

Case Study of Moderating Effect of Customer Characteristics on the Relationship Among Service Quality, Customer Satisfaction and Customer Loyalty

Chi-Wen Huang^{1,2} Chin-Chiuan Lin^{2*}

¹ General Manager of Pin Yi Technology Co., Ltd, Tainan, Taiwan

² Department of Business Administration, Kun Shan University, Tainan, Taiwan

*Corresponding author. Email: chiwen88@yahoo.com.tw¹, cclin@mail.ksu.edu.tw²

ABSTRACT

The laser-cutting machine in line with the current manufacturing trend, small amount of diversification, elimination of the cost of molds, capability to finish the products through software, can reduce the processing time and with high quality. The case company is an agent of spare parts and laser-cutting machine which are imported from well-known brands in the United States, Germany and Japan. In general, most of the procurement of spare-parts needs through the original equipment manufacturers. However, changes in the ecological environment make the customers have to find cheaper spare parts and better service quality that can reduce costs and enhance competitiveness. Therefore, the case company tried to investigate the relationship among service quality, customer satisfaction and customer loyalty of the spare parts of laser-cutting machine. Results show that service quality significantly affected customer satisfaction and customer loyalty. Furthermore, customer satisfaction also significantly affected customer loyalty.

Keywords: Customer characteristics, Service quality, Customer satisfaction, Customer loyalty.

1. INTRODUCTION

In the market of laser-cutting machine industry, an agent must face with both of high quality of service demand from customer and low price competition with competitors. Therefore, how to strengthen the management of spare parts to shorten the service time and reduce logistics costs in order to increase the customer loyalty, becomes the key to competitive points in the spare-parts market.

Table 1 shows the import numbers and brands of laser-cutting machine in Taiwan. The numbers and brands of the laser-cutting machine might imply that the market share of

spare parts. Till the end of 2018, Amada had the greatest market share of laser-cutting machine, followed by Trumpf, Mitsubishi, Mazak, Bigfamily, Bystronic, Pentium, Leading, NTC and others. Therefore, the present study has the following aims: (1) Investigate the industry status and its structure of laser-cutting machine product. (2) Investigate the service strategy of case company. (3) Investigate the relationship between service quality, customer satisfaction and customer loyalty of the spare part products.

Table 1. The import numbers and brands of laser-cutting machine in Taiwan during 2015-2018

Year Brand	2015	2016	2017	2018	Total
Amada	38	25	40	34	137
Trumpf	34	33	22	24	113
Mitsubishi	35	2	25	25	87
Mazak	11	12	8	8	39
Bigfamily	0	3	7	6	16
Bystronic	0	3	2	9	14
Pentium	0	1	3	9	13
Leading	0	0	3	8	11
Hankwang	0	1	3	2	6
NTC	0	1	1	2	4
Others	0	0	0	4	4
Total	118	81	114	131	444

2. LITERATURE REVIEW

2.1 Service Quality

Knowledge about product quality, however, is insufficient to understand service quality. Three well-documented characteristics of services: intangibility, heterogeneity, and inseparability, must be acknowledged for a full understanding of service quality (Parasuraman et al., 1985). Parasuraman et al. (1985) proposed a conceptual model of service quality, which consist of 10 dimensions. Parasuraman et al. (1988) further identified 5 dimensions of service quality (viz. reliability, responsiveness, assurance, empathy, and tangibles) that link specific service characteristics to consumers' expectations.

Sureshchandar et al. (2003) have identified five factors of service quality from the customers' perspective. Theodosiou et al. (2019) proposed a conceptual model of electronic service quality, and argued that security, fulfilment, informativeness, website design, and customization are the main factors of e-service quality. However, the customer service did not significantly affect electronic service quality; this is out of our expectation. Furthermore, electronic service quality significantly affected trusting beliefs and satisfaction. The trusting beliefs and satisfaction also significantly affected loyalty intentions.

Due to the customers of spare parts of laser-cutting machine really pay attention to professional technology, therefore the present study involved professional service and non-professional service as sub-dimensions of service quality.

2.2 Customer Satisfaction

Customer satisfaction is stated as the psychological state ensuing when the emotion surrounding disconfirmed expectation is coupled with the customer's prior feelings regarding the consumption experience (Oliver, 1997). Customer satisfaction is a well known and established concept in several areas like marketing, consumer research, economic psychology, and economics (Akbar & Parvez, 2009).

The most common interpretations obtained from various authors reflect the notion that satisfaction is a feeling which results from a process of evaluating what has been received against what was expected, including the purchase decision itself and the needs and wants associated with the purchase (Armstrong & Kotler, 1996). Bitner and Zeithaml (2003) stated that satisfaction is the customers' evaluation of a product or service in terms of whether that product or service has met their needs and expectations. Boselie et al. (2002) argued that satisfaction is a positive, affective state resulting from the appraisal of all aspects of a party's working relationship with another.

There is a plethora of research on customer brand identification and customer behavioral intention of loyalty

carried out in sectors such as B2B contexts (Keh & Xie, 2009). Customer satisfaction has been recognized in marketing thought and practice as an important goal of all business activities (Wang & Lo, 2002).

In present study, we placed the product, management, and environment as sub-dimensions of customer satisfaction.

2.3 Customer Loyalty

Customer loyalty is a construct comprised of both customers' attitudes and behaviors. Customers' attitudinal component represents notions such as repurchase intention or purchasing additional products or services from the same company, willingness to recommend the company to others, demonstration of such commitment to the company by exhibiting a resistance to switching to another competitor (Cronin & Taylor, 1992; Narayandas, 1996; Prus & Brandt, 1995), and willingness to pay premium price (Zeithaml et al., 1996). Word-of-mouth and repurchase intention can be seen as sub-dimensions of customer loyalty (Kitapci et al, 2014). The word-of-mouth plays an important role in the product-selection process as well as in the selection of service providers (Gilly et al., 1998). Repurchase intention is a personal aim by customer in sustaining the relationship with a service provider and purchasing the next service from the same one (Jones & Taylor, 2007). Furthermore, Zboja and Voorhees (2006) indicated that customer loyalty and repurchase intention aspects of the taxonomy are most similar in nature.

Therefore, the present study placed the word-of-mouth and repurchase intention as sub-dimensions of customer loyalty.

2.4 Relationship Among Service Quality, Customer Satisfaction and Customer Loyalty

Over the past few years, there has been a heightened emphasis on service quality and customer satisfaction in business and academics. Sureshchandar et al. (2003) identified that strong relationships exist between service quality and customer satisfaction while emphasizing that these two variables are conceptually distinctive constructs from the customers' point of view. Spreng and Mackoy (1996) showed that service quality leads to customer satisfaction while working on the model developed by Oliver (1997). In recent study, Ribbink et al. (2004) also revealed that this relationship also exists in the e-commerce industry. Luo et al. (2019) pointed-out that service innovation shows significantly positive correlations with customer satisfaction.

In various studies, the relationship between service quality and customer preference loyalty had been examined (Boulding et al., 1993; Cronin & Taylor, 1992). Cronin and Taylor (1992) focused solely on repurchase intentions; whereas Boulding et al. (1993) focused on the elements of repurchase as well as the willingness to recommend. Cronin and Taylor (1992) pointed that service quality did not appear to have positive and significant effect on repurchase

intentions; in contrast Boulding et al. (1993) found that service quality has significant affect toward repurchase intentions.

Several previous studies have found positive correlation between customer satisfaction and customer loyalty (Anderson & Sullivan, 1993; Bolton & Drew, 1991; Fornell, 1992). The customer satisfaction can be used as a catalyst to drive brand trust, which in turn helps increase the affective commitment and repurchase intention of loyalty (Rather et al., 2019). Numerous studies in service sector also have empirically validated a positive behaviour (customer retention and word of mouth) of customer satisfaction (Anderson & Sullivan, 1993; Bansal & Taylor, 1999; Cronin & Taylor, 2000). Hart and Johnson (1999) added that one of the conditions of customer loyalty is total satisfaction. Customer satisfaction is a strong predictor of repurchase intention to revisit a firm and provide positive recommendations and referrals about the firm to others (Su et al., 2016; Rather & Sharma, 2018; Rather et al., 2019).

3. RESEARCH METHOD

3.1 Research Hypotheses

According to the literature review, there are six hypotheses, which are shown below.

Hypothesis 1: Service quality has significantly positive effect on customer satisfaction.

Hypothesis 2: Service quality has significantly positive effect on customer loyalty.

Hypothesis 3: Customer satisfaction has significantly positive effect on customer loyalty.

Hypothesis 4: Customer characteristics have significant moderating effect in relationship between service quality and customer satisfaction.

Hypothesis 5: Customer characteristics have significant moderating effect in relationship between service quality and customer loyalty.

Hypothesis 6: Customer characteristics have significant moderating effect in relationship between customer satisfaction and customer loyalty.

3.2 Research Structure

The research structure of present study is shown in Figure 1. There are three main factors: service quality, customer satisfaction and customer loyalty. The customer characteristics becomes a moderator.

The service quality includes two sub-dimensions: professional service and non-professional service. The customer satisfaction includes three sub-dimensions: product, management and environment satisfaction. The customer loyalty includes two sub-dimensions: repurchase intention and word-of-mouth.

The moderating variable is customer characteristics, which includes company's industry, number of workers and annual revenue.

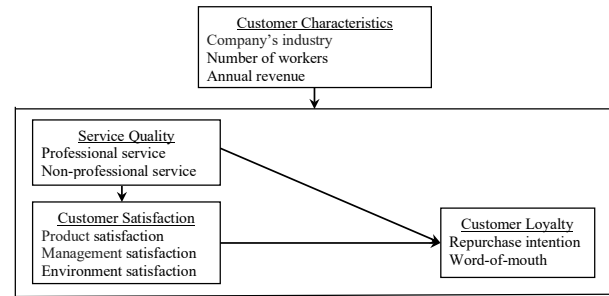


Fig. 1. Research structure of present study.

4. CASE COMPANY PROFILE

Case company was established in 2008, which was a specialized agency in sheet metal equipment and spare parts of laser-cutting machine of famous brands. It is a comprehensive company that integrates professional technology and services.

Case company has agents among many well-known-brands (Table 1) products. (1) Laser-cutting machine consumables; (2) High and low power laser lens; (3) Fiber laser-cutting machine protection lens; (4) Focusing mirror lens; (5) Fireproof sheath for laser-cutting machine; (6) 2D/3D measurement system; (7) Planetary edger; (8) Automatic storage system; (9) Hand-held bead cleaning machine; (10) Ceramic filter; and (11) cutting bellows, etc.

Content of service of case company is described below: (1) Parts sales service: parts specifications confirm / free of charge of machine parts test / preventive improvement of parts life education; (2) Repair service: confirm specifications / prepare materials / repair schedule / urgent repair can be processed during holiday; (3) Customer operation and maintenance training: Schedule inspections to provide regular machine for customers / keep machine running stable / part replacement recommendations to avoid machine unusual shutdown / teaching basic knowledge of operation required / specialized training courses based on customer needs.

5. RESULTS AND DISCUSSION

5.1 Descriptive Statistics

Table 2 shows the results of questionnaire items. The item 3-3 with the lowest rating score means that if the case company is out of stock for a short period of time, the customers will buy this spare parts from another company. The item 3-8 with the second lowest rating score means that the customers won't consider buying spare parts before case company has new promotion.

Table 2. The results of questionnaire items

Item	Questionnaire	Mean Rating
1-1	The wears of P company's service staff has a professional image.	5.63
1-2	P company's service staff makes me feel that they are trustworthy.	5.86
1-3	P company's personnel will immediately complete the work matters for me.	5.87
1-4	P company's service staff can explain to me in detail on how the parts are used.	5.91
1-5	P company's service staff can understand my needs in sales.	5.99
2-1	P company spare parts are priced reasonably.	5.30
2-2	The delivery speed of P company spare parts are very fast.	5.67
2-3	The quality of spare parts of P company is very stable.	5.49
2-4	Even if the appearance of the package is defaced, it will not affect the use of spare parts.	4.21
2-5	The spare parts from the original factory can be trusted.	5.51
2-6	Alternative spare-parts can have the same quality as the original one.	4.86
2-7	Do you think it is safer to collect a lot of information before purchasing?	5.64
2-8	You think that buying an unfamiliar brand can cause a lot of risk.	5.42
2-9	Do you think that the facade image of P company will affect your purchasing intention?	4.80
2-10	The warehouse environment where P company stores spare-parts will affect your purchasing willingness.	5.13
3-1	Would you like to buy this spare parts from P company again?	5.62
3-2	If the price of spare parts of P company is raised, I am still willing to buy again.	4.10
3-3	If the P company is out-of-stock for a short period of time, I will transfer it to another company to buy this spare parts.	2.82
3-4	You will increase the purchase of related spare parts of P company.	5.05
3-5	You are willing to share the information content of P company to your friends.	5.52
3-6	You are willing to keep in business with P company.	5.80
3-7	P company is my first choice when I need to buy spare parts.	5.31
3-8	I won't consider buying spare parts before P company has new promotion.	3.12
3-9	After the service of P company, I will be willing to introduce and share with my friends.	5.60

5.2 Hypothesis 1 to Hypothesis 3

ANOVA shows the hypothesis 1, 2 and 3 were supported, the t -values and the coefficients were ($t = 12.198$, $C = 4.641$), ($t = 10.579$, $C = 7.260$) and ($t = 11.282$, $C = 6.204$), respectively. This results indicate that service quality has significantly positive effect on customer satisfaction, service quality has significantly positive effect on customer loyalty, and customer satisfaction has significantly positive effect on customer loyalty. This results are consistent with those from previous studies (Spreng and Mackoy, 1996; Ribbink et al., 2004; Luo et al., 2019; Boulding et al., 1993; Anderson & Sullivan, 1993; Bolton & Drew, 1991; Fornell, 1992; Su et al., 2016; Rather & Sharma, 2018; Rather et al., 2019).

5.3 Hypothesis 4 to Hypothesis 6

ANOVA shows the hypothesis 4, 5 and 6 were all not supported. Although the results are out of our expectation, however, the results indicate that no matter of the company's industry, number of workers and annual revenue of the spare parts of laser-cutting machine do not influence their level of criteria on service quality, customer satisfaction and customer loyalty.

Therefore, the moderating effect of customer characteristics in the relationship between service quality and customer satisfaction is not significant, the moderating effect of customer characteristics in the relationship between service quality and customer loyalty is not significant, and the moderating effect of customer characteristics in the relationship between customer satisfaction and customer loyalty is not significant as well.

6. CONCLUSION

ANOVA shows that hypothesis 1, 2 and 3 were supported, which indicated that service quality had significantly positive effect on customer satisfaction, service quality had significantly positive effect on customer loyalty, and customer satisfaction had significantly positive effect on customer loyalty.

ANOVA shows that hypothesis 4, 5 and 6 were all not supported, indicated that the moderating effect of customer characteristics in the relationship between service quality and customer satisfaction; service quality and customer loyalty; and customer satisfaction and customer loyalty were all not significant.

Overall, customers gave relatively high-rating scores of service quality (5.85) which means that service quality of the case company is quite well. However, the case company

should improve its customer loyalty due to having low average-rating scores (4.77).

The case company can make the service strategy in feature to improve its competitive ability based on the results of present study. First, the different customer characteristics will not influence the required service quality, customer satisfaction and customer loyalty. Therefore, the company should treat each customer equally. Second, in general the customers gave well rating score (service quality, customer satisfaction) to the case company. However, if the case company is out-of-stock for a short period of time and without new promotion, the customers will shift their buying decision. Therefore, the case company should improve its spare-part inventory as well as conducting regularly launch promotions.

REFERENCES

- [1] Akbar, M.M. & Parvez, N.: Impact of service quality, trust, and customer satisfaction on customers loyalty, *ABAC Journal*, 29(1), pp. 24-38 (2009).
- [2] Anderson, E. & Sullivan, M.: The antecedents and consequences of customer satisfaction for firms, *Marketing Science*, 12(1), pp. 125-143 (1993).
- [3] Armstrong, G. & Kotler, P.: *Principles of Marketing* (7th eds.), Prentice Hall (1996).
- [4] Bansal, H.S. & Taylor, SF.: The service provider switching model (SPSM): a model of consumer switching behavior in the service industry, *Journal of service Research*, 2(2), pp. 200- 218 (1999).
- [5] Bitner, M.J. & Zeithaml, V.A.: *Service Marketing* (3rd eds.), McGraw Hill (2003).
- [6] Boselie, P., Hesselink, M. & Wiele, T.V.: Empirical evidence for the relationship between customer satisfaction and business performance, *Managing Service Quality*, 12(3), pp. 184-193 (2002).
- [7] Bolton, R.N. & Drew, J.H.: A multistage model of customers' assessments of service quality and value, *Journal of Consumer Research*, 17, pp. 375-384 (1991).
- [8] Boulding, W., Kalra, A., Staelin, R. & Zeithaml, V.A.: A dynamic process model of service quality: from expectations to behavioral intentions, *Journal of Marketing Research*, 30, pp. 7-27 (1993).
- [9] Cronin Jr, J.J. & Taylor, S.A.: Measuring service quality: a reexamination and Extension, *Journal of Marketing*, 56, pp. 55-68 (1992).
- [10] Fornell, C.: A national customer satisfaction barometer: the Swedish experience, *Journal of Marketing*, 56, pp. 6-21 (1992).
- [11] Gilly, M.C., Graham, J.L., Wolfinbarger, M.F. & Yale, L.J.: A dyadic study of international information search, *Journal of The Academy of Market Science*, 26(2), pp. 83-100 (1998).
- [12] Hart, C.W. & Johnson, M.D.: Growing the trust relationship, *Marketing Management*, 14, pp. 8-19 (1999).
- [13] Jones, T. & Taylor, S.F.: The conceptual domain of service loyalty: how many dimensions?, *Journal of Services Marketing*, 21(1), pp. 36-51 (2007).
- [14] Keh, H. T. & Xie, Y.: Corporate reputation and customer behavioral intentions: the role of trust, identification and commitment, *Industrial Marketing Management*, 38, pp. 732-742 (2009).
- [14] Kitapci, O., Akdogan, C. & Dortyol, İ.T.: The impact of service quality dimensions on patient satisfaction, repurchase intentions and word-of-mouth communication in the public healthcare industry, *Procedia- Social and Behavioral Sciences*, 148, pp. 161-169 (2014).
- [15] Luo, Y., Wang, W. & Sakura, W.: Factors affecting service innovation, customer value toward customer satisfaction: case on health care industry, *Revista De Cercetare Si Interventie Sociala*, 64, 213-222 (2019).
- [16] Narayandas, N.: The link between customer satisfaction and customer loyalty: an empirical investigation. Working Paper, No. 97-017, Harvard Business School, Boston, MA (1996).
- [17] Oliver, R.L.: *Satisfaction: a behavioral perspective on the consumer*, McGraw-Hill, NY (1997).
- [18] Parasuraman, A., Zeithaml, V.A. & Berry, L.L.: A conceptual model of service quality and its implications for future research, *Journal of Marketing*, 49(4), pp. 41-50 (1985).
- [19] Parasuraman, A., Zeithaml, V.A. & Berry, L.L.: SERVQUAL: a multiple-item scale for measuring consumer perceptions of service quality, *Journal of Retailing*, 64, pp. 12-40 (1988).
- [20] Prus, A. & Brandt, D.R.: Understanding your customers, *Marketing Tools*, 2(5), pp. 10-14 (1995).
- [21] Rather, R.A. & Sharma, J.: The effects of customer satisfaction and commitment on customer loyalty:

evidence from the hotel industry. *Journal of Hospitality Application & Research*, 12(2), pp. 41-60 (2018).

[22] Rather, R.A., Tehseen, S., Itoo M.H. & Parrey, S.H.: Customer brand identification, affective commitment, customer satisfaction, and brand trust as antecedents of customer behavioral intention of loyalty: an empirical study in the hospitality sector, *Journal of Global Scholars of Marketing Science*, 29(2), pp. 196-217 (2019).

[23] Ribbink, D., Van Riel, A.C.R., Liljander, V. & Streukens, S.: Comfort your online customer: quality, trust and loyalty on the internet, *Managing Service Quality*, 14, pp. 446-456 (2004).

[24] Spreng, R.A. & Mackoy, R.D.: An empirical examination of a model of perceived service quality and satisfaction, *Journal of Retailing*, 72(2), pp. 201-214 (1996).

[25] Theodosiou, M., Katsikea, E., Samiee S. & Makri K.: A comparison of formative versus reflective approaches for the measurement of electronic service quality, *Journal of Interactive Marketing*, 47, pp. 53-67 (2019).

[26] Su, L., Swanson, S.R., Chinchanchokchai, S., Hsu, M.K. & Chen, X.: Reputation and intentions: the role of satisfaction, identification, and commitment, *Journal of Business Research*, 69(9), pp. 3261-3269 (2016).

[27] Sureshchandar, G.S., Rajendran, C. & Anantharaman, R. N.: The relationship between service quality and customer satisfaction - a factor specific approach, *Journal of Service Marketing*, 16(4), pp. 363-379 (2003).

[28] Wang, Y. & Lo, H.P.: Service quality, customer satisfaction and behaviour intentions: evidence from China's telecommunication industry, *Telecommunication Industry*, 4(6), pp. 50-60 (2002).

[29] Zboja, J.J. & Voorhees, C.M.: The impact of brand trust and satisfaction on retailer repurchase intentions, *Journal of Services Marketing*, 20(5), pp. 381-390 (2006).

[30] Zeithaml, V.A., Berry, L.L. & Parasuraman, A.: The behavioral consequences of service quality, *Journal of Marketing*, 60(1), pp. 31-46 (1996).