ASSESSMENT OF CUSTOMER SATISFACTION ON TQM PRACTICES IN OMAN'S CONSTRUCTION INDUSTRY

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ABSTRACT: Customer satisfaction considered as the one of the key factors of the basic concept of quality management. Construction companies are competing to implement specific strategies, principles and norms of quality management to raise the level of quality in the Constructions sector to satisfy clients who are the owner of projects. Some of these companies resort to measure customers satisfaction level with a view to identify existing weakness of these companies, taking the opinion of the clients in mind so as to limit or reduce these shortcomings. This paper aims to highlight the view of the clients towards construction industries and the existing variables in these construction organizations in Oman. Such variables are administrative, project management, construction and logistical, according to the category of each company. In addition to that, the focus of this paper is to highlight the different views by customers to each category, questionnaires were distributed to some 300 clients of projects to gauge their views towards contractors, the results were analyzed by using T-test method. The finding of this study is that there was unhappiness by clients towards the first and third grades contractors, but they are satisfied in general.

Keywords: Customers satisfaction, Customer satisfaction level, Quality variables.

1.0 INTRODUCTION

Customer satisfaction has become one of the key issues for companies in their efforts to improve quality in the competitive marketplace. It can be seen as either a goal or a measurement tool in the development of construction quality. Customer satisfaction is considered to affect customer retention and, therefore, profitability and competitiveness (Nakata, 2002). According to Hitchcock and Willard (2002), complete customer satisfaction is the key to securing customer loyalty and generating superior long-term financial performance. It is also apparent that high customer satisfaction leads to the strengthening of the relationship between a customer and a company, and this deep sense of collaboration has been found to be profitable (Winser and Corney, 2001)). Accordingly, customer satisfaction is an important factor in the development of the construction process and the customer relationship. It is natural that managers in the construction industry should be concerned about customer satisfaction because of its expected influence on future projects and word-of mouth reputation. However, so far, customer satisfaction in the construction industry is under-researched and customers compare the perceived performance of a product (service, goods) with some performance standard. Customer satisfaction is a function of perceived quality and disconfirmation, the

extent to which perceived quality fails to match repurchases expectations, and customers are satisfied when the perceived performance is greater than the standard whereas dissatisfaction occurs when the performance falls short of the standard. Additionally, there is an extensive difference between the loyalty of merely satisfied customers and those who are completely satisfied. Customers who are just satisfied find it easy to switch suppliers when a better offer comes along. The emphasis on customer satisfaction or customer-driven quality is considered by many gurus and writers as a major success of the quality management effort (Corney, 2001; Li *et al.*, 2001; Nakata, 2002; Hitchcock and Willard, 2002 ,Porter, 1994; Rao *et al.*, 1996; Spring *et al.*, 1998; Oakland, 2000; Kanji, 1998a, b; Zairi, 1999a, b; Zairi, 2000;). Whereas Zairi (1994) considers measuring customer satisfaction as a cornerstone of (TQM). The customers' expectations play an important role in the evaluation of contractor's performance. Customer satisfaction in the construction industry can be defined as how well a contractor meets the customer's expectations, and the quality on construction projects can be regarded as the fulfilment of expectations (see e.g. Barrett 2000). Customer satisfaction should play a central role in the company's TQM (Eklof and Westlund, 1998). This requires listening to customers and trying to satisfy their needs (Eklof and Selivanova, 2000; Winser and Corney, 2001). Yasamis and associates (2002) refer to the transformation process from resources to the constructed facility as the contracting service. The customer's satisfaction with the constructed facility, the contracting facility and the contracting services define project-level quality in construction. In Oman clients are expecting that construction industries will provide their needs and make them satisfied.

2. METHODOLOGY

The quantitative approach was used in this research to highlight the reality of the client satisfaction level, the main source of information gathered in this research was from structured questionnaire survey. The questionnaire structure format designed in a simple, precise and concise way so the clients of projects or houses can answer these questions in easy way and reflect the exact situation by their opinion about the facilities provided by the construction companies to them, the content of questions, types of questions, question format and sequences of question were considered in this question document.

The questionnaire was sent to the owner of projects and was distributed by researcher and building inspectors in Muscat municipality depending on the size of construction companies, sizes are divided in to five major ranks, as per Oman Chamber of Commerce and Industry classification. (OCCI, information center, 2007).

It was required from the clients to put their views regarding the construction companies grades. They are as follows:

a- Rank 1- designates the largest contractors, which are called grade excellent.
b- Rank 2- called first grade.
c- Rank 3- called second grade.
d- Rank 4 – called third grade.
e- Rank 5 –called fourth grade represents the smallest contractors.

3. DATA COLLECTION AND ANALYSIS

The data has been collected from the customers of construction industries, out of 300 questionnaires that have been distributed to the clients, 200 questionnaires completed and returned with response rate of 67% which is acceptable for preceding this study. Table 1 shows the information about the status of questionnaire and the number of construction companies in Muscat 2007.

Table 1 Status of Questionnaire

Grades	*Construction Companies	Distributed	Received	Response Rate
Excellent	93	16	10	
First	607	94	67	
Second	312	54	35	
Third	158	33	17	
Fourth	639	103	71	
Total	*1814*	300	200	67%

**Source: (Information Centre 2007, Oman Chamber and Commercial Industry)*

3.1 Fields of Investigation

1-Administrative

Variables ssuch as relationship between parties, adequacy of office personnel, project cost within the budget, knowledge of client needs, attention to client priorities, adequacy of supervision, coordination with regulatory agencies, adequacy of planning, adequacy of training and customer satisfaction.

2-Project Management and Engineering

Such as progress review meetings**,** adequacy of project control, .adequacy of safety program, estimating, scheduling, interaction with Architect/Engineer, adequacy of supervision, shop drawing review, adequacy of planning and customer satisfaction.

3- Construction

Variables such as project quality, adequacy of job site personnel, material, quality of workmanship, equipment quality, timely completion of project phases, knowledge of the project, site cleanliness, adequacy of processing change orders and project close out.

4- Logistical

Variables such as adequacy of storage, adequacy of warehousing, adequacy of delivery and adequacy of maintenance.For answering this study objective, which is determination of the client satisfaction level towards construction industries, T- test has been used, frequency and the arithmetic mean and percentage of each variable for all categories of contractors to find the significances of these variables which revealed the values extracted for each category in the four fields and the analysis has been focused on follows:

a) Contractors grades (5 construction companies)
b) Fields (4 fields of management)

a) Construction Companies Grades analysis

In this part of surveying clients satisfaction views have been analyzed related to the five various grades of companies in general considering all the companies as one package. Table 2 shows mean values and percentages of client satisfaction factors of all grades.

Table 2 Mean Values and Percentages of Client Satisfaction Factors of All Grades

		Grades of Construction Companies				
1.Administrative		**Excellent**	**1st**	**2nd**	**3rd**	**4th**
1. Relationship between parties	M	3.6	3.6	3.71	3.41	3.1
	%	36	5.4	10.6	20	4.37
2. .Adequacy of office personnel	**M**	3.8	2.9	2.8	2.9	2.6
	%	38	4.3	8	17.1	3.7
3. Project cost within the Budget	**M**	4	2.8	3.69	3.2	3.6
	%	40	4.2	10.6	18.8	5.1
4. Knowledge of client needs	**M**	4.2	3.3	3.66	2.8	2.8

	%	42	4.9	10.6	16.5	3.94
5..Attention to client priorities	**M**	3.9	2.82	3.54	2.4	3
	%	39	4.21	10.11	14.1	4.2
6..Adequacy of supervision	**M**	3.8	2.9	3.34	3.2	3
	%	38	4.3	9.43	18.8	4.2
7.Coordination with regulatory agencies	**M**	4.1	3.2	3.17	2.76	2.9
	%	41	4.8	9.14	16.5	4.1
8. Adequacy of planning.	**M**	3.9	3.5	3.46	3.12	3.5
	%	39	5.2	10	18.2	4.9
9. Adequacy of Training	**M**	3.6	3.16	3.09	2.7	3
	%	36	4.78	8.86	15.9	4.2
10. Customer satisfaction	**M**	4.3	3.09	3.46	3.1	2.9
	%	43	4.61	10	18.2	4.1
General Arithmetic Mean Value		3.92	3.13	3.4	3	3.1

Table 2 Continued, Mean Values and Percentages of CS Factors of All Grades

2.Project Management and Engineering		Construction Companies Grades				
		Excellent	**1st**	**2nd**	**3rd**	**4th**
1. Progress review Meetings	M	3.7	3.3	3.46	3.24	3.1
	%	37	4.92	9.89	18.8	4.4
2.Adequacy of project control	**M**	3.6	2.79	3.71	3.29	3.5
	%	36	4.18	10.8	19.4	4.9
3.Adequacy of safety program	**M**	3.6	2.49	2.8	3.47	2.9
	%	36	3.72	8	20.6	4.1
4.Estimating	**M**	3.7	3.04	3.1	3.71	2.5
	%	37	4.48	8.86	21.8	3.5
5.Scheduling	**M**	3.5	2.73	3.1	2.29	2.3
	%	35	4.02	8.86	13.5	3.2
6.Ineraction with Architect/Engineer	**M**	3.9	3.13	3.34	3.53	3.3
	%	39	4.67	9.42	20.8	4.6
7.Adequacy of supervision	**M**	3.8	3.21	3.51	3	2.7
	%	38	4.78	10	17.6	3.8
8.Shop drawing review	**M**	3.7	3.4	3.26	3.2	2.7
	%	37	5.07	9.31	18.8	3.8
9.Adequacy of planning	**M**	4.3	2.78	3.286	3.18	2.6
	%	43	4.15	9.4	18.71	3.7
10.Adequaacy of subcontractor selection	**M**	3.6	2.46	3.17	3.35	2.3

	%	36	3.73	9.14	20	3.2
General Arithmetic Mean Value		3.74	2.92	3.3	3.22	2.8

Table 2 Continued, Mean Values and Percentages of CS Factors of All Grades

3.Construction		Construction Companies Grades				
		Excellent	**1st**	**2nd**	**3rd**	**4th**
1. Project quality	M	4.1	3.6	3.4	3.59	3.4
	%	41	5.37	9.71	21.18	4.8
2. Adeqquaacy of job site personnel	**M**	3.6	2.49	3.3	3.4	3.2
	%	36	3.73	9.4	20	4.5
3. Material	**M**	3.9	3.15	3.2	3.41	3.2
	%	39	4.63	9.14	20	4.5
4. Quality of workmanship	**M**	4.1	3.3	3.17	3.4	3.8
	%	41	4.93	9.14	20	5.4
5. Equipment Quality	**M**	4	3.31	3.09	3.5	3
	%	40	4.9	8.86	20.6	4.2
6. Timely completion of project phases	**M**	3.6	2.84	3.6	3	2.5
	%	36	4.18	10.3	17.6	3.5
7. Knowledge of the project	**M**	4	3.42	3.7	3.18	3.1
	%	40	5.07	10.6	18.8	4.4
8. Site cleanliness	**M**	3.8	3.39	3.4	3.71	3.2
	%	38	5.07	9.7	21.8	4.5
9. Adequacy of processing change orders.	**M**	3.5	2.76	3.4	3.29	2.8
	%	35	4.18	9.7	19.4	3.9
10. Project close out.	**M**	3.6	2.85	3.4	2.8	2.6
	%	36	4.33	9.7	16.5	3.7
General Arithmetic Mean Value		3.82	3.1	3.4	3.33	3.1

Table 2 Continued, Mean Values and Percentages of CS Factors of All Grades

4.Ligistical		Construction Companies Grades				
		Excellent	**1st**	**2nd**	**3rd**	**4th**
1. Adequacy of storage	M	4	3	3.1	3	2.3
	%	40	4.48	8.9	17.6	3.2
2.Adequacy of warehousing	**M**	3.6	2.761	3.11	3.06	2.2
	%	36	4.12	8.9	18.2	3.1
3.Adequacy of delivery	**M**	3.9	2.7	3.06	2.65	3.5
	%	39	4	8.9	15.3	3.5
4.Adequacy of maintenance	**M**	3.8	2.99	2.86	3.24	2.9
	%	38	4.48	8.3	18.8	4.1
General Arithmetic Mean Value		3.83	2.86	3.1	2.98	2.48

3.2 Analysis according to Companies grade

All grades of companies were analyzed to gauge the satisfaction level of clients. Table 3 shows the values of satisfaction level according to T-test.

Table 3 Values of Ssatisfaction Level According to T-Test

	Exc.	***1st***	***2nd***	***3rd***	***4th***	***General***
Total	1301	6907	3935	1821	7878	21842
Mean Value	130.1	103.1	112.4	107.1	109	108.7
S.D	24.23	23.49	22.3	29.68	27.9	25.04
variance	587.1	551.8	497.3	880.9	778.4	627.1
No. of samples	10	67	35	17	71	200
Mean hypothesized	102	102	102	102	102	102
T value	3.66	0.38	2.76	0.71	2.11	3.79

a. Excellent Grade

From the statistical analysis, it is clear from table 3 above that the value of extracted T is (3.66) which is more than the scheduled value of T which is (1.96) this means that there are differences of statistical indication at significance level (0.05), which shows that the specimen of this category is satisfactory with the companies that built the houses.

b. First Grade

The statistical analysis in the table 3 shows that the value of extracted T is(0.38) which is less than the scheduled value of T which is (1.96) this means that there are no differences of statistical indication at indication level (0.05),which shows that the specimen of this category is unsatisfactory with the companies that built the houses.

c. Second Grade

From the statistical analysis, it is clear from table 3 that the value of extracted T is (2.76) which is more than the scheduled value of T which is (1.96) this means that there are differences of statistical indication at indication level (0.05), which shows that the specimen of this category is satisfactory with the companies that built the houses.

d. Third Grade

The statistical analysis, shows from table 3 that the value of extracted T is(0.71) which is less than the scheduled value of T which is (1.96) this means that there are no differences of statistical indication at indication level (0.05),which shows that the specimen of this category is unsatisfactory with the companies that built the houses.

e. Fourth Grade

From the statistical analysis, it is clear from table 3 that the value of extracted T is (2.11) which is more than the scheduled value of T which is (1.96) this means that there are differences of statistical indication at significance level (0.05), which shows that the specimen of this category is nearly satisfactory with the companies that built the houses.

3.3 Analyzing all grades of companies

When taking all the categories results together, it is clear from table 3, that the value of extracted T is (3.79) which is more than the scheduled value of T which is (1.96) this means that there are differences of statistical indication at indication level (0.05), which shows that the specimen in general of all categories is satisfactory with the companies that built the houses, and here the researcher highlight the customers and supplier participation that confirmed by Evans & Dean (2003).

3.4 Analyzing according to Fields of client satisfaction level

In this part of surveying clients satisfaction views have been analyzed related to the four fields.

1. Administration

In order to arrange the significances of administration field, table 4 shows that excellent grade obtained rank one as its mean value reached 3.92 whereas the second rank occupied by grade two as its mean value reached 3.4, and grade one obtained the third rank as its mean value reached 3.13 then grade four at 3.1 obtained rank four and finally grade three at value reached 3 obtained rank five.

Table 4 Analyzing according to administration of client satisfaction factors

Grade of Companies	General Arithmetic Mean	Rank
Excellent	3.92	1
second	3.4	2
first	3.13	3
Fourth	3.10	4
Third	3.00	5

2. Project management and Engineering

To arrange the significances of project management and engineering field, table 5 shows that excellent grade obtained rank one as its mean value reached 3.74 whereas the second rank occupied by grade two as its mean value reached 3.30, and grade three obtained the third rank as its mean value reached 3.22 then grade one at 2.92 obtained rank four and finally grade four at value reached 2.8 obtained rank five.

Table 5 Analyzing according to project management and engineering factors

Grade of company	General Arithmetic Mean	Rank
Excellent	3.74	1
second	3.30	2
Third	3.22	3
first	2.92	4
Fourth	2.8	5

3. Construction

In order to arrange the significances of construction field, table 6 shows that excellent grade obtained rank one as its mean value reached 3.82 whereas the second rank occupied by grade two as its mean value reached 3.40, and grade three obtained the

third rank as its mean value reached 3.33 then grade one at 3.1 obtained rank four and finally grade four at value reached 3.1 obtained rank five.

Table 6 Analyzing according to construction factors

Grade of company	General Arithmetic Mean	Rank
Excellent	3.82	1
Second	3.40	2
Third	3.33	3
First	3.1	4
Fourth	3.1	5

4. Logistical

To arrange the significances of logistical field, table 7 shows that excellent grade obtained rank one as its mean value reached 3.83 whereas the second rank occupied by grade two as its mean value reached 3.1, and grade three obtained the third rank as its mean value reached 2.98 then grade one at 2.86 obtained rank four and finally grade four at value reached 2.48 obtained rank five.

Table 7 Analyzing according to logistical factors

Grade of company	General Arithmetic Mean	Rank
Excellent	3.83	1
Second	3.1	2
Third	2.98	3
First	2.86	4
Fourth	2.48	5

4. CONCLUSION

The results indicate that the specimen of survey are satisfy with contractors of grade excellent, second grade and four grade but unsatisfy with grade one and three. It is obvious from the statistical analysis to the four fields of client's satisfaction index that grade excellent occupied rank one followed by grade two. Researchers suggest to grade four, three and one to review their internal policies of the organization and to find the suitable solutions to avoid unsatisfactory from the clients towards each field.

The researchers conducted an interview with 10 clients to gauge why they feel unsatisfactory with grade one and grade three contractors, The majority of clients (80 %) of them believe that the source of problem came from the ministry of

commerce due to unrealistic classification of these contractors. Most of them show that they are not reflecting their exact situation or capability of human resource availability, workmanship, funding, capitals and equipments, that's why sometimes customers' selection based on clients chance. Whereas two clients (20%) of them indicated that it is their mistakes, because they based their selection on what they heard about these contractors from their friends.

REFERENCES

Allred, A. (2001), ``Creating customer service worth advertising at Browning Arms'', *The TQM Magazine*, Vol. 13 No. 1, pp. 6-11.

Barrett, P. (2000). Systems and relationships for construction quality. International Journal of Quality & Reliability Management, Vol. 17, Nos. 4/5, pp. 377-392.

Eklof, J. and Selivanova, I. (2000), ``Corporate quality management practice in Russia: with international comparisons'', *Total Quality Management*, Vol. 11 No. 4/5/6, pp. 714-19

Hitchcock, D. and Willard, M. (2002), ``Sustainability: enlarging quality's mission'', *Quality Progress*, Vol. 35 No. 2, pp. 43-8.

Kanji, G.K. (1998a), ``Measurement of business excellence'', *Total Quality Management*, Vol. 9 No. 7, pp. 633-43.

Kanji, G.K. (1998b), ``An innovative approach to make ISO 9000 standards more effective'', *Total Quality Management*, Vol. 9 No. 1, pp. 67-78.

Li, E., Zhao, X. and Lee, T-S. (2001), ``Quality management initiatives in Hong Kong's banking industry: a longitudinal study'', *Total Quality Management*, Vol. 12 No. 4, pp. 451-68.

Nakata, C. (2002), ``Activating the marketing concept in a global context: an MNC country managers' perspective'', *International Marketing Review*, Vol. 19 No. 1, pp. 39-64.

Oakland, J. (2000), Total Quality Management – Text with Cases, 2nd ed., Butterworth-Heinemann, London.

Rao, A., Carr, L., Dambolena, I., Kopp, R., Martin, J., Rafii, F. and Schlesinger, P. (1996), *Total Quality Management: A Cross-functional Perspective*, John Wiley and Sons.

Winser, J. and Corney, W. (2001), ``Comparing practices for capturing bank customer feedback: Internet versus traditional banking?'', *Benchmarking: An International Journal*, Vol. 8 No. 3, pp. 240-50.

Yasamis, F., D. Arditi and J. Mohammadi (2002). Assessing contractor quality performance. Construction Management and Economics 20, pp. 211-223.