A path analysis of factors that influence acceptance of online food ordering systems among Davao City customers

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ABSTRACT

This study examines the factors influencing the acceptance of online ordering systems among consumers in Davao City, focusing on the variables of personal IT innovativeness, social influence, user convenience, and system quality. Using the Technology Acceptance Model (TAM) as a theoretical framework, the research identifies how these factors affect perceived ease-of-use, perceived usefulness, and overall user attitudes toward online food ordering applications. A sample of 367 respondents, selected based on their use of online food ordering platforms such as GrabFood and FoodPanda, participated in this study. Path analysis was employed to determine the causal relationships between the independent variables and their impact on user acceptance. Results show that system quality and perceived usefulness are the most significant determinants of positive user attitudes, followed by social influence and personal IT innovativeness. The study reveals that users' perception of ease and functionality plays a crucial role in fostering the adoption of these technologies, providing valuable insights for businesses looking to improve their online food ordering platforms. The findings also highlight the need for further technological and service improvements to enhance consumer satisfaction and long-term loyalty in the competitive online food delivery market.

1. Introduction

The global pandemic functioned as a profound catalyst, dramatically accelerating the digital transformation of the food service industry and compelling a mass migration of both businesses and consumers to online platforms (Chowdhury et al., 2022). This period of necessity spurred a significant shift in consumer behavior, characterized by an increased demand for meals and snacks that offered maximum convenience and speed through technological interfaces. This burgeoning digital marketplace, however, is not without its significant challenges. Persistent consumer apprehension, driven by concerns over unsecured payments, slow delivery, and various technological friction points,

remains a critical barrier to seamless adoption and can lead to profound dissatisfaction with the product, platform, or brand.

This global phenomenon is distinctly evident in the Philippine context, where Online Food Ordering Systems (OFOS) like GrabFood and FoodPanda have become ubiquitous. These platforms represent an evolution in the shared economy model, fundamentally altering restaurant distribution channels and requiring robust, user-friendly retail interfaces. Technologically, these systems are innovations that enable consumers to place orders via websites or mobile apps for seamless delivery, a service that became indispensable and accelerated adoption across diverse user segments (Ali et al., 2021; Ganapathi & Abu-Shanab, 2020; Ray et al., 2019; Chai & Yat, 2019). The scale of this shift is substantial; The World Bank's (2020) Philippines Digital Economy Report estimated that 76 million Filipinos used online technologies, a trend fueled by expanding broadband access that has spurred the growth of electronic services, particularly in commerce. This suggests the Philippine market is actively joining the mobile commerce movement.

Despite this high internet penetration, a notable paradox emerges: digital adoption in the Philippines, especially in e-commerce and online ordering, generally lags behind regional neighbors like Thailand, Singapore, Brunei, and Malaysia (World Bank Philippines, 2020). This gap underscores the critical need to investigate the specific determinants of technology acceptance within this unique market. The rapid adoption has also intensified pressure on platforms to enhance system usability, ensure customer satisfaction, and deliver consistently safe services amid rising consumer expectations (Keeble et al., 2020; Pinto, Hawaldar, & Pinto, 2021; Mehrolia, Alagarsamy, & Solaikutty, 2020).

Against this backdrop, a critical research imperative emerges: understanding the precise drivers of adoption and continued use of OFOS. The literature points to a confluence of psychological, social, and system-level factors. A key psychological driver is personal innovativeness, where consumers with a higher propensity to try new technologies are more likely to be early and repeat users (Ciftci, Berezina, & Kang, 2021). This internal trait intersects with powerful external forces, particularly social influence, which acts as a behavioral heuristic that shapes preferences, perceived credibility, and digital consumption habits through peer feedback and social pressure (Epstein et al., 2021; Ikhsan, 2020; Argo & Dahl, 2020).

Concurrently, the technological attributes of the systems themselves are paramount. Studies consistently show that perceptions of system quality, ease of use, and usefulness are foundational to forming favorable user behaviors (Xin et al., 2023; Lee et al., 2019). Ease of use functions as a critical gateway by reducing learning curves, while system quality builds trust through performance reliability (Wilson, Alvita, & Wibisono, 2021; Indriyarti & Wijihastuti, 2021). Furthermore, perceived usefulness—the instrumental value derived from time savings and reduced effort—is a strong predictor of adoption (Iriani & Andjarwati, 2020; Suleman et al., 2020; Islami, Asdar, & Baumassepe, 2021). These multifaceted factors ultimately coalesce to shape a user's attitude toward using the technology. This attitude is a synthesis of internal predispositions, external social cues, and tangible system experiences, and is further influenced by branding and subjective norms (Alalwan, 2020; Hebbar et al., 2020; Haase, Wiedmann, & Bettels, 2020). As a central construct in technology acceptance models, attitude mediates the relationship between technological and psychological inputs and

behavioral outcomes like purchase intention. Nevertheless, this construct remains underexplored within the culturally and economically nuanced context of Philippine consumers, and a significant gap exists in researching consumer acceptance and behavior specific to these platforms (Gunden, Morosan, & DeFranco, 2020).

Therefore, this study seeks to address this gap by proposing an integrative model to investigate the path relationships among personal innovativeness, social influence, system quality, user convenience, and attitude toward usage in Davao City, a key urban center in the southern Philippines. The findings will provide a concrete, evidence-based framework for local businesses and platform developers to enhance user experience and for policymakers to foster a more robust digital economy, directly addressing the unique adoption challenges within the Philippine market.

2. Theoretical Basis

This research is fundamentally based on Davis's (1985) Technology Acceptance Model (TAM), a seminal paradigm for comprehending user adoption of information systems. The original Technology Acceptance Model asserts that a person's intention to utilize a system is influenced by their attitude towards its utilization. This disposition is influenced by two fundamental perceptual beliefs: perceived usefulness, which refers to the extent to which an individual believes that utilizing a system would improve their performance, and perceived ease of use, which denotes the extent to which an individual believes that utilizing a system will require minimal effort. A fundamental principle of the approach is that usability significantly impacts perceived usefulness.

The theoretical foundations of TAM are additionally reinforced by the Theory of Reasoned Action (TRA), developed by Fishbein and Ajzen (1975). TRA offers an expansive perspective on social psychology, positing that an individual's actual behavior is directly forecasted by their behavioral intention. This intention is a result of the individual's personal disposition towards the activity and the perceived subjective norms—social pressures from significant persons over the performance of the conduct. This integration emphasizes that technology adoption is not solely an individual assessment but is also influenced by the user's social context.

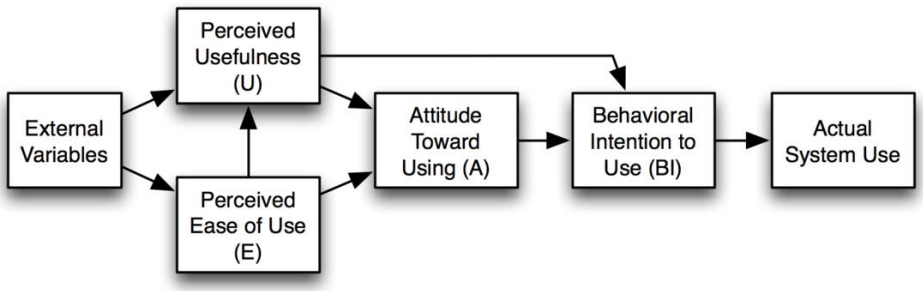

Figure 1. *The adopted conceptual paradigm of the study*

This research used a modified Technology adoption Model (TAM) framework to examine the adoption of online food ordering systems, guided by established theories. The conceptual model depicted in Figure 1 identifies four exogenous variables—personal IT innovativeness, social influence, user convenience, and system quality—as direct precursors to the fundamental TAM constructs of perceived ease of use, perceived utility,

and attitude toward system utilization. The mediators are subsequently modeled to result in the final endogenous variable: behavioral intention to use, which acts as the principal metric of technological acceptance. This methodical methodology enables the research to methodically assess user perceptions, analyze their interconnections, and pinpoint the most significant pathways affecting consumer acceptance in the local context.

3. Methodology

3.1 ***Participants***

Research participants for this study were Davao City consumers who have food ordering mobile applications in their smartphones. These customers were at least 18 years old, has been using any mobile food ordering applications for at least six months, are residents or has stayed in Davao City for that same duration, and have made at least ten (10) orders in the past three (3) months; otherwise, they are not qualified to participate in the study. Participants who qualified and opts not to participate in the study can withdraw before or during the actual response without penalty of consequence. In terms of sampling, simple random sampling with predetermined time duration was used, since the manner of data collection was random targeting of respondents (Bradley, 1999). Meta's sponsored or boosted ads can predefine location radius and respondents can be randomly targeted. A total of 367 respondents (95% confidence level and 5% margin of error) responded within a window of 30 days of online data collection covering Davao City.

3.2 ***Materials or Instruments***

This study utilized a set of established measurement scales to capture the constructs under investigation. Personal IT innovativeness was measured using the four-item scale of Agarwal and Prasad (1998), which represents one dimension of their two-factor model, with the second dimension (computer playfulness) excluded given the study's focus on innovativeness in the domain of information technology. Responses were rated on a five-point Likert scale, with higher scores indicating stronger manifestations of personal IT innovativeness. Social influence was measured using the 42-item instrument developed by Stibe and Cugelman (2019), which encompasses seven dimensions—social learning, social comparison, social norms, social facilitation, social cooperation, social competition, and social recognition—each consisting of six items. Similarly, client convenience was assessed through the 17-item Service Convenience (ServCon) scale of Aagja, Mammen, and Saraswat (2011), covering five dimensions: decision, access, benefit, transaction, and post-benefit convenience. System quality was measured using the 13-item scale of Halawi, McCarthy, and Aronson (2008), which captures respondents' perceptions of the technical and functional quality of the system.

In line with the Technology Acceptance Model (TAM), perceived ease of use and perceived usefulness were measured using the six-item scales of Davis (1989). Attitude towards use was assessed through the nine-item utilitarian version proposed by van der Heijden and Sørensen (2003), which evaluates respondents' evaluative orientation toward using the system. Finally, acceptance of the mobile food ordering system was measured using a single item, originally formulated as a seven-point Likert measure but revised to a five-point scale for consistency across constructs. In all cases, the Likert

scale ranged from 1 (very low) to 5 (very high), with gradations corresponding to the frequency or intensity with which the attribute was manifested (e.g., rarely, occasionally, often, or always).

Prior to full administration, both content validation and reliability testing were conducted. Content validation involved expert review, while internal consistency was examined using Cronbach's alpha and McDonald's omega coefficients. Results confirmed acceptable to excellent reliability across most constructs, thereby ensuring the robustness of the measurement instruments.

3.3 ***Data Collection***

The study used the descriptive-correlational research approach and employed both correlation and path analyses in testing for the hypotheses of the study. Upon establishing the readiness and acceptability of the survey questionnaire and contingent to UMERC approval (UMERC Protocol # 2024-284), collection of the necessary data commenced online through boosting of sponsored post/ads dependent on the geographic radius and inclusion criteria of target respondents. The online survey was made available to targeted respondents in the Meta platform (Facebook and Instagram) for 30 days or until the dataset has sufficient responses. After the data collection period, collated responses in Google Forms were extracted and cleaned before exporting to IBM-SPSS software for descriptive and preliminary inferential statistical analysis. Final modelling procedure was performed via IBM-AMoS 8.0 software. Results were then be interpreted and discussed to address the objectives of the study.

4. Result and Discussion

4.1. Results

4.1.1. ***Descriptive Statistics: External Variables***

Table 1 reports means and standard deviations for external variables influencing acceptance of mobile food ordering applications. All variables were rated at a high descriptive level. Social influence had the highest mean (M = 3.92, SD = 0.643). System quality was also highly rated (M = 3.81, SD = 0.561). Personal IT innovativeness and user convenience both had means of 3.60. Within user convenience, transaction convenience was highest (M = 3.67, SD = 0.740), while post-benefit convenience was comparatively lowest yet still high (M = 3.57, SD = 0.874).

Table 1. *Descriptive statistics for external variables affecting acceptance of mobile food ordering applications*

Variable	$\bar{x}$	SD	Descriptive level
Personal IT innovativeness	**3.60**	**0.786**	**high**
Social influence	**3.92**	**0.643**	**high**
User convenience (overall)	**3.60**	**0.637**	**high**
— *Decision convenience*	3.51	0.741	high
— *Access convenience*	3.62	0.757	high
— *Benefit convenience*	3.61	0.763	high
— *Transaction convenience*	3.67	0.740	high
— *Post-benefit convenience*	3.57	0.874	high
System quality	**3.81**	**0.561**	**high**

Note. Higher values indicate stronger positive perceptions.

4.1.2 ***Descriptive Statistics: TAM Variables***

As shown in *Table 2*, all Technology Acceptance Model (TAM) variables were rated high. Attitude toward use was highest (M = 4.14, SD = 0.683), followed by perceived usefulness (M = 3.84, SD = 0.673) and perceived ease-of-use (M = 3.30, SD = 0.538).

Table 2. *Descriptive statistics for TAM variables*

Variable	$\bar{x}$	SD	Descriptive level
Perceived ease-of-use	3.30	0.538	high
Perceived usefulness	3.84	0.673	high
Attitude toward use	4.14	0.683	high

4.1.3 ***Descriptive Statistics: Acceptance of Use***

Table 3 indicates high overall acceptance of mobile food ordering applications (M = 4.12, SD = 0.824).

Table 3. *Descriptive statistics for acceptance of mobile food ordering applications*

Variable	$\bar{x}$	SD	Descriptive level
Acceptance of use	4.12	0.824	High

4.1.4 ***Correlations with Acceptance***

As reported in *Table 4*, acceptance was significantly and positively correlated with all predictors examined: personal IT innovativeness ($r = .409$, $p < .001$), social influence ($r = .315$, $p < .001$), user convenience ($r = .374$, $p < .001$), system quality ($r = .592$, $p < .001$), perceived ease-of-use ($r = .292$, $p < .001$), perceived usefulness ($r = .528$, $p < .001$), and attitude toward use ($r = .610$, $p < .001$).

Table 4. *Bivariate correlations with acceptance of use*

Predictor	r with Acceptance	p
Personal IT innovativeness	.409**	< .001
Social influence	.315**	< .001
User convenience	.374**	< .001
System quality	.592**	< .001
Perceived ease-of-use	.292**	< .001
Perceived usefulness	.528**	< .001
Attitude toward use	.610**	< .001

Note. **p** values are two-tailed. ** indicates $p < .001$.

4.1.5 ***Path Analysis***

The final path model estimates are summarized in *Table 5* and displayed in Figure 2. Among exogenous paths to perceived ease-of-use, social influence ($\beta = 0.136$, $p = .028$) and system quality ($\beta = 0.403$, $p < .001$) were positive and significant, whereas user convenience was negative ($\beta = -0.187$, $p = .006$); personal IT innovativeness was not significant ($\beta = -0.032$, $p = .535$). For perceived usefulness, personal IT innovativeness ($\beta = 0.153$, $p = .002$), user convenience ($\beta = 0.135$, $p = .045$), and system quality ($\beta = 0.634$, $p < .001$) were significant; social influence was not ($\beta = -0.072$, $p = .233$). The path from perceived ease-of-use to perceived usefulness was marginal ($\beta = 0.128$, $p = .062$). For attitudinal outcomes, perceived usefulness ($\beta = 0.424$, $p < .001$), social influence ($\beta = 0.188$, $p = .002$), and system quality ($\beta = 0.279$, $p = .002$) significantly predicted attitude toward use, whereas perceived ease-of-use did not ($\beta = 0.111$, $p =$

.100). Finally, attitude toward use (β = 0.556, p < .001) and perceived usefulness (β = 0.280, p = .002) significantly predicted acceptance.

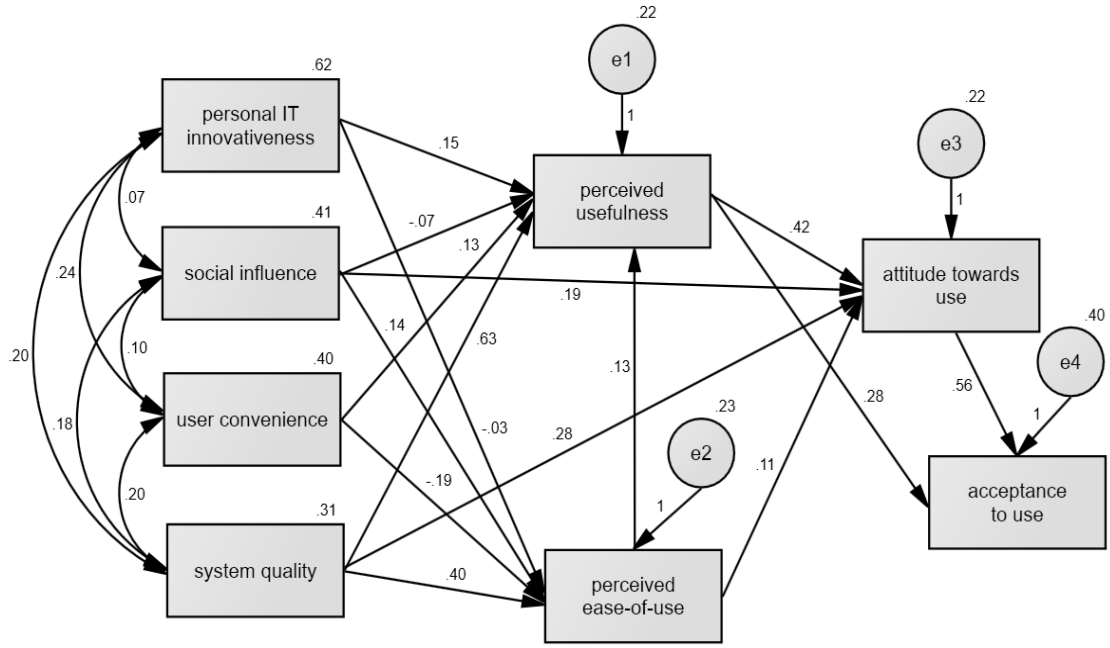

Figure 2. *Final path model showing the causal relationships of the external variables, perceived ease-of-use, perceived usefulness, attitude towards use, and acceptance of use of mobile food ordering applications*

Table 5. *Final path analysis results (standardized estimates)*

Path	β	SE	CR	p
PITI → EASE	−0.032	0.052	−0.621	.535
SOC → EASE	0.136	0.062	2.200	.028**
USCONV → EASE	−0.187	0.068	−2.734	.006***
SYSQUAL → EASE	0.403	0.086	4.710	< .001***
PITI → USEFUL	0.153	0.050	3.057	.002***
SOC → USEFUL	−0.072	0.061	−1.193	.233
USCONV → USEFUL	0.135	0.067	2.004	.045**
SYSQUAL → USEFUL	0.634	0.087	7.271	< .001***
EASE → USEFUL	0.128	0.069	1.863	.062*
EASE → ATTI	0.111	0.068	1.644	.100
USEFUL → ATTI	0.424	0.069	6.195	< .001***
SOC → ATTI	0.188	0.061	3.068	.002***
SYSQUAL → ATTI	0.279	0.092	3.045	.002***
ATTI → ACCEPT	0.556	0.087	6.382	< .001***
USEFUL → ACCEPT	0.280	0.083	3.362	.002***

Note. PITI = Personal IT innovativeness; SOC = Social influence; USCONV = User convenience; SYSQUAL = System quality; EASE = Perceived ease-of-use; USEFUL = Perceived usefulness; ATTI = Attitude toward use; ACCEPT = Acceptance. * p < .10 (marginal); ** p < .05; *** p < .01.

4.2. Discussion

The findings highlight that external factors such as social influence, system quality, user convenience, and personal IT innovativeness all contribute positively to the

acceptance of mobile food ordering systems. Among these, social influence emerged as the most salient factor, emphasizing the strong role of peer recommendations, endorsements, and social networks in shaping adoption decisions. This is consistent with previous research showing that in collectivist societies, individuals are heavily guided by social validation in adopting digital innovations (Okumus et al., 2018; Pitchay et al., 2021). System quality also proved highly influential, suggesting that users expect mobile food ordering applications to be reliable, efficient, and technically robust. These results echo studies demonstrating that technical performance and system reliability significantly enhance user trust and satisfaction in digital services (Wu, 2022; Hussein & Mansour, 2020).

Convenience was also rated highly, with transaction convenience—particularly the ease and security of payments—being most valued. Prior research confirms that customers place high importance on seamless ordering and payment processes, which often drive repeat use (Anjana, 2020; Gopal, 2023). Post-benefit convenience, while slightly less emphasized, still held importance, indicating that users appreciate after-sales support such as refunds or follow-up services, albeit to a lesser extent. Collectively, these findings reinforce that acceptance is shaped not only by technological capability but also by users' everyday social and transactional experiences.

Results from the Technology Acceptance Model (TAM) dimensions demonstrate that perceived ease-of-use, perceived usefulness, and especially attitude toward use were all rated positively. Attitude toward use emerged as the strongest dimension, suggesting that overall user sentiment toward mobile food ordering applications is highly favorable. This indicates that once users perceive benefits and form positive attitudes, their likelihood of adopting and continuously using these applications increases significantly. These outcomes align with prior evidence that both ease-of-use and usefulness influence user evaluations, but attitudes are the most powerful driver of behavioral intentions (Dirsehan & Cankat, 2021). The findings further suggest that while usability and functionality are critical, what ultimately sustains acceptance is a favorable overall evaluation of the system.

Acceptance of mobile food ordering applications was found to be widespread and favorable, reflecting the integration of these platforms into everyday consumer routines. This strong receptivity mirrors findings in other contexts where mobile food applications have become integral due to their convenience, efficiency, and practical benefits (Dirsehan & Cankat, 2021; Saxena & Gupta, 2020; Akram et al., 2020). The moderate variability among responses suggests that while enthusiasm is generally high, some users may adopt these systems more cautiously due to individual factors such as technological familiarity or lifestyle. Nonetheless, the overall high acceptance indicates that the market in Davao City is well-positioned for further growth in mobile food ordering adoption, provided that applications continue to deliver consistent value and meet user expectations.

The correlational findings underscore the importance of both external and TAM-related variables in influencing acceptance. System quality and user attitudes emerged as the strongest correlates, reinforcing the idea that technological performance and

favorable perceptions are decisive factors in shaping consumer behavior. This is in line with prior work showing that reliable systems and positive user attitudes drive continued adoption in food ordering and other mobile services (Wu, 2022; Hussein & Mansour, 2020; Aziz, 2022).

Perceived usefulness was also strongly associated with acceptance, affirming that when consumers see tangible benefits such as time-saving, convenience, and access to diverse food options, they are more likely to adopt these applications (Atulkar & Singh, 2021; Chung et al., 2022; Kim, 2023). By contrast, perceived ease-of-use, while still relevant, showed a comparatively weaker link to acceptance. This suggests that once usability reaches a basic threshold, it is system quality and usefulness that drive longer-term adoption (Baguio et al., 2020).

Social influence also played a significant role, reflecting the importance of collectivist cultural norms in the Philippine context, where peer recommendations and group validation strongly influence behavior (Pitchay et al., 2021). Similarly, convenience features continued to demonstrate their importance in shaping adoption, as highlighted in studies emphasizing ease and accessibility as key drivers of satisfaction and acceptance (Anjana, 2020; Gopal, 2023).

Finally, the path analysis further clarifies the mechanisms by which external and TAM variables affect acceptance. System quality was the most consistent predictor across multiple pathways, shaping perceptions of both ease-of-use and usefulness, and also influencing attitudes. This reinforces the view that technical robustness and interface quality are indispensable for shaping positive user experiences (Fearnley & Amora, 2020; de Carvalho et al., 2023). Social influence had notable effects on ease-of-use and attitudes, suggesting that endorsements from peers and social circles not only make applications feel easier to use but also strengthen favorable evaluations. Prior studies have shown similar patterns, where social validation helps reduce perceived complexity and fosters trust in digital systems (Okumus et al., 2018; Vorm & Combs, 2022).

User convenience showed an interesting dual effect: while it enhanced perceptions of usefulness, it appeared to reduce perceptions of ease-of-use. This may indicate that highly convenience-oriented users set higher standards, and when apps do not meet these expectations, usability is judged more harshly. Such dynamics have been observed in prior research, where convenience expectations heighten scrutiny of system usability (Wardana et al., 2022; Chowdhury, 2023). Meanwhile, personal IT innovativeness shaped perceived usefulness but did not affect ease-of-use, implying that innovativeness helps users appreciate functional benefits but does not necessarily reduce the cognitive effort required to use the system. This reflects mixed findings in the literature, with some studies suggesting that innovativeness improves perceptions of ease, while others highlight the greater role of design and trust in usability (An et al., 2023; Alsabban & Najmi, 2023).

Finally, perceived usefulness emerged as the strongest determinant of both attitudes and acceptance, underscoring that tangible benefits are central to adoption. When users find the system functionally valuable, their attitudes improve, and this directly translates to higher acceptance. These findings are supported by prior studies that

link perceived usefulness with satisfaction, trust, and loyalty in mobile food platforms (Garas, 2021; Al Amin & Arefin, 2020; Bussaban et al., 2022; Su, 2022). Attitude itself was also a powerful predictor of acceptance, aligning with TAM and reinforcing that favorable user evaluations are critical to successful adoption (Inthong et al., 2022; Anggraeny & Baihaqi, 2021).

5. Conclusions and Recommendations

This study shows that the acceptance of mobile food ordering applications in Davao City is mostly influenced by social factors, superior system quality, user ease, and a pronounced perception of utility. Although these aspects are important, social validation and the technological reliability of an application stand out as the most influential external catalysts for adoption. The results confirm that users cultivate a favorable disposition and intention to utilize an application when they recognize distinct practical advantages and are swayed by their social networks. While simplicity of use is significant, its direct influence is subordinate to the app's perceived value and performance.

To facilitate acceptance, it is advisable for developers and marketers to focus on two principal areas. Initially, substantial expenditure must be allocated to guarantee superior system quality, emphasizing a fluid, error-free user interface and dependable transaction operations. Secondly, marketing techniques must to utilize social proof via peer endorsements and testimonials to establish trust and reduce adoption obstacles. Moreover, enhancing post-purchase convenience features such as delivery monitoring and loyalty programs can augment perceived utility and customer retention, ultimately cultivating a more favorable and lasting disposition toward the platform.

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NO CONFLICT OF INTEREST STATEMENT

All authors declare that they have no conflict of interest.

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