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DISCUSSING THE EFFECTS OF ONLINE STORE IMAGE ON CUSTOMERS' PERCEIVED VALUE BASED ON STATISTICS EDUCATION

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Abstract

To enhance consumer competition, product advertising is regarded as the first choice. Nevertheless, the advertisement of each online shop is about the same that online stores have to apply statistics education, extract problem-related and meaningful information from diversified information, and further analyze and understand consumer needs and perceived value to estimate the constructed store image. The statistics education therefore becomes extremely important for online stores.

Consumers of Yahoo! Super Mall, as the research subjects in this study, are distributed 300 copies of questionnaire. Deducting invalid and incomplete ones, 238 valid copies are retrieved, with the retrieval rate 79%. The research results conclude the significant correlations between 1.store image and perceived value, 2.statistics education and store image, and 3.statistics education and perceived value as well as 4.the moderating effect of statistics education on store image towards perceived value. According to the research results, suggestions are proposed, expecting to essentially assist online stores in the sustained-yield management.

Keywords: online stores, store image, perceived value, statistics education

Introduction

In the network-advance era, shopping is no longer completed by going out. Network allows people proceeding online shopping without

going out. According to the survey of Taiwan Network Information Center, the shopping times and shopping amount of consumers in Taiwan increase significantly. It reveals the growing online shopping market. The promotion of low costs and high profits results in the boom of online shops, as entertainment TV shows, and a lot of enterprises purchase the required materials through online shopping in past years. In such a huge market, it becomes a major issue for online stores to attract consumers. The advance of information technology allows online stores rapidly applying statistics software to analyze a large amount of data to make the inquiry of statistics, probability, and sampling become more convenient. In this case, online stores have to proposed problems, according to the consumer phenomena concerned in statistics education, and present, interpret, and analyze problem-related and meaningful information extracted from diversified information to transform into useful data, and further propose analyses and understanding of consumer needs and perceived value. Apparently, statistics education is a primary capability of online stores. Product advertising is the first choice to enhance consumer competition, but the advertisement of each online shop is about the same. Online store image therefore becomes more important.

The new style online stores present great differences from traditional stores. Online stores could overcome various regional problems, such as relative distance, convenient transportation, cross-borders to have markets globally. Nonetheless, online stores could not provide services as physical stores do.

Domestic and international research on online shopping used to concentrate on physical store image, but little discussed the effect of store image on customers. It might be the reason that it was merely a decade for the openness of network to commercial use. Research on online stores was comparatively less than on physical stores. Under the shopping environment of online stores, consumers are lack of contact with actual products that they could hardly judge and evaluate the product information. For this reason, the store image is more important than traditional physical stores for customers' shopping considerations. It is therefore worth discussing the effect of online store image on customers. Focusing on online store image, this study intends to discuss the effect on customers' perceived value.

Literature and Hypothesis

Store Image

The former was an objective factor, while the latter was more subjective. Mazaheri et al. (2014) regarded store image as customers' attitudes towards and belief in a store or an enterprise based on the past experience in the interaction with the store. Çağman & Karataş (2013) also indicated that store image and management performance presented specific and important relevance and would affect the profitability of a store. The creation of store image required differences and advantages so that customers could easily distinguish the differences, e.g. to have customers present objective and subjective perceived stores through external and internal design, allocation, display, and service. Shin et al. (2013) regarded store image as the overall imagination related to customers' memories and store characteristics, which was larger than the sum of individual dimensions, and the mutual effects among dimensions existed in customers' mind.

Referring to Chen et al. (2016), store image is divided physical, non-physical, and dreamed dimensions.

(1) Physical dimension included product quality, product width, product depth, stocks, popular patterns, order speed, adequate service staff, checkout speed, and maintenance service.
(2) Non-physical dimension contained intimacy, pleasure, trust, helpfulness, self-contentment, and tidiness.
(3) Dreamed dimension covered the feeling of like, being respected, and trust.

Statistics Education

PayPal (2013) indicated that educators should concern about the contents in statistics education to enhance students' statistics thinking and promote students' statistics ability. Math education in various countries has gradually stressed on the connection of statistics contents with life and emphasized that the learning of math should start from students' life experiences with practical operation. Bagchi & Cheema (2013) proposed four directions of (1)data collection, (2)data organization, (3)data presentation, and (4)data interpretation to explain the points in the statistics instruction process. In this case, a complete statistics instruction should contain dynamic activity for students' actual participation, start from collecting relevant data, and develop necessary insight or enhance the level of understanding. Lee & Chen (2013) indicated that the purpose of statistics was to find out the message hid in data through analyses and organization for explaining certain phenomena or making predictions. Kareem (2015) stated that statistics

was used for dealing with data, which were composed of numbers; however, they were not simply numbers, but numbers with contents. As a result, statistics was to find out message from data and make conclusions.

Referring to the statistics literacy model proposed by Lin (2014), the following contents are included in this study.

(1) Knowledge: When the elements of "literacy skills", "statistics knowledge", "math knowledge", "context knowledge", and "critical questioning" are combined, the ability to comprehend, explain, critically comment, and respond to statistics message could be presented.

(2) Affection: Statistics literacy stresses on the attitude of "wise use". Statistics literacy could be the intrinsic psychological process and could be expanded to the outer, such as thinking of the meaning of read articles and reviewing statistic charts in newspapers and magazines as well as statistical survey reported in TV media.

Perceived Value

Alsemgeest et al. (2013) regarded perceived value as the comparison between total perceived benefit and total perceived cost. Shobeiri et al. (2014) considered that perceived value referred to the difference between acquired benefits and paid costs when customers intended to maintain the continuous relationship with service providers. Hsia et al. (2013) defined customer value and did several studies based on the definition. With the empirical research on customers' opinions about value, Wang et al. (2013) proposed customer value as customers' perceived preference and evaluation of product attributes, which could help (hinder) the fulfillment of personal goals under specific use situations, the effectiveness of such attributes, and the use result. The definition emphasized that customer value was originated from customers' perception, preference, and evaluation acquired from learning and the connection between products, use situations and goal- oriented customers' experiences. Karwowski & Mital (2014) divided it into perceived value and expected value. From above analyses, researchers showed plenty of comprehension of customer value, but they treated value from the aspect of exchange and agreed that the core of perceived value was the weight between perceived benefits and perceived losses.

Referring to Chien et al. (2015), the evaluation of customers' overall

effectiveness of certain service or product is measured with single dimension.

Research Hypothesis

Çağman & Karataş (2013) indicated that customers would compare the perception with previous expectation to form customer satisfaction. Shi et al. (2013) regarded store image as customers, based on the past interaction with a store or the acquired experiences, forming the attitudes towards and belief in the store or an enterprise and reflecting the satisfaction on the later behavior. Hsu et al. (2015) also pointed out the effects of the specific and important relevance between store image and management performance on the profitability of a store, e.g. customers' later behaviors (return rate/sharing with friends). Wu (2013) indicated that successful store image created value for customers and further agreed by targeted consumers; therefore, successful store image of brand could form obvious discrimination from competitive brands. Domestic and international researchers regarded store image of brand as the key success factor in products. Mazaheri et al. (2014) revealed that favorable store image of brand would have customers show positive evaluation on the price promotion to further enhance customers' perceived value and purchase intention. The following hypotheses are therefore proposed in this study.

H1: Store image shows significant correlations with perceived value.

H4: Statistics education presents moderating effects on store image towards perceived value.

Statistics aims to find out message from data that it is considered from three points. 1. How to generate data? 2. How to integrate data? 3. How to make conclusions from data (PayPal, 2013)? In this case, phenomenon description becomes the condition of statistics, and the explanation of phenomenon through organization and analyses becomes the purpose of learning statistics (Tong, 2015). Yeh (2016) mentioned that the purpose of statistics was to find out the message hid in data through analyses and organization for explaining certain phenomena or making predictions. In the fiercely competitive market, online store businesses should better understand customers' characteristics and needs, successfully create store image which was the value for customers and was further agreed by targeted consumers, collect huge customer data with market survey for statistical analyses, and create successful store

image. For this reason, being closer to customers and listening to customers' voice would have larger opportunity to succeed (Lee& Chen, 2013). The following hypothesis is therefore proposed in this study.

H2: Statistics education reveals remarkable correlations with store image.

Worrell et al (2013) regarded "statistics" as collecting, organizing, presenting & analyzing, and interpreting data and inferring interested things with the message acquired from samples to estimate the fact which one would like to understand. Zhou et al. (2013) proposed the technique of statistical analysis as to cover the entire statistical process from question formation to result explanation and communication. Besides, the final goal was not simply being capable of completing statistics survey, but could criticize and analyze the message in the life or delivered by media. Wang et al. (2013) indicated that an enterprise usually had the consumer database and the analyzers in the company were to wash gold from the database or provide market information, through data analyses, to support the internal enterprise. Lin (2014) mentioned that customer value grouping was often used as the information basis for various corporate decision-making; statistics education allowed learning statistics analysis of customer grouping as well as solving many problems. Karwowski & Mital (2014) indicated that statistics education could enhance the ability to analyze customer data with statistical analysis and have online store businesses definitely understand customers' perceived value to definitely make operation strategies for enhancing operation performance. Accordingly, the following hypothesis is proposed in this study.

H3: Statistics education appears notable correlations with perceived value.

Research Method Design

Research Sample

Aiming at consumers of Yahoo! Super Mall, total 300 copies of questionnaire are distributed in this study. After deducting invalid and incomplete ones, valid copies are 238, with the retrieval rate 79%.Yahoo! Super Mall is the third e-commerce platform under Yahoo!, mainly accepting companies or firms with tax ID numbers, stores, and small business entities for selling products. Super Mall outsources the booth recruitment to Proshare and eTansy Marketing & Trading Corp.

There are 1502 stores and the number of non-repeated browsing people is 5.14 million per month. It grows so fast that it announces the total amount of issued invoice being ranked on top of platforms with the same nature.

Analysis Methods

With SPSS, Regression Analysis and Hierarchical Regression Analysis are applied in this study to understand the relationship among store image, statistics education, and perceived value as well as the moderating effect of statistics education on store image towards perceived value.

Analysis and Discussion

Factor Analysis

(1) Store image.

The store image scale is extracted three factors with Factor Analysis, including "physical dimension" (eigenvalue=2.633, α=0.84), "non-physical dimension" (eigenvalue=2.275, α=0.85), and "dreamed dimension" (eigenvalue=1.877, α=0.88). The cumulative covariance explained achieves 73.581%.

(2) Statistics education.

With Factor Analysis, the statistics education scale is extracted two factors of "knowledge" (eigenvalue=3.262, α=0.87) and "affection" (eigenvalue=2.813, α=0.87). The cumulative covariance explained reaches 80.335%.

(3) Perceived value.

The store image scale, with Factor Analysis, shows eigenvalue=4.983, α=0.90, and the cumulative covariance explained achieves 85.748%.

Correlation Analysis Of Store Image And Statistics Education Towards Perceived Value

Regression Analysis is utilized for testing the hypotheses and theoretical structure in this study. The first regression analysis results are shown in Table 1, where the regression equation reaches the significance ($F=31.638$, $p < 0.001$). Store image presents remarkable effects on perceived value, where "physical dimension", "non-physical dimension", and "dreamed dimension" in store image show notably positive effects on perceived value, with the significance ($\beta = 2.233$, $p < 0.01$, $\beta = 2.162$, $p < 0.01$, $\beta = 2.075$, $p < 0.01$). H1 is therefore supported.

The second regression analysis results, Table 1, show the regression equation reaching the significance ($F=37.224$, $p < 0.001$). Statistics edu-

cation reveals notable effects on perceived value, where "knowledge" and "affection" in statistics education appear significantly positive effects on perceived value, with the significance ($\beta = 2.183$, $p < 0.01$, $\beta = 2.334$, $p < 0.01$) that H3 is supported.

Correlation Analysis Of Statistics Education And Store Image

Regression Analysis is applied to test the hypotheses and the theoretical structure in this study. The first regression analysis results are shown in Table 2, where the regression equationachieves the significance ($F=21.422$, $p < 0.001$). Statistics education presents remarkable effects on physical dimension, where "knowledge" in statistics education shows notably positive effects, with the significance ($\beta = 2.357$, $p < 0.05$, $\beta = 2.162$, $p < 0.01$).

Table 1: Regression Analysis of store image towards statistics education

dependent variable→ independent variable↓	perceived value			
store image	β	ρ	β	ρ
physical dimension	2.233**	0.000		
non-physical dimension	2.162**	0.000		
dreamed dimension	2.075**	0.000		
statistics education				
knowledge			2.183**	0.000
affection			2.334**	0.000
F	31.638		37.224	
P	0.000***		0.000***	
R2	0.283		0.325	
adjusted R2	0.257		0.296	

Note: * stands for p<0.05, ** for p<0.01.

The second regression analysis results, Table 2, reveal the regression equation reaching the significance

(F=23.825, p < 0.001). Statistics education appears significantly positive effects on non-physical dimension, where "knowledge" and "affection" in statistics education present remarkably positive effects on non-physical dimension in store image, with the significance (β = 2.098, p < 0.01, β = 2.469, p < 0.01).

The third regression analysis results, Table 2, present the regression equation achieving the significance (F=26.413, p < 0.001). Statistics education shows notable effects on dreamed dimension, where "knowledge" and "affection" in statistics education appear significantly positive effects on dreamed dimension in store image, with the significance (β = 2.184, p < 0.01, β = 2.266, p < 0.01) that H2 is supported.

Table 2: Regression Analysis of statistics education towards store image

dependent variable→	store image					
independent variable↓	physical dimension		non-physical dimension		dreamed dimension	
statistics education	β	ρ	β	ρ	β	ρ
knowledge	2.357**	0.000	2.098**	0.019	2.184**	0.000
affection	2.162**	0.000	2.469**	0.004	2.266**	0.000
F	21.422		23.825		26.413	
P	0.000***		0.000***		0.000***	
R2	0.245		0.268		0.292	
adjusted R2	0.214		0.236		0.264	

Note: * stands for p<0.05, ** for p<0.01.

Moderating Effects Of Store Image And Statistics Education On Perceived Value

The moderating effect of statistics education in this study, with Hierarchical Regression Analysis, is shown in Table 3. Store image presents notable explanation on perceived value (F=31.638, p<0.001). According to model 2, the effects of store image and statistics education on perceived value are taken into account to discuss the moderating effect of statistics education. It is discovered that β of physical dimension significantly increases from .233 (p<.01) to .317(p<.01), showing that statistics education would reinforce the direct effect of physical dimension on perceived value. Furthermore, β of non-physical dimension remarkably increases

from .162 (p<.01) to .284(p<.01), revealing that statistics education would reinforce the direct effect of non- physical dimension on perceived value. Finally, β of dreamed dimension significantly increases from .075(p<.01) to .156(p<.01), presenting that statistics education would reinforce the direct effect of dreamed dimension on perceived value. Accordingly, statistics education shows partial moderating effects on store image towards perceived value that

Table 3: Hierarchical Regression of store image and statistics education towards perceived value

dependent variable→ independent variable↓	perceived value			
store image	β	ρ	β	ρ
physical dimension	2.233**	0.000	2.317**	0.000
non-physical dimension	2.162**	0.000	2.284**	0.000
dreamed dimension	2.075**	0.000	2.156**	0.000
statistics education				
knowledge			2.357**	0.000
affection			2.426**	0.000
F	31.638		38.751	
P	0.000***		0.000***	
R2	0.283		0.369	
adjusted R2	0.257		0.086	

Note: * stands for p<0.05, ** for p<0.01.

H4 is supported.

Conclusion

The research findings show that online store image is the reference before consumers' shopping. Online store image presents critical effects on the establishment of trust in the beginning that online stores should keep good store image to attract new customers. Good reputation is accumulated by the past transaction. For this reason, online stores should enhance the statistics education and service quality, statistically analyze

the advantages and drawbacks in the past transaction, cultivate loyal customers aiming at customer needs, and acquire the visit of new customers through the satisfaction of old customers. Online stores with higher store image and reputation would have consumers show higher perceived value of the store. Customers would present positive word-of-mouth on online stores with high perceived value. Positive word-of-mouth is the best tactic for promoting products. With consumers' spread, people are likely to recommend the advantages of products, e.g. cheap, to friends or publish articles on the Internet to share with more people. It would then enhance the online stores' store image as well as customers' perceived value and purchase intention. Apparently, statistics education aims to collect, organize, present & analyze, ad interpret data and, with customers' message, infer the things in which consumers are interested and further estimate the constructed store image. Online store businesses should understand customers' characteristics and needs to successfully create store image, which is the value for customers and is further agreed by targeted consumers. Online stores, without good store image and high information quality, would not receive consumers' trust.

Suggestions

According to the research findings, the following suggestions are proposed in this study.

1. The first impression of online stores' image is extremely important for consumers. Under the high-risk and uncertain network environment, trust is the key to have consumers feel comfortable to consume in online stores. The reputation, complete transaction safety measures, and after-sales service of online stores could enhance consumers' trust. Customers' opinions and feedback are also important.

2. The enhancement of trust with current consumers is the best basis for online stores. Consumers could not judge online stores with less reputation. For this reason, in addition to advertising in various websites or forums to enhance the exposure, online stores also need exchange experiences among consumers.

3. Online stores should pay attention to the service quality and education & training of all staff, even part-time staff. The staff training and professional literacy could have customers perceive the kindness of service staff to appear good perceived value, enhance consumption intention, and further become loyal customers.

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