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## **IMPROVING THE 3PS IN CONSTRUCTION WITH A FOCUS ON CUSTOMER EXPERIENCE**

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**Abstract:** Quality is gradually becoming a measure to assess organizations that will succeed in any particular industry. Quality has many definitions, but in construction, it has mostly focused on satisfying the customers' requirements. This approach to quality is focused on "technical" requirements, which may be seen as important to the project, but nowadays satisfying customers' "technical" requirements may not be enough to bring about repeat business or customer loyalty. This tends to indicate that total customer experience throughout the lifecycle of the project is essential to customer loyalty. Although Total Quality Management (TQM) emphasizes the importance of customer focus, there is limited research in the construction sector as to what customer experience involves. This research uses a qualitative approach to investigate the aspects that make up customer experience in the construction industry. It also presents various aspects that construction companies will have to plan for, to ensure that they improve the 3Ps (people, products and processes) to achieve better total customer experience. This research study provides valuable information that will enable design and construction professionals to improve quality in their projects by having an understanding of customer experience.

### **1 INTRODUCTION**

Quality has many definitions, but one thing that is common amongst all definitions of quality is its goal to satisfy the customer's need. Several researchers have investigated aspects of customer expectation and satisfaction. Most of the research on customer satisfaction is focused on gathering feedback from the customer at the end of each project work or at the end of the entire project. This can be seen as reactive and can affect the construction companies in several ways such as bad image, and no repeat business. Other researchers have focused on identifying the aspects that are essential for customer satisfaction. There is very scarce information on how and what to focus on to improve customer experience, which is a framework on improving customer satisfaction with a focus on creating better customer experience in residential construction projects. The current work intends to investigate the determinants of customer experience that construction companies should focus on to ensure that their customers are satisfied. This research primarily focuses on residential construction projects.

### **2 LITERATURE REVIEW**

Goetsch and Davis (2016) defined quality as meeting or surpassing the customers' expectation. This definition of quality highlights the importance of understanding customers' expectations. One of the most popular research was carried out by Parasuraman et al. (1985), in which they identified 10 determinants of service quality as; access, communication, competence, courtesy, credibility, reliability, responsiveness, security, tangibles, and understanding and knowing the customer. Delgado and Aspinwall (2008) presented

the three groups of quality as; corporate, product and service quality. Kärnä, (2004) proposed a framework that evaluates customer satisfaction and quality in construction projects, and it was observed that the customers had concerns with quality assurance and handover. It was also observed in the research that every negative experience by the customer, affected how they perceived the success of the project. Torbica and Stroh (2001) investigated how home buyer's satisfaction evaluated home builder' performance. They indicated that the home buyer's satisfaction was affected by the house design, house quality, and the service. Using these three variables (dimensions) and after checking for the significant variables, the researchers proposed a regression model for predicting home buyer's satisfaction as;

$$[1] \text{ OVERALL SATISFACTION} = 0.648(\text{SERVICE}) + 0.277(\text{DESIGN})$$

They pointed out that the service dimension was the most significant of all three dimensions. Forsythe (2007) proposed a framework that explains how customers in residential construction assess satisfaction. The framework was based on the theory that the difference between pre-purchase expectations and post-purchase perception throughout the project determines whether the customer is satisfied or not. Forsythe (2016) used a single case study to investigate service quality and customer satisfaction in a construction project. He found that even customers who have a price and product pre-purchase expectation, their satisfaction is still dependent on the service quality. He indicated that customer satisfaction became more dependent on service quality as the number of negative incidents the customer is exposed to increase. Maloney (2002) suggested that contractors should investigate the criteria that are important to customer expectations and develop customer expectations based on such criteria and that project management is essential for customer satisfaction. Merholz (2009) proposed a framework for building customer experience by suggesting that rather than planning for customer experience by starting their design from the systems, procedures, touch points, interactions, and experiences, the organizations should design the system by thinking of what makes a customer delighted and then design interactions, touch points, procedures, and systems that will support improving customer experience

### **3 RESEARCH PROBLEM**

There is so many research in the area of quality that is focused on customer satisfaction as was evident from the literature. Many of the research work focuses on developing frameworks for understanding customer satisfaction. Other researchers have investigated the variables or dimensions that influence customer satisfaction. There is a general agreement within the subject of quality that customer's expectation and experience determine customer satisfaction, but there is very scarce information in residential construction on how to understand customer expectation and improve customer experience. It is also important to understand the specific aspects of the project that make up customer experience. The aim of this research is to develop a framework that improves the customer experience and service quality in residential construction projects.

### **4 RESEARCH METHOD**

Secondary sources were utilized to identify several aspects that are essential to developing a framework for improving customer experience. From the work of Merholz (2009) and Parasuraman et al. (1985), it was evident that in order to improve customer experience we should focus on the 3Ps; the people that the customers come in contact with during the project, the processes that are used during the project lifecycle up to operation of the building, and finally the product. Table 1 shows the aspects of the 10 dimensions of service quality as proposed by Parasuraman et al. (1985). The development of the framework involved identifying the variables that can affect customer experience and satisfaction prior to starting the project, which includes the customer's prior experiences, and the customer's expectation. Then we identify the aspects of the construction company that the customer has to interact with throughout the lifecycle of the project. The customer experience is considered up to and including the handover and operation of the facility. This is because as noted customer experience can extend up to the warranty period (Nahmens and Ikuma, 2009).

Table 1: 10 dimensions of service quality by Parasuraman et al. (1985)

S/N	10 dimensions	description
1	Access	How easy for the client to contact the company
2	Communication	The ability to pass on information
3	Competence	The ability to perform services offered by the customer
4	Courtesy	The degree of kindness to the customer
5	Credibility	The ability to fulfill its promises
6	Reliability	The correctness of the activities
7	Responsiveness	The ability to react to issues that arise
8	Security	The ability to abide by confidentiality
9	Tangibles	The appearance of employees and facilities
10	Understanding/knowing customer	Ability to understand customers' needs

A framework for understanding customer experience throughout the life cycle of a project is to be developed by analyzing the work of Merholz (2009), Parasuraman et al. (1985) and others.

## 5 FINDINGS

All three aspects of customer experience (the 3Ps) are interdependent, but for service quality, the people and the processes used during the construction project is more important. Table 2 shows the aspects of the 10 dimensions that may be necessary to improve or enhance the customer's interaction mapped with each of the 3Ps. The construction company has to ensure that all their employees abide by all the 10 dimensions of service quality. The processes and procedures should be created in such a way that the client can easily contact the essential persons within the organization. The customer should also be able to use the processes to communicate effectively, for example, the customer should be able to book meetings using the processes agreed upon by both parties. In addition, the processes and systems should be reliable, secure and be of good appearance. For the product (deliverables), it is the expectation of the customer that it is reliable and it is of good appearance during each phase of the project. Furthermore, the presentation of the deliverables to the customer also matters as regards to creating a better customer experience. A framework for understanding customer experience and service quality was developed using previous work by Merholz (2009), Forsythe (2016) and Parasuraman et al. (1985). The framework is based on the premise that customer experience is dependent on the interaction the customer has with the 3Ps, and that the customer satisfaction is the sum of all the experience the customer had with the 3Ps throughout the life cycle of the project, that is;

$$[2] \text{ Customer Experience} = \sum (P_1 + P_2 + P_3)_{\text{Project lifecycle}}$$

Where  $P_1$  is the sum of the interactions the customer had with the contractor and other workers throughout the project lifecycle,  $P_2$  is the sum of the interactions the customer had with the processes throughout the lifecycle of the project, and  $P_3$  is the sum of the interactions the customer had with the product (deliverables) throughout the lifecycle of the project. It is worth indicating that although the product is not considered part of service quality, the customer will not be satisfied without a product that satisfies the customer's needs regardless of positive service quality. As indicated, every negative experience the customer has with one or more of the 3Ps indicated in Equation 2, the more the level of dissatisfaction increases (Kärnä, 2004). So the more positive Equation 2 is, the higher the level of satisfaction. By focusing on the 10 dimensions of service quality mapped with the 3Ps as shown in Table 2, customer experience as described in Equation 2 can be maximized.

Table 2: 3Ps and the 10 dimensions of service quality

S/N	10 dimensions	People, P <sub>1</sub>	Process, P <sub>2</sub>	Product, P <sub>3</sub>
1	Access	x	x	
2	Communication	x	x	
3	Competence	x		
4	Courtesy	x		
5	Credibility	x		
6	Reliability	x	x	x
7	Responsiveness	x		
8	Security	x	x	
9	Tangibles	x	x	x
10	Understanding/knowing customer	x		

The framework also relies on the premise that if the customer experience as indicated in Equation 2 is greater than the customer expectations then the customer is satisfied (Forsythe, 2016). Figure 1 shows the conceptual framework.

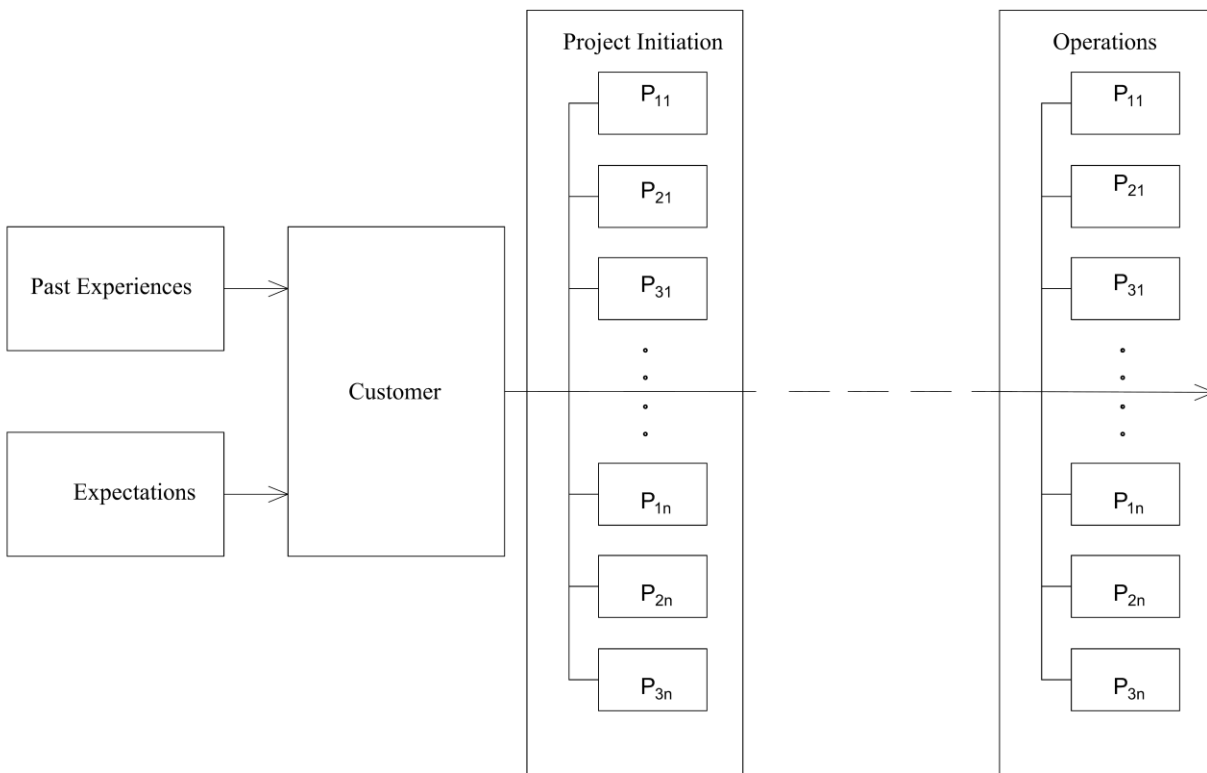


Figure 1: Framework for understanding and improving the customer experience

For organizations to effectively utilize this framework to enhance customer experience, they should understand the customer's needs and expectations and then design the 3Ps to satisfy that expectation. Figure 2 shows an approach that can be used for the implementation of the framework at each phase of the project lifecycle. The first step is to identify the customer's service needs and expectations. The second step is to identify the 3Ps that will satisfy the customer expectations based on the activities to be carried out in the project. The third step involves creating the 3Ps and creating the metrics to assess their

performance. Then the fourth and the fifth steps involve the implementation and assessment of the performance of the 3Ps in terms of the 10 dimensions of service quality, respectively. The final step is to make changes to the 3Ps if necessary.

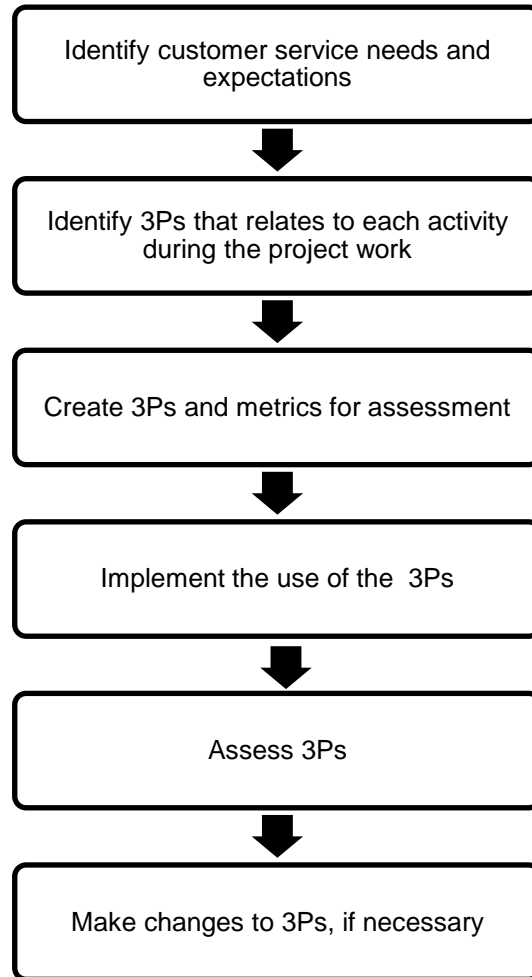


Figure 2: Steps to enhance the customer experience

Although the 3Ps will be different from project to project. Table 3 shows several aspects that relate to the 3Ps that should form the focus of Construction Company's effort during each phase of the residential construction project lifecycle. For example, the people that will be interacting with the owner (customer) during the initiation phase of the project will be the Design Consultants, and the Project Manager or Construction Manager if he or she is hired early. During this phase of the project, the project team will be utilizing their organization's policies, guidelines and information system to communicate, and gather requirements from the customer. The product or deliverable that the customer will be in contact with during the initiation phase will be the written statement of requirements, business case, and the project charter. All the aspects of the 3Ps are identified up to the operations phase since during this phase customer can still get dissatisfied with the reliability of the completed building or the services provided by the construction companies in resolving issues or warranty claims that arise during the operation of the facility. The knowledge of the 3Ps will assist the construction companies to design systems and processes to deliver quality to the customer.

Table 3: Aspects of 3Ps in residential construction (Gould and Joyce, 2014)

Phase	People	Processes	Product
Initiation	Owner, Project Managers, Design Consultants	Guidelines, information systems, QMS, requirements gathering process, communications	Statement of requirements, Business case, Project Charter
Feasibility	Owner, Project Managers, Design Consultants	Communications	Feasibility report
Design	Owner, Project Manager, Design Consultants	Progress reporting, communications, Information systems, Customer education	Estimates, Drawings, and specifications
Procurement	Owner, Project Manager, Design Consultant, Contractor, Subcontractor	Bidding Process, Purchasing Process, job organization	Personnel, Equipment, materials
Construction	Owner, Project Manager, Design Consultant, Contractor, Subcontractors	Progress reporting, communications, Information systems, Customer education, job organization, site organization/safety, quality control, Inspection	Construction deliverables
Handover	Owner, Project Manager, Contractor	Inspection/Testing, handover process, training	Warranty certificates, as-built drawings, certificate of occupancy, Inspection reports, Insurance certificates, Waivers
Operations	Owner, Contractor/Project Management firm	Issues reporting, Warranty process, checks, and other services	Fixed problems, Fixed Warranty issues

## 6 DISCUSSION

### 6.1 Quality in Construction Projects

Quality is defined in many ways depending on the context. In construction, quality is aimed at meeting and exceeding the customer's expectation. Therefore, in order to exceed the customer's expectation, we must understand various aspects of quality. During a construction project, the customer interacts with the people carrying out the construction work, the processes and the products. As the work progresses, the customer compares the interaction with the 3Ps with expectations and past experience. The difference between the expectations and the customer's perception determines whether the customer is satisfied or not (Parasuraman et al. 1985; Forsythe, 2016). Unlike in other service industries, construction projects are made up of several phases, and each phase has several activities and has several deliverables.

The framework describes that the customer starts a project with some past experiences that are accumulated from past projects even if not directly related to construction. The customer also enters into the project with some expectations that are based on past experiences, communication with other people, and idea on what the specific construction company or any other construction company can offer. The latter can be based on word of mouth (Maloney, 2002). As the customer progresses into the initiation phase of the project, there is an interaction with the 3Ps. Customer satisfaction during this phase is dependent on an assessment of 3Ps in terms of the 10 dimensions proposed by Parasuraman et al. (1985). For example, during the initiation phase of the project, the customer is assessing the competence of the project team working in the construction project. The customer is also assessing the process by which the project is

being executed. Finally, the customer is assessing the deliverables, such as business case, from that phase. The customer typically compares the experience with expectations and if the experience is less than what is expected the level of dissatisfaction starts to increase. Similarly, as the customer moves into other phases in the project lifecycle, there are repeated interactions with the 3Ps. Clearly as indicated by Forsythe (2016), as the number of negative interactions increases the level of dissatisfaction increases.

## **6.2 Application of the framework**

The framework was developed from analysis of the work done by other researchers in the past. The framework improves the understanding of customer experience during the lifecycle of the construction project. Its application is aimed at small to medium size residential construction companies. Modifications will have to be made to the proposed framework for other subsectors in the construction industry.

## **7 IMPORTANCE OF RESEARCH**

To ensure quality in construction projects, it is essential that customer satisfaction remains central to construction companies, Customer satisfaction is complex, and depends on the customer's experience during the project lifecycle. Therefore, the current research provides a framework for understanding the customer experience of a residential construction project. It exposes the 3Ps (that is, people, processes, and product) as the aspects that make up the total customer experience. This will enable contraction and the construction companies to identify and design the customer's interaction with the 3Ps so as to maximize customer satisfaction. The application of the framework should improve customer experience, customer satisfaction, customer loyalty and customer retention.

## **8 FUTURE WORK AND RECOMMENDATIONS**

This research highlights areas that are important to customer experience by proposing a framework. The research work is still ongoing and intends to investigate other areas that may be necessary to enhance service quality. It is recommended that residential construction companies identify aspects of the 3Ps that the customers are likely to interact with during the project lifecycle. The people that would be in contact with the customer should be made known of the customers' expectations and be trained on how to attend to the customers' needs in the most effective manner. The processes should be designed with the customers' expectations in mind. Information about the customer's expectation can be obtained from various means such as one on one meetings, statement of requirements, business case and other documents prepared during the early stages of the project. Finally, the client or customer's satisfaction is dependent on the success of each milestone, deliverable or activity. So it is important that the project team show successes in terms of product from each activity, phase or stage of the project.

Future work in this area involves modification of the framework for various sizes of construction projects. The framework could also be tested and modified for use in other subsectors of the construction industry.

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