CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

The purpose of this chapter is to provide a description of the research design and the methodological procedures for the study. The chapter includes sampling, tools for data collection and the statistical techniques used to analyze the data.

3.2 SAMPLING

The population for the study is organizational managers who are employed at different software organizations in the national capital region, India. The sample consisted of managers having employees reporting directly to them. A list of software organizations from National Association of Software and Services Companies (NASSCOM) directory was used for inviting the software organizations for participating in the research. The population is stated in vague terms to honor the request and to protect the confidentiality of the organizations participating in the study. From the NASSCOM List, E-mails were sent to the software organizations, which were employing minimum 100 employees, purposely so that sufficient & appropriate groups of managers and their subordinates are available to participate in the research. ESCI (rating version) and MLQ 5x (Rater Form) requires at least two subordinates to rate the manager. These subordinates and manager must have been working together for at least six months. Participants in the study were not limited by gender, age, ethnicity or religion.

Software organizations that showed interest were approached for the detailed discussions of the research study. Senior executives of these organizations were briefed about the research objectives and participation requirements. The senior executives connected the researcher to their human resources (HR) departments for identifying participants for completion of research questionnaires. The HR department of each organization made a pool of managers, who fit in to the above requirement. All the managers of the pool were invited to participate in the study and give the names of minimum 2 subordinates who could rate their managers. The
managers’ and subordinates’ participation was voluntary. The final sample for the study was 156 managers and 312 subordinates.

3.3 SAMPLE

The population for this study consisted of managers employed at different software organizations in National Capital Region, India. In each software organization, number of managers and subordinates varies according to the size of the organization. In each participating organization managers who volunteered for participating in the study were given the demographic questionnaire and their nominated subordinates were given questionnaires for rating their supervisors/managers. Some participants did not fill the questionnaires. Some questionnaires were not usable because of missing values. The final sample for the study was 156 managers and 312 subordinates.

3.4 TOOLS OF DATA COLLECTION

Based on literature and discussions, two research instruments were identified and obtained from the publishers. The Emotional and Social Competence Inventory (ESCI) rating version was used for measuring the manager’s emotional intelligence. The Multifactor Leadership Questionnaire (MLQ) 5x (Rater Form) was used for measuring the manager’s leadership styles and leadership effectiveness. Paper-pencil versions of ESCI and MLQ 5x were used in the study. All the managers and their nominated subordinates of participating software organizations were invited to participate in the study. The managers were given the demographic surveys, which were returned by them along with names of two of their subordinates. The subordinates of each manager completed above two surveys.

ESCI assesses 12 competencies. Each of these competencies is further organized into four clusters [22]. ESCI contains a total of 68 questions and the respondents rated their supervisors on a 6-point Likert scale ranging from 1 (never) to 5 (consistently) with the 6th selection being don’t know. The test has been shown to have desired reliability and validity [186]. The test also has been shown to have good model fit, and convergent and divergent validity at the scale level [82]. MLQ-5x is considered widely accepted measurement of transformational, transactional, and laissez-faire leadership styles and leadership outcomes [187].
3.4.1 Emotional & Social Competence Inventory (ESCI) Rating Version

The Emotional & Social Competence Inventory (ESCI) is a “360°” survey designed to assess competencies that differentiate outstanding from average performers. The ESCI measures the demonstration of individuals’ behaviors, through their perceptions as well as those of their raters [64]. The ESCI assesses 12 competencies: Emotional Self-Awareness, Achievement Orientation, Adaptability, Emotional Self-Control, Positive Outlook, Empathy, Organizational Awareness, Coach and Mentor, Conflict Management, Inspirational Leadership, Influence, and Teamwork. The 12 competencies cover four distinct areas of ability: Self Awareness, Self-Management, Social Awareness, and Relationship Management [22]. ESCI contains 68 items and for each of the 68 items, peers and subordinates of the executive described how frequently he or she typically demonstrated the behaviour described in the item.

Since it is a demonstration of behaviour, self-assessment from the subjects was discarded for the analysis. As Self-report measures are problematic in that they are vulnerable to social desirability biases and faking [188] as well as to the respondents’ inaccurate judgments of their own abilities [189]. Self report measures of EI have also been found to lack discriminant validity from existing personality measures [190] [191].

The test has been shown to have desired reliability and validity [192], good model fit, and convergent and divergent validity at the scale level in a sample of more than 67,000 test takers [82]. ECI-2 (Earlier version of ESCI) has been found to have statistically significant reliability coefficient and divergent validity with Stress Personality test on the Indian sample [193]. Respondents rated each item on a 6-point Likert scale ranging from 1 (never) to 5 (consistently) with the 6th selection being don’t know.

The 12 measured competencies are separated into four clusters of Self Awareness, Self Management, Social Awareness, and Relationship Management.

Self Awareness:

Emotional Self-Awareness: the ability to understand our own emotions and their effects on our performance.

Self Management:
1. Emotional Self-Control: the ability to keep disruptive emotions and impulses in check and maintain our effectiveness under stressful or hostile conditions.

2. Adaptability: flexibility in handling change, juggling multiple demands and adapting our ideas or approaches.

3. Achievement Orientation: striving to meet or exceed a standard of excellence; looking for ways to do things better, set challenging goals and take calculated risks.

4. Positive Outlook: the ability to see the positive in people, situations and events and our persistence in pursuing goals despite obstacles and setbacks.

**Social Awareness:**

1. Empathy: the ability to sense others’ feelings and perspectives, taking an active interest in their concerns and picking up cues to what is being felt and thought.

2. Organizational Awareness: the ability to read a group’s emotional currents and power relationships, identifying influencers, networks and dynamics.

**Relationship Management:**

1. Coach and Mentor: the ability to foster the long term learning or development of others by giving feedback and support.

2. Inspirational Leadership: the ability to inspire and guide individuals and groups to get the job done, and to bring out the best in others.

3. Influence: the ability to have a positive impact on others, persuading or convincing others in order to gain their support.

4. Conflict Management: the ability to help others through emotional or tense situations, tactfully bringing disagreements into the open and finding solutions all can endorse.

5. Teamwork: the ability to work with others towards a shared goal, participating actively, sharing responsibility and rewards and contributing to the capability of the team. [64]
Key events in the development of the ESCI  [64]

1973 David McClelland’s article *Testing for competence rather than intelligence* initiates interest into the research of competencies and their application in organizations.

1982 Richard Boyatzis publishes *The competent manager*, an empirical approach to identifying the characteristics which enable managers to be effective in various management jobs.

1985 Hay/McBer’s *Generic competency dictionary* was first developed by Richard Boyatzis *et al*.


1993 Signe and Lyle Spencer developed and documented the generic dictionary in their book *Competence at work*.

1998 Daniel Goleman’s *Working with emotional intelligence* draws on Boyatzis’ work and the Hay/McBer generic dictionary to identify core emotional competencies.

1998 *The Emotional competence inventory* (ECI) is developed by Boyatzis and Goleman, in partnership with Hay Group, measuring twenty two competencies.

2002 Ongoing testing, analysis, development and validation results in version 2 of the ECI measuring with a reduced number of competencies (18).

2007 Boyatzis *et al* re-conceptualize the ECI as a measure of emotional and social intelligence competencies. A review of all competencies and items, along with factor analysis, lead to the *Emotional and social competency inventory* (ESCI) with a higher psychometric standard and a reduced number of competencies (12).

2009-2011 Ongoing item review, testing and analysis of the ESCI.

2010 ESCI norms derived from a data set consisting of 4,014 participants, 42,092 respondents and 273 organizations.

2011 Version 2 of the ESCI launched with 12 competency scales and 68 items.
3.4.2 Multifactor Leadership Questionnaire (MLQ 5x) Rater Form

The Multifactor Leadership Questionnaire (MLQ 5x) which was used to measure leadership styles and leadership effectiveness, contains a total of 45 descriptive statements. Each statement on the questionnaire is rated on a 5-point Likert scale. The rating scale has a range of 0 (not at all) to 4 (frequently, if not always). This questionnaire was expected to take an average of approximately 15 minutes to complete [194]. Nine factors were measured to determine three different leadership styles. The factors and leadership styles measured were: (a) transformational leadership; idealized attributes, idealized behaviors, inspirational motivation, intellectual stimulation, individualized consideration; (b) transactional leadership; contingent reward, active management-by-exception; (c) passive/avoidant; passive management-by-exception and laissez-faire [194].

Bass and Avolio noted that researchers have conducted many studies on the relationship between leadership effectiveness and transformational leadership using the MLQ instrument, including in the areas of business, military, nonprofit, government, educational, technology, and religious organizations. The initial sample set evaluating a leader using a set of nine samples (N = 2,154) produced reliabilities for each leadership factor scale ranging from .74 to .94 [23]. Several MLQ 5x revisions have been performed since the initial conceptualization that generally produced high scale reliabilities.

The MLQ-5x contains 45 items [92]. Of those 45, 36 items were based on the current nine components that measure three leadership styles. The other nine items assess three leadership outcomes namely extra effort, effectiveness, and satisfaction [195]. Antonakis et al. [195] and Barge and Schlueter [196] also support the current MLQ-5x as being a valid and reliable instrument. Table 3.1 shows Leadership Categories and Subscales of MLQ-5x.

3.4.3 Demographics

Software organization managers were asked a series of questions about their background. The demographic items asked the respondents to report their age, gender, marital status, supervisory experience and total work experience.
Table 3.1: MLQ 5x Leadership Categories and Subscales

<table>
<thead>
<tr>
<th>Transformational</th>
<th>Transactional</th>
<th>Passive avoidant</th>
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<tbody>
<tr>
<td>Idealized attributes (IA)</td>
<td>Contingent reward (CR)</td>
<td>Laissez-faire (LF)</td>
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<tr>
<td>Idealized behaviors (IB)</td>
<td>Management-by-exception-Active (MBEA)</td>
<td>Management-by-exception-Passive(MBEP)</td>
</tr>
<tr>
<td>Inspirational motivation (IM)</td>
<td>Intellectual stimulation (IS)</td>
<td></td>
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<td>Individual consideration (IC)</td>
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### 3.5 PROCEDURE FOR DATA ANALYSIS

Missing data is inevitable in survey research. All subjects with missing data were eliminated before data analyses are performed. Two step data analysis technique was used to analyze data in the current study: confirmatory factor analysis (CFA), and structural equation modelling (SEM). Before conducting all of these analyses, the descriptive statistics of the participants’ demographic information were calculated using SPSS 18.0.

The internal consistency (Cronbach’s alpha) of each subscale was estimated using SPSS 18.0. Alpha coefficients greater than .70 are assumed to be adequate for internal consistency in the field of social science. To test for convergent validity, items in each construct must have reliabilities (loadings) over 0.5 [197] [27] and Composite Reliabilities (CR) should be over 0.7 [198], and greater than their respective Average Variance Extracted (AVE). Lastly, the average variance extracted should be maximized, with a minimum of 50% [199]. Discriminant validity is established by showing that the correlation between any two constructs is less than the square root of the average variance extracted by the measures of that construct [200].

The Structural Equation Modeling (SEM) technique that is available through AMOS 18.0 was used to perform CFA on each proposed model. As the number of constructs was more, therefore second order CFA was performed on each second order factor. In Emotional Intelligence data, CFA was performed on four factors of Self Awareness, Self Management, Social Awareness, and Relationship Management separately.
In Leadership effectiveness data, CFA was performed on three scales extra effort, effectiveness, and Satisfaction of leadership effectiveness. In transformational leadership style data, CFA was performed on five scales idealized attributes, idealized behaviors, inspirational motivation, intellectual stimulation, and individualized consideration. In transactional leadership style data, CFA was performed on contingent reward and management by exception (active) scales. In passive avoidant leadership style, CFA was performed on management by exception (passive) and laissez faire scales. Next, four CFAs were performed separately for four proposed models and then, SEM was performed on each model to test hypothesis. Overall fit of each model was assessed by chi-square ($\chi^2$), Comparative Fit Index (CFI) and Root Mean Square Error of Approximation (RMSEA). The values of ($\chi^2$), CFI and RMSEA were compared with the recommended values. Chi-Square/degree of Freedom should be less than 3, CFI $\geq$.90 and RMSEA< .80 are considered good [201] [202] [203] [204].

Figure 3.1 presents the measurement model for emotional intelligence factors/ clusters and leadership effectiveness factors. All factors of emotional intelligence are second order factors except self awareness, which is a first order factor having only one competence. Leadership effectiveness is also a second order factor. Figure 3.2 presents the structural model for emotional intelligence competences and leadership effectiveness. Figure 3.3 presents the measurement model for emotional intelligence competencies and transformational leadership style. Figure 3.4 presents the structural model for emotional intelligence competencies and transformational leadership style. All factors of emotional intelligence are second order factors except self awareness, which is a first order factor having only one competence. Transformational leadership style is a second order factor. Figure 3.5 presents the measurement model for emotional intelligence competencies and transactional leadership style. Figure 3.6 presents the structural model for emotional intelligence competencies and transactional leadership style. All factors of emotional intelligence are second order factors except self awareness, which is a first order factor having only one competence. Transactional leadership style is a second order factor. Figure 3.7 presents the measurement model for emotional intelligence competencies and passive avoidant leadership style. Figure 3.8 presents the structural model for emotional intelligence competencies and passive avoidant leadership style. All factors of emotional intelligence are second order factors except self
awareness, which is a first order factor having only one competence. Passive avoidant leadership style is a second order factor.

Figure 3.1: Measurement Model of Emotional Intelligence and Leadership Effectiveness

Figure 3.2: Structural Model of Emotional Intelligence and Leadership Effectiveness

Figure 3.3: Measurement Model of Emotional Intelligence and Transformational Leadership Style

Figure 3.4: Structural Model of Emotional Intelligence and Transformational Leadership Style

Figure 3.5: Measurement Model of Emotional Intelligence and Transactional Leadership Style

Figure 3.6: Structural Model of Emotional Intelligence and Transactional Leadership Style

Figure 3.7: Measurement Model of Emotional Intelligence and Passive Avoidant Leadership Style

Figure 3.8: Structural Model of Emotional Intelligence and Passive Avoidant Leadership Style

3.6 CONCLUSION

In this chapter research design has been presented. Sampling, tools of data collection, sample, have been discussed in detail. This chapter also explained the tools which are used to analyze the data. Correlations, Confirmatory Factor Analysis (CFA), and Structural Equation Modeling (SEM) techniques are used to test the hypotheses of the study.

In next chapter, details of the findings and analyses of the study are presented. It starts with demographic analysis of the participants. Reliability and validity of the research tools is presented in the chapter. Then, it presents the mean and standard deviations of the various scales of the research instruments used. Each hypothesis was tested using two step Structural Equation Modeling technique.