

Prioritizing and Achieving Quality Services in Gas Stations using Analytical Hierarchy Process and Quality Function Deployment

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Identifying customer requirement and modifying the services as per expectation of customer in service sector leads to achieve the profit of organization and sustain in the market. The customer expectations towards the service organization dramatically increased in recent years, in order to sustain in the market, the organization should identify the customer requirements, adopting the system, process, services as per expectation of customer in the organization. This article highlights the expectation of customer in gas stations located at Jeddah, Saudi Arabia. The data collection done at various gas stations, a questioner-based survey conducted to identify the customer requirements from 10 gas stations, 250 responds collected from different category of customer based on the driving vehicle such as four wheelers and heavy vehicle. The data collection validated by SPSS software and Analytical Hierarchy process used for prioritizing the customer requirements and House of quality constructed as per requirement of customer, the quality function deployment introduced to enhance the services in gas stations. The article concludes that, the following requirements were highly expected from gas stations, the requirements were need space between one pump to another pump, payment by credit card also to be considered, services for cleaning car windows, quick wash, availability of rest room and the proper maintenance of gas stations (calibration of air machine, cleaning of work station frequently, introducing 5S Concept and displaying in and exit board). The article suggests the function modification required in gas stations for achieving customer requirement.

Keywords: Customer requirement, Prioritizing Services, House of Quality, Gas stations, AHP

Introduction

The primary objectives of every organization are achieving the selling target and maximizes the profit and minimize the waste or handling cost without affecting primary function of the system. The profit of the organization achieved by the way of identifying customer expectation and fulfilling their needs. In this research work made an attempt of identifying customer expectation from gas stations located at Jeddah, Saudi. In this work started with data collection from various customers utilizing the services from gas station, the customer categorised based on the utilizing the vehicle such as four-wheeler and heavy vehicle. Most of the researchers utilized this SERVQUAL model for collecting initial responds from customer. In this research work questioner-based survey conducted from 250 customers, the questions were framed with the reference of quality model SERVQUAL. The data collection validated by SPSS software and Analytical Hierarchy process used for prioritising the customer

requirements and House of quality constructed as per requirement of customer, the quality function deployment introduced to enhance the services in gas stations. Total quality management principles are customer oriented and each specific quality objective and policy is defined clearly³. In recent times, customer assessment of quality for gas station has begun to play a critical role because of the consumers. Their satisfaction or dissatisfaction with services received has become an area of wide researches. There are increasing expectations for transparency, value, and customer service. Consumers, especially the younger generations, expect gas stations to work the same way as the other digital markets, with more user-friendly interfaces, clearly defined rates, and the wide choice of product options^{1,5}. It might increasingly be recognized that a higher quality of product and service and their related satisfaction of consumers are the keys to survival and prosperity of any enterprise^{4,6}. The literature review evidenced, only identifying customer expectation and fulfilling their needs lead to enhance the quality services in organization.

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Research methodology and measures

Implementing QFD in improving Gas Stations at Jeddah city

Seven steps for the construction of house of quality (Customer Requirement Planning Matrix) for Jeddah’s Gas Station:

Sample

The acquired study includes the reviews of 250 customers utilizing the services from 10 differed gas stations in Jeddah (2018). There are 55 percent of four-wheeler driving and 45 percentage heavy vehicle driving customers were included in the sample.

Identified customer requirements

The identified customer requirements were listed below

- No enough space between pumpers.
- Only cash payment (no credit payment).
- Availability of cleaning window tools for cars.
- Providing restrooms.
- Increase the quality of gas station.

Identify Product Requirements

- Redesign the gas station by exploiting the space.
- Providing pumpers which accept credit cards payment.

- Establish a new small area for cleaning window tools for cars.
- Construct restrooms for men and women.
- Make periodical maintenance and cleaning

Develop Inter-relationship Matrix between customer requirements and Technical requirements

Data Analysis

Correlation Matrix: The correction matrix described in below table, the empty boxes in table 1 denotes No relationship between customer requirement and Technical requirements. Prioritized Customer and Technical Requirements: The Analytical Hierarchy process adopted for prioritizing and ranking of customer and technical requirement, the following table 2 describes the AHP results in detailed manner.

Results and Discussion

The above table evidenced the customer were highly expected introducing online or card payment rather than cash payment followed by the cleanness of gas station to be enhanced. The ranking of the customer requirements was Only cash payment (no credit payment) (1), Increase the quality of gas station (2), Providing restrooms (3), Availability of cleaning

Table 1 — Inter-relationship Matrix between customer requirements and Technical requirements

SI No.	Customer requirement	Technical requirement				
		Redesign the gas station by exploiting the space.	Providing pumpers which accept credit cards payment.	Establish a new small area for cleaning window tools for cars.	Construct restrooms for men and women.	Make periodical maintenance and cleaning.
1	No enough space between pumpers.	★		▲		
2	Only cash payment (no credit payment).	▲	★			●
3	Availability of cleaning window tools for cars.	■		★		●
4	Providing restrooms.	●			★	★
5	Increase the quality of gas station.	■	★	★	★	★

Symbol	Correlation Level	Symbol	Correlation Level
★	Very Strong Relationship	▲	Strong Relationship
■	Medium Relationship	●	Weak Relation

Table 2 — Pair wise Comparison Matrix of Customer Requirements (CR) & Technical Requirements (TR) using AHP Method

Customer Requirements	CR1	CR2	CR3	CR4	CR5	Weight	Technical Requirement	TR1	TR2	TR3	TR4	TR5	Weight
CR1	1	0.14	0.33	0.33	1	6.8 %	TR1	1	0.33	3	0.2	1	11.6 %
CR2	7	1	7	3	5	49.2 %	TR2	3	1	3	1	5	33.5 %
CR3	3	0.14	1	0.2	0.2	7.7 %	TR3	0.33	0.33	1	0.2	0.33	5.9 %
CR4	3	0.33	5	1	0.33	16.7 %	TR4	5	1	5	1	0.33	27.9 %
CR5	1	0.2	5	3	1	19.6 %	TR5	1	0.2	3	3	1	21.1 %

Table 3 — Recommendation proposed to enhance the services in gas station

Customer Requirements	Proposed Recommendations to enhance the services in gas station
Only cash payment (no credit payment) (1)	The online payment / credit card payment system to be initiated
Increase the quality of gas station (2)	5S, Periodic maintenance to be implemented
Providing restrooms (3)	Proper Layout design proposed with availability of rest room for both men and women
Availability of cleaning window tools for cars (4)	service station to be located within the gas station for cleaning windows, Water wash, repairing work & maintenance of vehicles
No enough space between pumpers (5)	The proper layout design proposed for making enough spaces between one pump to another pump

window tools for cars (4), No enough space between pumpers (5). For addressing the above customer requirements, this article suggested some functional modification required in gas station to achieve the quality services. The recommendation proposed to enhance the services in gas station is listed in table 3.

Conclusion

This article concludes, the proper market research required for identifying customer expectation to enhance the services in the organization. The QFD and AHP methods utilized for analyzing the collected data in better way. The four-wheeler driving customers highly expecting enough space between one pump to another pump and incase heavy vehicle driving customers were expecting to introduce online

payment or credit card payment in gas stations. At that end, this research made an attempt of prioritizing customer requirements in gas stations located at Jeddah. Future the total quality management tools like the Sig Sigma, FMEA, and Bench marking will be utilized for achieving the quality services.

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