

RESEARCH ARTICLE

E-banking Performance of Commercial Banks in Bangladesh: A Study on its Efficiency, Fulfillment, and Trust as the predictors

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ABSTRACT

The term "electronic banking" involves the performance of banking transactions through the Internet. The banking industry is hopeful about adopting new technology known as e-banking, believing that it will help banks improve customer service quality and close the gap between the clients and the bank. However, experts have given little attention to the upheaval brought about by electronic banking to bank performance. This study aims at filling the gaps and adding to the existing literature regarding the efficiency of electronic and internet banking in Bangladesh. The research employed a convenience sampling technique to select the study respondents. A total of 348 respondents were selected for answering the research questions and specific objectives. The Covariance Based-Structural Equation Modeling (CB-SEM) technique was used to analyze the collected data. The findings show that efficiency and fulfillment have a positive effect on the e-banking service performance of commercial banks in Bangladesh. The outcomes of this research may assist the Bangladesh Bank in classifying private commercial banks based on the quality of their e-banking services. The findings of the study also allow them to determine pricing and charges based on service quality, as various banks charge differently for the same level of e-banking services.

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1. Introduction

The concept of "electronic banking" refers to the practice of conducting banking transactions through the internet. It encompasses the procedures for doing banking business utilizing information and communication technology (ICT) to meet immediate and long-term objectives. To Alhajri (2008), E-banking is the delivery of financial services to clients over the Internet. The Banking Supervision Basel Committee [BSBC] (2003) points out that electronic banking encompasses the delivery of retail banking products and services over electronic networks as well as large-value online payments and other commercial banking services. In addition, the definition of electronic banking differs among academics since it comprises a wide range of services via the diversity among clients seeking information and also that of banking services (Alsmadi and Alwabel, 2011).

It is argued that electronic banking can lower operational costs while increasing revenue. As a result, the investment in putting electronic banking in place is growing day by day (Simpson, 2002). However, due to the adoption of this form of banking, the banking industry confronts considerable challenges, as banks are more subject to hazards such as high-volume deposit management, fraudulent practices, and central bank oversight of particular services. On the other hand, the use of information technology in banks should not be disregarded. The fundamental reason is that banks deal in massive amounts of data regularly, and implementing information technology (IT) has become a requirement for offering better customer service. Customers benefit from IT because it lets them engage in and manage more aspects of their service outcomes, such as cash deposit and withdrawal, check deposit and clearance, direct queries such as the statement of accounts, and money transfers, among other things. Apart from that banks need quick and accurate information on accounts, income, credit facilities, profitability indices, recovery, deposits, interest, charges, and other financial information control, all of which can be simplified and accelerated via technology.

Several factors influence the acceptability of E-banking in a specific country and region. Internet accessibility, internet usage rate in homes, new and advanced features in online banking, customer views of technology uses, and the regulatory climate in a country, all influence the rate of electronic banking acceptance and use in a culture. E-speed,

banking's quickness, and dependability, as compared to manual banking, can provide more outstanding service quality, resulting in increased customer satisfaction for banks. The banking industry is hopeful about adopting new technology known as e-banking, believing that it will help banks improve customer service quality and close the gap between customers and the bank (Abaenewe et al., 2013).

On the other hand, experts have given less attention to the upheaval brought upon by electronic banking when it comes to e-banking performance. This study seeks to address the gaps by assessing the impact of E-banking service quality dimensions like efficiency, fulfillment, and trust on e-banking performance and add significant insights to the existing literature in Bangladesh regarding electronic and internet banking.

2. The Rationale of the Study

Currently, everything revolves around service. Those who provide much more services than their competitors will have a significant competitive edge. As a result, firms are seeking to establish their new services regularly, and the competition is expanding day by day by giving high-quality services. ICT-based banking (also known as e-banking) has emerged as a result of these initiatives. Electronic banking has garnered a resounding response from both the banking industry and banking clients due to the excellent benefits it brings. Since services require a high level of experience and credibility, they are more challenging to evaluate, and service quality is essential for service marketing (Zeithml et al., 2013). In the case of e-banking services in developing countries like Bangladesh, the problem is compounded by the fact that a huge section of the population is underprivileged and illiterate, making it impossible to judge service quality rationally. However, a recent societal shift toward the use of smartphones and social media has driven service businesses to include ICT in their core business activities. Apart from that, the government of Bangladesh (GoB) has taken significant strides to digitize its services through fostering ICT use across the board. As a result, Bangladesh Bank (the country's central bank) has worked hard to promote e-banking services in the banking sector. The Bangladesh Bank also recognizes the importance and benefits of implementing e-banking services, and they execute it in addition to their existing traditional services. Bangladesh

has 57 scheduled banks that are wholly supervised and regulated by the Bangladesh Bank. Moreover, there are forty private commercial banks (PCB) (<https://www.bb.org.bd/fnansys/bankfi.php>, 2017), with 32 conventional PCBs and eight Islami Shariah-based PCBs. E-banking has been deployed at various levels by the majority of PCBs.

Recent studies show that a few researchers have focused on the integration of an appropriate e-banking service quality measurement scale or the effect of different electronic banking service quality dimensions on e-banking performances using advanced matrices (structural equation modeling). Thus, the study aims to identify the impact of different quality dimensions of e-banking services on the e-banking performance of private commercial banks in Bangladesh.

3. The Theoretical Framework: Technology Adoption Model (TAM)

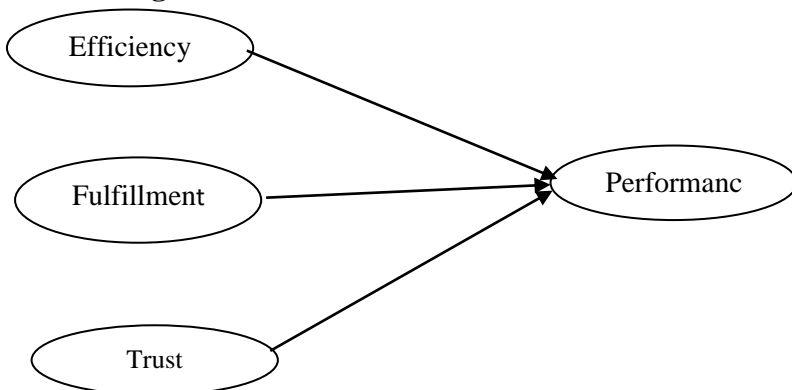
In 1986, Davis developed a model known as the Technology Adoption Model (TAM), intending to determine how people will adapt to new products, ideas, or technologies. TAM explains why people accept new ideas or technologies and how external factors (such as perceived usefulness and perceived ease of use) affect people's feelings about new products or systems when they adopt them.

The model also reveals how people think about new products or systems after adopting them (Davis, 1989). Studies (such as by Venkatesh and Davis, 1996) argue that people are more likely to adopt a new piece of technology or system if they believe it would benefit them and will be simple to operate. The findings of a few studies support the arguments mentioned above (Bitkina et al., 2022). Scholars believe that researching on how people utilize technology, particularly new technologies and systems, has become an interesting topic in recent years. Evidence shows that the various psychological and sociological aspects have been incorporated to the original TAM to explore a deeper understanding of how people's actions and thoughts could change due to adopting new technology or an invention.

E-service quality may be described as the comprehensive evaluation and customer assessment of e-service delivery in the virtual marketplace (Santos, 2003). Successful e-service providers recognized that electronic service quality is more important than website presence and low price,

which acts as an essential factor for determining success for e-business. (Yang, 2001; Zeithaml, 2002). Parasuraman et al (2005) offered E-SQual and E-Res-Qual scales to measure ESQ by using seven dimensions, for instances, responsiveness, efficiency, privacy, compensation, system availability, fulfillment, and contact as service quality dimensions using a total 33-item scale. However, Yang (2001) developed a seven-dimensional online SQ measurement scale close to basic SERVQUAL that comprises of credibility, reliability, access, responsiveness, ease of use, attentiveness, and security dimensions. Besides, a new service quality measurement scale was developed by Jayawardhena (2004) and subsequently improved and proposed by Kumbhar (2011) for assessing service quality and customer satisfaction in e-banking services. The scale includes twelve items to measure e-banking service quality: e-fulfillment, system availability, efficiency, responsiveness, accuracy, security, problem handling, easy to use, convenience, compensation, cost-effectiveness, and contact. The participants reported levels of subjective enjoyment, and also how they felt about the consideration of the direct result of the study. Several studies have found that TAM results in customer satisfaction at their places of employment and enhances the institution's performance (Alalwan et al., 2018). Analyzing the above models, the study has developed the following framework for conceptualizing the measurement and structural models by critical consultation with different kinds of literature (Parasuraman et al, 2005; Jayawardhena, 2004; Kumbhar, 2011; Yang, 2001; Zeithaml, 2002; Kenova & Jonasson (2006).

Figure 1: The Research Framework



(Source: Authors' generated framework, 2022)

4. Hypotheses

From the above framework, the researchers have formulated the following three hypotheses:

- H1:** Efficiency has a positive effect on the e-banking performance of commercial banks in Bangladesh.
- H2:** Fulfillment has a positive effect on the e-banking performance of commercial banks in Bangladesh.
- H3:** Trust has a positive effect on the e-banking performance of commercial banks in Bangladesh.

5. Methods and Procedures

5.1 Research Design

The current study has been designed to employ quantitative research techniques for exploring specific objectives. The hypotheses were tested quantitatively by applying a range of statistical tools. In order to generalize the results of this research, a large sample size was utilized to uncover the causal relationship between the dependent and independent factors (Lazaraton, 2005). The dependent variable of the study is e-banking performance, whereas efficiency, fulfillment, and trust are the independent variables. Despite the fact that many studies have been conducted in the areas of service quality, perceived value, and customer satisfaction, a few researches have been deployed to find the relationship between service quality and outcome variables mediated through perceived value. Furthermore, utilizing Structural Equation Modeling (SEM)-related methodologies, this study has contributed by evaluating the direct effect of efficiency, fulfillment, and trust on e-banking performance.

5.2 Sampling Technique and Sample Size

The convenience sampling technique, as a part of the non-probability sampling procedure, was used in this study. The main reason behind that was the unavailability of the identity of the e-banking users of different private commercial banks, as none of the private commercial banks agreed to provide the e-banking customer list. Evidence also suggests that non-probability convenience sampling was widely used in different Information Systems (IS) research (Hoque, 2016; EZE Uc et al., 2011).

Scholars (Hoques & Sorwar, 2017; Hair et al., 1995) argued that a great deal of heterogeneity of opinions existed in different literatures regarding the selection/calculation of optimal sample size for various forms of statistical analysis. Statistical analysis involving Structural Equation Modeling (SEM) suggested that a sample size of 200 is acceptable and that of 300 is excellent (Hoques & Sorwar, 2017; Lline, 2015). Hair et al. (2010) also suggested that a sample size of 200 should be used for testing of a model using SEM. Moreover, Roscoe (1975) in his research work utilized a sample size of 300 respondents for SEM data analysis. Considering these arguments, a total of 348 respondents have been selected for demographic and SEM analysis. By administering the IBM SPSS 23, the cleaning process has been accomplished. The relationship between the determinant and outcome variables has been established by analyzing the collected data from the sample respondents.

5.3 Research Instrument

The researcher developed the questionnaire using a Google form that was sent to the respondents using different social media platforms like Gmail, Facebook, WhatsApp, etc. In the questionnaire, three mandatory questions were set and the convenience sampling technique was used. Customers were asked three questions to determine if they were e-bank users. The questions are: (1) Do you have a bank account? (2) Do you utilize E-banking? and, (3) Do you accept to take part in this study? The respondents who gave their consent to participate in this research were asked to complete the (google form) questionnaire that normally took 30 to 35 minutes to complete. The data were collected through the 7 Likert Type Scale, excluding the demographic information.

5.4 Statistical Tools

The researcher employed Covariance Based-Structural Equation Model(CB-SEM) as the data analysis technique. As part of the advancements made in statistical research, the Structural Equation Modeling (SEM) method for multivariate data analysis was used (Chin, 1998). The items of the factors for this study were selected following the research carried out by Parasuraman et al, (2005) and Kenova & Jonasson (2006).

6. Findings and Analysis

6.1 Demographic analysis:

Table 1: Demographic Profile of the Respondents

Variable	Factors	Frequency	Percentage	Variable	Factors	Frequency	Percentage
Age	< 25 years	71	20.4	Frequency of e-banking Transactions in a month	4 or less	220	63.2
	25 to 40 years	246	70.7		5 to 8 times	95	27.3
	41 to 55 years	27	7.8		9 to 12 times	22	6.3
	> 55 years	4	1.1		13 or more times	11	3.2
Gender	Male	280	80.5	Customers of Banks	Jamuna Bank	43	12.4
	Female	685	19.5		Bangladesh Krishi Bank	20	5.7
Level of Education	Primary	0	0		BRAC Bank	75	21.6
	S.S.C	0	0		IBBL	77	22.1
	H.S.C	92	26.4		SIBL	35	10.1
	Graduation	123	35.3		Standard Bank	21	6.0
	Post-Graduation	133	38.2		DBBL	3	.9
Length of e-banking services used in months	< 3	74	21.3		Dhaka Bank	19	5.5
	3-12	150	43.1		National Bank	1	.3
	> 12	124	35.6		Mutual Trust Bank	17	4.9
				City Bank	22	6.3	
				Agroni Bank Ltd.	15	4.3	

(Source: Descriptive statistics, 2022)

From the demographic analysis, it was found that 80.5% of the respondents were male, and 19.5% were female. The table revealed that most of the participants belonged to the 25- 40-year age group. A large proportion of the respondents (73.5%) were well educated. However,

their length of use of e-banking service was relatively shorter (i.e. 64% of the respondents had e-banking experience of about one year or less). The majority of the respondents indicated that the frequency of their e-banking transactions is 8 times per month or less. The study showed that the respondents were well educated but their level of interaction with e-banking services is medium to low.

6.2 Preliminary analysis

Microsoft Excel (MsExcel) 16 was utilized to identify missing data in the dataset. The MsExcel analysis showed that data were not missed. Additionally, the Mahalanobis D2 measure was used to detect the multivariate outliers and found the data set was free from outliers.

In terms of normality, all the variables in this study were grouped within the normal range of skewness and kurtosis. VIF and tolerance effect were determined through the multiple regression procedure with the analysis of the collinearity diagnostic option. The analysis showed that there was no multi-collinearity problem. At the beginning, we conducted a t-test on the 4 latent variables and identified the overall performance of the e-banking services of some commercial Banks in Bangladesh.

Table 2: Latent Variables of the Research.

Variables	Mean	Standard Deviation	Standard Error of Mean
E-banking Performance	4.5070	.92277	.04947
Efficiency	4.7305	.98665	.05289
Fulfilment	4.6171	1.04687	.05612
Trust	4.9684	.99226	.05319
Overall Service Quality	4.6772	.86227	.04622

(Source: Descriptive statistics, 2022)

Table 3: One-Sample t-test Result

Variables	t	df	Sig. (2-tailed)	Mean Difference
E-banking Performance	10.249	347	.000	.50698
Efficiency	13.811	347	.000	.73046
Fulfillment	10.996	347	.000	.61710
Trust	18.206	347	.000	.96839
Overall Service Quality	14.650	347	.000	.67716

Test Value = 4 out of 7 point scale

(Source: Inferential Statistics, 2022)

The above tables (2 and 3) reveal that the overall performance of the e-banking services of the twelve banks is quite satisfactory which is 4.5 on a 7-point scale and the overall quality perception by the respondents are also good with a mean value of 4.68 out of 7.

6.3 Inferential Analysis

6.3.1 Measurement Model

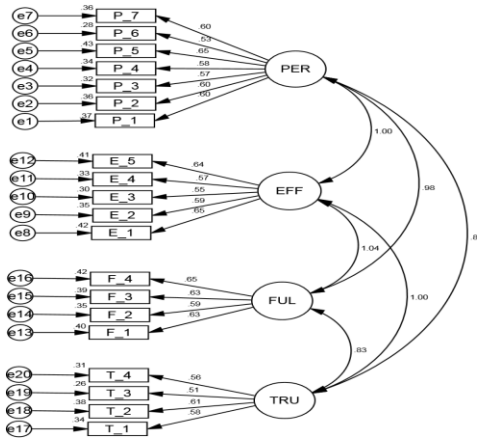
In the inferential analysis part, the researchers have focused on analyzing the measurement and structural models. The study has analyzed the measurement model by using SPSS-AMOS- 23 software. In so doing, the study identified the reliability of the measurement model to administer the structure model for the identification of the relationship among latent variables. The final standardized measurement model is as follows:

Table 4: Measures of Reliability

	Items	Reliability	RMSEA	GFI	AGFI	CFI	Chi-sq/df
EFF	5	.82	.076	.888	.864	.859	3.46
FUL	4	.84	.066	.888	.854	.878	2.63
TRU	4	.80	.078	.924	.892	.874	2.67
Measurement Model			.082	.852	.810	.947	3.33

(Source: Reliability test, 2022)

Figure 2: The Final Standardized Measurement Model



(Source: Authors' generated measurement model, 2022)

The assessment of the model fit indicated that the model fitted with the data perfectly (see table 4). The reliability test relied on the most indices such as the relative Chi-square with a value of 3.33 (which was less than the recommended value of five), and CFI with values of more than 0.900 (0.947). In addition, based on RMSEA with a value of 0.082, which was slightly more than the recommended value of 0.08, referred to as an acceptable level. The reliability test result guided us to explore the structural model to test the hypothesis.

6.3.2 Structural Model

The result of the measurement model allowed the researchers to go for analyzing the structural model.

Table 5: Paths Coefficient and P-value

	β	Standard Error	C.R.	P-Values	Decision
Efficiency \rightarrow Performance	0.341	.175	1.671	.005	Accepted
Fulfillment \rightarrow Performance	0.572	.174	3.187	.001	Accepted
Trust \rightarrow Performance	0.068	.159	.416	.677	Rejected

(Source: SEM regression analysis using SPSS- AMOS, 2022)

Table 6: SEM Regression Analysis

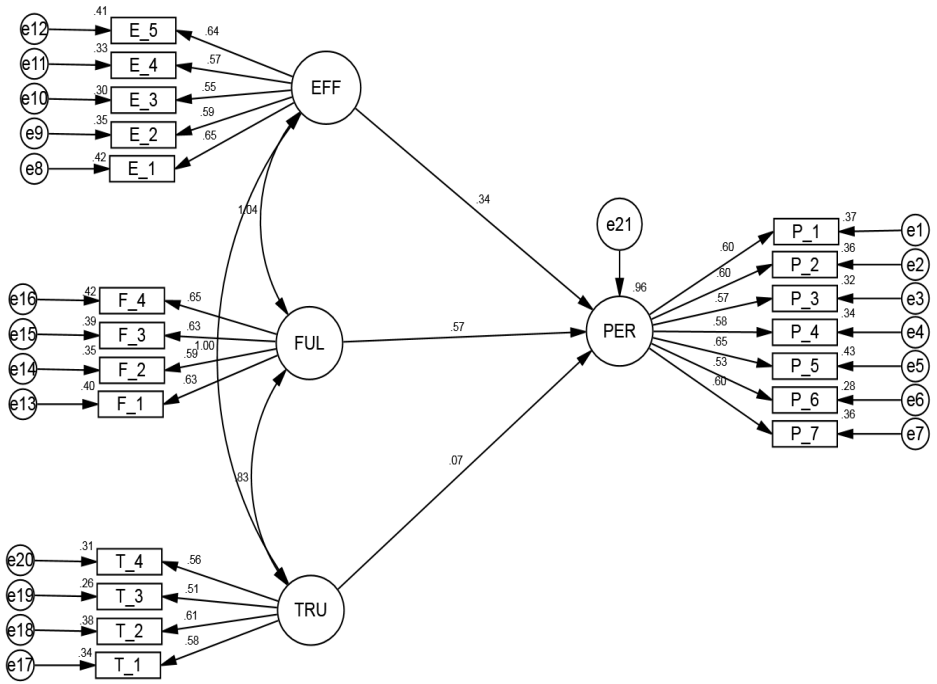
SEM Regression Analyses of Structured model

Standardized Regression Weights:
(Structured model)

	Estimate	S.E.	C.R.	P		Estimate
PER <--- EFF	.293	.175	1.671	.005	PER <--- EFF	.341
PER <--- FUL	.556	.174	3.187	.001	PER <--- FUL	.572
PER <--- TRU	.066	.159	.416	.677	PER <--- TRU	.068
P_1 <--- PER	1.000				P_1 <--- PER	.604
P_2 <--- PER	1.082	.116	9.340	***	P_2 <--- PER	.599
P_3 <--- PER	.914	.102	8.938	***	P_3 <--- PER	.566
P_4 <--- PER	1.095	.120	9.159	***	P_4 <--- PER	.584
P_5 <--- PER	1.148	.115	9.977	***	P_5 <--- PER	.653
P_6 <--- PER	.878	.104	8.444	***	P_6 <--- PER	.528
P_7 <--- PER	1.060	.113	9.391	***	P_7 <--- PER	.603
E_1 <--- EFF	1.000				E_1 <--- EFF	.651
E_2 <--- EFF	.862	.084	10.252	***	E_2 <--- EFF	.594
E_3 <--- EFF	.823	.086	9.519	***	E_3 <--- EFF	.547
E_4 <--- EFF	.841	.085	9.917	***	E_4 <--- EFF	.572
E_5 <--- EFF	1.041	.095	10.936	***	E_5 <--- EFF	.639
F_1 <--- FUL	1.000				F_1 <--- FUL	.630
F_2 <--- FUL	1.111	.116	9.603	***	F_2 <--- FUL	.591
F_3 <--- FUL	1.035	.103	10.082	***	F_3 <--- FUL	.627
F_4 <--- FUL	1.144	.111	10.328	***	F_4 <--- FUL	.646
T_1 <--- TRU	1.000				T_1 <--- TRU	.580
T_2 <--- TRU	1.011	.114	8.836	***	T_2 <--- TRU	.615
T_3 <--- TRU	.879	.113	7.753	***	T_3 <--- TRU	.515
T_4 <--- TRU	1.021	.124	8.268	***	T_4 <--- TRU	.560

(Source: SEM regression analysis using SPSS- AMOS, 2022)

Figure 3: The Final Structural Model



(Source: Authors' generated structural model, 2022)

Table 5 shows that two hypotheses (H1 and H2) have been accepted. It is found that efficiency (p-value: 0.005) and fulfillment (p-value: 0.001) have a positive effect on the e-banking performance of commercial banks in Bangladesh. However, in terms of the trust, the effect has not shown any significant effect on the e-banking performance of commercial banks in Bangladesh (p-value: 0.677).

The study, moreover, pinpointed that fulfillment (including reliability) is the most important service quality dimension that has a positive ($\beta=0.572$) impact on E-banking service performance. Efficiency is in 2nd position with $\beta=0.341$. However, the impact of Trust is not significant. So it can be concluded that customers consider fulfillment and efficiency to measure the E-banking service performance of a bank.

7. Contributions of the Research

The results of this study will assist the Bangladesh Bank in classifying private commercial banks based on the E-banking service quality performance and allowing them to design their service marketing mix strategies. E-banking service charges are based on the two most important service quality dimensions, for instance, e-banking service efficiency, and service fulfillment. Moreover, the study will provide significant insights into the current body of knowledge by proposing an alternative model for assessing the e-banking service quality performance, which is likely to be more accurate in the context of Bangladesh. It also highlights the holistic relationship between e-banking service quality dimensions and E-banking performance, whereas previous models simply looked at one or a few items separately to measure different dimensions of E-banking service quality and performance.

8. Conclusion and Recommendations

The study focused on the impact of different E-banking service quality dimensions on the E-banking service performance of a few selected private commercial banks in Bangladesh. By employing a range of quantitative tools, the research explored the central research questions and the test of the hypothesis has been established by carrying out inferential statistics, such as regression analysis and SEM. The research employed an advanced statistical method (SEM) which facilitated us to test the hypotheses we set for this research. The study revealed that the efficiency and fulfillment of e-banking services among private commercial banks have positive effects on overall banking service performances. In terms of trust in e-banking service performance, the relationship between e-banking trust and e-banking service performances could not be established. The study recommended that the academics and other related stakeholders would better understand the customers' perception of service quality in the banking sector of Bangladesh from the standpoint of E-banking service performance. It may also provide a few guidelines for future research that would be carried out for proper adaption and organization-wide resource investment and service marketing mix designing to enhance the E-Banking service performance.

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Declaration of Interests

We, the authors of this research manuscript, declare that we have no financial interest. We have provided written consent to publish the paper in this journal.

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