Modelling Customers' Satisfaction Towards Online Shopping using Multiple Linear Regression

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Abstract: Online shopping can be defined as the process a customer takes to purchase a service or product over the internet. Online shopping is the easy solution for busy life in today's world. With the advancement of technology and the huge role of the internet, online shopping has been fulfilling customers' and businesses' needs. In Malaysia, online shopping has begun to grow, thus, it is essential to embrace issues that influence customers' satisfaction. The purpose of this study is to determine factors affecting customers' satisfaction towards online shopping. A cross-sectional design was used in this study conducted among Universiti Teknologi MARA Cawangan Kelantan, Kampus Kota Bharu (UiTMKB) students. A sample size of 336 students from Part 2 to Part 6 studying in semester October 2020 to February 2021 was obtained using Proportionate Stratified Random Sampling technique. A self-administered questionnaire was used to collect the data through Google Forms questionnaire. Pearson Correlation and Multiple Linear Regression was used as data analyses. There was a significant positive moderate linear association between independent variables (product and service quality, system security and delivery service) and customer satisfaction. Results indicate that the factors that affect customers' satisfaction towards online shopping were product and service quality and delivery service. It is recommended, in order to obtain a more precise result, that this study be carried out with larger respondents and different demographics. It is also recommended to include other variables. Improvement actions need to be planned, especially by online sellers, on the quality of products and services as well as delivery services for online purchases to satisfy customer satisfaction.

Keywords: Customer satisfaction, Delivery service, Online shopping, Product and service quality, System security

1   Introduction

Online shopping can be defined as the process a customer takes to purchase a service or product over the internet [1]. In addition, Vadivu [2] also defines online shopping as a process of consumers directly buying goods and services from sellers interactively in real-time without an intermediary service over the internet. Online shopping is the easy solution for the busy lifestyle in today's world. Growth in online shopping is from the growth in the use of smartphones. The report reveals that 78% of customers shop through mobile phones [1].

In the present world, online shopping has become the trendiest phenomenon. Rather than moving from place to place, it is more convenient to sit at one place and shop. It all began back in 1979 when Michael Aldrich 'invented' online shopping by using videotext, a two-way message service. In 1994, the first online shopping system was introduced by the German company Inter shop. Over the past years, online shopping usage has grown rapidly and grown enormously for delivering, trading information, services, and goods in the current business scenario [3]. Nowadays, in the 21ˢᵗ century,

online shopping has increased significantly throughout the world. Globally, e-commerce constituted about US$2.29 trillion market and is expected to reach US$4 trillion by 2020 [4].

With the advancement of technology and the huge role of the internet, online shopping has been fulfilling customers' and businesses' needs. In Malaysia, online shopping has begun to grow, thus it is essential to embrace issues that influence customer satisfaction. It is a good strategy for retailers to attract potential customers by advertising their products. This strategy can help to ensure that customers have a better shopping experience that meets their requirements and attract customers to visit the retailer's site again in the future. This can help retailers develop and expand their business on a larger scale [5]. In 2016, online sales for the Asia Pacific region made about US$1 trillion and most of it came from China, constituting about US$899 billion. On the other hand, Malaysia had made about US$124 billion [4].

Recently, the Covid-19 virus has been declared a pandemic by the World Health Organization (WHO). Prior to the declaration of this pandemic, online shopping activities has been the main method for Malaysians to make purchases. So, the expectation of online shopping increased drastically during the pandemic season.

As the expectation of online shopping transactions increases, this led to new problems aside from the pandemic issue itself. The problem that arises is about customers' satisfaction when making purchases. Customer satisfaction is an important thing to online shopping businesses. Satisfaction is the outcome of the customer's experience during different purchase phases. Consumer satisfaction has been found to rely on consumer perception and on online store experience.

From the previous study, the survey found that 39% of respondents were dissatisfied with the current delivery systems. Within the delivery services group, 50% complained about slow or late delivery, 38% thought delivery providers were inefficient or ineffective, 12% stated tracking issues and 7% complained about missing or damaged products [6]. According to Bazargan [7], the study on the relationship between richness of information and satisfaction of participants in online communities indicates that the abundance of channels of communication and the completeness of information contribute to the trust and satisfaction of participants.

Once customers' satisfaction is not fulfilled through online shopping, customers may lose intention to make online purchasing. Dissatisfaction would occur if the perceived quality does not meet customers' expectations [8]. Satisfied consumers are the ones who repeat their purchases when service providers greatly exceed their demands [9].

According to Khan et al. [10], the existence of online shops has made Bhutanese people feel more convenient without them having to physically visit the stores. From their research, 38% of the active internet users are university students of Bhutan. This has led them to become a major contributor to online shopping. Majority of students, that is 91%, strongly agree that personal privacy and security have a great role when buying online [11].

Since online shopping has become more convenient to people nowadays, this study will provide insights into the factors that affect the Universiti Teknologi MARA Cawangan Kelantan, Kampus Kota Bharu (UiTMKB)'s students' satisfaction towards online shopping. The study's findings will be beneficial for online shopping companies, consumers of online shopping and the country.

2 Review of Literature

Online shopping is electronic commerce that helps to buy products or services directly from sellers through the Internet. Nowadays, online shopping is an effective solution for a busy life. There has been a massive change in customers' shopping methods for the past decade. Modern people find it more convenient and saves a lot of time to do online shopping rather than buy from a physical store. Unlike physical stores, online stores will provide links for more information about their products that can be

explained through text, photos, and multimedia files. Some online shoppers can be adventurous explorers, fun seekers, shopping lovers, and some are technology muddlers, hate waiting for the products to ship. Over time, more consumers are using the web to shop for a variety of items such as houses, shoes, and airplane tickets. There are a lot of options to choose from shopping through online platforms such as Lazada, Zalora, Shopee and others. In order to offer the best products and services to consumers, online stores should fulfil consumer satisfaction very well [11]. According to Murugananthan et al. [12], people who use the internet from 5 to 7 hours a day contribute to the factors that are significant in online shopping. Retailers should be focusing on issues that influence customers' satisfaction to ensure they have a good shopping [5].

Satisfaction is when a customer is satisfied with the provision of a product or service. Satisfaction also refers to a person's feelings whether he/she feels pleasure or displeasure when comparing expectations with the product's performance. Besides, satisfaction is also a happy feeling that comes out from a certain situation. However, the perception of each person may be different, and it is possible that not everyone is satisfied since satisfaction is subjective. Customer satisfaction can be measured in many ways such as in survey forms where feedback from customers is quantitatively evaluated or by organized focus groups where discussions led by a trained moderator reveal show customers feel [13]. Feelings of satisfaction are achieved by customers when one assesses perceptions towards products or services with what is being expected before buying it and the perception comes out to be better than or equal to its expectations. Comparison and evaluation action is taken between pre-purchase expectations and post-purchase experience of customers.

Security is one of the major concerns of online customers around the world. An online store's security credentials, privacy policy and trust are just some of the criteria of web shopping protection. The higher these parameters are developed in online shopping websites, the higher the level of customer satisfaction. Most security studies integrate this into their study structure and test its impact on satisfaction and trust [14]. Getting a trustworthy website with outstanding protection, therefore, allows consumers to feel more relaxed and satisfied. Websites with a high number of users are usually targeted by cybercriminals to steal users' financial and personal information. Worldpay confirmed that 31% of customers are concerned about the privacy of their details saved in their online profiles. Consumers usually make online purchases when they perceive lower security risks. Thus, to secure online transactions from the attack of hackers and cybercriminals, owners of online shops should tighten the security of their online shopping websites with the help of advanced technology and network firewalls [15].

Service quality can be viewed as an attempt to satisfy customers' needs and desires and service delivery's consistency to match consumer expectations. Service quality is also described as the subjective evaluation of expectations by customers as compared to the actual service. Given the extensive use of the internet in the service sector, the provision of high-quality service has become necessary for the survival of online service companies. According to Xiaoying et al. [16], results of the research show that the overall e-service quality has a significant positive impact on customer satisfaction with online shopping and the positive effects of overall e-service quality and e-satisfaction on e-loyalty. The researcher points out that a superior standard of a service is needed and in meeting the demand of customers. Having a generally good e-service quality is, therefore, important to increase customer satisfaction [14]. Thus, online customers expect a level of service quality that is equal to or higher than traditional channels' customers.

Customers prefer to shop at physical retail stores rather than online when purchasing expensive products such as electronic devices and jewelry because they want to check the quality of the products before purchasing it. On the contrary, digital products like movies, games, and music were most likely to be purchased online because of their intangibility form. Time wasted in looking for reliable online stores, searching for products and processing transactions will result in time risk [15]. Consumers in any region of the world feel concerned about the quality of the products they purchased, especially in online shopping where it is a major indicator of customers' satisfaction. Customers are satisfied whenever their expectation exceeds their perceived probability. If the consumers received the quality

of product is below their expectations, it will drop their satisfaction. Quality applies to whatever satisfies customers' satisfaction.

Delivery can be defined as a key activity that links the supply to the customers that stimulates their satisfaction. Customers will be satisfied when they receive a well-packed product, the quality and specification are in accordance with the order, as well as the agreed delivery time and place. Retailers should deliver the promised product in a guaranteed and suitable method to meet customers' expectations. Customers expect to receive the ordered product within the agreed time and in good condition. In online shopping, the basic and essential goal for online consumers is a safe, trustful, and well-timed delivery. Effects on customer satisfaction can be influenced by any delay in delivery time. If the products are delivered after a week or two from the promised time during the purchase, customers will not be satisfied with the delivery service. It is also important to ensure that the right products are delivered to customers according to their purchases. The packaging of the products is also important to ensure that the products are in good condition and meet customers' expectations [5]. Online business success depends on how competently sellers can deliver products regardless of the location of the customers. Postponing will negatively affect the performance of the online business company.

3 Methodology

A Study and Sampling Design

The cross-sectional study was conducted among full-time undergraduate students in Part 2 to Part 6, Semester October 2020 until February 2021, studying at UiTMKB. The total number of full-time students at UiTMKB from both FSKM and FPP in the semester of October 2020 to February 2021 was 1464. Thus, the target sample that has been calculated from the Raosoft website with a 5% margin error and a 95% confidence interval was 305 students. The sample calculation was calculated with the addition of a 10% sample, considering the non-response rate. The new sample size was 336 students.

A proportionate stratified random sampling method was used to enrol these 336 samples. This study divided the target population into two strata, which were the Faculty of Computer and Mathematical Sciences (FSKM) and the Faculty of Business Administration (FPP). The percentages of Strata I (FSKM) and Strata II (FPP) were 30.05% and 69.95%, respectively.

B Research Instrument and Data Collection Method

A self-administered structured questionnaire was used as a research tool in this study. The questionnaire was adapted mostly by using four main sources which were Vasić et al. [9], Guo et al. [16], Tandon et al. [17] and Jukariya and Singhvi [18]. The questionnaire was divided into three sections: Section A for Demographic Profiles, Section B for factors (Product and Service Quality; System Security; and Delivery Service) and Section C for Customer's Satisfaction Towards Online Shopping. For Section B and Section C, the questions were constructed using a 10-Likert scale from strongly disagree to strongly agree. Table 1 summarized the number of items for each section. The questionnaire was pre-tested on 30 students in December 2020 and was modified based on the feedback.

Table 1: Summary of the Questionnaire by Section

Section	Variable	Number of Items
A	Demographic Profiles	2
B	Product and Service Quality	5
	System Security	6
	Delivery Service	5
C	Customer's Satisfaction[a]	6

Notes: [a]Dependent Variable

C   Statistical Analyses

The reliability analysis was used to test the stability and consistency of the items in the questionnaire, and it demonstrated how well the items measured the concept. In this study, the quantitative variables (product and service quality, system security, delivery service, and customer's satisfaction) were described as mean and standard deviation. For the qualitative variables (gender and faculty), frequency and percentages were used to describe the data.

Pearson Product Correlation Coefficient was used to measure the relationship between factors (product and service quality, system security and delivery service) and customer satisfaction. All the assumptions for Pearson Product Correlation Coefficient test such as normality distribution, linearity relationship and no significant outliers were checked before the test was performed.

Multiple linear regression with a stepwise variable selection procedure was used to determine the factors that contribute to customers' satisfaction towards online shopping. The significant variables were checked for multicollinearity. Meanwhile, the assumptions of multiple linear regression, the significance of the regression model and model adequacy were assessed. The estimated multiple linear regression model is shown in Eq. (1).

$$\hat{Y} = \hat{\beta}_0 + \hat{\beta}_1 X_1 + \hat{\beta}_2 X_2 + \hat{\beta}_3 X_3 \tag{1}$$

where:

$\hat{Y}$: Customers' satisfaction
X_1 : Product and Service Quality
X_2 : System Security
X_3 : Delivery Service
$\hat{\beta}_0$: y-intercept
$\hat{\beta}_j$: Regression Coefficients

A two-sided hypotheses testing was used in all analyses with $p < 0.05$ was considered statistically significant. All the analyses were done by using Statistical Package for the Social Sciences (SPSS) version 23 (SPSS 23.0).

4   Results and Discussion

A   Reliability Analysis

Table 2 shows the reliability tests of the pilot and actual study. The Cronbach's Alpha Coefficient of the pilot study is in the range of 0.855 to 0.983, which indicates that the internal consistency for all constructs varies from acceptable to excellent. Meanwhile, the Cronbach's Alpha Coefficient of the actual study is in the range of 0.792 to 0.956, which indicates that the internal consistency for all constructs also varies from acceptable to excellent.

Table 2: Cronbach's Alpha for Pilot and Actual Study

Variable	Cronbach's Alpha for Pilot Study	Cronbach's Alpha for Actual Study
Product and Service Quality	0.932	0.866
System Security	0.855	0.777
Delivery Service	0.869	0.792
Customer's Satisfaction[a]	0.983	0.956

Notes: [a]Dependent Variable

B   Descriptive Statistics

All randomly selected respondents completed the questionnaire (n=336). The number of respondents for the Faculty of Computer and Mathematical Sciences and the Faculty of Business Administration was 101 (30.06%) and 235 (69.94%) respondents, respectively. Majority of the respondents were female students with 82.14% (n=276) of the total number of respondents.

Table 3 summarizes the quantitative variables based on the mean and standard deviation. The mean score for Product and Service Quality, System Security and Delivery Service was above seven. Meanwhile, the mean score for Customer Satisfaction was above eight.

Table 3: Descriptive Statistics of Quantitative Variables

Variable	Mean (*SD*)
Product and Service Quality	7.99 (1.36)
System Security	7.73 (1.34)
Delivery Service	7.92 (1.38)
Customer Satisfaction	8.46 (1.19)

Notes: *SD* = Standard Deviation

C   Pearson Product Correlation Coefficient

Table 4 exhibits the results from Pearson Product Correlation Coefficient between independent variables (product and service quality, system security, delivery service) and dependent variable (customer satisfaction). The test can be performed since the assumption of normality, linearity and no significant outliers was met. All variables have significant relationship with customer satisfaction. Therefore, there are positive moderate association between independent variables (product and service quality, system security and delivery service) and customer satisfaction.

Table 4: Pearson Correlation Coefficient

[a]Variable	Correlation Coefficient	*p*-value
Product and Service Quality	0.707	<0.001
System Security	0.559	<0.001
Delivery Service	0.670	<0.001

Notes: [a]Dependent Variable= Customer Satisfaction

D   Multiple Linear Regression

Based on the test for significant of regression model (Overall F-test), regression model obtained in this study was statistically significant with an F statistic 211.094 and p-value less than 0.001. The model was adequate since the assumption of normality of residuals, linearity, independence of residuals, and homoscedasticity for the model were met. Multicollinearity does not exist among the significant variables since the value of Variance Inflation Factor (VIF) and tolerance were satisfied which were smaller than 10 and larger than 0.1, respectively, for each variable (Table 5).

Table 5: The Collinearity Statistics

Variable	*Tolerance*	*VIF*
Product and Service Quality	0.434	2.305
System Security	0.520	1.924
Delivery Service	0.457	2.190

Moreover, about 78.2% ($R^2 = 0.782$) of the total variation of customer satisfaction towards online shopping was explained by the significant independent variables (Product and service quality;

and Delivery service). Meanwhile, the 21.8% of total variation can be explained by other factors. Since the R Squared value was more than 75%, it can be concluded that the model explains well the university students' satisfaction towards online shopping.

Table 6 shows that Product and service quality and Delivery service were found to significantly influence students' satisfaction towards online shopping. If all values of significant factors (Product and service quality and Delivery service) are equal to 0, the mean score of students' satisfaction towards online shopping will be increased by 1.288. It can be concluded that, for every one-unit increase of the mean score of factors Product and service quality and Delivery service, the mean score of students' satisfaction will be increased by 0.525 and 0.376, respectively. This interpretation is valid for each significant factor provided that other factors are held constant.

Table 6: Regression Coefficients of the Regression Model

Variable	*Beta Coefficient*	*t*- statistics	*p*- value
Constant	1.288	3.661	<0.001
Product and Service Quality	0.525	9.146	<0.001
Delivery Service	0.376	6.673	<0.001

Hence, the estimated regression model for this study is shown in Eq. (2).

$$\hat{Y} = 1.288 + 0.525 X_1 + 0.376 X_2 \tag{2}$$

where:

$\hat{Y}$: Customer's satisfaction towards online shopping
X_1: Product and Service Quality
X_2: Delivery Service

5   Conclusion and Recommendations

According to a study by Izyan and Boon [14], 61% of respondents will continue their Internet transactions if their privacy and personal information are protected in a secure manner. However, the study stated that there is no positive relationship between security and customer satisfaction, and it is not significant. Based on the finding of this study, there is a moderate positive relationship between system security and university students' satisfaction that are different from the previous study. However, for this study, by using multiple linear regression, system security did not significantly influence the university students' satisfaction, which is similar with the previous study.

According to a previous study by Xiaoying et al. [16], it was found that the overall e-service quality has a significant positive impact on customer e-satisfaction with online shopping and the positive effects of overall e-service quality and e-satisfaction on e-loyalty. It stated that product quality has significant positive relationship towards online shopping. Based on the finding of this study, there is a moderate positive relationship between product and service quality and students' satisfaction. Product quality was also found to significantly affect students' satisfaction in this study, similar with Xiaoying et al. [16].

Vegiayan et al. [5] stated that bad effects on customers' satisfaction can be contributed by any delay in delivery time. It was stated that delivery service has a significant positive relationship towards online shopping. Based on this study, delivery service has a moderate relationship towards online shopping that is quite similar from the previous study. Delivery service was also a significant variable that affects the university students' satisfaction in this study, similar with the previous study.

The findings of this study can be used as an ongoing framework to enhance more optimal findings to students' satisfaction towards online shopping in Malaysia especially for those who are directly involved in buying behaviour. The suggestions that can be put into action from this study are that the researcher is suggested to employ another study with a broader population and demographic characteristics for an efficient comparison and a better scope of representative. Other methods of analysis are also recommended for future studies to obtain a more comprehensive model. Hence, the findings of this study might be changed accordingly depending on the future expansion of customer satisfaction towards the online shopping model.

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