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## **Analysing customer satisfaction and quality in construction – the case of public and private customers**

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***Abstract.** Improving quality and customer satisfaction has received considerable attention in recent years. This study examines construction in terms of customer satisfaction and quality. A framework is developed to evaluate the dynamics of customer satisfaction and quality. An empirical analysis is conducted to explore customer satisfaction in construction as perceived by two customer groups: public and private customers. Results indicate that the need for contractors to improve performance relates mostly to quality assurance, handover procedures and material. Public customers were found to be less satisfied with the contractor's performance than private customers. For a contractor, the main benefit of high customer satisfaction is the opportunity to remain a customer's potential partner in the future.*

**Keywords:** construction quality, customer satisfaction, project management.

### **1 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 (Anderson and Sullivan 1993). According to Jones and Sasser (1995), 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 (e.g. Storbacka *et al.* 1994).

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. For example, Torbica & Stroh (2001) emphasise that the use of "soft" performance criteria, such as customer satisfaction, is at an early evolutionary stage in construction. In addition, the main focus on customer satisfaction approaches in the construction has been on house building.

The significance of customer satisfaction, and its use for evaluating the quality from the customer's perspective, have been emphasised by many authors in construction (Barret 2000; Torbica and Stroh 2001; Maloney 2002; Yasamis *et al.* 2002). This study examines customer satisfaction in construction as perceived by two customer groups: public and private customers. The main focus is to explore these customer groups' perceptions of the contractors' performance. The results are interesting, because there are some distinguishing features of customers groups, related to for example the competitive bidding process and procurement. It is also essential to find out how the perceptions of the customer groups differ from each other. For example, Al-Momani (2000) has observed that many public projects are not achieving what was expected. According to his study, public customers were found to be less satisfied than private ones. Soetanto and associates (2001) have also examined the customers' and architects' perceptions of contractor performance. They found that the architects were less satisfied than customers in regard to overall contractor performance.

Initially, this paper presents an overview of customer satisfaction, which has developed in the service industry. Then a brief review of existing approaches to customer satisfaction and quality in construction is discussed. In order to examine the links between customer satisfaction and quality, a theoretical framework is also created. Subsequently, the results of a data analysis and findings are presented, based on performance of Finnish construction companies. Finally, some conclusions are also presented.

## **2 Customer satisfaction**

Customer satisfaction is a function of perceived quality and disconfirmation – the extent to which perceived quality fails to match repurchase expectations. Customers compare the perceived performance of a product (service, goods) with some performance standard. Customers are satisfied when the perceived performance is greater than the standard (positively disconfirmed), whereas dissatisfaction occurs when the performance falls short of the standard (negatively disconfirmed). 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. As a result, the significance of customer satisfaction is emphasised in markets where competition is intense (Kotler 2000; Jones and Sasser 1995).

A company must periodically measure customer satisfaction in order to learn how satisfied its customers are. Torbica and Stroh (2001) argue that, in construction, the extent of customer satisfaction is only known late in the project when most of the customer's money has already been spent. When companies know which attributes of a service or product affect customer satisfaction, their challenge is to modify their current offering in a way that would lead to maximum customer satisfaction.

Customer satisfaction is one of the key elements in total quality management (TQM), an approach that emphasises overall satisfaction through the continuous improvement of products. Construction companies are adopting TQM to improve their performance. However, construction has lagged behind other industries in implementing total quality management because of its inability to accurately determine customer requirements and successfully transform these requirements into the completed facility (Ahmed and Kangari 1995). In addition, there is much dissimilarity between manufacturing and construction, so TQM techniques must be adapted for the construction industry. Understanding the customer's requirements is essential in ensuring customer satisfaction, and the demand for the construction product must be viewed in relation to the intended use of the facility. Ahmed and Kangari (1995) suggest that customer orientation, communication skills and response to complaints all play an important role in the overall satisfaction of the customer in the construction industry.

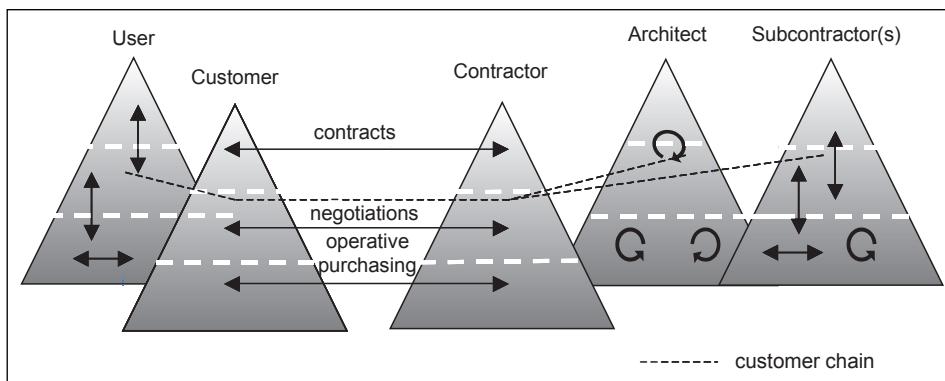
According to an earlier study, based on RALA's feedback data (Kärnä *et al.* 2004), factors of quality and co-operation have a strong effect on overall satisfaction. Therefore, these factors can be used as a basis for improving overall satisfaction. The study emphasises the fact that the contractors' ability to co-operate can reduce the adverse impact of poor quality assurance in the completion stage. There also exists a dependency between the quality of the overall service level and the quality of the contracted work.

In order to measure customer satisfaction in construction, the main subjects must be identified. A customer may be defined as the owner of the project and the one that needs the constructed facility. In simple terms, the customer is the buyer of the product or service. Kamara *et al.* (2000) describes the 'customer' as a body that incorporates the interests of the buyer of construction services, prospective users and other interest groups. Ireland (1992) lists the potential customers that have expectations and requirements that affect the outcome of a project. This wider perspective on the customer includes: the co-contractors and partners, project director, project team members, contractors and subcontractors, vendors and suppliers, users of the product and services and society. It is also important to note that there are generally several persons involved in a buying decision. This 'buying centre' includes all persons involved in the procurement of the service and consists of the following: decider, influencer, purchaser, gatekeeper and user. Customer satisfaction is affected by the roles of individual members of the buying centre in terms of interests and goals, the decision process and structures (Brockmann, 2002).

### 3 Literature review

The relationship between customer and contractor in construction constitutes a multilevel complex in which parties operate simultaneously and collaborate with in-groups of networks (Figure 1). Therefore, customer satisfaction should be understood as a relationship-specific rather than transaction-specific construct (see e.g. Homburgh and Rudolph 2001). As a result, traditional customer relationship management models used in product manufacturing will not produce the best results in construction. In addition, co-operation between customer and contractor is strongly emphasised; the customer's input has considerable implications for the outcome of the construction project. The complex nature of the construction process, changes in project organisation, and the uniqueness of each project make it difficult to exploit past experiences and customer feedback in future projects. In addition, Love and associates (2000) suggest that each firm in the construction supply chain is both customer and supplier, and that their creation of value is the fundamental factor in successful projects.

Ireland (1992) emphasises that the project manager's role is vital for mutual, trusting relationships and customer satisfaction. Ireland also found that the project manager's ability to manage customers relates directly to the success of the project. Soetanto and associates (2001) additionally recognise that the satisfactory performance of participants is a prerequisite to maintaining harmonious working relationships. Because the performance of each participant in the construction project coalition is interdependent, other participants should assess their performance.



**Figure 1.** Customer relationships and interactions in the construction supply chain.

Determining quality in construction is a complex issue. In general, quality can be defined through two approaches: conformance to requirements and customer satisfaction. The major concern in the conformance to requirements approach is how well the constructed facility conforms to design specifications. This is the contractors' internally focused definition of quality. The limitation

of this approach is that customers may not know or care about how well the product and/or service conforms to internal specifications; customers want their needs and expectations met or even exceeded. The strengths of this approach are that measuring quality is relatively straightforward and easy and should lead to increased efficiency on the part of the organisation.

On the other hand, the customer satisfaction approach defines quality as the extent to which a product or service meets and/or exceeds a customer's expectations. The strength of this approach compared to the quality approach is that it captures what is important for the *customers* rather than establishes standards based on management judgements that may or may not be accurate. Customer satisfaction thus approaches quality from a customer's viewpoint. According to this determination, it is the customer who defines quality. The weaknesses of this approach are that measuring customers' expectations is a difficult task and the fact that a customer's short-term and long-term evaluations may differ (Reeves and Bednar 1994).

Barrett (2000) sees that quality in construction can be thought of as the satisfaction of a whole range of performance criteria held by an interacting host of stakeholders and mediated by a range of mechanisms. According to Winch and associates (1998) the problem with the existing literature on construction is that it concentrates on the problems of producers instead of providing value for the customer. There is a need for customer orientation and satisfaction, not for allocating liability.

Customer satisfaction can be used for evaluation of quality and ultimately for assessment of the success of a company's quality improvement programme. According to Torbica and Stroh (2001), a quality improvement effort will lead to a higher product and service quality, which will lead to improved customer satisfaction. Their study has confirmed that implementation of TQM is positively associated with homebuyer satisfaction, and it is the "total offering" that generates the total degree of customer satisfaction. Al-Momani (2000) examined service quality in construction delivered by contractors and the project owner's expectations using the service quality gap as his analysis tool. He found that contractors pay very little attention to the owners (customers) satisfaction, and that this contributes to poor performance.

#### **4 Customer satisfaction framework**

In order to evaluate the dynamics of customer satisfaction and quality in construction, a framework must be created. The theoretical basis for a framework can be built using the service marketing literature and the characteristics of construction quality. Essentially, construction is a service industry. Customers purchase the capacity to produce, and usually participate in the construction process to a considerable extent – these are also characteristics of services (e.g. Winch *et al.* 1998).

The relationship between customer satisfaction and quality can be explored by using Grönroos' (1984, 2000) quality dimensions. In his work, Grönroos determines the technical quality of the service process that the customer is left with when the service production process and its buyer-seller interactions are over. Customers can often measure this dimension relatively objectively because of its technical nature. The service dimension is another quality dimension, which has also been used in the literature as a functional or process quality of the process. The customer is also influenced by *how* he receives the service and how he experiences the simultaneous production and consumption process. Functional quality, however, cannot be evaluated as objectively as the technical dimension, yet functional quality would probably be more important than technical quality in determining overall perceived quality. Various services have the nature of both quality dimensions (technical; what? and functional; how?). For example, if a defect in the construction process is settled with satisfactory results for the customer, the outcome of the defect handling process has good technical quality, whereas if the defect handling process had been complicated and time-consuming, the functional quality and total perceived quality would be lower than it otherwise would have been.

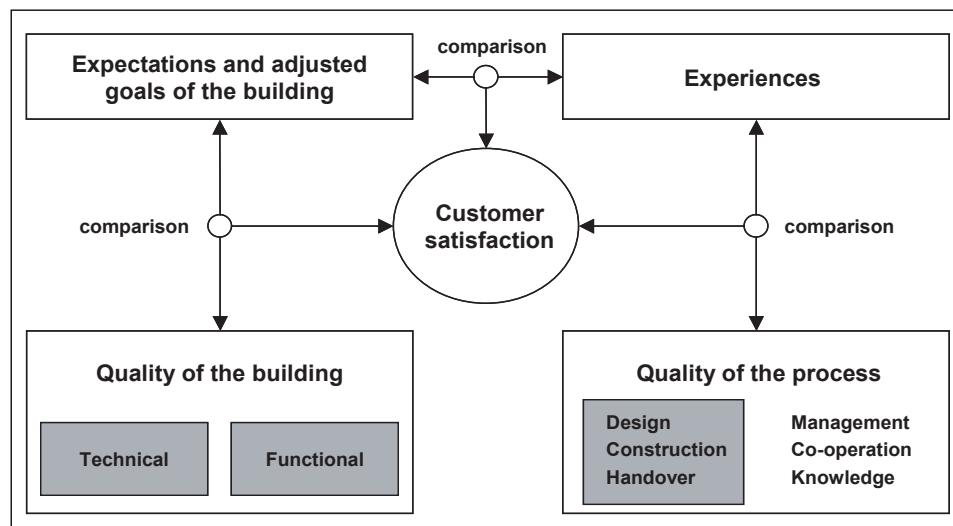
The customers' expectations play an important role in the evaluation of contractor's performance. Customer satisfaction in the construction industry can be defined as how well a contractor meets the customer's expectations, and the quality on construction projects can be regarded as the fulfilment of expectations (see e.g. Barrett 2000). The customer's expectations of construction are a function of several factors: the customer's past or direct experiences with the contractor and similar contractors, word-of-mouth information about the contractor, and the customer's personal needs. In addition, a customer's expectations are affected by a contractor's marketing activities and image, and the customer's own investment in the project and the relationship.

The distinction between product quality and process quality has also been noticed in the construction industry. For example, Ardit and Gunaydin (1997) found that product quality refers to achieving quality in the materials, equipments and technology that go into the building of a structure, whereas process quality refers to achieving quality in the way the project is organized and managed in the three phases of design, construction, and operation and maintenance.

In construction, the completed facility refers to the physical product left standing when the work has been completed and the contractor-customer interactions involved in it are over. Yasamis and associates (2002) refer to the transformation process from resources to the constructed facility as the contracting service. They suggest that quality in construction includes a mix of product and service quality dimensions (see also Maloney 2002). The customer's satisfaction with the constructed facility, the contracting facility and the contracting services define project-level quality in construction.

At the project level, the customer assesses the contractors' performance in relation to three comparisons, all of which impact customer satisfaction (Figure 2).

1. comparison – between the quality of the building, the customer's expectations and the adjusted goals for the building.
2. comparison – between the quality of the construction process and the experiences, which have emerged during the process.
3. comparison – between the customer's expectations and experiences.



**Figure 2.** Interrelationships between customer satisfaction and quality at project level.

## 5 Data analysis and findings

### RALA's feedback system

In this chapter we empirically examine customer satisfaction as perceived by the customers. The focus is on process quality, although there are some items, such as quality assurance and handover, which refer to the technical quality and physical elements of the construction outcome.

The data for this study were generated as a function of the Construction Quality Association (RALA). RALA is an independent joint association offering audited information for the Finnish construction and real estate sector. The basis of RALA's feedback system is a standard evaluation, which is part of each project (Figure 3). In practice, the customer (owner or general contractor in case of subcontracts) fills in a form at the time of conclusion of a project and delivers it to RALA immediately after the completion of the project.

This feedback system provides a workable and resource-saving means of collecting customer feedback. Feedback information from this system may also be considered more objective than a contractor's own feedback survey, because social interaction components do not exist. The questionnaire used was developed in expert meetings with a wide range of representatives from construction management and the real estate industry in Finland.

While this study is among the first to measure customer satisfaction in the Finnish construction industry, it is not without limitations. RALA's customer feedback system is a simplified model, which ought to be developed towards the framework presented in the preceding chapter. The evaluation process of the first experiences of the feedback model is at an early stage and the feedback model is going to be created in phases. Phased creation of the model is important for two reasons. Firstly, in this stage the main objective was to get the customers to commit to adopting the model and to acquire the contractors' approval for a model. The second objective was to show the practical value of the model to the parties by using the model, for example for improving communication between the parties. Hence, the feedback model was not created solely for research purposes; it is developed as a practical tool to assist co-operation between parties.



**Figure 3.** RALA's feedback system (RALA 2003).

### ***Survey and data findings***

The respondents gave their responses regarding their level of satisfaction on a five-point interval scale from 1 (indicating very high dissatisfaction) to 5 (indicating very high satisfaction) for all the items.

Feedback from the projects was collected using a 22-item scale that measures quality according to five subheadings, namely 1) (Q) quality assurance and handover procedures, 2) (E) environment and safety at work, 3) (C) functional modes of co-operation, 4) (P) personnel, and 5) (S) site supervision and subcontracts of the contractor (Table 2). Evaluated attributes, means, gap sizes and *p*-values are shown in Table 2. The survey data was gathered from 354 respondents (Table 1).

The analysis of data was performed using the chi-square test to compare the mean responses for the customer groups. Individual attributes and subheadings are presented in the table.

**Table 1.** Distribution of respondents between the two groups of customers.

	n	%
Private	200	56
Public	154	44
Total	354	100

This section outlines the results from analyses conducted on empirical data obtained from the survey. The mean values vary from 2.96 (workability of handover material and maintenance manual) to 3.83 (capacity of supplier's personnel for co-operation). The overall customer satisfaction rate is 3.32 for public customers and 3.54 for private customers.

In general, low satisfaction could be found in both groups for the items related to quality assurance and handover: workability of handover material and maintenance manual, quality of assignment material, and repair of defects and deficiencies noticed *during* the handover inspection. This result highlights the importance of quality assurance during the project and its impact on customer satisfaction. The common feature of the low satisfaction items is that they emerge in later phases of the construction project. They also require mutual co-operation between parties.

Highest ratings in this survey concerned the contractor's co-operative abilities and the skills of the contractor's workers and supervisors. This result was a surprise because it is a broadly held assumption in the construction industry that constructors' abilities to co-operate are rather poor. The result indicates that the skills of the supplier's work supervisors and workers, and the contractor's capacity for co-operation could compensate for – or lessen the impact of – poor quality assurance and handover.

A negative experience of some attributes of the project seems to reflect very strongly on how the customer perceives the success of the whole project. This survey of the projects, which have had poor overall customer satisfaction, shows the interesting way in which customers assess the contractor's performance as poor in all areas, even if that is not the case.

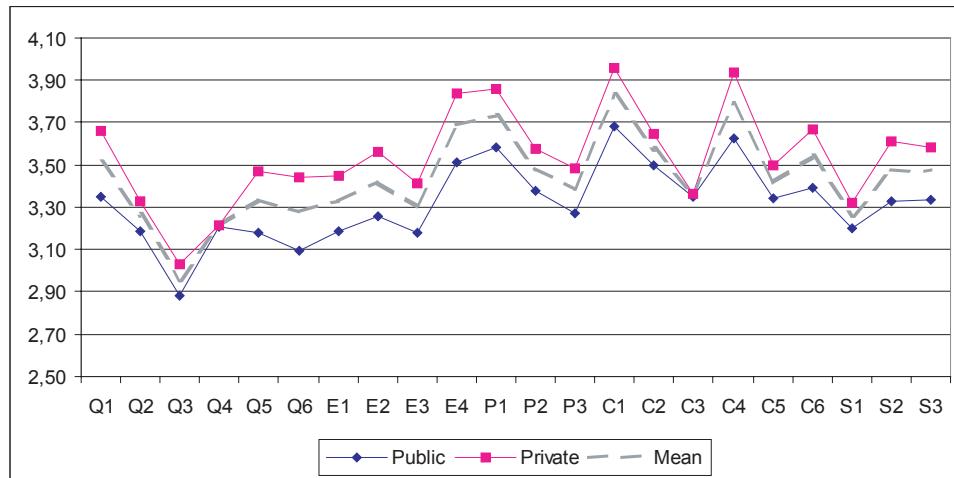
Table 2 contains a list of 22 attributes, mean scores and gap sizes. The largest gap of a value -0.35 between the customer groups is for attribute 6 (repair of defects and deficiencies noticed during handover inspection), while the smallest gap of a value -0.01 is for attributes Q4 (quality of assignment material and maintenance manual) and C3 (tending to notices of defect). According to the survey, public customers have lower satisfaction rates for each attribute than private customers.

The smallest differences amongst customer groups were in attributes Q4 (quality of assignment material and maintenance manual) and 16 (tending to notices of defect). The differences between public and private customers perceptions of contractors performance is illustrated in Figure 4.

**Table 2.** Attributes, mean scores and gap sizes

	Attributes	Mean					
		Code	Public	Private	Gap	p-value	Mean
<i>Quality assurance and handover</i>	1 Contracted work quality	Q1	3.35 **	3.66	-0.31	0.00	3.52
	2 Management and implementation of agreed quality assurance procedures	Q2	3.19	3.33	-0.14	0.15	3.26
	3 Workability of handover material and maintenance manual	Q3	2.88	3.03	-0.15	0.12	2.96
	4 Quality of assignment material and maintenance manual	Q4	3.21	3.22	-0.01	0.36	3.21
	5 Degree of completion at handover inspection	Q5	3.18 *	3.47	-0.29	0.01	3.34
	6 Repair of defects and deficiencies noticed during handover inspection	Q6	3.09 *	3.44	-0.35	0.00	3.28
<i>Environment and safety at work</i>	7 Cleanliness and order on site	E1	3.19 *	3.45	-0.27	0.00	3.33
	8 Management of work safety on site	E2	3.26 **	3.56	-0.30	0.00	3.42
	9 Management of environmental issues and related know-how on site	E3	3.18 *	3.42	-0.24	0.00	3.31
	10 Tending to official obligations	E4	3.51 **	3.84	-0.32	0.00	3.69
	11 Skill of supplier's work supervisors	P1	3.58 *	3.86	-0.28	0.01	3.73
	12 Skill of supplier's workers	P2	3.38	3.57	-0.19	0.01	3.48
<i>Co-operation</i>	13 Commitment of supplier's employees to set goals	P3	3.27	3.48	-0.21	0.02	3.38
	14 Capacity of supplier's personnel for co-operation	C1	3.69 *	3.96	-0.27	0.01	3.83
	15 Agreement about changes	C2	3.50	3.65	-0.15	0.11	3.58
	16 Tending to notices of defect	C3	3.35	3.36	-0.01	0.68	3.36
	17 Access of supplier's employees	C4	3.63 **	3.94	-0.31	0.00	3.79
	18 Information flow on site	C5	3.35	3.50	-0.15	0.01	3.42
<i>Site supervision and subcontracting</i>	19 Quality of overall service level	C6	3.39 *	3.66	-0.27	0.00	3.54
	20 Conformity of supplier's subcontracting to contract agreements	S1	3.20	3.32	-0.12	0.16	3.26
	21 Adherence to schedule in accordance with common agreements	S2	3.33	3.61	-0.28	0.01	3.48
	22 Tending to site supervision duties	S3	3.33 *	3.58	-0.25	0.01	3.47
	Significant at the level: * 0.05; ** 0.01						

Although there is a significant difference in the customer groups' perceptions of the contractors' performance, both groups behave similarly in relation to low and high satisfaction items.



**Figure 4.** Performance analysis.

## 6 Conclusions

The research presented here has focused on customer satisfaction and quality in the construction industry. As construction companies face increasing competition, greater attention continues to be given to customer relationships and satisfied customers. Companies use various approaches to customer satisfaction in developing and monitoring product/service offerings in order to manage and improve customer relationships and quality. Measuring customer satisfaction also has several benefits for organisations, for example, in improving communication between parties, enabling mutual agreement, evaluating progress towards the goal, and monitoring accomplished results and changes.

Customer satisfaction surveys also bring contractors valuable information about their customers. In order to achieve customer satisfaction, companies must understand what their customers need and how contractors meet those needs. Grönroos (2001) emphasises that customers also have certain wishes regarding how they want to be treated; furthermore, he notes, the service or physical product purchased has to fit the customer's internal value-generating processes. In this survey, the views of the two groups of project owners regarding contractor's performance differed in all areas. The results highlight the need to design the service product from the customer's perspective.

Typically, customers were satisfied with the contractor's abilities to co-operate and the skills of the contractor's workers and supervisors, whereas low

satisfaction could be identified in the items related to quality assurance and handover. According to this survey, a common feature of the low satisfaction items is that they come out in later phases of the construction project. This result could indicate that the contractor and customer have not planned the completion stage, or that it has been poorly designed. It could also indicate that there is a problem in managing schedules, which also requires mutual co-operation between parties. This finding is similar to the findings of Soetanto and associates (2001), whose importance-performance analysis suggests that contractors need to improve their performance in most aspects of the project. In terms of criteria in need of improvement, customers considered correction of defects the priority. However, this situation could also be derived from the customer's subjective perceptions of the project: The customer might overemphasise the later stages of a project because of its long duration and because the defects found during the hand-over period stay clearly in the customer's mind. This is a limitation of the study, but it is important to notice the quality improvement efforts that contractors should be aware of.

Winch and associates (1998) emphasise that in a construction, a surprised customer is a dissatisfied customer. As mentioned earlier, a negative experience of some attributes of the project seems to reflect strongly on the customers overall sense of satisfaction. In this situation, contractors might pursue short-term customer satisfaction at the expense of long-term quality and high customer satisfaction.

Public customers could be more professional than private ones, in which case their demands and expectations would be at a higher level. Public owners typically operate with a larger number of contractors and therefore the contractors' qualitative deviation (small and big contractors) is greater than in the case of private customers. Al-Momani (2000) also found that there are some important differences among the views of different owners (customers); public officials have a very poor satisfaction rate and have the most complaints regarding the contractors' performance.

In addition, private customers could be more established partners in co-operation, which would then reflect on customer satisfaction. By contrast, public customers have to follow legislative procurement, which essentially narrows the criteria for selecting contractors. Competitive bidding is usually based on price criteria, and therefore contractors do not have enough incentive to exceed the customer's expectations, and may see customer satisfaction as insignificant. In the case of public customers, contractors participate in new competitive biddings for each new contract despite the success or failure of their earlier projects, whereas private customers would drop unsatisfactory contractors from the competition.

In construction, customer satisfaction does not guarantee loyalty (future work with that customer). The criteria of selecting a contractor are mainly based on price, but also on the contractor's technical and financial capability and on previous experiences of the contractor's competence. Satisfaction is therefore

reflective of customers' experiences of and confidence in the contractor's abilities and co-operation capability. A dissatisfied customer will not work with that contractor in the future, but a satisfied customer would not necessarily guarantee future projects for the contractor. Therefore, the main benefit of high customer satisfaction for a contractor is the opportunity to remain a customer's *potential* partner in the future. However, the essential objective in improving customer satisfaction is to achieve customer loyalty, which can lead, for example, to partnering arrangements.

## References

- Ahmed, S.M. and R. Kangari (1995). Analysis of Client-Satisfaction Factors in Construction Industry. *Journal of Management in Engineering*, Vol. 11, No. 2, pp. 36-42.
- Al-Momani, A.H. (2000). Examining service quality within construction processes. *Technovation* 20, pp. 643-651.
- Anderson, E.W. and M.W. Sullivan (1993). The Antecedents and Consequences of Customer Satisfaction for Firms. *Marketing Science*, Vol. 12, No. 2, pp. 125-143.
- Arditi, D. and D.A. Gunaydin (1997). Total Quality Management in the construction process. *International Journal of Project Management*, Vol. 15, No. 4, pp. 235-243.
- Barrett, P. (2000). Systems and relationships for construction quality. *International Journal of Quality & Reliability Management*, Vol. 17, Nos. 4/5, pp. 377-392.
- Brockmann, C. (2002). Modeling Customer Satisfaction for the AEC Industry. *AACE International Transactions*. P. PM161.
- Grönroos, C. (1984). A Service Quality Model and its Marketing Implications. *European Journal of Marketing*, Vol. 18, No. 4, pp. 36-44.
- Grönroos, C. (2000). Service Management and Marketing – a customer relationship management approach, 2nd ed. John Wiley & Sons, LTD.
- Homburg C. and B. Rudolph (2000). Customer Satisfaction in Industrial Markets: dimensional and multiple role issues. *Journal of Business Research*, Vol. 52, pp. 15-33.
- Ireland, L.R. (1992). Customer Satisfaction: the project manager's role. *International journal of Project Management*, Vol. 20, No. 2, pp.123-127.
- Jones T.O. and W.E. Sasser (1995). Why Satisfied Customers Defect. *Harvard Business Review*. Nov-Dec, pp. 88-99.
- Kamara, J.M. and C.J. Anumba (2000). Establishing and processing client requirements – a key aspect of concurrent engineering in construction. *Engineering Construction and Architectural Management*, Vol. 7, No. 1, pp. 15-28.
- Kotler, P. (2000). *Marketing Management*. The Millennium Edition. Prentice Hall International, Inc.

- Kärnä, S., J.M. Junnonen and J. Kankainen (2004). Customer satisfaction in Construction. Proceedings of the 12th Annual Conference on Lean Construction, pp. 476-488.
- Love, P.E.D, J. Smith, G.J. Treloar and H. Li (2000). Some empirical observations of service quality in construction. *Engineering Construction and Architectural Management*, Vol. 7, No. 2, pp. 191-201.
- Maloney, W.F. (2002). Construction product/service and customer satisfaction. *Journal of Construction Engineering and Management*. November/December, pp. 522-529.
- RALA (2003). Rakentamisen laatu RALA ry (Web pages and databases; available at (<http://www.ralacon.fi/>). (Helsinki: Rakentamisen Laatu RALA ry [Construction Quality Association]).
- Reeves, C.A. and D.A. Bednar (1994). Defining quality: alternatives and implications. *Academy of Management. The Academy of Management Review*, Vol. 19, No. 3, pp. 419-445.
- Soetanto, R., D.G. Proverbs and G.D. Holt (2001). Achieving quality construction projects based on harmonious working relationships. Clients' and architects' perceptions of contractor performance. *International Journal of Quality & Reliability Management*, Vol. 18, No. 5, pp. 528-548.
- Storbacka, K., T. Strandvik and C. Grönroos (1994). Managing Customer Relationship for Profit: The Dynamics of Relationship Quality. *International Journal of Service Industry Management*, Vol. 5, No. 5, pp. 21-38.
- Torbica Z.M. and R.C. Stroh (2001). Customer Satisfaction in Home Building. *Journal of Construction Engineering and Management*. Jan/Feb, pp. 82-86.
- Winch, G., A. Usmani and A. Edkins (1998). Towards total project quality: a gap analysis approach. *Construction Management and Analysis*, Vol. 16, pp.193-207.
- Yasamis, F., D. Ardit and J. Mohammadi (2002). Assessing contractor quality performance. *Construction Management and Economics* 20, pp. 211-223.