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Assessing the Technological Factors behind Customer Repurchase Intention in E-commerce Industry of Bangladesh: Mediating Effect of Big Data Driven Marketing and IT Innovation Acceptance

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Abstract - The rapid advancement of digital technology is reshaping the e-commerce landscape in Bangladesh by influencing customer behavior and repurchase intentions. This study examines the direct and indirect effects of technological factors such as Website Appearance (WA), System Quality (SQ), Customer Service through AI chatbots (CSAI), and Search Engine Optimization (SEO), along with the mediating roles of Big Data Driven Marketing (BDM) and IT Innovation Acceptance (IIA), on Customer Repurchase Intention (CRI). A structured questionnaire yielded 404 valid responses from e-commerce users. Data were analyzed using SmartPLS 4.0, beginning with evaluation of the measurement model for reliability and validity, followed by testing the structural model. Results indicate that WA, SQ, BDM, and IIA have significant positive effects on CRI, whereas CSAI has a negative impact. SEO is not directly significant but influences CRI indirectly through BDM and IIA. BDM does not mediate WA and CRI but mediates SQ, CSAI, and SEO. IIA mediates all technological factors and is the strongest predictor of CRI. The study provides actionable insights for e-commerce platforms in Bangladesh to enhance design, system reliability, personalization, and innovation adoption to strengthen customer loyalty and sustainable growth.

Keywords - Chatbot, Big Data, Technology, Customer Satisfaction and Customer Repurchase Intention.

I. INTRODUCTION

The rapid growth of digital technology has transformed how people purchase products and services. Customers increasingly prefer online shopping because it is convenient, time saving, and allows them to compare products and prices before making decisions [1], [2]. The expansion of smartphones and internet access has accelerated e-commerce adoption across the world, including Bangladesh [3].

Technological features such as website design, system quality, search engine optimization, and the use of artificial intelligence in customer service are now critical in shaping customer experience and loyalty. Attractive website appearance builds trust, system quality ensures reliability and ease of navigation, and effective SEO improves visibility in competitive online markets [4], [5]. Similarly, artificial intelligence chatbots provide quick responses, although their effectiveness depends on user experience and

cultural acceptance [6]. In addition, big data driven marketing and IT innovations such as secure payments and mobile applications are becoming key to personalization and customer retention [7], [8].

Although the e-commerce industry in Bangladesh has expanded rapidly, customer retention remains a major challenge as many customers purchase once but do not return, creating uncertainty for long term sustainability. Traditional marketing methods are not sufficient to address this issue because satisfaction and loyalty in online environments are shaped primarily by technological factors and user experience [9]. Customer retention is essential for sustainable business growth in digital commerce and identifying the technological factors that directly and indirectly affect repurchase intention will help e-commerce firms improve service quality, strengthen customer trust, and build long term relationships. A clearer understanding of these factors will also guide businesses in designing strategies that enhance customer satisfaction and ensure sustainability in a competitive digital marketplace.

Most previous studies have focused on individual factors such as website quality, mobile application features, or chatbot services [4]. Very few have explored how multiple technological factors interact to influence repurchase intention. In addition, there is limited evidence on how big data driven marketing and IT innovation acceptance mediate the relationship between technology adoption and customer retention in Bangladesh's e-commerce sector.

The primary objective of this study is to assess the influence of technological factors, namely website appearance, system quality, customer service through AI chatbots, and search engine optimization, on customer repurchase intention, while also examining the mediating roles of big data driven marketing and IT innovation acceptance in the e-commerce industry of Bangladesh.

II. LITERATURE REVIEW AND DEVELOPMENT OF CONSTRUCTS

• Theoretical Review

This study is guided by two well established theories that explain how technology and service quality influence customer behavior. The Technology Acceptance Model (TAM) proposed by Davis [10] emphasizes that adoption of

technology depends on perceived usefulness and ease of use. In e-commerce, factors such as website appearance, system quality, and IT innovations shape customer acceptance and continued use, which can lead to repeated purchases. The Service Quality Theory (ServQual) developed by Zeithaml [11] highlights reliability, assurance, tangibility, empathy, and responsiveness as measures of service quality. These elements are closely linked to system performance and customer service through AI chatbots in digital platforms, where higher service quality builds trust and satisfaction that encourage repurchase. Together, TAM and ServQual provide a strong foundation for understanding how technological and service related factors influence customer loyalty in the e-commerce sector.

- *Customer Repurchase Intention (CRI)*

Customer repurchase intention is the decision to buy again from the same seller, shaped by prior experience and satisfaction, and reflects loyalty, reduced search effort, and long-term profitability [12], [13], [14]. In e-commerce, repurchase intention is influenced by system quality, which ensures smooth website performance and reliability, and by customer service tools such as AI chatbots that can enhance efficiency when they meet user expectations [15], [16]. SEO also supports retention by increasing visibility and strengthening customer awareness [17]. Since sustained loyalty is vital for business sustainability, identifying the technological drivers of repurchase intention is crucial for the growth of e-commerce in Bangladesh.

- *Website Appearance (WA) and Customer Repurchase Intention (CRI)*

Website appearance refers to the overall visual design and presentation of an online platform. In e-commerce, the website often creates the first impression and represents the brand's image. An attractive and user-friendly design enhances perceived trust, quality, and value in the minds of customers [18], [19], [20]. A positive website appearance strengthens customer satisfaction and loyalty, both rationally and emotionally, which in turn increases repurchase intention. Previous studies confirm that creative and appealing design features encourage repeat engagement and reduce customer switching [4], [21], [22], [23]. Therefore, the hypothesis can be formulated:

H1: Website Appearance (WA) has a positive impact on Customer Repurchase Intention (CRI).

- *System Quality (SQ) and Customer Repurchase Intention (CRI)*

System quality refers to the technical performance of an online platform, which determine how easily and effectively customers can complete transactions. In e-commerce, a system that is fast, safe, and user friendly provides a smooth shopping experience, builds trust, and enhances satisfaction. Prior studies show that strong system quality reduces complaints, increases customer engagement, and directly strengthens loyalty and repurchase intention [24], [25], [26], [27]. Therefore, the hypothesis can be formulated:

H2: System Quality (SQ) has a positive impact on Customer Repurchase Intention (CRI).

- *Customer Service through AI chatbot (CSAI) and Customer Repurchase Intention (CRI)*

Customer service through AI chatbots (CSAI) refers to the use of conversational agents that assist customers with product searches, recommendations, transactions, and payment-related inquiries in e-commerce. These tools provide instant responses and round-the-clock availability, enabling businesses to handle diverse customer needs efficiently [28]. Research shows that effective chatbot services improve customer trust, satisfaction, and loyalty, which are essential for repurchase intention [29], [30]. Chatbots that demonstrate accuracy, flexibility, and responsiveness enhance both rational and emotional satisfaction, further motivating customers to continue purchasing from the same platform [31]. Therefore, the hypothesis can be formulated:

H3: Customer service through AI chatbot (CSAI) has significant impact on Customer Repurchase Intention (CRI).

- *Search Engine Optimization (SEO) and Customer Repurchase Intention (CRI)*

Search engine optimization (SEO) is the process of increasing a website's visibility in search results, helping customers to locate relevant products and services. In e-commerce, it ensures that platforms appear in top search pages, which influences customer decision-making because buyers are more likely to click on the first displayed results [5]. Technical features such as keyword use, loading speed, and site optimization are also critical in shaping the customer experience and encouraging repeat purchases [32]. Recent studies confirm that effective SEO strategies improve engagement, extend browsing time, and increase the likelihood of repurchase in online markets [33], [34]. Therefore, the hypothesis can be formulated:

H4: Search Engine Optimization (SEO) has a positive impact on Customer Repurchase Intention (CRI).

- *Big Data Driven Marketing (BDM) and Customer Repurchase Intention (CRI)*

Big data driven marketing (BDM) refers to the use of customer data to deliver personalized offers and targeted messages. It enables businesses to understand customer behavior more accurately and suggest products that match individual needs [35]. In e-commerce, BDM helps firms move from traditional approaches to customer-centric strategies, improving satisfaction and retention [36]. With the support of digital platforms such as social media, data-driven campaigns strengthen relationships with customers and create competitive advantages [37]. Research also shows that BDM enhances customer relationship management and satisfaction, which directly increase loyalty and repurchase intention [38], [39]. By improving personalization and user experiences, BDM encourages customers to make repeat purchases, thereby sustaining long-term business growth [40]. Therefore, the hypothesis can be formulated:

H5: Big Data Driven Marketing (BDDM) has a positive impact on Customer Repurchase Intention (CRI).

- *IT Innovation Acceptance (IIA) and Customer Repurchase Intention (CRI)*

IT innovation acceptance (IIA) refers to the readiness of customers to adopt new technological solutions that enhance convenience, security, and efficiency in online transactions. Innovations such as digital payment systems, mobile applications, and self-service technologies reduce perceived risk and increase trust, thereby improving satisfaction [41], [42]. Studies confirm that customer perceptions of value and originality in innovation significantly influence satisfaction, which then strengthens repurchase behavior [43], [44]. The adoption of IT innovations also supports competitive advantage by improving user experience and service quality [45], [46]. Evidence from recent research further shows that IT innovation acceptance positively affects customer loyalty, making it an important driver of repurchase intention in e-commerce [8]. Therefore, the hypothesis can be formulated:

H6: IT Innovation Acceptance (IIA) has a positive impact on Customer Repurchase Intention (CRI).

- *The Mediating effect of Big Data Driven Marketing*

The mediating effect of BDM suggests that it serves as an intermediary process through technological factors such as WA, SQ, CSAI, and SEO that influence CRI. Prior studies show that customers often respond more positively when firms use data to create personalized experiences [7], [8], [38]. BDM helps transform technological features into tailored offers and targeted communication, which enhance satisfaction and loyalty. Some research found that BDM can mediate the relationship between technological factors and consumer behavior [1]. Through the creation of virtual marketplaces and digital connections, technological development and especially the rise of BDM are completely changing the market. Thus, data driven marketing that makes offers more personalized and customized has a mediating effect on these factors [2]. Therefore, the hypothesis can be formulated:

H7: Big Data Driven Marketing (BDM) mediates the relationship between Website Appearance (WA) and Customer Repurchase Intention (CRI).

H8: Big Data Driven Marketing (BDM) mediates the relationship between System Quality (SQ) and Customer Repurchase Intention (CRI).

H9: Big Data Driven Marketing (BDM) mediates the relationship between Customer Service through AI chatbot (CSAI) and Customer Repurchase Intention (CRI).

H10: Big Data Driven Marketing (BDM) mediates the relationship between Search Engine Optimization (SEO) and Customer Repurchase Intention (CRI).

- *The Mediating effect of IT Innovation Acceptance*

IIA serves as a mediating factor by connecting technological features such as WA, SQ, CSAI, and SEO with CRI. Innovations such as mobile applications and secure payments not only provide functional benefits but

also build trust and convenience, which lead to stronger loyalty [47]. Previous studies confirm that innovation adoption often acts as a pathway linking technology and customer retention [8], [42]. Studies show that when customers adopt new technologies, their satisfaction and loyalty increase, which strengthens repurchase behavior [47]. Innovation adoption is further supported by factors such as digital payment security and trust, which influence consumers' willingness to continue online purchasing [48]. Research also highlights that organizations that successfully introduce and integrate innovations achieve stronger customer interaction and improved service quality, both of which enhance loyalty [8]. Evidence from self service technologies similarly shows that innovation acceptance mediates service convenience and customer behavior [42]. Therefore, the hypothesis can be formulated:

H11: IT Innovation Acceptance (IIA) mediates the relationship between Website Appearance (WA) and Customer Repurchase Intention (CRI).

H12: IT Innovation Acceptance (IIA) mediates the relationship between System Quality (SQ) and Customer Repurchase Intention (CRI).

H13: IT Innovation Acceptance (IIA) mediates the relationship between Customer Service through AI chatbot (CSAI) and Customer Repurchase Intention (CRI).

H14: IT Innovation Acceptance (IIA) mediates the relationship between Search Engine Optimization (SEO) and Customer Repurchase Intention (CRI).

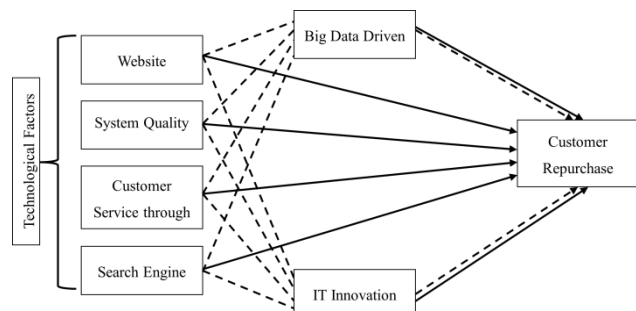


Fig. 1: Conceptual framework; Source: Author's own work

III. RESEARCH METHODOLOGY

a. Data Sampling

The study targeted e-commerce customers in Bangladesh with prior online shopping experience. As the total population was unknown, a non-probability purposive sampling method was used to reach active users [49]. Questionnaires were distributed via WhatsApp, Facebook, Messenger, and email, yielding 404 valid responses from 550 distributed. The sample size was adequate for PLS-SEM, as it exceeded the recommended minimum of ten times the estimated parameters [50], and satisfied guidelines for complex models [51].

b. Measurement Instrument

A structured questionnaire was designed to measure the constructs of this study. The measurement items were

adapted from validated scales and adjusted to the Bangladeshi context to ensure reliability and content validity [15]. Responses were recorded on a five-point Likert scale ranging from “strongly disagree” (1) to “strongly agree” (5), which is commonly used in social science and e-commerce research [52]. The instrument was pre-tested with 20 respondents, and minor wording changes were made to improve clarity.

c. Data Analysis Techniques

Data collected from 404 valid responses were first screened for completeness and accuracy. Descriptive statistics were generated using SPSS version 20 to summarize the demographic characteristics of respondents. To test the hypotheses, Partial Least Squares Structural Equation Modeling (PLS-SEM) was conducted with SmartPLS 4, which is suitable for complex models and predictive analysis with relatively small to medium samples [52]. The analysis followed a two-step approach, beginning with an evaluation of the measurement model to assess reliability and validity, and then testing the structural model to examine direct and mediating relationships among constructs [53], [54].

III. DATA ANALYSIS AND FINDINGS

• Respondents' Profile

The study surveyed 404 respondents. Most were aged 26–35 years (54.2%), and the majority were male (83.7%). In terms of e-commerce experience, 25.2% had more than six years and 22.8% had three to four years, indicating sufficient familiarity with online purchasing. A large proportion were job holders (66.1%), and more than half were graduates (56.2%). Regarding platform use, 47.3% reported using e-commerce sometimes and 23% very often, confirming that the sample was well suited for this study.

• Measurement Model

Convergent Validity

Convergent validity has been assessed through item loadings, Cronbach's Alpha (CA), Composite Reliability (CR), and Average Variance Extracted (AVE). All item loadings have exceeded the threshold of 0.70, CA values have been greater than 0.60, CR values have been higher than 0.70, and AVE values have been above 0.50. These results confirm that the constructs have been reliable and internally consistent [52], [53].

TABLE 1: ITEM LOADING, CONVERGENT VALIDITY AND RELIABILITY

Constructs	Items	Loading Value	CA	CR	AVE
Website Appearance (WA)	WA1	0.759	0.824	0.876	0.586
	WA2	0.778			
	WA3	0.756			
	WA4	0.772			
	WA5	0.763			
System Quality (SQ)	SQ1	0.719	0.815	0.871	0.575
	SQ2	0.766			
	SQ3	0.733			
	SQ4	0.775			

Customer Service through chatbot (CSAI)	SQ5	0.796	0.918	0.938	0.753
	CASI1	0.855			
	CASI2	0.877			
	CASI3	0.870			
	CASI4	0.866			
Search Engine Optimization (SEO)	CASI5	0.871	0.849	0.893	0.625
	SEO1	0.824			
	SEO2	0.776			
	SEO3	0.756			
	SEO4	0.825			
Big Data Driven Marketing (BDM)	SEO5	0.768	0.880	0.913	0.676
	BDM1	0.822			
	BDM2	0.824			
	BDM3	0.825			
	BDM4	0.856			
IT Innovation Acceptance (IIA)	BDM5	0.784	0.843	0.888	0.613
	IIA1	0.814			
	IIA2	0.777			
	IIA3	0.783			
	IIA4	0.779			
Customer Repurchase Intention (CRI)	IIA5	0.762	0.886	0.913	0.637
	CRI1	0.754			
	CRI2	0.826			
	CRI3	0.848			
	CRI4	0.812			
	CRI5	0.750			
	CRI6	0.795			

Source: Author's own work

Discriminant Validity:

Discriminant validity has been evaluated using the Heterotrait–Monotrait ratio (HTMT). Here, all HTMT ratios have been below the recommended threshold of 0.90, indicating that the constructs have been sufficiently distinct from one another [52], [53]. Thus, the conclusion can be made that the assessed variables had the sufficient validity and reliability towards further used for examining the structural model.

TABLE 2: HETEROTRAIT MONOTRAIT (HTMT) RATIO

	BDM	CRI	CSAI	IIA	SEO	SQ	WA
BDM							
CRI	0.750						
CSAI	0.708	0.500					
IIA	0.845	0.839	0.663				
SEO	0.888	0.717	0.652	0.815			
SQ	0.750	0.770	0.551	0.765	0.802		
WA	0.639	0.694	0.500	0.688	0.690	0.834	

Source: Author's own work

• Structural Model

The predictive power of the model has been assessed through the coefficient of determination (R^2). All R^2 values for BDM, IIA, and CRI have been between 0.50 and 0.75, indicating moderate predictive accuracy [52], [53]. Moreover, the direct effects of the technological factors on CRI have also been tested and shown in table 3. WA has shown a significant positive effect ($\beta = 0.138$, $p = 0.006$), and SQ has had a stronger significant positive effect ($\beta = 0.205$, $p = 0.000$). CSAI has demonstrated a negative but significant effect ($\beta = -0.086$, $p = 0.041$). SEO has not had a significant effect ($\beta = 0.017$, $p = 0.760$). BDM has shown

a significant positive effect ($\beta = 0.197$, $p = 0.002$), and IIA has produced the strongest positive effect ($\beta = 0.413$, $p = 0.000$). These results confirm that WA, SQ, BDM, and IIA have significantly improved repurchase intention, CSAI has negatively influenced it, and SEO has not directly affected it.

TABLE 3: RESULTS OF DIRECT PATH ANALYSIS

H	Path	β	STDEV	P Values	Results
H1	WA → CRI	0.138	0.050	0.006	Accepted
H2	SQ → CRI	0.205	0.057	0.000	Accepted
H3	CSAI → CRI	-0.086	0.042	0.041	Accepted
H4	SEO → CRI	0.017	0.055	0.760	Rejected
H5	BDM → CRI	0.197	0.063	0.002	Accepted
H6	IIA → CRI	0.413	0.052	0.000	Accepted

Source: Author's own work

Table 4 shows that BDM has not mediated the relationship between WA and CRI (H7: $\beta = 0.009$, $p = 0.407$), but it has significantly mediated SQ and CRI (H8: $\beta = 0.029$, $p = 0.046$), CSAI and CRI (H9: $\beta = 0.052$, $p = 0.008$), and SEO and CRI (H10: $\beta = 0.096$, $p = 0.003$). IIA has mediated all four relationships: WA and CRI (H11: $\beta = 0.058$, $p = 0.011$), SQ and CRI (H12: $\beta = 0.084$, $p = 0.001$), CSAI and CRI (H13: $\beta = 0.094$, $p = 0.000$), and SEO and CRI (H14: $\beta = 0.143$, $p = 0.000$). These results indicate that BDM has acted as a partial mediator, while IIA has been a consistent and stronger mediator of CRI.

TABLE 4: RESULTS OF SPECIFIC INDIRECT EFFECT

H	Path	β	STDEV	P Values	Results
H7	WA → BDM → CRI	0.009	0.011	0.407	Rejected
H8	SQ → BDM → CRI	0.029	0.015	0.046	Accepted
H9	CSAI → BDM → CRI	0.052	0.020	0.008	Accepted
H10	SEO → BDM → CRI	0.096	0.033	0.003	Accepted
H11	WA → IIA → CRI	0.058	0.023	0.011	Accepted
H12	SQ → IIA → CRI	0.084	0.025	0.001	Accepted
H13	CASI → IIA → CRI	0.094	0.024	0.000	Accepted
H14	SEO → IIA → CRI	0.143	0.029	0.000	Accepted

Source: Author's own work

IV. DISCUSSION ON FINDINGS

The study has found that WA has had a significant positive effect on CRI. In Bangladesh, where customers rely heavily on visual impressions of digital platforms, an attractive design with clear layout, color, and navigation has enhanced trust and encouraged repeat purchases. These

results are consistent with earlier studies that show how website aesthetics improve satisfaction and loyalty [4], [18], [19].

SQ has also shown a significant positive effect on CRI, highlighting that reliable, user friendly, and secure platforms are essential for Bangladeshi customers. A strong system has reduced complaints and increased trust, which is particularly important in a market where concerns about fraud and technical failures remain high. This finding is supported by previous studies confirming that system quality strengthens satisfaction and repurchase intention [25], [26], [27].

CSAI has demonstrated a negative but significant effect on CRI. Although chatbots have provided instant responses, many Bangladeshi customers have valued human like empathy and contextual understanding, which current chatbot systems often lack. This mismatch has lowered satisfaction, suggesting that automation must be combined with personalization to build loyalty. These findings are consistent with studies that show poorly designed chatbots can reduce trust [55], [56].

SEO has not shown a significant direct effect on CRI. While SEO improves visibility, Bangladeshi customers often depend more on social referrals, peer recommendations, and brand familiarity than on search rankings when deciding to repurchase. This result supports earlier research that visibility alone does not guarantee loyalty [57].

BDM has been confirmed as a partial mediator, significantly linking SQ, CSAI, and SEO with CRI but not WA. Personalization and targeted campaigns based on customer data have strengthened the influence of system performance, chatbot interactions, and search visibility on repurchase, while website design has affected CRI more directly through aesthetics and trust. In Bangladesh, social media platforms such as Facebook have provided essential data for BDM, enabling firms to customize offers and build stronger customer relationships that encourage loyalty and repeat purchases [38], [58].

IIA has emerged as a consistent and strong mediator, linking WA, SQ, CSAI, and SEO with CRI. Customer acceptance of innovations such as secure digital payments, mobile applications, and self service tools has improved trust, convenience, and satisfaction, which have led to stronger loyalty. Unlike BDM, which has mediated only part of the relationships, IIA has provided a consistent pathway by translating technological features into customer benefits. In Bangladesh, where mobile banking and fintech adoption have expanded quickly, IIA has been especially influential in shaping repurchase behavior and connecting technological advancement with loyalty [8], [47].

V. IMPLICATIONS AND CONCLUSION

• Practical Implications

The study has shown that WA and SQ have strengthened CRI, meaning firms should focus on attractive

design and reliable systems to build trust. The negative effect of CSAI has indicated that chatbots need more personalized and human like features. SEO has not influenced CRI, suggesting that visibility must be supported with referrals and brand trust in Bangladesh. BDM has shown value in using social media data for targeted offers, while IIA has confirmed that mobile payments and apps are essential for customer retention.

- *Policy Implications*

The findings have offered guidance for policymakers in developing Bangladesh's e-commerce sector. WA and SQ have pointed to the need for digital standards that ensure usability and security. CSAI has shown that guidelines are required for improving AI-based services. SEO has suggested that policy should focus more on consumer protection and secure payments, while the mediating roles of BDM and IIA have confirmed the importance of promoting data-driven marketing and fintech adoption.

- *Conclusion*

This study has examined the effects of WA, SQ, CSAI, and SEO on CRI, with BDM and IIA as mediators in Bangladeshi e-commerce. WA and SQ have increased CRI, CSAI has had a negative effect, and SEO has not been significant. BDM has partly mediated the relationships, while IIA has consistently mediated all factors and emerged as the strongest driver of CRI. The findings have extended TAM and ServQual in this context and offered practical insights for firms and policymakers.

VI. LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

This study has been limited to Bangladeshi e-commerce customers, which restricts the generalizability of the findings. A non-probability purposive sampling method has been used, which reduces representativeness, and the reliance on self-reported data may have introduced bias. The study has also applied a cross-sectional design, which does not capture changes in customer behavior over time or allow strong causal inferences. Future research may apply probability-based sampling across multiple countries, use longitudinal designs to observe behavioral changes, and include additional constructs such as culture, trust, or perceived risk to extend the model.

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