

Full Length Research Paper

Identifying important service quality parameters for major Indian food retailers- A case study

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This study attempts to codify the service quality dimensions within the scope of the Organized Retailing Sector in India. It is a known fact that organized retailing is making a strong impact in many parts of India's growing economy. This research article studied the services quality of major food retailers by taking important services quality dimensions like physical aspects, reliability, personal interaction, problem solving and policy which assesses the retail service users, especially the food retailers. Moreover, the study made an attempt to scrutinize the impact of services quality dimensions on the overall services quality of food retailers. In order to measure the impact of services quality dimensions, we contacted 630 retail shoppers from major food retail stores namely: Spencer's, Nilgiris, Reliance Fresh and Margin Free. Then we issued the instrument which comprised of 28 services quality items under the 5 dimensions to the retail shoppers. After data collection is over, the marginal and joint normality of Servqual were also checked by using the Shapiro Wilk Test, Mardia's Multivariate Skewness Test, Mardia's Multivariate Kurtosis Test and Henze Zirkler Test respectively. The result of the aforementioned test clearly portrays the services quality items that are purely departed from the normality assumption. Hence, we were forced to undertake a non-parametric estimation technique to dissect the impact of services quality facet. For the purpose of estimation we use the causal approach of research by adopting the technique of least absolute deviation (LAD) estimation in data analysis. We used Systat Version 12 to perform the LAD estimation and treat the overall services quality as dependent variable, and independent variables are items under the services quality dimensions.

Key words: Food retailing, normality test, causal approach, least absolute deviation technique.

INTRODUCTION

Organized food retailing is a relatively new phenomenon in India with small Western-style supermarkets starting to appear only since the 1980s. Most food is still sold through local wet market vendors, roadside pushcart sellers or tiny kirana (grocery) stores. Although less than 1% of food is estimated to be sold through supermarkets, this share is growing rapidly. Most supermarkets resemble

the small independent operations that existed in Australian cities and towns about 20 years ago, typically occupying 275 to 750²m and carrying about 6000 stock-keeping units. Most of the supermarket developments have occurred in the south of the country in the major cities of Bangalore, Chennai and Hyderabad, as well as New Delhi and Mumbai in the north. According to the Images-KSA Technopak India Retail Report 2005, an estimated 500 shopping malls are expected to be built by 2010 from a near-zero base in 2000, in a trend that can benefit Australian producers by providing greater visibility and shelf space. Convenience stores are also taking off

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in major cities, usually in the form of 'shell shops' or 'food stops' attached to petrol station outlets. The format and product range are surprisingly similar to those in Australia, and they often include chilled and refrigerated sections. Market analysts estimate that the organized retail sector has been growing by nearly 30% year since 2000 with similar growth likely in the short-to-medium term. The sector is expected to undergo further change with prospective new domestic and global foreign entrants, and the takeover or exit of some existing participants.

Global players such as Wal-Mart (US) and Carrefour (France) have showed their plans to enter India once Indian foreign investment regulations permit.

FOOD RETAILING IN INDIA – AN OVERVIEW

Traditional local markets and small-scale retailing continue to dominate India's food retail sector. There are an estimated 12 million retail outlets of which almost seven million sell food and grocery products. Most of these are small kiosks (17%), general provision stores (14%) and grocery stores (called kirana; 56% of all rural retail outlets) run by a single trader and his family. With more than 71% of the population living in small villages and engaged in agriculture, most of India still does its food shopping at small-scale vendors in the local village, or at larger-scale weekly markets often serving several villages in one area, where small individual vendors trade. In the towns and cities, most consumers do their food shopping at the local neighborhood independent small retailers, kiosks and street hawkers. Servants in high income households usually undertake this task. Most cities and towns also have one (or more) large central fresh produce market where wholesalers and retailers (plus some consumers) get their supplies for the day from individual traders. The Food Corporation of India (FCI) has an extensive nationwide network of about 478,000 fair price shops and sells subsidized food grains and certain other staples, but, since the retargeting of the public distribution system (PDS) in 1997 to focus on the poor, these are only available for those below the poverty line set by the government. There are also a few other chains of government-operated provisions stores such as the Kendriya Bhandar (about 120 stores nationwide) run by the Ministry of Personnel.

Grievances and pensions and the canteen stores (about 34 plus 3400 canteens) run by the Ministry of Defense, which are exclusively for defense personnel. Thus, the majority of food and beverage retailing in India is categorized as belonging to the unorganized sector. There is no firm data for the total value of India's annual food and beverage expenditure; however there are various calculations and estimates such as about US\$90 billion by 2000 based on the Indian government's estimates of average urban and rural household

expenditure on food and beverages, and about US\$135 billion by 2004 and growing at 4 to 5% a year, based on industry estimates cited by the USDA. However, it is commonly believed that less than 1% of food and beverage retail sales take place through the organised retail sector, though this share is estimated to be growing rapidly. An early form of 'supermarket' has been around in India such as the single-unit, smaller family-owned grocery and provisional stores now calling itself a supermarket (while others may call it a 'super-kirana'), of which there are at least 5 to 20 in each city.

Another form is a specific food and grocery section contained in some department stores such as the Sahkari Bhandar department store chain which has about 16 acres in Mumbai. However, it is only in the past decade so that a form of supermarket akin to a Western-style supermarket, albeit on a smaller scale has started to appear in India, mainly in certain cities of southern India plus in New Delhi and Mumbai.

RPG's Spencer's

RPG enterprise is not only one of the biggest, but also one of the most respected names in the industry. A US\$ 2.55 billion business conglomerate, RPG is one of the powerhouses that drive Indian Industry. With more than 20 companies, it spans 7 business sectors, retail, technology, entertainment, power, transmission, tyres and specialties- all under the RPG banner. With such a diverse portfolio, the fact that RPG enterprises has had nothing but only unrivalled success in all these sectors, speak very highly of the efficiency and vision with which the company is run. Over the years, RPG enterprise has built a huge reservoir of trust and goodwill among the people of India. We at Spencer's are truly proud to be a part of the RPG family. Spencer's quality is a time-tested phrase, which has been ingrained in the minds of the Indian consumer for over 100 years now. Spencer's express is your store next door for your fresh needs at arm's length. These stores are around 1000 sq ft in size. They are open from 7 am to 9 pm and also provide you with home delivery. Express stores stock dairy, fruit and vegetable, bread and bread products, cut vegetables/ready to cook, fruit juices, fresh batter, fresh coffee/tea, fresh spices, fresh pickles, fresh Ghee, fresh fish and meat. Spencer's Fresh stores provide you with an enjoyable and convenient shopping environment in your very own neighborhood. These 2000 sq ft air-conditioned stores are well stocked with fresh food of the very best quality, such as fresh farm produce, vegetables, fruit, milk, eggs, breads and much more. With an impressive range and a clean, bright and hygienic ambience, Spencer's fresh is far better than the regular vegetable outlets.

Spencer's Fresh provides fresh, clean and tasty farm produce at lowest possible prices in the locality. The

Spencer's store is your friendly neighborhood store which caters to your entire daily shopping needs - from regular groceries to fresh food and weekly top-up shopping. About 4000 to 7000 sq ft in size and with a bright and friendly atmosphere, Spencer's saves the hassle of bargaining with the local Kirana shop owners.

Nilgiris

Another pioneer, the Nilgiris supermarket chain opened its first supermarket in Bangalore in 1971 and by 2005 had built a network of 30 stores, both company-owned and franchised in the states of Tamil Nadu, Andhra Pradesh, Maharashtra and Karnataka. Muthusamy Mudaliar opened a small bunk shop in Ooty. That was in 1905 and the beginning of a long story in procurement and customer satisfaction. In 1936, the shop moved to Bangalore with its registered office on Brigade Road, a small shop exactly where the huge mother store is now located. The first expansion happened when Muthusamy Mudaliar's son Chenniappan, also the chairman established Nilgiris as a modest store carrying Nilgiris' own products, mostly dairy and bakery. Eventually, it evolved into a supermarket when Mr. Chenniappan visited the U.S. and Europe and was influenced by the old supermarket concept in the west. This chain has now blossomed to cover a vast region in South India with 26 outlets and annual sales of about Rs2300 millions. They plan to open an additional 30 outlets in their next phase of expansion.

Margin free

Margin free markets are the largest retail chain in the state of Kerala and one of the leading retail chains in India. The first outlet of this chain started functioning on 26th January 1994 at Thiruvananthapuram. There are currently more than 275 franchisees of 'margin free markets' spread all over south India. The outlets are franchises and are not actually owned by the chain. The 'consumer protection and guidance society' currently control margin free markets which is a registered charitable institution that started functioning in 1993. The consumers are assured of quality, quantity and the fair price of the goods sold through the 'margin free markets'. Any retailer can upgrade his shop into a 'margin free' outlet by sending in an application to this society. If his application is accepted, he has to make the necessary investment required.

The Kerala-based 'margin free' discount stores, the 'pure retail' chain with arguably the largest presence in the country. The retail store chain is uniformly spread across the 240- odd Margin Free franchisees in Kerala, Tamil Nadu and Karnataka. Margin Free draws inspiration from the undying loyalty of its customers who

have wholeheartedly welcomed all its growth plans in the past. Margin Free plans to open huge hypermarkets (50,000 sq ft each) in place like Ernakulam, Thiruvananthapuram and Kozhikode in the immediate future.

Reliance fresh

The contribution to the Indian food retail success being done by other premier retailers like Pantaloon's Food Bazaar, Reliance Retail and Heritage@fresh are also doing innovations in the food retail sector. The Indian government has taken a cautious approach of allowing foreign direct investment (FDI) in food retailing (and retailing generally), with majority of foreign ownership in food retail chains not allowed and approvals generally given on a case-by-case basis (in February 2006, the government made a small concession on FDI in retailing by announcing that up to 51% in retailing of "angle brand" products would be allowed). Major Indian retail groups, such as the RPG Group and the Pantaloon Group have expressed their strong opposition of allowing more foreign direct investment into Indian retailing especially majority foreign ownership. They argue that the sector is still at a very early stage of development and multinationals such as Wal-Mart would swamp local players.

However, the Indian government appears to be considering some degree of liberalisation in the interests of improving efficiency in retailing and supply chains and so strengthening the integration of the Indian agrifood market, plus opening possible new avenues for Indian exports via multinational retailers.

REVIEW OF LITERATURE

Retailing is the most dominant business in India. Though, various types of retail formats have existed in our country, food retailing plays a vital role. In this current scenario the concentration of the researchers, academicians and retail managers were diverted and expanded into scrutinizing the food retailing business. This is possible through the quality of services provided by the food retailers to each and every individual in the society.

The quality of services provided by food retailers can be assessed by the pioneering work done by the experts in retail marketing. Dinesh (2008), two powerful, highly effective strategic tools that retailers possess involves pricing and store format decisions. From the several strategic choices available for each decision, a retailer can choose any combination. We focus on two gaps in the literature. First, both decisions are specific to the consumers to whom the stores cater and the environments within which they operate, yet little

academic research study them jointly. Thus, it is important to determine the joint effects of considering pricing and format decisions in a single framework.

Secondly, do retailers, privy to findings from rich prior literature pertaining to consumer store choices related to their pricing and format preferences; actually take such information into account when making strategic choices. Ann and Jihyun (2007) empirically studied that shopping experience has expanded. Reflecting the integrative (experiential and utilitarian) nature of shopping experience, he aims to propose an overarching stimulus-organism-response based shopping experience framework. He offers a framework that integrates components of both the hedonic experience related consciousness-emotion-value model and the utilitarian experience-related cognition-affect-behavior model.

Michel et al (2005) indicated that consumers' evaluations of service quality in a shopping environment mediate their pleasure and purchase intention. Consumer mall shopping decision-making process is invariant across English and French Canadian consumers.

For researchers who are interested in understanding consumer mall shopping behavior cross-culturally, this research provides a model that can be tested in cross-cultural contexts. For mall operators and store managers attempting to improve the mall environment, product quality, and offer better service, the study provides interesting solutions. Originality/value – by incorporating service quality into consumer mall shopping decision making, this research has demonstrated that consumers' moods evoked by their perceptions of shopping mall environment and of product quality influence, their purchase intentions through their perceptions of service quality. The mall shopping decision-making process of English and French Canadian consumers is universal, regardless of their cultural orientations. Dirk et al. (2005) developed a framework for competitive strategies in food retailing.

Managers of food retail channels were surveyed in order to derive the basic dimensions of competitive advantages that companies attempt to achieve in this industry sector. In a second study based on consumers, the central dimensions of retail store perception were investigated. Both studies reveal that three basic types of competitive advantage seem to prevail in food retailing: 1) price, 2) quality (with a comprehensive set of quality-orientated instruments, including customer service), 3) convenience. We find quality leadership and price leadership to be independent factors which can be achieved without conflicting with each other.

Prem et al. (2005) critically appraised various service quality models and identifies issues for future research based on the critical analysis of literature. The article critically examines 19 different service quality models reported in the literature. The critical review of the different service quality models is intended to derive linkage among them and highlight the area for further

research. The review of various service quality model revealed that the service quality outcome and measurement depends on type of service setting, situation, time, need etc. In addition to this, even the customer's expectations towards particular services are also changing with respect to factor like time, increase in the number of encounters with a particular service, competitive environment, etc. This article provides a rich agenda for future research in the subject. Gordon (2005) has produced two schools of thought on the cause of customer loyalty in services industries. The service quality perspective puts forward that service quality evaluations substantially drive customer loyalty in services industries. The relationship marketing perspective puts forward that customer commitment to the service provider substantially drives customer loyalty in services industries. In addition, commitment is a complex construct with at least two forms, one based in liking and identification (affective commitment) and one based in dependence and switching costs (continuance commitment). These positions were examined in an integrated model of retail-service relationships (Amy and Amrik, 2003). This study attempt to examine the impact of service quality dimensions on customer loyalty, on two levels of retail relationships: person-to-person (salesperson level) and person-to-firm (store level). A total of 1,261 surveys were administered to shoppers who were leaving a large chain departmental store in Victoria, Australia.

The results showed that service quality is positively associated with customer loyalty, and that the relationship between the two is stronger at the company level, rather than at the interpersonal level. Specifically, among the dimensions of service quality, the most significant predictor of customer loyalty at a company level is tangibles, while the most significant predictor of customer loyalty at an interpersonal level is empathy. Further discussion and managerial implications can be drawn from these findings (Valarie et al., 1996). If service quality relates to retention of customers at the aggregate level, as other research has indicated, then evidence of its impact on customers' behavioral responses should be detectable. The authors offer a conceptual model of the impact of service quality on particular behaviors that signal whether customers remain with defect from a company. Results from a multi company empirical study examining relationships from the model concerning customers' behavioral intentions show strong evidence of their being influenced by service quality. The findings also reveal differences in the nature of the quality-intentions link across different dimensions of behavioural intentions. The authors' discussion centers on ways the results and research approach of their study can be helpful to researchers and managers. The authors respond to concern raised by expert about the SERVQUAL instrument and the perceptions-minus-expectations specification invoked by it to operationalize

services quality. After demonstrating that the validity and alleged severity of many of those concerns are questionable, they offer a set of research directions for addressing unresolved issues and adding to the understanding of service quality assessment (Emin et al., 2004). Effects of perceived merchandise and service quality, relative to competition, on retail store performance are investigated using store traffic and revenue growth as outcome variables. A model is proposed and tested using aggregate customer data and store performance outcomes from a group of stores owned by a national retail organization.

Results suggest that both service and merchandise quality exert significant influence on store performance, measured by sales growth and customer growth, and their impact is mediated by customer satisfaction. Implications of the results and future research directions are discussed.

RESEARCH DESIGN

Scope and objective of the study

This research article is exclusively conducted as a case study for the major food retailers in India. The human capital of food retailers in India are in a need to get a clear picture about the food retailing world. For this purpose the study focused on the in-depth issues regarding the nature and quality of services provided by the food retail stores to the Indian customers. It is a known fact that organized retailing is making a strong impact in many parts of India's growing economy. This research article studied the services quality of major food retailers by taking important services quality dimensions like physical aspects, reliability, personal interaction, problem solving and policy which assess the retail service users, especially the food retailers. Moreover, the study made an attempt to scrutinize the impact of services quality dimensions on the overall services quality of food retailers.

Data collection and analysis

To measure the impact of services quality dimensions, we contacted 630 retail shoppers from major food retail stores namely: Spencer's, Nilgiris, Reliance Fresh and Margin Free. Then we issued the instrument which comprised of 28 services quality items under the 5 dimensions to the retail shoppers. After data collection is over, the marginal and joint normality of Servqual items were also checked by using the Shapiro Wilk test, Mardia's multivariate skewness test, Mardia's multivariate kurtosis test and Henze Zirkler test respectively. Table 1 shows the results of the marginal normality test named Shapiro Wilk Test. The results shows all the service quality items exactly and purely departed from the univariate normality at 1% and 5% level respectively. Moreover, Table 2 also explains the results of multivariate or 'joint normality test' of the service quality items. We made an attempt to prove the multivariate normality of the items by using three battery of test namely: Mardia's skewness, Mardia's kurtosis and Henze-Zirkler test. The result of the test statistic shows that the 28 service quality items are purely departed from the multivariate normality at 1 and 5% significance level respectively. The result of the aforementioned tests clearly portrays the services quality items are purely departed from the normality assumption. Hence, we are forced to undertake a non-parametric estimation technique to dissect the impact of

services quality facet.

For the purpose of estimation, we use the casual approach of research by using the technique of LAD estimation in data analysis, an alternative to Least Squares estimation. Before presenting the results of the analysis, let us see the brief technicalities about the least absolute deviation estimation technique.

Least absolute deviation method

Least absolute deviations (LAD), also known as least absolute errors (LAE), least absolute value (LAV) or the L_1 norm problem is a mathematical optimization technique similar to the popular least squares technique that attempts to find a function which closely approximates a set of data. In the simple case of a set of (x, y) data, the approximation function is a simple "trend line" in two-dimensional Cartesian coordinates. The method minimizes the sum of absolute errors (SAE) (the sum of the absolute values of the vertical "residuals" between points generated by the function and corresponding points in the data). The least absolute deviations estimate also arises as the maximum likelihood estimate if the errors have a distribution. Suppose that the data set consists of the points (x_i, y_i) with $i = 1, 2, \dots, n$. We want to find a function f such that

$f(x_i) \approx y_i$. To attain this goal, we suppose that the function f is of a particular form containing some parameters which need to be determined. For instance, the simplest form would be linear: $f(x) = bx + c$, where b and c parameters whose values are not known but which we would like to estimate. Less simply, suppose that $f(x)$ is quadratic, meaning that $f(x) = ax^2 + bx + c$, where a, b and c are not yet known (more generally, there could be not just one explanator x , but rather multiple explanators, all appearing as arguments of the function f).

We now seek estimated values of the unknown parameters that minimize the sum of the absolute values of the residuals:

$$S = \sum_{i=1}^n |y_i - f(x_i)|.$$

The least absolute deviation problem may be extended to include constraints and regularization, for example a linear model with linear constraints:

Minimize:

$$S(\mathbf{x}) = \sum_i |\mathbf{a}'_i \mathbf{x} + b_i|$$

Subject to constraints:

$$\mathbf{a}'_i \mathbf{x} - b_i \leq 0$$

Though the idea of least absolute deviations regression is just as straightforward as that of least squares regression, the least absolute deviations line is not as simple to compute efficiently. Unlike least squares regression, least absolute deviations regression does not have an analytical solving method. Therefore, an iterative approach is required. The following is the enumeration of some least absolute deviations solving methods:

- i) Simplex-based methods (such as the Barrodale-Roberts algorithm)
- ii) Iteratively Re-weighted Least squares
- iii) Wesolowsky's direct descent method
- iv) Li-Arce's maximum likelihood approach

Table 1. Shapiro wilk marginal normality test.

Dimensions	Variables	Test statistic*
Physical aspects	Modern equipment and fixtures	0.723
	Physical facilities	0.706
	Good looking shopping materials	0.805
	Attractive and convenient public areas	0.808
	Easy accessibility	0.817
	Easy internal mobility	0.813
Reliability	Promising services	0.867
	Time promising services	0.876
	Doing it right	0.865
	Supply of right products	0.822
	Error free transactions	0.821
Personal interaction	Employees knowledge	0.858
	Employees confidential behavior	0.861
	Security in transactions	0.777
	Performing prompt services	0.841
	Performing exact services	0.857
	Immediate response to customer request	0.868
	Individual caretaking	0.869
	Courteousness of employees	0.869
Courteous communication	0.870	
Problem solving	Returns and exchanges	0.857
	Sincerity in problem solving	0.859
	Handling customer compliance	0.857
Policy	Offering quality products	0.762
	Convenient parking facilities	0.896
	Convenient operating hours	0.784
	Acceptance of credit cards	0.775

*P-value<0.01 (n = 630).

Table 2. Multivariate (or) joint normality test.

Test name	Coefficients	Test statistic*
Mardia's skewness	103.141	10885.040
Mardia's kurtosis	1019.543	75.016
Henze-Zirkler		1.384

*P-value<0.01 (n = 630).

v) Check all combinations of point-to-point lines for minimum sum of errors

Simplex-based methods are the "preferred" way to solve the least absolute deviations problem. A simplex method is a method for solving a problem in linear programming. The most popular algorithm is the Barrodale-Roberts modified Simplex algorithm (1973). The algorithms for IRLS, Wesolowsky's Method (1981) and

Li's method (2006) can also be used to solve the problem iteratively. Checking all combinations of lines traversing any two (x, y) data points is another method of finding the least absolute deviations line. Since it is known that at least one least absolute deviations line traverses at least two data points, this method will find a line by comparing the SAE of each line and choosing the line with the smallest SAE. In addition, if multiple lines have the same smallest SAE, then the lines outline the region of multiple solutions.

Though simple, this final method is inefficient for large sets of data. The problem can be solved using any linear programming technique on the following problem specification. We wish to:

$$\text{Minimize } \sum_{i=1}^n |y_i - a_0 - a_1x_{i1} - a_2x_{i2} - \dots - a_kx_{ik}|$$

With respect to the choice of the values of the parameters a_0, \dots, a_k , where y_j is the value of the i th observation of the dependent variable, and x_{ij} is the value of the j th observation of the i th independent variable ($j = 1, \dots, k$). We rewrite this problem in terms of artificial variables u_j as:

$$\text{Minimize } \sum_{i=1}^n u_i$$

With respect to a_0, \dots, a_k and u_1, \dots, u_n .

Subject to:

$$u_i \geq y_i - a_0 - a_1x_{i1} - a_2x_{i2} - \dots - a_kx_{ik} \quad \text{for } i = 1, \dots, n$$

$$u_i \geq -[y_i - a_0 - a_1x_{i1} - a_2x_{i2} - \dots - a_kx_{ik}] \quad \text{for } i = 1, \dots, n.$$

These constraints have the effect of forcing each u_j to equal

$$|y_i - a_0 - a_1x_{i1} - a_2x_{i2} - \dots - a_kx_{ik}|_{\text{up to}}$$

n being minimized, so the objective function is equivalent to the original objective function. Since this version of the problem statement does not contain the absolute value operator, it is in a format that can be solved with any linear programming package. We used Systat Version 12 to perform the Lad estimation and treat the summated score of 28 services qual items as dependent variable and independent variables are items under each service quality dimension. The results of the LAD estimation are presented as follows: Table 3 visualises the impact of the items of physical aspects on the overall services quality of the food retailers. The result of the LAD regression shows that the variable “convenient public areas” gives a positive increase to the services quality of Spencer’s. As far as Nilgiris, Margin Free, Reliance Fresh are concerned, the earlier said variable dominantly influence the overall services quality of the store. These results were extracted by using the Barrodale-Roberts simplex Algorithm and the SAD is 19.382 is minimum for the Margin Free retail store. This show the items in physical aspects accurately predict the service quality of Margin Free retail store followed by the Reliance Fresh, Nilgiris and the Spencer’s.

Table 4 exhibits the impact of the substance of reliability on the overall services quality of the food retailers. The results of the LAD regression prove that the item “doing it right” produces a positive increase to the service quality of RPG Spencer’s. As far as Nilgiris Stores, Margin Free and Reliance Fresh are concerned, the earlier said variable governs the overall services quality of the retail format. These results were extracted by using the Barrodale-Roberts simplex Algorithm and the SAD is 8.084 is least for the Margin Free retail store. This show the proportions in reliability accurately predict the service quality of Margin Free followed by the Reliance Fresh, Nilgiris and the Spencer’s. Table 5 reveals the impact of the substance of personal interaction on the overall services quality of the food retailers. The results of the LAD regression prove that the

item “security in transactions” produces a positive increase to the service effectiveness of RPG Spencer’s. As far as Nilgiris Stores, Margin Free and Reliance Fresh are concerned the earlier said variable oversees the overall services quality of the food retail format. These results were extracted by using the Barrodale-Roberts Simplex Algorithm and the SAD is 4.052 is lowest for the Margin Free retail store. This confirms the proportions in personal interaction accurately envisage the service quality of Margin Free followed by the Reliance Fresh, Nilgiris and Spencer’s.

Table 6 exposes the impact of the essence of problem solving on the overall services quality of the food retailers. The consequences of the LAD regression prove that the dimension “handling customer compliance” produces a positive increase to the service effectiveness of Margin Free. As far as Reliance Fresh, RPG Spencer’s and Nilgiris are concerned the earlier said variable oversees the overall services quality of the food retail venture. These results haul out by using the Barrodale-Roberts Simplex Algorithm and the SAD is 8.556 is lowest for the Margin Free retail store. This confirms the proportions in problem solving accurately foresee the service quality of Margin Free pursued by the Reliance Fresh, Nilgiris and Spencer’s. Table 7 examines the impact of the policy on the overall services quality of the food retailers. The consequences of the LAD regression prove that the element “acceptance of credit cards” produces a positive increase to the service quality of Nilgiris. As far as Spencer’s, Reliance Fresh and Margin Free are concerned the earlier said variable oversees the overall services quality of the food retail venture. These results illustrate by using the Barrodale-Roberts Simplex Algorithm and the SAD is 9.010 is minimum for the Margin Free Super Markets. This confirms the proportions in policy accurately predict the service quality of Margin Free pursued by the Reliance Fresh, Nilgiris and Spencer’s.

FINDINGS AND IMPLICATION

The results found that most of the Services Quality Dimensions gives a positive impact on the overall Services Quality of major food retailers. The result extracted from the study is fruitful and helps to take the major managerial initiatives for improving food retail service quality.

Spencer’s

Spencer’s is the leading food retailer having a dozen of retail outlets all over the Chennai City. The customers who came to this retail outlet are very modern and they are potential to this store. They perceive Spencer’s in five different dimensions. Based on this dimension the researcher recommends some suggestions to enhance the services quality of the retail outlet.

Physical aspect

The customers of Spencer’s identified the elements of physical aspects which declined the quality of services provided by the store. Whenever customers entered the store, their eyes always looked for the equipments and fixtures and the availability of physical and storage

Table 3. Lad parameter estimates – physical aspects dependent variable: service quality (Y).

Independent variables	^a Spencer's (n = 250)		^b Nilgiris (n = 143)		^c Margin Free (n = 55)		^d Reliance Fresh (n = 182)	
	Coefficients	Standard error	Coefficients	Standard error	Coefficients	Standard error	Coefficients	Standard error
Constant	2.442	0.266	1.354	0.278	6.859	0.798	1.741	0.161
Modern equipment and fixtures (X ₁)	0.068	0.055	0.093	0.045	-0.194	0.141	0.046	0.022
Physical facilities (X ₂)	-0.104	0.066	0.098	0.041	-0.467	0.146	0.102	0.021
Good looking shopping materials (X ₃)	0.040	0.036	0.123	0.046	-0.194	0.116	0.055	0.024
Attractive and convenient public areas (X ₄)	0.215	0.045	0.138	0.041	0.146	0.123	0.176	0.022
Easy accessibility (X ₅)	0.074	0.042	0.078	0.046	-0.131	0.171	0.148	0.018
Easy internal mobility (X ₆)	0.004	0.040	0.076	0.044	-0.152	0.122	0.074	0.020

Method: LAD regression algorithm:Barrodale-Roberts simplex. ^a SAD = 45.797, ^b SAD = 30.573, ^c SAD = 19.382, ^d SAD = 21.608.

$$\hat{Y} = 2.442 + 0.068X_1 - 0.104X_2 + 0.040X_3 + 0.215X_4 + 0.074X_5 + 0.004X_6 \text{ -----(1)}$$

$$\hat{Y} = 1.354 + 0.093X_1 + 0.098X_2 + 0.123X_3 + 0.138X_4 + 0.078X_5 + 0.076X_6 \text{ -----(2)}$$

$$\hat{Y} = 6.859 - 0.194 X_1 - 0.467X_2 - 0.194X_3 + 0.146X_4 - 0.131X_5 - 0.152X_6 \text{ -----(3)}$$

$$\hat{Y} = 1.741 + 0.046X_1 + 0.102X_2 + 0.055X_3 + 0.176X_4 + 0.148X_5 + 0.074X_6 \text{ -----(4)}$$

\hat{Y} is the estimated service quality score.

Table 4. Lad parameter estimates – reliability dependent variable: service quality (Y).

Independent variables	^a Spencer's (n = 250)		^b Nilgiris (n = 143)		^c Margin Free (n = 55)		^d Reliance Fresh (n = 182)	
	Coefficients	Standard error	Coefficients	Standard error	Coefficients	Standard error	Coefficients	Standard error
Constant	2.071	0.094	1.587	0.187	2.983	0.153	1.919	0.153
Promising services (X ₁)	0.120	0.015	0.158	0.032	0.132	0.035	0.152	0.023
Time promising services (X ₂)	0.121	0.012	0.128	0.032	0.012	0.037	0.063	0.020
Doing it right (X ₃)	0.163	0.015	0.088	0.033	-0.039	0.041	0.089	0.022
Supply of right products (X ₄)	0.080	0.014	0.153	0.028	-0.042	0.032	0.115	0.021
Error free transactions (X ₅)	0.005	0.016	0.055	0.029	0.049	0.031	0.137	0.019

Method: LAD regression algorithm:Barrodale-Roberts simplex. ^a SAD = 31.557, ^b SAD = 28.829, ^c SAD = 8.084, ^d SAD = 18.998.

$$\hat{Y} = 2.071 + 0.120X_1 + 0.121X_2 + 0.163X_3 + 0.080X_4 + 0.005X_5 \text{ ----- (1)}$$

$$\hat{Y} = 1.587 + 0.158X_1 + 0.128X_2 + 0.088X_3 + 0.153X_4 + 0.055X_5 \text{ ----- (2)}$$

$$\hat{Y} = 2.983 + 0.132X_1 + 0.012X_2 - 0.039X_3 - 0.042X_4 + 0.049X_5 \text{ ----- (3)}$$

$$\hat{Y} = 1.919 + 0.152X_1 + 0.063X_2 + 0.089X_3 + 0.115X_4 + 0.137X_5 \text{ -----(4)}$$

\hat{Y} is the estimated service quality score.

facilities etc. In this regard, the managers of Spencer's should enhance the equipment and fixtures, physical facilities by providing a modern

look and a high-tech look to the customers. They should convert the old model of storage facilities into new modernised storage facilities to store the

food products like vegetables, fruits and other perishable products. Moreover, the managers should give due care to the conversion of old

Table 5. Lad parameter estimates – personal interaction dependent variable:service quality (Y).

Independent variables	^a Spencer's (n = 250)		^b Nilgiris (n = 143)		^c Margin Free (n = 55)		^d Reliance Fresh (n = 182)	
	Coefficients	Standard error	coefficients	Standard error	Coefficients	Standard error	Coefficients	Standard error
Constant	1.276	0.123	1.252	0.104	1.198	0.179	1.204	0.170
Employees knowledge (X ₁)	-0.006	0.032	0.135	0.015	0.131	0.035	0.073	0.019
Employees confidential behaviour (X ₂)	0.046	0.032	0.087	0.014	0.132	0.041	0.080	0.018
Security in transactions (X ₃)	0.166	0.020	0.020	0.018	0.124	0.041	0.087	0.021
Performing prompt services (X ₄)	0.072	0.020	0.075	0.023	0.058	0.045	0.088	0.021
Performing exact services (X ₅)	0.069	0.023	0.038	0.018	-0.048	0.042	0.080	0.017
Immediate response to customer request (X ₆)	0.133	0.030	0.112	0.023	0.076	0.049	0.068	0.020
Individual caretaking (X ₇)	0.060	0.023	0.057	0.021	0.104	0.040	0.082	0.018
Courteousness of employees (X ₈)	0.088	0.031	0.048	0.021	0.002	0.043	0.077	0.019
Courteous communication (X ₉)	0.059	0.026	0.096	0.021	0.065	0.041	0.082	0.019

Method: LAD regression algorithm: Barrodale-Roberts simplex. ^a SAD = 25.610, ^b SAD =18.705, ^c SAD = 4.052, ^d SAD = 17.041.

$$\hat{Y} = 1.276 - 0.006X_1 + 0.046X_2 + 0.166X_3 + 0.072X_4 + 0.069X_5 + 0.133X_6 + 0.060X_7 + 0.088X_8 + 0.059X_9 \text{----- (1)}$$

$$\hat{Y} = 1.252 + 0.135X_1 + 0.087X_2 + 0.020X_3 + 0.075X_4 + 0.038X_5 + 0.112X_6 + 0.057X_7 + 0.048X_8 + 0.096X_9 \text{----- (2)}$$

$$\hat{Y} = 1.198 + 0.131X_1 + 0.132X_2 + 0.124X_3 + 0.058X_4 - 0.048X_5 + 0.076X_6 + 0.104X_7 + 0.002X_8 + 0.065X_9 \text{----- (3)}$$

$$\hat{Y} = 1.204 - 0.073X_1 + 0.080X_2 + 0.087X_3 + 0.088X_4 + 0.080X_5 + 0.068X_6 + 0.082X_7 + 0.077X_8 + 0.082X_9 \text{----- (4)}$$

\hat{Y} is the estimated service quality score.

Table 6. Lad parameter estimates – problem solving dependent variable: service quality (Y).

Independent variables	^a Spencer's (n = 250)		^b Nilgiris (n = 143)		^c Margin Free (n = 55)		^d Reliance Fresh (n = 182)	
	Coefficients	Standard error	Coefficients	Standard error	Coefficients	Standard error	Coefficients	Standard error
Constant	2.481	0.130	2.284	0.101	1.758	0.190	2.852	0.194
Returns and exchanges (X ₁)	0.056	0.028	0.173	0.031	0.185	0.057	0.037	0.034
Sincerity in problem solving (X ₂)	0.142	0.040	0.136	0.033	0.097	0.056	0.185	0.029
Handling customer compliance (X ₃)	0.173	0.038	0.111	0.031	0.231	0.054	0.111	0.031

Method: LAD regression algorithm: Barrodale-Roberts simplex. ^a SAD = 39.022, ^b SAD = 26.264, ^c SAD = 8.556, ^d SAD = 26.288.

$$\hat{Y} = 2.481 + 0.056X_1 + 0.142X_2 + 0.173X_3 \text{----- (1)}$$

$$\hat{Y} = 2.284 + 0.173X_1 + 0.136X_2 + 0.111X_3 \text{----- (2)}$$

$$\hat{Y} = 1.758 + 0.185X_1 + 0.097X_2 + 0.231X_3 \text{----- (3)}$$

$$\hat{Y} = 2.852 + 0.037X_1 + 0.185X_2 + 0.111X_3 \text{----- (4)}$$

\hat{Y} is the estimated service quality score.

Table 7. Lad parameter estimates – policy dependent variable: service quality (Y).

Independent variables	^a Spencer's (n = 250)		^b Nilgiris (n = 143)		^c Margin Free (n = 55)		^d Reliance Fresh (n = 182)	
	Coefficients	Standard error	Coefficients	Standard error	Coefficients	Standard error	Coefficients	Standard error
Constant	2.889	0.161	1.999	0.307	3.246	0.351	2.815	0.225
Offering quality products (X ₁)	0.037	0.033	0.037	0.048	0.148	0.044	0.074	0.036
Convenient parking facilities (X ₂)	0.074	0.024	0.136	0.047	0.019	0.032	0.037	0.021
Convenient operating hours (X ₃)	0.037	0.036	0.037	0.055	0.028	0.048	0.111	0.032
Acceptance of credit cards (X ₄)	0.037	0.026	0.272	0.048	-0.106	0.057	0.111	0.031

Method: LAD regression algorithm: Barrodale-Roberts simplex. ^a SAD = 42.878, ^b SAD = 33.719, ^c SAD = 9.010, ^d SAD = 28.824.

$$\hat{Y} = 2.889 + 0.037X_1 + 0.074X_2 + 0.037X_3 + 0.037X_4 \text{----- (1)}$$

$$\hat{Y} = 1.999 + 0.037X_1 + 0.136X_2 + 0.037X_3 + 0.272X_4 \text{----- (2)}$$

$$\hat{Y} = 3.246 + 0.148X_1 + 0.019X_2 + 0.028X_3 - 0.106X_4 \text{----- (3)}$$

$$\hat{Y} = 2.815 + 0.074X_1 + 0.037X_2 + 0.111X_3 + 0.111X_4 \text{----- (4)}$$

\hat{Y} is the estimated service quality score.

model chillers.

Reliability

The second dimension is the reliability of retail store. Reliability refers to the services which have to be done at the right moment based on the retail shoppers' expectations. The promised services have to be executed at the accurate time. The retail stores must supply the suitable goods to fulfill the demand of the customer. Here, the customers found that the nature of the store has to improve. First, the Spencer's retail segment has to be completely systemised by adopting advanced system software which would execute the services to customers at the right duration. Therefore, it leads to speedy and error free transactions. More importance is to use modernizing billing system like POSIFLEX. It will reduce the burden for billing in charge during the peak hours. Electronic point of sale (E-POS) is to be introduced among the Spencer's retail outlets. Finally, these kinds of measures would

automatically make better the services quality of the store.

Personal interaction

More specifically personal interaction in Spencer's refers to the knowledge of the employees in this store, their behaviour and services performed by them in a perfect, prompt and exact manner to their customers. The customers of Spencer's point out some negatives and they are also dissatisfied about the personal interaction of employees. The store administrator of Spencer's should immediately give due care to trigger and boost this dimension. This boosting process should be taken in different elements of personal interaction. At first, the manager in charge should give and conduct training programs for their employees. The training programs should be segregated and organised for the newly recruited employees as well as for the existing employees also. The training module should include the contents such as personality traits, managing skills, guidance to

customers, individual caretaking, courteous communication and how to do exact services.

Problem solving

This element is the core for the services criteria, because, the customers problems and issues have to deal with due care. Possible solution must be given to customers' grievance. The section supervisors of the food retail chain must give stress to the sincerity in problem solving. Similarly, the retail shoppers issues in Spencer's have been executed through the tool called as your's view matter (YVM). The customers' problems, which have been taken by the store managers is sent to the corporate office for redressal.

Policy

Finally, the retail services quality is also determined by the facet policy. Here, policy means

the retailers have to offer quality food and grocery brands to its buyers. Nowadays, the buyers are more aware about what they are going to purchase. The store comparison is also conducted by few end users. Here, in Spencer's own, credit cards should be mentioned in the store name itself which has to be introduced. Own gift vouchers are a favourable element to be introduced by Spencer's. Another core issue is the convenient parking facilities. Car-parking facilities are an inadequate feature in the store, because of the location congestion which blockade for the customer traffic flow. The store management has to arrange for parking facilities in the underground areas which will have customer resource magnetism towards the store. For this, the managers should plan before establishing the retail outlets in the heart of the cities.

Nilgiris

Physical aspects

The buyers of Nilgiris identified certain elements which decrease the nature and services quality offered by the food retail chain. When a customer visits the food retail chain he perceives the store environment and physical facilities of the store. Here, the buyers find that the level of anticipation is not up to the class. Therefore, the managers of the store must focus in improving the services of the retail chain. For efficient store performance, the management has to introduce amazing retail solution to fulfill the wants of the end-users. They have to establish exclusive design which is a compliment to the décor of the store. They have to fit open coolers for buyers to take the materials from the freezers. They can install large high contrast LCD display to see weight in kilograms of the products. They can set up high speed slide out printer for the printing purposes. To advice more proper retail security, Sensormatic is an American brand which provides integrated retail security solutions to meet the safety, inventory control and security challenges faced in the present retail scenario. This nature of high-tech equipments will adorn the quality of the food retail store.

Reliability

It examines the steadfastness of the retail chain through contributing a guaranteed service assurance done by the retail store. Reliability also refers to carry out each transaction with dedication and commitment. If a good has been determined to supply in a particular date, it has to be done with faithfulness to reach the end-users level of delight. The human resource of this food retail chain can introduce proactive retail software called ETP V5. It gives a support to handle proactive decisions that makes

a difference between success and failure. These kinds of retail services will create resoluteness in the mindset of the customers for a right product decision.

Personal interaction

It is the appraisal of the employee's performance in the food and grocery retail channel. This factor also reviews the behavioral attitude of the employees. They have to answer for the queries of the customer's in a well mannered way. The bay is clear and employees are advised to stock the materials in lean time and refill if required. In this retail store, the employees who are in the billing section receive the products from the customer, execute the transactions and finally give away the purchase products with the right hand only and not through the two hands. Here the employees are given training on the soft skills. The retail managers while recruiting the candidate must look for enthusiasm and learning tendency of the human resource. These areas in the personal interaction dimension must be given due care by this retail store and should be followed to become a lead retailer in this segment.

Problem solving

The next aspect in evaluating the service quality is the problem solving. From these stores, customers' reaction is found that they are lacking in the element such as returns and exchanges, sincerity in problem solving and handling customer compliance. Also, the patrons believe that the nature of the retail store does not match the prospect at a certain level. Here the store manager and supervisors should be trained and empowered in handling the customers' tough issues brought by them. The employees must be very sincere in tackling the problems noticed by the customer and it should be taken for elucidation to the superiors.

Policy

To end, the services quality is also powered by the façade policy. The retailers should offer branded products. In the present retail scenario, many food retailers are increasing at a rapid pace. In Nilgiris, the patrons have identified the elements such as convenient parking facilities and acceptance of credit cards being weighed at a destitute status. This under privileged nature has to be completely changed. So for this, acceptance of the premier credit card companies is to be taken under consideration. Food coupons should also be introduced to the buyers. This depressed condition should be given due care by the store management. Sodex is also like a coupon introduced by this food

retailer for purchasing the products but it is under the disadvantaged profile. Vehicle parking is also to be streamlined to create centre of attraction for the posh customers' attention.

Margin free

Physical aspects

The regular patrons of this store identified that the physical aspects factor lessened the services quality rendered by them. However, the customers find that the ambience of the store has to be improved by providing a comfy environment. The Margin Free chain store has to be made more accessible near the residential apartments. The store has to be modernized with adequate shopping devices such as trolleys, shopping materials, attractive packages etc.

Reliability

The next feature which elicits the services quality of the retail store is reliability. It refers to the timely services obtainable to the customers. At this juncture we find that the expectations are not fulfilled according to the customers' preferences. The services are not executed at the right time because of derisory manpower. The delivery staffs which are available in this retail store are only few. In a day, these delivery staff carries out twenty to thirty transactions only. Here, the managers of the store have to increase the manpower ratio to a higher extent which is a possible solution to reach more number of customers.

Personal interaction

Claims about how effectively the employees of the store do interact with its end-users. In these retail stores, the sales executives are not well qualified; therefore they cannot respond what the customers' desires because they are qualified at higher secondary level only. Here the managers have to go for highly skilled sales person who provide exact services to its customers. The store managers have to explain the objectives and aims of the corporate retail environment and customization concepts to be feed to its supervisory staff. As well as the store administration of Margin Free must devise an ideal compensation plan in which more focus has to be made because the pay package level is poor.

Problem solving

It refers to how the managers provide possible retail

solutions to its end-users. Problem solving facet is one of the important determining cause because the issues have to be carefully solved. At this point, the returns and exchanges of the products have not fulfilled the customers' anticipation level. More queries should be raised in this feature. The company gives replacements for only few items. So, this has to be raised over in future by offering more replacements for the goods purchased. The other important component which is insufficient is handling customer compliance. The store managers must take adequate steps through receiving a compliant letter from the customers. Complaint letters lodged by the customers have to be collected and produced by the sales officer or the marketing managers in the monthly meeting arranged by the store board. These measures will upgrade the quality of the retail corporate.

Policy

Aspect scrutinizes the operating success of retail store. It refers to the quality of products offered. In the present scenario, the customers are more time conscious. In Margin Free, the end-users perceive that the expectations are not fulfilled to their maximum extent because of the present working hours of the store. The operating hours of the store has to be increased up to 10:00 p.m. Specified parking for the stores have to be arranged near the store itself for its customers. More membership cards have to issue the regular customers which is absent in most of Margin Free outlets. They can also affix colors to the membership holders which could be easily differentiated among the customers.

Reliance fresh

Physical aspects

The retail shoppers of Reliance Fresh have identified that certain physical aspects have not been satisfied according to the shopper's expectations. The customers find that the requirements have not been matched. Here in Reliance Fresh, the physical facilities of the store provide more inadequacy to the customers. Basically, in the retail outlets, the store ambience deprives the service quality component. The store is not so modernized when compared with its competitors. The store should be made air-conditioned and this will improve its status consciousness.

Reliability

This variation examines about giving right to the customers what they want. It is a vital correlation between the respondents of the retail store and the store

administration. Here we find that the more gaps that exist in the availability of merchandise and customer management, the promised service have not been done properly to the customers at the right situation. There are more pit falls in executing the transactions to the ideal customers. The delivery of the right products has not been done significantly because of the lesser number of delivery staffs. So, therefore the time promised, services cannot reach the end users at the right moment.

Personal interaction

Pursuing the third factor is the personal interaction which makes an assessment regarding the manpower potential of the food retailers. The retail patrons of Reliance Fresh find that more improvement must be done for the human resource in the selling skills. Persuasive selling skills (PSS) program has to give exposure for the employees. In the retail store, the behavior of employees also decreases the morale of the customers. They are not promptly responded according to the situation arises. So, the management has to arrange executive development program (EDP).

Problem solving

It is one of the core dimensions for the retail store. Here, in Reliance Fresh, the customer complaints have not been solved in proper manner according to the customer's expectations. Crisis exists in the number of checkout counters. Increase in the checkout counters would carry out the work in an easy manner. The store managers must take action for customer complaints through the customer problems and clearance cell. They can also plan for online customer solutions which would be more adequate. The problems must reach the corporate office for further clearances. Extensive care should be given for the complete replacement of the products if damaged. Brand cards should be introduced to explain the kilograms of the product mentioned.

Policy

Pursuing the final variation is the policy of the retail store. This element review about offering quality products, convenient parking facilities, operating hours and acceptance of credit cards. In Reliance Fresh, the patrons have assessed that the products offered is inferior when compared with other retailers. Few retailers and manufactures sell the products in their own brand name itself. The price mechanism of Reliance Fresh is good at certain level but the high quality component is weakened. So, this element has to be given more concentration by the retail managers. Imported food

items such as meat, chicken, pork etc sold by other competitive food retailers is deficient in this retail chain and specific actions should be taken off. These products will improve the superiority of the retail brand name. Improvement has to be done through providing private parking facilities which will attract more buyers. Reliance Fresh could also launch the co-branded cards through having the tie-up with the financial companies. This also comes under the credit card nature. In conclusion, the store has to consider these elements which would upgrade the performance of the food retailer.

REFERENCES

- Amy W, Amrik S (2003). Service Quality and customer loyalty perspectives on two levels of retail relationships, *J. Retail*, 17: 495-513.
- Ann MF, Jihyun K (2007). An integrative framework capturing experiential and utilitarian shopping experience," *Int.J.Retail. &Dist. Mgmt*, 35: 421-442. This reference contradicts the Author's name in the main text.
- Barrodale F, Roberts DK (1973). An improved algorithm for discrete L_1 linear approximation. *SIAM J. Nume. Anal.*, 10: 839-848.
- Dinesh KG (2008). Understanding the Determinants of Retail Strategy: An Empirical Analysis, *J. Retail*, 84(3): 256-267.
- Dirk M, Bernhard S, Hanna S (2005). "Competitive strategies in retailing—an investigation of the applicability of Porter's framework for food retailers," *J. Retail. & Cons. Serv.*, 13(4): 275-287.
- Emin BC, Bienstock C, James RVS (2004). "Liking Perceived Quality and Customer Satisfaction to Store Traffic and Revenue Growth". *Deci. Sci.*, 35: 713-737.
- Gordon F (2005). The Service Quality-Loyalty Relationship In Retail Services: Does Commitment Matter?" *J. Retail Cons. Serv.*, 12: 99-111.
- Li W, Michael DG, Ji Z (2006). Regularized Least Absolute Deviations Regression and an Efficient Algorithm for Parameter Tuning. *Proceedings of the Sixth International Conference on Data Mining*. pp. 690-700.
- Michel L, Lefa T, Richard M, Jean-Charles C (2005). "Incorporating service quality into consumer mall shopping decision making: a comparison between English and French Canadian consumers," *J. Serv. Mar.*, 19: 153-163.
- Prem V, Deshmukh SG, Nitin S (2005). Service Quality Models: a Review. *Inter. J. Qual. Reli. & Mgt.*, 22: 913-949.
- Valarie AZ, Leonard LB, Parasuraman A (1996). The Behavioral Consequences of Service Quality, *J. Mar.*, 60: 31-46.
- Wesolowsky GO (1981). A new descent algorithm for the least absolute value regression problem". *Commun. Stat, Simul.& Comput.*, B10 (5): 479-491.