CHAPTER-III

RESEARCH DESIGN
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3.1 INTRODUCTION

Research begins with the identification of a problem and ends with the suggestive solution by addressing the problem. As such, Research Design is a procedural plan that is adopted by the researcher to address the research problem identified. Research design helps the researcher in advance planning of sample design, methods to collect the appropriate data, research instruments and statistical tools, data analysis, etc., required to address the research problem.

After careful analysis of the earlier studies, the present study has identified the specific gap in the literature. Based on the literature gap, the present study specifically aimed to examine the factors influencing employee engagement and involvement in a large steel plant in public sector in India. Descriptive research method has been adopted to carry-out the research work\(^1\).

After careful review of literature, an attempt has been made in this study to examine the extent to which employee engagement and involvement are able to draw the attention of researchers, academicians, consultants and practicing managers for enriching the existing literature and also developing new theories for better results. After extensive review of literature, the present study identified the most appropriate drivers that influence employee engagement and involvement and also the levels of their engagement so that appropriate suggestions can be made to achieve the desired outcomes in the Steel Plant under study.

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3.2 NEED FOR THE PRESENT STUDY

In recent years, Employee Engagement has assumed importance and has been a subject of research mostly by consulting firms. In many quarters, it is felt that there is a dearth of research on employee engagement in the academic circles. The review of literature presented in Chapter-II of this study clearly reveals that very few research studies on employee engagement and involvement have been undertaken by academicians. Keeping in view, the research gap on employee engagement in industrial undertakings in general and Steel Plant in particular, the present study has been undertaken. The primary purpose of the present study is to explore the concept of employee engagement, identify the most important drivers of engagement and to assess the employee engagement levels in a large public enterprise in India – Visakhapatnam Steel Plant (hereinafter referred to as ‘the Steel Plant’) and to suggest measures to be adopted by the company to further enhance engagement levels of its workforce and contribute to sustained growth. The present study is also necessitated specifically for the following reasons:

Further, during discussions with the senior management of the Steel Plant, it was indicated that there is a need to study majority of the important drivers of employee engagement in the organization in a holistic manner and they suggested the topic ‘Employee Engagement and Involvement’ in order to reflect the exact scope of the study. This would enable the managers to think about ways and means of further enhancing employee engagement and involvement among different cadres of the Steel Plant viz., Executives, Supervisors and Workers.

Finally, there is no denying the fact that per capita consumption of steel is an index of the development of a nation. Public sector steel plants in India are facing cut-throat competition not only from international players but also from domestic competitors, especially from the secondary producers. Being a “Navaratna” company, the Steel Plant needs high efficiency levels and superior techno-economic parameters, which will provide a competitive
advantage to the company, and this will be possible only if its employee engagement and involvement levels are enhanced.

There is, therefore, a need to study the current employee engagement and involvement levels in the Steel Plant, analyze the drivers and suggest additional measures for fully engaging the workforce of the company for its sustained growth. The Management of the Steel Plant needs to continuously review whether the current employee engagement and involvement levels in the company are satisfactory for achieving sustained performance of the organization. Such measures must transform in response to the changes taking place in the external and internal environment of the business. Hence, there is a need to evaluate from time to time how far the measures adopted by the Steel Plant are appropriate in the present context and what more needs to be done to improve employee engagement and involvement in the company at various levels i.e. Executives, Supervisors and Workers for successful performance and growth of the Steel Plant.

By dint of the efforts of veterans in the steel sector, the overall productivity of steel plants in the country has increased substantially over the years. Even then, many steel plants are struggling with industrial conflicts reflecting poor employee engagement levels. To the best of the knowledge of the researcher, there was little or no reported research on the measures to be adopted by steel companies to overcome the problem of low employee engagement and involvement. Hence, there is a need to evaluate how far the employee engagement and involvement practices adopted by a typical Indian steel company are appropriate in the present context and what more additional measures they need to adopt to overcome the problem of ‘disengagement’ among certain sections of employees.

1. **Navratna** was the title given originally to nine Public Sector Enterprises (PSEs) identified by the Government of India in 1997 as “public sector companies that have comparative advantages”, giving them greater autonomy to compete in the global market so as to
"support them in their drive to become global giants". The number of PSEs having Navratna status has now been raised to 16, in which the Steel Plant is one of them.

Further, research studies on employee engagement in large business enterprises in Andhra Pradesh are not many, although such businesses form a major part of the economy in India. There is, therefore, a need to study the employee engagement levels and the drivers of employee engagement in a large manufacturing organization located in Andhra Pradesh.

In the above backdrop, there is a research gap and felt need for the present study. Keeping some of the previous studies in view, a sincere attempt has been made in the present study to examine the employee engagement and involvement levels among executives, supervisors and workers in the Steel Plant and also the drivers contributing to engagement thereof. In order to suggest additional measures and initiatives that should be taken by the Steel Plant to improve its employee engagement levels and improve its performance, the present study is expected to contribute to enhancement of engagement levels in all the three categories of employees on the one hand, and help in bringing coordination between them to improve overall productivity and profitability of the Steel Plant.

3.3 THEORETICAL FRAMEWORK FOR THE STUDY

A growing and increasingly important trend in the social and behavioral sciences is to think about and attempt to understand specific research problems from an interdisciplinary perspective. One way to do this is not to rely exclusively on the theories in a particular discipline, but to think about how an issue might be informed by theories developed in other disciplines.

A theoretical framework specifies which key variables influence a phenomenon of interest and highlights the need to examine how those key variables might differ and under what circumstances.

The present theoretical model developed for the study is based on the simple premise that opinions of the employees are the basis for the formation of feelings or attitudes of an employee towards any specific phenomena in the
organizational environment. The model adopts individual opinions as independent variable; which means to say that any opinion framed by the individual is basically his or her ‘perceivers’ reality’ which leads to the creation of feelings of being engaged or disengaged with the organization. This opinion can be influenced by organizational effort or initiative and commitment in terms of employee engagement activities, which in the study are taken as mediating variables and called as drivers of employee engagement.

**Exhibit- 3.1: Theoretical Framework for the study**

The main objective is to study the employee engagement levels among various categories of employees and also the drivers of engagement and involvement in the Steel Plant. The study attempts to suggest additional measures that can be taken to enhance employee engagement and involvement in the company for achieving increased productivity, organizational performance and profitability. This diagnostic study is expected to be useful to the steel industry in general and the Steel Plant under study in particular.

The following are the specific objectives set for the study:

1. To examine the interface of respondents’ demographic variables (age, qualifications, service, etc.) and employee engagement in the Steel Plant.
2. To know the impact of the various drivers of employee engagement on employee engagement in the Steel Plant

3. To assess the difference in the levels of employee engagement among Executives, Supervisors and Workers of the Steel Plant using discriminate analysis specifically ad hoc Tukey analysis.

4. To identify the most influencing drivers in terms of their influence on the employee engagement in the Steel Plant by factorizing the drivers.

5. To offer appropriate suggestions wherever necessary, to improve the levels of employee engagement in the organization.

3.5 HYPOTHESES

Based on the empirical studies reviewed in the previous chapter, the following null hypotheses are formulated to study employee engagement in the Steel Plant.

Hypothesis-(H₁) : Demographic-variables such as income, experience and marital status have no significant impact on engagement levels of employees of the Steel Plant.

Hypothesis-(H₂) : Drivers of engagement such as nature of job, work environment, opportunities for growth and development, avenues for learning at work, etc., have no significant relationship with employee engagement in the Steel Plant.

Hypothesis-(H₃) : There is no significant difference in the employee engagement levels among Executives, Supervisors and Workers in the Steel Plant.

3.6 METHODOLOGY OF THE STUDY
In general terms, the design of the study can be classified as descriptive research design. Descriptive studies can involve a one-time interaction with groups of people (cross-sectional study) or a study might follow individuals’ overtime.

In this section an attempt has been made to explain the methodology adopted in the present study. The objective is to gain understanding of the key drivers of employee engagement and involvement. On a broader level, by determining the important variables, the study provides a framework for further theory building and hypothesis testing, and at a practical level, will assist the management of Visakhapatnam Steel Plant, one of the largest steel plants in public sector in India, located in the state of Andhra Pradesh.

The steps taken in the process of the study are:

- Selection of the enterprise for study
- Preparation of the interview schedule
- Pilot study
- Research instruments and statistical tools
- Sample design
- Data collection
- Data Analysis.
- Scoring methodology

Each of the above steps is briefly explained below:

### 3.6.1 Selection of the Enterprise for Study

Visakhapatnam Steel Plant (VSP) has been selected for the study because it is one of the largest steel plants located in Visakhapatnam in the State of Andhra Pradesh in India. Secondly, VSP is one of the very few profit making enterprises in public sector. Thirdly, VSP is the only integrated steel plant in South India with ‘Nava Ratna’ status. Fourthly, the plant employs a large contingent of workforce consisting of nearly 18,000 employees in various categories whose commitment and involvement is necessary for its success. Fifthly, the company is one of the few steel plants which has established a
Knowledge Management Centre focusing on employee engagement. Last but not the least, the company achieved a remarkable turnaround in the recent past through adoption of several HR policies and practices and the company has highly streamlined systems and processes for management of human resources.

3.6.2 Preparation of the Questionnaire

The researcher has collected information from executives, supervisors and workers by using a detailed questionnaire. The questionnaire has been carefully prepared and arranged for the purpose of taking each respondent through the same sequence, and asking each respondent the same questions. It is considered as one of the best methods and an effective approach for eliciting the opinions of the respondents.

After a careful examination of the theoretical framework gleaned from various research studies and other available published information, as many as 15 drivers have been identified to assess the magnitude and spread of employee engagement and involvement in the Steel Plant. These drivers include Nature of Job, Supervision and Support, Work-life Balance, Working Environment, Opportunities for Growth and Development, Job Involvement, Working Relations, Team Work / Collaboration, Empowerment, Recognition and Rewards, Opportunities for Learning at Work, Trust and Respect, Health, Safety & Welfare, Job Satisfaction and Quality of Leadership.

Specific questions were included under each driver mentioned above to elicit the information and perception on employee engagement and involvement from the selected respondents from Executives, Supervisors and Workers. While finalizing the questions the researcher had interacted with senior faculty in GITAM University and Andhra University and also the executives in Visakhapatnam Steel Plant. The questionnaire is annexed as Appendix-1.

3.6.3 Pilot Study
Initially, as part of the study, interviews were conducted to pre-test the questionnaire format and determine the relevance and depth of the data to be obtained. Based on the pilot interviews the schedule was finalized. The questionnaire was finalized after a careful collection and analysis of literature in the field, and testing the questionnaire with 15 respondents from each segment viz., the Executives, Supervisors and Workers, which works out to 10 per cent of the sample in each category. This process took about three months to be completed.

3.6.4 Sample Design

As on the date of the survey, there are about 18,000 employees in VSP consisting of various cadres in different functional areas i.e. production, maintenance, finance, marketing, human resource management, etc. Since there are various cadres and levels of employees, it is desirable to segment them with meaningful classification. Hence, for the purpose of this study the employees are grouped into three categories, viz., Executive, Supervisory and Worker cadres as per the details given below:

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<th>Cadres</th>
<th>Designations</th>
<th>Grades</th>
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Executive cadre includes various levels of executives who are associated with policy making and execution of strategies. They include broadly Executive Directors, General Managers, Dy. General Managers, Asst. General Managers, Managers and Dy. Managers. Supervisory cadre includes those who directly supervise the employees in all the functional areas and includes categories of Asst. Managers, Junior Managers, Junior Officers and Charge-men. The rest of employees are included in the category of ‘Workers’.
Since there are different designations and cadres of employee in the Steel Plant, nearly 2.5 per cent of the total workforce has been taken as a sample for the purpose of the present study which comes to 450, that is equally divided among executives, supervisors and workers. The respondents have been selected using Simple Random Sampling Technique. It may be noted that only a fixed number of respondents are selected from each cadre irrespective of the number of employees in each category for the purpose of this study. This method is followed with a view to avoiding the possibility of the views of any particular cadre dominating the views of others on the basis of numbers. Apart from administering the questionnaire, personal interviews were also held with some of the top and middle level managers of the Steel Plant.

### 3.6.5 Research Instruments and statistical tools used

Questionnaire was used as an instrument for data collection. As already stated, the questionnaire is based on 15 drivers of Employee Engagement. These drivers of employee engagement have been selected after conducting comprehensive review of literature and considering different employee engagement models in vogue such as CIPD, Robinson, Penna, Macey and Schnieder, etc.

For analysis of data, Statistical Package for Social Sciences (SPSS) has been used. The 5-point Likert scale has been used and the mean scores arrived at for each Driver have been utilized to assess the levels of Employee Engagement at Executive, Supervisory and Worker levels across the 15 drivers of Engagement. The statistical tool of Factor Analysis has been used to remove redundancy or duplication from a set of correlated variables. With the help of other statistical tools such as Cronbach’s Alpha, KMO and Bartlett’s Test, Rotated Component Matrix and Correlation analysis, the validity and reliability of the factors of each driver has been determined so that they reflect the employee engagement levels in the Steel Plant. Later, Chi square test statistics are used to test the dependence of the employee
engagement levels on income, experience and marital status. Also, the statistical method of Analysis of Variance (ANOVA) has been used to test the differences in engagement levels among Executives, Supervisors and Workers. In addition, Tukey HSD analysis was also undertaken to know the direction of the differences as the ANOVA results showed significant differences in all the 15 drivers tested.

3.6.6 Data Collection

The study is based on both primary and secondary data.

**Primary Data:** As already mentioned, the primary data was collected by interview method through a structured questionnaire after conducting pilot study. Careful consideration was given to the wording of each question in relation to its development and appropriateness. The questionnaire contained 225 questions (Appendix-1). In addition to this, informal discussions were held with knowledgeable persons in the field, viz., functional directors, executive directors, general managers and other experts in respective functional areas of the Steel Plant.

**Secondary Data:** The study is also based on the secondary data obtained from different sources. For analytical purpose, both official sources of data from the organization and various other databases are used. Secondary data mostly related to the HR wing of the company. Reports of Steel Authority of India Limited (SAIL) and VSP and various journals both in hard and soft form are taken as the source of data for preparation of the research report. In addition, desk research undertaken at the libraries of GITAM University, Andhra University, Osmania University at Hyderabad, Indian School of Business, Hyderabad and Administrative Staff College of India (ASCI), Hyderabad, Indian Institute of Management, Ahmedabad were also referred to.

3.6.7 Analysis of data
The data and information thus collected is analyzed and interpreted with the help of statistical tools. For testing the null hypothesis, correlation, t-test and variance analysis, etc., have been used to depict the employee perceptions regarding the interface of select drivers of employee engagement across different demographic variables. The results are measured with the help of mean values so as to find out the levels of significance. As already explained several statistical tools like Factor Analysis, Cronbach’s Alpha, KMO and Bartlett’s Test, Rotated Component Matrix, Correlation analysis, Chi Square analysis, ANOVA and Tukey HSD Test are extensively used for analysis of data.

3.6.8 Scoring Methodology

To assess the levels of Employee Engagement, a 5-Point Likert Scale has been used for quantification of qualitative responses in the following pattern.

- Strongly agree – 5
- Agree – 4
- Neither Agree/Nor Disagree – 3
- Disagree – 2
- Strongly Disagree – 1

The fifteen drivers selected have been used to measure the extent of employee engagement and involvement. Each of these drivers, in turn, comprises 15 questions. The engagement scale that has been developed using “15X15 employee engagement-questionnaire” determines as to what percentage of VSP workforce is ‘Highly engaged’, ‘Partly engaged’ or ‘Disengaged’. As already mentioned, the said 15X15 employee engagement-questionnaire” comprises a 5-level response scale: Strongly Disagree, Disagree, Neither agree nor disagree, Agree, Strongly Agree. A point value raising from 1 to 5 has been assigned in the order to each of the possible responses with ‘Strongly Disagree’ equating to a value of 1 and ‘Strongly Agree’ equating to a value of 5.
In case a respondent answered ‘Strongly Agree’ to all the fifteen engagement questions of a particular driver, that respondent would have an engagement score of 75 (15X5) in that driver (The Strongly agree point value of 5 times the 15 questions of the particular driver equals 75) and a total score of 1125 (15X75) for all the drivers.

In case a respondent answered ‘Agree’ to all the fifteen engagement questions of a particular driver, that respondent would have an engagement score of 60 (15X4) in that driver (The Agree point value of 4 times the 15 questions of the particular driver equals 60) and a total score of 900 (15X60) for all the drivers. In case a respondent answered ‘Neither Agree Nor Disagree’ to all the fifteen questions of a particular driver, that respondent would have an engagement score of 45 (15X3) in that driver (The Neither Agree Nor Disagree point value of 3 times the 15 questions of the particular driver equals 45) and a total score of 675(15X45) for all the drivers.

In case a respondent answered ‘Disagree’ to all the fifteen engagement questions of a particular driver, that respondent would have an engagement score of 30 (15X2) in that driver (The Disagree point value of 2 times the 15 questions of the particular driver equals 30) and a total score of 450 (15X30) for all the drivers.

Similarly if a respondent answered ‘Strongly Disagree’ to all the fifteen engagement questions of a particular driver, that respondent would have an engagement score of 15 (15X1) (The Strongly Disagree point value of 1 times the 15 questions of the particular driver equals 15) and a total score of 225 (15X15) for all the drivers.

For purposes of this study, an employee has been classified as “Highly engaged” if he obtained a total score of 900 (15X60) as if he/she agreed with each of the 15 questions. The cut-off of 900 (15X60) is simply the break-point used to denote an engaged employee based on the belief that to be treated as ‘engaged’, an employee’s score should average out to show agreement with each of the given questions. It is needless to say that the respondent who
has answered “strongly agree” to some questions and “agree” to other questions, his total score would exceed 900 and he is classified as “highly engaged”.

An employee has been classified as “Partly Engaged” if he/she obtained a total score of 675 (15X45) as if the employee had answered ‘Neither Agree Nor Disagree’ for each of the questions (15X3) under the particular driver. The cut-off of 675 (15X45) is simply the break-point used to denote a partly engaged employee.

The employees having scored less than 675 i.e., they achieved less than neutrality for each question, are, therefore, categorized as “Disengaged”.

First, an analysis has been made based on the ‘mean values’ obtained by the respondents viz., Executives, Supervisors and Workers on each driver. Later, an analysis has been made on the percentages obtained by each category of respondents. Such analysis helped the researcher to assess the employee engagement levels in each category i.e. Executives, Supervisors and Workers. The analysis is further subjected to statistical tools such as factor analysis, ANOVA and Tukey HSD analysis to test the reliability and validity of the data and compare the engagement levels among various categories of employees.

3.7 PRESENTATION OF THE STUDY

The study has been presented in nine Chapters. The framework of the study is as follows:

CHAPTER-I-Introduction: This Chapter deals with the introduction of the subject, origin of the concept of employee engagement, its Significance and Relevance.
Chapter-II – Review of Literature: pertaining to the elements of employee engagement, drivers of employee engagement, outcomes of employee engagement, etc.

CHAPTER – III-The Present Study: This Chapter deals with the need for the study, specific objectives, hypotheses, research methodology, sampling and limitations.

CHAPTER-IV-An Overview of Steel Industry and Profile of Visakhapatnam Steel Plant: The Chapter gives the international and domestic overview of Steel Industry and a profile of Visakhapatnam Steel Plant comprising genesis and growth of the Steel Plant, production and sales and employee profile.

CHAPTER-V-HR Policies and Practices of VSP: The Chapter presents the HR policies and practices that exist in the Steel Plant to facilitate employee engagement and involvement.

CHAPTER – VI Analysis of Demographic Profile and Engagement Levels: The Chapter analyzes the demographic background of the respondents and assesses their engagement levels.

CHAPTER-VII-Analysis of Drivers of Engagement and Factor Analysis: The Chapter assesses the drivers of engagement and their impact on engagement levels in the Steel Plant. The drivers of engagement are further analyzed using statistical tools such as Factor analysis, Cronbach’s Alpha, Bartlett’s test of sphericity, correlation analysis, etc.

CHAPTER-VIII-Engagement Levels of Executives, Supervisors and Workers: In this chapter an integrated analysis of the outcomes of the study with 15 drivers of employee engagement and engagement levels of Executives, Supervisors and Workers is presented. Later, Chi square test statistics are used to test the dependence of the employee engagement levels on income, experience and marital status. Comparisons between engagement levels of various categories of employees is further analyzed using ANOVA and Tukey HSD Test.
CHAPTER-IX-Summary and Suggestions: The Chapter presents a summary of the study and major findings that emerged from the study. The chapter also offers suggestions to improve the employee engagement and involvement levels in the Steel Plant. Further, it delineates the implications for managers and scope for further research.

3.8 LIMITATIONS OF THE STUDY

The researcher has taken utmost care in designing the research work in consultation with the research guide, resource persons from reputed universities and also interacted with top level executives not only in the Steel Plant under study but also in other steel companies. The researcher spent considerable time in obtaining secondary data and also collecting primary data from the respondents selected under three categories – Executives, Supervisors and Workers. Even though every effort was made to enrich the study with the required data and analysis, it is humbly submitted that the study is not free from a few limitations. The study has the following limitations:

1. As in any employee engagement and involvement study, data relating to HR policies, strategies and other information only are used. The variables from other functional areas are not examined which the researcher could not cover them, as they are beyond the scope of the study.

2. The requirement of secondary data has become a critical input in the study which was collected not only from the Steel Plant under study but also from various research studies in India and abroad, published papers both in hard and soft form. While using the required data drawing from various sources, it is observed that there are some variations in the data collected from different sources. While computing the data under the same category slight variations are overlooked in the analysis of data. However, it is felt that such variations may not have much impact on the analysis and the working out of the results.
3. Steel industry all over the world started experiencing an unprecedented recession during the past few years. This study does not address the likely impact of the recessionary trends on the engagement levels of employees in the Steel Plant.

In spite of the above limitations, it is felt that the present study might be useful to the steel manufactures, company managements and the policy makers. Since few comprehensive studies of this type have been undertaken by researchers in the past in the Steel Plant, an attempt has been made in this study to fill this gap.

By looking at the employee engagement process and the drivers of employee engagement in the Steel Plant under study, it is hoped that this study will make contribution to literature in two ways: Firstly, to know about the HR initiatives and policies adopted by a large business enterprise in India and the employee engagement and involvement levels achieved by the Steel Plant. Secondly, it contributes to the literature on the relationship between organizational initiatives, drivers and engagement levels in the Steel Plant. Further, this might also add to a better knowledge of the micro process of motivating employees for improved performance.