

Are there any key factors that encourage food delivery applications use during the COVID-19 pandemic in Thailand and the role of HRM?

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Abstract.

BACKGROUND: Recently, because of the COVID-19 pandemic, customer sentiment has evolved as the new “normal” for food consumption—as it affects customer behavioral change, including the way customers eat. Therefore, understanding customer demands and needs will help food delivery aggregators and retailers produce sustainable, competitive advantage and drive profitability.

OBJECTIVE: This paper aims to investigate the determinant factors of Thai consumers’ intention to use on-demand food delivery applications.

METHODS: Convenient random sampling was used to gather data from 250 participants who have used food delivery applications in Thailand and Amos version 23 to test model validity and the hypotheses.

RESULTS: The results show that satisfaction is critical for the intention to use food delivery applications. Social influence, trust, convenience, and application quality were found to play an essential role in meeting the needs of satisfaction toward the intention to use, and application quality is the most important. However, habit showed a negative relationship, and price value was found to have a nonsignificant impact on satisfaction.

CONCLUSIONS: Food delivery aggregators should ensure the quality of application updates and efficiency and that users have the best quality experience to maintain customer satisfaction. However, customers are also concerned about their health and safety, which has altered their purchasing behavior. Therefore, restaurant players should add a third delivery system that optimize online ordering and delivery.

Keywords: E-commerce, food delivery, habit, convenience, trust, thai consumer, HRM, COVID-19



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1. Introduction

As shopping restrictions such as social distancing and quarantine are now in place because of COVID-19, online shopping offers the benefit of convenience. As customers have embraced social distancing as a way to slow the spread of the pandemic, there has naturally been a drop-off in in-store shopping, and customers have opted to window-shop online instead. As a result, the e-commerce business sector is likely increasingly growing and will continue post-pandemic. It is predicted that the value of the e-commerce market in 2020 could be as high as \$70 billion, or 35% growth from the previous year [1]. While e-commerce sales have soared, orders for delivery service have also increased, especially food delivery. Several aggregators play a role in food delivery service. However, the customers mostly use more massive, better-known aggregators, such as Grab, LINE MAN, GET, and Foodpanda, because of a stronger relationship and credibility. With the ease and simplicity of food delivery applications, customers can order food from a wide variety of establishments with a single tap on mobile devices. Simultaneously, diners have discovered a new opportunity and desire to avoid inconvenience (e.g., traffic jams, scorching weather, and a high PM 2.5 level). Moreover, with the provision of delivery services, such as time saved and convenience to minimize the demand of busy lives, the number of customers adopting delivery services has increased rapidly [2].

At present, customers, particularly busy people, love the food delivery options because they can enjoy fresh and healthy food, even though they are still in the workplace, at home, or under restrictions due to the pandemic (e.g., COVID-19). Previously, food delivery was expected to grow around 10%–20% per year. However, in March and April 2020, during the COVID-19 pandemic, it grew to more than 100%, with orders increasing two to three times [3]. Since food delivery service and application usage behavior are emerging in Thailand, it could affect customer behavioral changes in food consumption. For example, the growth of technology innovation (e.g., application) affected the Japanese information service industry [4].

As a result, this study aims to investigate the determinant factors influencing customer intention to use food delivery applications. This requires establishing an integrated model that investigates the relationship of several antecedents: the unified theory of

acceptance and use of technology 2 (UTAUT2—price value, social influence, habit), the information systems (IS) success model (e.g., information quality, system quality, service quality), and the technology acceptance model (TAM) (e.g., attitude toward using). In addition, this paper includes trust and convenience toward satisfaction, providing an understanding of customer intention to use food delivery applications among Thai customers.

In terms of the food delivery context, most studies have focused on the examined factors influencing customer intention regarding new services. Examples include Online to Offline (O2O) service [5], trust transferred [6], usage transfer behavior [7], and moral obligation [8]. The most recent study on food delivery extended the UTAUT2 model with mobile application features to examine continuous use intention [9]. Therefore, this research will go further by considering and examining the impact and importance of satisfaction aspects on customers' intention to adopt food delivery applications. Besides, satisfaction aspects have still not been fully studied and properly tested against Thailand's food delivery context. Therefore, considering the satisfaction aspect is worth researching and might contribute to the successful implementation of food delivery applications. Although Thailand does not have the largest food delivery market share in Association of Southeast Asian Nations (ASEAN), it is still developing faster than other countries in the region. There are many reasons why Thailand is an attractive destination for e-commerce for food delivery service: the attractive incentive offered by Thailand for businesses, relatively advanced infrastructure, rising disposable income levels, and highly active online users, which are suitable for food delivery service businesses [10, 11]. However, notably, in food delivery, few studies have provided insight into the suitability of the model that has been used in this field, and the model has not been substantively researched. By addressing these gaps, this study provides a more precise understanding of customer intention to use food delivery applications through evaluating food delivery services to comprehend the importance of consumer psychology. Therefore, this study seeks to understand customers' attitudes toward intention to use online food delivery applications, and experienced users were selected to examine the empirical findings expected to contribute managerial implications for marketers and academia.

In summary, the research questions of interest to this exploratory paper are as follows:

1. What factors influence customers' attitudes in terms of satisfaction regarding Thai customers' intention to use food delivery applications during the COVID-19 pandemic?
2. How do these perceptions affect Thai customers' intention to use food delivery applications?
3. What strategies should be implemented to improve Thai customers' adoption intentions and restaurant operators' solutions?

The rest of this paper is organized as follows: the literature review in section 2, which provides a summary of food delivery service, UTAUT2, the IS success model, and vital relational factors; the methodology and research model in section 3; the most relevant finding and result in section 4; the discussion, which provides the theoretical and practical implications, and managerial contributions in section 5; and finally, the conclusion, which provides the research limitations and future research directions in section 6.

2. Literature review

2.1. Food delivery service

Until recently, people were ordering the food needed for collection in person, even in major cities. Now, new technology has made delivery more convenient for consumers and broadened the range of food available for delivery. At present, the service and industry sectors in Thailand must adjust to support the changing of technology, or what is known as "digital disruption," which not only causes a change in business methods and production processes but also affects the economy and society of the country through consumer behavioral changes. An example of technology that plays a role in the restaurant business is a food delivery application.

The survey of Kasikorn Research Center [12], found that 63% of the respondents thought that having a food delivery application makes it easier to switch to ordering food and that 88% of the respondents ordered food through the application because of promotions and discounts. The expansion of food delivery and food delivery applications creates the opportunity to generate revenue for those who work in a restaurant chain, which is expected to produce

revenue sharing of around \$0.8 billion [12]. Food delivery applications had a revenue share of roughly \$106 million from the total value of the food delivery business in 2019 (between \$1 billion and \$1.1 billion), growing by 14% from the previous year and accounting for 8% of the total value of the food business in Thailand in 2019 [12].

The Electronic Transactions Development Agency conducted a food delivery survey and found that 85% of respondents ordered food online, with 51.09% of them being Gen Y. Also, 89% of respondents chose to order the food through the food delivery application, and 61.06% ordered fast food. Gen X spent the most, around \$15–\$32. Furthermore, the Electronic Transactions Development Agency reported that concern over the situation of the COVID-19 pandemic is one of the critical factors that affect the behavior of consumers in deciding to order food online. The most concerned about the spread of COVID-19 is Gen Y at 40.2%—followed by Gen Z at 30.0%, baby boomers at 28.6%, and Gen X at 26.9%, with a total average of 33.96% [13]. The baby boomer segment was born between 1944 and 1964, Gen X was born between 1965 and 1980, Gen Y was born between 1981 and 1996, and Gen Z was born between 1995 and 2015.

While most restaurants have been turned upside down by the disruptions caused by the Thai government's reaction to the COVID-19 pandemic, all restaurants have discontinued sit-in dining and now offer takeout through a delivery service. Therefore, the delivery services provide a valuable service by getting food to customers stranded at home while applying social distancing for the safety of their drivers and hungry customers. Food delivery services are among the few local businesses that will survive and thrive during Thailand's outbreak. The restaurant business has experienced a particularly strong impact of the COVID-19 pandemic. Many restaurants have adopted food delivery to continue doing business. After relying on food delivery and home-cooked meals during the lockdown, diners are now gradually adapting to the "new normal." At the same time, they remain alert and care for their activities (e.g., eating). The new normal has created a great opportunity for food delivery aggregators because customers are concerned about their health and avoid crowded areas such as shopping malls, restaurants, and cafés. Although these places prepare protection, customers still cannot enjoy the experience as before, so they use a delivery service as their solution. The major food delivery aggregators (such as Grab, LINE MAN, GET, and Foodpanda) served customers with

Table 1
Third-party aggregators and their highlights

Aggregators	Highlight
Grab	Direct contact with the driver
	Calculations estimating waiting time, exact food price, and delivery charge before ordering
	The delivery driver calls every step of the way
LINE MAN	The service always offers promos for discounts More choices at night compared to other competitors
Foodpanda	Step-by-step notification and it is easy to use. Food can be preordered and delivered for free to nearby restaurants.
GET	Free delivery vouchers for new users. The service can make more than one order and send them to different addresses.

rapid response, offering maximum convenience and transparency with orders (see Table 1). These food delivery aggregators not only enable users to quickly browse menus, prices, and reviews but also allow them to track the progress of their food deliveries in real time. Moreover, online delivery platforms benefit users by enabling them to conveniently explore many local restaurants' food choices they may not have known existed.

Besides offering local cuisines and street food, restaurants have an excellent opportunity and advantage afforded by aggregators to attract customers through technology. Restaurants can avoid paying a rental fee because they do not need to provide ample space for customers, so this is a competitive point that may save cost and provide a cheaper food cost for the customer. Still, they must face the service and commission fee from food delivery aggregators [8], so restaurant players should focus on balancing costs and customer needs.

2.2. Role of human resource management in food delivery service

Through examining restaurants or cafés and food-related businesses, it might seem like the place for human resource management (HRM) is gradually dwindling. On the contrary, online food businesses need more HR roles than ever. As the online food service and applications continue to boom and expand, particularly during the COVID-19 pandemic, HRM's role also increases. Although the online food service might be functioning mainly online, employees are

still the backbone of the businesses; thus, HR tools are needed. One of the common traits of a successful food delivery service is courteous and reliable staff that work tirelessly to deliver top-notch service to customers. However, with severe competition in the food delivery service sector, hiring the right team and creating the correct HR structure remains one of the biggest challenges. HRM is an integral part of business administration and encompasses important personnel activities to ensure the effective contribution of human capital to the creation and achievement of business strategies [14]. Furthermore, effective HRM is also considered a crucial element of service quality and customer satisfaction [15]. HRM is particularly critical for service businesses that result in a relationship between employee experiences of the organization and customer service experiences [16]. Organizations need to find ways to manage the employment relationship to motivate their employees to provide the support and interaction customers expect. There is a need to align their business strategies and their HRM strategies to pursue long-term competitive advantage [17]. Parry and Tyson [18] revealed that HRM could improve efficiency, service delivery, and market visibility; create a wider customer base; empower managers; and transform HR into a more strategic function. Hence, if companies do not give due emphasis to HR strategies, investment in technologies such as applications or online services may not provide the sought competitive advantage. For service industries whose products involve personal interaction, strategies to achieve competitive advantage inevitably involve employee management.

An emerging sustainable HRM approach might be effective for a firm that adopts a long-term perspective to improve employees' quality of life to achieve a social sustainability outcome [19]. Moreover, the firm should be aware of creating conditions that facilitate the balance of sustainability behaviors between work and life at home [20]. The sustainable HR approach to performance management as part of the bundle of HRM practices will balance organizational financial goals and provide positive human and social outcomes to gain a competitive advantage. This suggests that sustainable HRM must be carefully tailored to each firm's situation. Therefore, to obtain greater strength, the sustainable HRM system should enhance the clarity of interpretation of HR practices among employees. Also, business leaders must recognize HR's strategic role in delivering value to the organization [21].

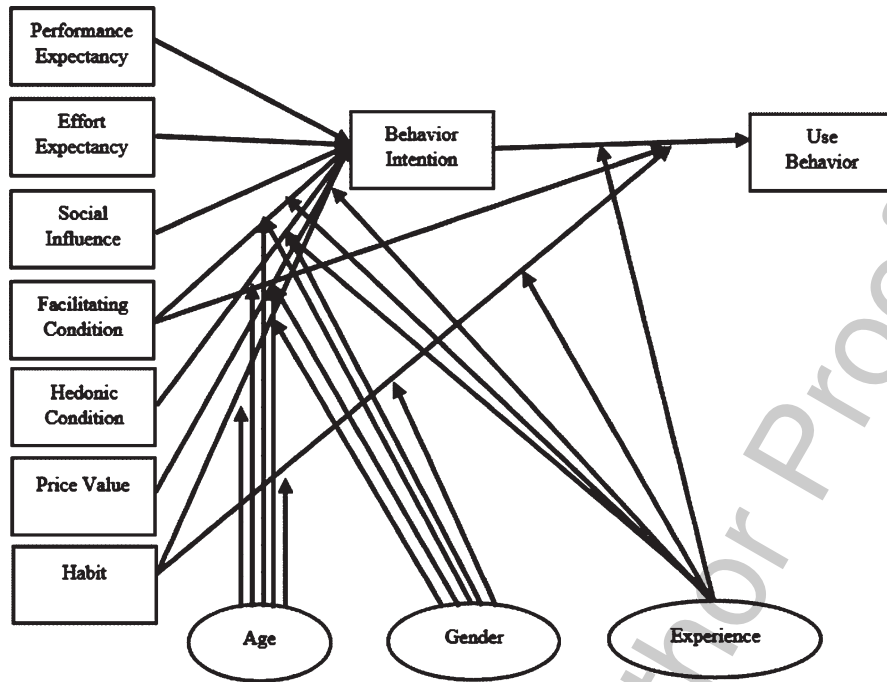


Fig. 1. The unified theory of acceptance and use of technology 2 model.

335 For companies to survive and be successful in
 336 the rapidly changing business world, it is necessary
 337 to understand and accept its challenges and
 338 adapt business activities to the requirements raised
 339 by its characteristics and trends. Identifying risks connected
 340 to HR is the first step of such a strategy [22].
 341 One of the biggest challenges for HR managers is how
 342 to engage employees effectively during the COVID-
 343 19 pandemic. Ahmed et al. [23] found that knowledge
 344 sharing could be a possible way to engage employees
 345 during the pandemic. Therefore, to maintain the organization's
 346 high performance, employee engagement and knowledge
 347 sharing could be the best solution to meet the current HR
 348 challenges.

349 *2.3. UTAUT2 (price value, habit, and social influence)*
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351 The UTAUT model was developed by Venkatesh
 352 et al. (2003) and is widely used by many researchers
 353 in many fields. It has been useful to explain
 354 about 70% of the variance in behavioral intention
 355 and 50% of the variance in technology use [24].
 356 The UTAUT model has four fundamental
 357 constructs—performance expectancy, effort expectancy,
 358 social influence, and facilitating conditions—that
 359 influence behavioral intention to use technology.

The UTAUT model was initially designed to explain
 employee technology acceptance and use but not provide
 context to the consumer. Therefore, Venkatesh
 et al. [25] proposed a new comprehensive UTAUT
 model called UTAUT2 to improve analytical ability
 by paying particular attention to customer use
 through incorporating the original model with three
 key constructs: hedonic motivation, price value, and
 habit (see Fig. 1). Performance expectancy is a
 concept in line with perceived usefulness. Effort
 expectancy is also in line with perceived ease of use
 in TAM, but both expectancies are replaced by
 convenience to provide a more comprehensive model.
 Some studies have found that effort expectancy is not
 significant with regard to the intention to use
 technology because of the ubiquity of smartphones
 and the similarity of common features that put the
 customer at ease in using new applications [26–28].
 Lee et al. [26] found that facilitating conditions
 and hedonic motivation are not key factors that
 encourage customers to use delivery applications.
 This may be explained by time usage, which is
 quite short when customers use delivery applications
 to order food, so customers still do not enjoy fun
 and enjoyment from using delivery applications.

Price is important for the adoption of new
 technology. Online shopping can offer a lower
 price to

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customers because of the lower operating cost of an online business. The monetary benefit from online shopping can be derived from a lower price, promotions and discounts, and a loyalty point system. We followed the idea of Dodds et al. [29] and define price value as a customer's cognitive trade-off between the perceived benefit of a food delivery application and the monetary cost of using it. The price value is positive when the customer is satisfied that the delivery application's use is greater than the monetary cost.

Following the idea of Venkatesh et al. [24], we define social influence as the degree to which individuals perceive that important others believe they should use a food delivery application. Social influence as a direct determinant of behavioral intention is represented as the subjective norm in Theory of Reasoned Action (TRA), Technology Acceptance Model 2 (TAM2), Theory of Planned Behavior/Decomposed Theory of Planned Behavior (TPB/DTPB), Combined TAM-TPB (C-TAM-TPB), social factors in Model of PC Utilization (MPCU), and image in Innovation Diffusion Theory (IDT) [24]. The new user who never uses the food delivery application will show the intention to check and gather information on a service or product before deciding by asking, questioning, or searching to increase their perception and understanding. As a person in society, a user is very likely surrounded by friends, family, and colleagues and susceptible to their suggestions. When friends, family, and colleagues of a user start to use a particular food delivery application, the user will be influenced, and the user will adopt it more quickly. As food delivery applications are widely used in society, users strongly consider the opinion of the people they trust since users regard a significant person's attitude as one of the decision criteria. Likewise, personal satisfaction is given the most priority. Customer satisfaction is often influenced by the quality of the interpersonal interaction between the user and the contact person [27]. In the early stage of adopting the new technology (i.e., a new application), if customers are satisfied with using it for the first time, they will show the intention to use it more often.

Habit is defined as an individual who automatically performs behaviors because of experience using a food delivery application [25]. The empirical findings of Venkatesh et al. [25] about the role of habit in technology use delineate different underlying processes by which habit influences technology use. Habit represents the involuntary behavior to use technology for any activity. Habitual users of food delivery will tend to browse online for food and order it as part

of their natural response. As Khalifa and Liu [30] suggested, if customers have the same level of satisfaction with an online store, a customer with high levels of habit will be more likely to repurchase from the same online store than those without such a habit. Such automaticity allows habitual behaviors to be performed easily and quickly [31]. Prior research has reported that habit is a major driver of affect [32]. Affect is defined as "feelings of joy, pleasure, depression, displeasure, or hate associated by an individual with a particular act" [33], an emotional response to the thought of the behavior [32]. Satisfaction is also an effect [30]. HT directly affects satisfaction [32]. Therefore, a customer is likely to be more satisfied with food delivery via an application if they have acquired the habit of application use. We, therefore, offer the following hypotheses:

H1: Price value (PV) positively affects customer satisfaction toward the use of food delivery applications.

H2: Social influence (SI) positively affects customer satisfaction toward the use of food delivery applications.

H3: Habit (HT) positively affects customer satisfaction toward the use of food delivery applications.

2.3.1. Convenience

As the definition of convenience is not easy to explain, many prior studies have focused on convenience in the time element. Brown and McEnally [34] suggested that it is important to consider convenience at all stages in the process of food consumption and determine the proportionate importance that consumers attach to the time and energy used in the acquisition, consumption, and disposal. Darian and Cohen [35] added the new elements of consumer decision-making, preparation, and clearing up to the three scales mentioned above. Therefore, this study conceptualizes convenience as the degree to which a consumer is inclined to save time—considering place, acquisition, use, and execution—during the use of a food delivery application [7]. The importance of convenience in online marketing in the food industry is increasing, especially in an emergency crisis (i.e., COVID-19) in which the influence of convenience should be emphasized. The study of Jiang et al. [36] stated that convenience is one of the principal motivations for users to adopt electronic technology because customers must be convinced of their value

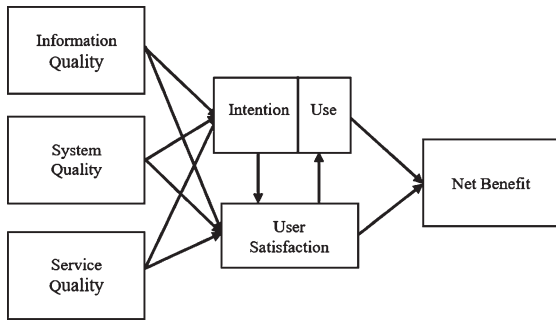


Fig. 2. The information systems success model.

before they are willing to use new technology. The convenience of the internet has an impact on customers who are willing to purchase a product. It is possible to place an order anytime and anywhere, and this channel meets the customer's desire to save time and effort [36]. Moreover, online shopping convenience is one of the essential keys to creating a pleasant shopping experience. Many prior studies have reported that a greater convenience orientation positively affects the usage of convenience food [37], ready meals, and takeout [38]. In the online shopping experience, we found that convenience constructs directly affect satisfaction. Prior studies involving a convenience context have reported that the overall measure of convenience influences satisfaction [39, 40]. We, therefore, offer the following hypothesis:

H4: Convenience (C) positively affects customer satisfaction toward the use of food delivery applications.

2.3.2. Application quality

The IS success model was developed by DeLone and McLean in 1992 [41]. Many prior studies have attempted to redefine or extend the original IS success model from a different perspective to provide a more comprehensive model. Some researchers found the weakness of the original IS success model [42]. Therefore, DeLone and McLean responded and redeveloped the IS success model in 2003 [43]. The updated model consists of six factors: system quality, information quality, service quality, intention to use, user satisfaction, and net benefit, as shown in Fig. 2. The results demonstrated that three characteristics of quality used to evaluate the system affected the intention to use and satisfaction negatively or positively, depending on the net benefit provided. The original IS success model [41] was

used by many researchers to evaluate the success of various types of IS—for example, e-commerce [44], the web portal [45], O2O service [7], and mobile catering applications [46]. This study proposes application quality, which combines three main factors of the IS success model: system quality, information quality, and service quality. We define application quality as a multidimensional interface stimulating positive or negative user responses resulting from the interaction between users and an application [47]. Pantano and Priporas's [48] study found that to encourage customers to adopt mobile commerce, the following features are required: reasonable price, shopping efficiency, transaction security, and service quality. Furthermore, Chi [47] reported that the perceived quality measure is consistent with information quality, service quality, and system quality and that perceived quality positively affects customer satisfaction. The quality of a food delivery application—which is related to visual merchandising, information, the transaction process, and service response—influences customer pleasure and arousal to support quality customer experiences and purchasing decisions. We, therefore, offer the following hypothesis:

H5: Application quality (AQ) positively affects customer satisfaction toward the use of food delivery applications.

2.3.3. Trust

Another critical point in getting consumers to use new technology (e.g., an application) is to build trust. Trust is widely used and has been described in various fields, such as management [49], marketing [50], IS [51, 52], social media [53], and e-commerce [54]. We describe trust as a belief that a food delivery application from which a customer obtains service performs its business with a customer in a responsible, dependable, and competent manner, as well as behaves in a way that is not harmful to its customer and considers customers' best interests [55]. In the e-commerce context, trust is seen as being of considerable importance in the process of building and maintaining customer relationships. In offline commerce, face-to-face interaction or interpersonal communication can create trust. However, mainly as a new online business, it is challenging to build trust with consumers. Therefore, a new business player should provide adequate information—such as company info, policies, and customer service and support, which are necessary to establish customer trust—to

customers. Also, the information must be accessible, and effort should be made to avoid confusing customers. Conversely, a well-known business can quickly create consumer confidence, which is particularly useful when companies launch new services because consumers already have confidence in the efficiency and reputation of these companies. A successful relationship with customers, particularly in the online context, requires businesses to describe their information collection process, dissemination practices, and policies. In turn, customers must trust the company's policies before providing personal information in order to enable businesses to advance customer relationships [56]. Therefore, trust is considered to be an essential factor in developing online relationships with customers; the online seller should establish a high level of trust to encourage customer confidence and reliability to engage their intention to use [57]. The benefit of an offline business is that it is more reliable than an online business because of face-to-face interaction. Therefore, if online businesses that provide services using an application that uses intermediaries to deliver goods and services through individuals (such as food delivery) allow consumers to choose the person who provides the service, it will help the business create more credibility and satisfaction. Trust and satisfaction are two key ingredients for long-term business relationships with customers, and trust directly influences satisfaction [58]. The relationship between trust and satisfaction is supported by prior studies—which have confirmed that trust and satisfaction have positive relations [59], with trust being the most significant determinant of customer satisfaction [60]. We, therefore, offer the following hypothesis:

H6: Trust (T) positively affects customer satisfaction toward the use of food delivery applications.

2.3.4. Satisfaction

TAM was proposed by Davis [61]. TAM explains technology adoption with only two factors—perceived usefulness and perceived ease of use—and incorporates them with attitude toward technology adoption (see Fig. 3), but in the end, the factors omit the attitude because of a low mediating effect on technology adoption. The attitude expressed by an individual's positive or negative feelings evaluates technology use [62]. The attitude has both positive and negative expressions, but if consumers have a negative mind-set to use from the beginning, it may cause them to avoid using such technology.

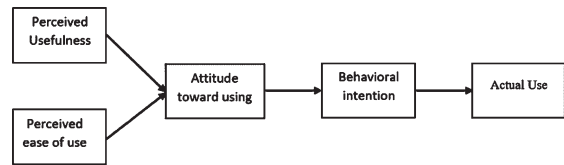


Fig. 3. The technology acceptance model.

Therefore, we propose satisfaction, which shows a positive expression. As an effect of intrinsic motivation, a service provider's user-friendliness may increase satisfaction with the use of its food delivery application. Customers tend to be satisfied with the use of technology if they perceive it meets their expectations. We define satisfaction as customer judgment that the food delivery application's product or service provides a pleasurable level of consumption-related fulfillment [63]. The satisfied customers can create a viral effect using technology, especially new technology, if they recommend or share their impressions with others [64]. High customer satisfaction should reduce the operating cost of a company in the future because the company does not need to spend more on acquiring customers [65]. Satisfaction plays a significant role in building and maintaining customer relationships and other vital assets [66]. Tsai et al. [67] demonstrated that satisfied customers are more likely to continue with their intention with a particular organization than dissatisfied customers. Previous empirical studies have supported satisfaction as a positive influence on future intention [68], a key influence on forming a customer's future intention [69]. To achieve a company's ultimate goal, the company should devote sincere attention to satisfied customers to increase its competitive advantage. This point is even more critical in e-commerce because the customer does not directly deal with the seller and cannot judge the seller trustworthy [70]. Anderson and Srinivasan [71] reported that customers willing to repurchase from e-retailers believe in assuring an ongoing satisfaction level. We, therefore, offer the following hypothesis:

H7: Satisfaction (SAT) positively affects customer intention to use food delivery applications.

3. Methodology

Figure 4 illustrates an overview of the research methodology. For the theoretical assessment, the first step was to conceptualize the constructs of interest, including defining each construct and identifying its

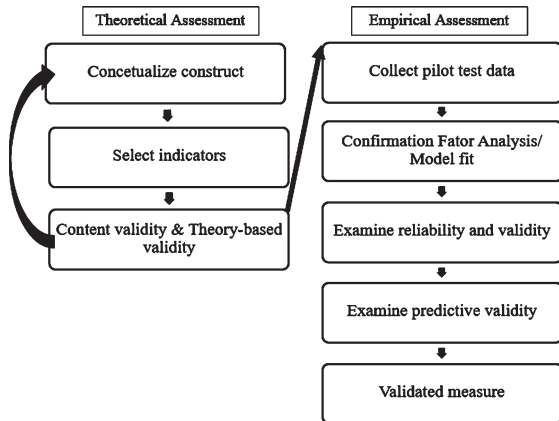


Fig. 4. Our proposed assessment, including theoretical and empirical approaches [72].

constituent domains. Next, items or indicators for each construct were selected based on the literature reviews of these constructs. Each of the selected items was re-examined by content and for theory-based validity. If an adequate set of items was not achieved at this stage, new items had to be created based on the intended construct’s conceptual definition. For the empirical assessment, a research instrument was created, comprising all the delicate construct items, and administered to representative respondents from the target population. Next, the steps mentioned in section 3.2 to section 4.2 were carried out to assess validity and reliability and assure that our operationalized measures were adequate and accurate.

3.1. Structural model

This study aims to examine the key factors that facilitate customers’ experiences in terms of satisfaction with the intention to use food delivery applications. The UTAUT2 model was considered theoretically and practically useful to utilize as the theoretical basis in this research. To make it fit food delivery applications, some modifications were necessary. Therefore, this study is designed based on the main indicators of UTAUT2 (social influence, price value, and habit), combined with quality constructs from the IS success model and three variables (convenience, trust, and satisfaction) explicitly proposed to be important in the food delivery application context. The modifications of the model are presented below.

First, performance expectancy, effort expectancy, hedonic motivation, and facilitating conditions were excluded from the model, although they have been

proven in prior studies to be significant [25]. Considering an example of dining activity, performance expectancy is not required. Likewise, given the overlap between performance expectancy and perceived usefulness, it has been found that the impact of performance expectancy toward intention might be uncertain, as findings for the impact of performance expectancy on adoption have been mixed [9, 73, 74]. Since mobile applications are omnipresent nowadays and due to the intuitive use of food delivery applications, effort expectancy does not exist. Previous studies have also proved the nonsignificance of effort expectancy [9, 27]. As consumers use food delivery applications as a beneficial service rather than to have fun or entertain, hedonic motivation was also not considered in the model. Also, prior studies have failed to prove the role of hedonic motivation [75, 76]. Experienced users are not concerned about facilitating conditions because they have gained experience and know how to use food delivery applications. Also, no huge effort is needed to use these applications as a navigator to guide the user. Moreover, these applications are designed to fully support users. Recent studies also support the nonsignificant impact of facilitating conditions [27, 73].

Second, application quality and consumer satisfaction levels were included in the research model because perceived quality and satisfaction are at the core of motivating consumers to adopt food delivery applications. Previous research suggests that consumer perceptions of quality determine technology acceptance [46, 47]. The importance of customer satisfaction does not discriminate, as it can make or break a business’s success. The more satisfied users are, the more likely they are to spend more and recommend a food delivery application to friends and family members. The studies of Alalwan [9] and Wang et al. [46] prove that satisfaction facilitates and increases customer intention.

Third, with the advent of food delivery services, the standards of convenience have risen even further. To succeed, restaurant operators will have to continuously up the standard and make it more convenient for consumers to get fresh food delivered to their doorsteps. More importantly, there is a consensus in the literature on food delivery services that convenience plays an important role [8]. Trust is another critical factor in consumers’ online purchasing decisions. The lack of trust is a fundamental reason why consumers do not purchase a product from a site. Many prior studies on mobile commerce have noted that the greater consumers’ trust, the more likely they

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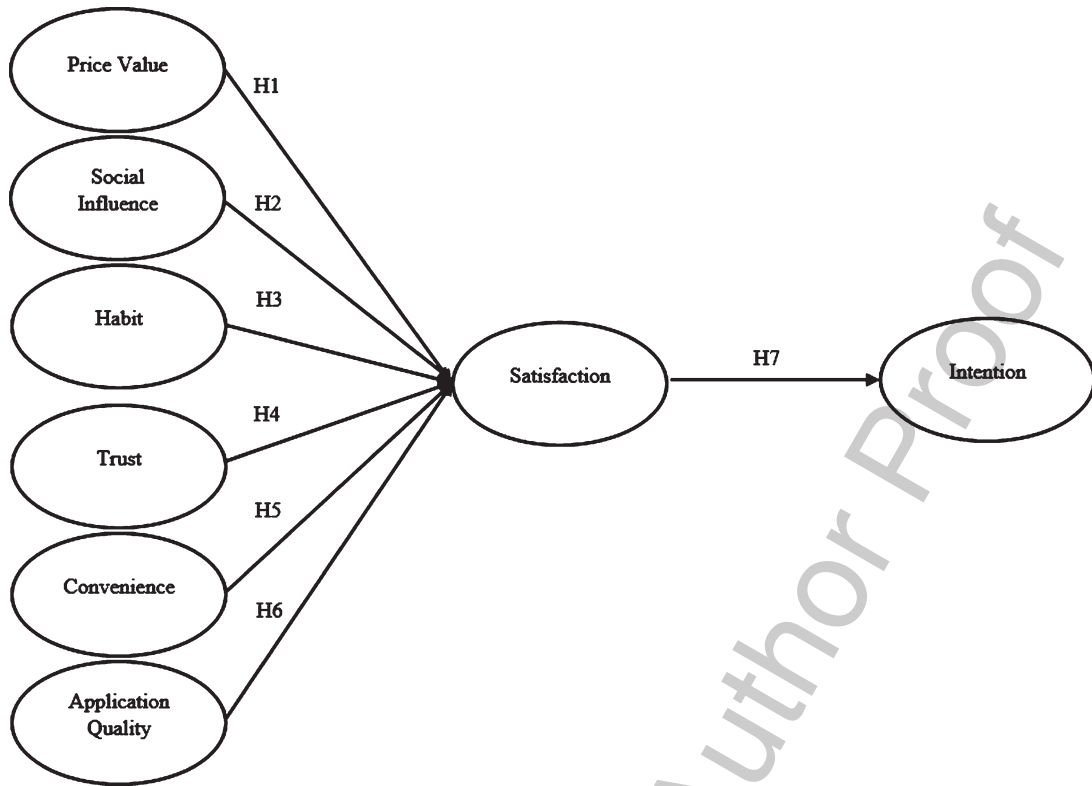


Fig. 5. The research model.

are to engage their intention [74, 77]. The conceptual model, including the proposed path hypothesis, is shown in Fig. 5.

3.2. Measurement model

This empirical research is based on a nonprobabilistic sampling method. The scale items used to measure the construct were selected after an intensive and careful review of relevant literature. We chose questionnaires that were developed based on an energetic body, a well-documented scale, and a match with the current research context. The items of price value were adapted from Venkatesh et al. [25], convenience was borrowed from Liu et al. [78], application quality was proposed by Mutaz et al. [45], and subsequent conceptualization of information quality by Lee et al. [26]. Trust was developed from Xiao et al. [6]; social influence, habit, and intention to use were derived by Lee et al. [26]; and satisfaction was based on the instruments proposed by Ashfaq et al. [79]. Specifically, the data set was collected in Thailand. The questionnaire was first translated into Thai by the authors, and it was tested as a pilot study among 20

respondents who had experienced using food delivery. Based on their feedback, we revised some items to improve clarity and comprehensibility. Then the authors translated them back into English to ensure consistency. Moreover, Cronbach's alpha was used to check the reliability, and a pilot study revealed that all the constructs captured more than 0.7, which proves that all the constructs are reliable [80]. The final scales and items are presented in Appendix 1.

3.3. Sampling and data collection

Recently, there was a boom in the delivery service business. This was due to various factors that allowed for rapid expansion, whether it is the rapid growth of the e-commerce market, B2C online customer behavior, or technology trends that makes applications smarter and better respond to user needs. The food industry was also affected by these reasons. The delivery service business started to provide more food deliveries to match consumer demands. The food delivery service is growing faster than expected. In addition to delivery, the platform can do much more, creating a situation that benefits all parties. The

793 delivery service providers' new strategy has offered
 794 aggressive service tightly related to the customer's
 795 lifestyle to engage users continuously. At present,
 796 many factors (e.g., COVID-19) may have caused the
 797 "new normal" in customer consumption and cus-
 798 tomer behavior. Among these changes, this study
 799 focuses on how food delivery leads to satisfaction
 800 toward the intention to use food delivery applica-
 801 tions. The target respondents are smartphone users
 802 who have used a food delivery application. Hence,
 803 this study seeks to understand customer attitude and
 804 examines the extent to which satisfaction with food
 805 delivery applications affects customer intention to
 806 use these applications. We developed exploratory and
 807 confirmatory research with a quantitative approach.
 808 The survey instrument to test the hypothesis and
 809 propose the research model was developed from
 810 prior studies. The relevant measures and scales were
 811 adapted and slightly modified from studies to prove
 812 the research questions' consistency and validity. The
 813 modification was made to fit the specific context of
 814 food delivery applications. Each item was evaluated
 815 using a five-point Likert scale, from strongly dis-
 816 agree = 1 to strongly agree = 5. This research model
 817 contains eight constructs; each construct was mea-
 818 sured with multiple items.

819 Data collection took place from April 1–30, 2020,
 820 via an online survey administered by Google Forms.
 821 Invitation links for the survey were sent to 304
 822 prospective respondents who wanted to participate.
 823 Fifty-four respondents were deleted because they
 824 returned incomplete surveys. Therefore, surveys from
 825 250 eligible respondents were collected. Tables 2 and
 826 3 summarize the demographic and behavioral char-
 827 acteristics of the participants. It was found that the
 828 sample had an almost equal number of males and
 829 females. Most of the participants (32.0%) were 31–35
 830 years old. Regarding education level, the majority
 831 (60.0%) had bachelor's degrees; personal monthly
 832 income data showed 48.8% were earning between
 833 \$500 and \$1,000; and 43.2% were office workers. In
 834 terms of their usage behavior, most of the respon-
 835 dents (54.8%) use Grab delivery service; 43.6% use
 836 it two to three times per week, and 39.6% reported an
 837 average spending of \$3.05–\$3.10 per time.

838 **4. Data analysis and results**

839 This study used confirmatory factor analysis (CFA)
 840 based on Amos version 23 software to access the fac-
 841 tor structure and validate the scale of the model. The

Table 2
 Descriptive statistic of samples

Demographic Variable	Item	Frequency	Percentage (%)
Gender	Male	127	50.8
	Female	123	49.2
Age	Below 25 years	33	13.2
	25–30 years	56	22.4
	31–35 years	80	32.0
	36–40 years	58	23.2
	Above 40 years	23	09.2
Education	High School	23	09.2
	Vocational	35	14.0
	Bachelor's degree	150	60.0
	Master's degree	42	16.8
Income	Below \$500	50	20.0
	\$500–1,000	122	48.8
	\$1,001–1,460	68	27.2
	\$1,461–2,435	9	03.6
	Above \$2,435	1	00.4
Occupation	Unemployed	7	02.8
	Self-employed	55	22.0
	Office worker	108	43.2
	Government officer	45	18.0
	Student	31	12.4
	Retired	4	01.6

Table 3
 Characteristic statistic of samples

Characteristic variable	Item	Frequency	Percentage (%)
The food delivery service providers	Grab	137	54.8
	GET	22	08.8
	Line Man	32	12.8
	Lalamove	25	10.0
	FoodPanda	14	05.6
Usage frequency for 1 week	Others	20	08.0
	1 time	71	28.4
	2–3 times	109	43.6
	4–6 times	57	22.8
	7 times	10	04.0
Average spending per times	Above 7 times	3	01.2
	Below \$3.5	39	15.6
	\$3.5–10	99	39.6
	\$10.1–16	77	30.8
	Above \$16	35	14.0

Table 4
Result of measurement model

Fit indices	Cut-off point	Initial measurement model	Modified measurement model
χ^2/df	<3	1.797	1.377
GFI	>0.90	0.854	0.908
RMSEA	<0.08	0.057	0.039
RMSR	<0.05	0.019	0.015
SRMR	<0.08	0.033	0.027
NFI	>0.80	0.917	0.943
CFI	>0.90	0.961	0.984
TLI	>0.90	0.954	0.980

congeneric model was examined for model fit, reliability, convergent validity, and discriminant validity. Following Hair et al.'s (2010) recommendation, certain indices should be considered: the goodness-of-fit index (GFI), normed fit index (NFI), root mean square error of approximation (RMSEA), root mean square residuals, standardized root mean residual, comparative fit index (CFI), and Tucker–Lewis index. The primary model consisted of 8 constructs with 27 indicators: price value (PV)=3 indicators, social influence (S)=3 indicators, habit (H)=3 indicators, convenience (C)=3 indicators, application quality (AQ)=6 indicators, satisfaction (Sa)=3 indicators, and intention (I)=3 indicators. The results of the initial CFA revealed a lack of fit ($\chi^2/df=1.797$; GFI=0.854; RMSEA=0.057; root mean square residuals=0.019; standardized root mean residual=0.037; NFI=0.917; CFI=0.961; Tucker–Lewis index=0.954). To improve the model fit, some items were removed on the basis of modification indices, factor loading, and standardized residuals [81].

4.1. Measurement model results: Confirmatory factor analysis model fitness was tested initially in the CFA, followed by evaluating the reliability and validity constructs

To achieve an acceptable model fit and confirm that this model is appropriate to predict adoption of the food delivery application, it was necessary to eliminate 3 of the original 27 indicators. The indices' results, along with their recommended values of model fit, are shown in Table 4. We conclude that the goodness-of-fit indices met the recommended levels, suggesting that the research model provides a good fit for the data [81].

To validate the survey instrument, we examined the convergent and discriminant validity. Convergent validity is evaluated by measuring the standardized path loadings, composite reliability (CR), and average variance extracted to prove reliability and validity. Table 5 indicates all reflective item constructs. The item loadings reported ranged from 0.760 to 0.912, and according to Hair et al. (2010), factor loading estimates should be higher than 0.5 and ideally 0.7 or higher. In the present study, the value of CR reported ranged from 0.835 to 0.928; CR is usually satisfied by a recommended value of 0.7 (for an exploratory study, 0.6 could be accepted [81]). The value of average variance extracted reported ranged from 0.684 to 0.812; the recommended value of AVE should exceed 0.5 [82]. This finding indicates that the items meet the requirement of convergent validity, and all indicators are closely related to the given constructs. Discriminant validity is valid when the square root of each construct's AVE is larger than its correlations with other constructs [83], as shown in Table 6. The results show that discriminant validity is satisfactory for all constructs, implying that the model meets the criteria to support discriminant validity.

4.2. Structural model results: Path coefficient analysis

The relationships between and among factors in terms of the combination of direct and indirect effects are referred to as the total effects. Table 7 shows the overall total effect of each prediction factor on each endogenous factor. For example, the standardized total effect of application quality on intention is 0.473, which means that when application quality goes up by 1 standard deviation, the intention will go up by 0.473 standard deviations. Conversely, the total effect on intention from habit is -0.146 , which means that an increase of habit of 1 standard deviation would predict a change in intention by -0.146 standard deviation.

To analyze the structural model, as shown in Fig. 5, the model, path coefficients, and R^2 for the endogenous construct were tested. The χ^2/df for the structural model was 1.613 and by chi-square was 371.20 with Degree of Freedom (DF) being 230 ($p=0.000$). The GFI=0.892, adjusted GFI=0.859, NFI=0.931, CFI=0.972, and RMSEA=0.050. These fit measures are comparable to those obtained with the CFA and show a good fit measure. The path coefficients are found at both significant and nonsignificant paths, the significant paths found at the $p=0.001$, $p=0.05$,

Table 5
Construct reliability and validity

Construct		Standardized Loading	Composite Reliability (CR)	Average Variance Extracted (AVE)	R ²
Price Value (PV)	PV1	0.839	0.890	0.730	
	PV2	0.852			
	PV3	0.872			
Social Influence (SI)	S1	0.891	0.890	0.730	
	S2	0.905			
	S3	0.760			
Habit (HT)	H1	0.828	0.867	0.684	
	H2	0.823			
	H3	0.831			
Trust (T)	T1	0.818	0.835	0.629	
	T2	0.763			
	T3	0.797			
Convenience (C)	C1	0.831	0.885	0.720	
	C2	0.871			
	C3	0.843			
Application Quality (AQ)	AQ1	0.844	0.910	0.772	
	AQ5	0.906			
	AQ6	0.885			
Satisfaction (SAT)	Sa1	0.912	0.928	0.812	0.770
	Sa2	0.902			
	Sa3	0.889			
Intention (I)	I1	0.846	0.916	0.785	0.710
	I2	0.902			
	I3	0.908			

Table 6
The discriminant validity of the measurement model

Variable	Price value	Social influence	Habit	Trust	Convenience	Application quality	Satisfaction	Intention
Price value	0.854							
Social influence	0.836	0.854						
Habit	0.754	0.764	0.827					
Trust	0.643	0.707	0.771	0.793				
Convenience	0.639	0.675	0.756	0.728	0.848			
Application quality	0.719	0.765	0.779	0.750	0.707	0.879		
Satisfaction	0.653	0.714	0.670	0.715	0.677	0.823	0.901	
Intention	0.718	0.769	0.692	0.767	0.728	0.791	0.798	0.886

The bold number in the diagonal row represents the value of the square root of the average variance extracted (AVE) value for each latent construct, while the value below represents squared inter-construct correlations.

925 and $p=0.1$ levels, with price value to satisfaction
 926 path at $p=0.638$, the social influence to satisfaction
 927 path at $p=0.096$, the habit to satisfaction path at
 928 $p=0.092$, the trust to satisfaction path at $p=0.024$,
 929 the convenience to satisfaction path at $p=0.036$, the
 930 application quality to satisfaction path at $p=0.000$,

and the satisfaction to intention path at $p=0.000$. The
 price value to satisfaction path coefficient at $\beta=0.04$,
 the social influence to satisfaction of $\beta=0.17$, the
 habit to satisfaction of $\beta=-0.17$, the trust to satis-
 faction of $\beta=0.20$, the convenience to satisfaction
 of $\beta=0.16$, the application quality to satisfaction

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Table 7
Standardized total effects on endogenous factors

Variable	Price value	Social influence	Habit	Trust	Convenience	Application quality	Satisfaction	Intention
Price value 1	0.839	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Price value 2	0.851	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Price value 3	0.873	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Social influence 1	0.000	0.890	0.000	0.000	0.000	0.000	0.000	0.000
Social influence 2	0.000	0.908	0.000	0.000	0.000	0.000	0.000	0.000
Social influence 3	0.000	0.757	0.000	0.000	0.000	0.000	0.000	0.000
Habit 1	0.000	0.000	0.828	0.000	0.000	0.000	0.000	0.000
Habit 2	0.000	0.000	0.823	0.000	0.000	0.000	0.000	0.000
Habit 3	0.000	0.000	0.831	0.000	0.000	0.000	0.000	0.000
Trust 1	0.000	0.000	0.000	0.825	0.000	0.000	0.000	0.000
Trust 2	0.000	0.000	0.000	0.762	0.000	0.840	0.000	0.000
Trust 3	0.000	0.000	0.000	0.790	0.000	0.849	0.000	0.000
Convenience 1	0.000	0.000	0.000	0.000	0.834	0.891	0.000	0.000
Convenience 2	0.000	0.000	0.000	0.000	0.870	0.636	0.000	0.000
Convenience 3	0.000	0.000	0.000	0.000	0.841	0.540	0.000	0.000
Application quality 1	0.000	0.000	0.000	0.000	0.000	0.844	0.000	0.000
Application quality 5	0.000	0.000	0.000	0.000	0.000	0.906	0.000	0.000
Application quality 6	0.000	0.000	0.000	0.000	0.000	0.885	0.000	0.000
Satisfaction	0.044	0.167	-0.174	0.200	0.159	0.561	0.000	0.000
Satisfaction 1	0.039	0.150	-0.156	0.179	0.143	0.504	0.898	0.000
Satisfaction 2	0.039	0.148	-0.154	0.177	0.141	0.498	0.887	0.000
Satisfaction 3	0.039	0.149	-0.155	0.178	0.142	0.501	0.892	0.000
Intention	0.037	0.141	-0.146	0.168	0.134	0.473	0.843	0.000
Intention 1	0.032	0.120	-0.125	0.144	0.114	0.404	0.719	0.853
Intention 2	0.033	0.126	-0.131	0.151	0.120	0.424	0.755	0.897
Intention 3	0.034	0.128	-0.133	0.153	0.122	0.429	0.765	0.908

of $\beta = 0.56$ (relatively stronger than the other paths to satisfaction), and the satisfaction to intention of $\beta = 0.84$.

The R^2 measure is used to explain the proportion of the dependent variable by influencing variables. For the overall R^2 for satisfaction and intention, the dependent variables are 0.77 and 0.71, respectively, which is considered strong (see Table 5). The model testing in Fig. 5. shows that one of the seven hypotheses, price value (H1), is nonsignificant; two of the seven hypotheses, social influence (H2) and habit (H3), are supported at a significance level of $p < 0.10$; two of the seven hypotheses, trust (H4) and convenience (H5), are supported at a significance level of $p < 0.05$; and two of the seven hypotheses, application quality (H6) and satisfaction (H7), are supported at a significance level of $p < 0.001$. To summarize, the model provided support for six hypotheses (H2–H7) in their predicted directions.

5. Discussion

5.1. Theoretical implications

The primary purpose of this study was to understand the key drivers of food delivery applications. We propose that food delivery applications are driven by customer satisfaction—which, in turn, is driven by six relational factors: price value, social influence, habit, trust, convenience, and application quality. Empirical support was found for six of the seven research hypotheses (H2–H7), as shown in Fig. 6.

Somewhat surprisingly, of the main predictors of satisfaction toward adoption—namely, price value (H1), which is one of the main predictions of a fundamental theory (UTAUT2)—price value was not validated as a significant predictor of satisfaction toward adoption, which shows the opposite result from the previous study [25]. Notably, this

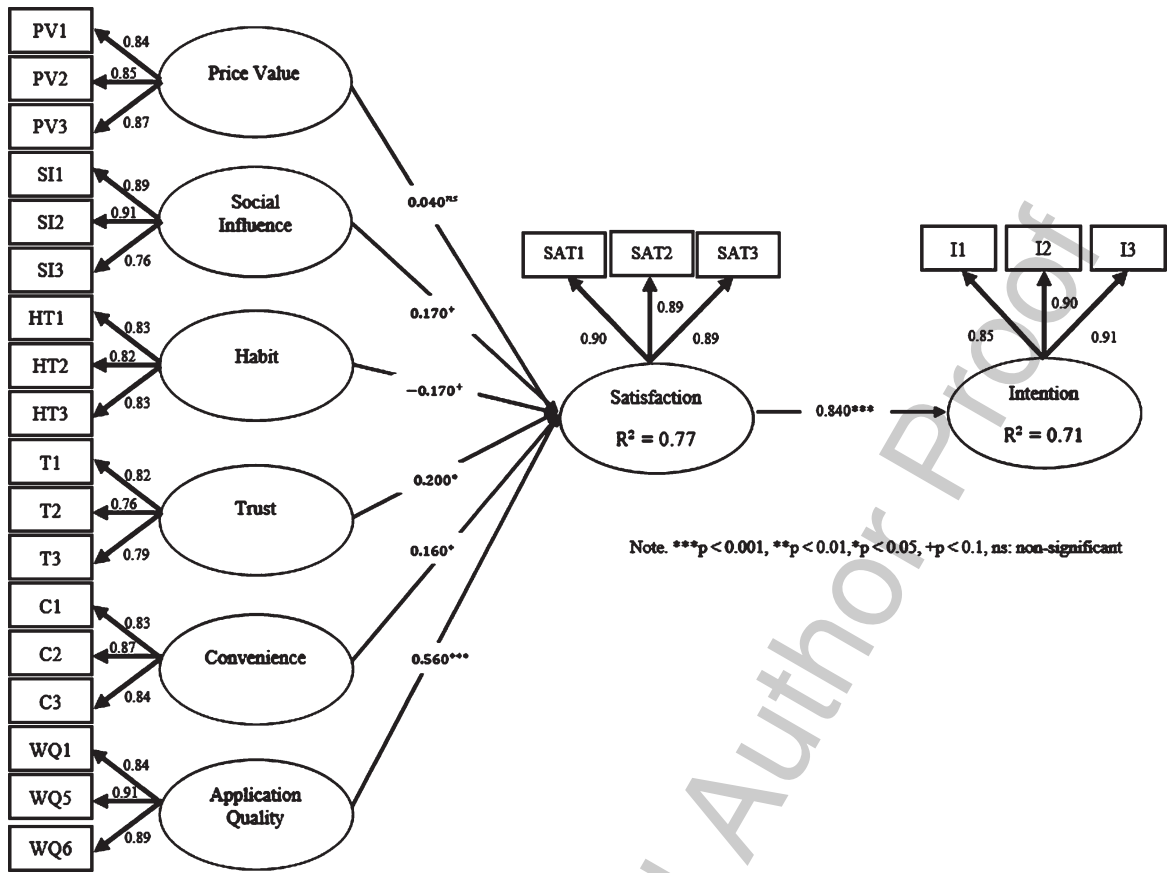


Fig. 6. Results of the structural modeling analysis.

empirical finding supports the notion that food delivery application users have discovered there are no additional price benefits between placing a food order with/without a delivery application [26], and financial concern seems to play an insignificant role because of decreasing cost (e.g., delivery fee, commission fee) [84]. The invalidated relationship between price value and satisfaction toward adoption exhibits that, given today's food delivery application toward pleasant feelings, the user's perceptions regarding commission fees, discounts, or coupons using food delivery applications do not represent a strong indicator anymore. This may imply that the competition among food delivery aggregators has intensified, so they already provide a reasonable price and always launch their promotions or special events to encourage users to use food delivery services. Therefore, prices do not help users decide whether to opt-in or not [76].

Also, the results provide empirical clarification that the paths from the two factors social influence (H2) and trust (H4) are mediating effects of satisfaction

toward adoption. The strength of social influence is consistent with the original studies of UTAUT on information technology [24], late IS theory [25], and other recent conceptualizations of IS adoption [26, 74, 85]: users will be more willing to use technology if they gain a favorable opinion from friends, family, or referents. However, some studies in mobile commerce [27] and airline e-commerce [75] have found a nonsignificant influence of social influence on intention to use technology. Moreover, the findings on trust agree with prior studies in e-commerce [60, 77, 86] that trust has a long-term impact on future relationships and intention through satisfaction, and it can be concluded that a greater trust of the user results in greater intention to use any service.

The empirically proven factor habit (H3), as a significant factor negatively determining the satisfaction to adopt food delivery applications ($\beta = -0.17$; $p < 0.10$), implies that it is an important aspect considered by users in formulating their satisfaction to use or reject food delivery applications. In addition,

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the negative sign indicates that users are less likely to be satisfied and discouraged to use food delivery applications, with a higher degree of expectation of recovery from COVID-19. The spread of COVID-19 has forced consumers to cope with changing their eating habits. Being stuck at home, consumers tend to eat more to cope with stress or boredom, and right now, people find an abundance of both [87], which may be the cause of a negative relationship. Moreover, current eating habits require social distancing, which may not form actual customer intention, so eating habits will be in constant evolution throughout the upcoming year as consumers decide which habits to keep and which to return to the “old normal.” As McKinsey’s [49] survey found, consumers plan to resume some of their out-of-home activities soon, and dining at a restaurant or bar is on the list. This proves that if safety measures are in place and the development of a COVID-19 vaccine is confirmed, consumers will start the shift to their “normal” out-of-home activities, which directly affects the intention to use food delivery.

Convenience (H5) is a factor that plays a crucial role as a direct driver of satisfaction, provided the most convenient access to save time and effort in using applications lead to a stronger feeling of satisfaction. This critical role of convenience is supported by studies on customer experience [40] and usage transfer behavior [7]. This result reflects the convenience-oriented user’s decisive perception of a food delivery application matching their pleasant feeling.

Our results show that satisfaction is usually derived from application quality (H6). This result is consistent with studies that have demonstrated the important role of application quality in the context of m-commerce [47] and e-service [88]. Online customer satisfaction forms during the interaction between customers and components of the application and service [88]. Continued updates in application quality and service provision that meet customer needs and expectations will improve customer shopping experiences toward intention to use [47].

This study supports the five factors that perform the role of mediator satisfaction and exhibit a high explanatory power, which explains 77% of the variance. Finally, the results reveal that satisfaction (H7) is the critical dominant factor toward intention to use food delivery applications, with a high explanatory power of 71% of the variance. This result coincides with IS studies that have confirmed that satisfaction determines the user’s continuance intention to use [9,

46, 89] and that satisfaction has a positive effect on the intention to recommend [88]. Our result implies that customers who adopt food delivery applications are more likely to evaluate such a claim as satisfied and raise their intention to use.

5.2. Practical implications

In addition to the theoretical implications, the results of this study also provide implications for practice. First is the validation of application quality as the strongest predictor of satisfaction toward the intention to use. As a result, food delivery aggregators or retailers should develop high-quality applications that provide a seamless experience between customers and the applications, which would provide future benefits [45]. Moreover, such an application should have interactive features that respond in a way that feels natural to the user, the presentation of products should be improved practically, and the application should be implemented to attract customer interest to stimulate and place an order [36, 47, 89]. Besides, extra efforts should be made to improve the quality of the system (e.g., features, the payment system, real-time tracking), information (e.g., delivery area, event, certification), and service (e.g., delivery, in-app chat) for the fulfillment of the customer aspect and their shopping experience.

Second, both social influence and trust show a mediating effect on satisfaction toward intention to use food delivery applications. Therefore, food delivery aggregators should deploy advertising via social media and focus on extroverted users—who are likely to share an experience from their previous use, which will encourage potential users to use the applications. These methods will help general users become aware of the benefits of using food delivery applications [85]. Moreover, the marketing strategy should focus on reputation building to gain positive feedback from users and should promote and encourage user intentions and trust [27, 77]. The information quality and security assurance provided by these applications will help to improve trustworthiness. Proper security and privacy protection should be implemented to enhance and maintain perceived trust from users [77]. Offering useful and complete advice will eventually result in a higher intention to adopt food delivery applications.

Third, this study shows that habit is a significant factor hindering satisfaction toward the intention to use. Therefore, food delivery providers or restaurant players should wait to observe customer behavior

1116 after COVID-19 recovery to propose the proper
 1117 consumer retention strategy and maintain customer
 1118 loyalty. Moreover, according to a research study from
 1119 University College London, forming a habit takes an
 1120 average of 66 days [90], and Thai customers have
 1121 already surpassed that mark. This means that new
 1122 habits and practices have formed already, and con-
 1123 sumers will soon begin to blend their new practices
 1124 with old routines [91].

1125 Fourth, the role of convenience encourages cus-
 1126 tomer satisfaction and intention. Hsu et al. [39] and
 1127 Jiang et al. [36] suggested that convenience provides
 1128 additional improvement and minimize service time,
 1129 search efforts, conditions, and energy spent to meet
 1130 customer expectations. Therefore, business operators
 1131 should provide the easiest and fastest service and
 1132 effort to aid customers' perception of convenience
 1133 and enhance satisfaction. Food delivery aggregators
 1134 offer greater convenience than restaurants; hence,
 1135 they would benefit more and earn a competitive
 1136 advantage. As food delivery often involves a payment
 1137 method and a service person during food shopping
 1138 and delivery, offering users opportunities to choose
 1139 the form of payment and the service person may help
 1140 them derive more satisfaction.

1141 Last, it is important to address satisfaction because
 1142 it plays a vital role in increasing customer intention
 1143 and competitive advantage. Customer satisfaction is
 1144 paramount in sustaining a business in a highly com-
 1145 petitive market [40]. Also, food delivery aggregators
 1146 and retailers should maximize customer expectations
 1147 and needs during customers' use of food delivery
 1148 applications. This will strengthen the relationship
 1149 with customers [79, 92]. Therefore, food delivery
 1150 aggregators and retailers should fulfill customers'
 1151 needs and understand the ingredients to achieve cus-
 1152 tomer satisfaction.

1153 5.3. Managerial contributions

1154 This study's findings can be interpreted to provide
 1155 specific practical/industry solutions in order for the
 1156 food industry, consumers, and academia to appropri-
 1157 ate value from their experiences. The food industry
 1158 can utilize the findings in their food delivery services.

1159 In this regard, when setting a service fee or com-
 1160 mission fee, a business must make sure that the fees
 1161 set are reasonable and appropriate with customers'
 1162 living expenses while bearing in mind the fees its
 1163 competitors charge. Special treatments are also nec-
 1164 essary to keep customers loyal to a business and
 1165 attract other customers.

1166 Marketers should also provide more value to their
 1167 customers, such as helpful tips that benefit them, and
 1168 then their followers will engage and share with oth-
 1169 ers in return. Building an engaged excited following
 1170 requires tapping into emotions and paying attention
 1171 to customer needs. Followers who are engaged in a
 1172 business will more likely share its content with others,
 1173 thereby expanding its influence. Creating high-
 1174 quality content and a good social media campaign can
 1175 help to drive brand awareness, increasing customer
 1176 retention and/or boosting sales and reputation.

1177 Food delivery practitioners must be aware and
 1178 make sure their customers are safe when they shop
 1179 with them. Clearly showing contact information and
 1180 being always available through responding quickly
 1181 puts customers at ease, knowing that when they
 1182 encounter problems, they will be able to get in touch
 1183 with a professional customer service.

1184 Customers who wish to engage in food delivery
 1185 services want to experience convenience. Food deliv-
 1186 ery practitioners should ensure that they optimize the
 1187 customer menu for delivery and that customers enjoy
 1188 a fast delivery time. The food delivery applications
 1189 should be easy to access to help customers find popu-
 1190 lar restaurants to order some delicious food and easy
 1191 to use to make an order. Multiple options for payment,
 1192 packaging, and so forth should be provided, making
 1193 customers feel more comfortable purchasing from the
 1194 service. Offering customers opportunities to choose
 1195 ingredients simply and effectively also provides an
 1196 advantage. The key to delivery is that it should be
 1197 fast, smooth, and satisfactory for every customer.

1198 Developing and improving food delivery applica-
 1199 tions could enhance the customer's experience of
 1200 ordering food by focusing more on the quality of
 1201 food delivery applications. Food delivery applica-
 1202 tions should be designed in such a way that customers
 1203 are afforded interactivities and responsiveness with
 1204 the application. Therefore, a minimalistic design
 1205 approach should be adopted to create a simple and
 1206 highly usable application. With the massive num-
 1207 ber of food delivery users, the existing technical
 1208 support must have the ability to support concu-
 1209 rent users and do so very quickly without crashing.
 1210 The easy navigation design, advanced search, con-
 1211 sistency, and information provided will all improve
 1212 the application's usability to a great extent. It would
 1213 be best to offer live chat assistance within the appli-
 1214 cation through which customers can live chat with
 1215 the support team whenever they need to. Display-
 1216 ing too much content should be avoided; in contrast,
 1217 more and more images should be provided to make

1218 the application more interactive. Moreover, provid- 1267
 1219 ing the ability to sign up via social media accounts 1268
 1220 and enabling customers to share content from the 1269
 1221 application is great for extending services to other 1270
 1222 customers. 1271

1223 Besides, as mentioned above, in terms of improv- 1272
 1224 ing service effectiveness, customer satisfaction, and 1273
 1225 higher business performance, food delivery providers 1274
 1226 and restaurant operators should understand and culti- 1275
 1227 vate good HRM practices—as food businesses are 1276
 1228 associated with human capital and need to care- 1277
 1229 fully manage, particularly during the COVID-19 1278
 1230 pandemic. Tensay and Singh's [93] study revealed 1279
 1231 that HRM systems, employee engagement, and orga- 1280
 1232 nizational performance have positive and significant 1281
 1233 relationships with each other. Thus, implementing 1282
 1234 proper HR practices helps to enhance the effect of 1283
 1235 performance on both the individual and the orga- 1284
 1236 nization. Therefore, attention should be paid to 1285
 1237 HRM practices—adapting and implementing them 1286
 1238 through investing a significant amount of time, 1287
 1239 thereby improving business performance and enhanc- 1288
 1240 ing employee productivity. As a result, HRM will 1289
 1241 help reduce business costs, achieve business goals, 1290
 1242 and build an engaged workforce that is satisfied, 1291
 1243 motivated, and committed to providing the expected 1292
 1244 service. Moreover, providing a mutual benefit per- 1293
 1245 spective between the organization and individual 1294
 1246 employees must involve being resilient to cope with 1295
 1247 work challenges imposed by the organizational-level 1296
 1248 bundles of sustainable HRM practices. 1297

1249 **6. Conclusion, limitations, and future** 1298 1250 **research directions** 1299

1251 Along with technology innovation, the COVID-19 1300
 1252 pandemic has taken food delivery service, which had 1301
 1253 been accelerating and boosting food delivery growth 1302
 1254 due to increased consumer demand for delivery, to 1303
 1255 another level. In particular, online food delivery has 1304
 1256 grown by 150% compared to the same period last year 1305
 1257 [94]. Food delivery service as a business has surged 1306
 1258 in popularity and customer behavioral change, espe- 1307
 1259 cially as customers try to adapt to the “new normal.” 1308
 1260 This shows that consumers are adapting to conform 1309
 1261 to the delivery service, particularly food delivery. 1310
 1262 Moreover, COVID-19 pandemic has been instrumen- 1311
 1263 tal in changing how the food industry works and 1312
 1264 does business. Therefore, understanding the determi- 1313
 1265 nant factors that influence the customers' intention 1314
 1266 to use food delivery applications and knowing the 1315

best customers should bring added value and con- 1267
 venience to encourage more consumers—potentially 1268
 resulting in an increase in sales and revenue, which 1269
 is significant for today's market. 1270

This research model was empirically tested among 1271
 Thai consumers who already use a food delivery 1272
 application. The results reveal that application quality 1273
 has the most definite impact on customer satisfac- 1274
 tion. Application quality should balance three core 1275
 qualities: system quality, information quality, and 1276
 service quality. As a result, food delivery aggrega- 1277
 tors should ensure the quality of application updates 1278
 and efficiency. To increase satisfaction in application 1279
 quality, food delivery aggregators should provide a 1280
 user interface that is extremely interactive and accu- 1281
 rate and provides up-to-date information (e.g., fees, 1282
 secured transactions, delivery conditions, customer 1283
 support, etc.). Furthermore, the food delivery service 1284
 should ensure that users have the best quality expe- 1285
 rience to maintain customer satisfaction because it is 1286
 essential to develop and maintain willingness, posi- 1287
 tive opinions, and a long-term customer relationship. 1288
 Therefore, maintaining and enhancing customer sat- 1289
 isfaction will be the key to restaurant players' suc- 1290
 cess and challenging task. Our findings show that sat- 1291
 isfaction is a strong factor that shapes customers' 1292
 attitudes toward accepting food delivery applications. 1293
 This finding is consistent with the results of studies on 1294
 mobile food-ordering apps in Jordan [9] and Taiwan 1295
 [46], which indicate that new adopters of technol- 1296
 ogy are more likely to evaluate the actual outcome 1297
 with their expectations, and if the business can treat 1298
 the customer well enough, they are likely to reuse 1299
 such service. Besides, restaurant players should not 1300
 overlook the “new normal.” Still, they should adapt 1301
 as quickly as possible because customers are already 1302
 aware of the impact of a pandemic and public health 1303
 crises (e.g., COVID-19). Furthermore, customers are 1304
 also concerned about their health and safety, which 1305
 has altered their purchasing behavior and led to cus- 1306
 tomer behavioral change to demand food in different 1307
 ways. Therefore, restaurant players should add a third 1308
 delivery system and adapt the menu to optimize 1309
 online ordering and delivery. However, restaurant 1310
 players do not need to build their platform; they can 1311
 choose to use the benefit of a food delivery aggrega- 1312
 tor's service instead and pay commissions and service 1313
 fees in exchange. 1314

Although this study provides meaningful results, 1315
 there are some limitations. First, the sample used 1316
 was recruited only in Thailand; therefore, the study 1317
 only included Thai customers' perspectives, which 1318

1319 may not be generalizable to other countries' settings.
 1320 Furthermore, the respondents' recruitment may not
 1321 represent general populations because some respon-
 1322 dents may have completed the questionnaire with
 1323 little thought or reflected a self-selection bias, and
 1324 this research paid no attention to customers who
 1325 have rejected using food delivery applications, in
 1326 which the generalization of the results and model
 1327 may be questioned. Therefore, it would be inter-
 1328 esting to replicate our model, with appropriate
 1329 adjustments, in additional studies in other countries
 1330 and the highlighted kind of customer, which will
 1331 provide greater empirical support for this study's
 1332 findings.

1333 Second, we mainly conducted a cross-sectional
 1334 study; it may not reflect comprehensive enough
 1335 insight, as the number of food delivery users is
 1336 increasing over time, particularly during the COVID-
 1337 19 pandemic. Also, the food delivery service and
 1338 applications are still in their initial stages but are fast-
 1339 changing and developing over time. Moreover, this
 1340 study gathered data during a particular time; thus, lon-
 1341 gitudinal research may be necessary to gather more
 1342 insight and deepen the understanding of the inter-
 1343 relationship among factors relevant to food delivery
 1344 applications.

1345 Third, although this research model explained 71%
 1346 of the variance in intention to use food delivery appli-
 1347 cations, the variance remains unexplained, so future
 1348 research should add some new constructs (e.g., the
 1349 unique feature of food delivery applications). Inno-
 1350 vation features were found to play an important role
 1351 in the adoption of mobile food delivery applications
 1352 [9]. Thus, future research might integrate the unique
 1353 features in order to broaden the range of context and
 1354 enhance explanatory power on the intention to use
 1355 food delivery applications.

1356 Further research should be conducted in differ-
 1357 ent cultural aspects, mainly in countries where food
 1358 delivery applications are more adopted by the pop-
 1359 ulation, for comparative analysis to generalize these
 1360 findings. Additionally, more empirical and theoretic-
 1361 al evidence is needed regarding the role of unique
 1362 features, HRM practices, or other constructs in order
 1363 to analyze which attributes increase the explanatory
 1364 power of intention to use food delivery applica-
 1365 tions. Another interesting route to extend insight
 1366 might involve comparing users' behavioral intentions
 1367 before/after and during the COVID-19 pandemic to
 1368 identify the differences and investigate the change
 1369 of importance in the constructs. Exploration of these
 issues can be worth pursuing.

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Appendix A. Survey items

Constructs	Items	Measures
Price Value (PV)	PV1	The food delivery application offers a reasonable price.
	PV2	Using a food delivery application service is a good value for the money.
	PV3	At the current price, the food delivery application provides a good price.
Social Influence (S)	S1	People who are important to me think that I should use a food delivery application for ordering food.
	S2	People around me are in favor of using food delivery application, so when I would like to order the food, I use food delivery application.
	S3	The social network, advertising, comment & review, and word of mouth influence me on whether or not to using food delivery applications.
Habit (H)	H1	Using food delivery application has become a habit for me.
	H2	I am an addict to use food delivery application for order the food.
	H3	I feel the need to use food delivery application in my daily life.
Trust (T)	T1	The food delivery application is trustworthy.
	T2	A food delivery application is a reliable means to carry out transactions.
	T3	I think the food delivery application is truthful in its dealing with high integrity and keeps my best interest in mind.
Convenience (C)	C1	Using food delivery applications enables me to purchase food at any time I wanted.
	C2	Using food delivery application enables me to purchase food wherever I am.
	C3	I find that food delivery application is convenient for purchasing food.
Application Quality (AQ)	AQ1	The food delivery application is easy to use.
	AQ2	The food delivery application allows me to search and locate the information I need quickly and effectively.
	AQ3	The information provided by the food delivery application is accurate and reliable.
	AQ4	The information provided by the food delivery application is understandable and clear.
	AQ5	Food delivery application staffs show a sincere interest in solving and troubleshooting the technical problem and normally provide quality service.
	AQ6	Food delivery staff provide undivided attention whenever I experience the problem and dedicate enough time to resolve my specific technical needs and concerns.
Satisfaction (Sa)	Sa1	I am delighted to order the food via the food delivery application.
	Sa2	The service provided by the food delivery application meets or exceeds my expectations.
	Sa3	I think I did the right decision to use food delivery application for ordering the food
Intention (I)	I1	I intend to continue using food delivery application.
	I2	I would recommend using a food delivery application to family, colleagues, and friends.
	I3	I intend to increase my use of food delivery application when the opportunity arises.