

**Pre and Post Purchase Satisfaction of Industrial Buyers on Water Treatment Plant**

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**Abstract**

The present study aimed to study the relationship between the pre and post customer satisfaction as well as the (industrial) customer loyalty towards the use of Water Treatment Plant. The earlier literature focussed on Customer Satisfaction being a post purchase satisfaction. But studying only the post purchase satisfaction while studying the customer satisfaction is incomplete as there are multiple stages tangled and entangled in the purchase decision making process. In regards to Industrial Customers, Price is the main factor while making purchase decisions. As the study reveals, the WTP manufacturers have to be competitive while designing their pricing strategies. Further it is observed that when the product prices rise the loyalty of the customer gets affected resulting into decreasing loyalty from the customers. Therefore prices if at all needed to be increased should be increased cautiously. This study also concludes that Price and "After sales service" are the areas where manufacturers should focus as they are amongst the most preferred factors contributing to the customer satisfaction.

Keywords- Customer Satisfaction, Pre satisfaction, Post satisfaction, Industrial Customer

## **Introduction**

Consumer Satisfaction has won importance in the previous few years. After Liberalization Privatisation and Globalization, there is excessive competition and the whole world has emerged as a worldwide village. All of the business activities of an employer have now shifted their interest to the customer satisfaction than merely selling goods and services at an income. The attitude “Take it or go away” has become a thing of the past. Today organizations are identifying the wants and needs of the purchaser and are creating services and products as per what the consumer demands which in turn powers the organization’s income. The satisfaction concept comprises of cognitive element but it also includes an emotional element while determining the customer’s satisfaction. The organization’s today are quick to note the element playing a role in satisfying and retaining their customer. Organization’s today also draw strategies keeping the market forces, competitors changing customer base, innovations in product in view. The term satisfaction presumably leads to repeat purchases, more publicity, future acceptance of other products in the same product line and above all a loyalty towards the organization. In case of industrial buying it is important to understand what and how the individuals and groups as well as organizational dynamics come to play in making purchasing decisions for the organization. Webster and Wind (1972) have developed a model which shows the factors that determine industrial buying behaviour. The model shows “.....*The factors that determine the buying behaviour are : individual, social, organizational and environmental factors. They further broadly classified these factors as Task and Non-Task factors. Task factors or economic factor models view the organizational buyer as an economic man (that is to say, a rational buyer). Non-task models emphasize the role of personal motive in the buying process – they introduce the human elements into organized industrial buying.*

This research aims at investigating the satisfaction and loyalty of industrial water treatment plant users and buying behaviour of these industries with respect to water treatment plant (WTP).

## **Literature Review**

Anderson et al (1994) in their study have defined customer satisfaction as the behaviour or the assessment that the customer reflects after the purchase and use of the product/service. Customer satisfaction in a way also leads to customer loyalty. The major factors which

determine satisfaction leading to loyalty are quality, cost, responsiveness, openness, communication, service. Today organizations understand that markets are driven by aggressiveness. Many companies turn into aggressive marketing concepts just to make their presence felt before the customer. However, the more aggressive companies become the more critical consumer loyalty comes. In this context, organizations do find difficult in maintaining and giving the customer the satisfaction level that he aims. Increasing the quality will to a certain extent increase the satisfaction level but somewhere other costs related to the organization might crop up. The organization here might want to seek help from the satisfied customers as it will bring down the cost of attracting new customers. But dealing with customers who are dissatisfied; might have an inverse impact on the organization.

Ladhari et al. (2008) found out that customer satisfaction is positively related to the customer recommendations. They also proved that the quality of service given in restaurants has a strong relationship with the customer loyalty. Restaurants and eateries have to improve their service and should have no lacking of service for the customers. A happy customer will always bring in more customers and the restaurant will secure those customers in the long run. With the growth of eateries and restaurants, in order to manage a place in the market the eateries have to focus on two main things. One being quality the other being service. Customer satisfaction and customer loyalty will lead to the success of restaurant business. So the restaurants have to train their employees accordingly and proper evaluation of the services should be maintained timely.

Wilson et al. (1991) have brought forth a model of industrial buying behaviour and industrial customer satisfaction. The model is most helpful in categorizing and explaining organizational buyer behaviour differences. The model states that *“the industrial buying process is a series of stages (called buy phases) which may vary depending on which buying situation (called classes) the particular buying firm is confronted with. The model views organizational buying behaviour as depending on the amount of experience the buyer has with product class, the amount of information sought and the time spent on the decision. A cross-tabulation of the phases with the buy classes results in a buy-Grid-framework”*.

### **Objectives of the Study**

The research objectives of the study are

- To study buying performance of organizations with respect to water treatment plant.

- To study satisfaction level for water treatment plants in organizations from Ahmednagar and Pune Districts.
- To identify and analyze the relationship between satisfaction and loyalty for water treatment plant in specific.

### **Hypothesis of the Study**

On the basis of the above objectives, the following hypothesis are framed and tested for the study.-

**H1:** There is a significant relationship between Manufacturer of WTP (Brand) and satisfaction level of the industrial Customers.

**H2-** The form (type) of organization and buying performance of the organization is significantly associated with each other.

**H2a** - The form (type) of organization and buying efficiency of the organization is significantly associated with each other.

**H2b** - The form (type) of organization and buying effectiveness of the organization is significantly associated with each other. .

### **Research Methodology**

The study is conducted in the Ahmednagar and Pune District of Maharashtra. With the help of Maharashtra Pollution Control Board (MPCB) a list of organizations using water treatment plant in Ahmednagar and Pune is collected. A total of 264 organizations are identified from various industries and of various forms. 135 (more than 50% of total population) responses are collected and considered for data analysis. The study is mainly based on primary data, collected directly from the selected respondents (industries). The secondary data sources are used for analysing the literature and to strongly develop a theoretical base for the study. For the study 160 organizations were contacted from both cities for collecting responses. But 135 responses are collected and accurately recorded which are further considered for data analysis. Out of 135 organizations 72 are from Pune and 63 are from Ahmednagar. The Sampling approach which is followed is Purposive sampling technique. Since the population involves organizations from two cities, it was planned to involve approximately equal number of organizations from both cities. A **structured** Questionnaire was designed to collect and analyse data. The entire questionnaire of 40 items is divided in 6 parts. The first part includes forced questions which collects data regarding characteristics of the organizations. The second part is to collect information related to buying performance for

water treatment plant and it includes 7 items. The third part includes 5 items and collects information about the water treatment plant installed in the organization. Fourth and fifth subscales are used to collect responses for pre-purchase behaviour and post purchase satisfaction respectively. 4th section is made up of 9 items similarly 5th section also comprises of 9 items. Last section of the questionnaire is designed to collect responses for customer loyalty. It includes 4 questions.

Cronbach's Alpha was taken into consideration for checking the reliability of the scale.

**Table-1=- Reliability Scale of the Instrument**

<b>Subscale</b>	<b>Cronbach's Alpha</b>	<b>N of Items</b>
Organization profile, buying performance, WTP details and pre-purchase factors	.846	27
Satisfaction and loyalty	.852	13

With the coefficient value being greater than .7 the scale was considered reliable for collecting the responses from organizations.

### **Data Analysis**

Data Collected for the study is further analysed using the SPSS Version 21.0. The descriptive statistics for the items in the scale are shown below-

**Table-2 - Descriptive statistics pre-purchase behaviour subscale**

Factor considered before buying WTP	N	Minimum	Maximum	Mean	Std. Deviation
Pre_2 Cost (Price)	135	2	5	4.13	1.013343807
Pre_6 After sales service performance	135	2	5	3.93	0.971227873
Pre_7 Operation Mode (Automatic/ Semi-Automatic)	135	2	5	3.91	0.663174935
Pre_1 Reputation of manufacturer (Brand)	135	3	5	3.81	0.824044415
Pre_5 Reference from existing customers of the Water Treatment Plant	135	2	5	3.69	0.934150318
Pre_9 Water recovery rate	135	2	5	3.48	0.751633563
Pre_3 Return on investment	135	2	5	3.45	0.698810487
Pre_4 Warranty period	135	2	5	3.44	1.156852825
Pre_8 Output Capacity (litre of water)	135	2	5	3.05	0.650126492
Overall Mean				3.89	

From graph below, it is found that the highest mean (4.13) among 9 items on pre-purchase behaviour subscale is for price of the WTP whereas the lowest mean (3.05) is for output capacity of the WTP. In other words, the price was the most preferred factor while deciding to buy and output of the WTP was the least preferred factor. Overall mean for the subscale is 3.89, suggesting that all factors are significantly considered before buying decision is made. „After sales service“ was also one of the most sought factors by the organizations before buying the WTP.

Graph No 1 Factors Considered before buying WTP

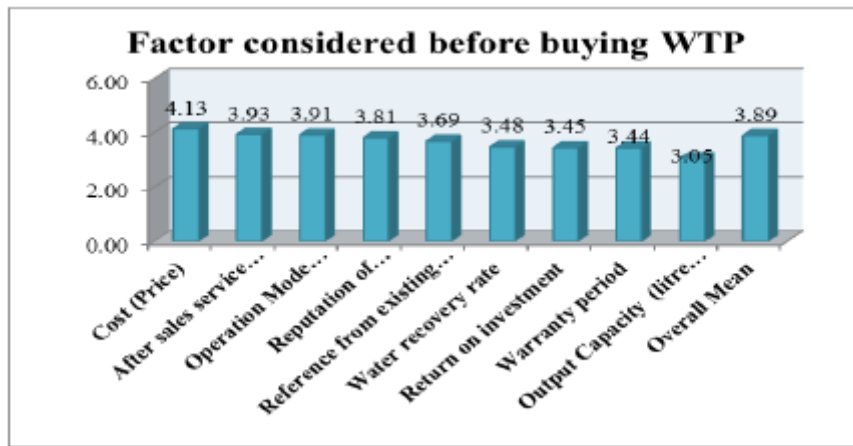
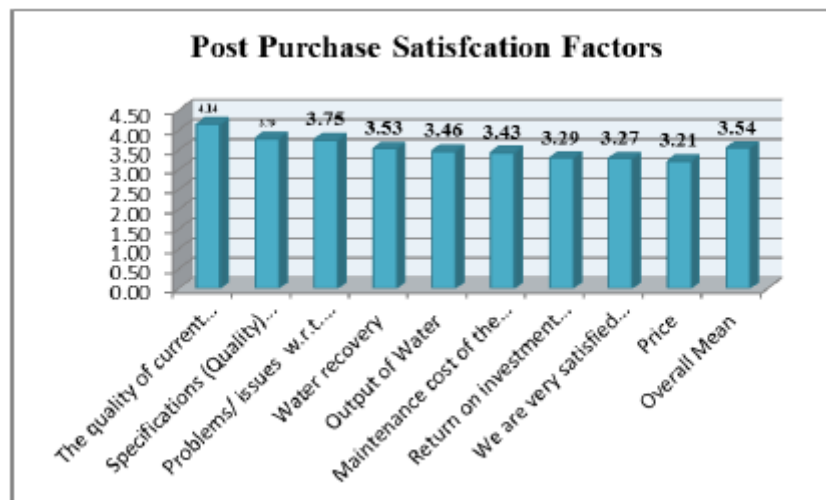


Table-3 Descriptive statistics of Post Purchase Satisfaction Factors.

Post Purchase Satisfaction Factors	N	Min.	Max.	Mean	Std. Deviation
Post_9 The quality of current Water Treatment Plant	135	3	5	4.140741	0.587976075
Post_8 Specifications (Quality) of Output water	135	3	5	3.785185	0.627541819
Post_4 Problems/ issues w.r.t. to Water Treatment Plant is addressed by the after sales service team within promised timeframe	135	3	5	3.748148	0.698810487
Post_6 Water recovery	135	2	5	3.525926	0.904628477
Post_5 Output of Water	135	3	5	3.459259	0.677605122
Post_7 Maintenance cost of the Water Treatment Plant	135	2	5	3.42963	0.777872536
Post_2 Return on investment was achieved as expected	135	3	4	3.288889	0.454934253
Post_3 We are very satisfied with the after sales service team of the vendor of the WT Water Treatment Plant.	135	2	5	3.274074	0.757348375
Post_1 Price	135	2	5	3.214815	0.603289307
Overall Mean	135			3.540741	

**Graph No. 2 Post Purchase Satisfaction Factors**

Among nine factors the factor „The quality of current WTP“ has got the highest mean value (4.34). This suggests that users are satisfied with the WTP they are currently using. The lowest mean value 3.21 is for Price factor. It indicates that users (organizations) are not very satisfied with the price they paid for the WTP. It suggests that users were expecting something more from their WTP in the price range they have paid. Overall mean value 3.54 suggests that most of the organizations are satisfied with their WTP. The second highest mean value has been recorded for the quality of output water. This means that most of the organizations are satisfied with the water output quality. After price „after sales service“ has got the low mean value (3.27), which indicates that WTP manufacturers will have to improve on their after sales service.



**Table-4- Descriptive statistics of Loyalty subscale gives insights into customer Loyalty.**

Loyalty Level	N	Min.	Max.	Mean	Std. Deviation
We are you going to recommend this water treatment plant to other organization	135	3	5	3.70	0.635681255
We will not be looking for other brands in this category of products; this brand is good enough.	135	3	5	3.59	0.639323163
We intend to buy other products of the brand if we require so.	135	2	5	3.57	0.67515328
If this brand would increase their prices we would still consider the brand for our next purchase.	135	2	5	3.00	0.762947935
Overall Mean				3.46	

**Graph No. 3 Loyalty Level**

The graph no. 3 indicates that general loyalty of almost all users is high. The statement “*We are you going to recommend this water treatment plant to other organization*” records a highest mean of 3.7 whereas the lowest value 3.00 was recorded for “*If this brand would increase their prices we would still consider the brand for our next purchase*”. From this it can be inferred that the users are loyal to the brand they are using, however they will not continue their loyalty if the price of the product is increased significantly.

### Hypotheses Testing

Total two hypotheses are framed in this research. The second hypothesis H2 is divided in two sub-hypotheses. ANOVA, Chi-square and Pearson correlation are used to test hypotheses.

H1: *Manufacturer of WTP (Brand) and satisfaction level are significantly related.*

To test this hypothesis ANOVA is run in SPSS. All 135 organizations were using one of the 3 popular WTP brand namely Thermax, Ion Exchange, Nalco. The result of ANOVA is given in table below.

**Table-5: ANOVA- Brand and satisfaction level**

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	15.742	2	7.871	29.108	.000
Within Groups	35.695	132	.270		
Total	51.437	134			

Since the p value (Significance) at 95% significance level is less than .5 (F=29.108; p=.000) the test is statistically significant. This suggests that as brand of WTP changes the mean of satisfaction also changes significantly and not just by chance. Hence the null hypothesis is failed to be accepted and therefore we accept our alternate hypothesis.

**H2- The form (type) of organization and buying performance of the organization is significantly associated with each other.**

For measuring buying performance of organizations, efficiency and effectiveness in buying WTP was investigated. To check the buying efficiency and effectiveness separate question items were designed and both of them are on nominal (categorical) scales. Therefore to test this hypothesis it was divided into two sub-hypotheses as-

**1. H2a-** The form (type) of organization and buying efficiency of the organization is significantly associated with each other.

**2. H2b.** The form (type) of organization and buying effectiveness of the organization is significantly associated with each other.

**H2a- The form (type) of organization and buying efficiency of the organization is significantly associated with each other.**

From table no. 6, it is observed that actual count and expected count of the form of organization and the time taken to buy WTP are different from each other. To check if this difference is statically significant and if there is any association between form of organization and time taken to buy WTP chi-square test is used.

**Table-6: Form of organization \* BP\_3 How long it took for the organization to buy a WT plant after having realized the need for the same. Cross tabulation**

		BP_3 How long it took for the organization to buy a WT plant after having realized the need for the same?			Total
		25-35 days	35-45 days		
Form of organization	Public	Count	18	36	54
		Expected Count	28.8	25.2	54
	Private	Count	54	27	81
		Expected Count	43.2	37.8	81
Total		Count	72	63	135
		Expected Count	72	63	135

**Table- 7:Chi-Square Tests- Form of organization & how long it took for the organization to buy a WT plant after having realized the need for the same**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	14.464(b)	1	.000		
Continuity Correction(a)	13.156	1	.000		
Likelihood Ratio	14.690	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	14.357	1	.000		
N of Valid Cases	135				

a Computed only for a 2x2 table

b 0 cells (.0%) have expected count less than 5. The minimum expected count is 25.20.

Table 7 shows that the significance value is less than .05 for Pearson Chi-square ( $p=.000$ ;  $<.05$ ) which suggest that the difference in actual count and expected count is statistically

significantly related. In other words the type of organization and time taken to buy WTP (Buying Efficiency) are significantly associated. Therefore null hypothesis is failed to be accepted resulting in the acceptance of the above mentioned alternated hypothesis.

**H2b. The form (type) of organization and buying effectiveness of the organization is significantly associated with each other.**

From table no.8 it is observed that actual count and expected count of the form of organization and „whether quality and specifications of WTP are same as that were required“ are different from each other. To check if this difference is statically significant and if there is any association between form of organization and buying effectiveness (matching expectations with actual product) with respect to WTP, chi-square test is used. Table no. 8 shows the result of chi-square tests.

**Table 8- Cross tabulation Form of organization \* the quality and specifications of the WTP are exactly the same as those required by the organization.**

			BP_5 The quality and specifications of the WTP are exactly the same as those required by the organization.			Total
			Yes	No	Can't Say	
Form of organization	Public	Count	54	0	0	54
		Expected Count	43.6	3.2	7.2	54.0
	Private	Count	55	8	18	81
		Expected Count	65.4	4.8	10.8	81.0
Total	Count	109	8	18	135	
	Expected Count	109.0	8.0	18.0	135.0	

**Table 9- Chi-Square Tests- Form of organization \* BP\_5 the quality and specifications of the WTP are exactly the same as those required by the organization.**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	21.468(a)	2	.000
Likelihood Ratio	30.616	2	.000
Linear-by-Linear Association	19.511	1	.000
N of Valid Cases	135		

a. 2 cells (33.3%) have expected count less than 5. The minimum expected count is 3.20.

Since 0 cells have expected count less than 5 the assumption of chi-square test is not violated. Chi Square Tests table suggest that the relationship is statistically significant. (p=.000; <.05).

Therefore null hypothesis is rejected and the alternate hypothesis mentioned above gets accepted.

### **Recommendations and Scope for future research**

Government should encourage the installation of water treatment plants and its use in common. Water treatment plant will reduce the water pollution by treating the polluted water and then pouring the treated water into environment. To encourage the water treatment plant installation government must employ user friendly, easy process of applying for subsidy. Some of the current users have taken benefit of subsidy. Organizations which did not install the WTP so far and which are located nearby can come together and install the same and use it as a common facility.

Organizations should improve on their negotiating skills. Most of the organizations could not get credit period of more than 1 month. If credit period is improved it will help organizations to improve their buying performance. Particularly in case of public organizations the time taken to buy and install water treatment plant was significantly high. Public organization must delegate some authorities to managers and executives in order to make organizations more competitive. Research findings show that only 33% organizations were effective in their buying with respect to water treatment plant. Rest all were not effective in buying. This calls for critical observation of the process of buying in such firms. Budget for buying must be drawn cautiously by collecting all necessary information.

Manufacturers of the water treatment plants need to promote their products through all possible channels. Organizations rely on various sources of information and it was found that no one source of information is used widely while selecting WTP brand. Manufacturers who have range of WTP in their product portfolio need to focus on manufacturing WTP of capacity in the range of 0.5 to 1 lakh litres per hr. as the demand for this type of WTP is relatively high. The findings indicated that the brand of the WTP plays important role in pre-purchase decisions. Therefore Brand building must be ongoing process for manufacturers in order to become competitive.

Many of the organizations had not given weightage to return on investments before buying the WTP. Manufacturers should educate organizational buyers in this manner so as to make them aware of return on investment done in WTP. Warranty period is the implicit factor when buying WTP. All manufacturers give warranty of minimum 1 year. In order to become

more competitive manufacturers of WTP should try to increase warranty period. Many of the respondents consider references and testimonials from existing customers. Therefore it is good idea to present references and testimonials from past buyers. It will increase chances of WTP being bought.

It was surprising to find that buyers did not consider Water Recovery Rate and Output Capacity of WTP. Manufacturers should give all relative information about rate of recovery and output capacity while making presentations. Such information may educate buyers who are unaware about such specifications. The study revealed that price plays important role for organizational buyers while making the decision about the purchase. So, the WTP manufacturers have to be very competitive in their pricing and with the increase in price of products Loyalty will be negatively. So cautions should be exercised while considering an increase in price. Many of the respondents reported that maintenance cost of WTP is neither satisfactory nor dissatisfactory. This signifies that maintenance of WTP should be focused and manufacturers should help buyers to control maintenance cost. If required training should also be given to buyers in order to make them aware about preventive maintenance of WTP. It will reduce maintenance cost significantly.

This study also concludes that Price and “After sales service” are the areas where manufacturers should focus as they are amongst the most preferred factors while deciding to buy WTP. Therefore after sales service must be prompt and all personnel of after sales service team should be well trained.

Industrial WTP users expect more in the paid price for the same. They are not satisfied with the prices they had paid for the WTP. They think that the price paid is slightly high compared with the usability of the WTP. Research is required in this area. Most of the organizational buyers are loyal to their WTP brand. No respondent said that they will look for other brand. Manufacturers should take note of it and should collect testimonial from satisfied and loyal customers. Such testimonials and references will help attract new customers. Even if the users are very loyal to the brands of WTP they are currently using, they may not remain loyal if the price of the WTP increased. This indicates that the WTP industry is very price sensitive. Manufacturers must note this point in order remain competitive. Study showed that the satisfaction is dependent on the brand/ manufacturer of the WTP. This calls for research

as to why satisfaction is a function of brands in B2B settings. Future research should consider exploring this phenomenon.

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