

Gen-Z's Intention to Use Crowd Logistics in Dhaka: An Integrated UTAUT–UTAUT2–SET Framework

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Abstract: This study investigates factors shaping Gen-Z's intentions to adopt crowd logistics (CL) in Dhaka, Bangladesh, by integrating UTAUT, UTAUT2, and SET to capture both technological and behavioral drivers. Using a cross-sectional convenience sample of 202 Gen-Z respondents (surveyed between June and August 2025), constructs were measured on 5-point Likert scales and analyzed with PLS-SEM in SmartPLS4 employing a 5,000-resample bootstrapping procedure. The integrated model explained 73.5% of the variance in intention ($R^2 = 0.735$). Results show autonomy, effort expectancy, performance expectancy, price value, and trust significantly and positively predict intention to use CL, while hedonic motivation and perceived risk, although not significantly, negatively predict intention to use CL. Research findings indicate that Dhaka's Gen-Z approach CL in a pragmatic way that prioritizes control, ease of use, tangible performance gains, and value for money over enjoyment or risk concerns. Practically, CL platforms can foreground user control, seamless UX, transparent pricing, and baseline trust mechanisms; policymakers can support uptake via regulatory clarity, digital infrastructure, and sustainability alignment. The paper advances theory to provide explanations in an evolving economy by integrating perspectives on social exchange and technology acceptance.

Keywords: Crowd logistics, UTAUT, UTAUT 2, SET, Gen-Z consumer, Dhaka

1. Introduction

Last-mile logistics accounts for roughly 30% of CO₂ emissions in the logistics sector and is projected to grow by 78% by 2030, exacerbating congestion, noise, and urban air pollution. These impacts sharpen the global sustainability imperative reflected in policy targets such as the EU Green Deal's 55% reduction in car emissions and 50% in vans by 2030 (Levrey, et al., 2025). At the same time, consumers' appetite for rapid, frequent small-parcel deliveries fueled

by e-commerce and expectations of near-instant service drives additional vehicle miles traveled, congestion, and emissions (Amaya et al., 2025). The twin pressures of rising demand and environmental constraints underscore the need for innovative, greener last-mile solutions.

One promising initiative is crowd logistics (CL). Conceptually, CL refers to an innovative, decentralized delivery model in which digital platforms connect senders with individuals who use their unused transport capacity to carry packages along routes they are already taking. By mobilizing distributed, idle resources via mobile apps and websites, CL aims to enhance efficiency and lower costs while aligning with sharing- and circular-economy principles (Hashem, 2025). In practice, CL may reduce carbon and congestion by optimizing routes and avoiding duplicate trips, with packages “picked up and delivered personally, often faster and at a lower cost than traditional couriers” (Hashem, 2025).

These sustainability and efficiency logics resonate acutely in Bangladesh. Consumers today are becoming increasingly conscious and careful of their purchase decisions (Jahan Holy et al., 2022). In urban logistics, CL’s ability to tap existing trips and digital coordination could complement these imperatives if platforms can deliver the reliability and trust that rising consumer standards require (Ahmed et al., 2024). Dhaka, a megacity of over 20 million residents with chronic gridlock, epitomizes last-mile strain: “congested roadways and gridlocked traffic arteries” routinely impede timely goods movement (DHL Bangladesh, 2025). Against this backdrop and amid national investments in ICT, over 120 million (mostly mobile) internet subscribers, and rapid e-commerce growth toward a projected \$15.4 billion by 2029, offer a fertile ground for CL models. Local platforms illustrate early momentum (e.g., Pathao’s bike-enabled courier network reaching all 64 districts), even as trust and risk concerns remain salient.

Within this evolving landscape, Gen Z represents a particularly consequential consumer segment. Defined as those born between 1997 and 2012, they have grown up amid rapid technological change; representing roughly one-third of the global population, they are marked by strong digital proficiency, innovative outlooks, and relatively high educational attainment, and are projected to shape future customer behavior (Vu & Nguyen, 2025). Their preferences in emerging markets already make them an attractive proposition for retailers: tech-savvy Gen Z consumers act quickly in streamlined online environments where selecting, purchasing, paying, and receiving services at the doorstep are straightforward and highly valued (Upadhyay et al., 2022). Taken together with Bangladesh’s evidence on logistics-driven satisfaction (Ahmed et al., 2024), cost-efficient student-based delivery models (Jawad et al., 2024), and pragmatic evaluations of new delivery technologies (Hai et al., 2023), Gen Z emerges as an apt and timely population through which to understand the adoption of CL in Bangladesh.

2. Research Gap and Objectives

2.1 Research Gap

Despite extant studies, important gaps remain in the literature. First, the majority of existing studies emphasize the supply side of crowd logistics, such as platform design, operational feasibility, or driver participation (Carbone et al., 2017; Frehe et al., 2017; Jawad et al., 2024; Hai et al., 2023), with far fewer focusing on the demand side, especially consumer adoption ((Hashem, 2025)). Second, where consumer perspectives are examined, they often reflect developed-country contexts, leaving emerging economies underrepresented. This is particularly relevant for Bangladesh, where digitally native Gen-Z consumers constitute a large and growing segment of e-commerce but have yet to be systematically studied. Third, while prior work has identified trust as a pivotal determinant of crowdshipping adoption (Cebeci et al., 2023), theoretical models rarely integrate technology acceptance frameworks (UTAUT and UTAUT2) with social exchange perspectives (SET) to account for relational drivers such as reciprocity, autonomy,

and perceived risk. Addressing these gaps provides both scholarly and practical value in understanding how young consumers in Bangladesh approach new last-mile solutions.

Against this backdrop, our study examines Gen Z, individuals born between 1997 and 2012 who have grown up amid rapid technological change. Representing nearly one-third of the global population, they are characterized by strong digital proficiency, an innovative outlook, and comparatively high levels of educational attainment (Vu & Nguyen, 2025). The evidence above indicates that consumers consistently reward reliable and convenient delivery, yet logistics actors still face uneven digital maturity. At the same time, crowd logistics and gig-based configurations are proving locally plausible, while sustainability objectives remain increasingly salient.

What remains underexplored is how Gen-Z consumers in an emerging-economy context form intentions to adopt CL when both instrumental technology drivers and social-exchange dynamics are in play. This paper, therefore, integrates the UTAUT, UTAUT2, and SET into a single framework tailored to CL. This framing aligns with global findings on the centrality of trust in crowdshipping (Cebeci et al., 2023) and with evidence that gendered experiences and safety concerns shape participation in real-time crowdsourced logistics (Zhang et al., 2024).

2.2 Study Objectives and Research Questions

To advance a demand-side understanding suited to Dhaka's conditions, this paper pursues four connected objectives that culminate in three questions.

- First, we reorient analysis from firms and drivers to Gen-Z consumers, evaluating CL adoption.
- Second, we utilize UTAUT, UTAUT2, and SET to capture instrumental and relational mechanisms.
- Third, we identify enablers and barriers, including performance expectancy, effort expectancy, hedonic motivation, price value, trust, autonomy, and perceived risk in the context of Dhaka.
- Fourth, we translate results into practice and policy, informing platform design, digital inclusion, and greener urban logistics (Ahmed et al., 2024; Fahim et al., 2024; Hai et al., 2024; Hai et al., 2023; Jawad et al., 2024).

From these aims flow three focused questions:

RQ1: How do UTAUT constructs like performance expectancy, effort expectancy, and perceived risk influence Gen-Z intentions to use CL?

RQ2: How do UTAUT2 factors, particularly hedonic motivation and price value, affect Gen-Z's intention to use CL?

RQ3: How do SET factors, especially trust and autonomy, shape Gen-Z participation in CL?

In sum, Bangladesh's e-commerce trajectory, uneven digitalization, exploratory gig models, and sustainability priorities collectively motivate a consumer-centric, multi-theory examination of CL adoption. By centering Gen-Z and modeling both technology-acceptance and social-exchange pathways, this study aims to generate actionable insight for platforms and policymakers seeking reliable, inclusive, and sustainable last-mile solutions (Ahmed et al., 2024; Fahim et al., 2024; Hai et al., 2024; Hai et al., 2023; Jawad et al., 2024).

3. Theoretical Framework

3.1 Unified Theory of Acceptance and Use of Technology (UTAUT)

UTAUT was proposed as integrative of eight earlier adoption theories and suggests that behavioral intention to utilize technology is directly affected by four core constructs (Venkatesh et al., 2003). Within the context of logistics crowds, UTAUT's focus on expected outcomes and ease of use provides theoretical support for choosing performance expectancy and effort expectancy as primary antecedents of Gen-Z users' intention to adopt the service.

3.1.1 Performance Expectancy (PE) and Gen-Z's intention to use CL

PE, according to UTAUT, is how far an individual is able to achieve their goals as they utilize a system. In this study, PE is a statement of Gen-Z users' belief that crowd logistics (CL) will enhance their efficiency and reliability to achieve delivery-related tasks.

Kapser and Abdelrahman (2025), in a sample of 501 German respondents, found that PE had a strong influence on users' intention to adopt new delivery practices in last-mile logistics. Yuen et al. (2024) conducted research with 500 individuals in Singapore and established that PE strengthened customer loyalty to crowdsourced delivery platforms.

Similarly, Alhothali et al. (2024), in their survey of 323 Saudi Arabian users, observed that PE had a significant impact on users' attitudes towards last-mile logistics solutions. Yuen et al (2023), in a survey of 500 Singaporean respondents, observed that consumers' perceived value is greatly determined by the performance expectancy of crowdsourced delivery. Hashem (2025) also observed significant positive correlations between PE and users' attitudes towards the use of CL platforms in Egypt based on 432 responses.

Conversely, a few studies recognized PE to be statistically insignificant when it comes to its effect on behavioral intention (Singeh et al., 2013; Lian, 2015; Faraliza et al., 2014). Pobe (2021) also came up with the same finding for 522 Gen-Zs in Ghana.

Yet, as crowd logistics is a relatively new service in Dhaka, Gen-Z's performance-enhancing demands like speed, agility, and real-time monitoring can become a determinant in its adoption. Hence, this is the hypothesis:

H1: PE has a positive effect on Gen-Z's intention to adopt crowd logistics in Dhaka.

3.1.2 Effort Expectancy (EE) and Gen-Z's intention to use CL

EE is the ease of use of a system (Venkatesh et al., 2003). One of the fundamental axioms is that lower perceived effort raises an individual's intent to use a system (Ibrahim, 2020). However, its direct impact varies from context to context. A study on crowd logistics also created a positive relationship, wherein it was found that EE is a good predictor of adoption for consumers (Hashem, 2025). Likewise, studies on online food ordering apps deemed EE as a positive factor in users' everlasting intention to use the apps, emphasizing its role in long-term engagement (Ibrahim, 2020). Contrarily, however, a study of lockers conducted for parcels showed a different interplay; although EE did not explicitly influence behavioral intention, it was found to have a significant and supported relationship with the actual use of the lockers, suggesting its relevance becomes stronger under actual usage compared to preliminary consideration (Ramokoena, 2023).

Since CL is relatively new in Dhaka and app interfaces tend to vary, EE can remain a prominent determinant for Gen-Z adoption. Therefore, the following hypothesis is postulated:

H2: EE has a positive effect on Gen-Z's intention to adopt crowd logistics in Dhaka.

3.1.3 Perceived Risk (PR) and Gen-Z's intention to use CL

PR, being a significant inhibitor in the context of crowd logistics, has a strong and negative impact on the intention of a user to adopt and use such services (Hashem, 2025; Liu et al., 2024). This risk is a direct consequence of the decentralized nature of crowd logistics, a value co-creation system by which hundreds of ordinary people are entrusted with activities (Carbone et al., 2017). Empirical findings highlight that perceived risk is a critical driver for the adoption of CL, where customers are likely to use it when they think that their transactions are secure (Gharib, 2025).

Literature also suggests that this risk can be influenced by some factors; for instance, some shipment characteristics like being large or going to an out-of-state location can raise perceived risk among participants (Ermagun et al., 2019). Even though a high degree of trust in the service can significantly lower the perceived risk of a user (Hashem, 2025; Liu et al., 2024), risk can also be a negative moderator that lowers the positive effect of user satisfaction on continuous-use intention (Liu et al., 2024). Contrary to what would be expected, evidence on what determines private agents who conduct crowd logistics found that while there is perceived risk, it has a very weak but positive relationship with attractiveness, so that agents' incentives, such as the potential for career advancement, can outweigh what they see as risk (Ramanathan et al., n.d.).

Because Dhaka Gen-Z users are technology-literate but also cautious of crowd services, PR must be a dampener unless supported by some other element. Hence, the following hypothesis can be proposed:

H3: PR has a negative effect on Gen-Z's intention to adopt crowd logistics in Dhaka.

3.2 Unified Theory of Acceptance and Use of Technology 2 (UTAUT2)

UTAUT2 extends the UTAUT, originally developed for consumer environments, by maintaining the main constructs and introducing hedonic motivation (intrinsic pleasure), price value (economic cost–benefit), and habit (Venkatesh et al., 2012). These extensions recognize that, in the consumer context, intrinsic pleasure and perceived value often play a role in decisions about adopting something that goes well beyond utilitarian rationales (Venkatesh et al., 2012). Empirical examination of UTAUT2 indicated a large boost in explanatory power once hedonic motivation and price value were added (Venkatesh et al., 2012). For Gen-Z crowd logistics adoption, this means that, alongside the functionality-oriented motivators noted by UTAUT, hedonic motivation and price value are most likely significant determinants.

3.2.1 Hedonic Motivation (HM) and Gen-Z's intention to use CL

HM is the fun or enjoyment derived from service or technology use. When used in technology adoption models like UTAUT2, it is suggested as an important predictor of behavioral intentions (Venkatesh et al., 2012, p. 161). The belief is that Gen Z consumers, being natively digital, would adopt entertaining and fun platforms. Past research that has been conducted on sharing economy services supports this: for example, Hamari et al. (2016) concluded that enjoyment of experience was the strongest factor in why people engage in collaborative consumption. Simply put, the users are greatly motivated by the intrinsic enjoyment of experience, above and beyond practical advantages. Similarly, empirical evidence indicates hedonic dimensions will surpass utilitarian interests among young consumers; Koch et al. (2020) confirmed that fun and pleasure had a greater effect on Gen Y/Z consumers' online buying intentions

than functional utility. Such findings suggest that a crowd logistics (CL) platform, which offers the promise of a fun or rewarding user experience, can have a positive effect on Gen Z's adoption. In spite of these theoretical accounts, direct empirical data concerning hedonic motivation for Gen Z's adoption of crowd logistics in Bangladesh, more specifically, a youth-heavy, busy city like Dhaka, are still scarce. Existing literature documents that consumer drivers of CL are under-explored, and scholars suggest the existence of a gap that future research would fill. In keeping with the above argument, it can be hypothesized that:

H4: HM has a positive effect on Gen-Z's intention to adopt crowd logistics in Dhaka.

3.2.2 Price Value (PV) and Gen-Z's intention to use CL

PV is the user's judgment of whether or not the value of a service justifies its price. In technology adoption models, a good image of price-value, essentially a sense of "value for money," is a broad-based, established driver of intended use (Venkatesh et al., 2012, p.159). Cost-effectiveness is a major selling point in the context of crowd logistics. Studies note that crowd-based delivery services are cheaper and more economical than traditional logistics. For example, Rougès and Montreuil (2014) note that emerging crowdsourced delivery platforms seek to transform delivery by offering cost savings and dynamic pricing (p.5).

More broadly, research into participation in sharing economies finds that perceived economic value (e.g., cost savings) strongly motivates users (Hamari et al., 2016, p.2054). Empirical findings corroborate these hypotheses: in Bangladesh's economy, especially considering the Dhaka context, price value positively predicts adoption intention. An empirical research into ride-sharing found that a reasonable price trade-off led to greater intention to use the service (Bappy et al., 2020, p.95). Research in pharmaceutical logistics shows that optimizing delivery lead time, warehouse location, and transportation mode together improves efficiency, even at slightly higher costs (Sultana Mona, 2019). This suggests that in crowd logistics, ensuring coordinated and reliable deliveries can enhance customer adoption, as users value dependable service and may tolerate minor cost increases for it.

Even with this broad evidence, there is only very little direct research that solely isolates price value's impact on Gen-Z's crowd logistics adoption. This is acknowledged by Gharib (2025), who calls for future research into such financial influences in crowd logistics adoption for young consumers. The absence of Gen-Z-specific empirical findings on price value is a significant limitation. Hence, the following hypothesis can be proposed:

H5: PV has a positive effect on Gen-Z's intention to adopt crowd logistics services in Dhaka.

3.3 Social Exchange Theory (SET)

SET positions social interactions as reward-cost exchanges: individuals judge relationships by balancing advantages with efforts and tend to persist with interactions they judge rewarding (Cropanzano & Mitchell, 2005). Under this framework, constructs such as trust and autonomy may be defined as valuable rewards that induce contribution, wherein trust lowers perceived interpersonal and transaction risk, while autonomy offers control and intrinsic reward (Cropanzano & Mitchell, 2005). Empirical SET applications in crowds and crowdsourcing have pinpointed work autonomy and trust as critical positive predictors of participation (Ye & Kankanhalli, 2017). As applied to crowd logistics, SET thus provides support for incorporating trust and autonomy into predictors of Gen-Z users' intent to participate with and continue utilizing CL platforms.

3.3.1 Trust (TU) and Gen-Z's intention to use CL

TU is a critical part of the acceptance of crowd logistics, as participants must trust each other in order to be effective at their tasks (Gharib, 2025). Cited as "a state involving confident positive expectations about another's motives with respect to oneself in situations entailing risk" (Boon & Holmes, 1991, as cited in Gharib, 2025), trust has a major impact on users' intentions to participate in CL platforms. Empirical findings highlight that trust is a critical driver for the adoption of CL, where customers are likely to use it when they think that their data is secure (Gharib, 2025). Ahmed et al. (2024), for instance, quoted that trust-building mechanisms must be implemented on CL platforms targeting Gen-Z. Saha et al. (2023) suggested that poor communication, privacy breaches, and inconvenient delivery timing reduce customer trust and satisfaction. For crowd logistics in Dhaka, addressing these issues can increase user confidence and adoption, as customers are more likely to engage with platforms that protect their privacy and ensure product safety. However, the external validity of such findings could be in doubt as studies like Gharib's (2025) utilized convenience sampling of postgraduate students whose sentiments may not generalize CL user behavior. Hence, the following hypothesis can be proposed:

H6: TU in crowd logistics platforms positively influences Gen-Z's adoption intention in Dhaka.

3.3.2 Autonomy (AUT) and Gen-Z's intention to use CL

AUT is another main motivator of engagement in crowd logistics, particularly for the younger generation, like Gen-Z. Nguyen et al. (2023) determined that work autonomy, such as having the ability to select the delivery location and distance, has a great impact on crowdshippers' intentions to continue participating in last-mile delivery. Their study, founded on a 32-item questionnaire experimented with SmartPLS 4.0, brought to light that platforms that provide more job autonomy can generate long-term engagement. Bortolini et al. (2023) also reported that 55.5% of the surveyed individuals who would not otherwise use CL services were willing to register to become occasional drivers (ODs) if provided with a sense of autonomy. However, their examination of university students in Bologna limits its across-setting generalizability and suggests broader sampling (Bortolini et al., 2023). The results reaffirm autonomy as the prime mover for CL uptake but reveal contextual limitations. Hence, the following hypothesis can be proposed:

H7: AUT (from a consumer's perspective) positively influences Gen-Z's adoption intention toward crowd logistics platforms in Dhaka.

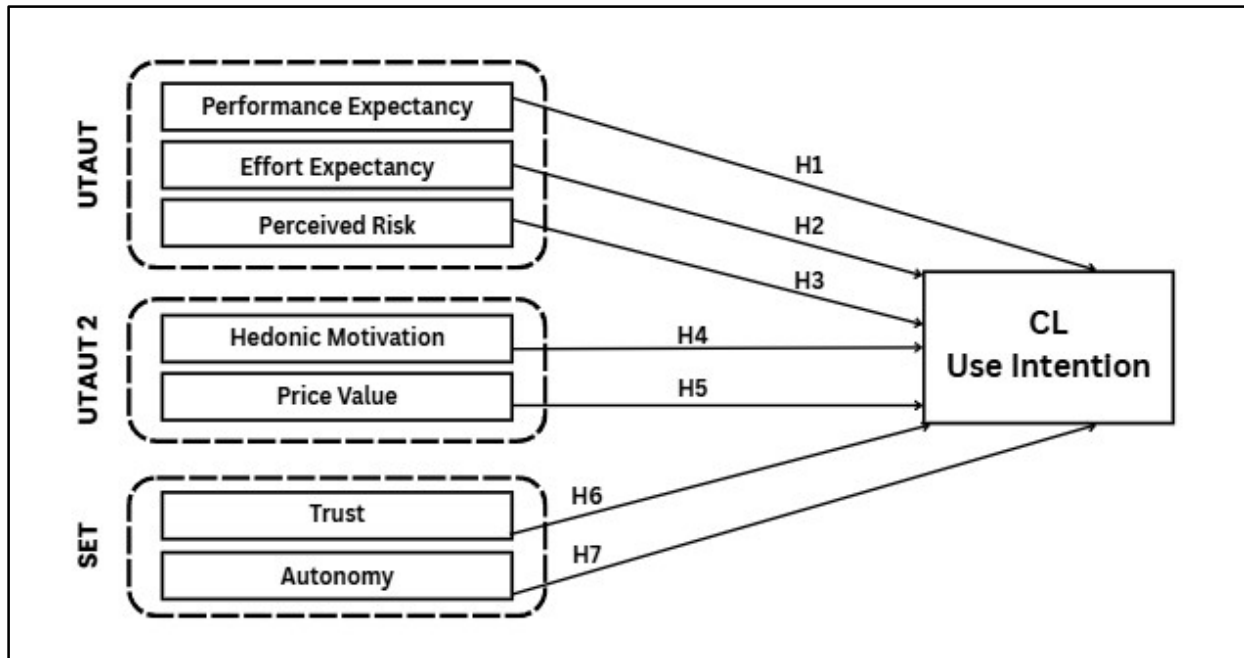


Fig. 1. The research model (Authors' work)

4. Methodology

4.1 Data Collection

Given the limited data on CL adopter communities and the scarcity of prior studies exploring the determinants of their behavioral intentions, the study employed a nonprobability convenience sampling method. To collect data, a cross-sectional research design was adopted, utilizing a structured questionnaire, an approach widely practiced in social research.

Convenience sampling is justifiable for several reasons. It is widely used in organizational and social research, and in this study, a full sampling frame could not be developed due to limited information on CL adopters in Bangladesh. The method also helps mitigate issues like low response rates and nonresponse bias while offering practical advantages such as lower costs, easier access to relevant participants, and the ability to build a reasonably representative sample despite scarce background data.

Previous studies in technology adoption and crowd logistics research have also widely employed convenience sampling, further validating its appropriateness. The present study focused on Gen-Z across Dhaka, surveyed between June and August 2025. Gen-Z was chosen as the target group because they are typically more digitally literate, given their academic or work environment and frequent use of technology for learning, working, and collaboration. This digital proficiency makes them particularly well-suited for adopting crowd logistics technologies, which rely on individuals' logistics. By contrast, other demographic groups, such as older adults, tend to exhibit lower levels of digital literacy, which may pose barriers to accessing and effectively utilizing such platforms.

Therefore, the Gen-Z participants were chosen not merely for their technical proficiency but also because they are active users of the crowd logistics platforms, as consumers and providers. The sample was then narrowed down to

incorporate the students from various parts of Dhaka who are frequent users of the crowd logistics services, so that the dataset becomes reliable. Ethical principles were closely followed in the study: informed consent was duly taken from the participants, who were given a clear idea of the objective, procedures involved in the study, as well as their rights. The right to anonymity and confidentiality was guaranteed such that the data were presented in aggregate forms only. In total, 202 responses were obtained for analysis.

4.2 Model

This study investigates the factors influencing consumers' intention to adopt CL by combining elements from the technology acceptance framework and social exchange theory, focusing on the context of an emerging economy.

A structured questionnaire was used to collect data, covering participants' demographic information and the study constructs. All items were measured on a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

The study incorporated eight variables, measured through 16 items adapted from prior literature and refined to fit the Dhaka context. The dependent variable, intention to use CL (INT), was captured with two items, while the independent variables, PE, EE, PR, HM, PV, TU, and AUT, were each evaluated using two items as well.

Analysis of data was done using Partial Least Squares Structural Equation Modeling (PLS-SEM) in SmartPLS4, supplemented by the bootstrapping method, which is widely applied in social science and business research on behavior and technology adoption.

Especially suited for exploratory research and theory development, PLS-SEM was applied since it can model complex relationships while avoiding strict distributional assumptions. (Ringle et al., 2023).

5. Data Analysis

5.1 Descriptive findings

The respondents' demographic profile shows a sample largely composed of Gen Z individuals. Most participants (96.8%) were under 25 years old, with an average age of around 22. The gender distribution was fairly balanced, with females slightly outnumbering males (59.9% vs. 40.1%). In terms of prior experience with crowd logistics platforms, the sample was almost evenly divided: 44.6% had no previous experience, while 55.4% had used such services before. To ensure complete data, all questionnaire items were made mandatory.

5.2 Analysis

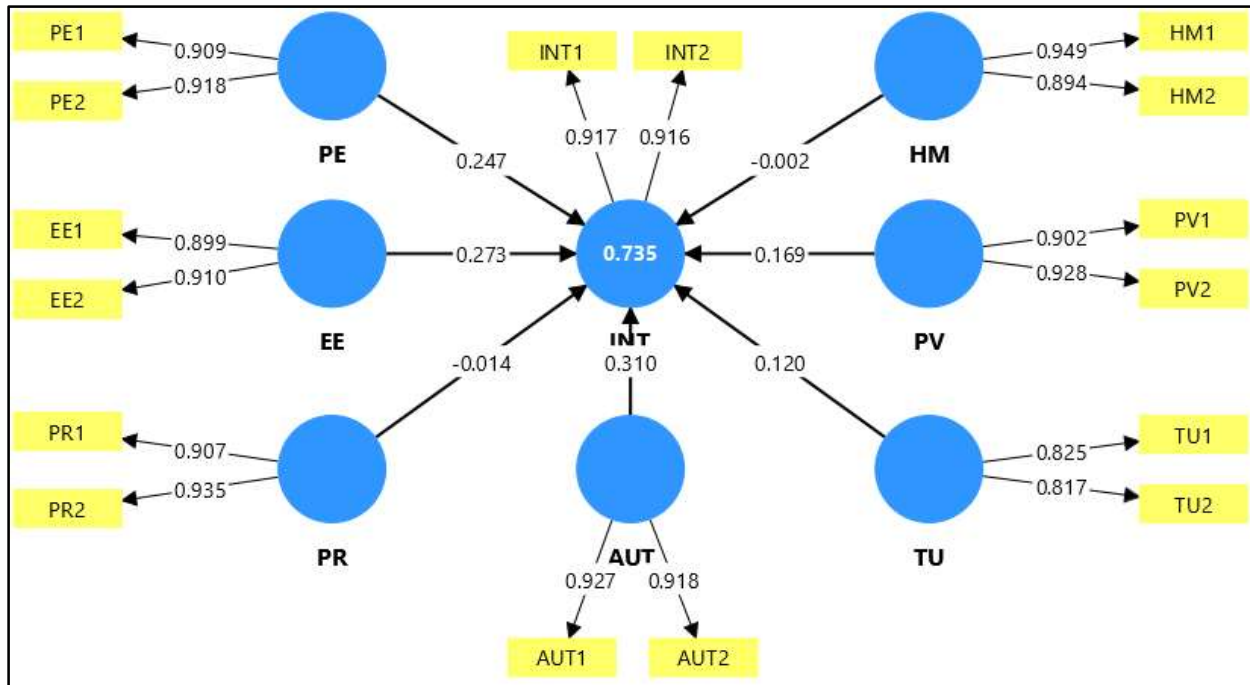
The measurement model was thoroughly evaluated for reliability, convergent validity, and discriminant validity. Table 1 presents the results, which generally support the soundness of the study's constructs.

Internal consistency was checked using Cronbach's alpha alongside composite reliability (ρ_a and ρ_c). Most constructs surpassed the 0.70 threshold, indicating strong reliability. One exception was Trust (TU), which showed a Cronbach's alpha of 0.517—below the conventional cutoff—implying the trust items are less internally consistent in this context. However, TU's composite reliability ($\rho_c = 0.806$) is acceptable, so the construct was retained for analysis with this caveat noted.

Convergent validity is supported as all AVE values exceed the minimum criterion of 0.50.

Table 1: Construct Reliability and Convergent Validity

Construct	Cronbach's Alpha	Composite Reliability (rho_a)	Composite Reliability (rho_c)	Average Variance Extracted (AVE)
AUT	0.826	0.828	0.920	0.852
EE	0.777	0.779	0.900	0.818
HM	0.828	0.902	0.919	0.850
INT	0.810	0.810	0.913	0.840
PE	0.802	0.803	0.910	0.835
PR	0.823	0.839	0.918	0.849
PV	0.807	0.820	0.912	0.837
TU	0.517	0.517	0.806	0.674



Discriminant validity confirms that a construct is truly distinct from other constructs in the model by sharing more variance with its own indicators than with others. It was assessed using two methods.

As presented in Table 2, the square root of the AVE for each construct exceeds its highest correlation with any other construct, indicating that each construct is more closely associated with its own indicators than with those of other constructs in the model.

Table 2: Fornell-Larcker Criterion for Discriminant Validity

	AUT	EE	HM	INT	PE	PR	PV	TU
AUT	0.923							
EE	0.472	0.904						
HM	0.163	0.110	0.922					

INT	0.698	0.661	0.145	0.917				
PE	0.491	0.515	0.121	0.687	0.914			
PR	-0.119	-0.025	0.079	-0.087	-0.037	0.921		
PV	0.515	0.414	0.168	0.626	0.563	-0.070	0.915	
TU	0.409	0.367	0.071	0.517	0.435	-0.073	0.370	0.821

Second, the HTMT was considered.

Table 3: HTMT Metrix

	AUT	EE	HM	INT	PE	PR	PV	TU
AUT								
EE	0.587							
HM	0.193	0.136						
INT	0.852	0.832	0.172					
PE	0.601	0.651	0.137	0.852				
PR	0.144	0.110	0.094	0.113	0.045			

PV	0.628	0.522	0.191	0.770	0.694	0.080		
TU	0.626	0.578	0.107	0.800	0.674	0.112	0.570	

An HTMT value above 0.85 (for conceptually similar constructs) or 0.90 (for conceptually distinct constructs) suggests a lack of discriminant validity (Henseler et al., 2015). The HTMT matrix shows that all values are well below the conservative threshold of 0.85. For instance, the highest HTMT value is 0.852 (between Performance Expectancy (PE) and Intention to Use (INT)), which is marginally above 0.85 but still below the more liberal 0.90 threshold, providing strong evidence that the constructs are empirically distinct.

5.3 Model

The structural model was evaluated through a bootstrapping technique with 5,000 resamples to determine the significance of path coefficients (β) and the model's predictive accuracy. Findings reveal that the integrated framework offers a strong explanation for the intention to adopt crowd logistics (CL), with the independent constructs accounting for 73.5% of the variance in the dependent variable ($R^2 = 0.735$, R^2 adjusted = 0.725). This high explanatory capacity highlights the value of combining technological and social factors when examining CL adoption.

Path analysis results show that five out of seven hypothesized relationships are statistically significant (see Table 7). Among these, four constructs demonstrate a substantial positive effect on CL adoption intention: AUT ($\beta = 0.310$, $p < 0.001$), EE ($\beta = 0.273$, $p < 0.001$), PE ($\beta = 0.247$, $p < 0.001$), and PV ($\beta = 0.169$, $p < 0.001$). T) also exerts a significant, though smaller, positive influence ($\beta = 0.120$, $p = 0.004$).

In contrast, HM ($\beta = -0.002$, $p = 0.965$) and PR ($\beta = -0.014$, $p = 0.719$) do not show significant effects on adoption intention. A closer inspection of the coefficients identifies AUT as the strongest predictor, followed by EE and PE. This pattern suggests that users' willingness to adopt CL is largely driven by their perceived independence in decision-making, the ease of use of the platform, and confidence that it will improve their performance. Additionally, PV contributes meaningfully by reinforcing adoption through perceived cost-benefit advantages.

The lack of significant influence from HM and PR implies that, for this sample, enjoyment and perceived threats are not central to shaping adoption behavior. Instead, CL appears to be approached more as a practical, efficiency-oriented solution than as a source of fun or as a risk-laden activity.

Table 4. Path Coefficients and Hypothesis Testing

Hypothesis	Path	β	Sample Mean	Standard Deviation	T Statistics	P Values	Support
H1	PE -> INT	0.247	0.248	0.042	5.864	0.000	Yes

H2	EE -> INT	0.273	0.275	0.043	6.334	0.000	Yes
H3	PR -> INT	-0.014	-0.017	0.038	0.360	0.719	No
H4	HM -> INT	-0.002	0.001	0.038	0.044	0.965	No
H5	PV -> INT	0.169	0.170	0.047	3.599	0.000	Yes
H6	TU -> INT	0.120	0.121	0.041	2.912	0.004	Yes
H7	AUT -> INT	0.310	0.306	0.051	6.125	0.000	Yes

In conclusion, the structural model analysis provides strong support for the majority of the research hypotheses, confirming the vital roles of autonomy, effort expectancy, performance expectancy, price value, and trust in shaping consumers' intentions to adopt crowd logistics services. The high R^2 value demonstrates the model's strong predictive accuracy and its utility for both researchers and practitioners seeking to understand and influence CL adoption.

6. Discussion

The purpose of this study was to look into the determinants of crowd logistics (CL) adoption intention among Gen-Z consumers in Dhaka, whose demographic and economic context differs greatly from those in earlier studies. By integrating the technology-focused UTAUT and UTAUT2 with the relation-focused SET, this paper developed an integrative framework to address the observed research gaps. The empirical results are fine evidence for the integrated model, which explains a significant 73.5% of adoption intention's variance. The results offer rich findings that are congruent and incongruent with international literature, providing a rich tapestry of the pragmatic, values-driven calculus of the Gen-Z consumer in Dhaka.

The strongest observation to emerge from the findings is the pronounced dominance of utilitarian and control concerns over hedonic or risk-averse considerations. The most significant predictor of CL adoption intention was Autonomy (AUT) ($\beta = 0.310$, $p < 0.001$), a SET measure. This is a very divergent result from a vast majority of technology adoption studies, where performance expectancy has typically been in the first place. For Dhaka's Gen-Z, the call of control and autonomy, presumably the ability to choose delivery times, track couriers in real-time, and be adaptable, is paramount. This aligns with Nguyen et al. (2023) and Bortolini et al. (2023), who found autonomy to be a main

driver of participation in crowd-based systems. It suggests that to young customers in a dense, often turbulent urban environment like Dhaka, being able to manage and dictate the terms of the last-mile experience is more valuable than the pure performance or fun aspect of the service. This result strongly addresses RQ3, highlighting that relational drivers, and in this specific instance, perceived control, are not merely ancillary but primary in adoption.

The constructs that proved to be of high significance next are the core UTAUT constructs, namely effort expectancy (EE) ($\beta = 0.273$, $p < 0.001$) and performance expectancy (PE) ($\beta = 0.247$, $p < 0.001$). The emphasis on the significance of EE suggests that CL platforms must possess extremely intuitive and easy-to-use interfaces. In a market with a documented "digital divide" between SMEs (Hai et al., 2024), consumers will be accustomed to navigating digital services of varying qualities. A low-friction, frictionless user experience is therefore a must-have competitive advantage. The positive effect of PE confirms that Gen-Z customers are pragmatic; they will adopt CL if they believe that it will actually enhance their efficiency, speed, and reliability in the delivery of products, as indicated by Kapser and Abdelrahman (2025) and Yuen et al. (2024). The findings explicitly answer RQ1, affirming that important UTAUT constructs are robust predictors in this newly developing economy.

Further, price value (PV) ($\beta = 0.169$, $p < 0.001$) was highly significant. This is intuitive but significant. In a price-conscious market, CL's economic value proposition of reducing costs through route optimization and a gig economy is a driving force. It supports the research of Rougès and Montreuil (2014) and empirical evidence of the Bangladeshi ride-sharing industry (Bappy et al., 2020), corroborating H5 and answering RQ2. For Gen-Z users, who are the majority of students or young professionals, value for money is an integral component of the adoption decision.

Trust (TU) ($\beta = 0.120$, $p = 0.004$) is also a significant but relatively weaker contribution. Though its path coefficient is lower than others, it should not be disregarded. It confirms the global emphasis on trust as one of the key elements for CL adoption (Cebeci et al., 2023; Gharib, 2025). The proportionally smaller beta weight, as well as the smaller Cronbach's alpha for the trust factor, may indicate that while trust is necessary, it is a baseline requirement. Once a baseline level of trust has been established (perhaps through platform reputation mechanisms and guarantees as outlined by Frehe et al., 2017), autonomy, performance expectancy, effort expectancy, and price value are the subsequent key differentiators. This finding partially addresses RQ3, suggesting trust is necessary for adoption intention but not sufficient alone.

The two non-significant hypotheses have the most counterintuitive findings. Hedonic motivation (HM) ($\beta = -0.002$, $p = 0.965$) had no apparent impact on adoption intention. This explicitly contradicts the common view of Gen-Z as an experiential and entertaining online interaction-driven generation (Koch et al., 2020; Hamari et al., 2016). This would mean that, in the domain of logistics, a utilitarian service by nature, Gen-Z consumers in Dhaka are not seeking fun. They want an effective tool that they can operate and that they can pay for. The suggestion that entertainment or gamification would drive adoption in this segment does not seem apropos, as functionality is of greater importance.

An unanticipated result was that for perceived risk (PR) ($\beta = -0.014$, $p = 0.719$). This is contrary to a wide body of literature that cites risk as one of the top CL adoption impediments (Liu et al., 2024; Hashem, 2025). This discrepancy can be accounted for from different angles. Initially, the sample consists of digitally native Gen-Z consumers who may have a higher innate tolerance for the risks of digital platforms and peer-to-peer services. Second, the specific risks of CL (e.g., online payments) can be viewed as *de minimis* compared to the overall difficulty of urban logistics in Dhaka, so that CL is a relative advantage. Finally, it is plausible that the strong influence of autonomy and trust minimizes the perceived risk to the point of irrelevance. Users who feel in control (autonomy) and have confidence in the platform (trust) may simply discount potential risks.

Overall, the results reveal that the Bangladeshi Gen-Z consumer approaches CL with a highly pragmatic mindset. Intangible risks do not meaningfully deter adoption intention, nor does hedonic enjoyment encourage adoption intention. Instead, it is emphatically driven by the desire for control (autonomy), ease of use (effort expectancy), tangible performance benefits (performance expectancy), and economic reasonableness (price value), with trust being an inalienable supporting condition. This study successfully shifts the attention from the supply-side and addresses the appeal of Hashem (2025) and others, and provides an established, multi-theory model of demand-side CL adoption in an emerging economy.

7. Conclusion

This study combines UTAUT, UTAUT2, and SET to investigate Gen-Z consumers' adoption of crowd logistics in Dhaka, contributing insights that extend existing research beyond its conventional supply-side and developed-nation focus.

7.1 Implications for Theory

This research has several significant theoretical contributions. To start, it clearly demonstrates the value of the integration of technology acceptance and social exchange theories for creating a more comprehensive CL adoption model, explaining an incredibly high level of variance (73.5%). Whereas earlier research commonly favored technological variables (e.g., Frehe et al., 2017), the results of this study demonstrate that a relational construct, autonomy, is the strongest singular predictor. This supports that CL is neither a technology platform nor an expert system, but a socio-technical system with user empowerment being pivotal.

Third, the insignificance of perceived risk in the setting of a developing economy presents a fascinating contrast with studies conducted in developed markets. It suggests that risk perceptions are relative and not absolute and are calibrated to the baseline experience and choices available to consumers, opening up new avenues for theoretical research on risk tolerance in emerging economies. This also aligns with sustainability-driven perspectives, since adopting CL can lower emissions and congestion despite risk perceptions, making it particularly relevant for megacities facing severe air quality concerns like Dhaka.

7.2 Implications for Practice and Policy

To CL platform providers who seek to penetrate or grow in the Bangladeshi market, particularly in Dhaka, this study provides them with educated suggestions:

1. Prioritize user control: Build apps that emphasize user control. User features like real-time, granular monitoring, flexible delivery windows of choice, and courier choice transparency are not just value-adds; they are probably the primary drivers of uptake.
2. Ensure simplicity and reliability: Invest in seamless UI/UX design to minimize effort expectancy. Meanwhile, ensure that the service is continuously reliable to meet performance expectations. In a competitive market, an application that falls short will likely fail, regardless of what it costs.
3. Emphasize value for money: Outline the benefits from reduced cost of CL compared to traditional logistics.
4. Build trust through transparency: Implement and prominently feature robust reputation systems, insurance guarantees, and secure payment gateways. While not the primary driver, trust is the table-stakes requirement that enables the other factors to operate.

5. Integrate sustainability messaging: Position CL as part of Dhaka's broader green urban mobility agenda; such framing may not only appeal to Gen-Z consumers but also align with national sustainability goals.

For policymakers, this study highlights the fact that CL adoption is possible among young people. To facilitate such a sustainable logistics network, policymakers have to:

1. Establish clear regulatory frameworks: Establish rules that establish liability, data protection, and labor standards for gig-delivery. This reduces uncertainty for platforms and builds long-term trust for customers.
2. Invest in digital infrastructure: Finance the "digital inclusion" of all the logistics stakeholders to facilitate the smooth operation of the platforms on which CL depends.
3. Promote CL as a sustainable option: Align endorsements of CL with general urban sustainability goals, such as reduced traffic and emissions, as cited by Li et al. (2019).
4. Incentivize participation: Provide subsidies, tax breaks, or startup grants for CL platforms and delivery partners to encourage early adoption and scale participation.
5. Integrate CL into urban mobility planning: Encourage collaboration between city authorities, public transport systems, and CL providers so that shared logistics becomes a visible, mainstream option for citizens.

8. Limitations and Future Research Avenues

This study has limitations that present opportunities for follow-up investigations. First, taking a convenience sample of Gen-Z consumers may likely limit the generalizability of the results to the population at large. Future studies can try to obtain a more diverse sample across age and socioeconomic strata.

Second, the cross-sectional design freezes a moment in time. CL adoption is a dynamic process. Longitudinal studies tracking how perceptions and usage change as consumers gain first-hand experience with CL services would be valuable.

Third, the seemingly counterintuitive non-significance of perceived risk and hedonic motivation needs to be investigated further. Qualitative follow-up research could explore why that is so and uncover more nuanced consumer psychologies.

Finally, future studies can include other potential moderators, such as gender, past e-commerce exposure or cultural factors, to further enhance our knowledge about adoption drivers in Dhaka and similar contexts.

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Appendix A. Questionnaire Items

Intention to Adopt Crowd Logistics (INT)

INT1: I intend to use crowd logistics services in the near future.

INT2: I will make every effort to use crowd-logistics services when I need logistics support.

Performance Expectancy (PE)

PE1: Using crowd logistics would enable me to complete my delivery/pickup tasks more quickly.

PE2: I believe crowd logistics would make it easier for me to track and manage my orders.

Effort Expectancy (EE)

EE1: Learning to use a crowd-logistics platform would be easy for me.

EE2: Interacting with crowd logistics apps or websites would be clear and understandable.

Perceived Risk (PR)

PR1: Sharing my personal information to crowd logistics is risky.

PR2: Online payment when using crowd logistics is unsafe.

Hedonic Motivation (HM)

HM1: Using crowd-logistics services makes my experience more entertaining than traditional logistics.

HM2: I enjoy exploring new features offered by crowd-logistics platforms.

Price Value (PV)

PV1: The cost of crowd-logistics services is reasonable compared to traditional options.

PV2: I get good value for money when I use crowd-logistics services compared to other delivery methods.

Trust (TU)

TU1: Crowd logistics platform protects my interests properly.

TU2: Crowd logistics platform will not misuse my personal information and solutions.

Autonomy (AUT)

AUT1: Crowd-logistics gives me the freedom to customize my delivery preferences.

AUT2: I feel empowered to control the delivery process when using crowd logistics.