

## Discriminant Analysis of IT Employees' Performance

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**Abstract:** Several business problems have many possible solutions across many variables. The multivariate techniques, such as Discriminant Analysis, are often used for solving such business problems. In this Paper, the Discriminant Analysis Technique is used to generate a set of well-defined rules, which would be very helpful to the HR department of an IT Company at the time of new recruits.

**Keywords:** Multivariate Techniques; Discriminant Analysis

### I. INTRODUCTION

Multivariate Statistical Techniques are often used now by the business organizations for getting great business insights [1]. The business problems involving big data analytics are at present tackled with the help of the Hadoop ecosystem[2]. The Data Analysts now use the KNN algorithm for the formulation of Price Predictors[3]. In this Paper, the Discriminant Analysis Technique is used to generate a set of well-defined rules, which would be very helpful to the HR department of an IT Company at the time of recruitment of freshers.

With the arrival of more and more players and technologies into the Start-up Ecosystem, their employees' performance is now the main watchword. The set of employees is probably the best asset of a Start-up. As the Start-ups work on cutting-edge techniques, they spend a lot of time and energy in imparting training to their new recruits. But, at times, some of the new recruits fail to scale up to the expectation of their employees, as a result of which lot of time and energy spent for imparting training to such new recruits become a waste. So, the Start-ups would like to have one or two scientific methods, with the help of which they would be able to determine at the time of recruitment itself whether a new recruit would scale up at the end of training or not. In this Paper, the possibility of utilization of Discriminant Analysis for this purpose is explored.

### II. DATA FOR ANALYSIS

The employees of the IT-related Start-ups in and around Trichy were considered for this study. The plan was to evolve a set of Discriminant Functions by studying the

characteristics of the existing employees and then make use of such functions in the future for identifying the most capable employees at the time of recruitment itself.

The existing employees of the IT-related Start-ups were initially classified into three categories, namely good, average, and below-average categories, by their Managers on the basis of their ability to efficiently execute the works assigned to them by their Superiors. The six different psychometric tests, which are widely used now in the western countries for the purpose of assessing the efficiency of the IT employees, were administered to all the above-mentioned three categories of employees. The marks scored by the employees in these six tests constitute the data set of this study.

### III. DISCRIMINANT ANALYSIS

In Discriminant Analysis, which is one of the well known and often used techniques in Multivariate Analysis, two or three groups are discriminated from one another on the basis of some well-defined characteristics. The six psychometric tests were administered to the employees of the IT-related Startups in and around Trichy. The observations were denoted as  $x_{ij}$ , where  $i = 1, 2, 3$  denote the stratum number and  $j = 1, 2, 3, \dots, n_1$  or  $n_2$  or  $n_3$  denote the number of individual units in each sample. The variance covariance matrix was derived and used to compute the following vital quantities:

$$\Theta_{11} = \sum l_{1i} X_{(i)}(1) \quad \Theta_{12} = \sum l_{2i} X_{(i)}(2)$$

$$\Theta_{22} = \sum l_{2i} X_{(i)}(2) \quad \Theta_{23} = \sum l_{3i} X_{(i)}(3)$$

$$\Theta_1 = (\Theta_{11} + \Theta_{22}) / 2 \quad \Theta_2 = (\Theta_{22} + \Theta_{23}) / 2$$

Based on the principles of Discriminant Analysis, the following criteria shall be used for discriminating any one

group from the remaining two groups:

If  $Y_1 \geq \Theta_1$  and  $Y_1 + Y_2 \geq \Theta_1 + \Theta_2$ ,  $x$  is assigned to stratum1.

If  $Y_1 \leq \Theta_1$  and  $Y_2 \geq \Theta_2$ ,  $x$  is assigned to stratum2.

If  $Y_1 \leq \Theta_2$  and  $Y_1 + Y_2 \leq \Theta_1 + \Theta_2$ ,  $x$  is assigned to stratum3.

#### IV. CONCLUSION

The scores obtained by the employees of the IT-related Startups located in and around Trichy in the six different psychometric tests were used along with the above criteria to arrive at the following set of rules for concluding whether an employee is good or average or below-average employee.

If  $Y_1 \geq -0.6347$  and  $Y_1 + Y_2 \geq 0.1512$ , the employee is a good employee.

If  $Y_1 \leq -0.6347$  and  $Y_2 \geq 0.8361$ , the employee is an average employee.

If  $Y_2 \leq 0.8361$  and  $Y_1 + Y_2 \leq 0.1512$ , the employee is a below-average employee.

The existing employees of the IT-related Start-ups in and around Trichy were classified into three groups, namely Good Employees, Average Employees and Below-Average Employees on the basis of the above set of rules. It was observed that these three groups and the three groups identified by the Managers were more or less same. So, it was recommended to the Start-ups to make use of the following set of rules to determine at the time of recruitment itself whether a new recruit would turn out to be a capable employee or not.

If  $Y_1 \geq -0.6347$  and  $Y_1 + Y_2 \geq 0.1512$  for a new Recruit, he is likely to emerge as a capable employee in the future. So, recruit him straightaway.

If  $Y_1 \leq -0.6347$  and  $Y_2 \geq 0.8361$  for a new Recruit, he belongs to the Average Category. If there is an urgent need, he may be provided the required training and then inducted into the Company. Otherwise, he may be rejected.

If  $Y_1 \leq 0.8361$  and  $Y_1 + Y_2 \leq 0.1512$  for a new Recruit, he belongs to the Below-Average Category. So, he may be rejected straightaway.

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