

SHAPING OUTCOME OF NEED SATISFACTION ON COMMITMENT: A CASE OF INDIAN RAILWAYS*

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The work investigates the correlates of organizational commitment and the percentage to which, need satisfaction predicts commitment in Logistic Regression Model. A Logistic Regression model hypothesizing relationships among need satisfaction as predictors and commitment to the organization as criterion was developed. Data from 400 Rail Engine Drivers (critical workforce of the Indian Railways) supported the existence of differential relationships between need satisfaction and organizational commitment. Predicting whether an employee low/high committed, as well as identifying the needs useful in making the prediction, is important in most academic/professional disciplines as well compared with the observed outcomes. Of the drivers with low commitment, 55.71% and in high commitment group 68.28% were correctly classified. Overall, 62.11% of the drivers were correctly classified. Implications, intervention tips for human resource development and limitations were discussed.

The entire safety edifice of Indian Railways (IR) rests on the human element. It is also true that on an average 2/3rd of accidents are attributable to 'staff failure', either directly or indirectly, despite the fact that railway men are considered one of the finest groups of loyal, dedicated, and hard working employees who perform more or less like armed forces. However, this high percentage of accidents on account of human failures is nothing uncommon to IR.

The success of Indian Railways is largely dependent on the performance of Rail Engine Drivers. Indian Railways are investing a lot in procuring hardware, but up to that time adequate care of humanware is not considered, the Indian Railway will have problem. Recognizing this, Indian Railways have started looking into the inner side of the drivers' behavior. A sick mind can never create healthy organization; various intervention programmes are being workers. For performance improvement, existing mind-set of workers betterments

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from their inside appeared lucid. Field experience indicates that driver alone rarely causes a railway accident, more than one person, who commits the error in their roles at the same time, cause it. In a number of day-to-day happenings, it has been observed that a single person i.e., the driver can prevent accidents, if he is committed to the job and the organization.

In order for an organization to be successful they must continuously ensure the satisfaction of their employees. Job satisfaction is an 'individual's reaction to the job experience' (Berry, 1997). One might think that pay is considered to be the most important component in job satisfaction, although this has not been found to be true.

Employees are more concerned with working in an environment they enjoy. Employees who begin with a high initial level of commitment tend to see their organization through the proverbial 'rose-colour glasses'. Thus, they develop high levels of job satisfaction. In contrast, those who begin with a low initial level of commitment (e.g., those view, the organization as a temporary location en-route to greener pastures) tend to focus on negative factors, and to develop low job satisfaction (Hirsch, 1987).

Organizational commitment is also a result of job satisfaction. The positive indicators of commitment are productivity and health. The more satisfied an employee is with his job, the more he will produce and the healthier he will be. However, studies have also shown that in some cases, high production itself causes high job satisfaction. Commitment-the willingness of social actors to give their energy and loyalty to social systems, the attachment of personality systems to social relations, which are seen as self expressive. Commitment is the process through which individual interests become attached to the carrying out of socially organized patterns of behavior (Khan & Mishra, 2003a).

Workforce commitment and management incompetence can not co-exist. Only committed managers enjoy committed workforce. Management cannot stand behind people every second of the day to check that they are giving off their best. The top quality of decision making, productivity, and quality can not be achieved by people who are uninvolved, alienated, and desperate. People can not be committed to an organization until they know what is going on (Hirschman, 1970).

The behavioral conceptualization of organizational commitment by Porter, Stears, Mowday, and Boulian, (1974) considers the relative

strength of an individuals' identification with, and involvement in, a particular organization.

Industries/organizations are downsizing their workforce on war footing. A large number of employees are losing their jobs. Remaining employees are working in the milieu of uncertainty, as the sword may fall on their livelihood any time. Commitment develops naturally, there is reason to believe that people need to be committed to do something; the opposite of commitment is alienation, and alienation is unhealthy. Twentieth century was the century of competencies over the globe because of information technological insurgency, and twenty-first will be the century of commitment, due to various regional, environmental, organizational, economical, and behavioral imbalances in the society (Khan & Mishra, 2003b).

Predicting whether an employee is low/high committed, as well as knowing the facets useful in making the prediction, is important in most academic/professional disciplines as well as in the 'real world'. There are a variety of multivariate statistical techniques that can be used to predict dependent variable from a set of independent variables. Multiple regression analysis and discriminant function analysis are two related techniques that quickly come to mind. However, these techniques pose difficulties when the dependent variable has only two values or binary in nature (low/high committed). Logistic regression comes to mind, which help in classifying/predicting the cases into one of the two groups. In the past most of the applications of logistic regression were in the medical field. Now there is a need for paradigm shift to explore the technique in human resource development.

Organizational commitment has been linked to absenteeism (Gellatly, 1995), turnover intentions (MacDonald, 1993; Meyer, Allen, & Smith, 1993) and actual turnover (Whitener & Walz, 1993), as well as other attitudes and behaviours (e.g., job satisfaction, see Hackett, Bycio, & Hausdorf, 1994; organizational citizenship, see Meyer & Allen, 1991). Even job performance may be affected by commitment (Meyer, Paunonen, Gellatly, Goffin, & Jackson, 1989). Thus, there is a growing body of evidence to illustrate that employee commitment has an impact on the organization.

The present study is an attempt to examine the correlates of organizational commitment and the degree to which need satisfaction predicts commitment and estimates the probability of classification of drivers into their respective groups (low/high committed).

METHOD

Sample

A representative sample of 400 rail engine drivers was drawn from thirty-four divisions of Central, Eastern, Northern, North-Eastern, Southern, South Eastern, and Western zones leaving only two zones unattended of the Indian Railways. Twenty-nine (10.2%) respondents were Shunter, forty-five (15.8%) were Asst. Drivers, one hundred eight (37.9%) were Driver (Goods), fifty-seven (20.0%) were Driver (Passengers) and forty-six (16.1%) were Driver (Mail/Express). The age of the respondents varied between 28 to 59 years, with mean age of 45 years. In education they varied between primary to post graduation, however, most of them were under or matriculate. Three hundred ninety one (97.8%) respondents were married; five (1.3%) were un-married, and rest divorced/widower. The working experience varied between 3 to 40 years, with a mean working experience of 23 years. The monthly income of the respondents diverges between Rs. 7000 to 20000, with a mean income of Rs. 11260.

The sample (on the basis of percentile values for criterion variable i.e., organizational commitment) was divided into three equal groups and labeled as low, medium, and high commitment groups. To make dependent variable binary, the middle group was dropped and hence, main study was carried out on 285 low and high committed drivers.

Instruments

The Indian adaptation of Porter's (1961) Need Satisfaction Scale (Khan & Mishra, 2002) and Allen and Meyer's (1993) Organizational Commitment Scale - Adapted and validated on target population (Khan & Mishra, 2003c) were used to collect the data. Both scales were bilingual (Hindi/English) in nature.

Need Satisfaction Scale

The Indian adaptation of Porter's (1961) Need Satisfaction Scale was used. This was translated, and adapted by Khan and Mishra, (2002). The need satisfaction scale having 15 items designed to provide information about five different motivational needs viz. compensation, social, autonomy, esteem, and self-accomplishment. The needs were named after detailed job analytic study of the drivers. The 5-point Likert format was used to indicate the extent of respondents' need satisfaction, anchors labeled (5 = Fully satisfied and 1 = Not at all satisfied). Thus, the minimum possible score of the scale was 15 and the maximum 75. Higher score indicates high level of

need satisfaction, and lower score indicates low-level of need satisfaction. In order to know as to how reliable the scale is, one of the most commonly used reliability coefficient (Cronbach's Alpha) based on internal consistency of the scale was calculated and found 0.82. The factorial validity of the scale was established using confirmatory factor analysis, five factors (needs) emerged accounting 63.1% of total variance.

Organizational Commitment Scale

This was originally developed by Allen & Meyer (1993) and translated and adapted by Khan and Mishra (2003a). The organizational commitment scale (Khan & Mishra, 2003a) having 18 items measuring three dimensions (affective, continuance, and normative) was used to measure the intensity of drivers' organizational commitment. Originally, the scale was 7 point Likert format. But, considering the literacy level of population being under or matriculate, the scaling was changed into 5-point Likert format, anchors labeled (5 = Strongly Agree and 1 = Strongly Disagree). Thus, the minimum possible score of the scale was 18 and the maximum 90. Lower score indicates low intensity of organizational commitment and higher score indicates high intensity of commitment. Median reliability for organizational commitment and higher the score indicates high intensity of commitment. Median reliability for organizational commitment scale appeared rational and it was found to be 0.87. The coefficient was higher than as reported by Allen and Meyer (1996) and found significant at 0.00. The factorial validity of the scale was established using confirmatory factor analysis, three factors emerged accounting 55.7% of the total variance.

Procedure

The scales were administered in control condition on a group of 40 to 50 drivers at the Zonal Training centers/safety camps of the railways, where they used to call on for training/refresher courses. The drivers were told in detail about the utility of the study. They were assured that the responses indicated by them would be used for research work only, which will help in having a thought-provoking look at various problems and human resource development programmes/interventions on Indian Railways. They were asked not to write their name on the answer sheets.

RESULTS AND DISCUSSION

The scores of all needs were transformed in comparable units of measures, such as stanine. Table 1 exhibits the descriptive statistics, related rank of each need on the basis of mode values (to indicate the central location of an individual need satisfaction) and correlation coefficients among needs and with organizational commitment.

Table 1

Descriptive Statistics and Correlation Matrix for Needs and Commitment

Needs	Rank	Mode	SD	Needs					Y4
				X5	X4	X3	X2	X1	
Social (x5)	V	7.0	1.63	1.00	0.44	0.24	0.48	0.43	0.23
Self-Accomplishment (x4)	IV	6.0	1.98		1.00	0.33	0.51	0.48	0.06
Compensation (x3)	III	5.0	1.49			1.00	0.39	0.33	0.01
Autonomy (x2)	II	4.0	1.88				1.00	0.56	0.11
Esteem (x1)	I	4.0	2.14					1.00	0.17
Organizational commitment (y4)									1.00

p -value: $.05 \leq 0.10$, $.01 \leq 0.12$, $.001 \leq 0.17$

Satisfaction from esteem need was lowest preceded by autonomy need. These needs were termed as high order needs, because these were found to be slightly satisfied. The fork need for rail engine drivers' was compensation. Satisfaction from social need was highest followed by self-accomplishment need. These needs were phrased as low order needs, because these needs were found to be moderately satisfied. The social and esteem needs satisfaction of drivers were found to have positive and highly significant relationship with organizational commitment.

The multivariate technique for estimating the probability that an event/behaviour occurs is the logistic regression analysis. In logistic regression we directly estimate the probability of an event/behaviour occurring. Logistic regression model is nonlinear. For the case of a

single independent variable, the logistic regression model can be written as:

$$\text{Prob (event)} = \frac{1}{1+e^{-(B_0+B_1X_1)}} \text{ or } \text{Prob (event)} = \frac{1}{1+e^{-z}}$$

Where B_0 and B_1 are coefficients estimated from the data, X_1 is the independent variable, and 'e' is the base of the natural logarithms, approximately equal to 2.718.

The probability of the even/behaviour not occurring is estimated as:

$$\text{Prob (no event)} = 1 - \text{Prob (event)}$$

The probability estimates will always be between 0 and 1, regardless of the value 'z'. In logistic regression, the parameters of the model are estimated using the maximum-likelihood method. That is, the coefficients that make our observed results most 'likely' are selected. The hypothesis for large sample sizes can be tested that a coefficient is zero based on the Wald statistic, which has a chi-square distribution.

PARAMETER ESTIMATES FOR THE REGRESSION MODEL

Dependent Variable: Organizational Commitment (binary in nature)

Low Committed – 140 and High Committed – 145 rail engine drivers

Independent Variables: Compensation, Social, Autonomy, Self-accomplishment, Esteem.

Table 2

Model Chi Square Test

Statistics	Chi square	d.f	p
Model Chi-square	25.25	5	0.000
Improvement	25.25	5	0.000

Model chi-square tests the null hypothesis that the coefficients for all of the terms in the current model, except the constant, are zero. The entry labeled Improvement is the change in -2LL (225.506) between successive steps of building a model. The probability of the observed results, given the parameter estimates, is known as the likelihood. Since the likelihood is a small number less than 1, it is customary to use -2 times the log of the likelihood (-2LL) as a measure of how well the estimated model fits the data. It tests the null hypothesis that the coefficients for the variables added at the last step are zero. This is comparable to the overall *F*-test for regression.

The Table 3 depicts the estimated coefficients and related statistics from the logistic regression model that predicts commitment from a constant and the independent variables.

Table 3

Coefficients and Other Statistics for the Logistic Regression Model

Variable	Variables in the Equation			
	B	S.E	Wald	<i>p</i>
X5	.2214	.0664	11.1089	.000
Constant	-1.7342	.6533	7.0475	

Note. X5=Social; *df*=1

The Wald statistics or the change in likelihood was used for removing the variables from the model. In identifying the subsets of independent variables (need), only social need emerged as the good predictor of dependent binary organizational commitment variable. Since people are social animals, most individuals like to interact and be with others where they feel they belong and are accepted. When an individual's social need is not satisfied, he/she may feel separate, isolated, distanced from others-friends, colleagues, lover, and family, etc. This need for affection is real, necessary and important for many and lack of its fulfillment may bring loneliness, rejection, and friendlessness. Further, using the logistic regression model, the probability of classification of cases was determined into their respective groups.

The Classification Table

Table 4

Classification Matrix to Compare Prediction to Observed Outcomes

Observed	Predicted		Percent correctly classified
	Low	High	
Low	78	62	55.71%
High	46	99	68.28%
Overall			62.11%

One way to form an opinion how well our model fits is to compare our predictions to the observed outcomes. As it exhibits in Table 4, 78 participants with low commitment were correctly predicted by the model belonged to low commitment group. Similarly, 99 participants with high commitment were correctly predicted belonged to high commitment group. The off-diagonal entries of the Table 4 shows how many participants were incorrectly classified. Total 108 participants were misclassified, 46 participants in low commitment group and 62 participants in high commitment group. In summing up, in all 55.71% participants with low commitment and 68.28% high commitment group were correctly classified. Overall, 62.11% out of the 285 participants were correctly classified.

The classification Table does not reveal the distribution of the estimated probabilities for participants in the two groups. Hence, there is need to draw the histogram of observed groups and predicted probabilities.

Observed Groups and Predicted Probabilities

Figure I is a histogram exhibiting distribution of estimated (observed and predicted) probabilities into low/high commitment groups.

The symbol used for each case designated the group to which the case actually belongs.

If we have a model that successfully distinguishes the two groups, the case for which the event/behaviour has occurred should be to the right of 0.50 probability, while those case for which the event/behaviour has not occurred should be left of 0.50 probability. The more the two groups cluster at their respective ends of the plot, the better goodness of fit of the model. A good model is one that results in a high likelihood of the observed results. If a model fits perfectly, the likelihood is 1, and -2 times the log likelihood is zero.

CONCLUSIONS

The present study furnished a quantitative view of the logistic regression model to predict organizational commitment on the basis of need satisfaction. In the analysis only 'social' need was emerged as a significant predictor and passed on the accepted criteria to enter into the logistic regression model, enabling to classify drivers in either of two groups (low/high committed). Satisfaction of social need has emerged in many other studies as a good predictor of commitment.

Locke and Latham (1990) have found a strong relationship between satisfaction and commitment. Commitment causes satisfaction. Carson, Carson, Lanford, and Roe (1997) found the interactive effects of career satisfaction and career entrenchment with organizational commitment.

When 'the system' does not value the person, social guilt is generated. Since society is felt to be impersonal, such guilt is impersonal guilt, or alienation. Alienation results when a person can not feel any rewarding satisfaction from his social involvements. He comes to view all personal contacts as links in an impersonal social system. 'The system' is impersonal, and so his life becomes 'impersonalized'. There is nothing that he can take responsibility for. His work is not valued by anyone. When a person's social roles are not valued by society any more, then isolation is generated as an anti-social belief. When a person does not value himself, guilt is generated in the mode of self-hate.

Overall, 78 participants with low commitment were correctly predicted by the model belonged to low commitment group. Similarly, 99 participants with high commitment were correctly predicted belonged to high commitment group. In summing up, in all 55.71% participants with low commitment and 68.28% high commitment group were correctly classified. Overall, 62.11% out of the 285 participants were correctly classified. The probability of classification of drivers into their respective groups was quite high.

Research including Mexican and US employees (Slocum, 1970; Slocum & Topichak, 1972) indicated that Mexicans had higher job satisfaction than US employees, and that they ranked the fulfillment of 'Social needs' (e.g., the opportunity to help others), very high in relation to this satisfaction.

The model is a useful guide to predict the event/behaviour in organizational settings. By looking at the histogram of the estimated probabilities the cases falling around (0.50 ± 0.10) probability region are of significant importance. These are the critical cases and have to

be viewed cautiously. The responsibility comes to management; to plan an intervention for identifying the personal/organizational/environmental factors, which enabled them to be around this region of haziness.

Implications

Job/Need satisfaction is a focal variable in evaluating an organization's success. In order for an organization to be productive, the employees' concerns should be met. Using standardized tools the job/need satisfaction of employees' can be determined. Employers can then act on these results to meet employee needs.

Committed individuals' tend to confront organizational problems and issues, whereas the low-committed or those who have planned to leave the organization are more prone to sidetracking the organizations' main aims/goals in preference to their personal goals. It is likely that a highly committed workforce would try to solve organizational and personal problems differently than a low-committed workforce.

If employees are lacking on social need satisfaction then, feelings of social guilt, anti-social belief, self-hate, and alienation generated with bizarre consequences. When personal guilt is amplified, it leads to 'depersonalization'. The person seems to become separated from identifying with the body. When impersonal guilt is amplified, it leads to 'impersonalisation'.

Interventions

If workers were found deficient on need satisfaction, there is a need to nourish sense of excitement with a totality of management involvement approach in the job using following steps:

1. Identify the needs/wants/desires of the workers.
2. Use expectancy model to determine the person-in-environment issues affecting job performance and job/need satisfaction.
3. Understand the consequences if the current situation were to continue for both parties.
4. Device an intervention plans to resolve identified problem areas affecting job performance and job/need satisfaction.
5. Assess the probability of success for task at hand (expectation of required effort to performance).

6. Determine the nature of rewards for success on task (expectation of performance to outcome).

The regression model can be conveniently applied on other industrial workers, which will certainly be applied on other industrial workers, which will certainly help in determining the individuals probability of commitment towards industry/organization.

Limitations

While present research has produced interesting results, predominantly all participants had been with the organization a long time. The present study gives quantitative outlook of prediction model. An argument could be made to suggest that it was the multi-variate technique discernment that helps estimating the probability of commitments. The full-fledged study is in hand for cause-and-effect analysis.

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