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To cite this article: Fransisca Dini Ariyanti and Anastasia Alowisius Joseph 2020 IOP Conf. Ser.: Earth Environ. Sci. 426 012130

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doi:10.1088/1755-1315/426/1/012130

Partial least squares structural equation modelling approach: how e-service quality affects customer satisfaction and behaviour intention of e-money

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Abstract. The purpose of this study is to find out how E-service quality (E-SQ) affects customer satisfaction (CS) and behaviour intention (BI) in electronic money. The research method used is Partial Least Square-Structural Equation Modelling, PLS-SEM to determine the relationship between E-SQ to CS, E-SQ to BI, CS to BI and the relationship of E-SQ to BI with CS as a mediating variable. In processing data, it is known that E-SQ significantly affects CS with a value of 81.1%. Non-significant E-SQ affects BI with a value of 0.056, where E-SQ significantly affects BI with CS variable as a mediating variable with a value of 0.599. Based on the calculation results, it is found that CS directly affects BI users of electronic money ABC with a value of 0.669. This shows that the higher the E-SQ given, the higher the level of customer satisfaction will also have an impact on BI users of electronic money X-cash.

Keywords: e-service quality, customer satisfaction, behaviour intention, PLS-SEM, e-money

1. Introduction

The more sophisticated technology lately, can bring us to do activities instantly, such as online transactions. Financial technology or called fintech, financial technology is a combination of financial services and technology that changes business from conventional to modern, so that transactions can be done remotely, without cash, and in seconds [1]. Fintech emerged in line withfast-paced lifestyle. Fintech, namely cashless helps transactions and payment systems to be more efficient and economical but still effective. Indonesia itself has begun to implement the use of non-cash financial services. Starting from generation Z is themost aware of the ease of this transaction. In Indonesia, the development of Electronic Money can be said to be very rapid. The term cashless is a term that has developed in the financial sector where, when conducting transactions, users do not need to use cash but only by using a tap card or using a cell phone they own. An investigation at advanced education foundations in Ghana, infers that E-Service Quality has a positive and noteworthy direct impact on the recurrence of utilization E-service [2]. The outcomes show that organizations that give more excellent E-service are bound to fulfill their clients, which thusly will influence their pledge to purchase and repurchase intentions. Next in an examination, inferred that there is a connection between measurements of service quality (responsiveness, trust, unwavering quality, and sympathy) and their effect on consumer loyalty and expectation to reuse in e-tax collection from the government income board in Pakistan [3]. Quality serviceshould be centered around improving and keeping up consumer

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doi:10.1088/1755-1315/426/1/012130

loyalty and must positively affect client reuse intentions. What's more, in an research directed by Hussain [4] reasoned that from the client's viewpoint, the security measurement was evaluated as the most huge E-servqual measurement seen from a mix of six measurements identified with dependability, responsiveness, usability, personalization, security, and web architecture. The aftereffects of this investigation show that the nature of E-service is legitimately identified with the servqual customer perceived. To present and socialize a new financial system for example, fintech with e-cash, appropriate of first, start a promoting effort to attempt to change individuals' social convictions in a positive manner and instruct them about the advantages of monetary service, for example, e-cash. Second, make another culture of trust and certainty among potential purchasers to pull in increasingly new clients to join and utilize the service. In addition, a ton of endeavors ought to be done from numerous gatherings to explain to the populace the advantages and helpfulness of utilizing the fintech system service for them and for the economy [5]. From the explanation above, it is important for companies to analyze customer satisfaction. Customer satisfaction can be measured by looking at the dimensions in E-service quality so that companies can find out whether customers are satisfied with the services provided and which dimensions most influence customer satisfaction in order to improve it to achieve customer satisfaction which can lead to consumer intentions. This research was conducted using the PLS-SEM method to see the relationship between E-service quality, customer satisfaction and behavior intention, with the problem formulation as follows: First, Does E-service quality have a positive effect on customer satisfaction level of e-money? Second, Does E-service quality have a positive effect on consumer intention (behavior intention) users of e-money? Third, does customer satisfaction have a positive effect on consumer intention (behavior intention) users of emoney? Last, Does E-service quality have a positive effect on consumer intention (behavior intention) with mediating variables customer satisfaction (customer satisfaction) users of e-money?

The study taken on the biggest communication providers companies in Indonesia (PT XYZ) that began to develop business in the field of non-cash payment instrumentby bringing up application-based called as electronic money (X-cash). With the emergence of X-cash from PT XYZ adding to the range of application-based non-cash payment tools that are developing in Indonesia, therefore PT XYZ needs to develop and plan strategies to continue to survive in this increasingly fierce competition. One important factor in order to survive in competition is to develop service quality. Indicated customer satisfaction has not yet had the maximum impact on customers.

2. Literature Review

2.1. E-Service Quality

2.1.1. Definition

The meaning of e-service quality (E-Servqual) is a site service that encourages proficient and viable shopping, obtaining, and conveyance of product and service to customers [6]. Generally the term E-service is utilized to depict an assortment of web based electronic communications that emerge from essential services, for example, delivery trace back and stock statements, to smart services or products, and so forth. This e-service includes various types, delivery systems, advanced information technology, online service methodologies and applications [7]. E-Servqual is a client's view of the service performance of an organization's e-service that can happen previously, during, and after a buy exchange, which thus decides their degree of fulfilment and therefore their future behaviour [2].

2.1.2. Dimension E-Service Quality

The following are the dimensions of E-servqual (Table 1) [8]:

doi:10.1088/1755-1315/426/1/012130

Table 1. Dimension of E-servqual

Dimension	Indicator	Dimension	Indicator		
Web Design	Attractive site display	Reliability	Providing services as promised		
			(reliable information)		
	The right and attractive color		There are no obstacles in		
	choices		accessing the website		
	Innovative site design		Website that is always updated		
	Easy to understand icons		the website can be accessed 24 hours		
Responsiveness	The answers given are appropriate	Privacy/Security	Maintain user's personal data		
	Can be contacted by customers		Convenience of customers to provide information		
	Speed in answering customer questions		Maintain user history information		
	Provides a FAQ section				
Privacy/Security	Maintain user's personal data	Ease of Use	The language on the website is easy to understand		
	Convenience of customers to provide information		Provide instructions that can be understood		
	Maintain user history information	Contact	Provides contacts that can be contacted		
Information	The information provided is easy		Can be contacted online		
Quality	to understand				

2.2. Customer Satisfaction

2.2.1. Definition

According to Kotler, customer satisfaction is the level of feeling when customers compare performance or results with expectations [9]. Purchaser fulfilment with the buy relies upon the genuine product or service execution, so it is in accordance with purchaser desires

2.2.2. Dimension Customer Satisfaction

The following are some dimensions of customer satisfaction (Table 2) [10]:

 Table 2. Dimension of Customer Satisfaction

D	т 1' 4	D	I 1' 4
Dimension	Indicator	Dimension	Indicator
Attributes	Website Design / Application	Attributes	Speed of service provided
Related to	Contact us available	Related to	The services provided are as promised and the information is updated
product Attributes related to purchase	Information provided Security	service	Website / Application Services The ease of using X-cash money

2.3. Behaviour Intention

2.3.1. Definition

Consumer behavior is influenced by several aspects including: cultural, social and personal, loyalty so that they are willing to recommend to other parties, the consumer attitude, subjective norms and behavior control [11-13].

doi:10.1088/1755-1315/426/1/012130

2.3.2. Dimension of Behavior Intention

The dimensions of behavior intention (Table 3) [12,14-18]:

Table 3. Dimension of Behavior Intention

Dimension	Indicator	Dimension	Indicator
Reuse	Using X-cash frequently	Word of Mouth Recommend for friends and relatives	
	Access X-cash Money Web or Application	Related to	Access X-cash Money Web or Application

2.4. Partial Least Square-Structured Equation Modelling

Systems utilized by scientists are relapse, relationship, factor examination, group investigation and other multivariate measurements strategies[19]. Factual investigation that can break down the relationship and interrelations between idle factors, and shows called Structural Equation Modeling (SEM), which at the time its essence was first upheld by a factual figuring apparatus called LISREL. SEM is known by its methodology or covariance based with its product that is LISREL, yet now there are other programming for count of SEM investigation.

Since dependent on covariance, the idea graph as above ought to be founded on the idea/hypothesis that from there on need to be affirmed with the example investigate so it needs numerous presumptions [19], for example, typical appropriated information, enormous example (proportion between watched variable with test is 1:10. is seen to repress analysts in directing exploration, the development of PLS as an answer for the different shortcomings above. SEM with PLS depends on the difference that isn't obliged in covariant-based SEM. Covariant-based SEM has an exceptional trademark that is reflective-molded marker, while SEM-based variance (PLS) can intelligent and developmental indicators. Here is a developmental and intelligent picture.

2.5. Smart PLS

This examination was analyzed by Smart PLSstatistical softwareor Smart Partial Least Square approach. The choice explanation is since PLS has the capacity to deal with restricted examples, regardless of the model structure is intricate [20, 21]. Due to evaluate the authenticity and steadfastness, we at first attempted the estimation appear before proceeding to get to the fundamental model [20]. The benefits of Smart PLS are first, to survey the connection between factors, either same idle variable or with variable marker, or show. Also, the PLS's capacity to process information both for developmental or intelligent SEM models. Thirdly, developmental SEM model's attributes contain idle or build factors create by pointer factors where bolts lead from the develop variable to the marker variable. Fourthly, the intelligent SEM model is a SEM model in which the develop variable is an impression of the marker variable, so the bolts lead from the pointer variable to the dormant variable. Fallout by measurement, there will be no mistake an incentive on the marker variable.

3. Theory and hypothesis

3.1. Relation between factors

3.1.1. Relationship between E-Servqual and Customer Satisfaction

In investigate shows that the four elements of E-SQ (usability, web architecture, security, and reliability) positively affect client fulfillment [22]. E-Servqual on Customer Satisfaction has a positive relationship and has a critical impact. This shows high E-Servqual will legitimately expand Customer Satisfaction. The better E-servqual gave or the exhibition of e-service equivalent or more noteworthy than desires, the fulfillment of utilizing e-service will likewise increment [23].

H1: E-service quality significantly influences customer satisfaction.

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3.1.2. Relation between E-ServQual and BehaviorIntension

High E-Servqualhas high impact to consumer behavioral intentions, for example, returning to sites, purchasing product or service from sites, and giving positive informal suggestions, and diminishing the probability of buyers going to contending sites [23]. In different examinations, four factors were explored as predecessors of conduct goal to utilize money benefits in the Yemeni setting specifically, e-servqual, legitimate structure, promotions and cultural beliefs [5]. If the client is happy with the e-servqual gotten through the online system, chances are that the client will keep on coming back to utilize the system [3]. Accomplishment is a powerful condition which is an enthusiastic response to a thing or administration experience.

H2: E-service quality significantly influences behavior intention.

3.1.3. Relationship Between Customer Satisfaction with Behavior Intention

The relationship of consumer loyalty with conduct aim in the journalshows that client fulfillment positively affects client conduct goals [22]. Fulfillment influences the buyer's expectation to rehash the acquisition of merchandise or the utilization of the service. That to expand consumer loyalty is essential to trigger the development of buyer goals to visit again and prescribe retailers to different clients [12].

H3: Customer satisfaction significantly influences behavior intention.

3.2. Research Model Design

Research conducted to see the satisfaction felt by users of X-cash who were influenced by the dimensions of E-service quality. In addition to seeing the effect of e-service quality (X1) on customer satisfaction (X2), this study was also conducted to see the effect of customer satisfaction that has an impact on Behavior Intention (X3). See Figure 1 of inner model interaction of X1, X2 and X3.

3.3. Hypotheses

Based on the identification of problems and theories that have been explained, researchers will develop hypotheses for testing that are useful to meet the following research objectives:

- 1. Ho: E-service quality (X1) does not significantly affect customer satisfaction (X2) users of X-cash H1: E-service quality (X1) significantly affects Customer satisfaction (X2) of users of X-cash
- 2. Ho: E-service quality (X1) does not significantly affect behavior intention (X3) users of X-cash H1: E-service quality (X1) significantly influences behavior intention (X3) users of X-cash
- 3. Ho: Customer satisfaction (X2) does not significantly affect behavior intention (X3) users of X-cash H1: Customer satisfaction (X2) significantly influences behavior intention (X3) users of X-cash.
- 4. Ho: E-service quality (X1) does not significantly affect behavior intention (X3) with customer satisfaction (X2) as mediation.
 - H1: E-service quality (X1) significantly influences behavior intention (X3) with variable customer satisfaction (X2) as mediation.

3.4. Hypothesis Testing

In Partial Least Square, hypothesis testing will be based on t-values and T-Statistics, where the hypothesis testing requirements in the least square partial can be explained as follows:

- a) If T-Statistics < T-Value, then Ho is accepted, H1 is rejected
- b) If T-Statistics> T-Value, then Ho is rejected, H1 is accepted

Hypothesis testing is also done with the p-value. If p-value <0.05 (α 5%), the results are significant, and if p-value> 0.05 (α 5), the results are not significant.

3.5. Descriptive research, data collection, dimension and questionnaire list

The research method used was associative descriptive research and data collection was carried out by survey. The population of X-cash users who also use the Application on mobile phoneor Website is unknown, so the sample calculation uses the formula as follows [23]:

doi:10.1088/1755-1315/426/1/012130

$$n = \frac{Z^2}{4(moe)^2}$$
n: Sample size z: Confident level value = 1.96 moe: Error tolerance = 10%
$$n = \frac{1.96^2}{4(0.1)^2} \qquad n = 96,04 \approx 97$$

Questionnaire design was based on the dimensions of E-service quality (Table 1), Customer satisfaction (Table 2) and behavior Intention (Table 3). The Questionnaire answer used a Likert scale consisting of 5 scores: Strongly agree (SA), Agree(A), neutral (N), Disagree (DA) and Strongly Disagree (SDA). The Questionnaires list in supplemenwas fulfilled by 294 respondents.

4. Result and Analysis

4.1. Respondent profile

Based on the results of questionnaire collection, from 294 respondents who are users of X-cash also user of itsapplications or websites. The following Table 4 shows the respondent profile based on age, domicile, X-cash holder duration and transaction frequency of X-cash within a month.

 Table 4. Respondent profile

				ubic i.	respondent pr	OIIIC			
Age,	year	%	Domicile,	%	Duration,	%	Transaction	Freq.	%
old			area		month		amonth, times		
17 - 30		84	Greater Jakarta	60	6	40	< 5		58
31 - 40		9	Java island	23	6 - 12	40	5 - 10		23
<17		5	Outside Java	17	>12	20	Never use		15
>41		2					>10		4

4.2. Path Model Analysis

The initial stage in processing data using PLS is by designing a path analysis. Path analysis is made to show the relationship between 3 latent variables in the study, namely E-service Quality (variable X1), Customer Satisfaction) (Consumer Behavior) (Variable X2), and Consumer Intention (Behavior Intention) (variable X3). The following Figure 1 is the path analysis of the results of initial data processing:

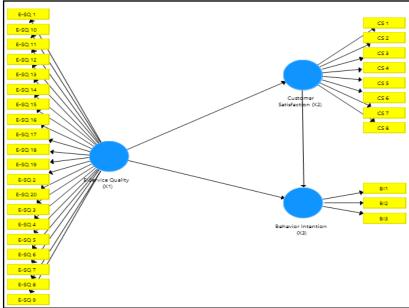


Figure 1. Path Model Analysis

doi:10.1088/1755-1315/426/1/012130

4.2.1. Testing the Measurement Model (Outer Model)

Outer model testing is done by conducting validity and reliability testing of the questionnaire data that has been collected.

4.2.2. Validity test

Validity test is done to measure every question contained in the questionnaire. The question is said to be valid if the question could answer what should be. Validity test is done by correlating each question with the total score for each variable. Validity test is performed on all variables used in research. The following is the method used to test the validity of using Smart PLS software version 3.0; convergent validity test using outer loading evaluation, which outer loadings are the value of loading factor indicators to determine whether the questionnaire data is convergent or not. Measurement of outer loadings serves to define how each indicator relates to the variable. Based on the E-service quality (X1) variable there are 20 indicators which are represented by questions number ESQ1-ESQ20. Customer satisfaction variable (X2) there are 8 indicators represented by questions number CS1-CS8. The variable consumer intention (behavior intention) (X3) there are 3 indicators represented by questions number BI1-BI3.

The low convergent validity value indicates that the indicators are not good enough to represent the variables formed. The loading factor value must be greater than 0.7 to be valid. However, for the initial stage of developing the measurement scale the loading factor value from 0.50 to 0.60 is still acceptable in the study. From the above explanation it can be concluded the basis for decision making is as follows [25]:

- Outer Loading correlation value> 0.50, then the question is valid
- Outer Loading correlation value <0.50, then the question is invalid

By using Smart PLS 3.0 software, the convergent validity test results are obtained as follows in Table 5:

Table 5. Outer validity test result						
	BI(X3)	CS(X2)	E-SQ (X1)	BI(X3)	<i>CS</i> (X2)	E- $SQ(X1)$
BI 1	0,885		E-SQ 1			0,611
BI 2	0,838		E-SQ 10			0,273
BI 3	0,828		E-SQ 11			0,680
CS 1		0,721	E-SQ 12			0,653
CS 2		0,632	E-SQ 13			0,726
CS 3		0,729	E-SQ 14			0,700
CS 4		0,722	E-SQ 15			0,705
CS 5		0,736	E-SQ 16			0,625
CS 6		0,740	E-SQ 17			0,675
CS 7		0,785	E-SQ 18			0,699
CS 8		0,764	E-SQ 19			0,722
			E-SQ 2			0,661
			E-SQ 20			0,704
			E-SQ 3			0,701
			E-SQ 4			0,706
			E-SQ 5			0,682
			E-SQ 6			0,652
			E-SQ 7			0,710
			E-SQ 8			0,581
			E-SQ 9			0,704

Table 5. Outer validity test result

From the results of validity test data processing using the outer model found that there are 1 indicator that does not meet the criteria or with a loading factor value below 0.5, namely the E-service quality (X1) variable on the indicator number E-SQ 10 with a loading factor value of 0.272. Based on

doi:10.1088/1755-1315/426/1/012130

the above results, it is rare to recalculate further by eliminating the indicator number E-SQ 10 so that the test meets the criteria. Figure 2 Path Model Convergent Validity are the results of testing the validity after removing the E-SQ10 indicator:

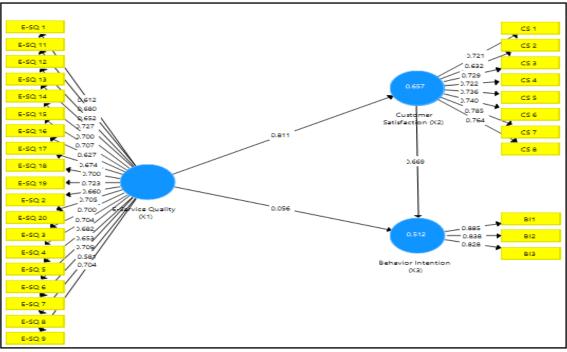


Figure 2. Path Model Convergent Validity

Discriminant validity measurements are used to ensure that each indicator reflects the latent variable rather than the other latent variables. Discriminant validity of the reflection indicator can be seen in the cross-loading value which has a value above 0.5. Based on the processing of the value of the cross loading indicator to the construct itself is greater than the correlation of the value of the cross loading of other constructs, so it can be concluded that the entire variable meets the requirements of discriminant validity and has a high validity value. Validity test is done to prove the accuracy, consistency and accuracy of instruments in measuring constructs. Construct reliability is measured by Composite Reliability and Cronbach's alpha. The construct is said to be reliable if the composite reliability and Cronbach's alpha values are above 0.7. The value of composite reliability and Cronbach's alpha on E-service quality, customer satisfaction and behavioral intention produced has a value greater than 0.7 which indicates that all variables are reliable as shown in Figure 3 and Figure 4.



Figure 3. Composite Reliability

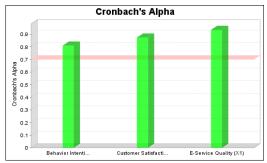


Figure 4. Cronbach's Alpha

doi:10.1088/1755-1315/426/1/012130

The coefficient value of the E-Service Quality (X1) variable to Customer Satisfaction (X2) of 21,129 (T-statistics) is greater than 1.96 (T-value) and the results of the original sample also show a positive value of 0.811, which can be concluded that there is a positive relationship between E-Service Quality and Customer Satisfaction which means that the higher the E-Service Quality provided, the higher the level of customer satisfaction felt by ABC electronic money users. The coefficient value of the E-Service Quality (X1) variable against Behavior Intention (X3) is 0.723 (T-statistics) which is smaller than 1.96 (T-value) and the results of the original sample value indicate a positive value of 0.056, which can be concluded there is a non-significant positive relationship between E-Service Quality (X1) and Behavior Intention (X3). The coefficient value of the customer satisfaction variable (X1) to Behavior Intention (X3) is 9,098 (T-statistics) which is greater than 1.96 (T-value) and the results of the original sample also show a positive value of 0.669, which can be concluded that there is a positive relationship between Customer Satisfaction and Behavior Intention which means that the higher the level of Customer Satisfaction perceived, the higher Behavior Intention of users of ABC electronic money. The following Table 6 are the results of the Path Coefficient output from SmartPLS:

Table 6. The path Coefficient output

	OriginalSam ple (O)	SampleM ean (M)	StandardDev iation (STDEV)	T-Statistics (O/STDEV)	P-Values
E-Service Quality (X1) → Customer Satisfaction (X2)	0.811	0.814	0.038	21.129	0.000
E-Service Quality (X1) → Behavior Intention (X3)	0.056	0.057	0.077	0.723	0.470
Customer Satisfaction (X2) → Behavior Intention (X3)	0.669	0.667	0.074	9.098	0.000

E-service quality significantly influences the behavior of X-Cash e-money users with customer satisfaction as a mediating variable. E-Service Quality (X1) indirectly influences Behavior Intention (X3) through Customer Satisfaction (X2) with an original sample value of 0.543 (Table 7), so that the total effect of the relationship between E-Service Quality (X1) and Behavior Intention (X3) can be calculated through Customer Satisfaction (X2) which is 0.599.

Table 7. The path Coefficient output

	Table 7. 1	ne patii co	criterent output		
	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T-Statistics (O/STDEV)	P-Values
E-Service Quality (X1) → Behavior Intention (X3)	0.543	0.542	0.064	8.512	0.000

Based on research conducted obtained that E-service Quality significantly affects Customer Satisfaction. E-service quality perceived by users of X-cash positively influences perceived customer satisfaction with a value of 81.1%. There is a non-significant positive relationship between E-service quality and Behavior Intention. The direct effect of E-service quality on behavior intention in this study was not significant. Significant influence is seen between E-service quality on behavior intention through customer satisfaction mediation variables. Customer Satisfaction significantly influences Behavior intention. The perceived satisfaction will positively influence the behavior intention of X-cash users with a value of 66.9%.

doi:10.1088/1755-1315/426/1/012130

5. Conclusion

Based on research that has been done, first, E-service quality has a significant positive effect on customer satisfaction of X-cash e-money users with a value of 0.811. Second, E-service quality positively non-significantly influences the behavior of users of X-cash e-money with a value of 0.056. Third, Customer Satisfaction positively significantly influences the behavior of users of X-cash e-money with a value of 0.669. Fourth, E-service quality positively significantly influences user behavior intention with customer satisfaction as a mediating variable of 0.599.

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