

Using the QFD Technical to improve Service Quality in Vegetarian Foods Industry

Shun-Hsing Chen

Department of Marketing and Logistics Management, Yu-Da University of Science and Technology, Taiwan, R.O.C
Corresponding Author Email: chen88@ydu.edu.tw

Chen-Kuo Pai

Faculty of Hospitality and Tourism Management, Macau University of Science and Technology, Macau, P R China
E-mail: ckpai@must.edu.mo

DOI Link: <http://dx.doi.org/10.6007/IJARBSS/v4-i2/613>

Published Date: 09 February 2014

Abstract

As the quality of product/service requirements of people dining rising. Because of the economic recession, the food and beverage industry is facing a strong competition. Only by understanding the true needs of consumers can their requirements are satisfied. For this reason, this study to use Quality Function Deployment (QFD) understanding the true needs of consumers, and explore a the best options to enhance service quality in order to help enhance the vegetarian industry service quality.

In this study, the Taipei Spring Vegetarian Restaurant consumers empirical object. First, through literature and interviews with experts to develop a consumer questionnaire with experts and scholars questionnaire, followed by the two-stage survey analysis through SPSS, Import QFD empirical analysis. The results show that the important degree of top five items: reliability and safety of the food source, ingredients quality, health and safety of the restaurant, warm service attitude of staff, and comfortable dining environment. To improve the quality of service before four items: business philosophy, product quality, service quality, culinary and specialty

Keywords Service quality, Quality Function Deployment (QFD), House of Quality.

Introduction

Goodland & Anhang (2009) proposed that the carbon emitted by the animal husbandry and its products is approximately 3260 million tons in total per year and makes up 51% of the total greenhouse gas emitted by human. Adapting to a vegetable food is the simplest and most effective way to protect our Earth and to improve human health, and this has been

proven feasible to the body needs. Therefore, vegetable food providers play an important role in changing the dietary habits of our people and looking for ways to improve service quality is the most important issue faced by these providers today.

Deming (1982) stated that service quality is a subjective measurement by the customers, and service providers must therefore cater to the needs of the customers in order to satisfy them. The QFD was used to develop or modify products while integrating customers' needs and a highly effective procedure into the system. It is deemed as the most effect system the industry and academic fields today. Many scholars have applied the QFD technique to many industries, such as: Weng, Hsiao & Tsai (2009) have used the QFD to decide on the most suitable designing needs. Raharjo et al. (2011) have applied the QFD system to prioritize the customers' needs for the service providers. Dai & Blackhurst (2012) have used the four phases QFD system to select suppliers. From all the aforementioned researchers, the study can tell that the QFD is able to highlight the customers' needs for the product/service providers.

The study realized that there have been no cases of integration QFD for the improvement of service quality for the vegetable food providers. This study used the QFD method to improve service quality of the vegetable food providers. The main objectives of this study are: To prioritize customers' needs of the vegetable food providers according to the level of importance

Literature Review

Vegetable food and environmental protection/health evaluation

Steinfeld et al. (2006) stated that the carbon emitted by the animal husbandry is the main cause of global warming, The main gas produced by animal husbandry is methane and its greenhouse effect is 72 times that of carbon dioxide; the green house effect produced by the petrochemical energy required for the production of beef is 16 times that required by the production of fruits and vegetables and the production of carbon dioxide is 24 time more. The Institute for Ecological Economy Research (2008) proposed that carbon dioxide can only be reduced by 8% if organic husbandry products were used to replace traditional husbandry products. But, the production of carbon dioxide can be reduced by 87% if vegetable food is employed without organic setting and reduced by 97% if 100% pure organic vegetable food is employed.

For these researches, the study can tell that animal husbandry is a high carbon dioxide producing and high energy consuming industry. It is therefore difficult to improve the climate shift despite the many advance technologies the study have today and adapting a vegetable food is the simplest, fastest and most effective way to reduce carbon dioxide emission and to resolve global warming.

Quality Function Deployment (QFD)

Hauser & Clausing (1988) stated that the customers' needs, product design and manufacturing information can be arrayed using the QFD and the production time can therefore be reduced and make better quality. This method is therefore widely applied by the industry and academic research field. Behara & Chase (1993) incorporated the QFD concept into the service industry and used the SERVQUAL method to incorporate the customers' needs into the designing procedure of the service. The "House of Quality" structure named the modified model as "House of Service".

This study utilizes the QFD structure proposed by Chen & Yang (2004) and the respective procedures for research. The main structure and steps are depicted in Figure 1.

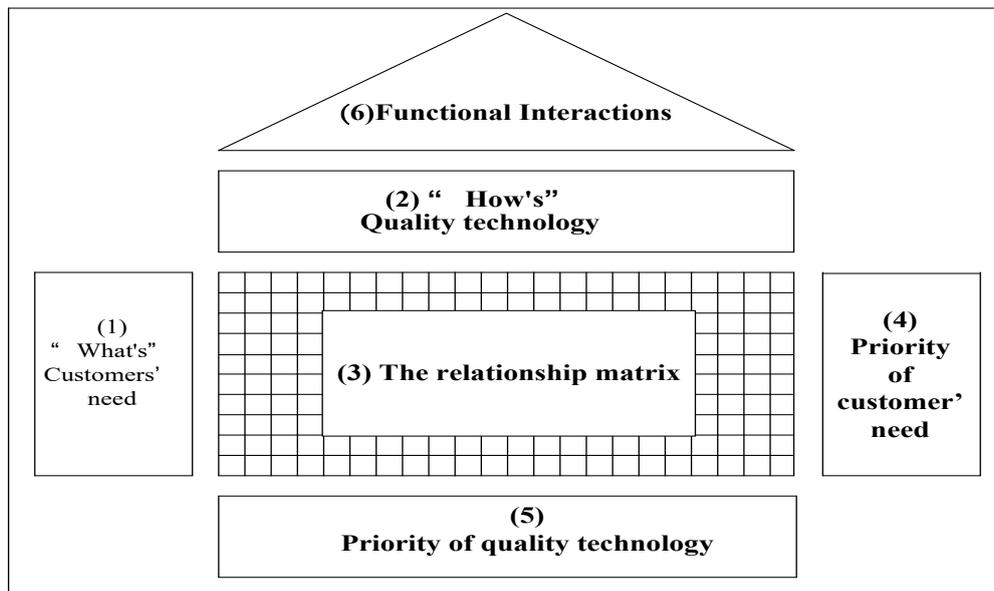


Figure 1 QFD framework of production plan

Sources: Chen & Yang (2004)

Research design

Questionnaire design

The present dimensions and questionnaire were therefore based on the following: (i) A review of the literature (PZB, 1985; Steven, et al., 1995); (ii) discussions with three experts and (iii) discussions with 8 customers in a vegetable foods industry (see Table 1). The questionnaire contains two phases: Customer’s questionnaire – the “importance and satisfaction level of customers’ needs” is measured using the Likert-type scale of 1 to 5. The level of importance can be ranked as: extremely unimportant, unimportant, normal, important, and very important. The level of satisfaction can be ranked as: extremely unsatisfactory, unsatisfactory, normal, satisfactory, and extremely satisfactory. A score of 1, 2, 3, 4 or 5 is designated to each option.

Table 1 Items of customer’ needs

Comfortable dining environment Safety and sanitation of restaurant Presentation and hygiene of staffs

Ease of transportation and parking
Service attitude and friendliness of staffs
Accuracy of order
Accuracy of bill
Accuracy of service during first attempt
Providing quick and accurate service
Notifying the customers about the waiting time
Immediate rectification of mistakes
Immediate response to customer's special needs
Staffs are able to gain the trust of customers
Staffs are provided with adequate authority to provide excellent services
Food source is reliable and safe
Quality of food
Taste of food
Diversity of menu
Regular alteration of menu
Price

Empirical study

Samples of questionnaire

The first phase – “customer questionnaire” was conducted from the 9th of July 2012 to the 20th of August in Spring Natural Vegetable Restaurant in Taipei. The customers were included as the subjects and the questionnaire was provided on a randomized basis. 350 questionnaires were provided and 347 were collected. The invalid responses were disregarded and the number of effective samples is 313. The effective collection rate is 90.2%.

Reliability and validity analysis

Cronbach's α for each dimension of medical services quality in service important and satisfaction ranged from 0.71 to 0.866 (see Table 2). Cronbach's α for each dimension were greater than 0.7 (Nunnally, 1978). This demonstrates that the scales of the formal questionnaire have considerable reliability. In terms of validity, the questionnaire had been designed on the basis of related studies, consultation with service-quality professionals and consultants, and discussion with customers. This demonstrates that the scales of the formal questionnaire have considerable reliability.

Table 2 Cronbach's α value of questionnaire

Dimensions	Importance survey	Satisfaction survey
Tangibility	0.744	0.783
Reliability	0.710	0.866
Responsiveness	0.732	0.859
Empathy	0.703	0.849
Assurance	0.767	0.822
Total	0.889	0.942

Application of the QFD

Verification of customers' needs

The first phase – “customer questionnaire” was analyzed using SPSS. The highest average level of importance was 4.911 and the lowest was 4.198. This shows that the 20 items were all important to the customers. The top five items in descending order are: Food source is reliable and safe, Quality of food, Health and safety of the restaurant, Service attitude and friendliness of staffs, and Comfortable dining environment.

Calculation relative weigh of customers’ needs and quality technology

The quality factors of customers’ needs and the association strength of quality technology were verified with the service provider. The study used the relation matrix to analysis association strengths of customers’ needs and quality technology. The association strengths were denoted by \odot , \circ and \triangle . \odot denotes close association with a score of 5, \circ denotes normal association with a score of 3, and \triangle denotes weak association with a score of 1. The column is left blank if there is no association. The results revealed that among the quality technology, “Operation philosophy” was very important, and the factors that were next important were: “Product quality”, “Service quality”, “Cooking skills and distinguishing features”. Other quality technologies were not unimportant but their priorities were not of urgent needs.

Identifying the interaction between the quality technology

This section is identifying the roof of the “House of Quality”. The primary objective is to understand the interaction between the various quality technologies and the interaction can be identified using this model. For example: “Product design” and “Cooking skills and distinguishing features” were highly and positively associated, therefore, uses \odot denotes highly and positively associated. In contrast, more “Cooking skills and distinguishing features” comes with more complex “Environmental design” and they are therefore highly and negatively associated. Therefore, uses \ast denotes highly and negatively associated. More “Cooking skills and distinguishing features” also comes with more a more difficult maintenance of “Environmental cleanliness” and they are therefore lowly negatively associated.

Conclusion

The following results were obtained from this using the QFD for the evaluation of quality improvements of vegetable restaurant in addition to the two phases questionnaire: In the first phase customers’ questionnaire, the top five important service attitudes are: Food source is reliable and safe, Quality of food, Health and safety of the restaurant, Service attitude and friendliness of staffs, and Comfortable dining environment.

This study found that the first three quality needs that the customers emphasize are all related to health and safety. They hope that what they eat is safe, clean, and fresh. Subjective senses come next and they hope that the customers hope that they can be respected during the ordering of food, can be treated with a friendly attitude, and can be provided with a comfortable dining environment.

This study suggests that the key to improving service quality lies in a correct management principle. This is the most important and the most basic principle in the operation of a company. The service provider will focus on the fulfillment of the customers’ needs if they can prioritize the customers’ interest. Moreover, the providers need to uphold their service quality to ensure that the customers have an enjoyable dining experience and lastly, they

need to improve on the cooking skills and the distinguishable features to ensure that the customers' enjoy the food. As for the other quality factors, they are not unimportant but their priorities are not of urgent needs.

Acknowledgements

The authors would also like to thank the National Science Council of Taiwan, R.O.C. for financially supporting this study in 2013 (Number: NSC 102-2221-E-412 -001).

References

- Behara, R.S. and Chase, R.B. (1993). *Service Quality Deployment: Quality Service by Design*. Perspectives in operations management: Essays in Honor of Elwood S. Buffa, Norwell, MA.
- Chen, S.H. and Yang, C.C. (2004). Applications of Web-QFD and E-Delphi method in the higher education system, *Human Systems Management*, 23(4), 245-256.
- Dai, J. and Blackhurst, J. (2012). A four-phase AHP-QFD approach for supplier assessment: A sustainability perspective. *International Journal of Production Research*, 50 (19), 5474-5490.
- Deming, W. E. (1982). *Quality Productivity and Competitive Position*. Cambridge, MA, MIT.
- Goodland, R. and Anhang, J. (2009). Livestock and climate change. *World Watch Magazine*, 11-19.
- Hauser, J.R. and Clausing, D. (1988). The house of quality. *Harvard Business Review*, 63-73.
- Institute for Ecological Economy Research (2008). *Going veggie can slash your carbon footprint*. http://www.terradaily.com/reports/Going_veggie_can_slash_your_carbon_footprint_study_says_999.html
- Nunnally, J. C. (1978). *Psychometric Theory*. New York: McGraw-Hill.
- Parasurman, A. Zeithaml, V.A. and Berry, L.L. (1985). A conceptual model of service quality and its implications for future research. *Journal of Marketing*, 49, 41-50.
- Raharjo, H. Xie, M. and Brombacher, A.C. (2011). A systematic methodology to deal with the dynamics of customer needs in Quality Function Deployment. *Expert Systems with Applications*, 38, 3653-3662.
- Stevens, T. Knutson, B. and Patton, M. (1995). DINESERV: A tool for measuring service quality in restaurants. *The Cornell Hotel and Restaurant Administration Quarterly*, 36(2), 56-60.
- Steinfeld, H. Gerber, P. Wassenaar, T. Castel, V. Rosales, M. and Haan, C. D, (2006). *Livestock's Long Shadow: environmental issues and options*, by the Food and Agriculture Organization of the United Nations (FAO).
- Weng, M.C. Hsiao, J.M. and Tsai, C.H. (2009). Fuzzy analytical approach to prioritize design requirements in quality function deployment. *Journal of Quality*, 16 (1), 61-71.