The Effect of E-Service Quality toward Customer Satisfaction: PlayStation Store

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Abstract: *A large population of internet users caused the online shopping became more popular nowadays. Not only by shopping physical goods through internet, people now can also purchase and pay for services online, for example by purchasing digital contents through a website. The example for this event is PlayStation Store. Sony PlayStation Store offers digital contents such as base game (digital game), and DLCs (Downloadable Contents) on their site since 2006. PlayStation Store site allows PSN users to provide feedback if they have problems with the PlayStation Network services. Most reported problems that were found in PlayStation Network consists of Sign-in (77%), Game play (11%), and PlayStation Store (10%).The objective of this study is to analyze and to observe the effect of online service quality (e-SQ) toward customer satisfaction using PlayStation Store as an application within this research. Five dimensions of e-SQ are used in this research such as: Efficiency, Reliability, System Availability, Fulfillment, and Privacy.This research used multiple regression analysis with the sample of 385. The most influential variable is Privacy with regression coefficient of 0.372, and System Availability with regression coefficient of 0.219, followed by Reliability with regression coefficient of 0.172, and Efficiency with regression coefficient of 0.129, meanwhile the very least influential is Fulfillment with -0.043.Based on the overall analysis, Sony PlayStation need to improve every aspect related to the Fulfillment variable, which is to provide better service that includes availability, and delivery time to the customer. With these improvements, Sony PlayStation Store would create a better environment regarding to the Fulfillment of products/services toward Customer Satisfaction.*

Keywords: e-Service Quality, e-Commerce, Customer Satisfaction, PlayStation Store.

1. Introduction

A large population of internet users caused the online shopping become more popular nowadays. Not only by shopping physical goods through internet, people now can also purchase and pay for services online, for example by purchasing digital contents through a website. The example for this event is PlayStation Store. Sony PlayStation Store offers digital contents such as base game (digital game), and DLCs (Downloadable Contents) on their site since 2006.

PlayStation Store site allows PSN users to provide feedback if they have problems with the PlayStation Network services. Unfortunately, problems were found during the service delivered to the customer. Most reported problems that were found in PlayStation Network consists of Sign-in (77%), Game play (11%), and PlayStation Store (10%).[11]

A good service that is provided by the company will lead into the enhanced customer satisfaction. According to Parasuraman, Zeithaml, and Berry (1988), "Customer satisfaction can be measured by five aspects that is known-well as TERRA (Tangibles, Empathy, Responsiveness, Reliability, and Assurance). In terms of e-commerce, service quality may be different with the TERRA concept of service quality, such as Efficiency, Reliability, Responsiveness, Fulfillment, and Privacy.", based on Saha, P. and Zhao, Y. (2005).[5]

The number of gamers in Indonesia is increasing from time to time. Of 126 million gamers, 60 million spend money on games. Last year, these 60 million consumers spent an average of $18.40 on games annually. As KPIs differ drastically per country in Southeast Asia, Newzoo believes Thailand will remain the largest games market in terms of revenues come 2017, followed closely by Indonesia and Malaysia. Similarly, Vietnam is expected to grow in line with the overall market to maintain its market share of 14 percent. Singapore will continue to grow, but lose some of its market share to faster growing countries, namely Indonesia and the Philippines. (TechinAsia.com, 2016)[8]

Table 1: Games Revenue Growth in Southeast Asia, Source: Newzoo (2016)

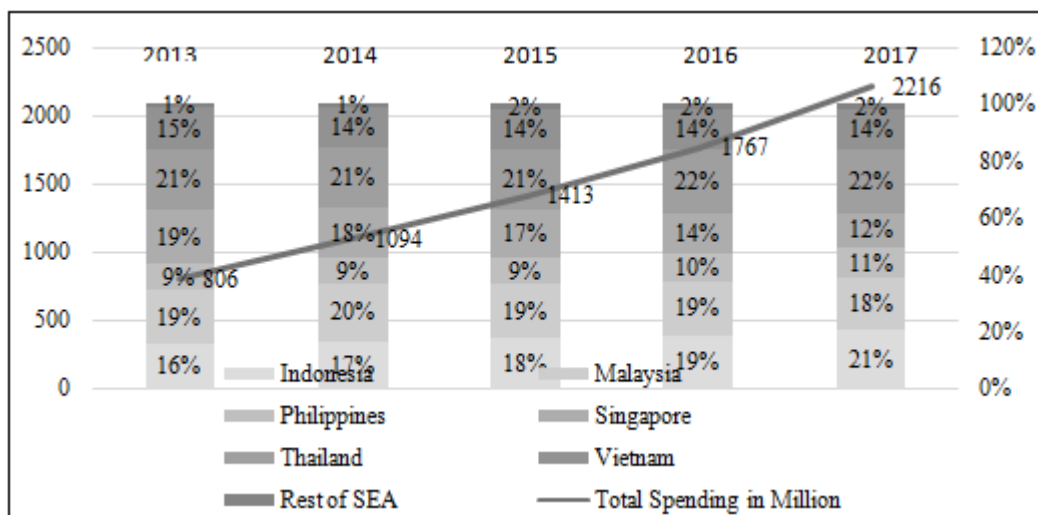| Country	Revenue					CAGR
	2013	2014	2015	2016	2017	
Indonesia	16%	17%	18%	19%	21%	+37.3%
Malaysia	19%	20%	19%	19%	18%	+27.0%
Philippines	9%	9%	9%	10%	11%	+14.4%
Thailand	19%	18%	17%	14%	12%	+30.9%
Vietnam	21%	21%	21%	22%	22%	+27.2%
Rest of SEA	1%	1%	2%	2%	2%	
Total	$806M	$1,094M	$1,413M	$1,767M	$2,216M	+28.8%

*CAGR = Compound Annual Growth Rate.

Figure 1: Southeast Asian Gaming Market 2013-2017

Indonesia has 66 million online population. The Indonesian games market is expected to generate revenues of $321 million in 2015. This is a 56 million increase in 2014, making Indonesia the 24th largest games market in the world and second in Southeast Asia. Of the 42.8 million gamers in Indonesia, 24.1 million spend money on games, a payer-to-player ratio of 56%, above the regional average. However, the annual average spend per payer of $13.30 is below average. Total revenues will grow towards 2018 with a CAGR (Compound Annual Growth Rate) of +45.7%. (Newzoo.com)[2]

According to Statista (2016)[6]; Figure 1.3., current PlayStation gaming platform available in the market (PS4) is categorized on the third position in the most important gaming platforms in 2016 after PC, and Smartphones/Tablets. Gaming industry's competition is very tight especially with the current situation; existence of PC (Steam) and Smartphones/Tablets (Android and iOS). Meanwhile, PS4 is over-performed against Xbox One (Microsoft).
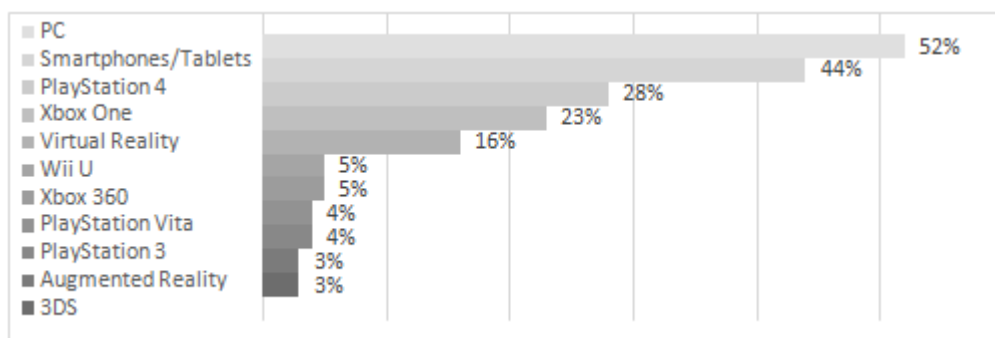

Figure 2: The Most Important Gaming Platforms in 2016

As of 6th February 2017, gaming software units sold globally (excluding USA, Europe (UK, Germany, and France), and Japan) as follows [9]:

Table 2: Global Gaming Software & Hardware Sales Yearly

Platform	Software Sales Yearly (in million)	Total Software Sales (in million)	Hardware Sales Yearly (in million)	Total Hardware Sales (in million)
Sony PlayStation 4	18	372.87	2.1	55.9
Microsoft Xbox One	5.72	186.97	0.76	28.7
Nintendo Wii U	1.4	88.2	0.58	13.8

Based on the Table 1.2, we can conclude that most of games are sold from PS4 platform (Sony) with the highest number than Microsoft Xbox One. Therefore, the gaming ecosystem in PS4 platform is higher than Xbox One and Nintendo Wii U ecosystem.

2. Research Framework

Suriasumantri (1986) and Sugiyono (2009) stated that a researcher need to master scientific theoris as a conceptual framework structure basis that will result hypotheses. Conceptual framework is a temporary explanation toward problem statement symptoms. (Sujarweni, V. W., 2015:66-67).[7]

In this research, the author adopted a conceptual framework from Saha, P., and Yanni, Z. (2005) on their research entitled: *Relationship between Online Service Quality and Customer Satisfaction.* [5] The framework consists of Online Service Quality Dimensions (Efficiency, Reliability, System Availability, Fulfillment, and Privacy)[3] [4] [10] variables and Customer Satisfaction in PlayStation Store variable based on Parasuraman et. al. (2005)[3]. Consequently, the author made some changes on Saha, P. (2005) framework from Responsiveness to System Availability since PlayStation

Store only providing digital contents not physical goods and there are no physical goods return in their service. The conceptual framework stated as follows:
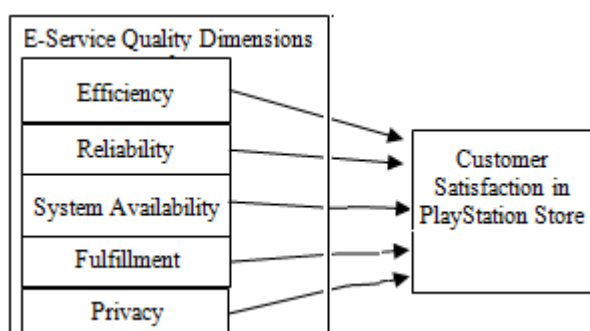

Figure 3: Conceptual Framework

Research Hypothesis
H1: Efficiency has a positive impact to the satisfaction of PlayStation Store customer.
H2: Reliability has a positive impact to the satisfaction of PlayStation Store customer.
H3: System Availability has a positive impact to the satisfaction of PlayStation Store customer.
H4: Fulfillment has a positive impact to the satisfaction of PlayStation Store customer.
H5: Privacy has a positive impact to the satisfaction of PlayStation Store customer.

Research Method and Result
This study collected data from 385 respondents to test hypotheses by using online questionnaire distributed to respondents. For data processing, the author used IBM SPSS Statistics version 23 for Windows. In IBM Statistics Data Editor. several tests were conducted such as Normal Distribution Test, Multicollinearity Test, Heteroscedasticity Test, and Multiple Regression Analysis before testing Hypotheses using T Test, F Test, and Coefficient of Determination (R2). Following are results of several tests conducted:

Table 3: Skewness and Kurtosis

Descriptive Statistics					
	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
eService_Quality	385	-.318	.124	.242	.248
Valid N (listwise)	385				

Based on Table 4.10, Skewness is -0.318 and Kurtosis is 0.242. Therefore, $z_{skewness}$ and $z_{kurtosis}$ resulted as follows:

$$z_{skewness} = \frac{skewness}{\sqrt{\frac{6}{N}}} \qquad z_{kurtosis} = \frac{kurtosis}{\sqrt{\frac{24}{N}}}$$

$$z_{skewness} = \frac{-0.318}{\sqrt{\frac{6}{385}}} \qquad z_{kurtosis} = \frac{0.242}{\sqrt{\frac{24}{385}}}$$

$$= -2.547 \qquad = 0.969$$

This research has a normal distribution, since it has $z_{skewness}$ = -2.547, which is less than +1.96 and $z_{kurtosis}$ = 0.969, which is less than +1.96. Another normality test can be also tested by using Kolmogorov-Smirnov Test as follows:

Table 4: Kolmogorov-Smirnov Test

One-Sample Kolmogorov-Smirnov Test

		Customer_Satisfaction	eService_Quality
N		385	385
Normal Parameters[a,b]	Mean	16.95	78.38
	Std. Deviation	2.327	9.904
Most Extreme Differences	Absolute	.124	.062
	Positive	.108	.062
	Negative	-.124	-.054
Test Statistic		.124	.062
Asymp. Sig. (2-tailed)		.000[c]	.001[c]

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.

Based on Table 4, the result of Asymptotic Significance of Customer Satisfaction is 0.000[c] and e-Service Quality dimension is 0.001[c] because of the Lilliefors Significance Correction. Therefore, the result cannot be determined. However, another way to determine normal distribution is by performing examination using P-P Plot Graph. The result of linear regression analysis using Normal P-P Plot Graph already shown the pattern is normal. A normal distribution is a data that formed spread points which are not far from the diagonal line. Following is the P-P Plot Graph based on this research:
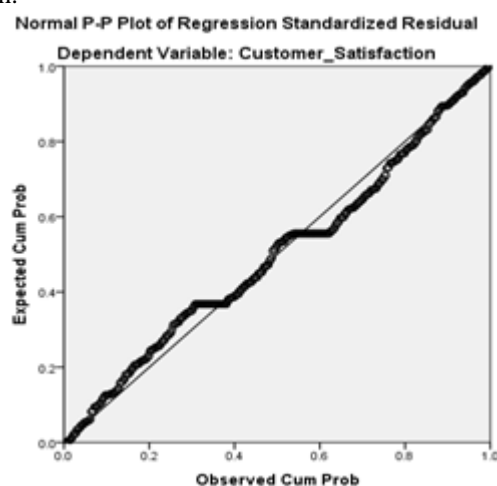

Figure 4: Normal P-P Plot

Based on figure 4, the regression model has a normal distribution because of the placement of dots are close to the diagonal line. In addition, this research has a normal distribution based on the P Plot Test result as follows:

Table 5: P Plot Test

Model Description

Model Name		MOD_1
Series or Sequence	1	Efficiency
	2	Reliability
	3	System_Availability
	4	Fulfillment
	5	Privacy
	6	Customer_Satisfaction
Transformation		None
Non-Seasonal Differencing		0
Seasonal Differencing		0
Length of Seasonal Period		No periodicity
Standardization		Not applied
Distribution	Type	Normal
	Location	estimated
	Scale	estimated
Fractional Rank Estimation Method		Blom's
Rank Assigned to Ties		Mean rank of tied values

Applying the model specifications from MOD_1

Multicollinearity Test

Multicollinearity test can be done by using VIF. Indicated multicollinearity variable can be recognized from the VIF that is high on independent variables within a regression model. VIF value of independent variables in regression model are shown below:

Table 6: Multicollinearity Test

Independent Variable	VIF	Explanation
Efficiency	2.355	Non-multicollinearity
Reliability	2.776	Non-multicollinearity
System Availability	2.519	Non-multicollinearity
Fulfillment	2.436	Non-multicollinearity
Privacy	2.301	Non-multicollinearity

Based on the result above, all VIF from each independent variable has value below 10. Therefore, the regression model in this research has no symptoms of multicollinearity.

Heteroscedasticity

Heteroscedasticity is a test to determine whether there is difference residual variance one and another. According to Gujarati (2003) and Ghozali (2005) in Sujarweni (2015), to test heteroscedasticity can use Glejser Test which suggested to regress absolute residual value toward independent variable. In this research, the heteroscedasticity result shown as follows:

Table 7: Glejser Test

Coefficients[a]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	2.929	.418		7.006	.000
	Efficiency	-.037	.026	-.109	-1.436	.152
	Reliability	.001	.036	.002	.028	.978
	System_Availability	-.082	.032	-.206	-2.616	.009
	Fulfillment	-.008	.045	-.015	-.187	.852
	Privacy	.036	.044	.061	.812	.417

a. Dependent Variable: Absl It

Based on Table 7, there is no heteroscedasticity in Efficiency, Reliability, Fulfillment, and Privacy since the Sig. result is greater than 0.05. Meanwhile, there is heteroscedasticity in System Availability since the result is 0.009 which is less than 0.05. However, overall data has no heteroscedasticity based on the following figure:
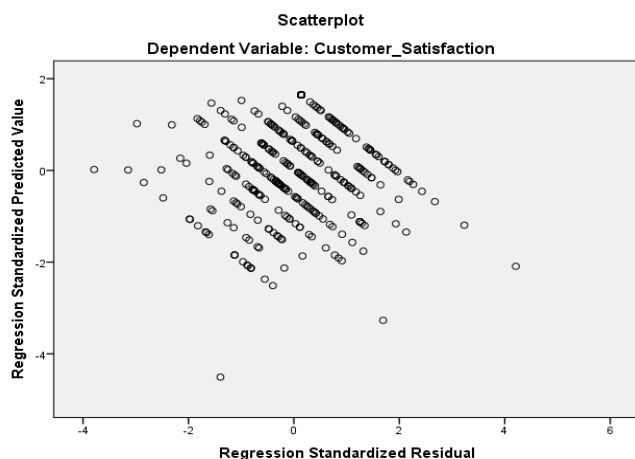

Figure 5: Scatter Plot

Based on Figure 5, the plots were not created a pattern. The existence of heteroscedasticity can be explained through scatterplot. A regression model has no heteroscedasticity when plots are widespread above and below or around 0. Plots are not allowed to create a pattern, such as wavy, widened, or narrowed. Therefore, there is no heteroscedasticity in this research.

Multiple Regression Analysis

Multiple regression analysis applied in this research to check whether hypotheses are proved about the impact of e-SQ dimensions that may affect toward Customer Satisfaction partially or even jointly. The calculation of multiple regression analysis in this research processed by SPSS version 23 for Windows. Following is the result of multiple regression analysis:

Table 8: Multiple Regression Analysis

Coefficients[a]						
Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	3.548	.654		5.421	.000
	Efficiency	.097	.040	.129	2.425	.016
	Reliability	.170	.057	.172	2.985	.003
	System_Availability	.196	.049	.219	3.977	.000
	Fulfillment	-.056	.070	-.043	-.792	.429
	Privacy	.488	.069	.372	7.076	.000
a. Dependent Variable: Customer_Satisfaction						

Regression model based on Table 8 shown as follows:
$$Y = 0.129 X_1 + 0.172 X_2 + 0.219 X_3 - 0.043 X_4 + 0.372 X_5$$

According to the calculation above, the explanation of equation described as follows:
a) Coefficient regression of Efficiency has positive effect to the customer satisfaction.
b) Coefficient regression of Reliability has positive effect to the customer satisfaction.
c) Coefficient regression of System Availability has positive effect to the customer satisfaction.

d) Coefficient regression of Fulfillment has negative effect to the customer satisfaction.
e) Coefficient regression of Privacy has positive effect to the customer satisfaction.

Hypothesis Testing

T Test (Partial Test)
In order to test the regression value model on each variable in partial, the author used t test to get the result. Followings are the result of t test for each variable:

Table 9: T Test

Variable	T Value	Significant Value	Hypothesis
Efficiency	2.425	0.016	Accepted
Reliability	2.985	0.003	Accepted
System Availability	3.977	0.000	Accepted
Fulfillment	-0.792	0.429	Rejected
Privacy	7.076	0.000	Accepted

F Test

Table 10: F Test

ANOVA[a]					
Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	1134.466	5	226.893	91.046	.000[b]
Residual	944.495	379	2.492		
Total	2078.961	384			
a. Dependent Variable: Customer_Satisfaction					
b. Predictors: (Constant), Privacy, Efficiency, System_Availability, Fulfillment, Reliability					

From the result, it shows that the calculated F value is 91.046 with a significance of 0.000 < 0.05. Therefore, Efficiency, Reliability, System Availability, Fulfillment, and Privacy has a positive and significant effect toward customer satisfaction.

Coefficient of Determination (R^2)

Table 11: Coefficient of Determination
Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.739[a]	.546	.540	1.57863

a. Predictors: (Constant), Privacy, Efficiency, System_Availability, Fulfillment, Reliability
b. Dependent Variable: Customer_Satisfaction

Based on the table above, the Adjusted R square is 0.540 which means that 54.6% of customer satisfaction were affected by Efficiency, Reliability, System Availability, Fulfillment, and Privacy of e-Service Quality. In addition, 45.4% of customer satisfaction affected by other variables that are applied in this research.

3. Discussion and Conclusion

Based on the descriptive analysis conducted on this research, the highest index score is in Customer Satisfaction (Y) with a score of 85% (very good) while e-Service Quality dimensions (X) such as, Efficiency has index score of 82% (good), Reliability 82% (good), System Availability 82% (good), Fulfillment 83% (good), and Privacy with a score of 83% (good).

Based on the statistical analysis through classical assumption test, this research has a normal distribution based on the tests conducted such as Skewness and Kurtosis, Kolmogorov-Smirnov, Normal P-P Plot Graph and P Plot Test. This study has no problem with multicollinearity (non-multicollinearity) since the result shows all variables has value less than 10, and has no problem with the heteroscedasticity based on the Glejser Test, and Scatter Plot. Based on the multiple regression analysis, all variables show positive impact toward Customer Satisfaction, except for Fulfillment which results a regression model as follows:

$$Y = 0.129 X_1 + 0.172 X_2 + 0.219 X_3 - 0.043 X_4 + 0.372 X_5$$

Where,
X1: Efficiency
X2: Reliability
X3: System Availability
X4: Fulfillment
X5: Privacy

Based on the hypothesis testing, on t Test (partial test), only Fulfillment has negative impact toward customer satisfaction. The result shown as follows:

Table 12: T Test Discussion

Variable	T Value	Sig. Value	Hypothesis
Efficiency	2.425	0.016	Reject H0, Accept H1
Reliability	2.985	0.003	Reject H0, Accept H2
System Availability	3.977	0.000	Reject H0, Accept H3
Fulfillment	-0.792	0.429	Accept H0, Reject H4
Privacy	7.076	0.000	Reject H0, Accept H5

Based on Table 4.18, the highest influence toward Customer Satisfaction is Privacy with T Value of 7.076, followed by System Availability 3.977, Reliability 2.985, Efficiency 2.485, and the lowest influence is Fulfillment with T Value of -0.792. The more positive of response result, the highest influence for those variables. Based on F Test, all e-Service Quality dimension variables have positive effect toward Customer Satisfaction since the significance value is 0.000 which is less than 0.05. According to Coefficient Determination (R^2), 54.6% of customer satisfaction affected by e-SQ dimensions included in this research and other 45.4% was affected by other excluded variables.

This research is different among other previous researches since this research target market is PlayStation Store users that bought digital content(s) in PlayStation Store while previous researchers focus was on e-Commerce website that sells physical goods and internet banking service. The framework of this research and previous research are same. Thus, different outcome may occur between this research and previous researches. According to previous research from Saha, P. (2005) and Kania, K. (2015), all of the e-SQ dimension on their research shows a significantly positive impact or effect toward customer satisfaction. Meanwhile, in this research there is one variable that has negative impact toward customer satisfaction, which is the Fulfillment variable.[1] Saha, P. and Zhao, Y. (2005), suggested that to increase the Fulfillment influence is by performing the service right the first time and also provide quick confirmation when the work done.[5]

Additionally, Kania, K. (2015) research showed that 86.2% of customer satisfaction was affected by e-Service Quality dimensions and 13.8% of customer satisfaction was affected by other variables that are not included in the research[1], while this research only 54.6% of customer satisfaction affected by e-SQ and other 45.4% was affected by other excluded variables. This difference indicates that even the same research framework would bring different outcome. The result affected by variables being used in the research and respondent answers as well.

Following are the conclusion:
1) Efficiency has positive effect to the customer satisfaction.
2) Reliability has positive effect to the customer satisfaction.
3) System Availability has positive effect to the customer satisfaction.
4) Fulfillment has negative effect to the customer satisfaction.
5) Privacy has positive effect to the customer satisfaction.
6) Efficiency, Reliability, System Availability, Fulfillment, and Privacy has a *positive* effect toward customer satisfaction.
7) 54.6% of PlayStation Store Customer Satisfaction can be explained by Efficiency, Reliability, System Availability, Fulfillment, and Privacy. Other 45.4% of Customer Satisfaction comes from other variables which are not included in this research.

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