fit

5.6 Discussion

In this research, we developed a structural equation model by analyzing multi-group SEM between Gen X and Gen Y using planned behavior theory (TPB). We found that the leading attitudes of Gen X and Gen Y towards online food ordering applications are significant differences. This is consistent with the research by Hwang, Lee, et al. (2019), who studied gender differences in the green image of drone food delivery services (Hwang, Lee, et al., 2019) and found that the suitable criteria between gender

and age were very different. This research, using a multi-group analysis of attitudes in diverse aspects of Gen X and Gen Y viewpoints, found the differences in the two societies. For example, the study on gender variance using E-learning from a multi-group of generations (Yawson & Yamoah, 2021), and the study of the behavioral intentions of healthcare service providers who perform Internet of Things (IoT) in Gen Y (Alraja, 2022), the identification of responses to questions on the Yahoo Website of different age groups (Figueroa & Timilsina, 2021).

5.6.1 Based on theory of planned behavior

For the TPB models of Gen X and Gen Y, positive attitudes increased the intentions of ordering food online through food ordering platforms in the majority. When considering the measurement model, the two groups showed similar behavior, focusing on the attitude towards online food ordering through the platform the most. This is consistent with several studies studying online food ordering behaviors through food ordering platforms (Al Amin et al., 2021; Bouarar et al., 2021; Hamid & Azhar, 2022; Troise et al., 2020; Wen et al., 2021) because if consumers have a positive attitude towards using the platform, it will result in a positive tendency to use the food ordering platform. Therefore, having a marketing strategy for promotion will make consumers more likely to turn to the service (Choe et al., 2021).

Subjective norms, especially friends, close friends, and parents, have a huge impact on consideration before deciding to order food through the platform or making an immediate purchase decision. Consistent with the research by Al Amin et al. (2021), the findings showed that when consumers see the group of important people ordering food online, they also order food online, including Troise et al. (2020), who found that the subjective norm factor positively influences online food ordering behavior. There are also many researchers whose research results found that the subjective norm factor of consumers using food ordering platforms has a positive influence on online food ordering behavior (Bouarar et al., 2021; Choe et al., 2021; Kim & Hwang, 2020; Roh & Park, 2019; Wen et al., 2021).

In terms of the outstanding difference, the perceived behavioral control is the factor, which had an influence only in the Gen X group. This is consistent with the research of Al Amin et al. (2021), whose results showed that perceived behavioral

control positively influences consumer behavior; and Troise et al. (2020), whose research results also showed that perceived behavioral control positively influences consumer behavior. In addition, there has been much research whose results found that perceived behavioral control has a positive influence on online food ordering behavior (Bouarar et al., 2021; Choe et al., 2021; Kim & Hwang, 2020; Roh & Park, 2019; Wen et al., 2021) Unlike people in Gen Y, they still had concerns about ordering food online through the platform due to their anxiety of its complexity in use.

5.6.2 Based on technology Acceptance Model

For the TAM models of Gen X and Gen Y, factors positively influenced attitudes toward online food ordering through food ordering platforms, considering the measurement models for both groups, it was found that both Gen X and Gen Y put the most importance on trust in online food ordering. This is consistent with research by Kang and Namkung (2019) that studied the quality of data and the credibility of customers towards online food ordering. However, there is a matter of subjective norm because both Gen X and Gen Y agreed that it is the last factor that affects consumer attitudes.

The next factor was perceived usefulness, which found that both groups had similar perceptions, focusing on perceived ease of use as the most important factor. This is consistent with the research of Nguyen et al. (2019); Troise et al. (2020), because if consumers find the platform easy to use, clear, and effortless to use, it will affect the perceived usefulness of the platform, followed by the task-technology-fit.

The last factor is perceived ease of use. We found that both groups had similar perceptions. (Considered by the loading values). That is, both Gen X and Gen Y have a perception that if the platform is properly implemented as its function should be, for example, clearly identifying order information as well as the use of the platform in accordance with the application specified, as a result, consumers can practically use the platform. This is consistent with research by Zhao and Bacao (2020), studying what factors will make customers continuously use food delivery apps during the new strain of coronavirus 2019 pandemic. Vanduhe et al. (2020) studied the integration of TAM and TIF with gamification training in higher education. Their research results found that the task-technology-fit positively influenced the perceived ease of use. For this study,

as there has never been research investigating the task-technology-fit factor associated with the theory of planned behavior and the technology acceptance model with online food ordering, the researchers have to cite relevant research findings that have examined the differences between Gen X and Gen Y.

5.7 Conclusions and implication

This research examines the factors or perceptions that influence ordering food online through applications using TPB (Ajzen, 1991). This theory is widely used in research studying behavior and motivation. A statistical analysis was performed using SEM to analyze Gen X and Gen Y sample groups. In the test between the Gen X and Gen Y models, multi-group SEM was used to compare parameter estimates.

The research results can be utilized as follows: We are able to rank the external variables in terms of the strength of their influence on the intention to order food online through the food ordering app. Attitudes have an influence on the intention to order food online through food ordering platforms. If consumers have a positive attitude towards using them, it will result in their continued use of the service and a positive tendency to use the food ordering platform. Consumers may consider or ponder using the food ordering applications before making a decision to use them. If they have a good attitude towards perceived ease of use, perceived usefulness, and reliability, this will result in further consideration of ordering food through the app. When consumers want to order food through an application more easily, such as building promotions to attract consumers who are both new and existing customer bases, the use of properties of food ordering applications, which are media that work on the Internet, can allow instant communication between the application and consumers, for example, providing product information and facilitating the work process, such as payment and food delivery systems. In addition, if consumers find that the functions of the apps are suitable for use to order and receive food, it will result in consumers making a decision to use them. Moreover, subjective norms, particularly those of friends, close friends, and parents, will have a huge impact on consideration before making a decision to order food via the app or immediately make a purchase decision when they see them ordering food or shopping for goods online

through the application. As they cannot see and select the actual products, customers can buy them if their demand is stimulated by an incentive responding to their needs. For example, sharing information or advertising products through these referrals about the food you want to offer to consumers may attract their consideration. An immediate purchase decision may be possible if they are very sensitive to them. From the analysis results, Gen Y's perceived behavioral control had no influence on behavioral intention to use ordering food online due to their anxiety about ordering food online through an app that is complicated to use. If business owners develop an application to be easy to use, or without complexity in use, it will encourage consumers to order food through the application. In addition, most of them want to order food over the Internet. Therefore, the government sector or relevant agencies should use these research results to formulate policies to facilitate the purchase of products in the digital marketing system (National Innovation Agency, 2021). Government agencies and companies that provide online food ordering services through applications should also take these results into account to make marketing plans and improve the food ordering platform consistent with consumer behavior.

5.8 Limitation and future research

This study highlights the ways to study the behavioral intentions of service users when ordering food online through platforms. Some limitations are the little differences in questions used to identify intentions expressing behavior. In future research, to gain more insight into service users' attitudes, other theories than TAM and TPB should be studied by conducting comparative studies between urban and rural areas. Another limitation is the scope of the study. In this research, SEM results were obtained by questioning online food ordering users only in the provinces representing each region. As a result, the research results or significance weight may differ from other countries. In future studies, there should be discussion on the attitudes towards various applications from other theories that affect the application users' behavior in order to acknowledge the factors and their viewpoints.

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CHAPTER 6

INFLUENCES ON BEHAVIORAL INTENTION BY THAI PEOPLE TO USE ONLINE FOOD DELIVERY PLATFORM: AN EXTENSION OF THE UNIFIED THEORY OF ACCEPTANCE AND USE OF TECHNOLOGY FRAMEWORK WITH A PLAYFULNESS FACTOR

6.1 Abstract

According to the recent COVID-19 epidemic, it affects to an increase of people ordering food via online applications. This research has studied the relationship of indicators in relevant to continuous intention to order food by 2 online food applications in Thailand, including Grab Food and Food Panda. Research tool consists of 1,320 sets of questionnaire. The research aims to study indicators influencing to the continuous intention to order food via online food applications in Thailand by using Structural Equation Model. The Data Analysis of Influences that affect to behavioral intention to continuously order food via online applications found that Performance Expectancy, Effort Expectancy, Habit, and Playfulness statistically affect to user's behavioral intention to order food via online food applications with 0.05 significance. Analysis result of causal model on factors influencing to continuous intention to order food via online applications in Thailand is in accordance with empirical data while all lists meet the criteria. Moreover, the research has additionally studied the Playfulness factor that influences to a continuous intention to order food via online food applications.

6.2 Introduction

6.2.1 Background

The COVID-19 epidemic and the strict measure to temporally close or limit services of business sector in Thailand, including restaurant business whose food has been only taken away, and delivered at home through different order applications

turns to be a main channel for restaurant business owners and consumers. This affects to the first half of year 2020 where amount of food delivered to residences had been expanded for approximately 150 percent, in comparison to the same period of a previous year. Refer to marketing aspect of food delivery business in the second half of year 2020, after the COVID-19 epidemic was recovered, and restaurant business had operated regularly, it affected to the density of food delivering to residences which was not as high as a period of COVID-19 epidemic (if there is another domestic epidemic, there will be a higher chance of transaction). Also, for the whole year 2020, Kasikorn Thai Research Center considered that number of delivery were between 66-68 million, that it was increased for 78.0-84.0 percent, comparing to the previous year, and it was a skipping growth ratio (Kasikorn Research Center, 2020). It is matched with Bank of Thailand that many people have to alter their behavior by working from home to avoid the epidemic. However, consumption is necessary so many people have adjusted their spending behavior by using more digital transaction. To buy from applications is easier and faster, and entrepreneurs also add more service channels through these platforms. This is an opportunity of digital service business's growth i.e. e-Commerce, Parcel delivery, and Online food delivery businesses. Especially the Online Food Delivery, there is over triple growth, comparing to the same period of a previous year. This skipping growth is reflected by Google Trend data for the words, E-Commerce and Logistic, as well as the words, Parcel Delivery and Online Food Delivery (Bank of Thailand, 2020). It is conformed to consumers' behavior who turn to use more e-commerce. Also, due to COVID-19 epidemic that causes the lockdown and social distancing, online purchase becomes necessary for consumers. It affects the skipping growth of E-commerce value, and it is able to ensure that demand of products and services by online purchase will become a key channel for consumers. Even though during the post-COVID-19 epidemic, this will become a New Normal (Electronic Transactions Development Agency, 2022). So that the epidemic control and lockdown measure, along with Food delivery platforms that facilitated the various restaurants for selection influenced to skipping growth amount of online food order, number of restaurants, and riders who joined the platforms since 2020, including Thailand. It also affected to a multiple increase on global income of Food delivery platform, including

Thailand (Economic Intelligence Center, 2021) that is in accordance with consumer behavior who used more E-commerce. Also, according to COVID-19 epidemic that affected to the lockdown and social distancing, online purchase is necessary for consumers that is affecting to a skipping growth of E-commerce value. Moreover, it is ensured that demand of online product and service purchase is a main channel for consumers. Even though it is the post-COVID-19 era, it will become a New Normal (Electronic Transactions Development Agency, 2022). So that the epidemic control and lockdown measure, along with Food delivery platforms that facilitated various restaurants for selection influenced to skipping growth amount of online food order, number of restaurants, and riders who joined the platforms in 2020, including Thailand. It also affected to a multiple increase on global income of Food delivery platform (Economic Intelligence Center, 2021).

The past research had studied different factors influencing to consumer's attitude and behavior toward use of food order via online application. According to literature review related to online food order, it found that there were researchers who had studied about the online food order as follow. Most studies of food order via online platform are about survey of fast food order in China (Akram, Ansari, Fu, & Junaid, 2020), Roles of mobile food order platform toward development of satisfaction and loyalty during the epidemic (Dirsehan & Cankat, 2021), Innovative views about use of food delivery application (Kaur, Dhir, Ray, Bala, & Khalil, 2020), Impacts on Aesthetic of food delivery application (Kumar, Jain, & Hsieh, 2021), Survey study on food delivery applications throughout India and the Philippines (Pandey, Chawla, & Puri, 2021), Factors affecting to online food delivery service in Bangladesh (Saad, 2020), Service use of online to offline food delivery of consumers in China and New Zealand (Wang & Scrimgeour, 2021), Examination on consumer's intention to use food delivery application (Wen, Pookulangara, & Josiam, 2021), Study on online food order behavior by using TAM and TPB (Troise, O'Driscoll, Tani, & Prisco, 2020), Mobile food order of fast food restaurants in China (Akram et al., 2020), Sustainably digital food purchase (Fuentes, Cegrell, & Vesterinen, 2021), Evaluation on food delivery consumption through web mining technique (Correa et al., 2019), Use of food delivery during the COVID-19 epidemic (Kumar & Shah, 2021), Study on reasons why consumers

buy food from food delivery application (Tandon, Kaur, Bhatt, Mäntymäki, & Dhir, 2021), Acceptance on mobile clothing purchase of Chinese consumers (Chi, 2018), and Study on factors influencing to customer's decision toward service use of online food delivery during COVID-19 epidemic (Jun, Yoon, Lee, & Lee, 2021). So the study on consumer behavior regarding online food order by food order application is an interesting topic. Also, nowadays, online food order via application is widely popular.

Refer to this study, researcher has applied Modified Unified Theory of Acceptance and Use of Technology (UTAUT2) by adding Playfulness factor where there is none of study using this factor with online food order. From the literature review related to Playfulness factor, there is a study about Technological analysis on form of acceptance in relevant to the learning administration during COVID-19 (Rokhim et al., 2022) that the studied factors influenced to instant messaging application on mobile (Huang and Lin, 2023). According to both research, it found that Playfulness factor gives a positive result. So it is considered that Playfulness is a useful and suitable factor for the study due to it is proper in order to study if users of online food delivery via application are playful.

Previously, Inthong et al. (2022) had studied factors affecting to consumer behavior who use online food delivery in Thailand by using Theory of Planned Behavior (TPB), Technology Acceptance Model (TAM), and Task-Technology Fit (TTF) to study consumer behavior. For first theory, TAM is used to study factors influencing to acceptance and use of food order application. For TPB, it is used to study consumer behavior who uses online food order via application. Also, TTF is used to study appropriateness of food order application if it can functionally respond to consumers. Moreover, this research is different from the previous ones that there is use of Modified UTAUT or UTAUT2 to study factors which mobilize consumers to make decision on continuous use of online food order via application.

Research objective is to study factors influencing to online food order via application by applying model of UTAUT2, and adding Playfulness factor to the study while there is none of previous study using this factor with online food delivery. So that it is considered as the identity of this research. Research result can be used for

commercial benefits. Entrepreneurs can take the obtained results to develop platform of food order application to enable a proper respond to consumer demands in future.

6.3 Theoretical underpinning and hypothesis development

Venkatesh et al. (2003) had offered Unified Theory of Acceptance and Use of Technology (UTAUT) to explain acceptance of individual technological use. Also, it is used to study acceptance of individual technological use in business sector by using the intention to behave and/or behavior of use as a key variable from Theory of Planned Behavior of (Ajzen, 1991). Principle of UTAUT is to study behavior of use which is motivated by intention to act while the 3 main factors influencing to intention to act are: (1) Performance Expectancy, (2) Effort Expectancy, and (3) Social influence. For Facilitating Conditions, it directly influences to behavior of use. Several variables of factor consist of control factors that are 4 user's individual factors, including gender, age, experience, and willingness to use Next, Venkatesh et al. (2012) found that the combined UTAUT had some limitations so they developed and studied additional factors to make it more suitable by calling it a Modified UTAUT or UTAUT2 while the additional factors directly influenced to intention to act and behavior of use, including Hedonic Motivation, Price Value, and Habit. So the study result found that the previous factors directly influenced to both and intention to act and behavior of use that made UTAUT2 apply for better explanation on intentional behavior of Use of Technology by consumers. In summary, the UTAUT2 principle is to study behavior of use which is motivated by intention to act. While 7 factors influencing to the intention to act consist of Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Hedonic Motivation, Price Value, and Habit. For control factors, there are 3 individual factors, including Gender, Age, and Experience.

Recently, there are research in relevant to online food order that used UTAUT and UTAUT2 such as Study on factors continuously determining customers by using food delivery application during COVID-19 epidemic (Zhao and Bacao, 2020), Study on factors affecting to customer's e-satisfaction and intention to continuously re-use (Alalwan, 2020), Study on consumer's intention to use online food delivery system in USA (Gunden et al., 2020), Study on factors influencing to foreign student's intention

to order food via online (Mensah, 2019), Study on factors influencing to continuous intention to use food order application during COVID-19 isolation in Mexico (Ramos, 2021), Survey on an increase of online food applications (Chakraborty, 2021), and Estimation on re-use of re-use prediction for online-to-offline food delivery (Agarwal and Sahu, 2021).

Performance Expectancy

Refer to the study context, Performance Expectancy (PE) means what users believe that online food order via application will bring an efficient service Ramos (2021). Confirmed by previous study, Zhao and Bacao (2020) presented that consumer's PE toward online food order is the most important predictor of CI for online food order. Other studies that focus on use of application to buy food still emphasize on importance of PE to explain CI (Alalwan, 2020, Gunden et al., 2020, Mensah, 2019). These factors are used to develop Hypothesis as follow.

H1: Performance Expectancy positively influences to behavior of continuous intention to order food via online.

Effort Expectancy

For this context, Effort Expectancy (EE) is a concept as what users believe that online food order via application is simple and not complicated while using. Ramos (2021). Confirmed by the previous study, Alalwan (2020) expressed that consumer's EE on online food order is an important predictor of CI for online food order. Other studies that focus on use of application to buy food still emphasize on importance of EE to explain CI (Mensah, 2019, Zhao and Bacao, 2020). These factors are used to develop Hypothesis as follow.

H2: Effort Expectancy positively influences to behavior of continuous intention to order food via online.

Habit

From this context, Habit (HB) means users tend to behave an online food order via application to support their living since their daily life depends on online food order, Agarwal and Sahu (2021). Confirmed by the previous study, Alalwan (2020) presented that consumer's HB toward online food order is an important predictor of CI for online food order. These factors are used to develop Hypothesis as follow.

H3: Habit positively influences to behavior of continuous intention to order food via online.

Price Value

In this context, Price Value (PV) means benefit of online food order via application that is considered as it is bigger than financial cost and paid price (Alalwan, 2020). It presents that consumer's HB toward online food order is an important predictor of CI for online food order. This factor is used to develop Hypothesis as follow.

H4: Price Value positively influences to behavior of continuous intention to order food via online.

This research has added the Playfulness factor in the context. That means playfulness of using online food order service via application. The online food order has an interesting qualification to consumers. So consumers place importance to playfulness of service use. While there is none of study on this factor with online food order so that it is the identity of this research. Refer to literature review in relevant to Playfulness factor, Rokhim et al. (2022) along with research of (Huang and Lin, 2023) had confirmed that Playfulness influenced to Continuous Intention. So we have offered the hypothesis as below.

H5: Playfulness positively influences to behavior of continuous intention to order food via online.

According to research review related to examination on structural relationship among factors in relevant to consumer behavior regarding use of online food order, as well as other related studies, most articles focused on the study of consumer behavior on acceptance and use of technology. Details of studied factors are about development of Modified UTAUT or UTAUT2 as showed in Table 6.1.

Table 6.1 Types of Relationship found in the study of Modified UTAUT or UTAUT2.

Authors	Analysis Methods	Playfulness	Price Value	Habit	Effort Expectancy	Performance Expectancy	Continuous Intention
Zhao and Bacao (2020)	EFA, CFA, SEM				√	√	√
Alalwan (2020)	CFA, SEM		√	√	√	√	√
Gunden et al. (2020)	CFA, SEM			√		√	√
Mensah (2019)	CFA, SEM				√	√	√
Ramos (2021)	EFA				√	√	√
Chakraborty (2021)	EFA, CFA, SEM						√
Agarwal and Sahu (2021)	CFA, SEM			√			√
This Study		√	√	√	√	√	√

EFA, Exploratory Factor Analysis; CFA, Confirmatory Factor Analysis; SEM, Structural equation modeling

According to Table 1, it presented research review related to examination of structural relationship among factors in relevant to consumer behavior on acceptance and use of technology (Modified UTAUT or UTAUT2) while there are different analysis methods such as Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), and Structural Equation Modeling (SEM)

Refer to Hypotheses H1-H7, we have created concept frame of the study in relevant to factors influencing to behavioral intention of food order, as presented in Figure 6.1.



Figure 6.1 Research Concept Frame

6.4 Research and methodology

This research focuses on study of user behavior to recommend method to develop food order application to reach food order application user's demand while there are 9 operation processes as showed in Figure 6.2

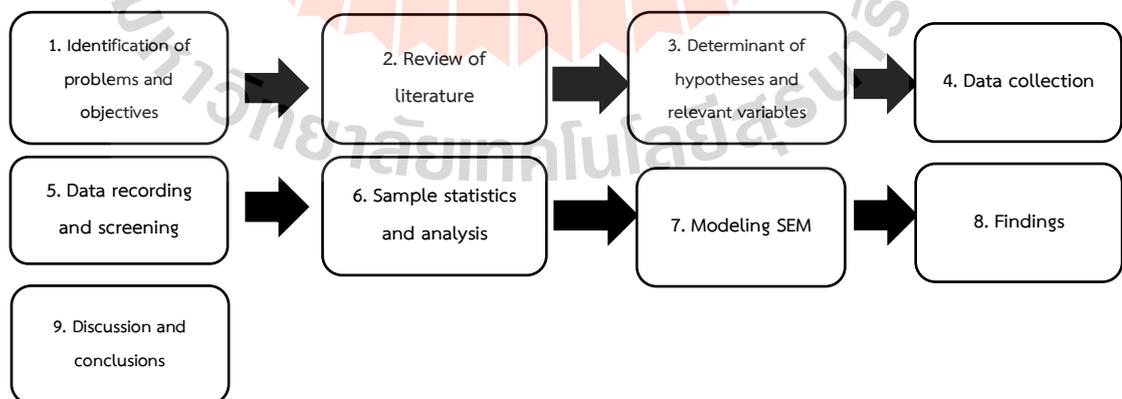


Figure 6.2 Research Process

6.4.1 Data collection

Questionnaire Design: The questionnaire is divided into 3 parts. Part 1 consists of Participants' personal and household characteristics (gender, age, highest education level, occupation, and average income), and user experience of food order service via application. Part 2 is about user behavior of food order service via application. Also, Part 3 is about other suggestions related to use of food order service via application.

Scale: Part 2 consists of 22 questions that are evaluated by five-point Likert scale ranked from 1-Strongly disagree to 5-Strongly agree. Even though it is an ordinal variable but it can be estimated by Maximum likelihood (ML) according to (Kline, 2011) who said that 'The second option for ordinal variable, which was analyzing parcels. A parcel is a total score across a set of homogeneous items each with a Likert-type scale. Parcels are generally treated as continuous variables. The score reliability of parcels (total scores) tends to be gather than that for the individual items. If the distribution of all parcels are normal, then default ML estimation could be used to analyze the data.

Sample size: Due to this study uses CFA for data analysis of SEM. so the suitable size of sample has to be more than 20 times of variable amount (Kline, 2011) while there are 22 variables so that sample scale has to consist of at least $22 \times 20 = 440$ samples.

Participants: Participants are users who order food via online application. The survey was operated from January to February 2021 in provinces that are the economic centers in 6 regions of Thailand including Central, Northern, Northeastern, Eastern, Western, and Southern regions. There are 1,320 samples in total, divided into 6 regions so that there are 220 samples per region.

Table 6.2 showed frequency and percentage analysis of basic data from 1,320 samples e.g. users who order food online, characteristics and frequency of use. Samples of participant are 805 females (61%), and 515 males (39%). Age: Most of participants are 21-30 years old (42.1%), and second is 31-40 years old (27.1%). Education level: Most of participants finished Bachelor degree (61.9%), and second is participants who finished secondary school (22.7%). Career: Most of participants are

students (29.9%), and second is office workers (27.7%). Income: Most of participants earn 10,001-20,000 Baht (31.3%), and second is 5,000-10,000 Baht (20.2%). The most frequent online order is less than 4 times a month (51.7%), and second is 5-10 times per month (30.7%).

Table 6.2 Characteristics of the sample

Characteristics	Types	Frequency	Percentage
Gender	Male	515	39.0
	Female	805	61.0
Age (years)	<20	149	11.3
	21-30	556	42.1
	31-40	358	27.1
	41-50	169	12.8
	51-60	83	6.3
	>60	5	0.4
	Education	Lower than junior high school	37
Junior High School		64	4.8
Senior High School		299	22.7
Bachelor's degree		817	61.9
Higher than the bachelor's degree		103	7.8
Occupation	Student/College Student	395	29.9
	General contractor	162	12.3
	Government employee/State	174	13.2
	Enterprises	366	27.7
	Company Employee	184	13.9
	Business owner	39	3.0
	Other	221	16.7
Revenue	<5,000 Baht	266	20.2
	5,000-10,000 Baht	413	31.3
	10,001-20,000 Baht	241	18.3
	20,001-30,000 Baht	89	6.7
	30,001-40,000 Baht	90	6.8
Used Frequency	>40,001 Baht	683	51.7
	Less than 4 times/month	405	30.7
	5-10 times/month	219	16.6
	More than 10 times/month Other	13	1.0

6.4.2 Reliability of the Questionnaire

Refer to quality examination on research tools, 5 experts had examined content accuracy and considered consistency of each question by analyzing and giving question's score with IOC. The IOC is more than 0.5 that meant content accuracy of questionnaire was within an acceptable range. Then we had done the pilot study with 30 participants who were excluded from the research. The reliability is analyzed by using Cronbach's alpha coefficient. Result indicated the Cronbach's alpha at 0.784-0.965 which was more than 0.7 (Tavakol and Dennick, 2011).

6.4.3 Structural Equation Modeling

Structural Equation Modeling (SEM) is a statistical method used for examination on relationship among variables. To measure the relationship among Observed Variables and Latent Variables (or Unobserved Variables), or to measure relationship among two or more Latent Variables, the important qualification of SEM is that it has to be Linear equation only. Also, to seek for relationship among variables, it might be a causal finding among variables, and relationship finding among variables that happened at the same time, or to search for relationship among variable groups. There are 2 models of SEM, consisting of Measurement Model and Structural Model: (1) Measurement Model is a representative creating model, including measuring variable and sub-variable. This model will present that if it is a good representative. For this model, variable coefficient is called Factor Loadings. (2) Structural Model is a casual finding model, including independent and dependent variables, as well as latent variable. This model will present that if independent variable is a cause of dependent variable. For this model, variable coefficient is called Regression Weight, and Factor Loadings. The SEM details are in-depth written by (Hair et al., 2010, Kline, 2011).

Therefore, SEM is a method which is used in this study by considering the Structural model to obtain relationship among Performance Expectancy, Effort Expectancy, Facilitating Conditions, Hedonic Motivation, Price Value, Habit and Joyfulness that influence to consumer behavior on continuous service use of online food order. It meant the perceived user of online food order via application. Then we

analyze each Measurement model to know in which factors have the highest loadings in order to recommend as a policy in future.

6.5 Findings

6.5.1 Descriptive Statistics

According to analysis of average, standard deviation, and R-Squared from basic data of 1,320 samples, the details can be expressed in Table 6.3 below.

Table 6.3 Descriptive statistics

Construct	Variables	Mean	SD	R ²
Performance (Alalwan, 2020)	I1: I find mobile food order apps useful in my daily life.	4.03	0.798	0.702
	I2: Mobile food order apps help me accomplish tasks more quickly.	3.94	0.821	0.612
	I3: Using mobile food order apps increases my productivity.	3.81	0.844	0.582
Effort Expectancy (Alalwan, 2020)	I4: Learning how to use mobile food order apps is easy for me.	4.03	0.822	0.737
	I5: My interaction with mobile food order apps is clear and understandable.	3.90	0.812	0.719
	I6: It is easy for me to become skillful at using mobile food order apps.	3.97	0.838	0.783
Habit (Alalwan, 2020)	I9: The use of mobile food order apps has become a habit for me.	3.40	1.030	0.784
	I10: I am addicted to using mobile food order apps.	3.24	1.091	0.653
	I11: Using mobile food order apps has become natural to me.	3.50	1.053	0.775
Price Value (Alalwan, 2020)	I14: Mobile food order apps are reasonably priced.	3.75	0.816	0.599
	I15: Mobile food order apps are good value for the money.	3.70	0.818	0.633
	I16: At the current price, mobile food order apps provide good value.	3.65	0.852	0.684
Playfulness Adapt from (Ahn et al., 2007)	I17: Using this Web gives enjoyment to me.	3.68	0.978	0.544
	I18: Using this Web gives convenient to me.	3.98	0.836	0.632
	I19: Using this Web gives fun to me.	3.69	0.996	0.559
Continuous Intention (Cho et al., 2019)	I20: I intend to use the food delivery app	3.79	0.881	0.775
	I21: If I have an opportunity, I will order food through the delivery app	3.81	0.843	0.740
	I22: I intend to keep ordering food through the delivery app	3.78	0.885	0.747

6.5.2 Structural Equation Model

6.5.2.1 Goodness-of-Fit Statistics

It found that Model is quite conformed to the empirical data: $\chi^2 = 293.023$, $df = 111$, ($p < 0.000$), $\chi^2/df = 2.639$, RMSEA = 0.035, CFI = 0.990, TLI = 0.986 and SRMR = 0.020. While comparing to the recommended criteria, (1) the suitable χ^2/df should be between 2-5 (Marsh and Hocevar, 1985), (2) root mean square error of approximation (RMSEA) should be less than 0.07 (Steiger, 2007), (3) Comparative fit index (CFI) should be equal to or over 0.90 (Hu and Bentler, 1999), (4) Tucker–Lewis index (TLI) or Non-Normed Fit Index (NNFI) should be equal to or over 0.80 (Hooper et al., 2008), and (5) standardized root mean square residual (SRMR) should be equal to or less than 0.70 (Hu and Bentler, 1999).

6.5.2.2 Measurement Model

The mentioned statistic is in accordance with empirical data. Overall, there are 8 latent variables, 22 variables and indicators. While considering standardize loadings, we found that they are between 0.738-0.947 which is matched with the criteria that has to be more than 0.4. So, we can summarize that this Model consists of a statistically significant method ($p < 0.001$), and standardize loadings of each list are as follow.

According to evaluation on the coefficient of Performance Expectancy from 3 observed variables: I1 presents the highest loadings at 0.838. Then it is I2 with 0.782 loadings. From 3 observed variables of Effort Expectancy, I6 presents the highest loadings at 0.885. Second is I4 with 0.858 loadings. Refer to 2 variables of Facilitating Conditions, I8 has the highest loadings at 0.841. Second is I7 with 0.839 loadings. From 3 variables of Habit, I9 has the highest loadings at 0.886. Second is I11 with 0.880 loadings. Refer to 2 variables of Hedonic Motivation, I12 has the highest loadings at 0.947. Second is I13 with 0.886 loadings. From 3 variables of Price Value, I16 has the highest loadings at 0.826. Second is I15 with 0.796 loadings. Refer to 2 variables of Playfulness, I18 has the highest loading at 0.795. Second is I19 with 0.748 loadings. For 3 variables of Behavioral intentions, I20 has the highest loadings at 0.880. Second is I22 with 0.864 loadings.

In reference to above data, I12 has the highest Loadings at 0.947. Second is I9 and I13 with Loadings = 0.886, while the lowest variable is I17 with Loadings = 0.738. Measurement model results are showed in Table 6.4.

Table 6.4 Measurement model results.

Construct	Variables	Standardized Loadings*	Standard Error	t-Value	CR	AVE	Cronbach's Alpha
Performance Expectancy	I1	0.860	0.011	78.491	0.854	0.662	0.870
	I2	0.819	0.012	65.781			
	I3	0.759	0.015	50.643			
Effort Expectancy	I4	0.863	0.009	95.669	0.899	0.747	0.898
	I5	0.850	0.010	89.234			
	I6	0.880	0.008	104.781			
Habit	I7	0.884	0.010	86.395	0.892	0.735	0.918
	I8	0.801	0.016	49.873			
	I9	0.884	0.010	86.522			
Price Value	I10	0.766	0.016	48.968	0.840	0.637	0.855
	I11	0.794	0.015	54.078			
	I12	0.833	0.013	64.750			
Playfulness	I13	0.725	0.018	40.977	0.736	0.583	0.857
	I14	0.800	0.016	51.172			
	I15	0.737	0.017	42.620			
Continuous Intention	I16	0.888	0.007	118.583	0.920	0.793	0.909
	I17	0.895	0.007	123.907			
	I18	0.889	0.007	119.852			

Note: Regression. * significant at $\alpha = 0.05$

6.5.2.3 Structural Model and Hypothesis Testing

Structural Model is estimated by using maximum probability. Research result found that the measured consistent index levels are: $\chi^2 = 293.023$, $df = 111$, ($p < 0.000$), $\chi^2/df = 2.639$, $RMSEA = 0.035$, $CFI = 0.990$, $TLI = 0.986$, and $SRMR = 0.020$. Such consistent indexes identify that it is suitable. So it can be summarized that Structural Equation Model is conformed to empirical data. Moreover, when we examine by 7 Hypotheses as presented in Table 4, it found that these influence to Behavioral intention of online food order with the following methods.

Table 6.4 showed SEM results of Structural Model on survey of relationship among 5 external variables that influenced to Behavioral intention of online food order via application. Coef. Indicates that Joyfulness factor has the highest influence to Continuous intention (0.374). Then there are factors of Habit (0.179), Performance Expectancy (0.151), Effort Expectancy (0.133), and Price Value (0.124). Results of factors influencing to Behavioral intention of online food order, and Analysis results of Hypothesis Testing are presented in Table 6.5

Table 6.5 Standardized path coefficient and t-value for the structural model.

Hypotheses	Description	Standardized	t-Value	Result
		Path Coefficient		
H1	Performance Expectancy → Continuous Intention	0.151	3.290	Supported
H2	Effort Expectancy → Continuous Intention	0.133	3.249	Supported
H3	Habit → Continuous Intention	0.179	4.906	Supported
H4	Price Value → Continuous Intention	0.124	2.863	Supported
H5	Playfulness → Continuous Intention	0.374	8.878	Supported

Conclusive testing of the offered research hypotheses (H1-H5) found that such hypotheses significantly affect to relationship as indicated and showed in Figure 6.3.

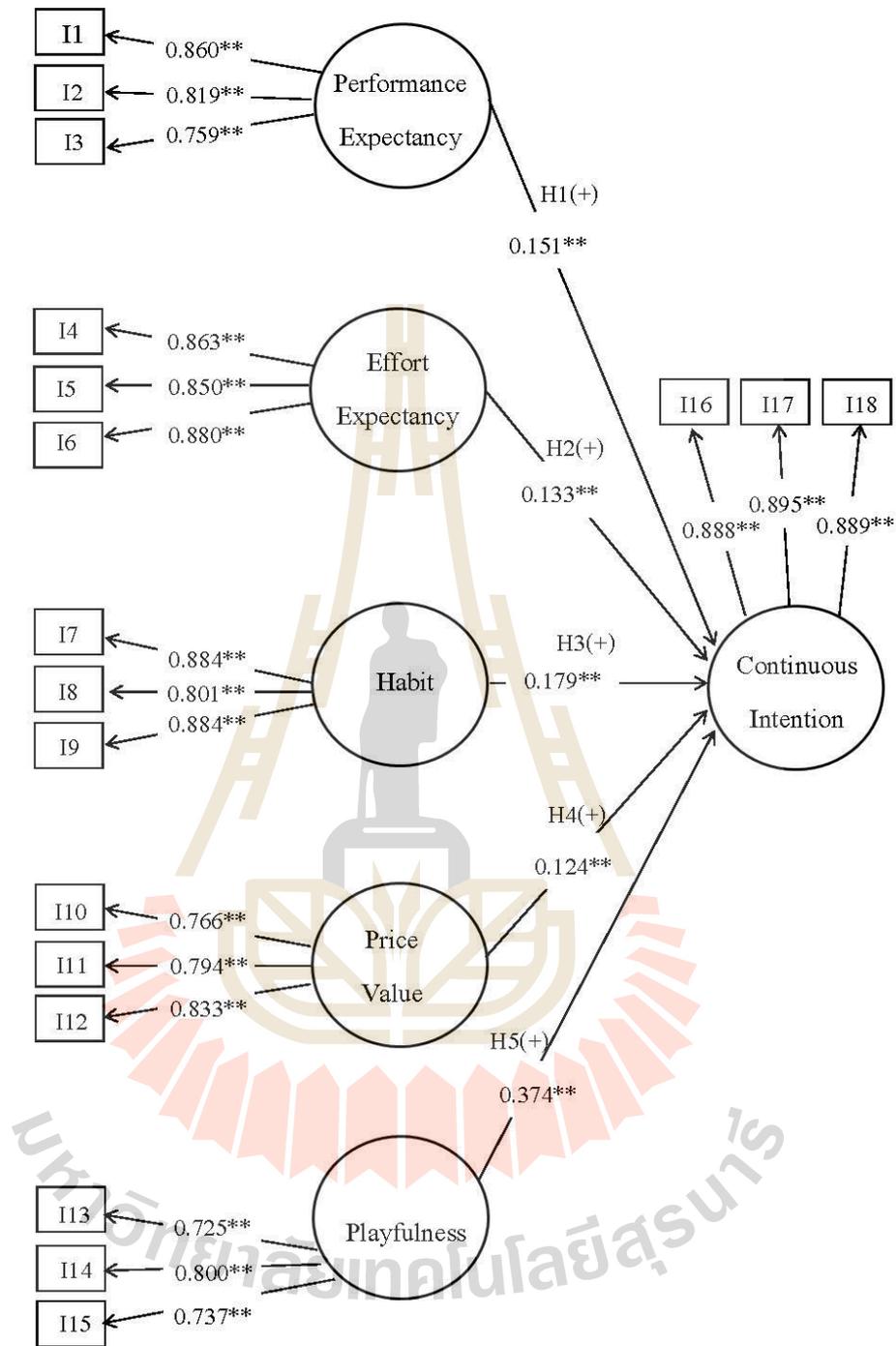


Figure 6.3 Results of main-test research model

6.6 Discussions

This research mainly aims to develop Structural Equation Model to examine structural relation of online food order via application. The studied factors in UTAUT consist of Performance Expectancy, Effort Expectancy, Habit, Facilitating Conditions, Hedonic Motivation, and Price Value. In addition, there is 1 more factor that is Playfulness for this study. The study method uses analysis index of confirmatory factor. There are 7 hypotheses for SEM analysis which examines relationship among different factors. CFA evaluation found that we can statistically and significantly assure components of such model. In addition, the SEM analysis found that consistent index of Model is well conformed to 5 out of 5 hypotheses. Studied factors are significantly related to hypotheses which can be explained as follow.

Refer to SEM, it found that there are factors directly influencing to intention to order food via online food application including Performance Expectancy, Effort Expectancy, Habit, Facilitating Conditions, Hedonic Motivation, Price Value, and Playfulness. From the examination of standard Path Coefficient:

Firstly, we found that Hypothesis 5, "Playfulness influences to continuous intention to use" is the highest = 0.374. It meant we found that Playfulness of online food order positively influences to intention to use food order application. Therefore, in case there is an online food order via application, users will be playful while using the service. So that it might be obtained from selection of restaurants or menus which matches with user demand. Also, recently the application contains many restaurants and menus. If users are playful and happy, it will affect to positive trend to use food order application. This is confirmed to research of (Huang and Lin, 2023, Rokhim et al., 2022) whose research result was that Playfulness positively influenced to behavioral intention to continuously order food via online.

Secondly, it is Hypothesis 3, Habit which influences to continuous intention to use = 0.179. It meant Habit of online food order directly and positively influences to intention to use food order application. So users tend to behave an online food order via application to support their living. Since in daily life, they have to order food via online then it will affect to consumers having habit of ordering food via online. If they want to eat or they are hungry, they will order food via online right away. That is

conformed to a research of (Agarwal and Sahu, 2021, Alalwan, 2020, Gunden et al., 2020) whose research result found that Habit positively influenced to behavioral intention to continuously order food via online.

Thirdly, it is Hypothesis 1, Performance Expectancy which influences to continuous intention to use = 0.151. It meant users believe that if there is an online food order via application, they will receive an effective service with no obstacle of use, and it is able to well respond to consumer's demand. That is conformed to a research of (Alalwan, 2020, Gunden et al., 2020, Mensah, 2019, Ramos, 2021, Zhao and Bacao, 2020) whose research result found that Performance Expectancy positively influenced to behavioral intention to continuously order food via online.

Fourthly, it is Hypothesis 2 Effort Expectancy which influences to continuous intention to use = 0.133 It meant users believe that online food order via application is simple, not complicated or difficult to use, and there is no attempt to use application. That is conformed to a research of (Alalwan, 2020, Mensah, 2019, Ramos, 2021, Zhao and Bacao, 2020) whose research result found that Effort Expectancy positively influenced to behavioral intention to continuously order food via online.

Lastly, it is Hypothesis 4, Price Value influences to continuous intention to use = 0.044. It meant users of online food order via application see that benefit of service use is a good value for money. Or users get the food as information specified in an application. That is conformed to a research of (Alalwan, 2020) whose research result found that Price Value positively influenced to behavioral intention to continuously order food via online.

6.7 Conclusions and implication

Writer has used SEM method for this study because it is more suitable and effective for a complicated phenomenal measurement. SEM has a similar purpose as the Multiple Regression but it is more effective while considering the following conditions: Response Model, Non-Linear, Relatively Independent Variable, Measuring Mistake, Relatively Mistake Condition, Several Latent Independent Variables (each is measured by many indicators), and One or more Latent Variables (each has many indicators) (Kline, 2011). The data is collected in Thailand, dividing into 6 regions,

including Central, Northern, Eastern, Northeastern, Western, and Southern regions.

The research results can be utilized as follow. We can rank the external variables in terms of strength of influence for behavioral intention to order food online via application. Playfulness factor influences to behavioral intention to order food online via application. If consumer is playful and convenient to use the application, it will affect to a continuous use of online food application. Second is Habit factor of users which found that some users order food online as a regular thing in daily life. Also, some users addict to online food order as a habit, and they continuously use such service. Next factor is Expectancy of use: If consumers found that learning to use mobile food order is simple, application's qualification is well functioning, able to clearly correspond between application and consumers, as well as it is easy for consumers to understand, it will affect to consumers having professional in mobile application's food order. Then it is Hedonic Motivation factor: If consumers are playful and entertaining with food order application such as Creating a promotion to attract consumers, and Discount coupons for food and delivery fees, to let consumers order food in accordance with their demand. Moreover, the analysis result found that Price Value factor has no influence to behavioral intention to order food via online. Because consumers are still worried about ordering food via online application since the online food order via application will present only details and photos of food. That affects to consumers may receive food which is not in accordance with what specified in the application. So that restaurants should deliver food which is matched with what specified in the application. Therefore consumers will receive products that are good value for money. In addition, it found that Facilitating Conditions factor has no influence to behavioral intention to order food via online due to all consumers already have the communicating devices that are functioning recently. However, for better development, business owners of food order applications should develop a simple and non-complicated application to make consumers use more food order applications. Also, consumer behavior of online food order application mostly needs to order food on internet. So government or the relevant organizations should take this research result to utilize as policy making to facilitate products purchase in the digital marketing system.

6.8 Limitation and future research

The study focuses on methods to study users' behavioral intention to continuously use online food order via application. However, the study has some limitations. Overall, there is a little difference between questions which are used to identify behavioral willingness. For future research, there should be other theories used in the studies besides UTAUT2, to perceive the true behavior of various users. Another limitation is the scope of study. SEM results obtained by asking questions to users of online food order via application in only provinces representing each region. So it might be different in other countries while the results or loadings maybe different. Future study should be able to discuss attitudes of using various applications form other theories which affect to behavior of application users, in order to perceive factors and viewpoints of users of food order application.

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CHAPTER 7

CONCLUSION AND RECOMMENDATION

Presently, it is undeniable that online food ordering is one of the primary services for many users, especially during Covid-19; it has led more consumers to turn to online food ordering services because their behavior needs to be adjusted in line with the current situation. Therefore, the focus is to study the factors that will make consumers more likely to use online food ordering services and make entrepreneurs aware of the factors that will encourage consumers to use more services. More the literature review found that the important dimensions related to online food ordering through the platform, if studied will result in recognizing factors that will affect consumer behavior, whether any factors are important to the use of consumer services. In addition, the difference in service usage among males and females was studied. Including the study of differences between Generation X and Generation Y, and the last point, there was a study of factors affecting motivation for using the service. The study's results revealed five important dimensions of this study. Therefore, the study was divided into six conclusions as follows:

7.1 Factor affecting consumer behavioral intentions toward online food ordering

Study 1: A model was created to analyze consumer behavior toward online food ordering. It was measured by online food ordering users in the form of latent variables, and Structural Equation Modeling was used to analyze the relationship, for example, female service users. The service users are 21-30 years old—occupation of company employees. Service user attitude, subjective norms, perceived ease of use, perceived usefulness, task-technology fit. This may result in users being more likely to order food online.

7.2 Differential between male and female

Study 2: A model was created using Multi Group Analysis to study the differences between male and female groups. as a result of different behavioral characteristics. This study aims to study the differences between male and female consumer behavior to have a policy. Different Marketing Promotion Strategies The variance measure was used in this study to compare the differences between male and female users. The results showed that the two sexes were different.

7.3 Influencing behavior intention of ordering food online: A Random thresholds random parameters hierarchical ordered probit

Study 3: This study aimed to analyze the factors affecting motivation for ordering food, which leads to an effective strategy formulation to add users. An online food ordering application was to determine the fixed limits of the fixed thresholds limitation of the traditional ordered probability models, so a random thresholds hierarchical ordered probit model with random parameters was used for data analysis. The study found that attitude, enjoyment, trust, and perceived ease of use can be summarized as policy recommendations and strategies to increase motivation for people to use food-ordering apps.

7.4 Differential between Generation X and Generation Y

Study 4: A model was created using Multi Group Analysis to study the differences between Generation X and Generation Y groups. as a result of different behavioral characteristics. This study aims to study the differences between Generation X and Generation Y consumer behavior to have a policy. Different Marketing Promotion Strategies The variance measure was used in this study to compare the differences between Generation X and Generation Y users. The results showed that the two generations were different.

7.5 Factor affecting consumer behavioral intentions toward online food ordering

Study 5: A model was created to analyze the factors influencing consumer behavior toward online food ordering. It was measured by online food ordering users in the form of latent variables, and Structural Equation Modeling was used to analyze the relationship, for example, female service users. The service users are 21-30 years old. -occupation of company employees. Performance expectancy, effort expectancy, habit, hedonic motivation, and playfulness factor. This may result in users being more likely to order food online.

7.6 Recommendations

The study focused on finding the factors influencing online food ordering, leading to policy recommendations and strategies to encourage more consumers to order food online. The following study was A study of the differences in the use of online food ordering services among males and females. They also studied the differences in the use of online food ordering services among Generation X and Generation Y groups. Next, the study of factors affecting their motivation to use food ordering apps. Moreover, the last point is Factors that continue to influence online food ordering behaviors. Therefore, the recommendations consist of five points:

The first point of the policy is to study the factors affecting the behavior of online food ordering users. It was found that if consumers had a positive attitude and were more likely to use a food-ordering app, there was consideration or rethinking before consumers decided to use the food-ordering app. Especially if the consumer has a good attitude towards, perceived ease of use, perceived usefulness, and trust, it will result in further consideration ponder to use the service later when consumers want to order food through the app more efficiently, whether creating promotions to attract consumers using the properties of applications, which are media that work on the Internet to allow instant communication between the application and the consumer—obtaining product information to decide to use the service and facilitate the work process, such as payment and food delivery systems. In addition, if the consumer finds that the application's functions are suitable for use, it will affect the

consumer's decision to use the service and be amenable to reference groups, especially close friends. Moreover, parents will significantly impact consideration before deciding to use the service or making a purchase decision immediately. Consumers who order food through the application Or buy various products online not choosing the product from seeing the actual product. However, choose products that meet the needs. Suppose there is an incentive to stimulate consumer demand. In that case, Sharing information or advertising products through these referrals may cause consideration. If consumers are susceptible to these groups, there is the possibility of an immediate decision; however, if a business owner develops applications, it is easy. Being uncomplicated will increase the use of the service.

Second: The differences in the behavior of male and female groups found that both groups had similar behaviors. Both groups gave the most importance to their attitude toward online food ordering. Because if consumers have a good attitude, they will have a positive tendency to use the service, followed by conformity with the reference group. Especially close friends and parents will have a significant impact on the decision to use the service immediately. However, they differ in their perception of behavior control. Because it only influences males, Factors directly influencing attitudes toward online food ordering were evident in the two groups because the male group values trust the most. For the female group, the emphasis was on perceived ease of use. However, there will be a subject of conformity with the reference group because both agree that it is the last factor affecting consumer attitudes. The perceived benefit factor found that both groups had similar perceptions. Is to focus on perceived ease of use is the most important thing. Because if consumers find the app to be easy to use, straightforward, and without effort, it will affect the perceived usefulness of the app. Next is the perception of the suitability between work and technology. The last factor is perceived ease of use found that both groups had similar perceptions. There is a perception that if the application is being used appropriately for its intended function, for example, providing clear order information. Including the application following the stated requirements will result in consumers being able to use the application easily.

Third, the factors most influencing motivation to use the food ordering app

were attitude, enjoyment, trust, and perceived ease of use. Developing a food ordering app that is easy to understand or may need to be promoted for use guarantees ease—just a few clicks. Next up is the enjoyment factor when ordering food. It is characterized by not being interrupted by application crashes, including restaurants or pictures of attractive food, to increase the appetite for ordering. The next step is application confidence. Certain groups of people have high confidence but do not want to use a food-ordering app. This point can be used as a promotional topic. There is a guarantee that the information will not leak or receive the exact order. Providers may also show in the form of an infographic a statistical accuracy of food delivery or a satisfaction score. Finally, it is perceived ease of use to encourage users. Those have not use to gain confidence, which is a question similar to a positive attitude, such as to promote the perceived ease of use and also be able to promote clarity of the app, such as the type of restaurant, type of food category, food prices, etc.

Fourth: A study of differences in the behavior of Generation X and Generation Y groups found that attitudes influenced their willingness to order food online. If the consumer has a good attitude, it will result in the continued use of the service if they have a good attitude regarding perceived ease of use, usefulness, and trust. It will only result in consideration in order to order food later. If consumers want to order food more efficiently, for example, creating promotions to attract consumers who are both new and former customers and obtaining product information to use the service and facilitate the work process, such as payment and food delivery systems. In addition, if the consumer finds that the application's functions are suitable for use, it will lead to the consumer's decision to use the application. Conforming to certain reference groups, especially close friends and parents, will have a significant impact on the consideration before making a decision or making a decision to buy immediately. Consumers who order food through the application Did not select the product from seeing the actual product. However, choose products that meet the needs. Suppose there is an incentive to stimulate demand. In that case, sharing information or advertising through these referrals may cause the use of the service. From the results of the analysis, it was found that the perception of behavior control of the Gen Y group did not influence their online food ordering behavior because consumers still had

concerns about the complexity of their use. However, suppose business owners develop applications to be simple and uncomplicated. In that case, consumers will turn to use the service even more, and the behavior of most consumers wanting to order food via the internet. Therefore, government agencies or relevant agencies should bring. The results of this research will be used to formulate policies to facilitate the purchase of goods in the digital marketing system. In addition, service companies can use the results to develop a marketing plan and improve the platform on consumer behavior.

Five: Factors influencing the behavior of intention to order food online through playfulness factor had the most significant influence on online food ordering behaviors. Suppose consumers have fun and it is convenient to use the application. In that case, it will result in the continued use of the service, followed by the user's habituation factor, found that some people use the service. Ordering food online has become a daily routine, and some people are addicted to ordering food online until it has become a habit and has continued to use the service. The next factor is Usage expectation. If consumers find it easy to learn how to use a food ordering app, including the features of the application that have a good workflow that can communicate with consumers clearly and is easy to understand will result in the use of expertise. Next is the entertainment motivation factor. If consumers have fun and enjoy using the food ordering app, for example, creating promotions to attract consumers, including providing discount codes for food and transportation, so that consumers can choose to order food directly. On-demand And the cost-effectiveness factor did not influence behavioral intentions in ordering food online because consumers were worried about ordering food online through apps. Since users have to order food through the app, they will only see details and pictures of the food, resulting in consumers who may not get the food specified in the app. However, the restaurant should deliver the food as specified so that the consumer can get the product worth the amount they pay. It also found that facilitation condition factors did not influence behavioral intentions in online food ordering. This is because today's consumers have a communication device ready to be used by everyone. However, for better development, Business owners should make the application development

simple. Not complicated to use It will make consumers turn to use the service even more.

7.7 Reference

Inthong, C., Champahom, T., Jomnonkwao, S., Chatpattananan, V., & Ratanavaraha, V. (2022). Exploring Factors Affecting Consumer Behavioral Intentions toward Online Food Ordering in Thailand. *Sustainability*, 14(14), 8493.





APPENDIX

LIST OF PUBLICATION

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Publication

Inthong, C., Champahom, T., Jomnonkwao, S., Chatpattananan, V., & Ratanavaraha, V. (2022). Exploring Factors Affecting Consumer Behavioral Intentions toward Online Food Ordering in Thailand. *Sustainability*, 14(14), 8493.



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Miss Chidchanok Inthong was born on October 21, 1988, in Bangkok. I studied elementary to middle school at Saint Theresa School. High school Bodindecha (Sing Singhaseni) 4 School, then pursue a bachelor's degree Industrial Management Mahanakorn University of Technology. Master's degree in the Logistics Technology Mahanakorn University of Technology. Then study for a Ph.D. Energy Management and Logistics Engineering Faculty of Mechanical Engineering institute of engineering Suranaree University of Technology

