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Prediction of Brand Equity Determinants in Paints Industry

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Abstract

This research attempts to predict brand loyalty of contractors / painters in the commercial paints industry based on eight predictors. These predictors are identified as factors contributing to brand loyalty. Analytic Hierarchy Process (AHP) is used to rank the predictors. Factors having their priority vectors greater than 10% are selected for further analysis. This study uses Discriminant Analysis on primary data to examine whether the predictors are capable of classifying the respondents into two distinct groups – those who show signs of brand loyalty vis-a-vis those who do not. Five-point Likert scale was used to collect responses for each parameter. Five out of eight predictors are finally selected for Discriminant Analysis to determine if it is possible to distinguish the two groups significantly. Responses reveal that there exists a significant difference between the two groups based on the predictors. This is an ex-ante decision model that can be used for anticipating brand loyal behaviour of the consumers in future. This work is one of the very first studies performing research on the classification variables of brand loyalty in the paints industry and intends to bridge the gap between theory and practice to aid the practitioners decide on suitable strategies to augment their brand loyalty.

Keywords: Consumer Marketing, Brand Loyalty, Analytical Hierarchy Process, Discriminant Analysis, Classification Technique, Prediction.

1. Introduction

Loyalty marketing has recently gained a lot of momentum worldwide. Indian companies in most sectors are researching and implementing strategies to retain brand loyalty. Several loyalty programs are designed to aim at cultivating strong relationships with repeat customers. This paper has freshly attempted to study the paints industry's emphasis on brand loyalty in the context of the Indian market. This study is done to explore the predictors of brand loyalty of the contractors and painters who act as major influencers for the household end user. Major paints companies vie for the brand loyal contractors for repeat purchase offering them with several promotional services. The main challenge for companies is to retain contractors from switching to its competitors during repetitive bulk purchases. Therefore it is a prerogative to offer lucrative deals to retain loyalty. This research work provides an insight into whether these predictors can ascertain the possibility of brand loyalty of the contractors in the industry.

Analytic Hierarchy Process (AHP), one of the multi-criteria decision making (MCDM) techniques, has been used to rank such predictors as per their importance and priority (Saaty, 1980). The priority vectors or weights of the predictors quantitatively indicate their importance and impact on the evaluation result (Vinogradova et. al., 2018). Predictors having insignificant weights (<10%) are discarded for further study. The predictors are further checked with the help of Discriminant Analysis whether they are capable of classifying the respondents in two distinct groups – high intention of brand loyalty and low intention of brand loyalty. Brand loyalty is a categorical dependent variable captured by binary options of repeat purchase or not (1, 0). The predictors having significant weights are the independent variables. Based on the analysis, the findings and various recommendations are made to help the management improve their practices and assist them in making effective relationship with contractors and painters. The subsequent sections review the related literature on the predictors, AHP and Discriminant Analysis, and then hypotheses are developed based on which the research model is established. Based on the analysis and findings, implications are derived for industry practitioners.

2. Literature Review

A review of literature unearthed eight predictors or variables that can be identified as possible discriminators. These are preview (P1), free sampling (P2), offer price (P3), perceived brand value (P4), training (P5), attractive schemes (P6), membership/loyalty programs (P7) and word of mouth (WOM) communication (P8) (Hirschman, 1970; Steven Podoshen, 2006; Familmaleki et al., 2015; Dawes, 2018). This study also reveals an analysis of

whether the said parameters are used to classify the sample elements into two distinct groups – willingness to purchase again vis-à-vis unwillingness to purchase again, depending on whether the customer is loyal to the brand. The predictors were prioritized using AHP by taking the opinions of experts from the industry and further study was conducted with the help of Discriminant Analysis on the primary data collected from contractors and painters. The eight predictors identified are discussed in the following paragraphs.

A preview facility brings value and convenience reflecting a strong customer orientation of the company. It is a practical way of drawing attention of busy yet quality conscious consumers to cater to their varied tastes and preferences. Latest simulation software if used can make it easy for consumers to create and experiment with different colour schemes on photographs of their home. This helps them pick the right combination before the actual painting, allowing them to create the perfect look for their living space. The idea of offering free sample is that it reinforces actions closely resembling the desired action (Lammers, 1991). Offering free samples tends to bring about operant conditioning of a probability of repeat purchase. In this study, sampling is a form of moulding the actual action of product purchase. The self-perception theory on the other hand, speaks of the consumer going through a formation process of self-perceptions and attributions. For instance, consumers accept free samples only if they want to try it out. Eventually they perceive themselves as actually willing to purchase the product when opportunity presents itself. This is in fact a case where sampling is assumed to produce positive experience. Sampling benefits can alternatively be looked as a "foot-in-the-door" phenomenon, the rationale being, if a customer has sampled the product in a smaller quantity, he has more probability of using a larger quantity. The Attribution Theory states that using sample may prompt in increasing the need for consuming the product. A free paints sample may accentuate the cues associated with the painting of homes, such as the change in look and feel of the painted space. If the cues are positive, customers are more likely to purchase the paint. In this paper, free sample was hypothesized as a predictor leading to increased repeat purchase of paint.

Berkowitz & Walton's (1980) seminal research showed how discount in price effectively induces sales. Study by Bitta & Monroe (1981) found that reducing price (of a product with a higher regular price) in form of discount increased consumers' perception of value for the product compared to a product with low price. Price cuts at particular intervals entice the users (contractors and painters in this case) to stock the brand and induce repeat purchase. Brand loyal contractors can expect a customized offer price especially on bulk purchases as an appreciation to their loyalty (Shukla, 2009). Discounted offer price also helps in reclaiming back any estranged contractors. Since the cost of attracting new customers is very high, companies must emphasize on establishing customized relationships (Casalo, 2008). This is especially true for the paints industry whose nature of purchase is in bulk amount. If a company's brand equity is high, its consumers believe important differences existing between this brand and its competitors in the same product category (Keller, 1993; 2009). Previous studies report that promotional offers on a brand slightly increase the probability of buying it again later. Associations with brand based on strong positive and exclusive grounds can be conducive towards brand loyalty (Khan et al., 2012). Although authors like Aaker (1996) consider loyalty as a dimension of brand equity; Keller (1993, 2009), in his works hypothesizes brand loyalty as a result of having a strong perception of brand value. Therefore perceived brand value is considered as a predictor variable of brand loyalty rather than a dimension of it.

Contractors and painters are attracted to take training for developing skills and knowledge so as to improve capability, capacity, productivity and performance and get involved with repeat purchase as a part of a streamlined process (Carlson, 2018). This is an important and futuristic predictor since most companies are moving towards a future that supports the development of collaborative consumer. It is the firm's prerogative to design engaging schemes that build and sustain brand loyalty. Various attractive schemes are adopted to earn brand loyalty (Uncles et. al., 2003). These schemes direct an intended behaviour towards the brand and/or its services. The primary task of these schemes is to provide with higher barriers to switch and no real alternatives to the services provided along with the product. Training is a domain of co-creation between the company and the users. Company training enhances some brand-specific skills which are acquired and retained after sessions are over. Switching to another brand can again lead to acquiring new skill for different application techniques (Apenes Solem, 2016). That brand therefore becomes more useful than other brands. This implies that consumers will switch brands only if they have to; due to substantial difference in costing. This theory is affiliated to standard search theory.

In order to retain customers with varied interests, membership/loyalty programs can play an active role as a point of differentiation. This is an effective business strategy to tap into the consumer's state of mind. If designed and implemented properly, such programs can be easily integrated with the repeat purchase of the product.

The programs and offerings need to be personalized depending on the frequency of usage. The rationale is similar to that of airlines offering frequent flyers with hotels, car rental and credit card facilities (Ou et. al, 2011). Word of mouth communication becomes an effective promotional tool when credible influential sources spread the word or message of the organisation and present the value proposition of the product successfully and accurately to the target consumer. The primary motivation behind this scheme is for others to inform potential consumers of the product about how the same can be beneficial for them to purchase. This paper verifies word of mouth communication as a parameter for intention to stay loyal – an attitudinal concept, for brand recommendation and repeat purchase (Wallin Andreassen & Lindestad, 1998). Conceptually, word of mouth strategies seek to build a durable network of customers.

The eight predictors under study can have subjective or objective weights. It is a common practice to use subjective weights determined by experts in the field. Several experts take part in determining the weights of the criteria simultaneously. These weights often play a significant role in prioritizing the criteria because they include the opinions of highly qualified experts with extensive experience. One such method used in ranking the categories is the AHP (Vinogradova et. al., 2018). AHP is a MCDM model developed by Thomas Saaty in the 1970s. This technique is based on pair wise comparisons and depends on the ability of human judgment to construct hierarchical perception of a multi-criteria problem. (Setiawan et al., 2014). AHP is used by researchers to determine the relative weights of the criteria through pair-wise comparisons and determination of relative priority of each criterion in a consistent way (Saaty, 1980). Wind & Saaty (1980) have reviewed applications of AHP in marketing such as portfolio decisions and desired target portfolio, directions for new product development and evaluation of marketing mix strategies. Zahedi (1986) has provided one of the earliest reviews of AHP. She has outlined four decision steps of AHP and categorized the diverse application fields of AHP in terms of evaluation, selection and prediction. Forman & Gass (2001) have discussed applications of AHP for decisions such as choice, prioritization and evaluation. Recent studies on AHP have been provided by Vaidya & Kumar (2006) and Sipahi & Timor (2010). One of the main strengths of AHP is its ability to consider subjective opinions of decision-makers (Ravikumar et al., 2013). In this study, AHP has been used to evaluate the priority vectors or weights of the predictors and the more significant ones (weights > 10%) have been retained for subsequent study.

Customer participation for the paints industry is crucial in the sense that contractors and painters act as a significant facilitatory role at the point of repeat bulk purchase. The predictors described above are all used for a prediction model to assess the brand loyalty for the company. Kočišová and Mišanková (2013) use Discriminant Analysis to find out impending problems in the company and to warn owners of the company and company´s business partners before the threat of bankruptcy. In the Discriminant Analysis literature one can find several studies used for both ex-ante and ex-post analyses, although this article tries to utilise the survey data for an ex-ante prediction model. Satisfaction from previous experiences (Oliver, 1980), attractive deals, discount offers etc. precede and influence repeat purchase oriented brand loyal attitude. Therefore, an accumulative satisfaction means that customers rely on multiple parameters in developing motive for repurchase decisions (More & Little, 1980). Out of many prediction models, this paper bases its construction on Discriminant Analysis. Discriminant Analysis is an appropriate classification technique based on a complex multidimensional phenomenon (Aurier & Séré de Lanauze 2012; Alayande & Adekunle (2015) centered on the concept of loyalty. In this paper, the term prediction of brand loyalty is perceived by the action of repeat purchase.

3. Research Framework

A firm that is primarily in the business of commercial paints has to provide with ancillary services as well in order to create long-term brand association. So it is imperative for such firms to target at creating and maintaining relationship network with customers and to tap into the factors that build and sustain brand loyalty. The value of the product increases if the company involves its users in co-creation; recognizing their engaging roles in value creation (Ranjan & Read, 2014). Most companies in this industry are plagued with two major issues. One issue is poor retention of quality resources and the other aspect is poor scheduling of job projects. These issues result in dissatisfied customers leading to lack of repeat contracts. It is quite natural that dissatisfied customers will also lead to low word-of-mouth referral rate. Implementing certain consumer marketing strategies can improve upon these issues to gain market share in India. This study attempts to test the effects of the above mentioned factors on brand loyalty in an organization. The management would like to observe the factors/promotional tools that discriminate those who have high intention of brand loyalty from those with low intention, the rationale being, once this can be identified, some intervention measures can be put in place

to enhance the brand loyalty. Fig. 1 provides the research framework of this work.

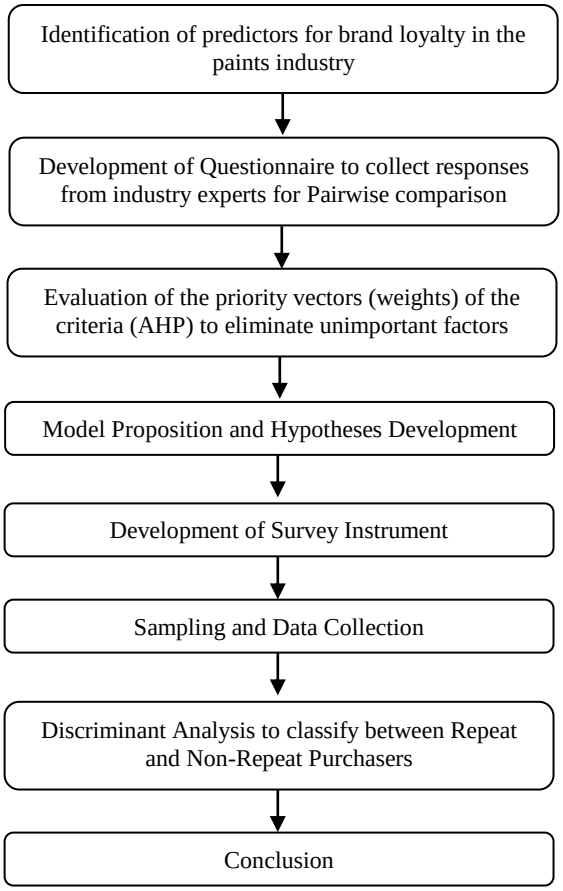

Fig. 1 Research methodology outline.

Ranking of the predictors has been performed by utilizing Saaty's 9 point scale (Saaty, 1980) to develop the comparison matrix. A questionnaire was developed to collect the responses on the eight factors from industry experts. The respondents were required to evaluate the predictors with respect to their importance and applicability in deciding repeat purchase in the paints industry. The respondents were thoroughly briefed about the predictors. The final aggregate Pairwise Judgemental Matrix (Table 1) is developed on the basis of the collected data.

The priority vectors of the top five predictors, namely, perceived brand value (P_4), preview (P_1), word of mouth communication (P_8), training (P_5) and free sampling (P_2) are 0.287, 0.187, 0.144, 0.110 and 0.102 respectively. These predictors can thus be ranked in the order 1, 2, 3, 4 and 5. Consistency Ratio (CR) is found to be 0.0997. As per Saaty (1990), value of CR<0.1 represents that the obtained comparison matrix is significant. It is observed from Table 1 that the predictors namely, offer price (P_3), attractive schemes (P_6) and membership/loyalty programs (P_7) have insignificant weights (less than 10%) and are thus eliminated for further study.

Several authors (Fornell et al., 1996) have suggested the cumulative effect of multiple predictors for the customers' satisfaction as better than studying future customer behaviour in a specific dimension. A single variable will fail to capture all aspects of the repeat purchase behaviour. A customer goes through a process while becoming loyal to a brand (Oliver, 1999). So, in developing our hypothesis, a few variables are considered that tap into customer loyalty in a cognitive sense such as word of mouth communication and positive experiences with free sampling of the brand. A few variables are considered which cater to loyalty in an affective sense, a situation where a consumer is engaged with the brand such as training, previews and loyalty programs. Positive responses to attractive schemes and offer price discounts also reflect a customer's willingness to repurchase, and recommend the brand. Loyalty is subsequently verifiable in terms of the observed and actual repurchasing of the brand. Discriminant Analysis is used to predict the loyal user of paints from a non-user. It is assumed that the sample comes from a normally distributed population. Dependent variable is a nominal variable with 2 levels/categories:

Repeat purchase (Brand loyal user) = 1

Non-repeat purchase = 0.

Based on the results of the AHP, the five hypotheses (Figure 2) are formulated as stated below.

H_1: Preview is a good predictor of repeat purchase.

H_2: Free Sampling is a good predictor of repeat purchase.

H_3: Perceived Brand Value is a good predictor of repeat purchase.

H_4: Training is a good predictor of repeat purchase.

H_5: Word of Mouth Communication is a good predictor of repeat purchase.

Table 1 : Final aggregate Pairwise Judgemental Matrix along with Priority Vectors

	P1	P2	P3	P4	P5	P6	P7	P8	Priority Vector (Weights)
P1	1.000	2.750	5.000	0.469	1.500	6.250	3.000	1.375	0.187
P2	0.364	1.000	2.375	0.396	1.875	3.125	1.375	0.479	0.102
P3	0.200	0.421	1.000	0.153	0.354	0.126	0.285	0.375	0.034
P4	2.133	2.526	6.556	1.000	3.375	6.750	4.500	2.000	0.287
P5	0.667	0.533	2.824	0.296	1.000	3.875	2.125	1.125	0.110
P6	0.160	0.320	7.937	0.148	0.258	1.000	0.223	0.146	0.056
P7	0.333	0.727	3.504	0.222	0.471	4.486	1.000	0.500	0.080
P8	0.727	2.087	2.667	0.500	0.889	6.857	2.000	1.000	0.144
Total	-	-	-	-	-				1.00

P1: Preview P2: Free Sampling P3: Offer Price P4: Perceived brand value
P5: Training P6: Attractive schemes P7: Membership/loyalty programs P8: WOM communication

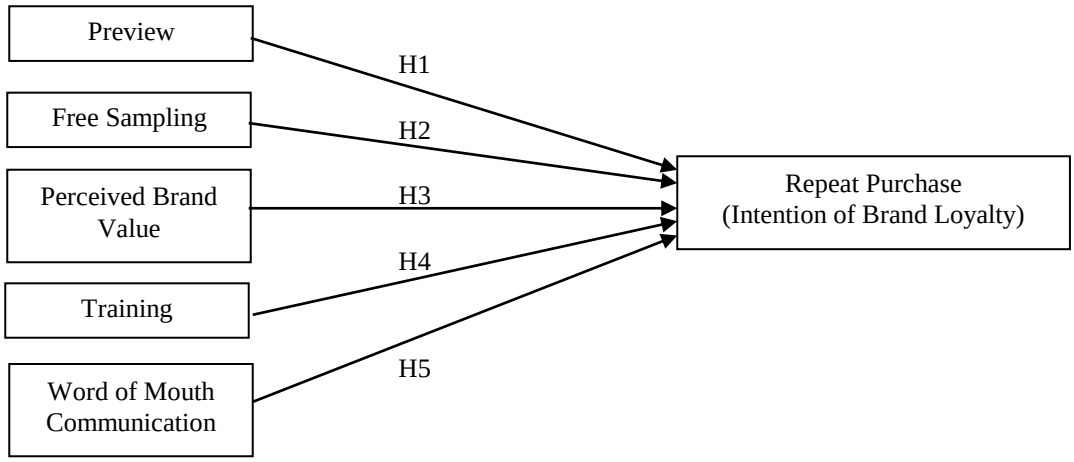

Fig. 2 The research model.

4. Analysis and Findings

An extensive questionnaire was designed to capture the responses on the selected five predictors, namely, preview, free sampling, perceived brand value, training and word of mouth communication. Five-point Likert scale (1 = Strongly disagree, 2 = Disagree, 3 = Indifferent, 4 = Agree, 5 = Strongly agree) was used in the present study to get the responses for each item on the perception about the importance/significance of a predictor involved in determining brand loyalty. The empirical research is focused on the painters and contractors in India. A total of 76 respondents were contacted out of which 60 usable filled-in (complete) questionnaires were received, ignoring 16 questionnaires consisting of missing responses.

Based on the hypothesis defined above an attempt is made to investigate whether the selected predictors help to classify the respondents in two distinct groups – brand loyal or not. The analysis can be organized by separation, discrimination, estimation and finally classification. The two groups can be separated by determining the intergroup differences in terms of mean vectors. The discrimination is based with respect to dimensions and can be attributed to the predictors acting as discriminators. The model estimates inter-population distances (between mean vectors) with the extent of association between the predictor variables and group membership. The respondents are classified to a particular group as per predetermined Likert scale scores. The conducted Discriminant analysis performs one Discriminant function as it is a two group analysis. Due to this, it is expected to distinguish between the customers showing more inclination towards brand loyalty and less intended ones. Table 2 shows the estimation of the Discriminant function according to the means of the canonical predictors. It is evident from the table that the less brand loyal customers contribute to the canonical function to a higher degree.

Table 2. Results of Discriminant Analysis

Eigen Value	48.061				
Box M	42.33*				
Predictors	Preview (P_1)	Free Sampling (P_2)	Perceived Brand Value (P_4)	Training (P_5)	WOM (P_6)
Wilks' Lambda	0.20*	0.28*	0.19*	0.35*	0.20*
Canonical Discriminant Function Coefficients	1.86	0.57	1.59	1.15	0.79
Standard Canonical Discriminant Function Coefficients	1.09	0.44	1.06	0.73	0.69
Canonical Correlation	0.99				

** indicates significance at p value < 1%*

From Table 2 it is understood that that all the independent variables are statistically significant as p values are less than 0.05. Wilks' lambda ranging from 0 to 1.0 shows how the independent variables cumulatively explain the categorization of the dependent variable. Values nearing 0 indicate strong group differences while values close to 1 indicate no group differences. The F statistic is a ratio of between-groups variability to the within-groups variability with a numerator (df1) and denominator (df2) signifying degrees of freedom. The numerator and denominator degrees of freedom are used to obtain the observed significance levels. Significance value if small (smaller than 0.10), indicates that the group differences are significant. If the significance value is large (greater than 0.10) then it indicates that the group differences are not significant. The Box M statistic tests the null hypothesis of equal population covariance matrices. The significance of Box M statistic is based on F transformation. The hypothesis of equal covariance matrices is rejected if the significance level is small (less than 0.10). Here we can see the Box M value is less than 0.10. So null hypothesis is rejected and the alternate hypothesis is accepted. The displayed Eigen value is the ratio of the between-groups sum of squares to the within-groups sum of squares. The percentage of variance allows evaluating which canonical variable accounts for most of the spread. The cumulative percentage expresses the percentage of the total dispersion accounted for by the canonical variables. The canonical correlation measures the association between the discriminant scores and the groups. Values close to 1 indicate a strong correlation between the discriminant scores and the groups. The centroid value obtained from the above data is 3.69. (The upper table which contains the Wilks' lambda value shows how dependent variable is explained by independent variables. Standardized canonical discriminant function coefficients show the beta value of the function by which the variables can be compared. From the canonical Discriminant function coefficients the following equation is obtained:

$$\text{Discriminant score} = 1.86P_1+0.57P_2+1.59P_4+1.15P_5+.79P_8-20.56$$

where P_1, P_2, P_4, P_5 and P_8 are the scores on the Likert Scale for Preview, Free Sampling, Perceived Brand Value, Training and Word of Mouth Communication respectively.

The distribution of observations into the purchase pattern groups are used as a starting point in the analysis. Values close to 1 indicate a strong correlation between the discriminant scores and the groups. For Wilks' lambda, the test of function tests the hypothesis that the means of the functions listed are equal across groups. Wilks' lambda is the proportion of the total variance in the discriminant scores not explained by differences among the groups. A chi-square transformation of Wilks' lambda is used along with the degrees of freedom to determine significance. For Standardized Canonical Discriminant Function Coefficient; when variables are measured in different units, the magnitude of an unstandardized coefficient provides little indication of the relative contribution of the variable to the overall discrimination. The coefficients of the canonical variable are used to compute a canonical variable score for each case. Box's M statistic tests the null hypothesis of equal population covariance matrices. The significance of Box's M statistic is based on an F transformation. The hypothesis of equal covariance matrices is not rejected if the significance level is large (more than 0.10). From Table 2 it is observed that that all the independent variables are statistically significant as its value is less than 0.05. From Table 2, it can also be understood from the Wilks' lambda values that P_4 has the

most significant value as its value is low compared to the others followed by P_8, P_1, P_2 and P_5.

Implications and Conclusion

At the onset of the research five hypotheses were set up. Based on the outcomes obtained in the analysis, it may very well be concluded that strategic intervention measures (predictors) have significant effect upon brand loyalty. This implies that the hypotheses H_1 to H_5 are accepted. The variables Offer price (P_3), Attractive Scheme (P_6) facility and Membership/Loyalty Programs (P_7) were excluded in the model, which means statistically speaking, these do not significantly influence brand loyalty. The predictor with lowest value of Wilks' lambda is the strongest predictor of this model. As it turns out, perceived brand value (P_4) exhibits the strongest influence followed by word of mouth communication (P_8) and preview (P_1). The subsequent factors in order of significance are free sampling (P_2) and training (P_5). Intervention strategies need to tap and establish desirable perception for the brand's value (Divett et al., 2003). Analogous to the previous implication, the customers also need to be sensitized more through positive word of mouth communication giving equivalent emphasis on preview facilities. Free sampling also plays a vital role in altering the purchase pattern of the customer. Training can also yield positive response to repeat purchase if considered as a co-creation tool for consumer marketing. This ex-ante study can be utilized in predicting the purchase pattern of the future consumer based on the importance of the predictors of the paints industry. Conceivable limitations of the paper come from the fact this research is based solely on the consumers of paints industry and consumers of other industries will possibly show different characteristics. Therefore, it opens up a future scope to perform studies on different industries.

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Biographies

Dr. Debaleena Chatterjee is an Assistant Professor in Economics and Finance. She is a doctorate from Indian Institute of Technology, Kharagpur in Public Finance. She has worked as an Academic Associate in IIM Indore and IIT Kharagpur. She has published in various international journals and presented papers in five international conferences, including conferences in RSA, Atlanta, USA and IIM Ahmadabad. She has recently won best paper award in the International Conference on sustainability at IIM Shillong.

Protik Basu is Associate Professor in Operations Management. He is a graduate engineer from Jadavpur University, Kolkata. He followed it with a Post Graduate Diploma in Business Management from Indian Institute of Management Calcutta. He worked in various managerial capacities in engineering multi-national companies. After having a successful stint in industry, Prof. Basu had associated himself with quite a few leading B-schools in India. In his academic tenure, he had presented papers in various national and international conferences, including conferences in Dhaka and Oxford University, UK. He has eleven publications to his credit, including ten international publications.

Indranil Ghosh is Assistant Professor in the area of Operations Management and Analytics. He has completed his graduation in Information Technology and post graduation in Industrial Engineering & Management from West Bengal University of Technology, India. His areas of interests include Artificial Intelligence, Data Science, Multivariate Data Analysis, Statistical Learning, Financial Econometrics and Supply Chain Analytics. He has published research papers in journals of Springer, Taylor & Francis, Growing Science etc.