

# **A Multi Dimensional Approach to Analyse the Core Dimensions of Organizational Culture in a Research and Development Organization in Tamil Nadu, India**

## **Abstract**

The research paper aims to analyse the core dimensions of Organizational Culture in a R&D institution that is completely dedicated to research in Basic and Allied Sciences. The sole purpose of this research is to capture those dimensions amenable to R&D activities in this organization that will lead to higher R&D performance. The research examines factors like Strategy, Structure, Resources, Risk taking, Job & Role Characteristics, Team Dynamics, Collaboration & Networking, Leadership, Reward System, Safety & Health and Customer Satisfaction in the context of the organization. Research data was collected using a questionnaire from a sample of (n = 110) respondents within the institute. All the variable items for Organisational Culture were measured using a five-point Likert scale. Parametric and Non-Parametric tests were used to analyze the dimensions of culture, relationship between organizational culture and job satisfaction of employees and also the influence of demographic factors on organizational culture. The paper also includes recommendations to guide the management of the organization to identify and inculcate cultural values that will enhance R&D activities and to gradually abandon those practices that hinder creativity and innovativeness among the employees.

Key Words: R&D Productivity, Creativity, Innovation, Parametric, Culture, Job Satisfaction

## **Background for Research**

Organizational culture is a set of values, understandings, beliefs, and norms that are shared among people within an organization. According to Handy (1999), different organizations have differing cultures that are reflected in different structures and systems. Organizational culture is manifested in the typical characteristics of the organization. The components of routine behaviour, norms, values, philosophy, rules of the game and feelings all form part of organizational culture (Hellriegel et al, 1998; Smit and Cronje, 1992). The examination of culture is broadly identified as (a) a set of cognitions (i.e.) values and beliefs, and (b) the outcome of these values and beliefs in the form of observable behavioural components. It is the latter aspect and perspective of culture that is of possible interest to the current study. The examination of behavioural norms across various dimensions of the organization relate directly to what can also be viewed as the human characteristics of the research organization. Such dimensions of organizational functioning can include factors such as Strategy, Structure, Resources, Risk taking, Job & Role Characteristics, Team Dynamics, Collaboration & Networking, Creative Leadership, Reward System, Safety & Health and Customer Satisfaction of the research organization identified in this literature review. Quantitative approach is one of the methods employed to study organizational culture. There are a number of studies that have adopted the quantitative approach to measure organizational culture. The attributes can be extracted from the three of the most frequently used and tested organizational culture assessing methods- Organizational Culture Survey by Denison and Neale (1996), Organizational Culture Inventory by Cooke and Rousseau (1988) and Organizational Culture Profile (OCP) by O' Reilly. These extracted attributes can be grouped in to eleven dimensions and these dimensions together constitute the R&D culture. The eleven dimensions and the attributes under each category are as follows: Strategy: Organizations whose strategic goals are clear, and whose cultures strongly support those goals, is fundamental in achieving excellent R&D productivity. This dimension provides the appropriate direction that keeps the organization right on track by determining personnel's understanding of the vision, mission and values of the organization and how these can be transformed into measurable individual & team goals and objectives. The structure category is about the explicitly established systems and processes of an organization that influences the R&D output of the organization. This dimension indicates how an organization can be designed in order to facilitate better research productivity. Such an organization that wishes to be research oriented should avoid vested interests, bureaucracy and routine control. Some of the attributes in this category can actually be regarded as the implementation side of the attributes in other ten categories. The major attributes are methods and

mechanisms that provide enough flexibility, freedom, autonomy and empowerment in carrying out research process. Resources: Resource allocation is an important factor in an R&D organization. This includes time, financial and human resources. For instance, proper financial resource allocation is a source of support for creativity seeking activities. Resource allocation is part of senior managers' responsibilities but the focus of this category is not the allocation of resources, but the resources themselves. Thus the attributes relating to this category are enough time allocation and allocation of money and material resources. Risk taking: The risks should be taken as long as they do not harm the organization as it is essential to encourage researchers to be creative and experimenting with new ideas. To stimulate creativity in R&D, organizations must encourage their people to embark on research efforts that involve a certain level of risks, and at the same time, the organization must be prepared to accept failures. Thus the attributes relating to this category are challenging the status quo and tolerance for mistakes. Job & Role Characteristics: Job & Role characteristics refer to the properties of each employee's work that increase the likelihood of their R&D contribution to the organization. The work should be challenging; intellectually stimulating; utilize varied skills; contain responsibilities; directed by goals and best fits with interest and ambitions of the employee. Thus the attributes relating to work characteristics are challenge, role clarity, responsibility and goals. Team Dynamics: Team working is a prerequisite to promote group synergies. Teamwork is enhanced when members respect and understand each other, allow for diversity, share common goals, resolves conflicts effectively and support each other by listening, discussing and openly questioning new ideas. Such effective team work is partly based on team members' skills and abilities and partly on the shared values within the group. Collaboration & Networking: Collaboration & Networking is socializing with peers of other organizations so as to exchange knowledge and experience and also develop potential future work collaboration by participating in conferences and professional societies; conducting mutual exchange programmes. Networking is critical to productive R&D activities. Creative Leadership: Creative leadership influences the employee creativity in the R&D context by deploying divergent and convergent thinking for generation of novel ideas, fostering an environment of innovation, employing open communication, providing constructive feedback and serving as a role model of inspiration. Reward System: Management should be sensitive to methods of reward and recognition that will inspire personnel to be creative and increase R&D outputs in the organization. If creative behavior is rewarded, it becomes the dominant way of behaving and behavior that is rewarded reflects the value of the organization. Personnel should be rewarded for risk taking, experimenting and generating ideas. Apart from extrinsic rewards, rewarding intrinsically encourages R&D behavior. It is also equally important to reward teams to inspire team performance. Safety & Health: Safety & Health in the workplace is embraced in a holistic way from the interactions between the working environment, equipment, systems, procedures and the people in the organisation. A prerequisite for a positive safety culture is good information flow, giving staff more training, using protective gears during work and adequately compensating in case of accidents. Customer Satisfaction: In essence, an organizational culture with customer orientation will most effectively and efficiently create the necessary behaviours for the creation of superior values for buyers. An overall orientation towards the customer experience is achieved by identifying a defined need, providing tech support, obtaining customer feedback, maintaining utmost confidentiality and delivering high quality of work in R&D work process. Strong identification with the customer thus increases satisfaction of the customers and enhances profound relationship with the customers. Organizational Culture and Job Satisfaction: Locke (1976) defines Job satisfaction as a pleasurable or positive emotional state resulting from the appraisal of one's job or job experiences. Research studies (Kerego & Mthupha, 1997; Robbins, 1993;) supported the five main job satisfaction dimensions as pay, nature of work, supervision, promotional prospects and relations with co-workers. There has been a long debate amongst researchers regarding the relationship between organisational culture and job satisfaction. Many researchers have found supporting evidence about the relationship between these two concepts (Schneider & Snyder, 1975; Field & Abelson, 1982; Hellriegel & Slocum, 1974).

Organizational culture is postulated to be one of the greatest theoretical levers required for understanding organizations. Verifying and using those theories minimally requires comparisons between the cultures of different firms, which in turn implies the identification of common dimensions for assessing organizational culture. Qualitative approaches used in initial research on organizational culture assess culture along unique dimensions, reflecting the inner view of organization's members. Although rich in detail, this process has two inherent weaknesses: (a) the dimensions of culture identified in one milieu through this approach are idiosyncratic and not necessarily relevant in another context, (b) this approach is unable to produce culture

information coherently linkable to major outcomes such as organizational performance (e.g., Cameron & Freeman, 1991) and individual behaviors (e.g., Koberg & Chusmir, 1987). To allow comparisons across organizations and to study relationships between organizational culture and other constructs, several quantitative measurement instruments have been designed. These capture culture through a priori dimensions which is helpful only to the degree that these dimensions are sufficiently relevant and generic. Chatman and Jehn (1994) put this challenge in these terms: "Demonstrating that a set of replicable dimensions exists is a prerequisite to making meaningful comparisons across organizations and industries" (p.525). Regrettably, to date, there is no consensus on a finite set of key dimensions able to describe and to compare organizational culture across a large range of organizations (Gordon & Di Tomaso, 1992). This paper attempts to fill that void by identifying core culture dimensions in current questionnaire and by synthesizing and modifying these into a new instrument.

## **Introduction**

Arnifa Asmawi and Avvari V Mohan. (2011). indicated that research and development (R&D) activities are influenced, to a large extent, by the culture of the organization. The author reveals that organizational culture in a R&D organizations may best be represented through a structure of eight factors. The eight factors are teamwork and knowledge sharing, empowerment and recognition, conformity and impediments to R&D, risk-taking, customer orientation, autonomy, social networking, and organizational design. They concluded by suggesting that R&D managers can deploy this model to establish the baseline level of research culture in their respective units and thus provide the foundation for management initiatives to drive R&D activities. Newman, J.L. (2009) states that a highly effective creative R&D culture combines Customer-focused, Risk-tolerant, Entrepreneurial, Alignment with strategy, Technology and scientific excellence, Innovative, Virtual organization (Collaboration), and Execution elements to consistently drive true innovation. The author also highly emphasizes that this creative framework provides guidance for building and maintaining a R&D culture of innovation excellence. The author also discusses about the number of potential steps required to build such a culture. (O'Reilly, C.A Chatman, J, and Caldwell, D.F.1991), suggests that the dimensionality of individual preferences for organizational culture and the existence of these cultures are interpretable. Understanding the fit between individuals' preferences and organization cultures is vital as person – organization fit predicts job satisfaction. The instrument called Organizational culture profile (OCP) was developed for this purpose that consists of 54 value statements that captures individual and organizational values. Ryan, J.C. and Hurley,J. (2007) examines the relationship between organizational characteristics and scientific research effectiveness by measuring six organizational characteristics of the research environment. The Organizational Culture Survey (OCS) measures six dimensions like teamwork, morale, information flow, involvement, supervision and meetings of organizational functional heads. Specific characteristics of the organizational environment are related to research performance. The study emphasises the fact that component characteristics of an organizations' culture is related to the performance of scientists within that organization. Sempene, M.E., Rieger H.S. and Roodt, G. (2002) established a significant relationship between organizational culture and job satisfaction. The article describes about the two questionnaire used for the study, one which measures organizational culture and the other that measures job satisfaction. Some biographical variables and its responses on the culture and job satisfaction variables have also been described. The job satisfaction has been considered as a single factor while organization culture included dimensions like customer orientation; organisational integration; performance orientation; reward orientation; conflict resolution; disposition towards change; locus of authority; task structure; management style; goal clarity and human resources orientation. As a R&D organization is dedicated to achieve excellence in research and innovation, it is imperative to nurture an organizational culture that is conducive to both creativity and innovation, which will lead to the achievement of organizational goals and mandate. The remarkable innovations in this sector have been guided throughout by its rich pedigree and culture. Although a qualitative appreciation is there for its feats, a methodical quantitative study on various contributing factors for its current state is a forlorn need. The success of any R&D endeavour lies in the cultural aspects of the organization and hence endowing an appropriate culture conducive to R&D activities in technology sector, acts as a key driver to spur higher R&D productivity among the researchers. Therefore, a research study to explore the dimensions of organizational culture in the current scenario of the organization and to plan appropriate interventions for the same has been undertaken. The stated institution has been engrossed in broad based multidisciplinary programme of scientific research and advanced Engineering since its inception in 1971. The remarkable innovations have been guided throughout by its rich pedigree and culture. Although a qualitative

appreciation is there for its feats, a methodical quantitative study on various dimensions of culture for its current state is a forlorn need. .

### **Research Methodology**

The research paper aims to analyse the core dimensions of Organizational Culture in an R&D institution that is completely dedicated to research in indigenous science and technology. The research focuses on exploring the dimensions of organizational culture in the current scenario of the organization and to plan appropriate interventions for the same. The scope of this study is restricted to the Group I (Scientists D & E) and Group II (Technical officers) employees of the specific organization. This is because of their higher level of participation in all of the organization's innovation pursuits as part of various R&D activities. The main objective is to analyse the core dimensions of organizational culture conducive to R&D activities and suggest suitable interventions for enriching the same. The research also aims to determine the influence of demographic factors on Organizational Culture & to ascertain the impact of Organizational Culture and its components on Job Satisfaction. The research is limited by the fact that the survey covered only 110 employees among the total 152 employees in Group I and Group II categories. This can be attributed to causes such as unwillingness of the respondents, transfer on deputation of employees, employees under long leave, and women employees in Child Care Leave (CCL) and few employees on the verge of retirement. The scale that has been used for the study does not measure in detail about the impact of Recruitment and Performance Appraisal process on the Culture of the Organization. The research design employed in the current study is descriptive research .In this study, the current state of R&D culture in the organization is analyzed through eleven dimensions.

The population of interest for the study refers to all the employees of the organization involved in innovation pursuits. The total number of employees, that is, the population size is 152 (Group I (D & E: Scientists-110,) Group II: (Technical Officers - 42). The sample size is 110 arrived through Stratified Random sampling. The primary data for the study was collected through questionnaire. A structured questionnaire - 5-point Likert scale was circulated to the Group I and Group II employees working in various departments through which the data was collected. Secondary data was collected from various references including books, journals, Company website and online research papers (as cited in the references section). The questionnaire was structured based on the eleven core dimensions measuring the R&D culture in the organization. The items measuring each dimension were framed based on the attributes pertaining to that dimension which were extracted from secondary sources. Based on the literature and pertinent issues from the case studies earlier the dimensions were identified .The questionnaire was divided into eleven sections based on the eleven dimensions and consisted of 59 items totally. Also to determine the impact of Organizational culture on Job satisfaction, a separate questionnaire to measure the job satisfaction of the employees was developed consisting of 20 items. The statistical tools used to analyse the data were Percentage Analysis, Friedman test, Chi-square test, Correlation & Regression.

### **Data Analysis and Interpretation**

Pilot study was done on a sample of 22 Respondents to check the Reliability of the Scale. The Cronbach's Alpha value which is an indicator of Reliability of the scale was determined using Statistical Package for Social Sciences (SPSS) software.

**Table 1 Reliability Statistics for scale measuring Organizational Culture**

| Cronbach's Alpha | N of Items |
|------------------|------------|
| 0.961            | 59         |

From Table 1, The Cronbach's Alpha Value for the scale measuring Organizational Culture is found to be 0.961 (>0.7) which shows that the scale has high reliability.

**Table.2 Reliability Statistics for scale measuring Job Satisfaction**

| Cronbach's Alpha | N of Items |
|------------------|------------|
|------------------|------------|

|       |    |
|-------|----|
| 0.913 | 20 |
|-------|----|

From Table 2, The Cronbach's Alpha Value for the scale measuring Job Satisfaction is found to be 0.913 (>0.7) which shows that the scale has high reliability.

#### **Demographic Profile - Descriptive Statistics**

Out of 100 respondents, 9% belong to below 35 age group, 34% belong to 35-45 age group, 42% belong to 46-55 age group and 15% belong to above 55 category. 73% are male and 27% are female. 56% of them have obtained Doctorate, 44% have obtained other degrees like ME/MTech, BE/BTech, MSc and many more. 65% belong to Group IV (Scientists) and 30% belong Group III (Technical Officers). 21% have below 10 years of experience, 29% have 10-20 years of experience and 50% have above 20 years of experience.

#### **Overall Rating of Organizational Culture by Respondents**

**Table 3 Rating of Organizational R&D Culture by Respondents**

| Organizational Culture | Frequency | Percent |
|------------------------|-----------|---------|
| Poor Culture           | 0         | 0       |
| Moderate Culture       | 6         | 6.0     |
| Good Culture           | 64        | 64.0    |
| Excellent Culture      | 30        | 30.0    |
| Total                  | 100       | 100.0   |

Overall Score

237-295: Excellent Culture

178-236: Good Culture

119-177: Moderate Culture

59-118: Poor Culture

It is inferred that 5.9% of the respondents have rated the organization as having a Moderate R&D Culture, 63.7% have rated the Organization as having a Good R&D Culture and the other 30.4% perceive that the organization is endowed with an Excellent Culture. None of them have rated the organization as having a poor culture. Hence we infer that the overall organizational culture is Good and there is a lot of scope for the organization to become an Excellent culture.

#### **Overall Job Satisfaction level of Respondents**

**Table 4 Overall Job Satisfaction Scores of Respondents**

| Job Satisfaction Level | Frequency | Percent |
|------------------------|-----------|---------|
| Dissatisfied           | 0         | 0       |
| Neutral                | 9         | 8.8     |
| Satisfied              | 49        | 48.1    |
| Highly Satisfied       | 44        | 43.1    |
| Total                  | 102       | 100.0   |

Overall Score

81-100: Highly Satisfied

61-80: Satisfied

41-60: Neutral

20-40: Dissatisfied

It is inferred that 8.8% of the respondents remain Neutral i.e. they aren't satisfied or dissatisfied with their job, 48.1% are satisfied with their job and the other 43.1% are Highly Satisfied with their job. None of them are dissatisfied with their job. Hence we infer that the overall job satisfaction level of the respondents is satisfied

## DESCRIPTIVE STATISTICS- MEAN SCORES

### Mean scores for different attributes of Strategy

**Table 5 Strategy–Mean Scores**

| Items                   | Mean |
|-------------------------|------|
| Strategic intent        | 4.48 |
| Strategic reinforcement | 3.86 |
| Strategic linkage       | 3.84 |
| Unit participation      | 3.94 |
| Alignment with business | 3.87 |

It is inferred that the items strategic intent ‘Awareness of the vision, mission and goals’ with the mean of 4.48 contributes the most to the dimension of Strategy. The next contributor is unit participation ‘Respective division comes out with plans for future projects which are aligned with strategic direction’. All the other items also contribute equally well to this dimension.

### Mean scores for different attributes of Structure

**Table 6 Structure–Mean Scores**

| Items                   | Mean |
|-------------------------|------|
| Structural type         | 3.85 |
| Delegation of Authority | 3.90 |
| Flexibility             | 3.58 |
| Freedom                 | 4.15 |
| Autonomy                | 3.96 |
| Openness                | 3.67 |
| Empowerment             | 3.80 |

It is inferred that the item freedom ‘Enough freedom to plan and act in own sphere has the highest mean score of 4.15 thus contributing the most to the dimension of structure followed by ‘Individual and role autonomy is encouraged’ with a mean of 3.96. The item Flexibility of administrative procedures and other adhoc committees with regard to the management of R&D activities needs to improve.

### Mean scores for different attributes of Resources

**Table 7 Resources–Mean Scores**

| Items                | Mean |
|----------------------|------|
| Human resource       | 4.18 |
| Information resource | 4.15 |
| Material resource    | 3.83 |
| Time resource        | 3.98 |
| Resource funding     | 3.39 |
| Resource training    | 3.62 |

It is inferred that the items ‘Availability of scientific & technical manpower with necessary skills and abilities in adequate strength to carry out R&D work’ and ‘Free access to information resources’ have the highest and second highest mean scores of 4.18 and 4.15 respectively thus contributing the most to the dimension of resources.

### Mean scores for different attributes of Risk taking

**Table 8 Risk taking–Mean Scores**

| Items                    | Mean |
|--------------------------|------|
| Challenge the status quo | 3.85 |
| Technology risk          | 3.54 |
| Failing with grace       | 3.72 |

It is inferred that the item challenge the status quo ‘Experiment with new ideas that are outside the scope of research projects’ has the highest mean scores of 3.85 ,thus contributing the most to the dimension of risk taking. This is followed by ‘Failing with grace’ with a mean of 3.72.

#### Mean scores for different attributes of Job & Role characteristics

**Table 9 Job & Role Characteristics–Mean Scores**

| Items             | Mean |
|-------------------|------|
| Self-set goals    | 3.95 |
| Role clarity      | 4.27 |
| Skill variety     | 4.28 |
| Task significance | 3.98 |
| Task challenge    | 4.16 |
| Job fit           | 4.15 |

It is inferred that the almost all the items contribute to the dimension of Job & Role characteristics with high mean scores, Skill variety and Role clarity topping the other items with a mean of 4.28 and 4.27 respectively.

#### Mean scores for different attributes of Team Dynamics

**Table 10 Team dynamics–Mean Scores**

| Items                        | Mean |
|------------------------------|------|
| Team work                    | 3.74 |
| Cross functional interaction | 3.77 |
| Team composition             | 3.93 |
| Team diversity               | 3.81 |
| Co-worker support            | 3.81 |
| Team conflict resolution     | 3.54 |

It is inferred that the item ‘Individual skill, abilities, personalities and interest are the major variables for team formation’ has the highest mean scores of 3.93 thus contributing the most to the dimension of team dynamics. This is followed by team diversity and co-worker support with a mean of 3.81.

#### Mean scores for different attributes of Collaboration & Networking

**Table 11 Collaboration & Networking –Mean Scores**

| Items   | Mean |
|---|------|
| Networking with external organization           | 3.98 |
| Participation in Industrial meets & conferences | 3.87 |
| Exchange programmes                             | 3.51 |
| Benchmark in research                           | 4.04 |

#### INFERENCE:

it is inferred that the item ‘Benchmark in Research’ has raised the standards of research. It has the highest mean scores of 4.04 thus contributing the most to the dimension of Collaboration & Networking. Also the second highest contributor to this dimension is ‘Networking with external organization’ with a mean of 3.98.

#### Mean scores for different attributes of Creative leadership

**Table 12 Creative Leadership–Mean Scores**

| Items                                       | Mean |
|---|------|
| Balancing divergence & convergence of ideas | 3.84 |
| Fostering innovation                        | 3.77 |
| Problem solving                             | 3.79 |
| Capability building                         | 3.63 |
| Open communication                          | 3.50 |
| Inspirational leading                       | 3.77 |

It is inferred that the item ‘Balancing divergence & convergence of ideas’ has the highest mean scores of 3.84 thus contributing the most to the dimension of Creative leadership. This is followed by problem solving ‘Innate ability to overcome challenges with breakthrough solutions to the problems’ with a mean of 3.79.

#### Mean scores for different attributes of Reward system

**Table 13 Reward Systems–Mean Scores**

| Items               | Mean |
|---------------------|------|
| Fairness in system  | 3.30 |
| Formal Recognition  | 3.72 |
| R&D behavior        | 3.46 |
| Intrinsic rewards   | 3.56 |
| Group based rewards | 3.44 |

It is inferred that the item formal recognition ‘Formally acknowledged for success and achievements in research work’ has the highest mean scores of 3.72 thus contributing the most to the dimension of Reward system. The second highest contributor is intrinsic reward ‘Rewards include freedom, opportunities for advancement that are intrinsic’ with a mean of 3.56.

#### Mean scores for different attributes of Safety & Health

**Table 14 Safety & Health–Mean Scores**

| Items                              | Mean |
|------------------------------------|------|
| Work environment                   | 3.64 |
| Protective equipment               | 3.29 |
| Information availability           | 3.29 |
| Compensation for injuries/accident | 3.31 |
| Training for safety                | 2.82 |

It is inferred that the items work environment ‘A safe and healthy environment is provided and maintained’ and ‘Compensation for injuries/accidents’ has the highest mean scores of 3.64 and 3.31 respectively thus contributing the most to the dimension of Safety & Health.

#### Mean scores for different attributes of Customer satisfaction

**Table 15 Customer Satisfaction–Mean Scores**

| Items                         | Mean |
|-------------------------------|------|
| Insights                      | 3.75 |
| Interaction with project team | 3.83 |
| Value system                  | 3.96 |
| Deliverables                  | 3.98 |
| Support                       | 4.06 |
| Feedback                      | 3.84 |

It is inferred that the items support ‘Techsupport during and after the technology transfer is taken care’ and value system ‘Content of innovation, Quality of work, Time frame observance are adhered to meet customer’s satisfaction’ have the highest and second highest mean scores of 4.06 and 3.96 respectively thus contributing the most to the dimension of Customer satisfaction.

### CORRELATION

#### Correlation between Organizational Culture and Core Dimensions

**Table 16 Correlations between Culture and Core Dimensions**

|              |  |  |  |
|--------------|--|--|--|
| Correlations |  |  |  |
|--------------|--|--|--|



|  |                     | Organizational Culture | Strategy | Structure | Resources | Risk taking | Job & Role characteristics | Team dynamics | Collaboration & Networking | Creative leadership | Reward system | Safety & Health | Customer satisfaction |
|--|---------------------|------------------------|----------|-----------|-----------|-------------|----------------------------|---------------|----------------------------|---------------------|---------------|-----------------|-----------------------|
| Organizational Culture                                       | Pearson Correlation | 1                      | .736**   | .865**    | .811*     | .449*       | .696*                      | .845*         | .744**                     | .807**              | .768**        | .586**          | .669**                |
|  | Sig. (2-tailed)     |                        | .000     | .000      | .000      | .000        | .000                       | .000          | .000                       | .000                | .000          | .000            | .000                  |
|  | N                   | 102                    | 102      | 102       | 102       | 102         | 102                        | 102           | 102                        | 102                 | 102           | 102             | 102                   |
| **. Correlation is significant at the 0.01 level (2-tailed). |                     |                        |          |           |           |             |                            |               |                            |                     |               |                 |                       |

It is inferred that there is a strong positive correlation between Organizational Culture and all the eleven dimensions of Organizational Culture -Strategy (.736), Structure(.865), Resources(.811), Risk taking(.449), Job & Role characteristics(.696), Team dynamics(.845), Collaboration & Networking(.744), Creative leadership(.807), Reward system(.768), Safety & Health(.586), and Customer satisfaction(.669). Thus the increase in degree of each of these dimensions can enrich the Culture of the organization and can transform the organization from a mere Good Culture to Excellent Culture.

### Correlation between Organizational Culture and Job Satisfaction

**Table 17 Correlations between Organizational culture and Job satisfaction**

|  |                     | Organizational Culture | Job satisfaction |
|--|---------------------|------------------------|------------------|
| Organizational Culture                                       | Pearson Correlation | 1                      | .762**           |
|  | Sig. (2-tailed)     |                        | .000             |
|  | N                   | 102                    | 102              |
| **. Correlation is significant at the 0.01 level (2-tailed). |                     |                        |                  |

It is inferred that there is a strong positive correlation between Organizational Culture and Job Satisfaction. The results show that the Pearson correlation coefficient is  $r = .762$  and hence the relationship is strong and these variables are significantly correlated.

### FRIEDMAN TEST

**AIM:** To test the significant difference between mean ranks of different dimensions contributing to organizational culture.

**H<sub>0</sub>:** There is no significant difference in mean ranks of different dimensions contributing to organizational culture.

**H<sub>1</sub>:** There is significant difference in mean ranks of different dimensions contributing to organizational culture.

**Table 18 Friedman Test-Significance**

|            |         |
|------------|---------|
| N          | 102     |
| Chi-Square | 213.608 |

|             |      |
|-------------|------|
| Df          | 10   |
| Asymp. Sig. | .000 |

**Table 19 Friedman Test-Ranks**

|                            | Mean Rank |
|----------------------------|-----------|
| Strategy                   | 7.55      |
| Structure                  | 6.65      |
| Resources                  | 6.70      |
| Risk taking                | 5.40      |
| Job & Role characteristics | 8.50      |
| Team dynamics              | 5.69      |
| Collaboration & Networking | 6.30      |
| Creative leadership        | 5.34      |
| Reward system              | 4.19      |
| Safety & Health            | 3.24      |
| Customer satisfaction      | 6.43      |

Table 19 shows that the significance level (0.000) is lesser than 0.05. Hence the null hypothesis is rejected and the alternate hypothesis is accepted at 95% confidence level. Therefore there is significant difference in mean ranks of different dimensions contributing to organizational culture. From table 4.22, it is inferred that Job & Role characteristics, Strategy, Resources and Structure occupy the first four ranks (8.50, 7.55, 6.70 and 6.65) respectively and these dimensions are the significant contributors to the organizational culture. It is also inferred that the dimensions Safety & Health and Reward system occupy the last two ranks (3.24 and 4.19) respectively.

## REGRESSION

**Table 20 Regression-Model Summary**

| Model | R     | R Square | Adjusted Square | R | Std. Error of the Estimate |
|-------|-------|----------|-----------------|---|----------------------------|
| 1     | 0.998 | 0.997    | 0.996           |   | 0.2613                     |

Predictors: (Constant), Structure, Team dynamics, Resources, Customer satisfaction, Creative leadership, Collaboration & Networking, Job & Role characteristics, Safety & Health, Reward system, Strategy

**Table 21 Regression-Coefficients**

| Model                      | Unstandardized Coefficients |            | Standardized Coefficients | Sig. |
|----------------------------|-----------------------------|------------|---------------------------|------|
|                            | B                           | Std. Error | Beta                      |      |
| 1 (Constant)               | .063                        | .028       |                           | .026 |
| Structure                  | .117                        | .008       | .162                      | .000 |
| Team dynamics              | .114                        | .008       | .162                      | .000 |
| Resources                  | .101                        | .007       | .147                      | .000 |
| Customer satisfaction      | .116                        | .008       | .117                      | .000 |
| Creative leadership        | .085                        | .008       | .102                      | .000 |
| Collaboration & Networking | .068                        | .008       | .084                      | .000 |
| Job & Role characteristics | .124                        | .007       | .149                      | .000 |
| Safety & Health            | .083                        | .005       | .139                      | .000 |

|               |      |      |      |      |
|---------------|------|------|------|------|
| Reward system | .093 | .006 | .155 | .000 |
| Strategy      | .078 | .007 | .099 | .000 |

Multiple Regression:  $Y = b_1X_1 + b_2X_2 + b_3X_3 + \dots + b_tX_t + u$

Organization Culture = .117(Structure) +.114(Team dynamics) +.101(Resources) +.116(Customer satisfaction) +.085(Creative leadership) +.068(Collaboration & Networking) +.124(Job & Role characteristics) +.083(Safety & Health) +.093(Reward system) +.078(Strategy) +.063(4.1)

The table 21 shows that the significance level of all the core dimensions of organizational culture except for risk taking (0.000) is lesser than 0.05. Hence there is a strong relationship between these dimensions and organizational culture. The equation 4.1, thus represents the regression equation of organizational culture.

### CHI-SQUARE TEST

#### Chi-square Test between Designation and Organizational Culture

**AIM:** To test if there is significant association between designation and Organizational culture.

**Ho:** There is no significant association between designation and Organizational culture.

**H1:** There is significant association between designation and Organizational culture.

**Table 22 Chi-square Test for association between Designation and Culture**

|                    | Value              | Df | Asymp. Sig. (2-sided) |
|--------------------|--------------------|----|-----------------------|
| Pearson Chi-Square | 3.883 <sup>a</sup> | 2  | .143                  |
| Likelihood Ratio   | 3.794              | 2  | .150                  |
| N of Valid Cases   | 102                |    |                       |

The table 22 shows that the significance level (.143) is greater than 0.05. Hence the null hypothesis is accepted and the alternate hypothesis is rejected at 95% confidence level. Therefore there is no significant association between designation and Organizational culture.

#### Chi-square test between Gender and Organizational Culture

**AIM:** To test if there is significant association between gender of respondents and culture.

**Ho:** There is no significant association between gender and Organizational culture.

**H1:** There is significant association between genders and Organizational culture.

**Table 23 Chi-square Test for association between Gender and Culture.**

|                    | Value              | Df | Asymp. Sig. (2-sided) |
|--------------------|--------------------|----|-----------------------|
| Pearson Chi-Square | 2.483 <sup>a</sup> | 2  | .289                  |
| Likelihood Ratio   | 2.448              | 2  | .294                  |
| N of Valid Cases   | 102                |    |                       |

The table 23 shows that the significance level (.289) is greater than 0.05. Hence the null hypothesis is accepted and the alternate hypothesis is rejected at 95% confidence level. Therefore there is no significant association between gender and Organizational culture.

#### Chi-square test between Educational qualifications and Organizational Culture

**AIM:** To test if there is significant association between educational qualifications of respondents and Organizational culture.

**Ho:** There is no significant association between educational qualifications and culture.

**H1:** There is significant association between educational qualifications and culture.

**Table 24 Chi-square Test for association between Qualifications and Culture.**

|                    | Value              | Df | Asymp. Sig. (2-sided) |
|--------------------|--------------------|----|-----------------------|
| Pearson Chi-Square | 4.203 <sup>a</sup> | 2  | .122                  |
| Likelihood Ratio   | 4.404              | 2  | .111                  |
| N of Valid Cases   | 102                |    |                       |

The table 24 shows that the significance level (.122) is greater than 0.05. Hence the null hypothesis is accepted and the alternate hypothesis is rejected at 95% confidence level. Therefore there is no significant association between educational qualifications and Organizational culture.

#### **Chi-square test between Organizational culture and Job satisfaction**

**AIM:** To test if there is significant association between Organizational culture and Job satisfaction

**Ho:** There is no significant association between Organizational culture and Job satisfaction

**H1:** There is significant association between Organizational culture and Job satisfaction

**Table 25 Crosstab- Organizational Culture and Job Satisfaction**

|                        |           | Job Satisfaction |           |                  | Total |
|------------------------|-----------|------------------|-----------|------------------|-------|
|                        |           | Neutral          | Satisfied | Highly Satisfied |       |
| Organizational Culture | Moderate  | 4                | 2         | 0                | 6     |
|                        | Good      | 5                | 44        | 16               | 65    |
|                        | Excellent | 0                | 3         | 28               | 31    |
| Total                  |           | 9                | 49        | 44               | 102   |

**Table 26 Chi-square Test for association between Culture and Job Satisfaction**

|                    | Value               | df | Asymp. Sig. (2-sided) |
|--------------------|---------------------|----|-----------------------|
| Pearson Chi-Square | 64.332 <sup>a</sup> | 4  | .000                  |
| Likelihood Ratio   | 57.343              | 4  | .000                  |
| N of Valid Cases   | 102                 |    |                       |

The table 26 shows that the significance level (.000) is lesser than 0.05. Hence the null hypothesis is rejected and the alternate hypothesis is accepted at 95% confidence level. Therefore there is significant association between Organizational culture and Job satisfaction.

## **CONCLUSION**

The project was mainly undertaken to analyse the core dimensions of R&D culture in the organization that is completely dedicated to research in Basic and allied sciences. The R&D Culture in the organization is found to be 'Good' with Job & Role characteristics, Strategy, Structure and Resources being the significant contributors to it. This is closely followed by Customer satisfaction and Collaboration and Networking. It is found that improving the safety culture, reward system and increase in the degree of risk-taking attitude among employees can transform the organization from 'Good Culture' to 'Excellent culture'. The findings suggest that the dimensions considered have strong relationship with the culture and increase in the degree of each of these dimensions can enrich the Culture of the organization. Clearly communicated mandates, encouraging bold talents, access to diverse technologies, robust networks will help in tunnelling conventional barriers to cope up with the changing scenario. The recommendations suggested provides a direction for the management of the organization to identify and inculcate cultural values that will enhance R&D activities and to gradually abandon those practices that hinder creativity and innovativeness.

## **SUGGESTIONS&RECOMMENDATIONS**

1) Setting both short term and long term goals for the organization, its different divisions and sub- divisions and making sure that they align with the goals is required to avoid the constant conflict between what is the mandate of the organization and what is exactly expected of the scientists. The targets and goals of the sub-division/the organization and how they contribute to the attainment of goals should be communicated to the employees in clear terms to increase workforce alignment.

2) Flexibility of administrative procedures and other adhoc committees with regard to the management of R&D activities with lesser hierarchy in decision making and set rules even for third party financed projects will set the tone for Excellent R&D culture.

- 3) Disciplinary boundaries need to be bridged in terms of projects rather than departments or divisions. Integration of skills and expertise in multidisciplinary area available at the organization should be taken seriously. Interdepartmental meetings and presentations should be held on a regular basis so that each and every employee comes to know of other's work in the organization.
- 4) Leadership to provide a work environment of openness built on trust and making the communication process transparent by holding open-ended meetings that give each team member the opportunity to share concerns, accomplishments and ideas without fear of ridicule or reprisal.
- 6) Department Heads should take the responsibility of inculcating the preparedness to address challenging R&D issues in a given domain among all the employees in a particular division irrespective of their age group, experience or designation. This can be done through periodic meetings thus enabling all the members to recognize the challenging side of their job, encouraging the members to set specific and difficult goals and giving them timely feedback. Such meetings will enable the organization to sustain the dimension of Job & Role characteristics which is currently the most significant contributor to the Organizational culture.
- 7) Rewarding R&D behavior that promotes creativity and risk taking via more engaging work, autonomy, opportunities of advancement and giving individual incentives with respect to innovation would help in sustaining the interest among employees to constantly involve them in bringing out innovative output. This will also improve the culture of experimenting, generating innovative ideas and risk taking. Reward System should emphasize collective attainment of objectives and recognize team performance that aids in promoting intra and inter-laboratory group harmony among working groups.
- 8) Applicative R&D and industrial oriented research problems should be taken up such that R&D outputs reach the society.

### **DIRECTIONS FOR FUTURE RESEARCH**

Future research should consider expanding the dimensions specified to provide a more comprehensive explanation on R&D culture. For instance, the study can measure in detail about the impact of Recruitment Practices and Performance Appraisal process on the Culture of the Organization. In addition, there should be a further discussion concerning the reasons for wider applicability (or not) of the findings across the other Regional Centres. The study can be enhanced further by including employees in other Group categories to better understand the demographic influence on organizational culture. It will in terms of future research be handy to expand this study to a larger sample where the relationship between the organisational culture and job satisfaction can be generalized. These specific observations necessitate that future research move to broader generalizations and theories on R&D culture.

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