Analysis on factors influencing customer satisfaction in residential building construction

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Abstract— **In the last few years, customer satisfaction have gained significant attention in construction sector. Customer satisfaction is one of the key performance indicators in order to improve quality and performance in the construction industry. Factor analysis has been used to examine factors influencing customer satisfaction in construction of residential building. This study mainly focus on finding out the main factors which may affect customer expectations in residential building construction. Twelve main factors such as facilities, aesthetics, etc. has been included in the analysis. The response are collected from customers of Er.Kandswamy constrction, karur. This paper describes the most prominent factors which influences the satisfaction of customers in case of residential building construction. This paper helps the contractors and engineers to understand the aspects which are to be given more importance in case of fulfilling customer needs**.

I. INTRODUCTION

Customer satisfaction in the construction industry can be defined as how well a contractor meets the customer's expectations. Customer satisfaction has become one of the key issues for companies in their efforts to improve quality in the competitive marketplace. It can be seen as either a goal of or a measurement tool in the development of construction quality. Customer satisfaction is considered to affect customer retention and, therefore, profitability and competitiveness (Anderson and Sullivan 1993). Methods which are commonly used for measuring customer satisfaction are customer survey, understanding expectations, assessing the competition, loyalty measurement, etc. Among which customer survey is used in this study, to collect responses from customers, which is one of the most effective method of measuring customer satisfaction. With those responses we have finally short listed few factors as the main factors which affects the customer satisfaction in construction of residential building.

1.1 OBJECTIVE

The main objective of this study is to find the main factors which influence customer satisfaction in construction of residential building.

1.2 NEED FOR STUDY

This study will help us to identify the main factors influencing customer satisfaction, which intern is also beneficial in few other aspects like reducing customer churn rate, etc.

Because customer satisfaction is a leading indicator of customer repurchase intensity and it is better to retain an existing customer than to acquire a new one. This study will help the contractor to understand the customer needs better.

II. LITERATURE STUDY

P.Meenakshi (2016) found that the increasing population growth demands a very larger area for the housing needs of people. People also prefer residing in residential complexes rather than going for individual houses. The questions for the questionnaire survey were framed by considering the points given by both customers as well as the flat promoters. The questionnaire survey was conducted among two types of customers. The first type was the customers who bought their flats for the cost ranging between 4-10 lakhs and the second type was the customers who bought their flats for 10-20 lakhs. It is found that all the parameters of flat buyers' satisfaction are significant predictors of overall satisfaction for the flat buyers. Based on the test statistics Quality of flats is the first priority for flat buyers then design of flat and service of promoters is the last rank.

Abdul Rahman et al., (2015) aims to reach the most important factors influencing client satisfaction level of performance provided by contractor in Jordanian construction industry. The results shows that there are seven extremely important factor that have a significant affect in client satisfaction level and immediately need to improve namely service quality, Communication skills, adherence to budget, safety performance, adherence to schedule, site

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personnel skills, and management capabilities. This clearly shows the two main elements that need to be considered in assessing client satisfaction levels the first one the performance of service provider second the service quality of service provider.

Nzekwe-Excel Chinney (2010) studied client satisfaction with agent based integrated model by using theoretical framework. He used team integration approach to find how interactions and relationships of agents affect overall satisfaction. He used perspectives like quality attributes in design and service for analysis and concluded that understanding client needs is paramount in decision making process and at various stages of project life cycle because it helps in aligning project outcome to client satisfaction. It involves an integrated approach that considers the entire supply chain of a construction project as a tree structure and each member of that tree as an intelligent agent. Relationships and interactions of the agents and how these affect the overall satisfaction levels of a single project, are analyzed based on current practices in client satisfaction.

Jyh-bin Yang et al., (2008) described that the success of a consulting firm depends on its ability to satisfy customer and he added that firms must redefine their bottom lines by using client satisfaction, high quality standards and profits as their top priorities in today's competitive market. He evaluated his model with reliability and validity test, mean value analysis and importance satisfaction matrix analysis. Test results show that the developed model is a feasible system. Research using this model reveals that CPM services in Taiwan are satisfactory with acceptable performance for clients. The developed model is a good reference for evaluating and assessing CPM performance.

III. METHODOLOGY

Methodology is the systematic, theoretical analysis of the methods applied to a field of study. The following flow chart shows the methodology implemented in this study Figure 3.1 represents the methodology adopted for successful completion of the project.

Fig. 3.1 Methodology Flow Chart

IV. DATA COLLECTION

Data collection is the process of gathering and measuring information on targeted variables in an established systematic fashion, which then enables one to answer relevant questions and evaluate outcomes. This chapter deals with the collection of data from literature.

IDENTIFICATION OF FACTORS

The literature were studied and the factors which influence the customer satisfaction in residential building were identified from literature and explained below:

- Quality
- Safety
- Facilities
- Privacy
- Time
- Cost
- Building Design
- Contractor
- Location of Site
- Maintenance
- Comfort
- Aesthetic

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V.   FACTOR ANALYSIS

The analysis done on the responses collected through factor survey. Nearly 130 questionnaire were distributed, from which 86 responses are obtained from the customers. The questionnaire contain 30 questions, in which each one represent a factor. Test for sampling adequacy, frequency analysis and statistical analysis are done. The test results show that the results are valid from KMO test.
KMO and Bartlett's Test

The following table indicates the Kaiser-Mayer-Olkin (KMO) measure of sampling adequacy in the study is 0.757, which was higher than the recommended minimum of 0.6 indicating that the sample size was adequate for applying factor analysis.
KMO returns values between 0 and 1. A rule of thumb for interpreting the statistic:
  ➢ KMO values between 0.8 and 1 indicate the sampling is adequate.
  ➢ KMO values less than 0.6 indicate the sampling is not adequate and that remedial action should be taken. Some authors put this value at 0.5, so use your own judgment for values between 0.5 and 0.6.

TABLE 1   KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.757
Bartlett's Test of Sphericity	Approx. Chi-Square	1189.607
	Df	435
	Sig.	.000

VI.   RESULT AND DISCUSSION

The results obtained from the total variable explained of this factor analysis shows that 30 factors are grouped into 9 components and those components are renamed for further analysis. The components which are renamed and grouped are listed below.

Table 2 Results from Total Variable Explained

GROUPED FACTOR	NEW NAME
Component 1	Orientation of building
Component 2	Contractor behavior
Component 3	Vasthu & design
Component 4	Peaceful neighborhood
Component 5	Construction cost
Component 6	Natural Lighting usage
Component 7	Additional facilities
Component 8	Future expansion

Component 9	Security

The above table is interpreted from the total varience explained from SPSS factor analysis. The orientation of building indicates ventilation and positioning of rooms, etc. The contractor behavior indicates, how well he understands customer needs and satisfy atleast basic facilities like water, electricity, etc. Vasthu and design indicates the overall effective building design. The peaceful neighbourhood indicate the locality of site, privacy in building, etc,. The construction cost must be reasonable and it should not not have high maintenance cost. The aditional facilities includes CCTV, transport facilities, etc. the natural lighting must be efficient used in building design to reduce the use of artificial light during day time, which may increase elwctricity charges. The future expansion means the recreational space near building and space for future expansion. Factor security refers to the availability of fire safety and absence of lead and asbestos, etc.

VII.   CONCLUSION

In construction industry customer satisfaction is inevitable to be fulfilled by any contractor or engineer. This study helps us to easily identify the main factors which influences the level of satisfaction of customers in construction of residential buildings. Now-a-days customers are not only expecting market value of a building but also other aspects like comfort, appearance, etc. As a result of this survey few suggestions can be given to the contractors and engineers they are as follows:
  ➢ The contractor must try to understand his customer needs properly and fulfil them along with other basic needs of a residential building like water, electricity, etc.
  ➢ The contractor must also be loyal to his client and good maintenance after construction.
  ➢ The orientation of the building should be in such a way that the building should have proper ventilation, better aesthetics, etc.
  ➢ The building should be designed in such a way that it should have correct vasthu and fit for local weather condition.
  ➢ The customer should have a peaceful neighbourhood both in terms of minimum pollution or noise level and privacy within the building.
  ➢ The overall construction cost must be low and it should be made sure that the maintenance cost of building must be considerable.
  ➢ One of the main customer expectation is that the natural lighting must be effectively used in building in order to reduce the use of artificial lights in day time and current charges.
  ➢ The residential buildings with additional facilities like CCTV, public transport, etc.

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➢ The building should have space for future expansion like recreational space, parking, etc.

➢ The residential building with 24 hour security, fire safety equipment and absence of lead and asbestos in building, etc.

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