

CUSTOMER SATISFACTION MEASUREMENT TOWARDS IMPROVING  
PROJECT DELIVERY FOR JABATAN KERJA RAYA

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To my dearest husband, Mohamad Azlan Haji Setapa, our daughters Nurul Husna  
and Nurul Hannah, beloved parents and in-laws

Thank you for your endless love and support

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## ABSTRACT

Customer satisfaction measurement is one of the crucial factors to ensure that the quality of the services offered meet and fulfill the needs and requirements of the customers. Thus, the aim of this study is to review the current Customer Satisfaction level for JKR and how the customer satisfaction forms are managed in terms of distribution method, approach and design of the forms that contribute to a reliable data to search for the level of customer satisfaction index ratings and which phase(s) of the JKR customer satisfaction that scores the lowest in terms of satisfaction level. The study also introduced a new concept of customer loyalty to the customer satisfaction programme and aim to examine the relationship and the influence between customer satisfaction and customer loyalty for JKR. It is hoped that by having this study will help JKR to improve and increase their performance in the area or project phase(s) that of concern in order to improve its project delivery. The study also reviews the current customer satisfaction data gathering method used by JKR to gather information and feedback on their services provided using questionnaire survey. This study uses both descriptive and inferential statistical method to analyze important characteristics and summarize survey results. A pilot survey of 20 respondents has been conducted to validate the reliability of the questionnaire. Cronbach's alpha coefficient gathered for each section of the questionnaire is above 0.7. A total of 107 respondents from among 24 ministries and agencies have participated in the survey. Results indicated the need to improve performance related to cost projection, handover procedures and quality assurance. The common feature for the areas of low satisfaction came out in later phases of the construction project. Generally the overall customer satisfaction is also proven to have influence on customer loyalty.

## ABSTRAK

Pengukuran kepuasan pelanggan adalah salah satu faktor penting bagi memastikan kualiti perkhidmatan yang ditawarkan adalah menepati dan memenuhi kehendak dan keperluan pihak pelanggan. Justeru, objektif khusus kajian ini adalah untuk mengukur tahap kepuasan pelanggan terhadap kualiti perkhidmatan yang ditawarkan dan disediakan oleh JKR dalam servis pengurusan projek-projek fizikal dalam usaha mengenalpasti fasa dalam kitaran projek yang menunjukkan tahap kepuasan yang paling rendah serta mendalami beberapa aspek administratif yang berkaitan dengan pentadbiran, pengurusan, pengedaran, kaedah dan pendekatan yang diambil oleh pihak JKR berkenaan pengurusan kepuasan pelanggan. Kajian ini juga memperkenalkan satu lagi aspek dalam kepuasan pelanggan, iaitu kesetiaan pelanggan (*Customer Loyalty*) yang boleh dijadikan panduan penambahbaikan untuk JKR meningkatkan mutu perkhidmatan yang ditawarkan kepada pelanggan. Hasil kajian mendapati walaupun dalam aspek perkhidmatan awam, tahap kepuasan pelanggan adalah saling berkaitan dan mempunyai pengaruh yang signifikan ke atas tahap kesetiaan pelanggan. Kajian ini menggunakan kaedah statistik untuk menganalisis data yang diterima melalui 107 bilangan responden daripada 24 kementerian dan jabatan kerajaan yang menyertai kajian. Berdasarkan dapatan kajian, tahap kepuasan pelanggan terhadap servis yang ditawarkan oleh JKR masih pada tahap sederhana (*average*). Dapatan juga mendapati JKR perlu meningkatkan prestasi perkhidmatan pada fasa-fasa terakhir dalam pengurusan projek terutamanya dari aspek unjuran kewangan, tatacara penyerahan projek dan jaminan kualiti produk yang dihasilkan. Secara umumnya turut didapati juga tahap kepuasan pelanggan adalah saling berkaitan dan mempunyai pengaruh yang signifikan ke atas tahap kesetiaan pelanggan.

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**LIST OF ABBREVIATIONS**

PWD	Public Works Department of Malaysia
SKALA	Sistem Kawal dan lapor
JKR	Jabatan Kerja Raya
CS	Customer Satisfaction
OCS	Overall Customer Satisfaction
FCS	Functional Customer Satisfaction
TCS	Technical Customer Satisfaction
CSM	Customer Satisfaction Measurement
CL	Customer Loyalty
SPSS	Statistical Package for Social Science
PMC	Project Management Consultancy
DG	Director General
SPB	<i>Sistem Pengurusan Bersepadu</i>
KPI	Key Performance Indicator

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## **CHAPTER 1**

### **INTRODUCTION**

#### **1.1 Introduction**

On the road to being the world class infrastructure provider especially for Government projects, delivering all projects within the specified time, cost and prevalence quality is the topmost priority and mission for JKR Malaysia, failing which will affect the performance of the whole organization, its reputation, brand and even its relevancy in the eyes of the other governmental agencies and most importantly, the public.

The role of JKR Malaysia is to become the main technical advisor and provider to and for the Government in delivering most of the development projects throughout the Country. However, in the recent years, most of Government departments, for instance Ministry of Home Affairs, Ministry of Education, Ministry of Housing, Local Government and Urban Well Being opt to implement projects on their own while at the same time doing projects with JKR. With this recent trend of adopting Project Management Consultancy (PMC) as a famous method of implementing own project especially in the 1990s, JKR is now facing the so-called 'competitors'. However thanks to the cost escalation and numbers of problems faced especially in relation to the technical issues, year 2009 marked the end of PMC. In

order to tackle the issues, these PMC projects were reverted back to JKR to do forensic studies, technical advices and to suggest solutions for all the damages done.

JKR is seen to have been ‘saved’ by the Arahan Perbendaharaan (AP) 182.1(a) which underlines that all non-technical departments who wish to implement physical projects need to refer to JKR for agreement prior to any implementation. It is only with the agreement by the Director General (DG) of JKR (KPKR) that they can implement the project on their own. Even with this privilege, there are several ministries who are still adamant to self-implement the projects by engaging their own consultants’ team instead of adopting PMC.

It is believed that this new sentiment is due to the failure to manage and deliver projects within the stipulated time, the allocated cost and of acceptable quality. These three factors have been identified as the major reason for the moderate rating of customer satisfaction index. Thus in 2007, in order to increase the performance of its project delivery and to win back its notable clientele, the top management of JKR and its ‘think-tanker’ later introduced a significant plan to improve their performance in both project management and delivery system. Customer Service Plan (CISP) was introduced to expedite communication and connection between JKR and its customers throughout the whole project life-cycle. In 2009, a team of consultant was engaged to study and determine the level of service quality offered by JKR and to identify the weaknesses they are facing for the betterment of their services towards the customers after the implementation of CISP. The overall result indicates that the customer satisfaction on the quality of services offered by JKR is pegged as ‘moderate’ and the crucial criteria that scores the unpopular votes are ‘not meeting the customer’s needs in terms of the overall management of the project, shoddy workmanship (quality) and incompetent personnel.’

Following that, JKR has developed a strategic objective to give emphasis on customer focus and customer loyalty under Chapter 2: Strategic Framework 2012-



2015. Under this renewed strategic plan, JKR Malaysia aims to achieve higher customer satisfaction rate through some of the following themes, namely Outstanding Project Delivery, Co-creative Customer experience, Centre of Technical Excellent, Leading sustainability and Innovative organization.

Thus, the aim of this study is to identify the current satisfaction level of the customer and the measuring instruments used by JKR to measure its Customer Satisfaction Index (CSI) and at the same time will explore how effective is the administration of the instrument (customer satisfaction survey forms) are handled in terms of its method, approach and design of the forms.

## **1.2 Problem Statement**

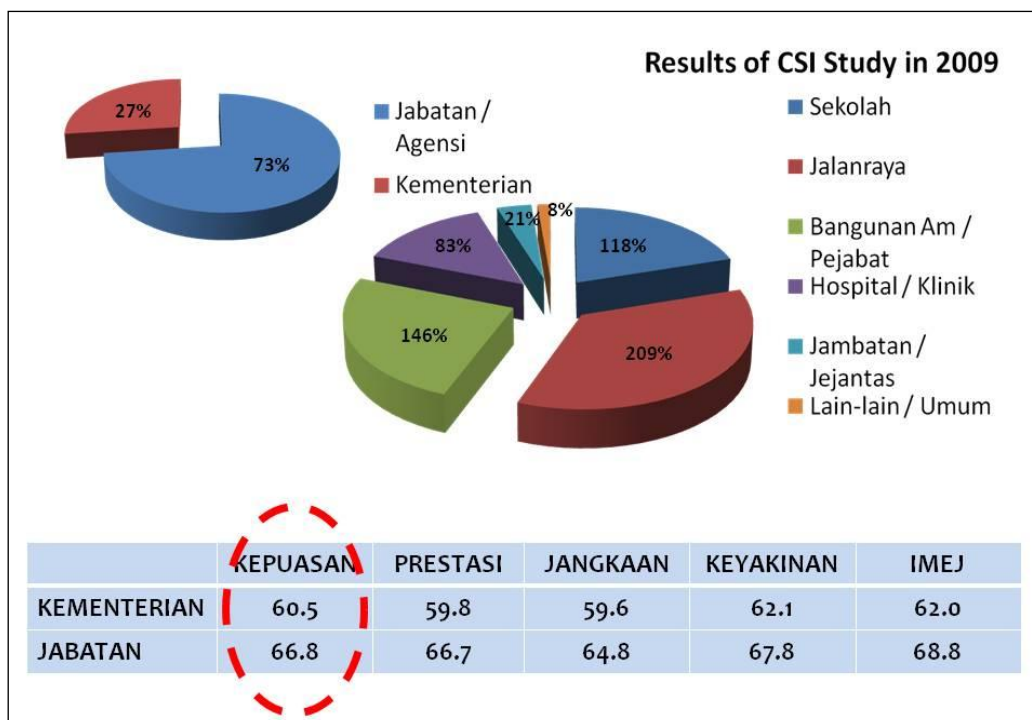
In order to benchmark the customer satisfaction level for development projects, JKR generally ask customers whether their product or service has met or exceeded expectations by means of filling of surveys forms (questionnaires). Thus, expectations are a key factor behind satisfaction. When customers have high expectations and the reality falls short, they will be disappointed and will likely rate their experience as less than satisfying when the forms or surveys are handed over to them to be filled in. The MS ISO 9000 quality system is used in monitoring procedures and implementation of any projects. Upon completion of each project, the customer's feedback or survey forms on the services rendered by JKR is gathered. The corresponding response rate for the year 2007, 2008 and 2009 are 79%, 82% and 50% respectively. The feedback form is the direct medium for the customer to state their level of satisfaction during the period of services. All the data derived from the surveys and forms are then analysed and the score is used to classify and conclude the customer satisfaction rating for the said project. Level of satisfaction is divided into 4 types of scores, namely 'Amat Berpuashati' (Highly Satisfy), 'Berpuashati'

(Satisfy), 'Kurang Berpuashati' (Less Satisfy) and 'Tidak Berpuashati' (Not Satisfy) with the indexes range from <50% to >80% onwards.

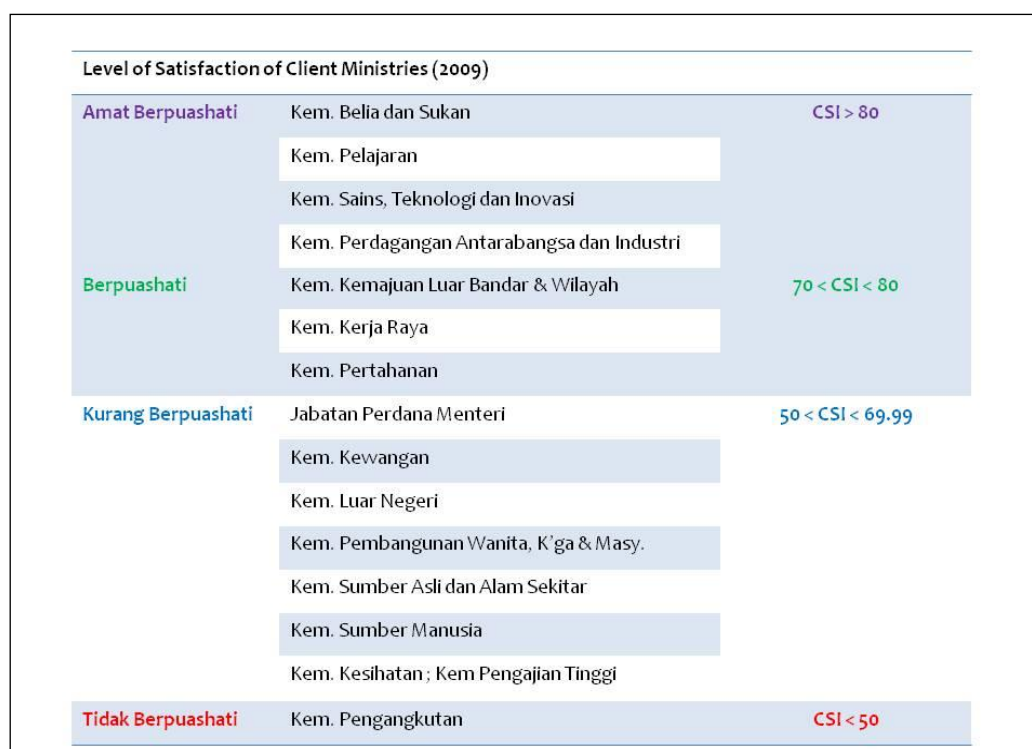
In December 2009, JKR has conducted a survey on Customer Satisfaction Index (CSI). The objective of the survey is to assess the views of the customers to the services and products provided by JKR. The study was also intended to assess the customer's viewpoint on the image of JKR and to identify strategic action for improvement. The result shows (figure 1.1 to 1.3) that customer satisfaction level is moderate for failing to meet the expectation of the customers. The CSI 2009 also concluded that projects which were implemented by JKR are poorly managed. And because of that customers at large had an impression that JKR is not able to discharge its duties to manage and implement projects in the near future. The result of the study also shows that JKR image as the main agency for Government project implementer is below moderate.

Despite the use of such system and data collection, it is upsetting to note that not much of a comprehensive action is taken to make full use of the data to upgrade the service quality. The downfall in managing customer satisfaction index is reflected in the recent trends where most of the client ministries now opt to self-deliver or self-implement their own projects through other means of procurement and no longer put much interest to engage JKR as their service provider.

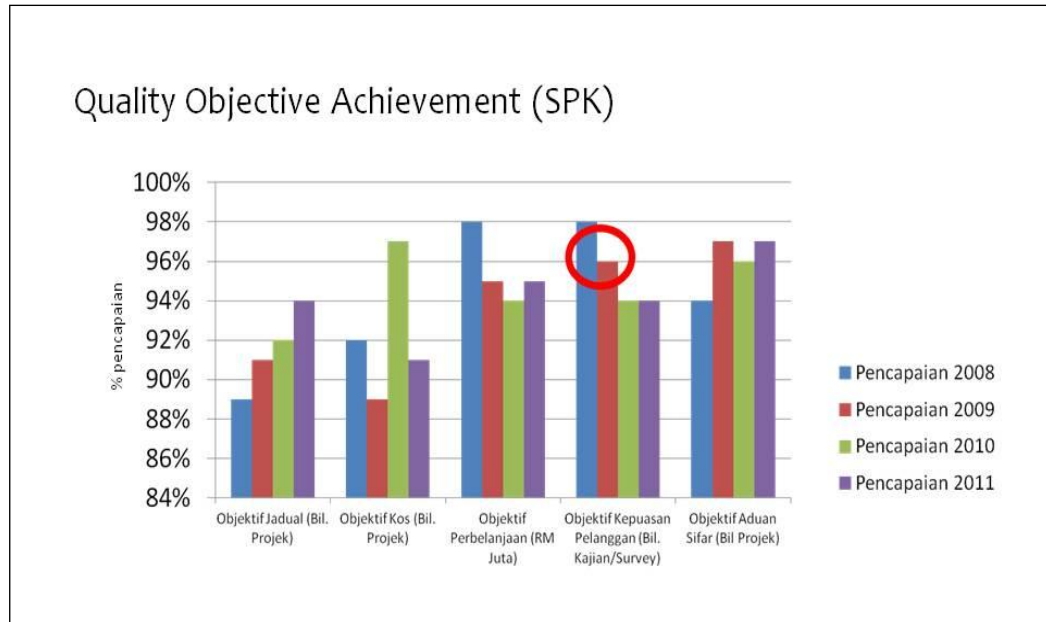
Although these projects are also having problems on their own and not smooth-sailing, the Government departments do not always favor JKR as their main project-implementer, which goes to reflect that JKR is struggling to meet the escalating and challenging demands of its clients and stakeholders. Hence, there is an urgent need for JKR to improve its customer service in meeting these needs, and later to boost its Customer Satisfaction Index (CSI) from 'moderate' to 'highly satisfied' level.



**Figure 1.1** JKR Customer Satisfaction Index (CSI) study, 2009



**Figure 1.2** Details of JKR CSI study, 2009



**Figure 1.3** Result for quality objective achievement, 2012

One of the eight strategies governed under the JKR Strategic Framework launched in 2007 is to improve services offered to the customers by means of introducing the Customer Service Improvement Plan (CSIP). Hashim, 2011 wrote that from the preliminary interviews done with the senior staffs who were involved in the JKR Strategic Framework it is learned that there was no significant development in the customer service index since its launch. This seems to be largely contributed by the lack of appropriate tool or instruments to measure the performance approximately and thoroughly, apart from just merely distributing surveys and feedback forms to the client. Thus this study aims at promoting the interest among project personnel to value customer service improvement so that JKR may improve its project delivery, concentrating on the three (3) major factors involving time, cost and quality.

### **1.3 Objectives of the Study**

The objectives of this study are as follows:

- 1) To measure the overall customer satisfaction level and the customer satisfaction in accordance to project phases within the context of JKR project delivery from the client's perspective;
- 2) To identify the frequency of the distribution method, approach and design of the Customer Satisfaction forms currently used by JKR;
- 3) To analyse the relationship between the overall customer satisfaction and customer loyalty within the context of JKR project delivery; and
- 4) To examine the influence of customer satisfaction on the overall customer loyalty.

### **1.4 Significance of the Study**

Customer's expectation and perception lead to customer satisfaction. When customers have high expectations and the reality falls short, they will be disappointed and will likely rate their experience as less than satisfying, which is later truncated as 'customer satisfaction'. Thus it is hoped that the study will help JKR to critically highlight the importance of achieving a high customer satisfaction rating and look into possibilities or to review its current measuring tools to measure their exact performance and customer satisfaction ratings in order to improve its project delivery.

It is significant to ensure that the right instrument is used in measuring customer satisfaction level and the importance to administer the instruments in the best manner so that the instrument can really benefit JKR after all the effort is taken to come up with such strategic framework and ideas to champion the customer's trust and satisfaction. The study will also review the current satisfaction index for each of project phases by highlighting the descriptive elements based on the three (3) factors; cost, time and quality which have been the utmost vision of JKR in implementing and delivering projects.

Most importantly it is also hoped that the study will benefit the body of knowledge in customer satisfaction that has been established in JKR itself. It is also notable to say that effective measurement systems can assist to align project delivery system and policy in ways that can help JKR to maximize customer satisfaction, loyalty and competitiveness.

## **1.5 Scope and its Limitation**

The research concentrated on the projects and clientele of all the Business Sector in JKR. The study will only focus on the new and ongoing physical and development projects of JKR and its Client' ministries.

Respondents were the clients or customers who engage JKR as their service providers and project implementers, particularly the respective ministries. This study however, does not involve technical or functional quality of the project and also those who are indirectly involve in delivering JKR's projects, such as the Contractors, Suppliers, and Consultants.

Due to the time constrain and ease of data collection, the project selection and respondents chosen will only concentrate on Klang Valley and Putrajaya.

## REFERENCES

- Abu Elsamem, A., Akroush, M.N., Al-Khawaldeh, F.M, Al-Shibly, M.S. (2011), "Towards an integrated model of customer service skills and customer loyalty-The mediating role of customer satisfaction." *International Journal of Commerce and Management*. Vol 21 No. 4, pp. 349-380.
- Ahola, T.J, Kujala J. "Measuring customer satisfaction in the context of a project based organization".
- Altany, D., (1993). *Bad Surveys Flood the Market, Industry Week*, p.12.
- Ali, E. (2014). "Customer Expectation Management For Project Delivery: A Case Study at JKR", Universiti Teknologi Malaysia
- Anderson, E.W., Fornell, C., Lehmann, D.R. (1994). "Customer Satisfaction, Market Share, and Profitability: Findings from Sweden." *Journal of Marketing*. Vol. 58, pp. 53-66.
- Anderson, E.W., Sullivan, M.W. (1993). "The Antecedents and Consequences of Customer Satisfaction for Firms." *Marketing Science*. Vol. 12 No. 2, pp. 125-143.
- Barrett, P. (2000). "Systems and relationships for construction quality." *International Journal of Quality & Reliability Management*. Vol. 17 Nos. 4/5, pp. 377-392.
- Best, J.W. (1977), "Hotel front office management", 3<sup>rd</sup>.ed Englewood Cliff, NJ: Prentice Hall, Inc.
- Bitner, J.B., Booms B.H., and Tetreault M.S. (1990). "The Service Encounter: diagnosing favourable and unfavourable incidents". *Journal of Marketing*. Vol. 54 No.1, pp. 71-84.
- Bitner, M.J. and Hubbert, A.R. (1994) "Encounter satisfaction versus overall satisfaction versus quality," in. Rust, R.T. and Oliver, T.I (Eds) *Service quality: New Directions in Theory and Practice*, Sage, Thousands Oaks, CA.,



pp. 70-94

- Bodet, G. (2008), 'Customer Satisfaction and loyalty in service; two concepts, four constructs, several relationships', *Journal of Retailing and Consumer Services*, Vol. 15, No.3, pp. 156-162
- Cooper, P.D. and Jackson, R.W. (1998). *Applying a Services Marketing Orientation to the Industrial Services Sector. Journal of Services Marketing*. Vol. 2 No. 4, pp. 67-70.
- Cronin, J.J and Taylor S.A. (1992). "Measuring Service Quality: a re-examination and extension." *Journal of Marketing*. Vol. 56, pp. 55-68.
- Danaher, P. (1997) *Using conjoint analysis to determine the relative importance of service attributes measured in customer satisfaction surveys, Journal of Retailing*. Greenwich. 73(2); p. 235
- Fornell, C., Johnson, M., Anderson, W., Cha, J. and Everitt, B. (1996), "The American customer satisfaction index: nature, Purpose and findings", *Journal of Marketing*, Vol. 18, pp. 39-50
- Fornell, C. and Wernerfelt, B., "Defensive Marketing Strategy by Customer Complaint Management: A Theoretical Analysis", *Journal of Marketing Research*, 1987.
- Gendall, P. (1998), "A Framework for Questionnaire Design: Labaw Revisited", *Marketing Bulletin*, 1998, 9, 28-39, Article 3
- Goodman, J.A, Broetzmann, S.M and Adamson, C. (1992), *Ineffective-That's The Problem With Customer Satisfaction Surveys, Quality Progress*, pp. 35-38
- Grönroos, C. (2000). *Service Management and Marketing –a customer relationship management approach*, 2nd ed. John Wiley & Sons, LTD.
- Hashim, H. (2011), "Implementing Customer Service Improvement Plan in JKR", *Universiti Teknologi Malaysia*
- Homburg C. and Rudolph B. (2000). "Customer Satisfaction in Industrial Markets: dimensional and multiple role issues." *Journal of Business Research*. Vol. 52, pp. 15-33.
- Israel, J.T (1992), "Steps to Create A Successful Customer Satisfaction Measurement System", *Satisfaction Strategies*.
- Jeffries, R. and Sells, *Customer satisfaction measurement instruments, Quality Progress*. Milwaukee. 33(2); p. 118
- JKR Customer Satisfaction Index (2009)

- Jones T.O. and W.E. Sasser (1995). "Why Satisfied Customers Defect." *Harvard Business Review*, Nov-Dec, pp. 88-99.
- Kamara, J.M., Anumba, C.J. (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.
- Kärnä, S., (2004). *Analysing customer satisfaction and quality in construction-the case of public and private customers. Nordic Journal of Surveying and Real Estate Research – Special Series*. Vol. 2, 2004.
- Kärnä, S., Junnonen, J.M, Kankainen, J. (*Customer Satisfaction in Construction*)
- Kerzner, H. (1995). *Project Management: A systems approach to planning, scheduling, and controlling, 5th edition*. Van Nostrand Reinhold. New York.
- Krejcie, V.R and Morgan, W.D (1970) *Educational and Psychological Measurement*, 20,607-610
- Kotler, P. (2000). *Marketing Management. The Millennium Edition*. Prentice Hall International, Inc.
- Kujala, J., Ahola, T., (2003) *A Conceptual Framework for Analyzing the Value and Role of Customer Satisfaction Surveys: An Application to Project-oriented Organization*, IRNOP VI Conference Proceedings, Turkey
- Labaw PJ (1980). "Advanced Questionnaire Design". Cambridge, MA: Abt Books.
- Liljander, V. (1995). "Comparison standards in perceived service quality". *Publications of the Swedish School of Economics and Business Administration, Nr 63*. Helsinki.
- Lin, B. and Jones, C. (1997). *Some issues in conducting customer satisfaction surveys, Journal of Marketing Practice: Applied Marketing Science*, 3(1), 4-13
- Loomis W. (1999). *QS-9000 Customer Satisfaction Monitoring Isn't Working: A better way requires more substantial measures, increased contact. Quality Progress*. 32(7), 54-59
- Maloney, W.F. (2002). "Construction product/service and customer satisfaction." *Journal of Construction Engineering and Management*, November/December, pp. 522-529.
- Nunnally, J.C. (1978), *Psychometric Theory*, 2<sup>nd</sup> ed., McGraw-Hill Companies, New York, NY.

- Ojasalo, J. (1999). *"Quality dynamics in professional services."* *Publications of the Swedish School of Economics and Business Administration*, Nr 76. Helsinki.
- Oliver, R.L. (1997), *Satisfaction: A Behavioral Perspective on the Customer*, Irwin McGraw-Hill, Boston, MA.
- Parasuraman, A., Zeithaml, V.A. and Berry (1988). *"SERVQUAL: a multiple-item scale for measuring consumer perceptions of service quality."* *Journal of Retailing*, Vol. 64, pp. 12-40.
- Pollack, B.L (2009), *"Linking hierarchical service quality model to customer satisfaction and loyalty"*, *Journal of Services Marketing*, Vol. 23 No 1, p. 42-50.
- Phillips, L., (1981). *Assessing measurement error in key information reports: A methodological note on organizational analysis in marketing*, *Journal of Marketing*. New York, 18(4); p. 395 (21 pages)
- Rala (2003). Rakentamisen laatu RALA ry (Web pages and databases; available at (<http://www.rala.fi>). (Helsinki: Rakentamisen Laatu RALA ry [Construction Quality Association]) (mainly in Finnish).
- Redman, T.C. (1992), *Data Quality: Management and Technology*, New York: Bantam Books
- Schellhase, R. Hardock, P. and Ohlwein, M. (1999). *"Customer satisfaction in business-to-business marketing: the case of retail organizations and their suppliers."* *Journal of Business & Industrial Marketing*. Vol. 14 No. 5/6, pp. 416-432.
- Soetanto, R., Proverbs, DG. and Holt G.D. (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., Strandvik, T. and Grönroos, C. (1994). *"Managing Customer Relationship for Profit: The Dynamics of Relationship Quality"*. *International Journal of Service Industry Management*. Vol. 5, No. 5, pp. 21-38.
- Tikkanen H. and Alajoutsijärvi K. (2002). *"Customer Satisfaction in Industrial Markets: opening up the concept."* *Journal of Business & Industrial Marketing*, Vol. 17 No.1, pp. 25-42.

- Torbica Z.M. and Stroh R.C. (2001). "*Customer Satisfaction in Home Building.*" *Journal of Construction Engineering and Management*, Jan/Feb, pp. 82-86.
- Xu, Y., Goedegebuure, R. and Heijden, B. (2006), "*Customer perception, customer satisfaction and customer loyalty within Chinese securities business: towards a mediation model for predicting customer behavior*", *Journal of Relationship Marketing*, Vol. 4, pp.79-104.
- Yasamis, F., Arditi, D. and Mohammadi, J. (2002). "*Assessing contractor quality performance.*" *Construction Management and Economics*. 20, pp. 211-223.
- Zulganef (2006), "*The existence of overall satisfaction in service customer relationships*", *International Journal of Business*, Vol. 3, Sep-Dec, pp. 301-21.