A Quality-Based Pricing Model for Internet-Enabled Services

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Abstract

E-services are a contemporary emergent issue of e-commerce that can reduce costs and increase efficiency, enhance services to maximize profits, and enable customer relationships. Due to the popularity of e-services, e-service pricing is still a contentious issue, and e-service providers must consider customer perspectives when deciding the costs. This study utilizes perceived service quality as the pricing basis to generate an effective e-service price. The objectives of this paper are as follows: (1) to establish a pricing method based on service quality of a specific e-service; and (2) observe the relationship between the price and the customer's perceived value. The proposed research approach employs the multi-attribute utility method, which can quantify the perceived service quality to estimate a final price from the proposed pricing approach. This study presents two major conclusions from selected cases (Wretch), as follows: (1) this paper investigates the relationship between price and quality. When the perceived quality of a user is poor, e-service providers should reduce costs and target profits to introduce a price lower than the original fee. Conversely, when the perceived quality of a user is good, e-service providers may reasonably increase the original price; and (2) this research investigates the relationship between price and perceived value. The generated price must be acceptable and appropriate to users, which enables them to generate more value of the e-service. In summation, the main contribution of this research is a pricing model for a specific e-service that uses a multiple attribute utility approach to establish an appropriate price based on perceived value.

Keyword: *Service Pricing, Internet Service, and Service Quality*

1. Background

The development of information technology has triggered a transformation of the traditional service concept into the notion of online services (electronic service). E-services reduce costs and enhance the efficiency to build strong customer relationships [5][1]. Rust and Kannan [5] define e-service as "providing services through an electronic network." Research on traditional services mostly focus on quality issues; particularly Zeithaml et al. [12][13] proposed E-SERVQUAL to measure service quality, and Wolfinbarger and Gilly [9] devised constructs to measure online shopping quality. However, the synthesized perspective of pricing and quality issues is still scant. In addition, existing literature on pricing issues also focuses on digital products. The essentiality of e-services is to provide a customer-centric quality of services [1][4][10], which is simultaneously influenced by a customer's perceived quality [5]. Hence, this research considers e-service quality to build an e-service pricing model.

In service marketing, the difficulty for pricing services is higher than that of products. A comprehensive e-service pricing method is also scant. The traditional cost-oriented pricing approach is not applicable to the e-service domain due to the features of e-services (e.g., storable and dividable) [6]. Furthermore, studies have frequently investigated the relationships between price, quality, and perceived value to examine consumer intentions based on existing research [2][11]. Hence, this study seeks the following: (1) to propose a pricing model for a particular e-service based on customer perceived quality; and (2) to observe the relationship between price and perceived value. In other words, the proposed pricing model generates an appropriate price and examines the influence of the perceived value from the price.

2. The model

This study investigates two parts: the pricing model and the perceived value, and proposes an e-service pricing model based on perceived e-service quality, as well as utilizing transaction utility theory as the basis to discuss the relationship between price and the perceived value for e-services.

2.1 The e-Service pricing model

This research uses the concept of the extended cost-oriented pricing approach for traditional services to build a new pricing model, which is based on e-service quality. In **Eq. (1)**, *C* is the total cost of an e-service (i.e., fixed cost and variable cost), *GP* is the expected profit of the e-service, and *Q* is the score of the customer-perceived e-service quality based on e-SERVQUAL. P^{α} is the revised price, and P^{m} is the average market price.

$$P^{\alpha} = P^{m} + (C + GP) * (1 + Q) \quad \text{(1)}$$

Eq. (1) can be divided into two parts: pricing basis (*C* and *GP*) and user benefit (*Q*). The concept is to consider the average market price (*P*) and perceived e-service quality simultaneously to generate a new price. In the pricing basis part, this study defines cost to include variable cost and fixed cost regarding a monetary value. A variable cost indicates the changeable cost of a specific e-service based the increment or decrement of users, such as maintenance cost. Fixed cost indicates the total amount of fixed costs of a specific e-service in a time period. Expected profit is the financial benefit that an e-service provider aims to gain in a time period.

In the user benefit part, this paper utilizes seven constructs from e-SERVQUAL (efficiency, fulfillment, reliability, privacy, responsiveness, compensation, and contact) to measure customer-perceived e-service quality, and to estimate the gap between perception and expectation. This research defines the concept as shown in **Eq. (2)**. *i* stands for i^{th} construct, P_i indicates the perceived e-service quality of the i^{th} construct, and E_i is the expected e-service quality of the i^{th} construct.

$$q_i = \left(P_i - E_i\right) \quad \text{(2)}$$

This study employs multi-attribute utility theory (MAUT) to sum the score of each construct as a final score. The customer also provides the weight of each construct simultaneously. MAUT is a decision-based approach for evaluating the value of a product. Each user has own value and weight based on perception. **Eq. (3)** shows the concept of MAUT for this research. In this study, *n* is equal to 7, which indicates the seven constructs. w_i indicates the relative value of weight for the i^{th} construct compared to other constructs from customer perception and $\sum_{i=1}^{n} w_i = 1$.

$$Q = \sum_{i=1}^{n} \left(w_i * q_i\right) \quad \text{(3)}$$

2.2 Perceived value function

In addition to the price, this study investigates the relationship between price and perceived value, employing transaction utility theory to estimate the perceived value of a specific e-service based on the generated price. Transaction utility theory employs two functions as the basis: value function and utility function. The concept of transaction utility theory is shown in Eq. (4), in which $v\left(\overline{p}, -p\right)$ indicates the acquisition utility, which is the gap between actual paid price (p) and perceived value equal to Product z ($\overline{p}$) for purchasing Product z. $v\left(-p : -p^{*}\right)$ represents transaction utility, which is

difference between actual paid price (p) and reference price (p^*) for Product z . Hence, the total utility is $W(z, p, p^*)$.

$$W(z, p, p^*) = v(\overline{p}, -p) + v(-p : -p^*) \quad \text{.....(4)}$$

The original definition for transaction utility theory is the utility of a specific product. This research considers e-service to be a type of information product that can be applied to this model. Thus, Product z can be changed to E-service z . p is the actual paid price for purchasing E-service z , p^* is the reference price for z , which is also the average paid price for z or similar e-services, and $\overline{p}$ is the perceived value for purchasing E-service z . Additionally, the value function is also applied to the proposed model, as shown in Fig. 1. The value function presents the mapping relationship between value and gains/losses. This study investigates and analyzes the changes of perceived value from the generated price.

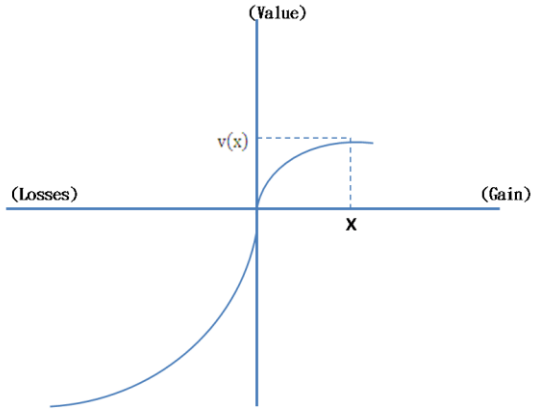

Figure 1. Value function [8]

3. An illustrative case

According to a report by InsightXplorer in Taiwan (August 2009), the market share of blogs in Taiwan is as follows: Wretch (57.9 %), Yahoo (14.7 %), Pixnet (5.6 %), Windows Live Spaces (4.4 %), and Yam (3.8 %). This study collected data from existing paid e-services. Yahoo and Yam provide free online space to registered users, and Windows Live Spaces provides free limited space to registered users. Wretch and Pixnet both provide free and paid memberships. Meanwhile, Wretch has the most members in Taiwan (officially 6.5 million users) compared to Pixnet (officially 1.45 million users), including 5 % paid members. Hence, this paper selected Wretch (http://www.wretch.cc/) as an example to test the proposed model.

This research utilized a simple questionnaire to collect data from paid members (silver, golden, and super golden). The purpose was to obtain the expectation and perception of e-service quality between membership prepurchase and post-purchase. This study utilized a 7-point Likert scale, with 1 indicating "very poor" to 7 indicating "very good." The expected price and equivalent value were obtained simultaneously regarding a monetary value. The question to obtain the expected price was, "What was the expected price for this e-service before purchasing the membership?" The question to obtain the equivalent value was, "What is the price based on perceived e-service performance after purchasing the membership?"

This study received 105 samples via an online sampling approach. The valid number of samples was 100, and the valid response rate was 95 %. The ratio of gender was even for males and females. The age of members centralized between 20 and 25 (70 %), and 26 and 30 (21 %). Member education

levels ranged from university/college (58 %) to graduate students (34 %). Paying members were mostly students (48 %). Finally, the income of members was chiefly below 10,000 TWD (36 %).

3.1 New price estimation

This research separates 100 data into six categories regarding the valid period and membership price, as follows: (1) 21 % for 30 days silver (2.75 USD); (2) 42 % for 365 days silver (15.6 USD); (3) 7% for 30 days golden (5.88 USD); (4) 24 % for 365 days golden (31.25 USD); (5) 2 % for 365 days super silver (64.5 USD); and (6) 4 % for super golden (125 USD). However, the numbers of samples for super silver and super golden members were insufficient. Therefore, the analysis was mainly based on silver and golden members. The e-services of usage for 30 days and 365 days for silver or golden members are the same. Therefore, the discussion is combined based on the different periods of membership instead of the types of membership.

(1) Silver 30 days
The actual price for this type of membership is 2.75 USD. The average expected price from respondents is 1.8 USD. The average equivalent value is 2.53 USD. The new estimated price is 1.94 USD.

(2) Silver 365 days
The actual price for this type of membership is 15.6 USD. The average expected price from respondents is 10.5 USD. The average equivalent value is 10.94 USD. The new estimated price is 4.69 USD.

(3) Golden 30 days
The actual price for this type of membership is 5.88 USD. The average expected price from respondents is 5.13 USD. The average equivalent value is 5.59 USD. The new estimated price is 5.31 USD.

(4) Golden 365 days
The actual price for this type of membership is 31.25 USD. The average expected price from respondents is 21.53 USD. The average equivalent value is 19.97 USD. The new estimated price is 9.38 USD.

4. Discussion

E-Service quality and price

The results revealed that the average numbers of perceived e-service quality for silver and golden members are both negative. The negative effect of perceived quality may generate a low estimated price. Figure 2 shows the comparison of the negative effects of average perceived quality. The average numbers of differences between expectation and perception for e-service quality are -1.3 (30 days silver), -1.7 (365 days silver), -1.1 (30 days golden), and -1.7 (365 days golden). The negative effect of 30 days silver is -30 %, which is derived from the sum of 1 and -1.3. Therefore, the total effect of the perceived e-service quality on new price estimation is merely 70 %. The impact for 365 days silver and 365 days golden is significant, which results in -70 %. The perceived e-service quality is extremely low (both -1.7). The minus effect of 30 days golden is low, which only reduces 10 % for new price estimation. Members who paid for 365 days (silver or golden) may expect a higher e-service quality compared to members who paid for 30 days. However, the results reveal that the perceived e-service quality is significantly lower than expected.

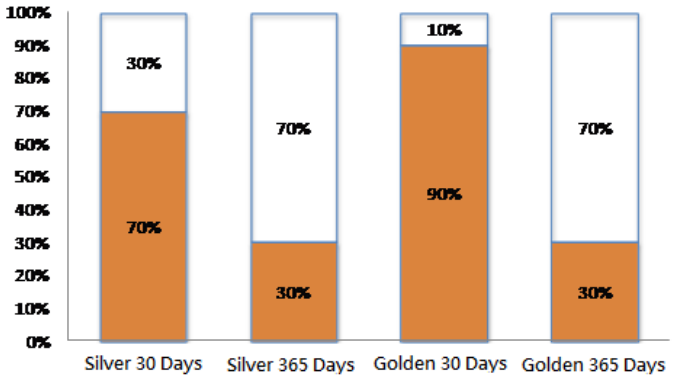

Figure 2. Comparison of the negative effects of average perceived e-service quality

Price and perceived value

(1) Silver 30 days

The new estimated price is 1.94 USD, which is lower than the original price of 2.75 USD. The total utility (acquisition utility plus transaction utility) is 1.63 USD based on the new price. The transaction utility is negative, which indicates that members still expect to pay less than the new price.

(2) Silver 365 days

The total utility is 11.75 USD when the new estimated price is 4.69 USD. However, the original total utility is -10.06 USD when the original price is 15.59 USD. The total utility is raised by approximately 220 %.

(3) Golden 30 days

The new price is 5.31 USD based on the perceived utility of 1.53 USD. The utility of the new price is 2.8 times compared to the utility of the old price. The transaction utility and acquisition utility are both raised for the new price. However, the transaction utility is still negative, which indicates that members still consider that the price can be further lowered.

(4) Golden 365 days

The new price is 9.38 USD based on the perceived utility of 22.03 USD. The utility of the new price is twice compared to the utility of the old price. The new price enables both acquisition and transaction utility to be positive, which indicates that members experience higher utility than expected. The expected price is higher than the actual paid price.

5. Conclusion

Existing studies mostly investigated the definition, scope, and quality of e-services. The pricing model for e-services still remains scant in related literature. Although pricing models for traditional services are addressed, the appropriateness for applying them in e-services still requires verification. This study proposed a quality-based e-service pricing model, utilizing e-SERVQUAL as the basis to measure e-service quality and combine multi-attribute utility theory to estimate the price. The results reveal that new price can increase perceived value from negative to positive. The new price is also closer to the reference point of the consumers. Furthermore, this paper investigated the causal relations between perceived quality, price, and perceived value, instead of price, perceived quality, and perceived value, as is the traditional perspective. This research also verified the relationship between old price and new price. The results confirm that price may be the intermediary between perceived quality and perceived value.

Several limitations are present in this research. Firstly, the proposed pricing model is designed for existing paid e-services. The applicability for applying the proposed model to free e-services still requires validation. Secondly, this study used e-SERVQUAL to measure perceived quality. However, the constructs for perceived quality may be incomplete. Thirdly, this paper simplified the utility function (Thaler, 1985) as a line function, instead of a curve function, which may increase the bias of the estimated utility. Finally, the number of collected data may be insufficient to generalize the results.

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