Beyond convenience: exploring the determinants of continuance usage intentions in online food delivery services in Vietnam

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ABSTRACT

This study examines the factors influencing continuance usage intentions in Vietnam’s online food delivery (OFD) market using the Unified Theory of Acceptance and Use of Technology (UTAUT) with health consciousness as a moderator. The research identifies performance expectancy, social influence, and facilitating conditions as significant determinants of continuance usage intentions, while effort expectancy plays a minor role. The analysis highlights health consciousness’s critical role in moderating the effects of performance expectancy and social influence on usage intentions, revealing that higher health awareness leads to more stringent evaluations of OFD services. Using a sample size of 406 and analyzed with Smart PLS 4, the study found that the UTAUT model explains approximately 77.9% of the variance in continuance usage intentions, showcasing its strong predictive power. This research contributes to understanding technology acceptance by highlighting the complex relationship between traditional service evaluation metrics and individual health values in influencing consumer behavior in a rapidly digitizing economy.

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Introduction

The recent surge in the e-commerce industry, particularly through digital platforms, has significantly transformed food service accessibility. This evolution has simplified access to goods and services for consumers and marked altered market dynamics (Robertson et al., 2022). This change, driven by technological advances and deeper digital integration, has been a primary force in expanding the online food delivery (OFD) sector (Oncini et al., 2020). Market revenue for the OFD is projected to reach US$1.22 trillion by 2024, with a compound annual growth rate (CAGR) of 10.06% from 2024 to 2028 (Platform Delivery - Worldwide | Statista Market Forecast, n.d.). In South Asia, particularly in Vietnam, the OFD market is expected to grow to US$3.41 billion by 2027 (Vo, 2023). Major players such as GrabFood, ShopeeFood, and Baemin are capitalizing on the trend towards healthier eating and are experiencing increased order values. According to the Vietnam market national website, the Vietnam Online Food Delivery Market is estimated to exceed US$1.555.4 million by 2027, with user penetration estimated at 13.9% in 2022. Recent data indicates that 83% of Vietnamese people use food delivery services, a significant increase from 62% the previous year. Additionally, 77% of food delivery users in Vietnam utilize online food delivery apps.

Online food delivery services have revolutionized how individuals order and consume food, offering unprecedented convenience, diversity, and accessibility (Robertson et al., 2022). This transformation is particularly notable in Vietnam, where rapid adoption of these services has significantly changed the landscape of the food industry and opened new business opportunities to meet consumer demands (Troise et al., 2020). Driven by technological advancements, urbanization, and changing lifestyle preferences, Vietnam has become a key area for online food delivery services. It is crucial for businesses operating in this competitive landscape to understand these determinants (Truong et al., 2023).
Several studies have explored the factors influencing customer behavior, identifying both the triggers and barriers related to the use of OFD services (Muangmee et al., 2021; Prasetyo et al., 2021; Wang et al., 2022). Researchers like Tran (2021) and Bouara et al. (2021) have applied the Theory of Planned Behavior (TPB) to analyze the impact of social norms and COVID-19 related factors. Ray et al. (2019) and Nguyen and Nguyen (2024) applied the Uses and Gratifications theory to highlight that convenience, societal pressure, and user experience are significant motivators for using food delivery apps. Pillai et al. (2022) integrated TPB with the Theory of Perceived Risks and the Elaboration Likelihood Model to study consumer attitudes and purchase intentions.

Researchers have shown that user experience, including ease of use, convenience, personalization, health consciousness, and overall service quality, is pivotal in determining the continued engagement with OFD services (Cheng et al., 2020; Hwang & Choe, 2019; Roh & Park, 2019; Su & Nguyen et al., 2022). Hoang and Le Tran (2023) have shown the importance of promotions in shaping users’ cost perception and their willingness to continue using the service. As technology further expands, consumers increasingly seek personalized and customized experiences in online services (Alimamy & Gnoth, 2022; Daoud et al., 2023).

The adoption of technology in food delivery services is influenced by a complex interplay of attitudes and behavioral intentions, shaped by personal values, social influences, and individual motivations (An et al., 2023; Aryani et al., 2022; Inthong et al., 2022). Ramos (2021) has stressed the need for expanding future research to cover additional dimensions of food delivery services and to explore these phenomena in various geographical contexts.

In Vietnam, researchers have placed significant emphasis on understanding how external factors such as service quality, perceived value, and trust impact consumer behavioral intentions towards OFD services. Studies have highlighted the importance of these factors in fostering customer satisfaction and loyalty, which are essential for the survival and growth of OFD services in the Vietnamese market (Luu et al., 2023; Nam & An, 2021; Su et al., 2022; Uzir et al., 2021). Moreover, the impact of social media marketing and the perceived trustworthiness of services have been examined by Alalwan (2018) and Cheng et al. (2020) as significant factors affecting consumers’ purchasing intentions and loyalty. These findings underline the need for OFD services to establish a strong digital presence and maintain high service quality standards to attract and retain customers.

In light of these considerations, the present study aims to advance our understanding of the behavioral model by leveraging the UTAUT model as the optimal framework for examining the continued use of food delivery services within the Vietnam’s distinctive socio-economic setting, characterized by unique patterns of technological adoption and consumer behaviors. Moreover, with the ascension of the middle-income class in Vietnamese society leading to enhanced living standards across all facets of life, health consciousness has become a predominant concern among most consumers (Naruetharadhol et al., 2023; A. T. Tran et al., 2020). This study endeavors to illuminate the complex interrelations between health consciousness and the adoption of OFD services amidst Vietnam’s rapidly evolving market.

**Literature Review**

**Theoretical Background: Unified Theory of Acceptance and Use of Technology**

The Unified Theory of Acceptance and Use of Technology (UTAUT) marks a significant evolution in our understanding of technology adoption and usage, building upon the foundational work of Venkatesh et al. (2003). This model integrates eight theoretical frameworks with the aim of identifying factors that influence information technology acceptance and behavior. The UTAUT model has been widely applied in various research contexts, assessing users’ intentions (Chopdar & Sivakumar, 2019; Marinković et al., 2019; Mizal & Wijayangka, 2020; Permana et al., 2024), demonstrating its effectiveness in explaining technology acceptance behaviors. The framework emphasizes four key constructs: Performance expectancy, effort expectancy, social influence, and facilitating conditions. These constructs are identified as critical determinants of technology acceptance (Muangmee et al., 2021).

**Performance Expectancy**

Performance expectancy (PE) refers to users’ perceptions of the benefits of new technologies in making tasks more efficient and convenient (Venkatesh et al., 2003). In the context of online food delivery services, PE relates to consumers’ beliefs regarding the efficiency, convenience, and time-saving attributes of using OFD services (Li et al., 2020). Research in various domains, including online education, digital apps, and online food delivery services, has consistently shown a positive relationship between PE and the intentions to use a technology (Gansser & Reich, 2021; García de Blanes Sebastián et al., 2023; Osei et al., 2021; Tamilmani et al., 2021; Yu et al., 2021). Therefore, the following hypothesis is proposed:

H1. Performance expectancy influences the continuance intention of OFD services.
Effort Expectancy

Effort expectancy (EE) refers to the perceived ease of use and the effort required to engage with a technology (Venkatesh et al., 2003). For OFD services, effort expectancy reflects the perceived ease of platform use, influenced by user interface design, navigation simplicity, and the flexibility of order customization features (Chen et al., 2020). Past research highlights the direct impact of effort expectancy on user experience and its influence on the likelihood of adopting and continuing to use these platforms (Ameri et al., 2020; Yu et al., 2021). Specifically, studies have shown that OFD platforms that are easy to navigate and interact with are more likely to be adopted and used repeatedly (Gupta et al., 2021; Lee et al., 2019; Novita & Husna, 2020). These findings affirm that effort expectancy is a key determinant of technology acceptance, emphasizing the need for OFD services to prioritize user-friendly design and functionality. Therefore, the following hypothesis is proposed:

H2. Effort expectancy influences the continuance intention of OFD services.

Social Influence

Social influence (SI) is defined as the extent to which individuals perceive the endorsement of certain behaviors by their peers (Venkatesh et al., 2003). This construct helps explain how social norms and peer influence contribute to the acceptance and diffusion of new technologies. In the context of OFD services, social influence includes the impact of social networks, peer reviews, and word-of-mouth recommendations on consumers’ decisions to adopt and use these platforms (Chen et al., 2020). The digital age has amplified the role of social influence, with studies demonstrating that positive online reviews and social media endorsements can significantly increase consumers’ intentions to use OFD platforms (Gupta et al., 2021; Zhou et al., 2020). These findings further suggested that OFD platforms can benefit from strategies that encourage users to share their positive experiences (Chauhan et al., 2021; C. Nguyen et al., 2022). Therefore, the following hypothesis is proposed:

H3. Social influence influences the continuance intention of OFD services.

Facilitating Conditions

Facilitating conditions (FC) are defined as the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of a system (Venkatesh et al., 2003). Facilitating conditions are grounded in the presence and quality of technical infrastructure and support systems, which are essential factors influencing consumers’ willingness to engage with OFD platforms. Key elements underpinning facilitating conditions in the e-commerce context include the dependability of internet connectivity, the effectiveness and reliability of the delivery infrastructure, the quality and responsiveness of customer service, and the provision of diverse and secure payment methods (Essel, 2022; Shi et al., 2022). Research across various technology adoption contexts has highlighted the significance of facilitating conditions in influencing users’ behavioral intentions and actual usage (Erjavec & Manfreda, 2021; Hu et al., 2020; Rachmawati et al., 2020). Specifically, findings suggest that the effectiveness of logistical support, the responsiveness of customer service, and the security of payment systems significantly affect consumers’ decisions to use OFD platforms (Izzati, 2020; Osei et al., 2021; Pitchay et al., 2021; Puriwat & Tripopsakul, 2021). Therefore, the following hypotheses are proposed:

H4. Facilitating conditions influence the continuance intention of OFD services.

Moderating Role of Health Consciousness

Health consciousness refers to the level of awareness, interest, and active engagement a consumer has in maintaining or enhancing their health (Suttikun, 2023). Recognized as a crucial factor influencing dietary choices and lifestyle behaviors. Health-conscious individuals are more likely to seek nutritional information, prefer healthy food options, and demonstrate a willingness to pay a more for such options (Ali & Ali, 2020). Studies indicate that consumers with high levels of health consciousness prioritize the performance of the delivery platform, particularly its efficiency in delivering healthy products and the user-friendly nature of its technology (Naruthaardhol et al., 2023).

However, a study revealed that the ease of use and functional conditions do not uniformly affect consumers’ behavioral intentions to adopt a platform across different health consciousness segments (Osaili et al., 2023). Similarly, studies examining consumer attitudes, satisfaction, food safety awareness, and purchase intentions regarding food ordered through online delivery apps have shown that positive perceptions of online food delivery services lead to higher satisfaction and greater awareness of food safety, with a higher likelihood of future purchases (Shafiee & Abdul Wahab, 2021). Contrary to expectations, research investigating how online menu features influence consumer desire to purchase food online, considering the moderating effects of openness to change and health consciousness, showed that these factors did not significantly moderate the relationship between food desire and online purchase intentions (Sari et al., 2023).

These findings highlight a significant transformation in the online food delivery industry, driven by deepening consumer awareness and concern for health consciousness, suggesting that online food delivery platforms need to tailor their strategies according to the health consciousness of their target consumer segments. By integrating the concept of health consciousness into the UTAUT model, this study aims to shed light on the impact of health-related factors on consumers’ acceptance and use of online food delivery services. Understanding the role of health consciousness in shaping consumer behavior can provide valuable insights for food delivery platform
operators, enabling them to tailor their offerings to meet the growing demand for healthier and more personalized food options. Additionally, it can help inform the development of effective management strategies and marketing approaches that resonate with health-conscious consumers in the Vietnamese market. Therefore, the following hypotheses are proposed:

H5: Health consciousness moderate the relationship between performance expectancy and continuance intention.
H6: Health consciousness moderate the relationship between effort expectancy and continuance intention.
H7: Health consciousness moderate the relationship between social influence and continuance intention.
H8: Health consciousness moderate the relationship between facilitating conditions and continuance intention.

Based on the H1 to H8 hypotheses, this study established a conceptual framework of relevant studies on factors affecting continuance intention to order food delivery services, as shown in Figure 1.

![Figure 1: Research Framework](image)

**Research & Methodology**

**Sampling and Data Collection**

This study explored the factors influencing Vietnamese consumers’ behavior regarding the use OFD services, employing a quantitative research approach based on the UTAUT model. We collected data across major Vietnamese cities through an online structured questionnaire. The questionnaire was developed from existing scales and adapted them for the local context, and rigorously translated into Vietnamese to ensuring cultural relevance and clarity.

Data collection occurred over three months, from December 2022 to February 2023, using an online survey created with Google Forms. This survey was distributed across various social media platforms, such as Facebook groups and Instagram, aiming to reach a broad and diverse group of respondents with experience in using online food delivery service in Vietnam. A filtering question “Have you ever used an online food delivery service?” was included to identify respondents who met the population’s inclusion criteria. Only participants who answered “yes” were allowed to continue with the survey. The selection criteria for participant were strictly defined to ensure the sample accurately represented the target demographic of interest, resulting in a qualified sample of 406 individuals.

Among the 406 valid responses obtained, 37.19% (n=151) were male, and 62.81% (n=255) were female. Approximately half portion of the respondents, 56.65% (n=230), reported being married. The majority of respondents fell within the 18 to 29 age group, accounting for 50.25% (n=204) of the sample, followed by the 30-39 age group at 27.59% (n=112). Regarding educational backgrounds, respondents with a bachelor’s degree constituted the largest group, making up 50.49% (n=205) of the respondents. Concerning monthly income, over 80% of respondents reported earning less than 20 million VND (approximately 800 USD). Regarding the frequency of using online food delivery services, the majority of participants, 57.14% (n=232), indicated they order food online approximately 2 to 4 times per week. The detailed demographic profile is presented in Table 1.
### Table 1: Demographic Characteristics of the Participants.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Categories</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>151</td>
<td>37.19%</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>255</td>
<td>62.81%</td>
</tr>
<tr>
<td>Marital status</td>
<td>Married</td>
<td>230</td>
<td>56.65%</td>
</tr>
<tr>
<td></td>
<td>Single</td>
<td>176</td>
<td>43.35%</td>
</tr>
<tr>
<td>Age</td>
<td>18 - 29</td>
<td>204</td>
<td>50.25%</td>
</tr>
<tr>
<td></td>
<td>30 - 39</td>
<td>112</td>
<td>27.59%</td>
</tr>
<tr>
<td></td>
<td>40 - 49</td>
<td>62</td>
<td>15.26%</td>
</tr>
<tr>
<td></td>
<td>More than 50</td>
<td>28</td>
<td>6.9%</td>
</tr>
<tr>
<td>Education level</td>
<td>High school or equivalent</td>
<td>58</td>
<td>14.29%</td>
</tr>
<tr>
<td></td>
<td>Bachelor</td>
<td>205</td>
<td>50.49%</td>
</tr>
<tr>
<td></td>
<td>Master’s degree or above</td>
<td>73</td>
<td>17.98%</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>70</td>
<td>17.24%</td>
</tr>
<tr>
<td>Monthly income</td>
<td>&lt; 8 million VND</td>
<td>109</td>
<td>26.85%</td>
</tr>
<tr>
<td></td>
<td>8 million - &gt;20 million</td>
<td>229</td>
<td>56.40%</td>
</tr>
<tr>
<td></td>
<td>20 million - &gt;50 million</td>
<td>40</td>
<td>9.85%</td>
</tr>
<tr>
<td></td>
<td>≥ 50 million</td>
<td>28</td>
<td>6.90%</td>
</tr>
<tr>
<td>Frequency of use within one month.</td>
<td>Everyday</td>
<td>42</td>
<td>10.34%</td>
</tr>
<tr>
<td></td>
<td>2-4 times per week</td>
<td>232</td>
<td>57.14%</td>
</tr>
<tr>
<td></td>
<td>Once per week</td>
<td>59</td>
<td>14.53%</td>
</tr>
<tr>
<td></td>
<td>Once or twice per month</td>
<td>40</td>
<td>9.85%</td>
</tr>
<tr>
<td></td>
<td>Not even once per month</td>
<td>33</td>
<td>8.13%</td>
</tr>
</tbody>
</table>

**Note:** Sample size=406.

### Measurement Development

To ensure content validity, measurements were based on a review of the relevant literature. This study utilized questionnaires developed by Venkatesh et al. (2003) to evaluate key constructs such as performance expectancy, effort expectancy, social influence, facilitating conditions, and behavioral intention towards OFD service. The questionnaire design included three sections. The first section comprised five questions aimed at capturing the demographic characteristics of Vietnamese consumers. The second section consisted of 24 questions designed to assess the UTAUT2 variables related to the use of online food delivery (OFD) services among Vietnamese customers. Lastly, the third section focused on measuring participants’ continuous intentions towards OFD services through three questions.

Prior to finalizing the questionnaire, a pre-testing phase was conducted with graduate business students. The feedback and results from the pre-test were utilized to review, reword, and revise the questionnaire items to enhance clarity and understanding. Additionally, the concept of health consciousness, serving as a moderating variable in this study, was assessed using measures developed by Wen and Li (2013) and Kaur et al. (2023). The initial draft of the questionnaire was prepared in English to ensure the clarity and coherence of the content aligned with the research objectives. After completion, the questionnaire was carefully reviewed and revised by a panel of three academicians proficient in both Vietnamese and English. This review process was aimed to refining the linguistic tones to ensure the clarity and coherence of the questionnaire’s content. The revised questionnaire was then translated into Vietnamese and further evaluated by the expert panel to confirm the accuracy of the translation and validate its semantic precision. A five-point Likert scale was used to evaluate the items for all variables, with 1 representing “strongly disagree” and 5 representing “strongly agree.” The integration of these established scales provided a strong methodological foundation for examining the dynamics in the adoption and sustained use of OFD services, particularly in the context of increasing health awareness among Vietnamese consumers.

### Data analysis

This study began with a descriptive statistical analysis using SPSS Statistics 27 to explore the respondents’ profiles. For the primary analysis, the Partial Least Squares (PLS) method was selected for its suitability in theoretical development (Urbach & Ahlemann, 2010) and its capability to analyze measurement and structural models concurrently. Additionally, the application of moderation analysis is one of the advantages of choosing PLS as the analytical tool (Ringle et al., 2012). PLS path modeling is appropriate for examining complex relationships between latent constructs and observed variables, which suits the study’s goal of investigating the factors influencing consumers behavior towards online food delivery services in this study (Hair et al., 2018).
Results

Measurement model

In this study, latent variables within the measurement model, or outer model, utilizing reflective constructs to ensure that each item adequately covers the context it aims to measure. The validity and reliability checks of construct measures are conducted to ensure that the measurement tools accurately and consistently reflect the concepts and theoretical constructs being studied. These also relate to the variables’ capacity to provide pertinent predictions for this study.

The integrity of the measurement model was assessed using Confirmatory Factor Analysis (CFA), focusing on the convergent and discriminant validities of the studied constructs. Reliability was confirmed as all constructs showed a Cronbach’s α coefficient and composite reliability (CR) above the accepted threshold of 0.7. According to Hair et al. (2018), factor loadings should be above .7 for adequate convergent validity, and average variance extracted (AVE) should exceed .5. As shown in Table 2, the factor loadings for all items met the .7 criterion, and AVE values ranged from .794 to .875, meeting the standards for convergent validity.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Measurement item</th>
<th>Factor loadings</th>
<th>Cronbach’s α</th>
<th>CR</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance Expectancy (PE)</td>
<td>PE1 I feel that online food delivery services are useful.</td>
<td>945</td>
<td>.929</td>
<td>.955</td>
<td>.875</td>
</tr>
<tr>
<td></td>
<td>PE2 I feel that online food delivery services are convenient</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PE3 Using online food delivery services improves the efficiency of ordering and</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>receiving delivery food</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effort Expectancy (EE)</td>
<td>EE1 Learning how to use food delivery service is easy.</td>
<td>920</td>
<td>.904</td>
<td>.940</td>
<td>.839</td>
</tr>
<tr>
<td></td>
<td>EE2 It is easy to follow all the steps of food deliver services.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>EE3 Interaction with food delivery service is clear.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Influence (SI)</td>
<td>SI1 People who are important to me (e.g., family members, close friends, and</td>
<td>897</td>
<td>.897</td>
<td>.936</td>
<td>.829</td>
</tr>
<tr>
<td></td>
<td>colleagues) recommend I use food delivery services.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SI2 People who are important to me think food delivery services are beneficial.</td>
<td>910</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SI3 People who are important to me think it is a good idea to use food delivery</td>
<td>925</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>services</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facilitating Conditions (FC)</td>
<td>FC1 I have the resources necessary to use food delivery services.</td>
<td>890</td>
<td>.870</td>
<td>.920</td>
<td>.794</td>
</tr>
<tr>
<td></td>
<td>FC2 I have the knowledge necessary to use food delivery services.</td>
<td>882</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>FC3 Food delivery services are similar to other services I use.</td>
<td>900</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health Consciousness (HC)</td>
<td>HC1 I believe knowing how to eat healthily is very important.</td>
<td>909</td>
<td>.902</td>
<td>.807</td>
<td>.836</td>
</tr>
<tr>
<td></td>
<td>HC 2 I am very concerned about the food quality and food safety</td>
<td>918</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>HC 3 I’m usually aware of my health.</td>
<td>916</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuance Usage Intention (CT)</td>
<td>CT1 I intend to use food delivery services continually.</td>
<td>925</td>
<td>.920</td>
<td>.949</td>
<td>.862</td>
</tr>
<tr>
<td></td>
<td>CT2 I am willing to use food delivery services in the future continually.</td>
<td>934</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CT3 I will always try to use food delivery services in my daily life.</td>
<td>926</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Discriminant validity was evaluated using the Fornell-Larcker (1981) criterion, which required that the square roots of the AVE values exceed the correlations among the latent variable (Hair et al., 2017). The results, as shown in Table 3, confirm that all constructs meet this condition. Furthermore, we addressed potential multicollinearity among the indicators by examining the Variance Inflation Factor (VIF). The VIF values, ranging from 2.162 to 4.132, were well below the threshold of 5 suggested by Hair et al. (2014). Indicating that significant multicollinearity issues are not presented in proposed model.

Table 3: Discriminant Validity Based on Fornell-Larcker Criterion.

<table>
<thead>
<tr>
<th>Constructs</th>
<th>CI</th>
<th>EE</th>
<th>FC</th>
<th>HC</th>
<th>PE</th>
<th>SI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuance Usage Intention (CI)</td>
<td>.928</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effort Expectancy (EE)</td>
<td>.763</td>
<td>.916</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facilitating Conditions (FC)</td>
<td>.755</td>
<td>.707</td>
<td>.891</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health Consciousness (HC)</td>
<td>.782</td>
<td>.726</td>
<td>.69</td>
<td>.914</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance Expectancy (PE)</td>
<td>.822</td>
<td>.806</td>
<td>.729</td>
<td>.736</td>
<td>.936</td>
<td></td>
</tr>
<tr>
<td>Social Influence (SI)</td>
<td>.742</td>
<td>.740</td>
<td>.700</td>
<td>.675</td>
<td>.755</td>
<td>.91</td>
</tr>
</tbody>
</table>

Note: AVE values can be found on the diagonal, values under the diagonal are the squared latent variable correlations of each construct.

Structural model

The bootstrapping method was used in Smart PLS 4 to evaluate the direct effects among the variables with a sample size of 406. Table 4 and Figure 2 detail the standardized path coefficients and their significance levels, highlighting the impact of each construct on the hypotheses. The analysis showed a pattern of significant and non-significant impacts among various predictors on continuous usage intention. Within the UTAUT model, performance expectancy (t=6.358, p<.001), facilitating conditions (t=5.113, p<.001), and social influence (t=3.563, p<.001) all demonstrated a significant positive influence on continuous usage intention, supporting hypotheses H1, H3, and H4. In contrast, effort expectancy did not show a statistically significant effect on continuous usage intention (t=1.847, p=.065).

Additionally, the study examined health consciousness as a moderating variable in the relationship between continuous usage intention and its antecedents. The interaction between health consciousness and performance expectancy on continuous usage intention yielded a significant result (β = .065, t value = 2.538, p<.001), but contrary to expectations, it suggested a negative moderation effect. This finding indicates that individuals with higher health consciousness might express more concerns or critical evaluations even when using systems, thereby moderating the positive influence of performance expectancy on continuous usage intention, which supports hypothesis H5. Also, social influence was found to have a significant negative mediating effect on continuous usage intention (β = -.073, t value = 1.983, p=.047). This result implies that social factors, while influential, may not always encourage continued use. Instead, in the context of health consciousness, social influence may lead individuals to reassess their usage intentions based on social norms or pressures that emphasize health considerations, thus supporting H7. However, the interaction effects between health consciousness with effort expectancy (t value = 0.912, p=.362) and facilitating conditions (t value = 1.331, p=.183) did not show significant statistical outcomes, implying that these factors in conjunction with health consciousness do not have a predictive strength for continuous usage intention, leading to the rejection of H6 and H8.

Table 4: Significance of model hypotheses and validation results.

<table>
<thead>
<tr>
<th>Path</th>
<th>Path coefficients</th>
<th>t-values</th>
<th>p-values</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1 PE→CI</td>
<td>.306</td>
<td>6.358</td>
<td>&lt;.001</td>
<td>Supported</td>
</tr>
<tr>
<td>H2 EE→CI</td>
<td>.078</td>
<td>1.847</td>
<td>.065</td>
<td>Not supported</td>
</tr>
<tr>
<td>H3 SI→CI</td>
<td>.136</td>
<td>3.563</td>
<td>&lt;.001</td>
<td>Supported</td>
</tr>
<tr>
<td>H4 FC→CI</td>
<td>.192</td>
<td>5.113</td>
<td>&lt;.001</td>
<td>Supported</td>
</tr>
<tr>
<td>H5 PE * HC→CI</td>
<td>-.120</td>
<td>2.538</td>
<td>.011</td>
<td>Supported</td>
</tr>
<tr>
<td>H6 EE * HC→CI</td>
<td>-.034</td>
<td>.912</td>
<td>.362</td>
<td>Not supported</td>
</tr>
<tr>
<td>H7 SI * HC→CI</td>
<td>-.073</td>
<td>1.983</td>
<td>.047</td>
<td>Supported</td>
</tr>
<tr>
<td>H8 FC * HC→CI</td>
<td>-.048</td>
<td>1.331</td>
<td>.183</td>
<td>Not supported</td>
</tr>
</tbody>
</table>

Note: The meanings represented by the abbreviations are as follows. PE: performance expectancy; EE: effort expectancy; SI: social influence; FC: facilitating conditions; CI: continuance usage intention; HC: health consciousness.
Figure 2: Test results of the research model; Note: *p < 0.05; **p < 0.01; ***p < 0.001. The dashed lines indicate non-significant variable relationships.

Model Explained Variance

The UTAUT model serves as the theoretical framework for evaluating factors influencing continuance usage intentions. In this study, the determination coefficient $R^2$ was computed to assess the proportion of variance in the dependent variables accounted for by the model. As illustrated in Figure 2, the $R^2$ value for continuance usage intentions is .779. This indicates that the UTAUT model explains approximately 77.9% of the variance in continuance usage intentions, highlighting a strong level of predictive power. The substantial $R^2$ value demonstrates that the UTAUT constructs effectively account for a considerable portion of the variance influencing continuance usage intentions, validating the model’s robustness in explaining the factors that drive the sustained use of technology in the context of online food delivery service.

Discussion and implications

The Application Effects of the UTAUT Model on Online Food Delivery Services

The results of this study indicate that the UTAUT model is a good framework for predicting OFD behavior. As expected, performance expectancy, social influence, and facilitating conditions indeed have a significant impact on continuance usage intentions. However, the non-significant impact of effort expectancy on continuance usage intentions in Vietnam’s OFD market differs from typical findings within the UTAUT framework, where effort expectancy is generally a significant predictor of technology adoption (Gansser & Reich, 2021; García de Blanes Sebastián et al., 2023; Mizal & Wijayangka, 2020; Osei et al., 2021; Tamilmani et al., 2021; Yu et al., 2021). This inconsistency could be influenced by the high technological literacy and adaptability among Vietnamese consumers, potentially diminishing the perceived importance of ease of use. Additionally, the maturity of the digital market might lead users to expect a basic level of user-friendliness across platforms, reducing the distinct impact of effort expectancy. Cultural traits such as flexibility in technology use may further mitigate the influence of effort expectancy. Consequently, in well-adapted digital societies, attributes such as service quality and performance expectancy might overshadow effort expectancy in shaping continuance usage intentions (Chen et al., 2020; Li et al., 2020).

These observations are consistent with studies indicating that, in contexts like Vietnam, consumers may prioritize factors like service quality and reliability over simplicity and ease of use (Karulkar et al., 2021; Kurniawan et al., 2024; Petin & Rotchanakitumnuat, 2021; Surya et al., 2021). This suggests that while an effortless ordering process is important, OFD service providers should not consider ease of use as the sole driver for customer retention and acquisition. Given Vietnam’s rapid urbanization and technological advancements, the consumer base, which is both tech-savvy and discerning, likely places greater value on service quality and social endorsements than on mere ease of use. Additionally, the findings underscore the importance of facilitating conditions in the OFD sector, indicating that systemic support and infrastructure, like payment systems, delivery logistics, and customer service, play a crucial role in sustaining the use of OFD services.
The Moderating Role of Health Consciousness

Previous research has extensively explored various moderating and mediating effects in the domain of consumer behavior, with a particular focus on health consciousness as a pivotal moderating variable. Studies such as those by Ali and Ali (2020), Naruetharadhol et al. (2023), and Suttikun (2023) have underscored the critical role of health consciousness in influencing dietary choices and technology acceptance behaviors. These works suggest that health-conscious consumers prioritize not only the quality and healthiness of products but also the efficiency and transparency of the delivery platforms. However, the relationship between health consciousness and technology acceptance factors such as effort expectancy and facilitating conditions appears to be complex and segment-specific, indicating a nuanced interplay between consumer values and technological features.

In exploring the moderating role of health consciousness within the OFD service, the findings indicate that the interaction effects between health consciousness and performance expectancy, as well as health consciousness and social influence, are significant but negatively associated with the continuous intention to use OFD services. While the moderating role of health consciousness adds a new dimension to our study, the nuanced impact of this factor on various UTAUT constructs requires further exploration. Health consciousness may significantly alter the consumer’s evaluation of performance expectancy. Specifically, consumers with heightened health awareness are likely to assess online food delivery services not only on their operational efficiency but also on their ability to meet health-specific criteria, such as offering nutritious and safe food options. This suggests that Vietnamese consumers with higher health consciousness engage in more critical evaluations of OFD services, affecting their continuous usage intentions. Vietnamese consumers are increasingly prioritizing health-conscious decisions, reflected in their preference for healthier food options, transparent ingredient sourcing, and adherence to sustainable and ethical food production practices. This trend aligns with broader lifestyle changes and an enhanced awareness of dietary health implications (Naruetharadhol et al., 2023; A. T. Tran et al., 2020). Paradoxically, this awareness may lead to more critical evaluations and potentially decreased usage if these expectations are not fully met.

Similarly, the interplay between social influence and health consciousness significantly impacts the usage intentions of OFD services. Social influence might be affected as consumers with high health consciousness could be more susceptible to the opinions of health-focused peers and social networks. This finding implies that, when health consciousness is integrated into this societal framework, there were no such relationships among factors for the health-conscious consumers. In Vietnam, where family and community bonds are strong, preparing meals at home is often seen as an expression of care and concern for family members’ well-being (Cong et al., 2013). Consequently, even when OFD services provide healthy food options, the ingrained cultural preference for home-cooked meals can influence consumer decisions, potentially leading to reduced reliance on OFD services. This insight into the role of social influence highlights the importance for OFD service providers to not only understand but actively integrate health considerations into their service offerings and marketing strategies. It indicates that fostering a positive social perception around the healthfulness and ethical sourcing of their offerings could be crucial in maintaining and enhancing customer loyalty and usage intentions in health-conscious consumer segments. This analysis would provide valuable insights for OFD service providers aiming to cater more effectively to health-conscious consumers, potentially improving customer satisfaction and loyalty.

Theoretical Implications

This study advances the UTAUT framework by incorporating health consciousness as a significant moderator, demonstrating that health-related factors can negatively affect the relationship between performance expectancy and social influence and continuance usage intentions. The research provides insight into how individual health values reshape technology adoption, indicating a move towards more personalized and value-driven user interactions with technology. Furthermore, the study underscores the necessity for UTAUT to be responsive to the subtleties of cultural and social contexts, as evidenced in the Vietnamese context where traditional practices like home cooking significantly influence technology acceptance patterns. This suggests a broader, more dynamic framework for understanding technology adoption, where personal health priorities and cultural values are integral to the model.

Practical Implications

This study’s insights emphasize critical practical implications for OFD service providers, highlighting the necessity of embedding health-conscious elements within their service offerings to appeal to the health-oriented consumer segment. Personalization of services, with an emphasis on the quality, transparency, and nutritional value of food options, becomes imperative. Additionally, OFD platforms are encouraged to enhance their marketing and communication strategies to foreground the health and quality dimensions of their offerings, a move that is particularly pertinent in health-aware markets such as Vietnam. Effective communication concerning food sourcing, the food preparation process, and nutritional content can be instrumental in shaping consumer preferences and decisions. Additionally, given the cultural preference for home-cooked meals, OFD services should explore ways to mimic this experience, possibly by offering fresh, locally sourced ingredients, meal kits for home cooking, or partnerships with local chefs to deliver authentic and wholesome food options, thus aligning their business practices with the local cultural and health preferences.

Conclusion

In conclusion, this study significantly enriches the UTAUT model by introducing health consciousness as a pivotal factor influencing OFD service adoption. The findings reveal that health consciousness critically moderates the impact of performance expectancy and
social influence on continuous usage intentions, highlighting the importance of health-related criteria in consumer evaluation processes. Particularly in Vietnam, cultural practices and health perceptions deeply influence consumer behaviors, underscoring the need for OFD services to integrate health-conscious elements into their offerings to meet evolving consumer preferences. Additionally, this research provides valuable insights into the complex interplay between technology acceptance and cultural factors, suggesting that OFD platforms must prioritize nutritional quality and transparency to foster customer loyalty and enhance service adoption. By aligning their marketing and operational strategies with the health priorities and cultural values of their target audience, OFD providers can more effectively serve a market that values both tradition and health. These findings offer a novel perspective for demonstrating how personal health priorities and cultural values can redefine user interactions with technology, promoting more personalized and health-oriented service offerings in the digital age.

Limitations and Future Study

This study has several limitations that should be acknowledged. Firstly, the geographical focus on Vietnam limits the generalizability of the findings to other countries or regions. The cultural, economic, and technological factors influencing online food delivery (OFD) services may vary significantly across different contexts, and thus, the results may not be applicable to consumers outside of Vietnam. Additionally, by centering on health consciousness, it may overlook other influential factors like economic conditions, technological infrastructure, and digital literacy. Its cross-sectional design also constrains the understanding of evolving consumer behaviors and market dynamics.

To address these limitations, future research could adopt a longitudinal design to track changes in consumer behavior and attitudes towards OFD services over an extended period. Such studies would provide deeper insights into the factors driving sustained use and the long-term impact of OFD services on consumer behavior. Additionally, experimental approaches could be employed to examine the causal relationships between specific variables and OFD service adoption. For example, controlled experiments could investigate how changes in platform features, promotional strategies, or external factors (such as health concerns) influence consumer decisions and usage patterns. Moreover, expanding the geographical scope of future studies to include multiple countries or regions would enhance the generalizability of the findings and allow for cross-cultural comparisons. This would provide a more comprehensive understanding of the global OFD market and the diverse factors influencing consumer behavior across different contexts.

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References


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