

A study on Customer satisfaction of post-sale services of Automobiles Companies in Patna

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ABSTRACT: Consumer Satisfaction from post-sale services provided by the Automobile companies in Patna city, is studied in the paper with the help of SERVQUAL. It is a well-known fact that the vehicle users get post-sale services from the company free of cost up to a limited time or limited kilometers. SERVQUAL model is used in the present work for better services provided by companies to the users. The primary and secondary data were used in the present study. Secondary data were collected from different reports and primary data were collected through questionnaires from 300 Respondents. Multiple Regression model was used to know the customer satisfaction and reliability of the primary data were tested by Cronbach's Alpha which comes at .816. It has been seen from the regression analysis that Reliability and Assurance parameters have negative attribute with the dependent variable i.e. customer satisfaction while the parameters like tangibility, empathy and responsiveness have a positive association with the dependent variable (customer satisfaction). The value of regression coefficient (R^2) was estimated 84 percent which indicated that all independent variables together are closely associated with dependent variable and found statistically significant at 5% level of significance. The majority of the respondents have positive responses towards post-sale services of the vehicles provided by the companies.

Keywords: Customer Satisfaction, Service Quality, Post-Sale Services, Automobile, SERVQUAL model, Multiple Regression model.

Background of the study

Indian Automobile Company

The activities of the Automobile industries involve manufacturing vehicles and their components such as engines and bodies but exclude batteries, fuel, and tires. India is the fourth largest automotive industry producing vehicles as per 2021 statistics.

The automobile industry has been recognized as one of the major drivers of economic growth in the country which divided into four categories i.e. passenger vehicles, two-wheelers, commercial vehicles, and three-wheelers with two-wheelers dominating the market.

Customer Satisfaction The term customer Satisfaction refers to customer responses after purchasing goods and hiring services from the company. Customer satisfaction is a situation where the customer expectation is to be matched with the performance of goods and services after consuming and purchasing them. It is a situation that is to be expected by customers and should be compared with the performance of goods and services. If customer satisfaction level is more than expected that means highly satisfied and vice-versa.

Customer satisfaction is individual feeling and perception towards the goods or services after purchasing in relation to their expectation and say that it is measure how much the customer is satisfied with the company's products, services, and capabilities.

Post-Sale Service -Post- Sale Service is the key factor in marketing transactions. The term Post sale service such as repair, replacement of spare parts, and smooth maintenance at lower charges. Post-sale service is common for costly and durable goods such as -Electric appliances, Refrigerators, Automobiles, washing machines, and many other domestic appliances. Companies provide effective service to the customer promptly, then customers are satisfied and take the decision to buy that product.

Service Quality-Service Quality is the major services delivers to customers within their expectation. SERVQUAL model was employed by the group of American Authors such as Parasuraman Valarie, A. Zeithamal, and Len berry in 1988 and tested the service quality of the industries/agencies. The SERVQUAL model is also known as RATER Model. R=Reliability, A=Assurance, T=Tangibility, E=Empathy, and R=Responsiveness

This paper was related to customer satisfaction and their level, which was measured with the help of the SERVQUAL model post-sale service provided by the automobile sector's for customer satisfaction level.

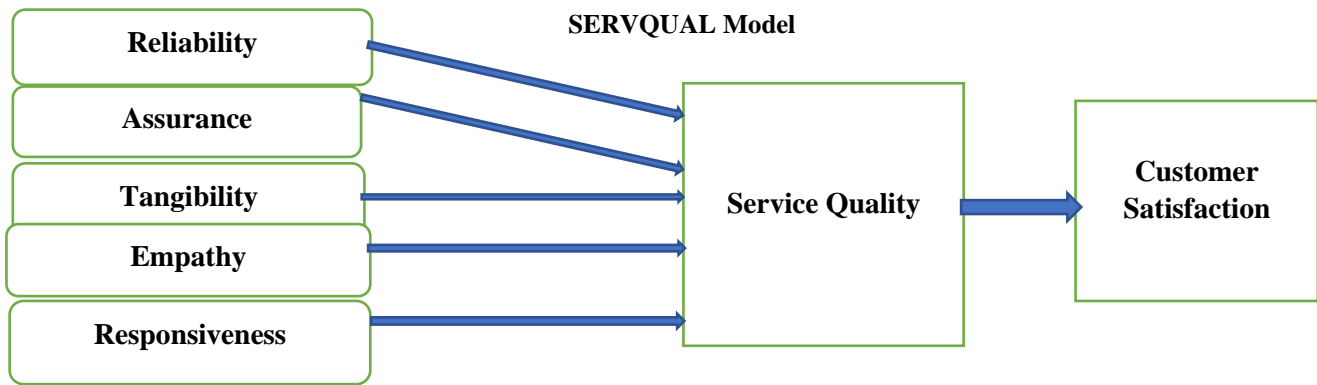
Reliability-It one of the dimensions of service quality that promises from company to customer to perform the service accurately and on time. With the help of reliability to measure whether the firm performs its promise to provide service.

Assurance-This dimension of service quality depends on the firm's employee performance that creates trust and credibility in the mind of customers. It is employees' knowledge and courtesy that create inspiring ability on trust and confidence in the customer's mind.

Tangibility-Tangibility refers to the equipment, communication, and physical appearance. It measures service equipment and physical performance and personnel appearance.

Empathy -To give individual attention and care to each and every customer. To give parity and actually needed for that service.

Responsiveness-Firm provides service instantly and promptly and helps the customer.



LITERATURE REVIEW

Amonkar. R (2016), explains how the customer is satisfied after-sale -service provided by an organization. This study basically focuses on 'Alcon Hyundai' in Goa offered after-sale service. Customer satisfaction is measured whether customers are satisfied or not and find which factor influences the customer satisfaction level after-sale service of Alcon Hyundai company in Goa studied the service of the different aspects post-sale affect customer satisfaction. Data is collected from the primary source i.e. by structural questionnaire and analyzed with the help of percentages and then after Pie-chart diagram is drawn. In this paper, the author measures the procedure of taking appointments, service timing consumption, service staff opinion, and servicing cost.

Giri. S & Thapa. K (2016), examined the relationship between customer satisfaction and attributes of after-sale service of two-wheeler brands. This is quantitative research, used quota and convenient sampling to collect the data. Collected data is analyzed through Kano Model Analysis, Correlation, ANOVA test, frequency analysis, independent sample t-test, etc. This study found that warranty, Bike wash, supply of spare parts, and service camp are the important dimension that must be required for after-sale service.

Ernest Emeka Izogo and Ike-Elechi Ogba (2014), examined the service quality impact on customer satisfaction and loyalty by using the SERVQUAL scale. Data were collected from primary sources with the help of a questionnaire using 32 items and a seven-point Likert -Scaled. The collected data were analyzed using exploratory factor analysis, Cronbach's internal consistency, and the t-test to, respectively, measure scale suitability, usability, and strength/direction of the association. The outcome of the study was the reduction of the 32 items to 26 scale items with 0.929 total scores. The outcomes show that the service quality dimensions are significant predictors of customer satisfaction and loyalty.

Gangwal .H & Awasthi's . T (2021), studied typical Indian Automobile leadership service quality levels. In this paper, service quality is measured with the help of instruments such as SERVQUAL, SERVPERF, Topsis. Data were collected from primary sources i.e. questionnaires and analyzed by statistical tools.

Sajjad .S , Sina .S, and Sepehr. (2020), identified the factor influencing customer satisfaction after-sale service provided by companies and organizations. Kano Model and SERVQUAL framework are applied to measure the customer satisfaction level after-sale service provided by the organization. RFM clustering techniques were used to analyze data on automobiles that provided after-sale service to a customer.

Noranee .S & et. al (2021), studies the relationship between the quality of service provided by the organization after the sale and the level of customer satisfaction who are customers of Orotan cars in Subang Jaya. In this paper, the SERVQUAL model is used and evaluate the customer post-sale service and also to evaluate the product quality component and the customer satisfaction. A convenient Sampling technique is used and data are analyzed in SPSS. Factor Analysis, Reliability Analysis, and hierarchical regression were used to analyze and interpret of data.

Adusei. C & et. al (2019), examined that customer satisfaction level depends on the service provided by the organization after-sale play an important role in customer satisfaction, its case study on CFAO Motor. Data is collected from primary sources through questionnaires and interviews. Kano's Model and Kendall's coefficient of concordance are used for analyzing the data. It is concluded from this study CFAO is a customer-centric organization that up long-term relationships with stakeholders to provide better performance to maintain a relationship.

Shuqin.W & Gangliu (2012), studied the five dimensions of service quality i.e. fairness, empathy reliability, responsiveness, and convenience, and three relationship quality dimensions i.e. satisfaction, trust, and commitment. This research analyzes the present situation and the development of future trends in the automobile sector after-sale service industry. With the use of Structural Equation Modelling to evaluate the relationship between service quality, relationship quality, and relationship value. Data is collected from a primary source through a valid questionnaire. SPSS software was used to construct reliability and validity. From this study, it is found that the above three service quality dimensions had a significant impact on customer satisfaction except for responsiveness. The relationship quality dimension positive effect on trust, and a positive effect on commitment but does not influence directly relationship value.

Roy Balinado . J & et. al (2021), studied Toyota Dasmarrinas -Cavite Philippines applying the SERVQUAL model and examine the factor influencing customer satisfaction that affects after-sale service in the automobile industry. By applying Structural Equation Modelling, it is to be found that reliability and empathy have a positive relationship to satisfying the customer at Toyota Dasmarrinas-Cavite Philippines and tangible, responsiveness and assurance had no positive significant relationship found in the study. By build trust in the mind of customers had a significant impact on customer satisfaction and the company.

PROBLEM STATEMENT

Are the customers satisfied by the post-sale services provided by automobile companies? The Satisfaction of the customer of vehicle users is tested by SERVQUAL Model in the present study which is related to reliability, tangibility, assurance, empathy, and responsible.

OBJECTIVES OF STUDY

1. To measure the customers' satisfaction towards post-sale service in the context of automobiles in Patna city.
2. To study the factor of the satisfaction of the customers by post-sale services.

RESEARCH METHODOLOGY

This study is based on primary data which were collected from 300 vehicle users. The list of vehicle users was prepared from Patna. The 300 vehicle users were identified for detailed data collection. The data were collected with the help of questionnaire and Google Form. The purposive sampling technique was followed for Primary data collection. Data were analysed on the basis of age group, monthly income, occupation, driving license, visit to service centre, Education level. Education index of vehicles user were also computed, and consumer satisfaction in terms of post-sale services. Multiple regression analysis was also used. The education index was developed with the help of weightage given to the different classes of formal education levels attained by a respondent. The scoring procedure is followed by *Somasundaram* (1995) was adopted. Education status refers to the sum of the educational score of family members. To categorize the sample households as per their family education status, an index was calculated by using the following formula:

$$\text{Educational Index} = \frac{\text{Total Educational Score of a family}}{\text{Number of eligible members for decision making}} \times 100$$

The satisfaction index of respondents was developed with the help of the Likert scale. The total score of individual respondents is multiplied by a hundred and divided by the number of questions of respondents. The result of the index has been considered with the help of the standard deviation and mean value of the major question reported by 300 respondents.

LIMITATION

1. Language is one of the limitations faced by investigators during data collection.
2. Cost of data collection is another limitation.
3. Lack of local cooperation of local people during data collection is also a constraint.
4. Time is one of the constraints faced by investigators during data collection.
5. Transport Infrastructure /mode of transport was a constraint faced by investigators.

RESULT AND ANALYSIS OF DATA

Table -1 Reliability Test and Cronbach Alpha

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	Number of Items
.816	.804	33

1. (Source: Author's Primary survey data)

The reliability test has been estimated/tested with the help of SPSS software. According to the above table, it has been seen that Cronbach's Alpha test was applied among 300 respondents & Reliability value of data was estimated at 0.816, which indicated that good/best fit reliability indicators was existing among the collected data which were supported by respondents.

Table:2 Summary Item Statistics

Summary Item Statistics							
	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	Number of Items
Item Means	3.842	2.000	4.1000	2.100	2.050	0.157	33

(Source: Author's Primary survey data)

3. Demographic Parameters of Vehicles users

The demographic parameters of customer satisfaction after-sales service were as follow: Gender details of vehicles users, distribution of respondents according to age group with gender, income distribution of vehicle users according to the monthly income of the respondents, education index of respondents, satisfaction index of vehicles users is used in the data. In the demographic parameter of vehicles, four tables are described i.e. sample size, education, income, gender-wise distribution of respondents, and distribution of households according to age group.

Table-3 Distribution of Sample households according to Gender

Gender	No. of Respondents
Total Male	238 (79.3)
Total Female	62 (20.7)
Total Sample Size	300 (100)

1. Source: Author's Primary survey data 2. Figures in Parentheses indicated the percentage of total

The sample size of the targeted group was 300 in Patna. The male respondents were 238 representing 79.3 percent as compared to female respondents (62) having a share of 20.7 percent

Table-4 Age-wise Distribution of respondents and their Gender

Sr No.	Age Group	Male	Female	Total
1	<20	8(2.7)	2(0.7)	10 (3.3)
2	20-29	88 (29.3)	22(7.3)	110 (36.7)
3	30-39	104(34.7)	28(9.3)	132 (44)
4	40-49	28(9.3)	8(2.7)	36 (12)
5	>50	10(3.3)	2(0.7)	12 (4)
	Total	238(79.3)	62(20.7)	300 (100)

1. Source: Author's Primary survey data 2. Figures in Parentheses indicator percentage to total

The above table shows the distribution of respondents into the five age groups. Age group 30-39 years had the highest respondents i.e. 132 which is 44 percent of the total respondents. This indicates that this age group has more vehicles and are satisfied with after sale services provided by companies.

Table-5 Income-wise Classification of Respondents

Income Range (Rs. per month)	No. of Respondents
Less than 25,000	42 (14)
Above 25,000-50,000	72 (24)
Above 50,000-75,000	124 (41.3)
Above 75,000-1,00,000	12 (4)
Above 1,00,000	50 (16.7)
Total	300 (100)

1. Source: Author's Primary survey data 2. Figures in parentheses indicates percentage to total

The above table shows the distribution of respondents on the basis of monthly income of the household, which have been divided into five categories. The third category (above 50,000-75,000) vehicles users has the highest number of vehicles among all categories i.e. 41.3 percent followed by the second category i.e. 24 percent.

Table-6 Distribution of respondents on the basis of Driving License

Driving License	No. of Respondents
Yes	238 (79.3)
No	62 (20.7)
Total	300 (100)

1. Source: Author's Primary survey data 2. Figures in parentheses Indicated percentage to total

This table revealed the details of license holders who had purchased the vehicles during the studied period in Patna city. About 80% buyers of vehicle have proper driving licence and about 20% of buyers do not obtain their driving license. It shows that maximum customers are cautious about safety and rules of the road.

Table-7 Distribution of respondents Visiting Service Centre

Going Service Centre last year	No. of Respondents
Yes	248(82.7)
No	52(17.3)
Total	300(100)

1. Source: Author's Primary survey data 2. Figures in parentheses Indicated percentage to total

The service of the vehicles is the post activity after purchasing of the vehicle by the customer. The maintenance of the vehicles is supporting the activity of the vehicles which provides the goodness of the vehicles engines as well as whole body of vehicles the timely service engine fuel, provide a better life to the engine which increases the customer satisfaction about vehicles. From the study, it has been observed that about 83 percent respondents who had vehicles were approached to service center of the vehicles as well as required /as per the schedule provided by company or agencies, at the time of purchasing of vehicles.

Table-8: Occupation-wise distribution of respondents

Occupation	Male	Female	Total(pool)
Student	52(17.3)	10(3.4)	62(20.7)
Housewife	00(0)	8(2.7)	8 (2.7)
Un-employed	18(6)	4(1.3)	22(7.3)
Self-employed	36(12)	8(2.6)	44(14.6)
Employed	132(44)	32(10.7)	164(54.7)
Total	238 (79.3)	62(20.7)	300(100)

1.(Source: Author's Primary survey data) 2. Figures in parentheses Indicated percentage to total

The above table reveals the distribution of respondents based on the nature of work doing the users of the vehicle. This table shows that majority of the users of the vehicle are doing permanent job somewhere followed by the student category. The third place is the self-employment of the vehicle users seen in both group male and female as well as in pool situations.

Table-9 Level of Education of the Respondents

Education level	<20		20-29		30-39		40-49		>50		Total
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	
High School	2(0.7)	0(00)	6(2)	0(00)	8 (2.7)	0(00)	2(0.7)	0(00)	0(00)	0(00)	18(6)
Intermediate	2(0.7)	0(00)	10(3.3)	4(1.3)	12(4)	2(0.7)	4(1.3)	0(00)	0(00)	0(00)	34(11.3)
Graduation	4(1.3)	2(0.7)	18(6)	6(2)	18(6)	4(1.3)	6(2)	2(0.7)	2(0.7)	0(00)	62(20.7)
Post-Graduation	0(00)	0(00)	24(8)	8(2.7)	28(9.3)	8(2.7)	6(2)	2(0.7)	4(1.3)	2(0.7)	82(27.4)
Professional Course	0(00)	0(00)	30(10)	4(1.3)	36(12.7)	14(4.6)	10(3.3)	4(1.3)	4(1.3)	0(00)	104(34.6)
Overall	8(2.7)	2(0.7)	88 (29.3)	22(7.3)	104(34.7)	28(9.3)	28(9.3)	4(2.7)	10(3.3)	2(0.7)	300(100)

1.(Source: Author's Primary survey data) 2. Figures in parentheses Indicated percentage of total

The above table reveals the Education level of the male and female members of the respondent's families according to age groups. It is observed from the table that the majority of respondents (44 percent) having their aged 30-39 years and have a better education level than that of other age group respondents. It is further noticed among different education levels of respondents the majority of vehicle users (34.6 percent) respond having professional courses i.e. B.Tech, M.Tech in Patna city, followed by 27.4 percent and 20.7 percent post-graduation and graduation courses respectively.

Education index of Vehicles owners

The education index has been calculated

Family Education Index (FEI)=Total education Score of a family / Driving member of the family*100

Table- 10 Education Index of Post-sale service of vehicle users n =300

Group/Category	Education Index Value	Respondent
Low	Less than 158.45<	28(9.3)
Medium	>158.45 to 333.49	208(69.4)
High	>333.49	64(21.3)

1.Source: Author's Primary survey data 2. Figures in parentheses Indicated percentage of total

The Education Index of the vehicle owner was estimated with the help of the weightage score given to the different levels of education. Based on the results vehicle users were classified into three major groups i.e. lower group has an index value of less than 158.45, the middle group of vehicle users has an index value between 158.45 to 333.49 while the high group has an index value of more than 333.49. It is further seen from the above table that the majority of vehicles user belong to the middle education index group, as the counterpart of other groups. This indicated that in the study area majority of the population has good quality of education which may reflect better maintenance of the vehicle.

Regression Model of Post-sale service of vehicle users

The algebraic form of Linear Function

$$Y=f(X_1+X_2+X_3+X_4+X_5+\dots+X_n+\epsilon)$$

Whereas, Y=Dependent Variable, f=function, $X_1, X_2, X_3, \dots, X_n$ =Independent variables

$\beta_1, \beta_2, \dots, \beta_n$ =Correlation Coefficient, ϵ =Error

Y=Customer Satisfaction weightage score (Post service of vehicles) (CSWS)

X_1 =Reliability weightage score of Customer view (RWSC)

X_2 = Assurance weightage score of Customer view (AWSC)

X_3 = Tangibility weightage score of Customer view (TWSC)

X_4 =Empathy weightage score of Customer view (EWSC)

X_5 =Responsiveness weightage score of Customer view (ResWSC)

ϵ = Error

Multivariate Regression Model Equation

$$CSWS = \beta_1 RWSC + \beta_2 AWSC + \beta_3 TWSC + \beta_4 EWSC + \beta_5 ResWSC + \epsilon$$

Satisfaction Index of Post-sale service users

Maximum= Mean + SD

Minimum= Mean - SD

The formula used for the satisfaction Index of post-sale service

Consumer satisfaction Index (CSI)= Total score consumer of the respondent/No. of major factor *100

Table-11 Satisfaction Index of post-sale service of vehicles users (n=300)

Group	Satisfaction Index Value	Respondent
High	>2385.49	30(10)
Medium	2385.49 -2170.51	210(70)
Low	<2170.51	60(20)

1. Source: Author’s Primary survey data 2. Figures in parentheses Indicated percentage to total

The Consumer Satisfaction Index was developed with the help of service quality parameters and provided the weightage scale to individuals. The Service quality parameters of the vehicle are Reliability, Assurance, Tangibility, Responsiveness, and Empathy. From the above table, it has been observed that majority of respondents come in the medium satisfaction groups (70 percent) followed by low satisfaction group (20 percent) and then high satisfaction group (10 percent). This indicated that the majority of vehicle consumers were satisfied with the quality of vehicles and their performance. This may affect the sale of company vehicles and the promotion of company vehicles at a faster rate.

ANOVA Table -12 : Regression Model of vehicles users

	Df
Regression	5
Residual	254
Total	299

(Source: Author’s Primary survey data)

Table -13 Multi-Variate Regression Model of Post-sale service of vehicles users

S.N	Intercept/Constant	RWSC(X ₁)	AWSC (X ₂)	TWSC(X ₃)	EWSC(X ₄)	ResWSC(X ₅)	P.Value	R ²
Variables	-5.65924 (0.788522)	*** 0.52534 (0.035542)	*** -0.48269 (0.034002)	*** -0.27677 (0.025598)	*** 0.163176 (0.02964)	*** 0.755016 (0.027326)		** 0.811492 (0.44715)
D.F							294 T.Estimate ** 2.73	
Observation							300	

1.(Source: Author’s Primary survey data) 2. Figures in parentheses indicated standard error (3)*** star indicated =1 percent level of significance, **star indicated=5 percent level of significance, *star indicated=10 percent level of significance.

The multiple regression model was used with the help of MS Excel 2019, to observe the effect of independent variables i.e. RWSC(X₁), AWSC (X₂), TWSC(X₃), EWSC(X₄), ResWSC(X₅) on dependent/explained variable (consumer satisfaction i.e. CSWS). The regression value shows that the regression coefficient (R²) having 81 percent effect on a dependent variable with 5 percent level of significance. It shows a close relationship with explained variable i.e. customer satisfaction. RWSC and TWSC attributes are playing negative role in the satisfaction of customers while RWSC, EWSC, and ResWSC have a positive association in the satisfaction of customers from post-sales services. However, the reliability and assurance condition has the scope for improvement at both levels i.e. agency as well as the company who is producing the vehicles. This may be advisable to improve such condition for betterment of the vehicles, publicity in the form of good nature and durability

FINDINGS

The result of 300 vehicle owners who had obtained the post-sale services from the vendor company or agency is presented in the manuscript. The respondents are divided into two groups male and female. It is further seen from the study that the majority of the vehicle owners belongs to the age group of 30-39 years followed by the age group in between 20 to 29 years. It is necessary to mention here that a higher number of vehicle user has professional education followed by post-graduation education. The education index of vehicle users was developed and found that the majority of the vehicle users come in the medium education index. While the minimum number of respondents comes under the lower category of the education index. The consumer/users satisfaction index was also developed which shows the feeling and opinions about post-sale services of the companies/agencies. The household/respondents were classified into three major groups i.e. lower, medium, and high value of the index. The study revealed that the majority of respondents (210) belong to medium level satisfaction index with the consent of vehicle users facilities and utility got in by households from the companies or agencies. The result of the regression analysis shows that the Reliability and Assurance parameters have a negative attribute with the dependent variable i.e. customer satisfaction while the other parameters like tangibility, empathy, and responsiveness have a positive association with the dependent variable (customer satisfaction). The value of regression coefficient (R²) was estimated at 84 percent and indicated that all the independent variables together were closely associated with dependent variable and found statistically significant at 5 percent level of significance. The majority of the respondents have positive responses towards post-sale services of the vehicles provided by the agencies.

CONCLUSION & SUGGESTION

From the analysis, it may be concluded that the majority of the respondent belongs to the medium group of the education index. The same situation was observed in the case of the consumer satisfaction index. It is further seen from the result of the study that customer satisfaction which is affected by the parameters like tangibility, empathy, and responsiveness positively and closely associated with the dependent variable. The value of regression coefficient (R²) was estimated at 84 percent and found statistically

significant at a 5 percent level of significance. The majority of the respondents have positive responses towards post-sale services of the vehicles provided by the agencies. In spite of all the above facts, there is scope for better post-sale services for vehicle users which may be needed to improve at the level of the agency/company.

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