

Factors effecting Satisfaction of Elevator Customers in Goa: Their Measurement & Analysis

^[1]Navesh Shirodkar, ^[2]Dr. Vinay Shirodkar

^{[1][2]} Master of Industrial Engineering

Goa College of Engineering, Farmagudi, Goa 403401, India

Abstract: -- Elevator Industry has witnessed tremendous changes over time and the entry of MNC's has transformed it both structurally and functionally. Satisfying the customers is an essential element to staying in business in this modern world of overall competition. In order to measure & analyse customer satisfaction in an elevator industry in Goa, Multi-Criteria Satisfaction Analysis (MUSA) method is used in this paper. Multi-Criteria analysis is a branch of a general class of Operations Research models, which deal with the process of making decisions in presence of multiple objectives. To attain high level of customer satisfaction and repeat business, it is necessary to satisfy and even delight customers with the value of products and services. Hence, the study analysed relative factors effecting customer satisfaction. In this paper well-structured questionnaire was used to collect relevant data. Customer satisfaction was studied through various criteria viz. Personnel, Products, Image, Service and Access. Study revealed that customers are quite satisfied with provided service whereas, image criteria has relatively low satisfaction index. Architects are not satisfied with the offered cost. Nevertheless, there are no critical satisfaction dimensions requiring immediate improvement efforts. However, if company wishes to create additional advantages against competition, the criteria with the lowest satisfaction index should be improved.

Index Terms — Customer Satisfaction measurement, Multi-criteria Satisfaction Analysis, Operations Research models, Satisfaction Index.

I. INTRODUCTION

In today's competitive environment delivering high quality service is the key for a sustainable competitive advantage. Introduction of latest technologies, economic unpredictability, fierce competition and changing demand of customers created a competitive scenario for elevator industry [1]. Satisfied customers form the foundation of any successful business because customer satisfaction leads to repeat purchases, brand loyalty, and positive word of mouth [2]. It is proved that satisfied customers share their experiences with lesser people. On the contrary, dissatisfied customers tell more people about their experience with product or service. Furthermore, to advance their competitive edge, modern organizations should better understand and profile their customers [3]. Customization requires a profound knowledge of customers and their needs and habits. This is more imperative in the elevator industry, where the variety of the products and services offered concerns particular groups of customers [4].

The objectives of the customer satisfaction surveys are focused on the assessment of the critical satisfaction dimensions, by means of qualitative questions, and the determination of customer groups with distinctive preferences and expectations [5]. This paper is organised into 6 sections. After the introduction in Section 1, Section 2 reviews the literature on factors effecting customer satisfaction. Section 3 presents briefly basic principles of the implemented multi-

criteria preference disaggregation approach (the MUSA method). Descriptive analysis of the customer satisfaction survey is presented in Section 4, while the main results of the application are presented in Section 5. Section 6 summarises some concluding remarks, as well as the basic advantages of a permanent customer satisfaction barometer.

II. LITERATURE REVIEW

Customer satisfaction can be considered as a valid indicator of the organization's financial viability [7]. Products need to be individualized and every customer should be approached in an individual way. This knowledge would help companies to find answers to questions such as: a) Which customers would be interested in certain types of products and services & how satisfied or dissatisfied are they b) How would a product or service be designed so as to satisfy the needs of an individual, or a group of customers c) How effective is the marketing d) Which attributes should be improved with product or service [6].

Goh Mei Ling, Yeo Sook Fern, Lim Kah Boona, Tan Seng Huat [1] compared the customer perception and satisfaction towards internet banking. The questionnaire consisted of five key factors namely service quality, web content, privacy, convenience and speed. It was circulated among working adults using simple random sampling technique. Study analysed that web content, convenience and speed have strong relationship with customer satisfaction towards Internet banking.

Johanudin Lahap, Nur Safiah Ramli, Noraslinda Mohd Said, Salleh Mohd Radzi, Razlan Adli Zain [5] examined the customer satisfaction level in hotel industry by conducting a comparative study in Malaysia. The results indicated that brand image contribute in large extent towards customer satisfaction. Through efficient branding, it is believed that proper organizational return on investment can be achieved. Moreover, the study revealed the extent of improvement needed in brand image to compete in the long run [5]. Therefore, the feedback regarding satisfaction dimensions mentioned in the previous section is a crucial input to strategic planning decisions [9], since it provides valuable information in identifying strong and weak performance criteria [10].

III. PREFERENCE DISAGGREGATION APPROACH

A. Basic Concepts

The MUSA model was initially developed to measure customer's satisfaction from a specific product or service, but the same principles can be used to measure overall satisfaction of a group of individuals regarding a specific service or operation they interact with [8]. The main objective of the MUSA model is the aggregation of individual judgements of the surveyed population in a collective manner [10]. Thus surveyed responders are asked to express on an ordinal scale their total satisfaction for each main dimension and the corresponding criteria [13].

Customer satisfaction measurements can be considered as a reliable feedback system, in the sense that it provides an effective direct, meaningful and objective way about the client's preferences and satisfactions [15]. The main features of the MUSA methodology include simplicity, friendliness & effectiveness [12]. The method considers the qualitative form of the responder's judgements and it estimates a quantitative scale that represents the collective satisfaction value of the surveyed population [13].

B. Satisfaction Analysis Results

The MUSA method evaluates the responder's satisfaction level, both overall and partially, and supplies a complete set of results that analyse in depth behaviour and expectations as follows: a) Overall satisfaction index as given in [14] is considered as the basic average performance indicator for the business organisation. b) Criteria satisfaction indices [11] show in the range 0–100%, the level of partial satisfaction of the responders for the specific criterion. c) Weights of criteria

shows the relative importance of each criterion within a satisfaction dimension.

Combining weights and average satisfaction indices, series of action diagrams can be developed [6]. These diagrams indicate the strong and weak points of customer satisfaction, and define the required improvement efforts [15].

C. Methodological Framework

The implementation of the MUSA method for evaluating the satisfaction is based on the results of a survey conducted among customers of German based elevator company. The main stages consists of the following steps: a) Preliminary analysis including face to face interviews with a target group of customers in order to define the basic satisfaction dimensions b) Questionnaire design and Administration of the Survey. c) Analysis of collected data using the MUSA model. d) Interpretation of the results derived from the data analysis.

IV. CUSTOMER SATISFACTION SURVEY

A. Satisfaction Criteria

The most important phase in the implementation of the MUSA model is the assessment of the set of satisfaction criteria and the definition of the value hierarchy. The main satisfaction criteria include: a) Personnel: skills and knowledge, responsiveness, communication and collaboration with customers, friendliness, etc. b) Products: variety, refund, cost, special services, etc. c) Image of the company: name, reputation, etc. d) Service: informing customers in an understandable way, explaining the service and other relevant factors, informing for new products, etc. d) Access: office location, Service response centre.

B. Survey Review

The customer satisfaction survey took place in Goa. Data collection was completed in individual customer offices using a simple anonymous questionnaire. Fig. 1(a) shows that among the samples collected builders with 37 percent were in the majority followed by architects with 26 percent. 55 percent of the respondents were between 41 to 55 years of age, 30 percent were between 31 to 40 years of age, and 4 percent were under 30 as indicated in Fig. 1 (b). With respect to their office location as shown in Fig. 1 (c), about 43 percent of respondents are from Panjim, about 14 percent from Mapusa, and about 11 percent from Ponda. Comparison between Satisfaction and Importance score in terms of brand, technology, appearance, quality, service processes and cost is shown in Fig. 2. Generally, customers are satisfied with the

provided services, although potential improvement margins appear in several satisfaction dimensions. In addition, cost is considered as the most important criterion by customers. Fig. 3 presents the descriptive customer satisfaction level in terms of image, quotation processing, technical support, product quality, price and customer service. Customers are satisfied in almost every criterion.

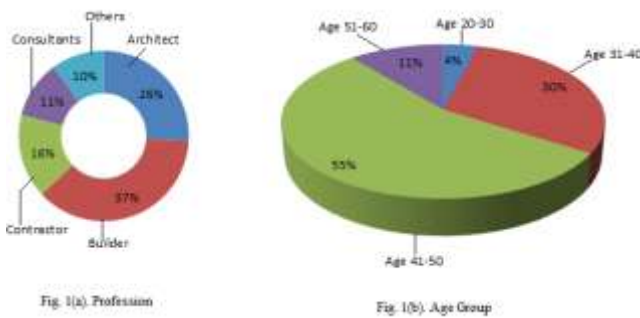


Fig. 3. Customer Satisfaction Level

V. RESULTS

A. Overall Satisfaction Analysis

Table I shows the overall satisfaction index for Personnel, Products, Image, Service and Access respectively. Weighing factor are used to define the level of importance of criteria. To obtain weighing factor individual importance score of criterion is divided by sum of weights of the criteria. A weighted score is calculated by multiplying the importance score by the weighing factor.

Table I. Overall Satisfaction Index

Attribute	Satisfaction Score	Importance Score
A. PERSONNEL		
Quality of staff	7.571428571	8.071428571
Relationship with team	8.142857143	8.357142857
Understanding your needs	8.071428571	8.857142857
B. PRODUCTS		
Our reputation/track record	7.642857143	8.285714286
Long term ability of our product	7.785714286	8.357142857
Quality of deliverables	8.071428571	8.142857143
C. IMAGE		
Exercising continual improvement	7.642857143	8.071428571
Was engineering/ Technical support knowledgeable	7.5	7.857142857
Did we proceed properly to any changes	7	8.071428571
D. SERVICE		
Responding to your needs	8.071428571	8.214285714
Timescale of deliverables	7.714285714	8.571428571
Value for money	8.571428571	8.857142857
E. ACCESS		
Our location/access to you	8.428571429	8
Handling of variations	8.571428571	8.857142857

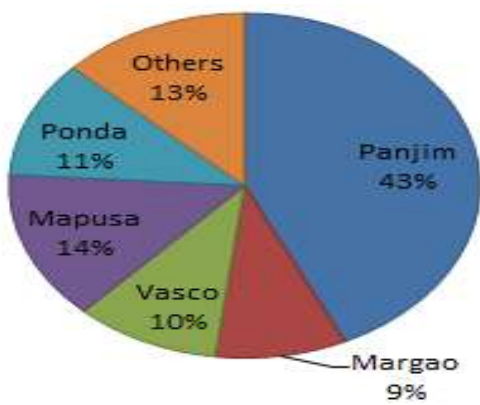


Fig. 1(c). Location

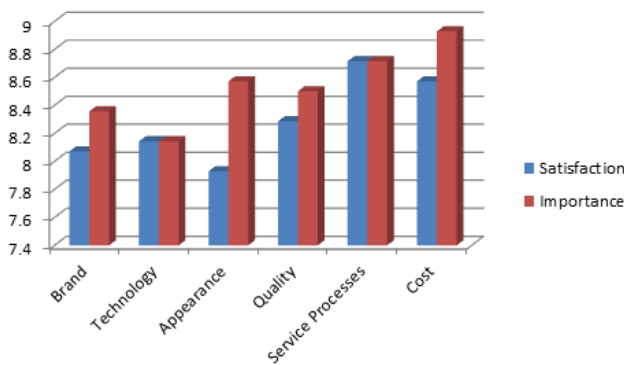


Fig. 2. Customer Satisfaction Comparison

Attribute	Importance Score	Weighing Factor	Weighted Score
A. PERSONNEL			
Quality of staff	8.071428571	6.924019608	0.558867297
Relationship with team	8.357142857	7.169117647	0.599133403
Understanding your needs	8.857142857	7.598039216	0.672969188
B. PRODUCTS			
Our reputation/track record	8.285714286	7.107843137	0.588935574
Long term ability of our product	8.357142857	7.169117647	0.599133403
Quality of deliverables	8.142857143	6.985294118	0.568802521
C. IMAGE			
Exercising continual improvement	8.071428571	6.924019608	0.558867297
Was engineering/ Technical support knowledgeable	7.857142857	6.740196078	0.529586835
Did we proceed properly to any changes	8.071428571	6.924019608	0.558867297
D. SERVICE			
Responding to your needs	8.214285714	7.046568627	0.57882528
Timescale of deliverables	8.571428571	7.352941176	0.630252101
Value for money	8.857142857	7.598039216	0.672969188
E. ACCESS			
Our location/access to you	8	6.862745098	0.549019608
Handling of variations	8.857142857	7.598039216	0.672969188
Total	116.5714286		8.339198179
Satisfaction Index			83.39%

In addition a bar chart for overall satisfaction index is shown in Fig. 4. As far as overall satisfaction index is concerned, it has relatively satisfactory value of 83.39% with margins for improvement. This is mainly due to the criterion of service, which has the highest satisfaction index (85.56%). However, customers are less satisfied with the criterion of image.

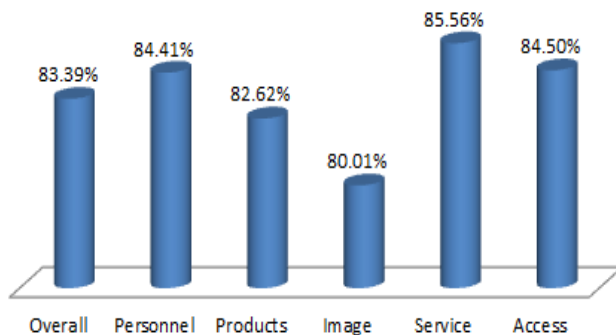


Fig. 4. Satisfaction Index

B. Segmentation Satisfaction Analysis

The purpose of segmentation satisfaction analysis is to reveal specific groups of customers with differences or similarities in relation to customer's total satisfaction. Segmentation enables us to focus sales, marketing and services effort on defined groups. Overall satisfaction index for architects & others are presented in Table II & III respectively. Architects are less satisfied as it has lower satisfaction index of 80.78%.

Table II. Satisfaction Index of Private Customers (Architects)

Attribute	Satisfaction Score	Importance Score
A. PERSONNEL		
Quality of staff	7	8.66666667
Relationship with team	8	8.33333333
Understanding your needs	7.66666667	8
B. PRODUCTS		
Our reputation/track record	7	8.66666667
Long term ability of our product	8.66666667	7.66666667
Quality of deliverables	8	7.33333333
C. IMAGE		
Exercising continual improvement	6.66666667	7.66666667
Was engineering/ Technical support knowledgeable	7	8.66666667
Did we proceed properly to any changes	6.33333333	7.33333333
D. SERVICE		
Responding to your needs	7.33333333	7.33333333
Timescale of deliverables	7.33333333	7.66666667
Value for money	8.33333333	9
E. ACCESS		
Our location/access to you	8.66666667	7
Handling of variations	8	9

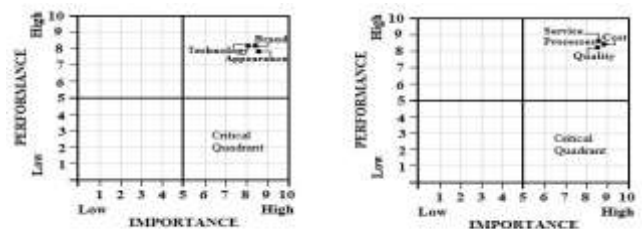
Attribute	Importance Score	Weighing Factor	Weighted Score
A. PERSONNEL			
Quality of staff	8.66666667	7.715133531	0.668644906
Relationship with team	8.333333333	7.418397626	0.618199802
Understanding your needs	8	7.121661721	0.569732938
B. PRODUCTS			
Our reputation/track record	8.66666667	7.715133531	0.668644906
Long term ability of our product	7.66666667	6.824925816	0.523244313
Quality of deliverables	7.333333333	6.528189911	0.478733927
C. IMAGE			
Exercising continual improvement	7.66666667	6.824925816	0.523244313
Was engineering/ Technical support knowledgeable	8.66666667	7.715133531	0.668644906
Did we proceed properly to any changes	7.333333333	6.528189911	0.478733927
D. SERVICE			
Responding to your needs	7.333333333	6.528189911	0.478733927
Timescale of deliverables	7.66666667	6.824925816	0.523244313
Value for money	9	8.011869436	0.721068249
E. ACCESS			
Our location/access to you	7	6.231454006	0.43620178
Handling of variations	9	8.011869436	0.721068249
Total	112.3333333		8.078140455
Satisfaction Index			80.78%

Attribute	Importance Score	Weighing Factor	Weighted Score
A. PERSONNEL			
Quality of staff	7.909090909	6.697459584	0.529708167
Relationship with team	8.363636364	7.082371055	0.592343761
Understanding your needs	9.090909091	7.698229407	0.699839037
B. PRODUCTS			
Our reputation/track record	8.181818182	6.928406467	0.56686962
Long term ability of our product	8.545454545	7.236355643	0.618377773
Quality of deliverables	8.363636364	7.082371055	0.592343761
C. IMAGE			
Exercising continual improvement	8.181818182	6.928406467	0.56686962
Was engineering/ Technical support knowledgeable	8	6.77441878	0.54195535
Did we proceed properly to any changes	8.272727273	7.005388761	0.579536707
D. SERVICE			
Responding to your needs	8.454545455	7.159353349	0.605290783
Timescale of deliverables	8.181818182	7.467282525	0.65847855
Value for money	8.181818182	7.467282525	0.65847855
E. ACCESS			
Our location/access to you	8.272727273	7.005388761	0.579536707
Handling of variations	8.181818182	7.467282525	0.65847855
Total	118.0909091		8.448106935
Satisfaction Index			84.48%

Table III. Satisfaction Index of Private Customers (Others)

Attribute	Satisfaction Score	Importance Score
A. PERSONNEL		
Quality of staff	7.727272727	7.909090909
Relationship with team	8.181818182	8.363636364
Understanding your needs	8.181818182	9.090909091
B. PRODUCTS		
Our reputation/track record	7.818181818	8.181818182
Long term ability of our product	7.545454545	8.545454545
Quality of deliverables	8.090909091	8.363636364
C. IMAGE		
Exercising continual improvement	7.909090909	8.181818182
Was engineering/ Technical support knowledgeable	7.636363636	8
Did we proceed properly to any changes	7.181818182	8.272727273
D. SERVICE		
Responding to your needs	8.272727273	8.454545455
Timescale of deliverables	7.818181818	8.181818182
Value for money	8.636363636	8.181818182
E. ACCESS		
Our location/access to you	8.363636364	8.272727273
Handling of variations	8.727272727	8.181818182

Action diagrams shown in Fig. 5 indicate current and potentially critical satisfaction dimensions. They are similar to SWOT analysis and represent strong and weak points of the elevator industry. In addition, satisfaction dimension that should be improved is also identified. Fig. 5 (a) reveals that there is no dimension in the critical quadrant and hence no immediate improvement is required. However, special attention should be paid to the criterion of appearance. Service Processes on the other hand, is a strong point and is considered to be a competitive advantage. Fig. 5 (b) shows that although appearance and cost are not located in the critical quadrant, architects are not sufficiently satisfied and therefore considered as potential critical factors.


Fig. 5(a). Action diagram for Private Customers (Overall)

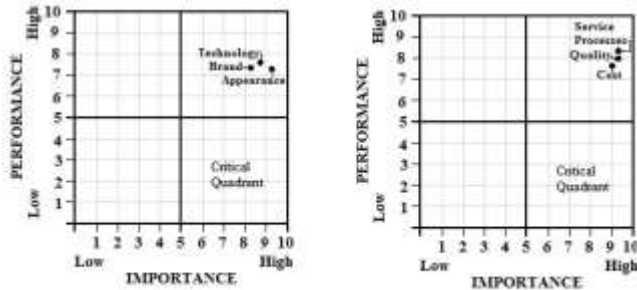


Fig. 5(b): Action diagram for Private Customers (Architects)

VI. CONCLUSION

To summarize, the paper tried to reveal the important factors which affect customer satisfaction of German based company in private elevator Industry. The MUSA methodology was used as a tool and some interesting results are analysed. According to the findings, satisfaction in customers varies in proportion to how they utilize products as well as to factors which affect total satisfaction.

The analysis presented indicates various improvement efforts that may be considered. In general, these refinement actions should be focussed on the following points: a) Special attention should be paid to the training of the personnel relative to advanced products and services. b) The Image criterion appears to have a relatively low average satisfaction index for all cases examined in this survey. So, it is a potential critical satisfaction dimension c) The Products criterion should also be considered for upgradation in terms of further enhanced looks.

Finally, as shown here it should be emphasized that MUSA method can measure and analyse customer satisfaction in a very concrete way. It can target groups through which crucial factors which affect group satisfaction can be recognized. Future research should be focused on extensions and comparative analysis between the results of the MUSA method that can help evaluation of the cost of quality.

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