Direct and Indirect Effects of Customer Satisfaction through Product and Service Quality–A Study of Phu Nhuan Jewelry Stores in Ho Chi Minh City, Vietnam

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Abstract—This study was conducted to identify the relationship between customer satisfaction, service quality and product quality of Phu Nhuan Jewelry (PNJ) stores in Ho Chi Minh City (HCMC). In addition, this study also examined the impacts of four independent variables which are tangibles, assurance, empathy and price and the intervening variables of perceived service quality and perceived product quality on customer satisfaction. Quantitative approach was the major method used, with statistical techniques applied, including factor, multiple regression, and path analyses. The unit of analysis was at individual level with the target population of all customers of PNJ Company. The empirical results of this study provided an insight of how customers assessed the product and service quality of PNJ stores in HCMC in order to make appropriate adjustments and effective improvements for the business. Based on the path analysis results about the direct and indirect effects of independent variables on the dependent variable, this study suggests that in order to achieve high customer satisfaction, PNJ stores should increase level of service and product quality, improve physical representation of the service (tangibles), promote staff's inspiration of trust and confidence (assurance), provide more empathy to customers, and offer better price.

Index Terms—Customer satisfaction, perceived product quality, perceived service quality, path analysis.

I. INTRODUCTION

Jewelry industry of Vietnam is one of the developing sectors of Vietnamese economy. And most of enterprises in the field do not have the organizational system. In the future, growth rate in Vietnam jewelry market is expected to be positive, which is driven by the increase in domestic demand and income. And as a result of this trend, customers with higher income will have higher requirements. For jewelry products industry, this is an opportunity as well as a challenge. Now that more and more enterprises start this kind of business with products of competitive quality and price, how can old enterprises attract more new customers and retain the old ones? The enterprises should not only concentrate on improving products quality and design, they should also attach special importance to enhance service quality in their stores. In order to achieve this, a method should be usually implemented is to do research about customer satisfaction about product quality and sale service quality of their distribution system

Many researchers have looked into the importance of customer satisfaction. According to [1], customer satisfaction has increasingly become an important indicator on how to develop or improve existing practices. The change to a more customer-oriented approach from a traditional product oriented road management approach requires new feedback input methods and involvement of the customer.

In addition, to be a strong brand with high reputation and credibility, Phu Nhuan Jewelry Joint Stock Company (PNJ) is considered to be one of the enterprises with significant contributions to the growth of the jewelry industry in Vietnam. It can be seen as the market leader among domestic jewelry company with 20% gold jewelry market share and up to 70% silver jewelry market share in Vietnam. Hence, to keep the leader position in jewelry industry in Vietnam, research on customer satisfaction on product quality as well as sales service quality is a necessary method to attract more new customers and retain the existing ones.

This research aimed to find out how customers satisfy with product and sales service quality of PNJ stores in HCMC. The objectives of this study should also make important contributions to both theoretical and practical research in the field of customer satisfaction by 1) analyzing and evaluating PNJ customer satisfaction with direct and indirect effects, 2) evaluating the product quality of PNJ, 3) evaluating the sales services quality of PNJ and 4) basing on the empirical results, improvement and development suggestions would be provided to the company in order to enhance the quality of product, sales service and customer satisfaction.

II. LITERATURE REVIEW

According to [2], satisfaction is the customers' evaluation of a product or service whether that product or service has met their needs and expectations. Customer satisfaction is very important in today's business world as according to [3] the ability of a service provider to create high degree of satisfaction is crucial for product differentiation and developing strong relationship with customers.

Reference [4] stated that customer satisfaction is commonly related to two most important elements including the customer's judgment of the product quality and his evaluation of the interaction experience he or she has made with the product provider. Reference [5] identified that strong relationships exist between service quality and customer satisfaction while emphasizing that these two are conceptually distinct constructs from the customers' point of view.

According to [6], service quality has been conceptualized as the difference between customer expectations regarding a service to be received and perceptions of the service being

received. Service quality is an approach to manage business processes in order to ensure full satisfaction of the customers which will help to increase competitiveness and effectiveness of the industry [7].

Reference [8] mentioned ten factors for evaluating service quality (including tangible, reliability, responsiveness, courtesy, credibility, security, accessibility, communication and understanding the customer). These ten factors were then simplified and reduced into five factors which are tangibles, reliability, responsiveness, assurance and empathy.

However, many criticisms have been leveled against SERVQUAL model. One of the major shortcomings of the model is that the five service quality dimensions are not universal and cannot be applied in all service industry, [9] and [10]. They contended that it depends on the context in which the dimensions are applied since the definitions and the number differ. Many researches using SERVQUAL quality did not use all 5 dimensions of the model because of the features of different industry. For example, the research study of [11] show that only 2 dimensions were found. In the same vein, Cronin and Taylor cited in [12] conducted an investigation into the banking, pest control and dry cleaning and fast food industries and found that there was no evidence of the five dimensions.

Hence, we can conclude that SERVQUAL model is an open model and it is applied flexibly in different industries. And it is the same with jewelry industry where not all the dimensions play an important role in determining customer satisfaction in jewelry industry. As mentioned above, PNJ company is a product-oriented business which mainly focuses on gaining profit through selling jewelry products. Thus, reliability and responsiveness are not as important in this industry.

Reference [13] and [14] defined product quality to be the totality of features and characteristics of a product that bears on its ability to satisfy given needs. If customer's expectation is fulfilled by the product, the customer will be satisfied and think that the product is of good or even high quality. If it is reversed, the customer will consider that the product is of low quality.

According to [15], product quality performance has eight criteria which are: performance, features, reliability, conformance, durability, serviceable, aesthetic, and perceived quality.

According to [16], price is the amount of money charged for a product or service, or the sum of the values that customers exchange for the benefits of having or using the product or service while reference [17] defined price as the amount of money or goods needed to acquire some combination of another goods and its companying services.

Economists (as well as many shrewd merchants) have long been aware of the concept of judging quality by price. According to [18], today, more than ever, the word "expensive" has come to connote "quality" in the mind of the consumer. The two concepts have almost become synonymous. The perception of price as an indicator of product is basically rational. It indicates a trust in the forces of supply and demand and is based on the assumption that prevailing market prices exist because they were found to be fair and reasonable.

With the mentioned above independent and intervening variables related to the customer satisfaction, this study hypothesizes that:

H_1: Customer satisfaction is positively associated with Perceived Product Quality and Perceived Service Quality.

H_2: Customer Satisfaction is hypothesized to be positively associated with factors of Assurance, Price, Empathy and Tangibles.

H_3: Customer Satisfaction is directly and indirectly affected by factors Assurance, Price, Empathy, Tangibles, Perceived Service Quality, and Perceived Product Quality.

III. METHODOLOGY

The target population of the research was all PNJ customers in HCMC. The sample size was (n=250) based number of variables for appropriate factor analysis. In this study, there were 19 items in the group of independent variables including assurance, price, empathy, tangibles and 14 items in the group of dependent variables including perceived service quality, and perceived product quality, and customer satisfaction. So the ratio used in this study was more than 10:1 in order to guarantee for the reliability and validity of research. The questionnaires were provided directly to customers of 29 PNJ stores in districts such as district. 1, 3, 5, 6, 10, 11, Tan Binh, Binh Thanh, and Phu Nhuan.

A. Survey Instrument

Questionnaire was designed based on the items of four independent variables and three dependent variables drawn from the literature as mentioned in the literature review section. Most questions were in the form of statements using five-point Likert scale, ranging from 1 is "strongly disagree" to 5 is "strongly agree". The draft version of questionnaire was sent to experts and colleagues in the field of sale and marketing and management for further comments of improvement. After that, questionnaire was revised by researcher and sent to 22 PNJ customers in HCMC for a pre-test procedure. The reliability of the measures was tested with Cronbach's alpha coefficients ranging mostly all above .80. These results of the reliability analysis of the pre-test showed that all items of the dependent and independent variables of this study had very good internal consistency. Finally, the final questionnaire was sent out to PNJ customers to collect data for this research.

B. Factor Analysis and Reliability

Two exploratory factory analyses, which used the principal component extraction method and varimax rotation of 14 items of the group of dependent variables related to perceived product quality, perceived service quality, and customer satisfaction and 19 items of the group of independent variables related to the factors affecting the customer satisfaction, were conducted on the sample of 250 PNJ customers. Prior to running the analysis with the SPSS, the data was screened by examining the descriptive statistics on each item, inter-item correlations, and possible univariate and multivariate assumption violations. From this initial assessment, all variables were found to be continuous, variable pairs appeared to be bivariate normally distributed, and all cases were independent of one another. For this study,

the factor analysis procedure was applied twice; once for the group of dependent variables, including 3 variables, and again for the group of independent variables, including 4 variables. The Kaiser-Meyer-Olkin measure of sampling adequacy was .824 for the dependent variables and .822 for the independent variables (according to reference [19], to be significant, the value has to be .60 or above), indicating that the present data was suitable for principal components analysis. Similarly, Bartlett's test of sphericity [20] was significant (p<.001), indicating sufficient correlation between the variables to proceed with the analysis.

Using the Kaiser-Guttman's retention criterion of Eigenvalues greater than 1.0, a three-factor solution provided the clearest extraction for the group of dependent variables, including 14 items [21], [22]. The three factors accounted for 61.22% of the total variance and the Cronbach's coefficients ranged from .797 to .884 among the factors, indicating good subscale reliability.

TABLE I: SUMMARY OF DVS WITH RELIABILITY COEFFICIENTS

	Given names	Number of items	Alpha
Factor 1	PERPROQUA	6	.884
Factor 2	PERSERQUA	4	.797
Factor 3	CUSTSATIS	4	.797

In addition, a four factor solution was conducted for the group of independent variables consisting of 19 items. The four factors accounted for 69.21% of the total variance. All four factors were considered appropriate and retained for further analysis. The Cronbach's coefficients ranged from .717 to .871 among the four factors indicating good subscale reliability.

TABLE II: SUMMARY OF IVS WITH RELIABILITY COEFFICIENTS

	Given names	Number of items	Alpha
Factor 1	Assurance	6	.871
Factor 2	Price	5	.717
Factor 3	Empathy	4	.833
Factor 4	Tangibles	4	.763

The rationale used in naming these four factors was guided in part by the recommendations of ref. [23], where sorted factor weights in excess of .65 were used to "drive" the process of labeling and interpreting each factor. The present three-factor model and four-factor model of this study were deemed the best solution because of their conceptual clarity and ease of interpretability.

IV. RESULTS AND DISCUSSION

A. Sample Demographic

TABLE III: PNJ CUSTOMERS IN HCMC PROFILE

		Frequency	Percentage (%)
Gender			
Male		53	25.9
Female		152	74.1
	Total	205	
Marital status			
Single		96	46.8
Married		109	53.2
	Total	205	
Age			
Under 18		6	2.9
18-22		32	15.6
23-30		86	42.0
31-45		71	34.6
45-65		6	2.9
Over 65		4	2.0
	Total	205	
Education			
High school		8	3.9
Vocational school		6	2.9
College		7	3.4
University		158	77.1
Post university		26	12.7
	Total	205	
Income			
Under 5 Mil		49	23.9
5-10 Mil		95	46.3
10-15 Mil		39	19.0
15-20 Mil		12	5.9
Over 20 Mil		10	4.9
	Total	205	

B. Factors Affecting Customer Satisfaction

In order to find out which factors had relationship with the dependent variable of customer satisfaction as well as to test hypotheses (H_1 and H_2), Pearson Product-moment Correlation Coefficients (r) were employed. Table IV shows that there were significantly positive relationships between the customer satisfaction and the independent variables of assurance, price, empathy, and tangibles.

TABLE IV: CORRELATIONS OF THE CUSTSATIS MODEL

		CUSTSATIS	1	2	3
1	ASSUARNACE	.462**			
2	PRICE	.378**	.558**		
3	EMPATHY	.502**	.629**	.654**	
4	TANGIBLES	.494**	.609**	.537**	.494**
	Mean	14.67	22.09	17.28	14.30
	SD.	2.57	4.21	3.57	2.88

Note: ** Significant level at $p < .001$

In these significant relationships, there was substantially positive correlation between Customer satisfaction and empathy ($r=.502$, $p<.001$). This means that the better the empathy customer achieved the higher level of satisfaction that customers felt. Besides that, the variables of assurance, price and tangibles were moderately correlated with customer satisfaction ($r=.462$, $p<.001$), ($r=.378$, $p<.001$) and ($r=.494$, $p<.001$), respectively. This means that better assurance, price and tangibles could lead to higher customer satisfaction.

In addition, Table V also shows that there were significant relationships between customer satisfaction and perceived product quality and perceived service quality.

TABLE V: CORRELATIONS OF THE CUSTSATIS MODEL 2

		CUSTSATIS	1	2
1	PERPROQUA	.365**		
2	PERSERQUA	.355**	.570*	
	Mean	14.67	22.41	15.04
	SD.	2.57	4.15	2.64

Note: ** Significant level at $p < .001$

There were moderate correlations between customer satisfaction and perceived product quality ($r=.365$, $p<.001$) and between customer satisfaction and perceived service quality ($r=.355$, $p<.001$). This means that the better the company's product quality and service, the higher satisfaction

that customer will perceive.

C. Indirect Effects of the Customer Satisfaction

1) Perceived service quality

The result of multiple regression analysis showed that the perceived service quality significantly related with four important predictors: assurance (β= .037, *p*>.05), price (β=.353, *p*<.001), empathy (β=.323, *p*<.001), and tangibles (β=.068, *p*>.05). Based on beta indicator and p value, two out of these four factors directly affected the perceived service quality and then perceived service quality directly caused an effect on the customer satisfaction with (β = .217, *p* < .001). Therefore, through the intervening variable of perceived service quality, the factors of price and empathy created indirect effects on the customer satisfaction at (.076) and (.070) respectively.

These findings indicated that the existence of price and empathy had significant positive effects on perceived service quality and customer satisfaction. Thus, this study argues that as price and empathy are present in a greater amount, the perceived service quality and customer satisfaction are likely to be greater. This result is consistent with reference [24] and [18].

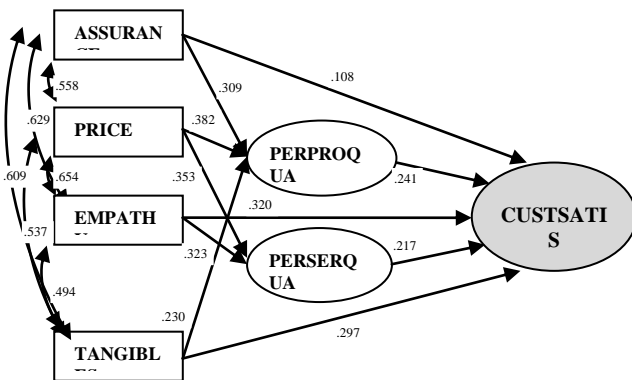### D. Path Diagram of the Customer Satisfaction

Fig. 1. Path coefficients of the structural equation.
Note: All coefficients in the model were significant at the .05 level.

E. Perceived Product Quality

The result of multiple regression analysis showed that the perceived product quality significantly related with four important predictors: assurance *(β= .309, p<.001)*, price *(β=.382, p<.001)*, empathy *(β=-.024 p>.05)*, and tangibles *(β=.230, p<.001)*. Based on beta indicator and p value, three out of these four factors directly affected the perceived product quality and then perceived product quality directly caused an effect on the customer satisfaction with *(β = .241, p <.001)*. Therefore, through the intervening variable of perceived product quality, the factors of assurance, price and tangibles created indirect effects on the customer satisfaction at (.075), (.092) and (.055) respectively.

These findings indicated that the existence of assurance, price and tangibles had significant positive effects on perceived service quality and customer satisfaction. Thus this study argues the higher quality level of assurance, price and tangibles is, the greater the perceived service quality and customer satisfaction are likely to be. This result is consistent with ref. [25]-[28].

F. Direct Effects of Customer Satisfaction

In order to explore the direct effects of the independent and intervening variables on the customer satisfaction, the result of multiple regression analyses showed that the customer satisfaction was directly affected by three predictors: empathy (β=.320, *p*<.001), tangibles (β=.291, *p*<.005), assurance (β=.108, *p*<.001), perceived product quality *(β=.241, p<.001)* and perceived service quality (β=.217, *p*<.001).

G. Total Causal Effects of the Customer Satisfaction

Table VI summarizes the effects of the independent variables (assurance, price, empathy and tangibles) together with perceived product quality and perceived service quality on the dependent variable (customer satisfaction) of this study. Regarding the total effects, the empathy factor had the strongest effect on customer satisfaction with β = .380, according to [29], this can be considered as a moderate effect. Next is the tangibles with β = .352, this also can be considered as a moderate effect [30]. The factor of perceived product quality was ranked at third with β =.241, and next is perceived service quality at fourth with β =.217. This means that perceived product quality and perceived service quality had a low effect on the Customer satisfaction. And lastly, the factor of price with β =.168. This means that price provided a trivial effect on the main dependent variable. The total effect of these factors on customer satisfaction was 1.541.

Regard to the direct effects, the Empathy had the strongest impact of the Customer satisfaction with β = .320. Next is the factor of Tangibles with β = .297, the factor of the Perceived product quality was ranked at third with β = .241, followed with Perceived service quality at fourth with β = .217 and lastly, the Assurance with β = .108. The total of direct effects of all these independent and dependent variables on the main dependent variable of the study was 1.183.

Regard to the indirect effects, the Price factor had the strongest indirect effect on the Customer satisfaction with β = .168, followed by the Assurance with β = .075 and the Empathy factor with β = .070. The last factor is Tangibles with β = .055. The total indirect effect of the independent variables through the intervening variables (Perceived product quality and Perceived service quality) on the Customer satisfaction was .368.

TABLE VI: INDIRECT AND TOTAL CAUSAL EFFECTS

Variables	Casual effects		
	Direct	Indirect	Total
ASSURANCE	.108	.075	.183
PRICE	-	.168	.168
EMPATHY	.320	.070	.380
TANGIBLES	.297	.055	.352
PERPROQUA	.241	-	.241
PERSERQUA	.217	-	.217
Total	1.183	.368	1.541

V. IMPLICATIONS OF THE STUDY

This study presented empirical evidence regarding the factors affecting the customer satisfaction directly and indirectly, as well as provided reliable scales to measure theoretical dimensions such as assurance, price, empathy and tangibles. The study also tried to measure the customer satisfaction through the intervening variables, perceived

product quality and perceived service quality. Thus, a more comprehensive conceptual framework for measuring customer satisfaction, with all important factors suggested by scientific researchers of previous studies, was built and tested in this study.

The results of this study, based on the significant correlations between the independent and dependent variables, suggested that in order to have higher customer satisfaction, PNJ company should: a) concentrate to enhance the empathy of staffs to customers (individual care such as giving gifts in special occasions, have some unique customized service, etc.), b) invest more on the tangibles of stores (adding modern equipment's like TV, sofa, adding more lights, adding accessory to staffs' uniform in special occasion, etc.), c) pay high attention in improving assurance of stores to customers (opening courses of specializing knowledge and skill to employee, courses of soft skill such as communication skill, organizing periodically meeting and award for good-performing staff to encourage efforts and responsibilities, etc.), d) control reasonable price, e) concern about product quality (design, durability, warranty, etc.) and f) increase service quality (promotion programs, customer service, staffs, etc.).

The empirical results of this study provided an insight of direct and indirect effects of independent variables on the dependent variable of customer satisfaction, this study suggests that in order to achieve high customer satisfaction, manager of PNJ stores should increase level of sales service and product quality, improve physical representation of the service (tangibles), promote staff's inspiration of trust and confidence (assurance), and provide more empathy to customers because these five factors provide direct significant contributions in predicting customer satisfaction. In addition, factors of assurance, price, empathy, tangibles provide indirect significant contributions in predicting customer satisfaction.

VI. CONCLUSION

All objectives of this study have been successfully obtained, firstly to analyze and evaluate PNJ customer satisfaction in HCMC with direct and indirect effects; secondly, to evaluate the product quality of PNJ and then evaluate the sales services quality of PNJ; finally to provide improvement suggestions to enhance quality of product, sales service and customer satisfaction for PNJ company.

The application of the multivariate statistical techniques with factor analysis, standard multiple regression analyses, and path analysis allows for the exertion of a causal relationship between variables of the customer satisfaction model. Explanations and suggestions given were based on the review of the literature and the empirical findings of the study. In terms of significant relationships, bivariate correlations and Pearson product-moment correlation coefficients were employed to explore the relationship and its strength between each independent variable and the customer satisfaction, as well as between each intervening variable and the dependent variable of the study. The direct and indirect effects of the customer satisfaction were discussed and explained in order to obtain clear answers and evidence for all research hypotheses.

Thus, the implications of this study provide both theoretical and practical contributions to the field of customer relationship management.

The results of this study showed that not all factors have direct and indirect effects on the customer satisfaction for several subjective and objective reasons. Future research should apply the model in other contexts with more meaningful statements for each factor or determinants of the customer satisfaction.

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