

Analysis Of Quality Improvement Of Two Wheel Motor Vehicle Services Using Quality Function Deployment Method At Rezky Jaya Motor Workshop Makassar

Siswanto ¹, Yan Herdianzah^{2*}, Nurhayati Rauf³, Muh. Alim Suja'setyahadi⁴

¹Department of Industrial Engineering, Faculty of Teknik, Muhammadiyah University of Luwuk, Sulawesi Tengah, Indonesia

^{2,3,4}Department of Industrial Engineering, Faculty of Industrial Technology, Indonesian Muslim University, Makassar, Indonesia

ARTICLE INFORMATION

Article history:

Received: August 3, 2022

Revised: August 27, 2022

Accepted: October 20, 2022

Keywords:

Keyword_Quality

Keyword_Quality Function Deployment (QFD)

Keyword_House of Quality (HOQ)

ABSTRACT

Resky Jaya Motor Makassar is one of the general motorcycle repair shops serving services such as medium service, light service, and heavy service. There are several complaints about service satisfaction at the Resky Jaya Motor workshop, most of the se complaints are in service, work supervision, vehicle systems, and inapropriate processing times. The purpose of this study is to know the service attributes desired by the customer and to know the service attributes that provide satisfaction to the customer. The method used in this research is Quality Function Deployment (QFD), as a method to transform customer desires into appropriate technical requirements at each stage of the life cycle of a product to product concept then sales and service. The results of this study indicate that the service attributes desired by service users based on observations there are 20 statement attributes, and in improving the quality of vehicle service services at the Rezky Jaya Motor Makassar workshop, technical engineering is carried out on the wishes of service users contained in the list of service users' needs so that service attributes which is expected to provide satisfaction to service users.

*Corresponding Author

Name: Yan Herdianzah

E-mail: yan.herdianzah@umi.ac.id

This is an open-access article under the CC BY 4.0 International License
© JISEM (2022)



© 20xx Some rights reserved

INTRODUCTION

Resky Jaya Motor Makassar is a general motorcycle repair shop that provides services such as medium service, light service, and heavy service. A service business is a type of business that sells or offers knowledge and expertise, then consumers will pay for the services provided [1]. Every company must pay attention to the quality of service provided to each of its customers, because every customer expects to get good service beyond what they expect or want so that customers will feel satisfied and happy [2][3].

[4] there are five perspectives on quality that are currently developing, namely the transcendental approach, product-based approach, user-based approach, manufacturing - based approach, and value-based approach [5][6].

[7], service quality includes 5 dimensions, namely: Tangibles: this dimension includes physical facilities, equipment, personnel and means of communication; Reliability: this dimension includes the ability to produce the promised service performance accurately and with certainty; Responsiveness: namely being able to answer needs or can be interpreted with a willingness to help consumers and provide fast service; Assurance: includes a guarantee of customer safety for the environment as well as the services provided to provide security; and Empathy: namely the existence of an inspiration and personal attention to consumers as well as the ease of making good communication relationships and understanding of customer needs [8] [9].

The task of translating target customer requests into a functioning prototype is assisted by several methods known as Quality Function Deployment (QFD) quality function deployment [10][11]. QFD is a customer-focused approach where customer requirements are brought in while designing products and services. Its adaptability and ability to capture what customers want has seen researchers apply QFD in areas such as product development, banking services and supply chain [12][13].

[14] QFD provides a number of benefits for organizations that are trying to enhance their competitiveness by continuously improving their quality and productivity. The benefits of QFD include customer focus, time efficiency, teamwork orientation, documentation orientation [15][16].

The main tool of the Quality Function Deployment (QFD) process is the matrix. Where there results can be achieved through the use of inter-departmental / functional teams by collecting, interpreting, documenting and prioritizing customer needs. The following is the form or matrix of the House of Quality [17].

The QFD process at this stage requires customer data written as attributes of the service. These attributes or needs are potential benefits that customers can receive from the service [18][19]. Generally, qualitative data is obtained from interviews and observations with customers, while quantitative data is obtained from surveys [20][21].

Location or customer voting as follows Importance to customer is a tool to record how important each need is for the customer, Customer satisfaction performance is the customer's perception, Competitive satisfaction performance In some companies to be competitive, the team must understand the competition, Goal decides the level of customer performance to be achieved in order to meet every consumer, Sales point contains information about the ability to sell products/services, based on how well each consumer needs: No selling point (0), Medium selling point (1,2), High selling point (1.5), Improvement Ratio Is a measure of the efforts made to increase customer satisfaction, Raw weight contains the calculated value from the data and decisions that have been made during the planning matrix and Normalized raw weight contains the raw weight value, scaled in the range from 0 to 1 or expressed in percentages [22][23]. House of quality (house of quality) is a technical graphic to explain the relationship between customer desires and products (or services) [24][25].

Only with Applying this relationship an operations manager can build products and processes with the features that customers want [26][27].

RESEARCH METHODS

The research location which is the object of research in data collection is carried out at the Rezky Jaya Motor Workshop on Jl. Bandang No.123, Bontoala District, Makassar City, South Sulawesi Province, with a research period of one month (21 March 2022-27 March 2022)

Data collection

a. Primary data

In this study the primary data in the form of preparation in improving services to increase customer satisfaction with the services of two-wheeled motorized vehicles obtained by conducting interviews

b. Secondary data

Secondary data in the form of data obtained from monthly report archives containing time of machine breakdown, number of machine breakdowns, machine repair time, and working hours data.

Data processing

The data processing used in this study uses the Quality Function Deployment (QFD) method, namely:

1. Data Sample Processing
2. Validity Test and Reliability Test

3. Determining the Level of Interest

4. Determination of Satisfaction Level

5. Steps in Filling House Of Quality (HOQ)

- a. Planning Matrix
- b. Technical Correlation
- c. Technical relationship
- d. Technical importance
- e. House Of Quality

RESULTS AND DISCUSSION**Validity test**

Validity test in this study using the help of SPSS 25 software for windows. This test is carried out using the Corrected Item-Total Correlation technique. If r count r table means the question item is declared valid and vice versa if r count r table means the question item is in valid.

Table 1. The results of the calculation of the Interest Level Validity Test (Importance to Customer)

No	Statement	R Count	R Table	Information
1	Have a clean toilet	0,349	0,1654	Valid
2	Has a comfortable waiting room (AC ,TV, and Sofa)	0,400	0,1654	Valid
3	Have a place to try/test the vehicle	0,311	0,1654	Valid
4	Have a good security system (security)	0,532	0,1654	Valid
5	Have an experienced mechanic	0,601	0,1654	Valid
6	Willing to provide services in an emergency	0,403	0,1654	Valid
7	Friendly and polite	0,697	0,1654	Valid
8	Employees remind consumers when the next Service is repeated	0,297	0,1654	Valid
9	Employees are responsive to customer requests	0,466	0,1654	Valid
10	Provide pick-up/drop-off facilities for vehicles That are about to be serviced	0,616	0,1654	Valid
11	Provide an explanation of the damaged spare parts	7,000	0,1654	Valid
12	Employees and mechanics are friendly and Honest with customers	0,429	0,1654	Valid
13	Guaranteed re-service without additional costs if there is damage during a certain period of time	0,533	0,1654	Valid
14	keep the spare parts order period Guarantee for replacement of spare	0,530	0,1654	Valid
15	parts in case of damage when new spare parts are Replaced (within a certain period of time)	0,332	0,1654	Valid
16	Maintain the integrity of goods or vehicles While in the workshop	0,400	0,1654	Valid
17	Customers can easily contact the workshop by telephone	0,330	0,1654	Valid

No	Statement	R Count	R Table	Information
18	Mechanic gives tips on vehicle maintenance in An emergency	0,286	0,1654	Valid
19	Provide non-cash payment facilities	0,443	0,1654	Valid
20	Send invoices to the customer's home or office	0,527	0,1654	Valid

Table2.Theresults of the calculation of the Consumer Level Validity Test (current satisfaction performance)

No	Statement	R Count	R Table	Information
1	Have a clean toilet	0,349	0,1654	Valid
2	Has a comfortable waiting room (AC, TV, and Sofa)	0,400	0,1654	Valid
3	Have a place to try/test the vehicle	0,311	0,1654	Valid
4	Have a good security system(security)	0,532	0,1654	Valid
5	Have an experienced mechanic	0,601	0,1654	Valid
6	Willing to provide services in an emergency	0,403	0,1654	Valid
7	Friendly and polite	0,697	0,1654	Valid
8	Employees remind consumers when the next service is repeated	0,297	0,1654	Valid
9	Employees are responsive to customer requests	0,466	0,1654	Valid
10	Provide pick-up/drop-off facilities for vehicles That are about to be serviced	0,616	0,1654	Valid
11	Provide an explanation of the damaged spare parts	7,000	0,1654	Valid
12	Employees and mechanics are friendly and Honest with customers	0,429	0,1654	Valid
13	Guaranteed re-service without additional costs if There is damage during a certain period of time	0,533	0,1654	Valid
14	keep the spare parts order period	0,530	0,1654	Valid
15	Guarantee for replacement of spare parts in case of damage when new spare parts are Replaced (within a certain period of time)	0,332	0,1654	Valid
16	Maintain the integrity of goods or vehicles while in the workshop	0,400	0,1654	Valid
17	Customers can easily contact the workshop by telephone	0,330	0,1654	Valid
18	Mechanic gives tips on vehicle maintenance in an emergency	0,286	0,1654	Valid
19	Provide non-cash payment facilities	0,443	0,1654	Valid
20	Send invoices to the customer's home or office	0,527	0,1654	Valid

A. House of Quality (HOQ)

between customer desires and the product (or service).

The house of quality is a technical graphic to explain the relationship

Table 3. House of Quality (HOQ)

How	Procurement of workshop facilities	Full responsibility of the workshop	Regular service queue	Waiting room cleanliness	Service use room floor level	Workshop facilities	ITC	CuSP	Goal	Improvement ratio	Sales Point	Raw weight	Normal raw weight
What's													
Attributes of Service User Needs													
Have a clean toilet	⊙	△		⊙	⊙	⊙	3,79	3,83	5	1,31	1,5	7,42	0,0475
Has a comfortable waiting room (AC, TV, and Sofa)	⊙			⊙	⊙	⊙	3,72	3,87	5	1,29	1,5	7,21	0,0461
Have a place to try/test the vehicle	⊙	⊙	△			⊙	3,87	3,95	5	1,27	1,5	7,35	0,0470
Have a good security system (security)	⊙	⊙			⊙	⊙	3,54	3,09	5	1,62	1,5	8,59	0,0549
Have an experienced mechanic		⊙	⊙		△		3,8	3,56	5	1,40	1,5	8,01	0,0512
Willing to provide services in an emergency	⊙	⊙	⊙		⊙		3,66	3,89	5	1,29	1,5	7,06	0,0451
Friendly and polite		⊙					3,93	3,74	5	1,34	1,5	7,88	0,0504
Employees remind consumers when the next service is repeated		⊙	⊙		⊙	⊙	3,67	3,99	5	1,25	1,5	6,90	0,0441
Employees are responsive to customer requests		⊙			⊙		3,96	3,95	5	1,27	1,5	7,52	0,0481
provide pick-up/drop-off facilities for vehicles that are about to be serviced	⊙	⊙			△	⊙	4,14	3,74	5	1,34	1,5	8,30	0,0531
Provide an explanation of the damaged spare parts	△	⊙	⊙		⊙	△	3,79	3,86	5	1,30	1,5	7,36	0,0471
Employees and mechanics are friendly and honest with customers	△	⊙			⊙	△	3,93	3,62	5	1,38	1,5	8,14	0,0521
Keep the spare parts order period	⊙	⊙	⊙			△	4,2	3,72	5	1,34	1,5	8,47	0,0541
Guarantee for replacement of spare parts in case of damage when new spare parts are	⊙	⊙	⊙			⊙	4,02	3,78	5	1,32	1,5	7,98	0,0510

replaced(within A certain period of time)													
Maintain the integrity of goods or vehicles while in the workshop	⊖	⊖			⊖	⊖	3,94	3,7	5	1,35	1,5	7,99	0,0511
Keep the spare parts order period	⊖	⊖	⊖		⊖	⊖	3,84	3,5	5	1,43	1,5	8,23	0,0526
Guarantee for replacement of spare parts in case of Damage when new spare parts are replaced (within a certain period of time)	⊖	⊖			⊖	⊖	3,94	3,75	5	1,33	1,5	7,88	0,0504
Mechanic gives tips on vehicle maintenance in an emergency	⊖	⊖			⊖	⊖	4,03	3,84	5	1,30	1,5	7,87	0,0503
Provide non-cash payment facilities	⊖	⊖			⊖		3,97	3,47	5	1,44	1,5	8,58	0,0549
Send invoices to the customer's home or office	⊖	⊖			⊖		3,91	3,83	5	1,31	1,5	7,66	0,0490
Absolute Importance	107	148	41	36	88	93							
Design priority	2	1	3	2	5	3							

CONCLUSIONS

Based on the data collection, processing, and analysis that has been done. Then it can be concluded that:

1. Attributes of service desired by service users based on observations there are 20 attribute statements. It can be seen that among the 20 attributes there are 5 attributes that are the main priority, namely:
 - a. Guaranteed re-service with out additional costs if there is damage during a certain period of time.
 - b. Provide pick-up/delivery facilities for vehicles that will be/finished in service
 - c. Mechanics provide vehicle maintenance tips in an emergency
 - d. Fulfill the spare parts order period
 - e. Providing non-cash payment facilities”
2. In improving the quality of vehicle service services at the Rezky Jaya Motor Makassar workshop, technical engineering is carried out on the wishes of service users contained in the list of service user needs so that the service attributes that are expected to provide satisfaction to service users include
 - a. Full responsibility of the workshop
 - b. Procurement of workshop facilities
 - c. Workshop facilities
 - d. Service user comfort level
 - e. Regular service queue
 - f. Waiting room cleanliness

REFERENCES

- [1] R. R. Menon and V. Ravi, "Using ANP and QFD methodologies to analyze eco-efficiency requirements in an electronic supply chain," *Clean. Eng. Technol.*, vol. 5, p. 100350, Dec. 2021, doi: 10.1016/j.clet.2021.100350.
- [2] N. Dyana, "Analisis Qfd (Quality Function Deployment) Untuk Perbaikan Produk Thai Tea Merek Kaw-Kaw Di Ukm Waralaba Di Landung sari, Malang," *J. Valtech (Jurnal Mhs. Tek. Ind.*, vol. Vol. 3 No., no. 2, pp. 153–159, 2020.
- [3] Y. Wagiono and H. Hamrah, "Metode Quality Function Deployment (Qfd) Untuk Informasi Penyempurnaan Perakitan Varietas Melon Wagiono, Y., & Hamrah, H. (2007). Metode Quality Function Deployment (Qfd) Untuk Informasi Penyempurnaan Perakitan Varietas Melon. Jurnal Agribisnis Dan Ekonomi," *J. Agribisnis dan Ekon. Pertan.*, vol. 1, no. 2, pp. 48–57, 2007.
- [4] A. Mahendar ingratry, E. Nursanti, and J. Hutabarat, "Desain dan Pengembangan Sistem Informasi Administrasi Akademik Dosen (SIAADOS) Dengan Web Dinamis Untuk Peningkatan Karir Dosen Tetap di Universitas Gajayana Malang," *J. Teknol. DAN Manaj. Ind.*, vol. 3, no. 1, pp. 20–25, Feb. 2017, doi: 10.36040/jtmi.v3i1.173.
- [5] Y. Zamrodah, "濟無No Title No Title No Title," vol. 15, no. 2, pp. 1–23, 2016.
- [6] A. Ady, S. Lana, and S. Muchtar, "Perancangan Mesin Pencacah Sampah Botol Plastik Skala Rumah Tangga," no. November 2021, pp. 1–10, 1846.
- [7] L. Anatolia, "Pengaruh Pengelolaan Sistem Pembuangan Akhir Sampah Dan Dampak Terhadap Kesehatan Masyarakat Di Desa Tibar, Kecamatan Bazartete, Kabupaten Liquiça, Timor-Leste.," *Bumi Lestari*, vol. 15, no. 2, pp. 115–124, 2015.
- [8] R. Prabowo and M. I. Zoelangga, "Pengembangan Produk Power Charger Portable dengan Menggunakan Metode Quality Function Deployment (QFD)," *J. ReKayasa Sist. Ind.*, vol. 8, no. 1, pp. 55–62, Apr. 2019, doi: 10.26593/jrsi.v8i1.3187.55-62.
- [9] R. Prabowo and B. E. Purwanto, "New Product Development for Dryer Fish for SMEs Scale with Quality Function Deployment (QFD) Method," *Pros. Int. Conf. ICOEN 3*, pp. 327–336, 2016.
- [10] Y. Shen, J. Zhou, A. A. Pantelous, Y. Liu, and Z. Zhang, "A voice of the customer real-time strategy: An integrated quality function deployment approach," *Comput. Ind. Eng.*, vol. 169, p. 108233, Jul. 2022, doi: 10.1016/j.cie.2022.108233.
- [11] Q. Yang, Z.-S. Chen, C. Y. P. Chan, W. Pedrycz, L. Martínez, and M. J. Skibniewski, "Large-scale group decision-making for prioritizing engineering characteristics in quality function deployment under comparative linguistic environment," *Appl. Soft Comput.*, vol. 127, p. 109359, Sep. 2022, doi: 10.1016/j.asoc.2022.109359.
- [12] M. Murugan and S. Marisamynathan, "Elucidating the Indian customers requirements for electric vehicle adoption: An integrated analytical hierarchy process–Quality function deployment approach," *Case Stud. Transp. Policy*, vol. 10, no. 2, pp. 1045–1057, Jun. 2022, doi: 10.1016/j.cstp.2022.03.017.
- [13] A. H. K. Babar and Y. Ali, "Enhancement of electric vehicles' market competitiveness using fuzzy quality function deployment," *Technol. Forecast. Soc. Change*, vol. 167, p. 120738, Jun. 2021, doi: 10.1016/j.techfore.2021.120738.
- [14] V. Lapinskienė and V. Motuzienė, "Integrated building design technology based on quality function deployment and axiomatic design methods: A case study," *Sustain. Cities Soc.*, vol. 65, p. 102631, Feb. 2021, doi: 10.1016/j.scs.2020.102631.
- [15] A. Erdil, "An Evaluation on Lifecycle of Products in Textile Industry of Turkey through Quality Function Deployment and Pareto Analysis," *Procedia Comput. Sci.*, vol. 158, pp. 735–744, 2019, doi: 10.1016/j.procs.2019.09.109.
- [16] Q. Mao, N. Li, and F. Peña-Mora, "Quality function deployment-based framework for improving the resilience of critical infrastructure systems," *Int. J. Crit. Infrastruct. Prot.*, vol. 26, p. 100304, Sep. 2019, doi: 10.1016/j.ijcip.2019.100304.
- [17] K.-S. Chin, Q. Yang, C. Y. P. Chan, K. L. Tsui, and Y. Li, "Identifying passengers' needs in cabin interiors of high-speed rails in China using quality function deployment for improving passenger satisfaction," *Transp.*

- Res. Part A Policy Pract.*, vol. 119, pp. 326–342, Jan. 2019, doi: 10.1016/j.tra.2018.12.004.
- [18] Q. Yang, K.-S. Chin, and Y.-L. Li, “A quality function deployment-based framework for the risk management of hazardous material transportation process,” *J. Loss Prev. Process Ind.*, vol. 52, pp. 81–92, Mar. 2018, doi: 10.1016/j.jlp.2018.02.001.
- [19] X. Wu and H. Liao, “An approach to quality function deployment based on probabilistic linguistic term sets and ORESTE method for multi-expert multi-criteria decision making,” *Inf. Fusion*, vol. 43, pp. 13–26, Sep. 2018, doi: 10.1016/j.inffus.2017.11.008.
- [20] A. J. C. Trappey, C. V. Trappey, C.-Y. Fan, and I. J. Y. Lee, “Consumer driven product technology function deployment using social media and patent mining,” *Adv. Eng. Informatics*, vol. 36, pp. 120–129, Apr. 2018, doi: 10.1016/j.aei.2018.03.004.
- [21] I. Djekic *et al.*, “Application of quality function deployment on shelf-life analysis of *Agaricus bisporus* Portobello,” *LWT*, vol. 78, pp. 82–89, May 2017, doi: 10.1016/j.lwt.2016.12.036.
- [22] Y. Miao, Y. Liu, Y. Chen, J. Zhou, and P. Ji, “Two uncertain chance-constrained programming models to setting target levels of design attributes in quality function deployment,” *Inf. Sci. (Ny)*, vol. 415–416, pp. 156–170, Nov. 2017, doi: 10.1016/j.ins.2017.06.025.
- [23] L.-H. Chen, W.-C. Ko, and F.-T. Yeh, “Approach based on fuzzy goal programming and quality function deployment for new product planning,” *Eur. J. Oper. Res.*, vol. 259, no. 2, pp. 654–663, Jun. 2017, doi: 10.1016/j.ejor.2016.10.028.
- [24] A. Popoff and D. Millet, “Sustainable Life Cycle Design Using Constraint Satisfaction Problems and Quality Function Deployment,” *Procedia CIRP*, vol. 61, pp. 75–80, 2017, doi: 10.1016/j.procir.2016.11.147.
- [25] R. S. Schillo, D. A. Isabelle, and A. Shakiba, “Linking advanced biofuels policies with stakeholder interests: A method building on Quality Function Deployment,” *Energy Policy*, vol. 100, pp. 126–137, Jan. 2017, doi: 10.1016/j.enpol.2016.09.056.
- [26] A. Mail, M. Dahlan, N. Rauf, A. N. Chairany, A. Ahmad, and K. Jufri, “ANALYSIS OF THE EFFECTIVENESS OF CLEAN WATER DISTRIBUTION MACHINE USING OVERALL EQUIPMENT EFFECTIVENESS (OEE) METHOD,” *J. Ind. Eng. Manag.*, vol. 6, no. 1, pp. 49–56, May 2021, doi: 10.33536/jiem.v6i1.884.
- [27] A. Ahmad and Z. Alnazar, “The Effect Of Work Shift On Subjective Fatigue At Pt . Sumber Setia Budi Kolaka Sultra Workers,” vol. 1, no. 1, pp. 36–40, 2022.