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Retailer Behavior in the Digital Economy: Factors Behind Cashless Payment Adoption

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PAPER ID: ICEBTM-25-1307

*Abstract-:***Purpose: This study delves into identifying the key factors influencing the adoption of cashless payment systems among retailers in Bangladesh. Based on the Unified Theory of Acceptance and Use of Technology (UTAUT) and Technology-Organization-Environment (TOE) theories, the study has incorporated performance expectancy, effort expectancy, social influence, facilitating conditions, relative advantages, and competitive pressure as the predicting variables, behavioral intention as the mediating variable, and payment system adoption as the outcome variable. Data has been collected from 349 retailers through structured offline questionnaires. Partial Least Squares Structural Equation Modeling (PLS-SEM) is run to test the hypothesized relationships with SmartPLS. Social influence and competitive pressure had a direct effect on cashless payment adoption, whereas other factors have insignificant direct impacts. Besides, the results show that behavior intention significantly mediates the relationship between performance expectancy, effort expectancy, social influence, and competitive pressure and the cashless payment system adoption. This study offers insights for policymakers and fintech providers to improve retailer adoption of cashless payments by focusing on behavioral intentions. The adoption of digital payments can be expedited by highlighting competitive pressure and social influence. Retailers' preparedness can be enhanced by enhancing awareness of performance advantages and user-friendliness. The results point to specific ways to make digital financial services available to more retailers in Bangladesh. This study uniquely combines the UTAUT and TOE frameworks to investigate the acceptance of cashless payments within the Bangladeshi retail sector. It presents behavioral intention as a mediating mechanism, providing an innovative structure in the literature on digital payments. It contributes context-specific insights to global adoption research by concentrating on retailers in emerging economies.**

Keywords - Cashless payment, Digital economy, Retail industry, TOE, UTAUT.

I. INTRODUCTION

The rise of digital platforms is driving the shift from cash-based transactions to a cashless economy [1]. Alongside the changing consumer behavior, technology and increased access to banking are key drivers. Even though still in its early stages, cashless payments offer clear benefits to businesses and the economy, including convenience, efficiency, and lower costs [2], [3]. The adoption is influenced by digital infrastructure, trust, social factors, and willingness to embrace new technology [4].

Retailers are key influencers of consumer behavior, making their adoption of cashless payments critical for the success of a cashless economy. While UTAUT explains individual technology adoption and the TOE framework addresses organizational contexts, few studies[4], [5] integrate them to understand cashless payment adoption among Bangladeshi retailers. Most research targets consumers, leaving small and medium retailers underrepresented [6], [7]. Adoption in Bangladesh is limited by poor infrastructure, mistrust of technology, reliance on cash, and varying merchant skills [8], [9]. This study addresses these gaps by combining UTAUT and TOE frameworks, highlighting behavioral intention as a mediator between technological, organizational, and environmental factors and cashless payment adoption.

Fintech companies like bKash, Nagad, and Rocket, along with government initiatives, have expanded digital finance in Bangladesh. However, retailer adoption remains uneven due to low digital literacy, infrastructure gaps, security concerns, and limited trust [3]. It reveals that by January 2025, total MFS accounts reached approximately 239.3 million, up from 219.12 million in January 2024, [10] ,but active usage is low. Policymakers, banks, and fintech providers must understand the factors influencing adoption to create effective strategies that encourage retailers to embrace cashless payments. Therefore, this study aims to explore the factors influencing cashless payment systems adoption by the retailers in Bangladesh.

II. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Unified Theory of Acceptance and Use of Technology (UTAUT) explains user intentions via performance expectancy, effort expectancy, social influence, and facilitating conditions, with moderators like age and experience [11] and Technology-Organization-Environment (TOE) framework adds organizational and environmental perspectives [12]. Together, they capture adoption drivers at individual and organizational levels. In Bangladesh, cashless payment adoption is limited by trust, digital literacy, and infrastructure. This study examines technological, social, and

ISBN 978-984-35-5270-9

environmental factors influencing retailers' adoption with behavioral intention as the mediator.

Fig. 1. Conceptual Framework of the Study

Performance expectancy is the belief that a technology improves work efficiency and provides tangible benefits [13], [14]. Studies indicate that people are more likely to adopt technologies like mobile banking or digital payments when they perceive them as useful, convenient, and effort-reducing [15]. Performance expectancy is widely recognized as a key factor in technology acceptance, positively shaping users' attitudes and behavioral intentions [16], [17], [18]. Based on this, it is proposed that:

H_1: Performance Expectancy has a significant positive impact on the adoption of cashless payment systems by retailers.

Effort expectancy captures the perceived ease of using a new technology, specifically how much effort users believe is needed to complete related tasks [4], [19]. The perceived simplicity and convenience of cashless payments, mobile banking, and e-wallets lead to a higher adoption rate [20], [21], [22]. The impact of effort expectancy on technology adoption is most pronounced during the initial phases, where it significantly enhances users' behavioral intentions [23], [24], [25]. Combining these insights, the following hypotheses is derived:

H_2: Effort Expectancy has a significant positive impact on the adoption of cashless payment systems by retailers.

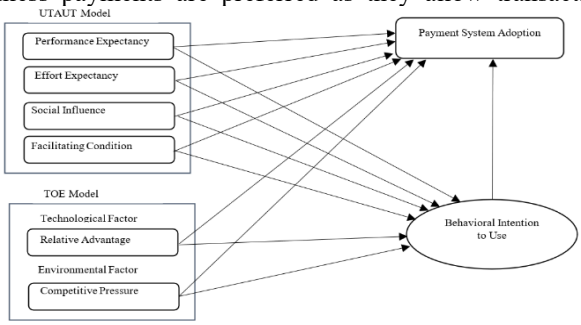
Social influence refers to how the opinions and behaviors of others affect an individual's decision to adopt a technology [19], [26]. In digital payments, users are guided by family, friends, peers, and respected figures [27], [28], [29]. Researches show that social influence acts as an extrinsic motivator, especially during early adoption, across mobile payments, internet banking, and m-commerce [21], [24], [30], [31]. Its' influence may lessen as users become familiar, but it remains an important factor in adoption behavior.

H_3: Social influence has a significant positive impact on the adoption of cashless payment systems by retailers.

Facilitating conditions refer to the extent to which individuals believe that adequate technical and organizational support exists for using a system [11], [21], [32]. For cashless payments, this includes access to smartphones, stable internet, compatible devices, and reliable customer support [26], [33]. Research shows that strong facilitating conditions positively influence adoption, especially where digital literacy and access are limited [16], [34], [35], [36]. Based on these insights, it is proposed that:

H_4: Facilitating conditions have a significant positive impact on the adoption of cashless payment systems by retailers.

Relative advantage refers to how much a new technology is perceived as better than previous methods, offering more benefits, convenience, and efficiency [37], [38]. Cashless payments are preferred as they allow transactions



anytime and anywhere, in both online and offline stores, and can enhance profitability, speed, and efficiency for businesses [39], [40], [41]. Studies show that perceived relative advantage strongly drives technology adoption across sectors, including mobile payments and customer relationship management (CRM) systems [42], [43], [44], [45]. Therefore, it is proposed that:

H_5: Relative advantage has a significant positive impact on the adoption of cashless payment systems by retailers.

Competitive pressure refers to the influence firms in an industry exert on each other, motivating businesses to adopt new technologies to stay competitive and protect market share [46], [47]. High competition drives innovation, digital solutions, and process improvements for growth and survival [43], [48]. Studies show that competitive pressure positively impacts adoption of technologies like e-business, supply chain systems, and mobile payments [49], [50], [51]. Therefore, it is proposed that:

H_6: Competitive pressure has a significant positive impact on the adoption of cashless payment systems by retailers.

Behavioral intention refers to an individual's willingness and motivation to perform a behavior, reflecting the likelihood that they will actually do it [5], [52]. In digital payments, it indicates users' readiness to adopt cashless systems, linking factors like performance expectancy, effort expectancy, and social influence to actual usage [13], [19]. Studies show that stronger behavioral intention leads to higher adoption rates, especially among innovative users [21], [53], [54]. In this study, behavioral intention is expected to mediate the effect of technological, social, and environmental factors on cashless payment adoption. Based on this, it is proposed that:

H_7: Behavioral intention mediates the relationship between performance expectancy and payment system adoption.

H_8: Behavioral intention mediates the relationship between effort expectancy and payment system adoption.

H_9: Behavioral intention mediates the relationship between social influence and payment system adoption.

H_{10}: Behavioral intention mediates the relationship between facilitating conditions and payment system adoption.

H_{11}: Behavioral intention mediates the relationship between relative advantage and payment system adoption.

H_{12}: Behavioral intention mediates the relationship between competitive pressure and payment system adoption.

III. METHODOLOGY

This study uses a quantitative research design to examine the factors influencing cashless payment adoption among retailers in Bangladesh. A hybrid model combining

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UTAUT and the TOE framework was applied to explore technological, social, and environmental factors. The target population includes retailers with prior experience using digital payment systems. With an unknown population size, non-probability convenience sampling was used, yielding 349 valid offline responses, exceeding the minimum required for reliable PLS-SEM analysis. The study focused on retailers across Bangladesh who either use or have the potential to adopt cashless payments, with purposive sampling employed to select respondents familiar with digital transactions to ensure reliable and relevant data. Information was gathered through a structured questionnaire based on a five-point Likert scale, drawing items from established studies. The instrument included five indicators for relative advantage [37], [55], [56] , competitive pressure[26], [56], social influence[19], [34], [57], effort expectancy[21], facilitating conditions[32], and performance expectancy [21], along with six indicators each for behavioral intention[32] and payment system adoption [26].

Data analysis involved descriptive statistics in SPSS to summarize demographics and response patterns, and PLS-SEM in SmartPLS for hypothesis testing. The analysis first assessed measurement model reliability and validity using composite reliability and average variance extracted, followed by structural model testing with bootstrapping to evaluate the significance of hypothesized relationships, including the mediating role of behavioral intention.

IV. DATA ANALYSIS AND RESULTS

The study sample consisted of retail business executives from different sectors in Bangladesh, the majority being male (96%) and business owners (76.5%). Nearly half of the respondents (50.2%) were between 31 and 45 years old, representing an experienced group in retail. In terms of education, 51.6% had completed HSC and 44.1% SSC, indicating moderate educational backgrounds with practical knowledge of financial systems. Most participants (69.4%) had operated their businesses for over three years, and more than 60% had been using cashless payment systems for at least six months, reflecting adequate exposure to digital payments. These demographic and business profiles highlight the relevance of the sample for exploring the drivers of cashless payment adoption in Bangladesh's retail sector.

Table I:Demographic Profile of the Respondents

Category		Frequency (N=349)	Percent
Gender	Male	335	96.0
	Female	14	4.0
Age Level	18–25	26	7.4
	26–30	54	15.5
	26–30	54	15.5
	31–35	77	22.1
	36–45	98	28.1
	Above 46	94	26.9
Level of Education	SSC	154	44.1
	HSC	180	51.6
	Graduation	13	3.7
	Masters and Above	2	0.6
Experience Using Cashless Payment System	3–6 months	76	21.8
	6–12 months	117	33.5
	12–18 months	99	28.4
	More than 18 months	57	16.3
Business Industry	Accessories and Makeup	11	3.2
	Daily Necessities	84	24.1
	Electronics	49	14.0
	Fashion	67	19.2
	Food and Beverages	37	10.6
	Pharmacy	19	5.4
	Print Shop	34	9.7
	Stationery	39	11.2
	Supershop	9	2.6
Position	Owner	267	76.5
	Manager	26	7.4
	Staff	56	16.0
Business Age	Less than 1 year	22	6.3
	2–3 years	85	24.4
	3–5 years	121	34.7
	More than 5 years	121	34.7

(Source(s): Authors' own work)

As represented in table II, item loadings are higher than 0.7 which signifies the reliable representation of corresponding construct [58]. Cronbach's Alpha (CA) is ranging from 0.810 to 0.941, indicating satisfactory internal stability [59]. Strong reliability is also depicted by composite reliability (CR) as values lie between 0.813 and 1.092 and are higher than the cut-off value of 0.7 [60]. For convergent validity, an average variance extracted (AVE) value of 0.5 or higher is expected [59]. Here, all constructs have AVE values higher than .5 which satisfies threshold. In terms of discriminant validity test as depicted in table III, all variables have passed the thresholds of Fornell Larcker [61] and Heterotrait-monotrait ratio of correlations (HTMT) model [62] which signifies that each construct is sufficiently distinct from the others.

In table IV, the results of direct and indirect path analysis shows that CP significantly influences PSA (H6: CP → PSA, $\beta = 0.132$, SD = 0.054, $t = 2.469$, $p = 0.014$), highlighting the role of market competition. SI also positively affects PSA (H3: SI → PSA, $\beta = 0.130$, SD = 0.061, $t = 2.129$, $p = 0.033$), confirming the impact of peers and social networks. In contrast, RA, EE, PE, and FC show no significant impact on PSA suggesting that perceived benefits, ease of use, usefulness, and available facilities may not directly influence adoption in this context. In addition, BI significantly mediates the relationship between CP and PSA (H12: CP → BI → PSA, $\beta = 0.071$, $p = 0.010$), SI (H9: SI → BI → PSA, $\beta = 0.091$, $p = 0.005$), EE (H8: EE → BI → PSA, $\beta = 0.102$, $p = 0.000$), and PE (H7: PE → BI → PSA, $\beta = 0.148$, $p = 0.000$). In contrast, no mediating effect was found for RA and FC.

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TABLE II
ITEM LOADING, CONVERGENT VALIDITY, AND RELIABILITY

Constructs	Items	Loading Value	CA	CR	AVE
Behavioral Intention to Use (BIU)	BI1	0.800	0.893	0.897	0.653
	BI2	0.817			
	BI3	0.741			
	BI4	0.833			
	BI5	0.814			
	BI6	0.839			
Competitive Pressure (CP)	CP2	0.754	0.829	0.831	0.662
	CP3	0.831			
	CP4	0.839			
	CP5	0.829			
Effort Expectancy (EE)	EE1	0.796	0.839	0.859	0.607
	EE2	0.805			
	EE3	0.849			
	EE4	0.706			
	EE5	0.730			
Facilitating Conditions (FC)	FC1	0.867	0.941	1.092	0.798
	FC2	0.877			
	FC3	0.943			
	FC4	0.909			
	FC5	0.869			
Performance Expectancy (PE)	PE1	0.812	0.866	0.867	0.652
	PE2	0.791			
	PE3	0.796			
	PE4	0.824			
	PE5	0.812			
Payment System Adoption (PSA)	PSA1	0.813	0.818	0.821	0.646
	PSA2	0.794			
	PSA3	0.776			
	PSA6	0.831			
Relative Advantage (RA)	RA2	0.804	0.810	0.813	0.637
	RA3	0.835			
	RA4	0.743			
	RA5	0.808			
Social Influence (SI)	SI1	0.748	0.865	0.866	0.650
	SI2	0.805			
	SI3	0.813			
	SI4	0.840			
	SI5	0.823			

TABLE III
DISCRIMINANT VALIDITY ASSESSMENT

Assessment		BI	CP	EE	FC	PE	PSA	RA	SI
Fornell – Larcker criterion	BI	0.808							
	CP	0.542	0.814						
	EE	0.651	0.397	0.779					
	FC	0.644	0583	0.658	0.894				
	PE	0.685	0.421	0.609	0.015	0.807			
	PSA	0.677	0.494	0.496	0.548	0.501	0.804		
	RA	0.545	0.488	0.444	0.629	0.583	0.388	0.798	
	SI	0.637	0.638	0.548	0.616	0.568	0.553	0.454	0.806
Heterotrait-monotrait ratio of correlations (HTMT)	BI								
	CP	0.629							
	EE	0.736	0.755						
	FC	0.641	0.691	0.784					
	PE	0.776	0.596	0.717	0.645				
	PSA	0.785	0.596	0.566	0.553	0.588			
	RA	0.638	0.600	0.535	0.556	0.694	0.774		
	SI	0.721	0.755	0.627	0.616	0.653	0.653	0.643	

V. FINDINGS AND DISCUSSION

This research confirmed that the specific elements have a mutual impact when it comes to cashless payments adoption by retailers, with behavioral intention (BI) being a significant mediator. A retailer's willingness or intention to adopt a system plays a crucial role, which further validates the earlier research underscoring intention as a must-have for adoption [13], [63]. Retailer adoption is further encouraged by social influence (SI) and competitive pressure (CP), since retailers are driven by the adoption of payment systems by their competitors or by pressures from peers and clients. This is indicative of businesses' inclination to adhere to social or market standards [30], [47].

Table Iv: Results Of Direct And Indirect Path Analysis

Hypothesis	Path	β	Standard deviation	T statistics	P values	Decision
H1	PE -> PSA	0.026	0.065	0.400	0.689	Not Supported
H2	EE -> PSA	0.055	0.059	0.939	0.348	Not Supported
H3	SI -> PSA	0.130	0.061	2.129	0.033	Supported
H4	FC -> PSA	0.001	0.040	0.030	0.976	Not Supported
H5	RA -> PSA	0.044	0.050	0.877	0.381	Not Supported
H6	CP -> PSA	0.132	0.054	2.469	0.014	Supported
H7	PE -> BI -> PSA	0.148	0.038	3.935	0.000	Supported
H8	EE-> BI -> PSA	0.102	0.027	3.778	0.000	Supported

ISBN 978-984-35-5270-9

Hypothesis	Path	β	Standard deviation	T statistics	P values	Decision
H9	SI -> BI -> PSA	0.033	0.033	2.794	0.005	Supported
H10	FC-> BI -> PSA	0.001	0.021	0.066	0.948	Not Supported
H11	RA-> BI -> PSA	0.048	0.025	1.953	0.051	Not Supported
H12	CP-> BI -> PSA	0.071	0.028	2.577	0.010	Supported

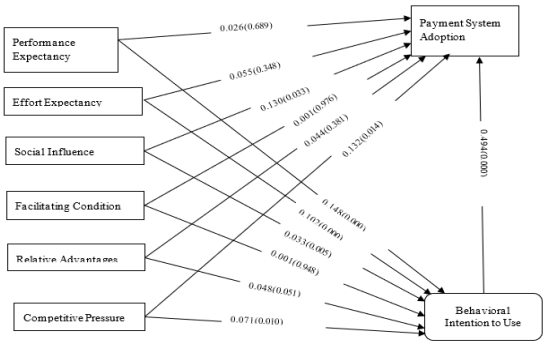


Fig. 2. Results of Path Coefficient with p-value

On the other hand, relative advantage (RA), effort expectancy (EE), performance expectancy (PE), and facilitating conditions (FC) show no impact on adoption, which is a sign that a system's ease of use or utility is not sufficient. Most independent variables rely on BI to transmit their effects on adoption, as shown by mediation analysis. For example, a system that is considered useful and simple would create a positive perception leading to stronger intentions, which in turn drives to adoption. EE simplifies reduction in uncertainties, but adoption depends on intentions shaped by customer demands [3], [13]. As earlier research suggests [39], [40], [41], PE has an indirect effect on adoption, in that the benefits a business perceives must be greater than the cost and risks. Neither RA nor FC has any notable impact, possibly because of fees, equipment costs, settlement delays, and uncertainty, which limit the perceived benefits of cashless payments, while cash continues to be well-known and free [41], [45]. FC, encompassing infrastructure, resources, and support services, cannot guarantee adoption in the absence of intention, and poor internet, power cuts, limited technical support, and low digital skills only diminish motivation. As a whole, adoption can be encouraged by improving BI via building awareness, social and competitive pressures, nurturing trust, and better infrastructure and support [3], [19].

VI. CONCLUSION

This study ascertains that competitive pressure and social influence both have direct and indirect influence on the adoption of cashless payment by retailers whereas effort expectancy, performance expectancy, and facilitating conditions will only influence the adoption if mediated by behavioral intention. That is to say, retailers' adoption of cashless payment systems is driven more by their intention. It highlights the need to focus on the development of favorable attitudes and bringing the feeling of readiness among the retailers for desired level of adoption.

Prior papers on payment methods predominantly focused either on individual consumers or on a single factor, which is why this study combines the UTAUT and TOE frameworks to focus on Bangladeshi retailers. As opposed to earlier studies which mainly focused on either organizational or social factors, this study incorporates social, environmental, and organizational pillars with behavioral intention as the mediating variable. The results indicate that environmental factors such as competitive pressure and perceived easiness have much stronger impacts than mere availability of technology. Adoption can therefore be improved by enhancing behavioral intention with education, awareness, and peer influence. Effective policies should build trust, guarantee system ease, offer competitive and social rewards, and upgrade the infrastructure to catalyze readiness for digital adoption. Nevertheless, the generalization of the findings may have been compromised due to the study's urban-centric sample, its' cross-sectional nature, and the use of self-reported data. Future studies may investigate socio-economic and trust-based mediators, adopt rural settings, and employ longitudinal designs to examine the effects of other mediators. Overall, enabling adoption requires boosting awareness of benefits, fostering trust, and offering social and competitive motivations while improving infrastructure and digital competencies. These insights can guide policymakers, businesses, and service providers in creating effective strategies that drive adoption, support financial modernization, and advance financial inclusion in Bangladesh.

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