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CUSTOMER SATISFACTION TOWARDS ONLINE SHOPPING: A CASE STUDY IN SQS, UUM

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ABSTRACT

Online shopping is the most popular electronic commerce platform that allows consumers to purchase goods or services directly from a seller over the internet via web browsing or mobile apps. This study proposed to investigate the factors that effecting customer satisfaction towards online shopping, hence to find the relationship between these factors and to develop a conceptual model to help in explaining customer satisfaction towards online shopping. The data collection was conducted through an online questionnaire using Google Form and the respondents were (N=200) from the SQS students, UUM. There are four items were constructed based on the customer satisfaction questions and 40 items constructed based on the online shopping experiences by the respondents. Structural Equation Modelling (SEM) including exploratory factor analysis and confirmatory factor analysis were used in this study to construct the model. As a result, three factors extracted which are product fulfilment, site revisit and website design. These factors show significant relationship towards customer satisfaction. It means that all the factors have a direct influence towards customer satisfaction when using online shopping.

Keywords: confirmatory factor analysis, customer satisfaction, exploratory factor analysis, online shopping, structural equation modelling

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Introduction

The development of Information Technology (IT) has fostered consumer empowerment towards the shopping behaviors all over the world. Customers prefer to shop via e-commerce rather than in the physical stores because it is more convenient. They may just sit at home and place their purchases, pay with a credit card or online banking and then wait for the items to arrive. In addition, physical stores have tried to acquire a competitive edge by interacting with customer through e-commerce because of the low entry barriers to enter the market. Many scholars have offered many criteria and dimensions to assess the quality of e-services. Rita *et. al* (2019) did an early study on e-service quality that looked at how to develop new knowledge to better understand the most important dimensions of e-service quality that have impact on customer satisfaction, customer trust and customer behavior.

Rita *et al.* (2019) study focuses on the four-dimensions of e-service quality model that better predict customer behavior. It is not only testing the impact of customer satisfaction on customer behavior such as repurchase intention, word of mouth and site revisit, but also the impact of customer trust. The analytical results showed that three dimensions of e-service quality, namely website design, security and fulfilment affect overall e-service quality. Meanwhile, customer service is not significantly related to overall e-service quality. Hence, in this study, it will focus on customer satisfaction based on the e-commerce service platform. The respondents for this study will be students from School of Quantitative Sciences (SQS), Universiti Utara Malaysia (UUM).

Literature review

The most difficult aspect of internet buying is ensuring and maintaining customer satisfaction. A service-focused approach is a critical success element for surviving in a fiercely competitive e-environment. Customers must have a positive experience with a company in order for them to repurchase and remain loyal to it. From that, a website with high system, information, and electronic service quality is essential for e-commerce success. Thus, this study will focus on determining the prominent factors that contribute to the customer satisfaction towards online shopping. Online shopping is the most popular electronic commerce platform that allows consumers to purchase goods or services directly from a seller over the internet via web browsing or mobile

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apps. In Malaysia, social commerce is expected to grow by 45.2% on an annual basis to reach US$1,327.5 million in 2022.

The service business has developed emphatically in regard to support time, cost and quality in order to stay up with technological headway and client shopping ways of behaving. Thus, organizations in the service business effectively search for new chances to set aside time and cash while conveying products to clients on time. Consequently, conveyance administration has become one of the service business' support points and has a huge important in the research literature. Besides, delivery service includes many vital parameters for the service industry, such as vehicles' availability, allocation of tasks, quality and delivery time reliability. It is necessary to find out the behavior of online shopping and customer satisfaction. Safety, trust, product quality plays an important role in customer satisfaction. Trust also a critical role in forming a psychological state with positive or negative feelings toward e-vendors. In this context, according to Shbool (2022), there are three major concerns which are justice, technology and trust.

In addition, the level of customer satisfaction is also affected by time, the determinants of customer satisfaction can change based on the amount of time customers spend with service providers and customer satisfaction varies according to the age of the customer, new customers and repeat customers have different levels of satisfaction (Xu, 2022). Thus, as service provision continues to meet the increasing consumers, it is impossible for service providers to avoid failure at times, which refers to service accidents that lead to dissatisfaction or change of brands, so increasing business interest to restore service as an important marketing strategy to maintain customer satisfaction and relationship with the client (Jung, 2017). According to Gilfraz (2022), customer satisfaction is influenced by purchasing behavior as customers often make a spontaneous, unplanned, non-reflective and unthought-out buying process referred to as impulsive online purchase.

Keeping in mind that the technological advancements brought about in the world, many day-to-day chores have been shifted to the internet. The most important shift to the internet is online shopping. It is not only convenient to shop from the comfort of your home, but it is also time-efficient and prevents unnecessary stress people experience while shopping (S.-Y. *et al*., 2021). The reason people are inclined towards online shopping is because of the convenience entails such as saving time, avoiding the insufferable stress

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caused by in-person shopping, the abundance of options and information on the products they are purchasing (Vasić *et al.*, 2019).

Methodology

The research was targeted for a specific group which is from SQS as the respondents that would provide the information necessary for this research and who matched some set criteria which is having an experience of using an online retailer website. After that, a questionnaire was developed based on the literature review from various sources. Then, data collection was conducted through an online questionnaire using Google Form and the link was shared on social media such as Facebook and WhatsApp platform. The respondents will be directed to a website containing the questionnaire via the shared link, for its self-administration and they will be instructed to respond based on the past experience using the online shopping platform. In addition, the 5-point numerical interval scale used in this study as follows:

Strongly disagree	1	2	3	4	5	Strongly agree

The reason why we choose this interval scale is because it has flexible use of various statistical testing techniques, minimizes missing values, no occurrence of outliers and easy to use by respondents. Besides, there are four items construct based on the customer satisfaction questions and 40 items construct based on the online shopping experiences by the respondents. The pilot test was run at the first place to test for the validity of the questionnaire. After making some amendment to the questionnaire, the final questionnaire was distributed to the target respondents.

Snowball sampling was used to recruit the participant in this study. Snowball sampling also known as chain sampling, chain-referral sampling, referral sampling, is a type of non-probability sampling where existing respondents of the population recruit future respondents from among their acquaintances to participate in this study. Thus, the sample group is said to grow like a rolling snowball. This type of sampling can help ease the research study. Other than that, data collection also can be facilitated in a short duration of time. It can also save the cost and budget for research purpose.

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To construct the model, Structural Equation Modelling (SEM) was adopted. SEM is a particular technique used for statistical modelling in behavioral science, which can be regarded as a mixture of factor, regression or path analysis. SEM is often concerned with theoretical constructions shown by latent variables. The theory connections are shown by regression or by the factor path coefficient. The structural equation model implies a system of covariance between the factors that can be observed and offers alternative modelling of the covariance structure of the title. Nevertheless, the model can be expanded to include within the model the means of the variables or factors observed. Factor analysis was carried out first, followed by goodness of fits. Besides, this study was conducted to explore the factors that affect customer satisfaction towards online shopping by using Exploratory Factor Analysis (EFA). EFA is a technique for variable reduction that identifies the number of factors constructed and the factor structure underlying the set of variables. Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy was conducted prior to conducting the exploratory factor analysis where the sample must be more than 0.6 in order to be sufficient (Hair, Anderson, Tatham and Black, 1998). The outcome demonstrates sufficient proof to demonstrate that our matrix of correlations is not an identity matrix, so we can proceed with exploratory factor analysis. EFA was carried out using SPSS based on our questionnaires and represented by a scree plot. The technique of varimax can extract the appropriate variables. The statistical method was used to model extensive multivariable interactions between observed and latent variables, enabling the examination of causal relationships among factors. Figure 1 shows the initial conceptual model that have been used in this study.

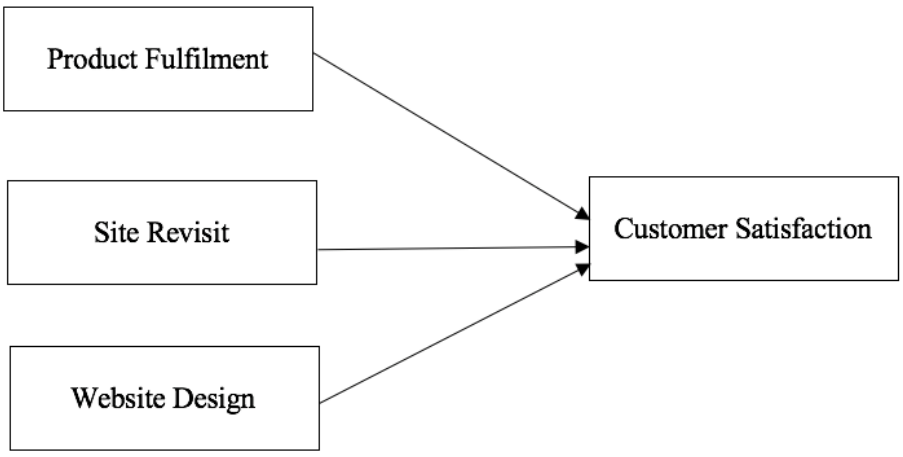

Figure 1 Initial Conceptual Model

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Confirmatory factor analysis (CFA) was used to test the reliability of a measurement model. AMOS software is used to perform CFA for all measurement elements retained by the EFA. Any item with a load factor less than 0.3 will be deleted to achieve uniformity (Tang, 1998). The extraction should be carried out one at a moment with first removal of the smallest factor. The model is then re-specified and resumed until no product has a loading factor of less than 0.3. The model's fitness indexes are then acquired to determine the fitness of the model's information. If the fitness index is not fulfilled, it will check the modifying indices (MI). To fix the correlated errors, remove the item or use a double-headed arrow to set the redundant items to 'estimate free parameter'. For our study, we used the double-headed arrow to fix the correlated errors.

Next, Absolute Model Fit which consist of Root Mean Square Error of Approximation (RMSEA), Incremental Fit which consist of Tucker-Lewis Index (TLI), Comparative Fit Index (CFI), Normed Fit Index (NFI) and Parsimonious Fit which consist of Normed Chi-Square (CMIN/DF) were evaluated according to the individual measuring models for the Model Fit assessment. The threshold values for all these fit indices were examined when evaluating the measuring model until each individual measuring model meets the acceptance level for each index, showing that each measuring model fits correctly.

Table 1 Criteria for Model Fit Assessment

Name of Index	Characteristics	Comments	Literature Support
Absolute Model Fit: the degree to which the proposed model predicts the observed covariance matrix			
Root Mean Square Error of Approximation (RMSEA)	Average discrepancy per *df* expected to occur in the population	< 0.05 (good) < 0.08 (acceptable) < 0.10 (mediocre)	Browne and Cudeck (1993) MacCallum et al. (1996)
Goodness-of-Fit Index (GFI)	Overall degree of fit	> 0.9 is a good fit	Browne and Cudeck (1989)
Incremental Fit: compares the proposed model to a realistic null or baseline model			
Comparative Fit Index (CFI)		> 0.9 is a good fit	Bentler (1990)
Tucker-Lewis Index (TLI)	Comparative index between the proposed and null model	> 0.9 is a good fit	Bentler and Bonett (1980)
Normed Fit Index (NFI)	Relative comparison of the proposed model to the null model	> 0.9 is a good fit	Bentler and Bonett (1980)
Parsimonious Fit: diagnostic on model fit due to over fitting data with too many coefficients			
Normed Chi-Square (CMIN/DF)	X^2/df	The value should be less than 5.0	Marsh and Hocevar (1985)

After that, for the hypothesis development, there were three hypotheses developed which were H_1: Product Fulfilment has a significant relationship with Customer Satisfaction, H_2: Site Revisit has a significant

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relationship with Customer Satisfaction and H_3: Website Design has a significant relationship with Customer Satisfaction.

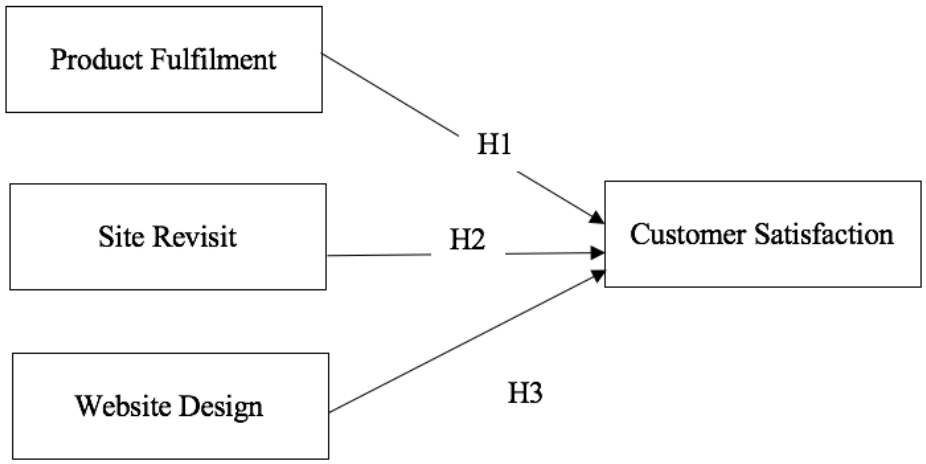

Figure 2 Conceptual Model with Hypothesis

Results and Discussion

Demographic Analysis

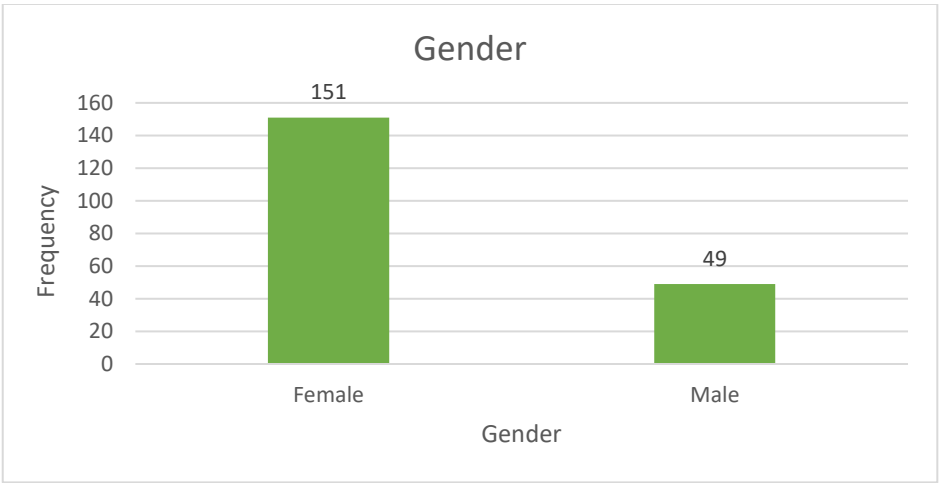

Figure 3 Gender

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Table 2: Frequency table for program taken

Program Taken	Frequency
Bachelor of Science with Honours (Business Mathematics)	66
Bachelor of Science with Honours (Decision Science)	53
Bachelor of Science with Honours (Industrial Statistics)	53
Master of Science (Data Analysis)	17
Master of Science (Research)	10
Doctor of Philosophy (PHD)	1

Based on the Table 2, the highest program taken of the respondents are from the Bachelor of Science with Honors (Business Mathematics) which is 66 representing 33% of the total observed for this study while the lowest program taken of the respondents are from the Doctor of Philosophy (PHD) which is one respondent only representing 0.5% of the total observed for this study.

As for the reliability testing of the instrument, the test is using Cronbach's Alpha value, The Cronbach's alpha as known as a measure of internal consistency was computed by using SPSS to measure the scale of reliability. It is also a statistic calculated from the pairwise correlations between items. The value of Cronbach's alpha is between 0 and 1. In this study, the Cronbach's alpha for 40 instruments is 0.968 indicates that the items have relatively high internal consistency. Therefore, the questionnaire is in the level of very excellent reliability since the reliability coefficient of greater than 0.9 indicates that very good and acceptable reliability.

Structural Equation Modelling

Exploratory Factor Analysis (EFA)

The correlation coefficient between variables that shows the pattern of relationship is observed. Variables with low correlation coefficient ($r < +/- 0.30$) were considered to be removed because of the absence of patterns relationship. The correlation between all variables were acceptable. The determinant of correlation matrix indicated that value is greater than 0.00001 that mean the data has no problem with multicollinearity.

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KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.940
Bartlett's Test of Sphericity	Approx. Chi-Square	5793.289
	df	780
	Sig.	.000

Figure 4 KMO and Bartlett Test

Figure 4 shows the Kaiser-Meyer-Olkin (KMO) value is equal to 0.940 that indicates greater adequacy among the variables. The closer the KMO value to 1, it shows that the sizeable sampling adequacy. It is also good for the factor analysis procedure. The significant value is equal to 0.000 which indicates that Bartlett' s is highly significant.

The communalities values and total variance explained. Show that all factors with the eigenvalues greater than 1 had been extracted and displayed the total of three factors which means that the total variance explained is 56.39%.

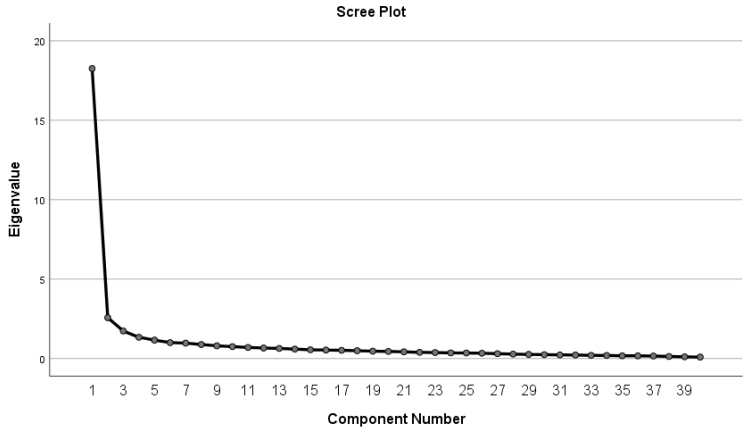

Figure 5: Scree Plot

Based on Figure 5, the inspection of scree plot determined the gradual trailing off (scree) and stop at factor three, which shows the plot curve start to constant. In other word, it is also known as the point of inflexion. Note that both eigenvalues and scree plot after factoring supports the conclusion that 40 variables reduced to three factors in this study.

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Table 3: Number of Item Extracted

Factor 1 (18 Items): Product Fulfilment	Factor 2 (11 Items): Site Revisit	Factor 3 (11 Items): Website Design
V1	V4	V7
V2	V11	V8
V3	V12	V14
V5	V13	V15
V6	V19	V16
V9	V20	V17
V10	V21	V22
V18	V26	V23
V31	V27	V24
V32	V28	V25
V33	V30	V29
V34		
V35		
V36		
V37		
V38		
V39		
V40		

Confirmatory Factor Analysis (CFA)

SEM has become the most selected technique used by researchers in many researches, studies. The way the researchers identified the model that will be the best present of the dataset is through the goodness of fit. Therefore, several indices are chosen as the guideline to develop the model fit. The chosen indices used in this study are Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Normed Fit Index (NIF) and Normed Chi-Square (CMIN/DF). All these indices are evaluated according to the individual measuring models until the significant values of indices are fit and satisfied the index's acceptance level. Table 4 shows the model's criteria to be considered as a fit model.

Table 4: Criteria for Model Fit Assessment

Name of Criteria	Name of Index	Characteristics
Absolute Model Fit	(RMSEA)	RMSEA $\leq$ 0.05
Incremental Fit	(CFI)	CFI $\geq$ 0.90
	(TLI)	TLI $\geq$ 0.90
	(NFI)	NFI $\geq$ 0.90
Parsimonious Fit	(CMIN/DF)	CMIN/DF < 5.0

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All models for each factor are developed individually using AMOS software. The fitness of models was then assessed using the model fitness indices. The modifying indices will be checked if the fitness index is not met (MI). The correlation error between items is displayed by the MI over 15. In this study, a double-headed arrow was used to change the redundant items to "estimate free parameter" in order to correct the related mistakes. The developed model with before and after modification for each of the factors are illustrated in the figure below.

Product Fulfilment

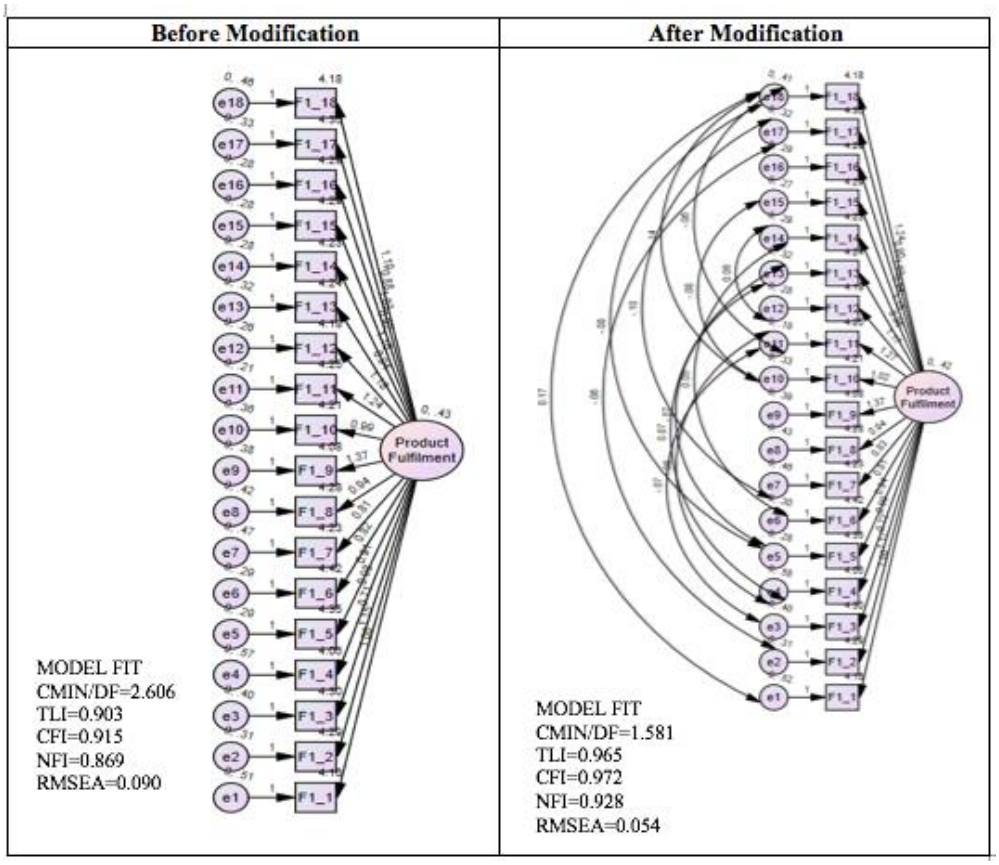

Figure 6: Product Fulfilment before and after modification

Table 5: Product Fulfilment with Index Values

Name of Criteria	Name of Index	Before Modification	After Modification

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Absolute Model Fit	(RMSEA)	0.090	0.054
Incremental Fit	(CFI)	0.915	0.972
	(TLI)	0.903	0.965
	(NFI)	0.869	0.928
Parsimonious Fit	(CMIN/DF)	2.606	1.581

Based on the Table 5, the overall assessment of the model fit indicates that the model is a good fit since all the indices are under the consideration of model fit. After modification, the value for RMSEA, CFI, TLI, NFI and CMIN/DF are above the recommendation value of model fit, which are 0.054, 0.972, 0.965, 0.928 and 1.581, respectively.

Site Revisit

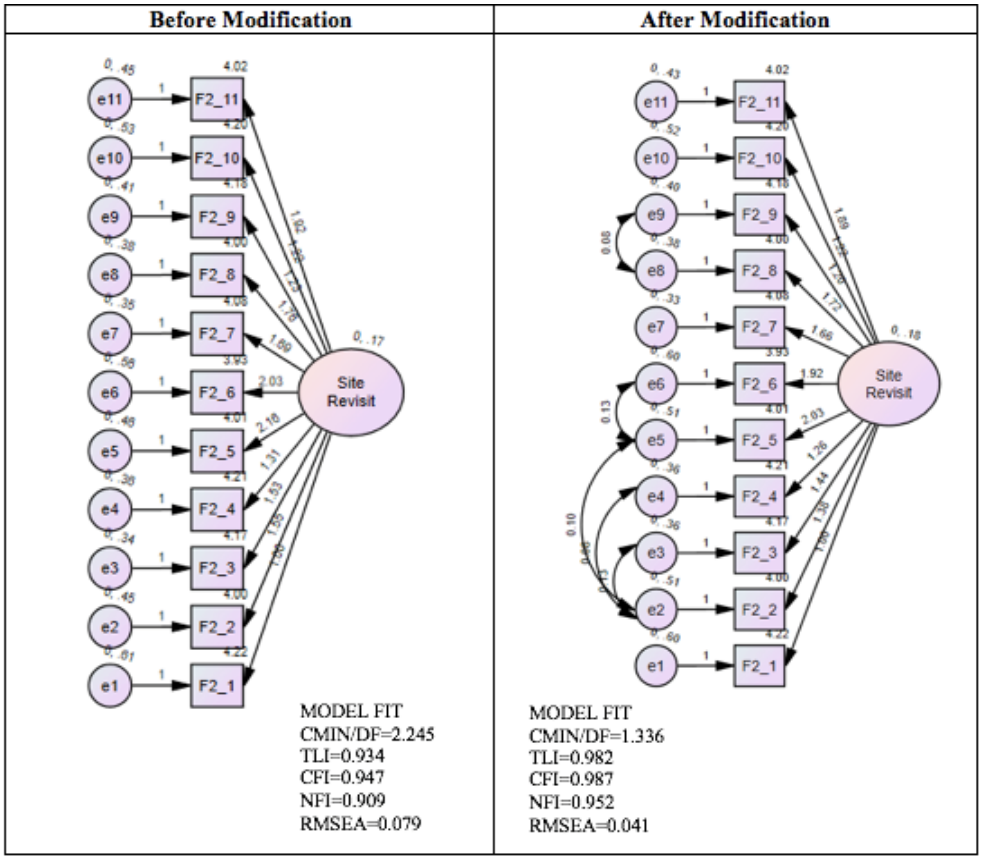

Figure 7: Site Revisit before and after modification

Table 6: Site Revisit with Index Values

Name of Criteria	Name of Index	Before Modification	After Modification

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Absolute Model Fit	(RMSEA)	0.079	0.041
Incremental Fit	(CFI)	0.947	0.987
	(TLI)	0.934	0.982
	(NFI)	0.909	0.952
Parsimonious Fit	(CMIN/DF)	2.245	1.336

Table 6 shows that all indices for Absolute Index, Incremental Index and Parsimony Index are fulfilled the requirements for model good fit after MI was performed. The value for RMSEA to be fitted must be less than and equal to 0.05. Before the modification, the RMSEA value is 0.079, which is more than 0.05 while other indices value is already in good fit. After the modification, the value of RMSEA changed to 0.041. Thus, this model can be used since all indices are already fulfilled the requirement.

Website Design

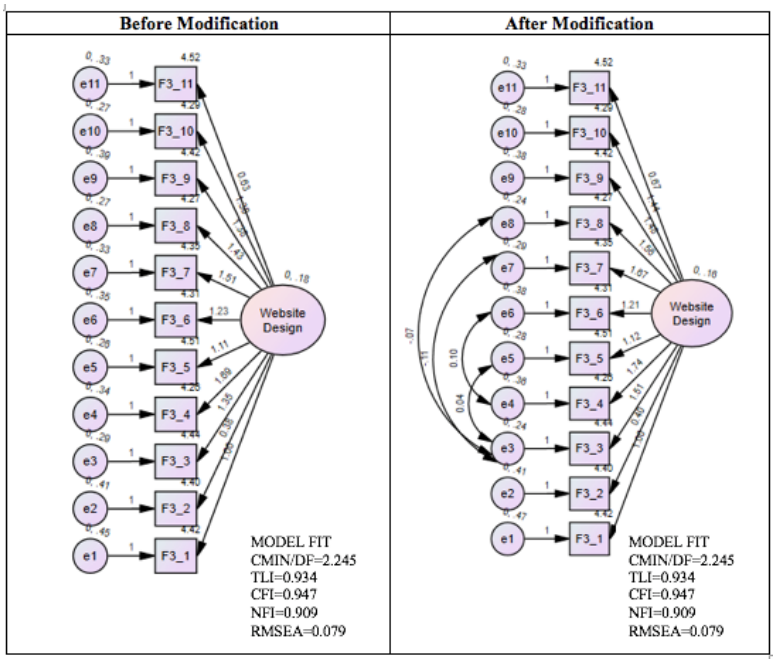

Figure 8: Website Design before and after modification

Table 7: Website Design with Index Values

Name of Criteria	Name of Index	Before Modification	After Modification
Absolute Model Fit	(RMSEA)	0.082	0.049
Incremental Fit	(CFI)	0.932	0.978
	(TLI)	0.915	0.970
	(NFI)	0.889	0.936
Parsimonious Fit	(CMIN/DF)	2.341	1.474

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As can be seen in Table 7, the value for CFI (0.932), TLI (0.915), and CMIN/DF (2.341) are already fulfilled the requirement of assessment on model fit. However, the RMSEA value is more than 0.08 and NFI value is lower than 0.90. Therefore, the modification was performed and the new value for all indexes are 0.049 (RMSEA), 0.978 (CFI), 0.970 (TLI), 0.936 (NFI) and 1.474 (CMIN/DF). Since all the requirements are fulfilled, this model can be used.

Customer Satisfaction

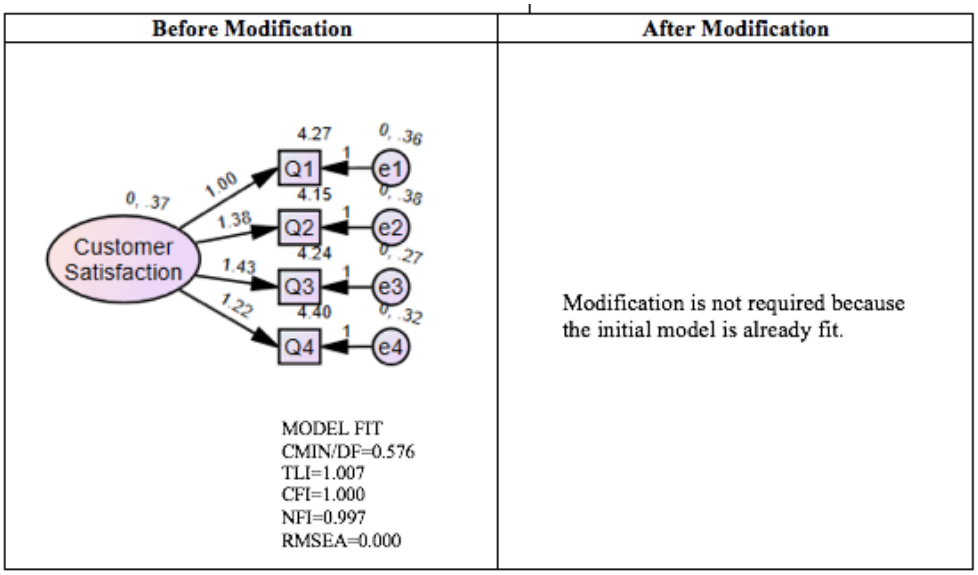

Figure 9: Customer Satisfaction before and after modification

Table 8: Customer Satisfaction with Index Values

Name of Criteria	Name of Index	Before Modification	After Modification
Absolute Model Fit	(RMSEA)	0.000	-
Incremental Fit	(CFI)	1.000	-
	(TLI)	1.007	-
	(NFI)	0.997	-
Parsimonious Fit	(CMIN/DF)	0.576	-

Referring to Table 8, the assessment of the model fit at the initial model development is already fulfilled. The value for RMSEA, CFI, TLI, NFI and CMIN/DF is already above the recommended value of model good fit, which is 0.000, 1.000, 1.007, 0.997 and 0.576, respectively. Therefore, the

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modification is not required, and this model can be used directly to further the study.

Overall Model

Table 9: Overall Model with Index Values

Name of Criteria	Name of Index	Before Modification	After Modification
Absolute Model Fit	(RMSEA)	0.070	0.031
Incremental Fit	(CFI)	0.861	0.976
	(TLI)	0.849	0.970
	(NFI)	0.755	0.872
Parsimonious Fit	(CMIN/DF)	1.972	1.192

Table 9 shows the overall model of the study before and after the modification. Before modification, all indexes do not fulfil the value of model good fit except for CMIN/DF (1.972). The value for RMSEA before the modification is 0.070 and the value after modification is 0.031, which is less than 0.05. Meanwhile, the value for CFI, TLI, and NFI before modification is 0.861, 0.849 and 0.755, respectively and after the modification, the value change to CFI (0.976), TLI (0.970) and NFI (0.872). Based on the model, the initial value for NFI is 0.755 and after the modification, the value is still less than 0.90, which is 0.872. However, it is acceptable since the value of NFI is almost approaches to the fit criteria (0.90). CMIN/DF value is 1.972, which is a good fit (< 5.0). Then after the modification, the value changed to 1.192. Therefore, this model is acceptable and can be used to further the study.

Hypothesis Testing

The degree of significance is commonly represented by a p-value. In academic research, instead of a 0.01 significant level, the researchers used 0.05. Thus, in this study, a 0.05 level of significance was applied. The results of the research hypothesis are summarized in Table 10.

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Table 10: Summary Result of Hypothesis Testing

Hypothesis	P-value	Results
H_1: Product Fulfilment has a significant relationship with Customer Satisfaction	0.00	Supported
H_2: Site Revisit has a significant relationship with Customer Satisfaction	0.00	Supported
H_3: Website Design has a significant relationship with Customer Satisfaction	0.00	Supported

H_1: There is a significant relationship between Product Fulfilment and Customer Satisfaction.

Based on Table 10, the significant value of Product Fulfilment is less than 0.05 (0.00 < 0.05). Therefore, this indicates that Product Fulfilment has a significant influence towards Customer Satisfaction when using online shopping. From this statement, we can conclude that product fulfilment plays an integral role in boosting customer satisfaction. Product fulfilment can be in the form of products feature, design, quality, delivery efficiency and so on. Hence, H1 is accepted.

H_2: There is a significant relationship between Site Revisit and Customer Satisfaction.

Table 10 shows a significant value for Site Revisit is 0.00 which is less than 0.05 (0.00 < 0.05). This shows that Site Revisit has a significant influence on Customer Satisfaction when using online shopping. Site revisit here referred to customers' royalty where they have intentions to use the same online shopping platform again. This statement has proven that the customers will revisit the online shopping platform because they are satisfied with that online shop based on previous experience. Hence, H2 is accepted.

H_3: There is a significant relationship between Site Revisit and Customer Satisfaction.

Refer to Table 16, the significant value of Website Design is less than 0.05 (0.00 > 0.05). It can be concluded that Website Design has a significant influence towards Customer Satisfaction when using online shopping. Here, a user-friendly website surely will reduce customers' chances of making mistakes and generate a more pleasurable purchasing experience. Hence, H3 is accepted.

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Based on the hypothesis statements earlier, it has been shown that by using the significant level of 0.05, all three factors have a significant relationship with Customer Satisfaction when using online shopping. This is because we will reject H_0 when the *p*-value is less than alpha (0.05). Since all the factors have a p-value less than 0.05, then we reject H_0. Therefore, it can be concluded that the results have supported the claim that Product Fulfilment, Site Revisit and Website Design have significantly contributed to Customer Satisfaction when using online shopping. Note that H_0 is Product Fulfilment, Site Revisit and Website Design do not have any significant relationship with Customer Satisfaction.

Conclusion

In a conclusion, the research has accomplished its main objective, which is to determine the prominent factors that contribute to the most customer satisfaction when using online shopping and to develop a new model for customer satisfaction. The study justified that product fulfilment, site revisit, and website design are the latent factors towards customer satisfaction. For each factor, it has a relationship with the other. It means all factors have a relationship and are affecting each other. Therefore, these factors will help the business industry to identify which areas or factors to focus on in order to raise customer satisfaction. In addition, a new model has been developed on behalf of customer satisfaction. The results have shown that all factors; product fulfilment, site revisit and website design have a significant relationship with customer satisfaction at the significant level of 0.05. It means that all the factors have a direct influence towards customer satisfaction when using online shopping.

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