# The Development of Usefulness and Ease of Use of Food Delivery Platform: A Case of Chinese Food Platform in Thailand

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# Abstract

Platform economy is a popular business model at present. Food delivery platforms are one of the platforms with potential for growth. Because of the epidemic food delivery platforms have been further developed in various countries. However, previous studies have shown that food delivery platforms still have some problems that need to be solved. To solve these problems, the research objective of this research is to identify the functionalities of food delivery platforms and the pain points of customers. Finally, a developmental functional model is proposed for reducing customer pain points. This research focuses on the customer side of the food delivery platform. This research uses a mixed research approach and the type of research is design science. Then, this research used three methods to collect data and the data was divided into qualitative and quantitative data, and then, analyzed separately. In the questionnaire method, 205 questionnaires were collected and in the interview method, 12 participants were interviewed. The data of this research passed the reliability and validity tests. Factors affecting perceived ease of use and factors affecting perceived usefulness in the area of food delivery platforms were identified in this research. In addition, this research found that the delivery map function affects perceived usefulness and use experience affects perceived ease of use. This research found that perceived usefulness is influenced by six factors namely user reviews, product information, system quality, delivery map, product quality and variety of food types. Perceived ease of use is influenced by four factors: design quality, usability, language and user experience.

# **Keywords :** Food delivery platforms, Technology acceptance models, Perceived ease of use, Perceived usefulness, Application development

# 1. Introduction

The development of e-commerce has largely changed the consumption pattern of consumers and increasingly consumers prefer to order food using online food delivery platforms (Hwang and et al., 2019). Consumers can save their time and effort by ordering food through online food delivery platforms (Ray and et al., 2019). According to "Online Food Delivery Services Market Global Briefing 2020-30: Covid 19 Growth and Change", the global online food delivery market is expected to grow at a Compound Annual Growth Rate of 10.65 percent starting from 2020 to reach 306.12 billion USD by 2030 (Troise and et al., 2020). This indicates that online food delivery platforms have high growth potential.

Generally, customers suggested that the functionality of current food delivery platforms needs to be developed. The first is the low usefulness of the delivery function. Studies in the United States and Thailand have shown that food delivery mistakes are regular and rider delivery performance is poor (Annaraud and Berezina, 2020; Fakfare, 2021). The second is the low usefulness of the after-sales function. In the preliminary study, the after-sales service of the Chinese food platforms in Thailand only provides a phone number and customer service WeChat, without direct communication function. Also, some reviews noted that the phone number is incorrect. Finally, the usefulness of the order function

is low. Research shows that customers need reviews and photos to help them decide on food, but this information is very poor and needs to be improved (Fakfare, 2021).

Literature studies have shown that there are some problems with food delivery platforms could be classified as two main problems were low functional usefulness of food delivery platforms and new customer's pain points are not solved. These two main problems still exist in the Chinese food delivery platform in Thailand, so this study research and develop the usefulness and ease of use of the Chinese food delivery platforms in Thailand. First, theoretical support obtained through literature studies on food delivery platforms, technology acceptance models and demographics. Second, data collected through observations, questionnaires, and interviews. Then, the data are analyzed using statistics and classification and coding of concepts. Next, new design is created with digital tools. Finally, the new design is evaluated and the conclusions of this research are drawn.

# 2. Objective

- 1) To analyze the functional and operational processes of the Chinese food delivery platform.
- 2) To identify the challenges and difficulties experienced by customers using the platform.
- 3) To suggest new features and functionalities that can help alleviate customer pain points.

#### 3. Literature review and

#### **Platform Economy**

The platform economy refers to the digital support activities that occur in the areas of business, politics and social interaction (Kenney and Zysman, 2016). For example, today's globally known companies eBay, Uber, Airbnb are all part of the platform economy (Laura, 2019). The Food Delivery Report 2021 shows that food delivery revenue is growing steadily worldwide (Matt, 2021).

The participants of the food delivery platform consist of five parts, which are the platform, customer, merchant, rider, and third-party payment (Sauce, 2017). Each component can benefit in a food delivery platform. For the merchant, the food delivery platform gives the merchant a new source of revenue, and higher utilization of existing kitchen facilities. For the customer, the customer can get more choices easily and quickly. (Hirschberg and et al., 2016). For the Platform, there are five main ways to generate revenue for the platform (FATbit, 2021). For riders, the food delivery platform can give them more orders and wages (Hirschberg and et al., 2016). For third-party payment, food delivery platform increases the usage of third-party payments and opportunities for cooperation (Frederick and Parappagoudar, 2021).

# Food delivery platform

Food delivery platform is a platform where consumers can compare and select products or services to make orders through a website or application. Then, the food is prepared by the merchant, finally delivered to the consumer by a rider for product delivery (Pigatto and et al., 2017; Ray and et al., 2019; Li, Mirosa and Bremer, 2020; Jun and et al., 2021). There are five participants in the food delivery platform, which are platform, customer, merchant, rider and third-party payment (Sauce, 2017).

There are five functions of the food delivery platform, namely order, payment, delivery, after-sales service and evaluation function (Wave, 2020). Each function has its own role to play, but current research shows that there are several problems with the food delivery function that need to be solved. In order function, customers have expressed the need for more product information and more product choices to help them make decisions (Annaraud and Berezina, 2020; Prasetyo and et al., 2021; Koay, Cheah and Chang, 2022). In delivery function, order mistakes and low quality of riders is repeatedly mentioned (Annaraud and Berezina, 2020; Fakfare, 2021). The most important problem in the after-sales function is that many platforms do not provide after-sales service function (Annaraud and Berezina, 2020). The problem in the evaluation function is that there are too few reviews (Fakfare, 2021). The improved functions in this research are order function, delivery function, after-sales function and evaluation function. The payment function is not in the scope of this research because it already meets the current needs of consumers.

#### **Technology Acceptance Model**

Technology Acceptance Model is a model proposed by Venkatesh and Davis (1996). This model can predict customer acceptance of using a new system. The two main variables in this model are perceived ease of use and perceived usefulness. Perceived usefulness is the degree to use a new system will improve job performance. Previous research has shown that there are six factors that affect perceived usefulness, which are user reviews, product information, system quality, delivery time, product quality and variety of food types (Lee, Lee and Jeon,2017; Lee and et. al., 2022; Fariz, 2022). Perceived ease of use is the degree to using a new system will save energy. Previous research has shown that there are three factors that affect perceived ease of use, which are design quality, usability and language (Chotigo and Kadono,2021; Papakostas and et. al., 2022).

#### **User characteristics**

Different user characteristics can affect user acceptance. Previous studies have shown that on use experience, Customer with experience of use is more likely to use new food delivery platforms (Alfadda and Mahdi, 2021). On education level, online food ordering service customers is mostly at the undergraduate level, because they are more easily to master the application (Jaroenwanit, Abbasi and Hongthong, 2022). On gender, female customers have a higher willingness to consistently use food delivery software (Wen, Pookulangara and Josiam, 2021).

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# 4. Theoretical framework & research questions

#### **Theoretical framework**



# **Research** questions

- 1) What are the functions of the Chinese food delivery platform?
- 2) What are the functions that need to be improved?
- 3) What does the improved function look like?

# 5. Research methodology

A mixed-methods research approach is used in this research. In this research the qualitative method was observation and interview method. The quantitative method was questionnaires survey. The type of research is design science research. Population of this research were customers of the Chinese food delivery platform. 205 questionnaires were received through the survey. 12 participants were interviewed to evaluate the new digital prototype. The reliability and validity values of this research were greater than 0.7 and passed the test.

# Table 1 Scale Reliability

Scale	Cronbach's Alpha	N of Items	
Problems with the function	0.876	16	
Influencing Factors of usefulness	0.894	12	
Influencing Factors of ease of use	0.749	6	

# Table 2 Scale Validity

Scale	Kaiser-Meyer-Olkin	Significance
Problems with the function	0.866	0.000
Influencing Factors of usefulness	0.903	0.000
Influencing Factors of ease of use	0.778	0.000

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# 6. Results

# User's requirement

By comparing quantitative data with qualitative data, user requirements can be clearly demonstrated. In order function, the summary of customer requirements explicitly adds food ingredients, packaging options and reviews to the order function. All of the above requirements are consistent with the findings of previous researchers (Lee, Lee and Jeon, 2017; Chotigo and Kadono, 2021; Fariz, 2022; Koay, Cheah and Chang, 2022; Papakostas and et. al., 2022). In delivery function, according to the researcher's experience, the present platform does not display the delivery process, no delivery map is shown. In after-sales service function, requirements of customers for after-sales service function are expressed in the need for the platform to provide after-sales service, increase the service attitude and convenience, then, increase the number of staff to reduce the waiting time. These requirements are consistent with the findings of Annaraud and Berezina (2020). In evaluation function, customer requirements for the evaluation function explicitly proposed to increase the usability and display of evaluations. These requirements are consistent with the findings of previous researchers (Lee, Lee and Jeon, 2017; Chotigo and Kadono, 2021; Fariz, 2022). The above customer requirements are shown in Table 3.

Table 3 User req	uirements of function	
Functions	Quantitative	Qualitative
	Questionnaires	Observation
	(Influence factors)	(Current)
Order function	Ingredients information	Don't have
	variety of product matching	Have
	variety of packaging options	Don't have
	customer reviews for food	No reviews for each food
Delivery	riders protect the food	Have (Found no delivery map)
function	delivery correctness	Have
	food packaging	Have
	attitude of the delivery service	Have
After-sales	provide after-sales service	Have
tunction	provide enough staff	Need to develop

Functions	Quantitative	Qualitative
	Questionnaires	Observation
	(Influence factors)	(Current)
	attitude of the service	Need to develop
	provide convenient service	Need to develop
Evaluation	provide evaluation function	Have
function	provide a variety of ways	Need to develop
	provide a variety of objects	Need to develop
	display Comments	Need to develop

Table 4 shows that main factors that influence perceived usefulness are user reviews, product information and system quality. These main factors of influence are consistent with Lee, Lee and Jeon (2017) findings that perceived usefulness is influenced by user reviews, product information and system quality. The specific factors are personal experiences, number of reviews, ingredients, menu, functions designed properly and functions available. These specific influencing factors are consistent with the findings of previous researchers (Lee, Lee and Jeon, 2017; Fakfare, 2021; Fariz, 2022).

In short, main factors that influence perceived usefulness are user reviews, product information and system quality. The specific factors are personal experiences, number of reviews, ingredients, menu, functions designed properly and functions available.

Factors	Quantitative	Qualitative
	Questionnaires	Observation
	(Influence factors)	(Current)
User reviews	personal experiences	Very few
	number of reviews	Many automatically evaluate
Product information	ingredients	Don't have
	menu	Have
System quality	functions designed properly	Need to develop
	functions available	Need to develop
Delivery time	length of time	Normal
	on-time delivery	Almost
Product quality	fresh	ОК

	well-packaged	OK
Variety of food types	variety of food choices	OK
	higher number of food types	OK

It can be seen that the main factors affecting perceived ease of use are usability and language. This is consistent with the results of previous researchers (Chotigo and Kadono, 2021; Papakostas and et. al. 2022). Specifically, the application can be easily understood, simple to operate and use the Chinese system are the main factors that affect the ease of use. These specific influencing factors are also consistent with the findings of previous research scholars (Chotigo and Kadono, 2021; Papakostas and et. al. 2022).

Table 5 User requirements of perceived ease of use

Factors	Quantitative	Qualitative
	Questionnaires	Observation
	(Influence factors)	(Current)
Design quality	font	ОК
	page layout	ОК
Usability	simple understanding	ок
	simple operation	Complicated
Language	Chinese	ок 18
2	second language	Need to develop

# **Conceptual design**

Based on the data collected for customer requirements the researcher has made a new design. In order function, add ingredient information, packaging options and reviews for each food item. In the delivery function, add delivery map. In the after-sales service function, add employees who provide service, multiple service methods and then evaluate the service attitude. In the evaluation function, add the way and object of evaluation. The evaluation can be divided into store evaluation and evaluation of each food item and the evaluation is displayed without the automatic system evaluation, but only the real evaluation.

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Functions	User requirements	Conceptual design
Order function	Ingredients information	Add ingredient information
	variety of packaging options	Add packaging options
	customer reviews for food	Add comments for each food
Delivery function	No delivery map	Add delivery map

 Table 6 Conceptual design of function

After-sales function	provide after-sales service	Keep it
	provide enough staff	Add multiple ways
	attitude of the service	Add attitude evaluation
	provide convenient service	Add multiple ways
Evaluation function	provide evaluation function	Keep it
	provide a variety of ways	Add multiple ways
	provide a variety of objects	Adding comment objects
	display reviews	Show real reviews

In terms of perceived usefulness, the quantitative analysis of the questionnaire shows that user reviews, product information, system quality, delivery time, product quality and variety of food types all have an impact on perceived usefulness. Thus, each sub-item needs to be considered when designing the concept. In the qualitative study, it was observed that some factors currently meet the customer's requirements, while others need improvement. Table 7 presents a combination of qualitative and quantitative analysis of the perceived usefulness design concept. The conceptual design of perceived usefulness requires attention to a number of points. Show real user comments, add ingredient information and packaging options, remove redundant functions and ensure that all functions are working.

Factors	User requirements	Design concepts
User reviews	personal experiences	Show real reviews
	number of reviews	Show real reviews
Product information	ingredients	Add ingredient information
	menu	Add ingredient information
System quality	functions designed properly	Delete redundant functions
	functions available	Ensure functions are working
Delivery time	length of time	Keep it
	on-time delivery	Keep it
Product quality	fresh	Keep it
	well-packaged	Adding packaging options
Variety of food types	variety of food choices	Keep it
	higher number of food types	Keep it

Table 7 Concentual design of persoived usefulness

In terms of perceived ease of use, a quantitative analysis of the questionnaire showed that design quality, usability and language all had an impact on perceived usefulness. Thus, each sub-item needs to be considered when designing the concept. In the qualitative study, it was observed that some factors currently meet customer requirements, while others need improvement. Table 8 shows a combination of qualitative and quantitative analysis of the perceived ease of use design concept. The conceptual design of perceived ease of use requires attention to the following points. Simplify or combine the operation steps to make the software easier to operate and add two more languages, English and Thai. The previous version had a second language but many functions were not translated so it needed to be developed.

Factors	User requirements	Design concepts
Design quality	font	Keep it
	page layout	Keep it
Usability	simple understanding	Keep it
	simple operation	Redesigned functions
Language	Chinese	Keep it
	second language	Add English and Thai

 Table 8 Conceptual design of perceived ease of use

# **New Food Delivery Platform Design**

Based on Conceptual design, the researcher produced a new digital prototype of food delivery platform named Chinese food (Figure2 left1). Language affects perceived ease of use, so the customer is given the choice of language system at the start screen (Figure2 left2). The order function adds ingredient information, reviews of each food and food packaging options according to customer requirements (Figure2 left3). A delivery map has been added to the delivery function, allowing customers to track deliveries (Figure2 right). The digital prototype added multiple communication channels to reduce customer waiting time and to solve the problem of the number of customer service staff (Figure3 left1). The convenience of customer service, customers are invited to make comments after each service (Figure3 left2). The evaluation object and method of evaluation have been added to the evaluation function (Figure3 left3). Reviews are displayed as store reviews and each food review and no automatic system reviews are displayed (Figure3 right).

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Figure 3 New digital prototype service & evaluation interface

12 Jan 2022 at 14:25

Soy beans are delicious! Recommend adding soybean

# Evaluation of the new digital prototype

Done

# - Evaluation of functions

Combining all these requirements, the researcher designed the order functions. During the interviews, 12 participants agreed with the design of the new order function digital prototype and mentioned three main design features as the main reasons for feeling that the order function design was useful. The three features designed were adding ingredient information, providing packaging options and adding customer reviews under each food item.

The researcher made improvements to the delivery function. Briefly, the order tracking function was added to the delivery function so that customers could see the delivery process and the location of the rider. The same unanimous support was received from the 12 participants in delivery function.

Combining all the above requirements, the researcher has improved the after-sales service function. In short, firstly, the after-sales service is provided in the software, then various function keys are designed to access the after-sales service, finally, various service methods are provided in the after-sales service and customers can freely choose. The customer service is evaluated in a timely manner at the end of the service. In the after-sales service function, all 12 participants supported the development of the new digital prototype for after-sales service. In particular, the added communication within the software was the most cited reason for support.

In response to these requests, the researcher added a variety of evaluation methods to the evaluation function and access keys to the evaluation function. In addition, the system's automatic evaluation method was not used for the display. The same support for the design of the functional development was obtained from all participants in the interviews of the evaluation function. Three main reasons were mentioned, which were the addition of ways and objects for reviews, as well as the division of reviews into store reviews and reviews for each food item when displaying them. Also, not to show automatic system reviews.

Functions	Evaluation	Participants	Reasons
Order	Useful	All 12 participants	Food Information
			Package Selection
			Comments for each food
Delivery	Useful	All 12 participants	Delivery map
After-sales	Useful	All 12 participants	Multiple service methods
			Evaluate the service attitude
Evaluation	Useful	All 12 participants	Evaluation way
			Evaluation objects
			Evaluation display

Table 9 Evaluation of the function

# Evaluation of perceived usefulness

In terms of perceived usefulness, the quantitative analysis of the questionnaire shows that user reviews, product information, system quality, delivery time, product quality and variety of food types all have an impact on perceived usefulness. Thus, each sub-item needs to be considered when designing the concept. In the qualitative study, it was observed that some factors currently meet the customer's requirements, while others need improvement. Combination of qualitative and quantitative analysis of the perceived usefulness design concept. The conceptual design of perceived usefulness requires attention to a number of points. Show real user comments, add ingredient information and packaging options, remove redundant functions and ensure that all functions are working. Participants gave a positive assessment of the perceived usefulness of the new digital prototype of the food delivery platform. 12 participants agreed that the new digital model provided a meaningful development of the perceived usefulness of the food delivery platform. During the interviews,

the customers mentioned some of the functions of the new digital prototype that they found useful, which were the following ten factors: food reviews, real reviews, review objects, review methods, ingredient information, functions are well designed, functions can be used, select package, food classification and delivery map (Table 4). Comparing the ten factors with the six influencing factors concluded by the previous researchers, it was found that five factors were consistent and only one delivery map was different from the previous study. This also allowed this research to obtain new findings. In the Thai food delivery platform, for the customer the usefulness in the delivery function is delivery map. The findings of these influencing factors are consistent with previous studies by researchers (Lee, Lee and Jeon,2017; Lee and et. al., 2022; Fariz, 2022).

In the interviews, participants answered mostly similarly. The first major factor was about user reviews. Increasing the number of reviews for each food can help them to get more information about the food. Adding review subjects can help customers to objectively evaluate each food and delivery service in the reviews. At the same time, adding reviews can meet the different preferences of all people as well as presenting the food in a more comprehensive way. Then, the choice of separate stores and reviews for each food item in the review display can help customers save time and get comprehensive information. The second main factor is about ingredient information. Adding ingredient information can help customers identify preferences and allergy issues more quickly. The third major factor was about the quality of information. Participants agreed that the new functions added to the digital prototype were very useful and accessible. The design of all the functions was clear and easy to use and very useful. The fourth factor was related to the quality of the product. All participants agreed that the option of packaging was a very useful design and that customers could choose different packaging in different situations. The fifth factor was related to the variety of food types. The design of the new digital prototype, which categorizes food according to Chinese cuisine, was unanimously supported by the participants. They wanted to eat different food is through the choice of food types can quickly access the food stores, etc., which makes them feel useful. Finally, a new usefulness factor obtained in this interview was the delivery map. Participants felt that the presentation of the delivery map would affect perceived usefulness. In summary, the customers were very satisfied with the design of the usefulness of the new digital prototype. The findings of these influencing factors from the interviews were like the results of the questionnaire. Also, this result is consistent with previous studies by researchers (Lee, Lee and Jeon, 2017; Lee and et. al., 2022; Fariz, 2022).

Table 10	Evaluation	of perce	eived us	sefulness

Useful reasons from the interviewers	Influencing factors from the literature	Comparison
Food Reviews	User reviews	Consistent
Real Reviews		
Review Objects		
Review Methods		

Ingredient Information	Product information	Consistent		
Functions are well designed	System quality	Consistent		
Functions can be used				
Select Package	Product quality	Consistent		
Food Classification	Variety of food types	Consistent		
Delivery Map	Delivery time	Inconsistent		

# - Evaluation of perceived ease of use

In terms of perceived ease of use, a quantitative analysis of the questionnaire showed that design quality, usability and language all had an impact on perceived usefulness. Thus, each sub-item needs to be considered when designing the concept. In the qualitative study, it was observed that some factors currently meet customer requirements, while others need improvement. Combination of qualitative and quantitative analysis of the perceived ease of use design concept, the conceptual design of perceived ease of use requires attention to the following points. Simplify or combine the operation steps to make the software easier to operate and add two more languages, English and Thai. The previous version had a second language but many functions were not translated so it needed to be developed. Participants gave consistent support for the perceived ease of use of the new digital prototype. The participants considered the new digital prototype to be successful in terms of ease of use. During the interviews, the 12 participants also mentioned that some of the factors that made them feel like the new design was easy to use were the variety of languages, the ease of use of the software and the use of appropriate fonts and images for the page layout that made the digital prototype easier to use. After comparing the findings with those of previous researchers on the factors influencing perceived ease of use, the results were found to be consistent. Also, a strong relationship obtained in this research was that all participants agreed that perceived ease of use was related to use experience. If a person had previously used similar software (food delivery platform), then that person would be more likely to operate the related software (new food delivery digital prototype). This is a new finding of the research. This research provides support for this influence factor. These influences are consistent with previous researchers' findings supported by the literature (Alfadda and Mahdi, 2021; Chotigo and Kadono, 2021; Papakostas and et. al., 2022).

The 12 participants in this interview felt that a well layout page would make the software feel easy to use for the customer. Using the right fonts and lots of images in the design makes customers feel easy to use. In addition, the use of multiple languages makes the software easy to understand and customers prefer to operate the software in their native language, so the design in multiple languages can satisfy customers with different language habits. Then, the design of the software is very simple and easy to understand and customers can easily master the operation of the software. In summary, the interviewer was very satisfied with the ease of use design of the new digital prototype.

 Table 11 Evaluation of perceived ease of use

Ease reasons from the	Influencing factors	Comparison		
interviewers	from the literature			
Fonts and pictures	Design quality	Consistent		
Page layout				
Simple to operate	Usability	Consistent		
Easy to understand				
Native language (Chinese)	Language	Consistent		
Second language (English/Thai)				
Use experience		New Funding		

# 7. Conclusion

The research on the Chinese food delivery platform in Thailand was used to review existing research and issues and to propose a new design prototype to solve the gaps. This research found that perceived usefulness is influenced by six factors namely user reviews, product information, system quality, delivery map, product quality and variety of food types. Perceived ease of use is influenced by four factors: design quality, usability, language and user experience. Meanwhile, these influencing factors are supported by the literature of previous researchers (Lee, Lee and Jeon, 2017; Alfadda and Mahdi, 2021; Chotigo and Kadono, 2021; Papakostas and et. al. 2022; Lee and et. al., 2022; Fariz, 2022). The researcher hopes that designers can pay more attention to customer perceived ease of use and perceived usefulness to improve customer acceptance. In terms of perceived ease of use, multiple languages can be added to enhance the ease of use for different customers. It is also possible to combine operation steps to make the system simple and easy to use. Regarding perceived usefulness it is recommended that all food delivery systems add delivery maps as a feature. At the same time, adding information about food to the food introduction screen can improve the perceived usefulness of the customer. It is hoped that this research will provide a theoretical basis for research related to the development of food delivery platforms.

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