Prioritization of Service Quality Dimensions for Healthcare Sector Using Analytic Hierarchy Process

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1

Presentation Outline

- ◻ Introduction
- ◻ Objective
- ◻ Literature Review
- ◻ Research Method
- ◻ Findings
- ◻ Conclusion

Introduction

- Healthcare is a service industry with unique characteristics. In healthcare, customers are the immediate patients followed by their families and possibly their friends, as the outcome of the healthcare service potentially affects all of their lives.

- Error or mistake in this field can be devastating to individuals and groups alike as lives and quality of life are at risk (McDonald, 2013).

- *Journal of Patient Safety* reveals that each year 210,000 - 400,000 patients die because of preventable adverse events (PAEs) in USA hospitals (Allen, 2013).

- All these suggest to pay maximum attention to uphold the quality at the healthcare sector at the maximum extent.

Objectives of the Study

- ☐ In this study, SERVQUAL has been considered as the main tool to measure service quality and Analytic Hierarchy Process (AHP) has been applied to prioritize the five dimensions of SERVQUAL for healthcare sector.

- ☐ Main objective of this study is to determine the priority of criteria and sub-criteria of SERVQUAL by interviewing hospital clients.

4

Literature Review

- In the early 1970s, service quality was researched for its capacity to measure organizations' performance. Parasurman *et al.* (1985, 1988, and 1991) established the concept of SERVQUAL to evaluate the service performance of an organization.

- They established SERVQUAL based on five dimensions, namely tangibles, reliability, responsiveness, assurance, and empathy.

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SERVQUAL

- *Tangibles:* This factor refers to the appearance of personnel, physical facilities, tools or equipment used to provide the service.

- *Reliability:* This factor involves consistency of performance and dependability. Basically, the dimension of reliability refers to the ability to perform the promised service dependably and accurately according to the customers' needs.

- *Responsiveness:* Responsiveness pertains to the willingness or readiness of service providers to provide prompt services to the customers.

- *Assurance*: This service quality dimension refers to employee knowledge, courtesy, and the ability to convey trust and confidence.

- *Empathy:* This dimension refers to the level of caring, knowing customer needs and individualized attention that the organization needs to provide to their customers.

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AHP in Healthcare

❑ In one of the first applications of AHP in healthcare sector, Dolan (1989) used AHP to identify the best from the seven antibiotic regimens for initial treatment of acute pyelonephritis.

❑ AHP has been used in solving medical decision making problems for practitioners (Sloane et al., 2003; Dolan, 2000), medical personnel management (Forman and Gass, 2001), patient discharge planning (Sloane et al., 2001), benchmarking healthcare facilities (Min et al., 1997).

❑ Shin et al. (2009) used AHP to assess the expanded national immunization programs and to evaluate two alternative healthcare policies.

❑ Kadohira et al. (2015) used risk profiling process and AHP to prioritize 98 zoometric diseases in Japan.

Method

- Data for the present research were collected from 27 respondents in Malaysia through interviews on personal contact basis.

- In the beginning, the respondents were asked to fill out a page providing their demographic information that consists of gender, age, educational qualification, and nationality.

- After collecting the demographic information, the respondents were briefed about the five dimensions of SERVQUAL.

- A sheet of paper was shown to them that provided the SERVQUAL items.

- After explaining the problem background as mentioned above a brief explanation was made on 1-9 scale of AHP.

- Team Expert Choice software was used to obtain the priorities from the pairwise comparison matrices.

- Geometric mean procedure was used (it is actually done by Expert Choice) to obtain the average response for each pairwise comparison.

- Priorities of the dimensions and the items are calculated on the basis of gender, nationality and overall.

Table: Service quality dimensions and their individual items

Service Quality Dimensions	Individual Items
Tangibles (D1)	1. Modern equipment (D11) 2. Visually appealing facilities (D12) 3. Professional appearance of the staff (D13) 4. Cleanliness of the hospital (D14)
Reliability (D2)	1. Perform the services at the right time as promised (D21) 2. Sincerity to solve patients' problems (D22) 3. Providing the service right the first time (D23) 4. Maintain error-free records (D24) 5. Availability of the doctors (D25)
Responsiveness (D3)	1. Minimal waiting time to get the service (prompt services) (D31) 2. Willingness to help the patients (D32) 3. Staff are never too busy to respond to their patients (D33) 4. Ease of obtaining information from the hospital pertaining to patients' queries (D34) 5. Response to the patients' complaints (D35)
Assurance (D4)	1. Hospital is capable to handle patients' medical problems effectively (D41) 2. Hospital takes sufficient measure for the safety of their patients (D42) 3. Doctors are well-mannered (D43) 4. Doctors and nurses are knowledgeable and professional to answer patients' questions (D44)
Empathy (D5)	1. Individual attention with friendly manner (D51) 2. Hospital has the best interest in mind for their patients (D52) 3. Understand patients' specific needs (D53) 4. Convenient consultation hours (D53)

Table: 1-9 AHP scale

Verbal Judgment of Importance	Numerical Rating
Equal importance	1
Equal to moderate importance	2
Moderate importance	3
Moderate to strong importance	4
Strong importance	5
Strong to very strong importance	6
Very strong importance	7
Very strong to extreme importance	8
Extreme importance	9

Findings

Table: Respondents' demographic information

Variable	Frequency	Percent
Gender		
• Male	18	72
• Female	9	28
Race		
• Malaysian	8	29.63
• Internationals	19	70.17
Age group		
• 21-30 years	7	25.93
• 31-40 years	14	51.85
• 41-50 years	4	14.81
• 51 years and above	2	07.40
Highest level of education		
• Diploma	3	11.11
• Bachelors	2	07.40
• Masters	13	48.15
• Ph.D.	9	33.33

Overall	D1	D2	D3	D4	D5
D1	1	0.42	0.37	0.28	0.33
D2		1	1.63	0.83	1.90
D3			1	0.90	1.32
D4				1	1.28
D5					1
	CR = 0.02				

Tangibles	D11	D12	D13	D14
D11	1	3.51	1.50	0.73
D12		1	0.89	0.78
D13			1	0.29
D14				1
	CR = 0.02			

Reliability	D21	D22	D23	D24	D25
D21	1	0.94	0.71	0.84	0.48
D22		1	1.42	1.50	0.77
D23			1	1.74	0.52
D24				1	0.64
D25					1
	CR = 0.02				

Responsiveness	D31	D32	D33	D34	D35
D31	1	0.64	1.70	0.76	0.49
D32		1	2.12	1.63	0.95
D33			1	0.98	0.58
D34				1	0.55
D35					1
	CR = 0.01				

Assurance	D41	D42	D43	D44
D41	1	1.74	0.96	1.19
D42		1	1.04	0.53
D43			1	0.58
D44				1
	CR = 0.02			

Empathy	D51	D52	D53	D54
D51	1	1.35	0.52	1.12
D52		1	0.56	1.51
D53			1	3.67
D54				1
	CR = 0.02			

Exhibit: Average pairwise comparison matrices

Prioritizing service quality dimensions

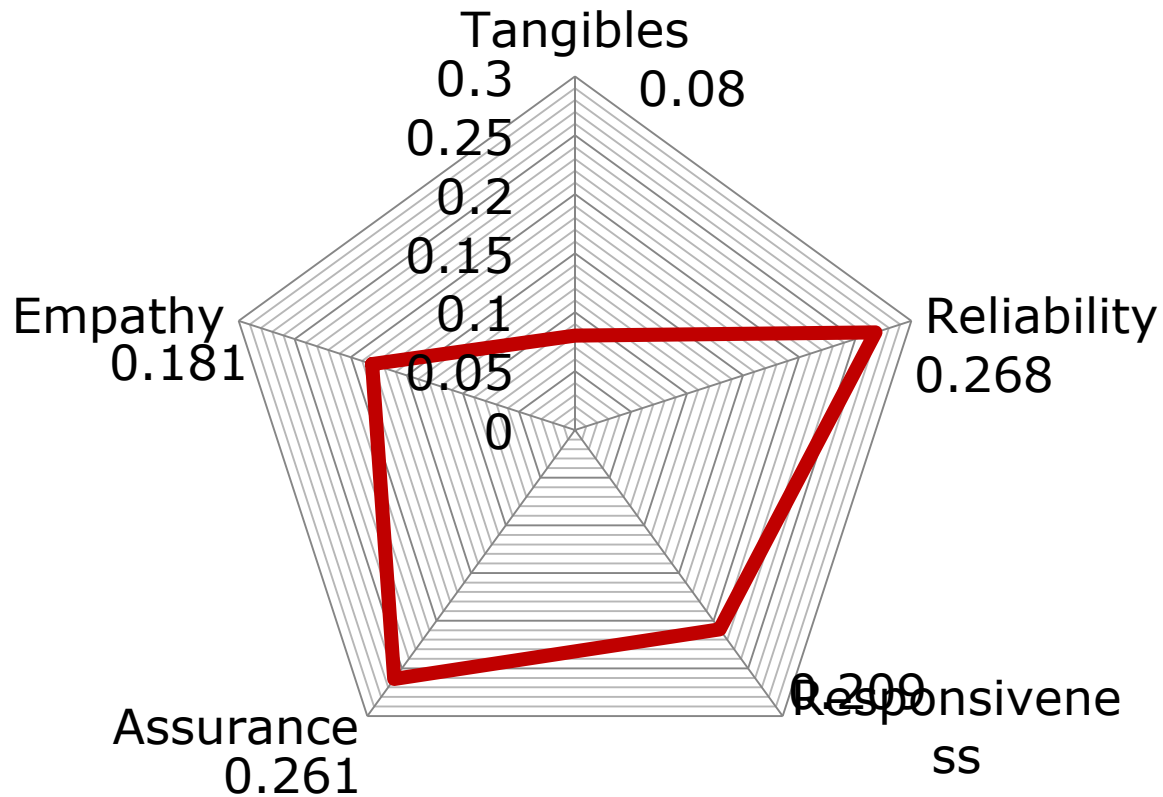| Tangibles (0.080)	Reliability (0.268)	Responsiveness (0.209)	Assurance (0.261)	Empathy (0.181)
Modern equipment (0.312)	Perform services at the right time as promised (0.150)	Provide prompt services (0.162)	Capable to handle medical problems (0.292)	Individual attention with friendly manner (0.218)
Visual appealing facilities (0.122)	Sincerity to solve patients' problem (0.216)	Willingness to help patients (0.263)	Sufficient measure for the patient safety (0.182)	Best interest in mind for the patients (0.205)
Professional appearance of the staff (0.152)	Providing the services right the first time (0.191)	Never too busy to respond (0.134)	Doctors are courteous (0.215)	Understand patients' specific needs (0.431)
Cleanliness of hospitals (0.414)	Maintain error-free records (0.152)	Ease of obtaining information (0.163)	Knowledgeable and professional doctors and nurses to answer patients' questions (0.311)	Convenient consultation hours (0.147)
	Availability of doctors (0.291)	Response to patients' complaints (0.278)		

Figure: Radar chart that shows the priorities of the five dimensions
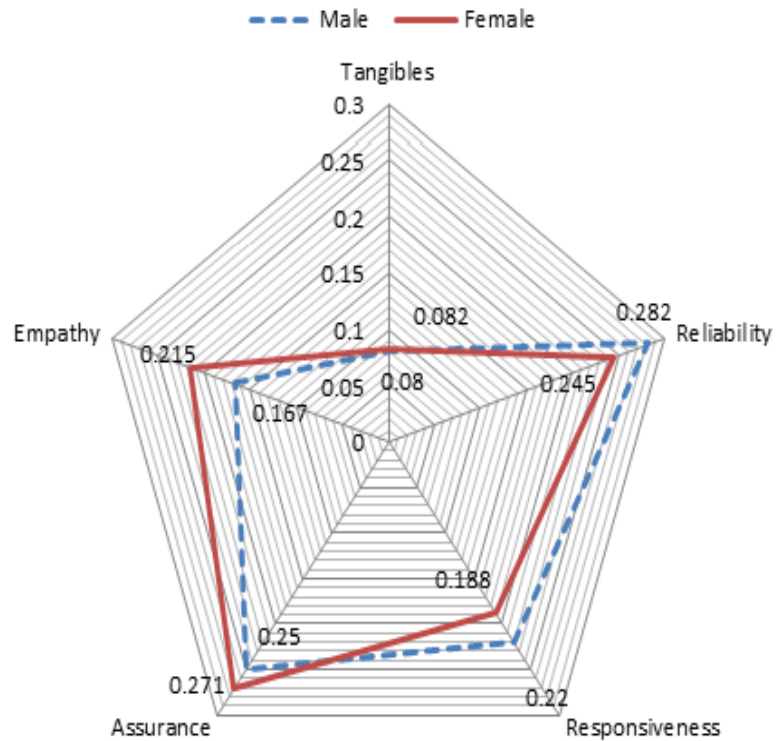
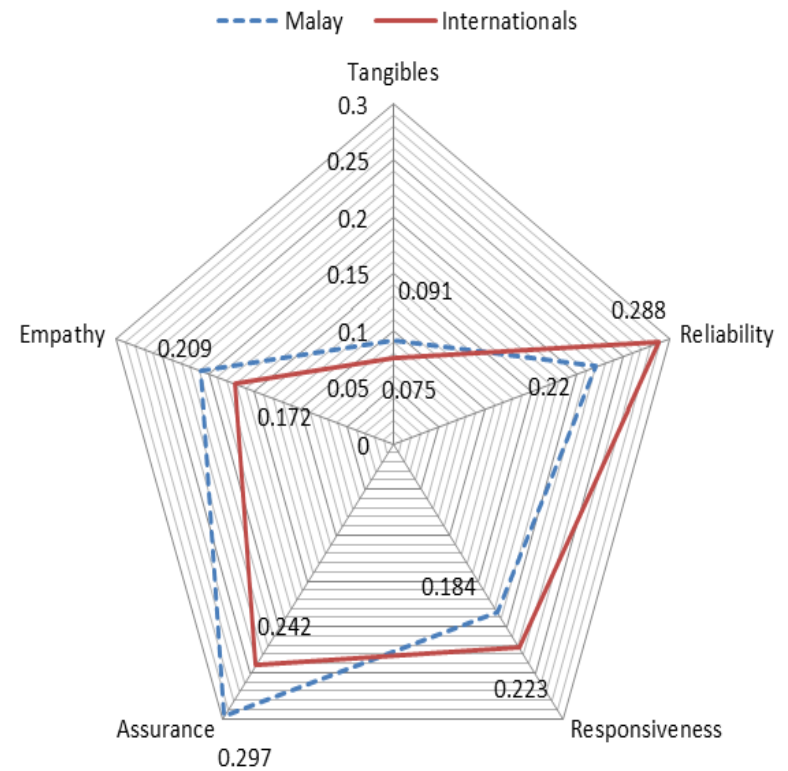Figure : Radar chart for male and female

Figure : Radar chart for Malaysians and   Internationals

Table: Priorities and ranks of the SERVQUAL dimensions and individual items (gender, nationality, and overall)

Dimensions and Items	Male Priority	Male Rank	Female Priority	Female Rank	Malaysian Priority	Malaysian Rank	International Priority	International Rank	Overall Priority	Overall Rank
D1	0.08	5	0.082	5	0.091	5	0.075	5	0.080	5
D11	0.33	2	0.27	2	0.20	2	0.37	1	0.312	2
D12	0.13	4	0.10	4	0.10	4	0.14	4	0.122	4
D13	0.14	3	0.19	3	0.18	3	0.14	3	0.152	3
D14	0.39	1	0.44	1	0.53	1	0.36	2	0.414	1
D2	0.282	1	0.245	2	0.220	2	0.288	1	0.268	1
D21	0.150	5	0.147	4	0.142	4	0.152	5	0.150	5
D22	0.234	2	0.183	3	0.216	3	0.215	2	0.216	2
D23	0.169	4	0.236	2	0.231	2	0.173	3	0.191	3
D24	0.172	3	0.117	5	0.115	5	0.171	4	0.152	4
D25	0.275	1	0.371	1	0.295	1	0.289	1	0.291	1
D3	0.220	3	0.188	4	0.184	4	0.223	3	0.209	3
D31	0.168	3	0.150	4	0.119	4	0.183	3	0.162	4
D32	0.253	2	0.276	2	0.297	2	0.244	2	0.263	2
D33	0.163	4	0.091	5	0.084	5	0.162	4	0.134	5
D34	0.153	5	0.181	3	0.203	3	0.146	5	0.163	3
D35	0.264	1	0.303	1	0.297	1	0.265	1	0.278	1
D4	0.250	2	0.271	1	0.297	1	0.242	2	0.261	2
D41	0.338	1	0.211	3	0.217	3	0.329	1	0.292	2
D42	0.184	3	0.176	4	0.170	4	0.188	4	0.182	4
D43	0.183	4	0.285	2	0.245	2	0.201	3	0.215	3
D44	0.295	2	0.328	1	0.368	1	0.282	2	0.311	1
D5	0.167	4	0.215	3	0.209	3	0.172	4	0.181	4
D51	0.255	2	0.156	4	0.134	4	0.265	4	0.281	2
D52	0.222	3	0.170	3	0.175	3	0.214	3	0.205	3
D53	0.390	1	0.501	1	0.492	1	0.397	1	0.431	1
D54	0.132	4	0.174	2	0.199	2	0.125	2	0.147	4

Analysis of the Priorities and Ranks

- **Tangibles**
  - Cleanliness of the hospital (Rank 1)
  - Modern equipment (Rank 2)
- **Reliability**
  - Availability of doctors (Rank 1)
  - Sincerity to solve patients' problems (Rank 2)
- **Responsiveness**
  - Response to the patients' complaints (Rank 1)
  - Willingness to help patients (Rank 2)
- **Assurance**
  - Doctors and nurses are knowledgeable and professional to answer patients' questions (Rank 1)
  - Hospital is cable to handle patients' medical problems effectively (Rank 2)
- **Empathy**
  - Understand patients' specific needs (Rank 1)
  - Individual attention with friendly manner (Rank 2)

17

Table: Frequency distribution of ranks of the five dimensions

Rank	Tangibles	Reliability	Responsiveness	Assurance	Empathy
1st	1 (3.7)*	9 (33.3)	3 (11.1)	11 (40.7)	4 (14.8)
2nd	2 (7.4)	8 (29.6)	13 (48.1)	5 (18.5)	1 (3.7)
3rd	3 (11.1)	5 (18.5)	4 (14.8)	6 (22.2)	8 (29.6)
4th	2 (7.4)	5 (18.5)	4 (14.8)	3 (11.1)	13 (48.1)
5th	19 (70.4)	0 (0)	3 (11.1)	2 (7.4)	1 (3.7)

Conclusions

□ Not just for healthcare sector, in every part of business, customers have become increasingly quality-conscious. It is essential for any firm to provide superior quality service in order to ensure customer satisfaction and garner customer loyalty.

□ In this context, it is important to know the priorities of various dimensions of service quality so that the service providers can optimally use their resources in designing service delivery system to orchestrate maximum customer satisfaction.

□ The present prioritization exercise for the various dimension of service quality will provide useful guidelines to healthcare service providers, such as hospitals, polyclinics, clinics, etc. to relook into their service delivery system.

19

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- For example, they need to keep high priority to the following:

  1. Understanding patients' specific needs

  2. Having knowledgeable and professional doctors and nurses

  3. Responding to all the complaints lodged by the patients

  4. providing individualistic attention to the patients with smiling face

  5. Ensuring availability of the doctors at the designated office hours.

- It is also observed that, overall, the ranks assigned by the respondents to the SERVQUAL dimensions and their constituent items are consistent across various demographic factors. This shows the robustness of the findings.