AN EMPIRICAL ANALYSIS OF RELATIONSHIP BETWEEN THE EMPLOYEES' COMPETENCIES AND QUALITY OF WORK LIFE

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Dedicated
to
My Son

Manvik Gandhi

Malaviya National Institute of Technology, Jaipur

CERTIFICATE

This is to certify that the thesis entitled "**An Empirical Analysis of Relationship between the Employees' Competencies and Quality of Work Life**" is being submitted by **Ms. Manisha Choudhary (ID. NO: 2010RBM202)** to the Malaviya National Institute of Technology, Jaipur for the award of the degree of **Doctorate of Philosophy** is a bonafide record of original research work carried out by her. She has worked under my guidance and supervision and has fulfilled the requirement for the submission of this thesis, which has reached the requisite standards.

The results contained in this thesis have not been submitted to any other university or institute for the award of a degree or diploma.

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DECLARATION

I hereby certify that the work which is being presented in the thesis entitled '**An Empirical Analysis of Relationship between the Employees' Competencies and Quality of Work Life**' in fulfillment of the requirements for the award of the degree of Doctor of Philosophy and submitted to the Malaviya National Institute of Technology Jaipur is an authentic record of my own work carried out at Department of Management Studies during a period from January, 2010 to May, 2015 under the supervision of Dr. Dipti Sharma, Assistant Professor, Department of Humanities and Social Sciences, MNIT Jaipur.

The result contained in this thesis has not been submitted by me, in part or full, to any other University or Institute for the award of any degree or diploma.

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Abstract

Recent organizational changes have refocused attention on the productivity and performance of the employees and consequently brought about a re-evaluation of the quality of work life that these employees experience, as well as their competencies in the organisation.

Employee competency and quality of work life (QWL) directly affects the company's ability to retain its talent, and if it is not measured, it cannot be effective. It is revealed from literature that employees with a high level of psychological well being are better, more committed and more productive than employees with a low level of psychological well being, Wright and Bonett (2007).

QWL and competencies are increasingly being identified as progressive indicators related to the function and sustainability of business organizations.

The present research is designed to fill the identified research gaps and further validate the existing sparse evidence on quality of work life and competency relationship by examining the influence of employee perception of quality of work life on their competencies in the Indian telecom sector. To accomplish the present research work, firstly a detailed study of the Indian telecom sector, structure, employee status and their roles and responsibilities was performed. The study comprised of three phases. First dealt with the review of existing literature than a pilot study was conducted followed by the empirical study.

Responses to an internet-based survey methodology and also personal visits in some cases were analyzed using quantitative techniques and structural equation modeling. Results confirm a positive relationship between employees' competencies and quality of work life.

This study accentuates the importance of management to be aware of the employees' competencies in the organisation as well as their experience of QWL.

The findings of this research study are useful since it provides valuable information about, and an understanding of, the relationship between employee competencies and quality of work life as reflected by the empirical analysis of the

middle level personnel of the Indian telecom industry. Thus, the research has practical implications which may be useful for the organizations. In general the present study showed that managers within the organizations should be more attentive regarding their competencies, as this might influence the building of good quality of work life within the organizations. Overall, the current study findings provide tentative support to the proposition that quality of work life should be recognized as a significant antecedent for employees' competencies. To sum up in a line the implications of the present research is 'Happy & healthy employees are more competent and add to productivity and profitability of the organizations.'

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Chapter - 1

Scientific Orientation to the Research

"Ability is what you're capable of doing. Motivation determines what you do. Attitude determines how well you do it."

This thesis aims to describe a quantitative research undertaken to explore the relationship between employees' competencies and the quality of their work life. The present chapter contains eleven sections related to introduction, background and motivation of the study and the problem statement. The objectives of the study, hypotheses, research design and method is reported in the introductory chapter. The final section of this chapter shows the importance of the study and its limitations.

1.1 Introduction

Human capital is one of the important resources on which companies build their competitive advantage. In order to meet the new challenges of today's business environment, organizations have to find new ways of doing business. Since the beginning of the 1980s, vast literature emphasizes more strategic role of human resources, Guest (1987). For sustainable competitive advantage it is essential for the organizations to manage their human resources efficiently. Now a days, for an organization, it is very important to satisfy the employees by providing a healthy working environment in order to be more successful in achieving its objectives. The working environment not only affects the employees' physical but also psychological and social wellbeing.

There is a need to develop the humanised jobs for satisfying the employees needs, wants, make use of their advanced skills and convert them into a better citizens, spouses and parents.

Employee competency and quality of work life (QWL) directly affects the company's ability to retain its talent, and it is effective only when it is measured correctly. It is revealed from literature that the employees who possess a high level psychological well being are superior, shows more commitment and trust towards the organization in comparison to those employees who possess low level of

psychological well being, Wright and Bonett (2007). QWL and competencies are the two factors which are being identified as progressive indicators of the organization aimed to increase its sustainability and function.

1.2 Background and motivation

Today we are living a life which is constantly changing and time-determined. According to Ellinger and Nissen(1987); Ballou and Godwin (2007); Huang, Lawler and Lei (2007), the quality of day to day life is highly dependent on various factors, like work, family, safety and leisure,

Today employees are facing a major problem in terms of dissatisfaction with work life. It affects each and every employee during his/her working career, regardless of position or status which results in frustration, boredom and anger. This can be costly to the individual as well as the organisation.

Walton (1973); May and Lau (1999) and Huang et al. (2007) stated that many managers search for job satisfaction at all the levels of organization, including their own. However they find it difficult to identify all of the attributes, which affect the quality of work life. Past research by Skrovan (1983); Reid (1992); Sirgy, Efraty, Siegel and Lee (2001); Kotzé (2005) indicate that quality of work life is an old phenomenon with a broad concept. Quality of work life is a concept used in almost every organization for instance, in education industry, government, labor, and management circles.

Quality of Work Life is a perception which is highly dependent on mutual respect, encourages employee participation, and supports open communication which affect employees' jobs, business, futures, and their feelings of self-esteem, Cascio (1998); Ellinger and Nissen (1987) and Singhapakdi and Vitell (2007).

The perception of the employees of working to earn has given way to enrich their quality of work life, May and Lau (1999); Haung et al. (2007). In present times the employees expect to gain benefits from their jobs and lay emphasis on "challenge and achievement, career development and growth, balance between work and family life, a harmonious organizational climate and a supportive managerial style".

An employee's quality of work life is based on two factors personal (subjective) and situational factors (objective) which are an important aspects of work-related rewards and experiences, Kaushik and Tonk (2008); Koonmee, Sanghapakdi, Virakul and Lee (2010).

Job security, reward systems, training, carrier advancements opportunities, participation in decision making are the integral part of the quality of work life, Lau RSM, Bruce EM (1998). According to Ellis and Pompli (2002), to improve the employees quality of work life an organization has to remove the barriers like poor working environments, workload, resident aggression, shift work, inability to deliver quality of care preferred, imbalance of work and family, lack of involvement in decision making, professional isolation, lack of recognition, poor relationships with supervisor/peers, role conflict, lack of opportunity to learn new skills. The organization need to focus on the working environment, remunerations, welfare schemes, promotion of the employees, the work environment, training and development, leadership style, cooperation among colleagues, organization image, communication, organizational rules and regulations, organization climate and culture, working time and workload of the employees, CHEN Jia-sheng and Fan Jingli (2003).

The growing significance of quality of work life influencing the employee perception, qualities and competencies motivated the researcher to undertake the present study and evaluate the impact and relationship between the employee competencies and quality of work life on the basis of an empirical study of the middle level personnel/managers of the Indian telecom sector. The Indian telecommunication sector is one of the most rapidly growing industry in the world. Besides it is the driving force behind the overall economic development of the Indian nation.

Thus in current times the organizations are focusing on the efficiency and performance of their managerial employees, in particular to the time spent in the office.

1.3 Problem statement

Around 150 research articles on competency, QWL and telecom industry in were reviewed by the researcher out of which 60 articles were found appropriate for the present research. These studies have found that there is sufficient scope to explore the relationship between QWL and competency. The detailed review of existing literature has been presented in chapter two.

As unveiled by review of existing literature, researchers have sparsely studied the impact of quality of work life on employees' competencies. The present work attempts to validate the related quality of work life outcomes in the Indian context. Moreover, the telecom industry plays a vital role in the development of economic growth and employment generation in developed as well as in developing countries; therefore researchers targeted to study this sector of the economy on the same have remained scarce.

Thus, the present research study is intended to fill these identified research gaps and further validate the existing sparse evidence on quality of work life and competency relationship by investigating the impact of employee perception of quality of work life on their competencies in the Indian telecom sector. The present research area not only enhances the literature on the quality of work life and employees' competencies, but also contributes to the organizational behavior literature within the Indian telecom sector. Furthermore, the current study seeks to examine the relationship of employee competencies with the quality of work life.

The quality of work life is becoming increasingly important for the employees and competencies of employees create meaning in individual's work environment. Thus, it is important to explore the relationship between these two constructs. To address the above issues, the present research has been designed to answer the literature and empirical questions related to:

- The factors of the construct competency
- The essential factors of the construct quality of work life
- The significant relationship between the dimensions of competency and quality of work life
- The possible recommendations to the organization in managing and retaining talented competent employees

1.4 Objectives of the study

The main objective of this research is to determine the relationship between the employees' competencies and quality of work life. The specific aims related to the literature review were:

1. Conceptualizing competency
2. Conceptualizing quality of work life
3. Integration of competency and quality of work life

The empirical study targets to:

i. determine whether or not there is a significant relationship between competency (middle management level) and quality of work life within the telecom sector of India;
ii. integrate the results of the various questionnaires used;
iii. formulate and compile recommendations and conclusions based on the results of the study.

1.5 Hypothesis of the study

The word 'hypothesis' is a proposed explanation for a phenomenon which means 'to suppose'. To prove a hypothesis, the scientific method requires that one can test it. A hypothesis requires a scientific basis to confirm or disprove it. The researcher has selected two dimensions over which the hypothesis would be based. These dimensions are quality of work life and employees competencies and the null hypothesis to be tested is:

H_0 : There is no significant relationship between the employee competencies and quality of work life.

1.6 Research design

According to Mouton (2002) and Struwig and Stead (2001) "a research design is a blueprint, framework or plan for collecting and using data in order to obtain the desired information with sufficient precision".

Descriptive quantitative research and cross-sectional data analysis has been used to answer the research questions of the present study. Two types of research have been conducted in the present work: descriptive research tries to explore certain

research phenomena which are already defined in the subject area. Exploratory research attempts to develop those paradigms which have not previously been researched, Struwig and Stead (2001).

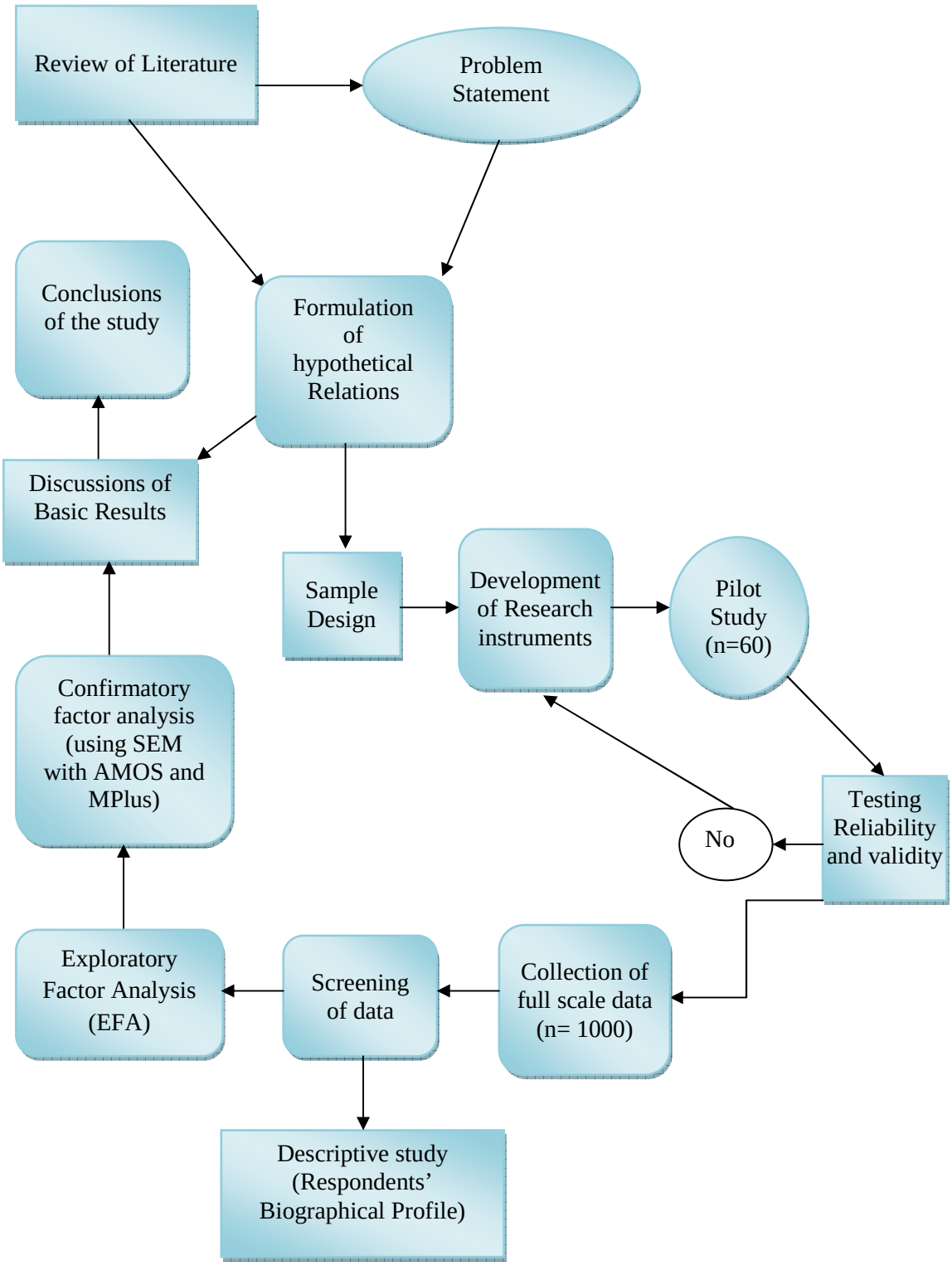
The cross-sectional research can be used to explore relationships between the variables and to compare the subgroups, Fife-Schaw (2002). For present research work, cross-sectional research has been used to elicit information at a single time from individuals in different conditions and conclusions can be drawn in a short period of time.

According to Salkind (2008) validity is used to measure the quality of the questionnaire i.e. what it says it does, and reliability represents the uniformity of a measurement. He further instated that in a research study validity and reliability are used to ensure content validity of the questionnaires. Cronbach alpha (coefficient of reliability) has been used to test the internal consistency reliability of the questionnaire.

An internet-based survey and personal visits in the organization approach was used to collect primary data from a probability sample of respondents. In this study, the units of analysis were middle level employees' within the Indian telecom organizations. Descriptive statistics related to the demographic sample were generated. To test the relationship between the various dimensions of competencies and quality of work life structural equation modeling (SEM) was used.

Frequency distributions, multiple linear regression, path estimates and goodness-of-fit as part of the SEM process were used to determine the stated relationship by using SPSS 20 (statistical package for social sciences) with AMOS 18 and Mplus 7.1 software.

Fig: 1.1 Flow chart of Research Design



1.7 Research method

The study comprised of three phases. First dealt with the review of existing literature, then a pilot study was conducted which was followed by the empirical study.

1.7.1 *Stage 1: Literature review*

The literature review contained the following steps:

a) Identifying the research gap and motivation for this study

b) The conceptualization of competency as a variable and construct within this study

c) The conceptualization of quality of work life as a variable and construct within this study

d) The theoretical integration of quality of work life and competency

1.7.2 *Stage 2: Pilot study*

The pilot study comprised of following steps**:**

a) Selection and description of population, sample and participants

b) Reliability and validity test of the measuring instrument.

1.7.3 *Stage 3: Empirical study*

The empirical study comprised of the following steps:

a) Study and selection of population, sample and participants

b) Measuring instruments and rationale for their selection

c) Methods of data collection

d) Analysis of the data and hypothesis formation

e) Results and their interpretation

f) Implications of the results

g) Conclusions

h) Limitations and recommendations

1.8 Sample study

The target population selected for this thesis was the middle-level personnel of the telecommunication sector in India. The middle level staff comprises a significant number in the sector as is indicated by the information collected from the

Indian telecom sector showing that the total middle-level staff during the financial year 2012-2013 was 22174. Besides, the middle level personnel serves as the link between the upper and lower levels hence their significance in managerial decision making and functioning cannot be ignored.

To accomplish the present research work, firstly a detailed study of the Indian telecom sector, structure, employee status and their roles and responsibilities was performed. Henceforth, a 67-item questionnaire was developed on the basis of dimensions developed by Walton (1973) for QWL and dimensions for competencies were developed on the basis of existing literature and inputs from the academic and industry experts**.**

1.8.1 Sampling technique

Multi stage random sampling technique is used for the present study. The Indian telecom sector is organized into twenty two *service areas*, out of these seven *service areas* were selected by random sampling. Eventually, the middle-level personnel from both private and public organizations of the selected service areas formed the sample in the present study.

1.8.2 Description of the questionnaire

- *Part 1: Demographic Profile*

  This part of the questionnaire contained twenty biographical questions related to the name of organization, employee designation, age, family size, family income, tenure within the organisation, etc.

- *Part 2: Competencies at middle-level personnel*

  This part measures six dimensions through twenty six questions.

- *Part 3: Quality of Work Life*

  This part contained forty one QWL questions for eight constructs.

Table 1.1: Factors and their acronyms

	Factors	**Acronyms**
I	**Competencies**	**Comp**
1	Achievement/result orientation	ACHRO
2	Basic knowledge and innovation	BKNOI
3	Skill and attributes	SKLAT
4	Meta qualities	MTKV
5	Communication	KMUN
6	Decisiveness	DCCV
II	**Quality of Work Life**	**QWL**
1	A fair and appropriate salary (remuneration)	SAL
2	Working conditions	WRK
3	Use of capacities at the work	KPW
4	Opportunities available at work	APO
5	Social integration at work	SOIN
6	Constitutionalism(respect to the laws) at work	KONS
7	The space that the work occupy in one's life	SPL
8	Social relevance and importance of work	SORI

1.9 Importance of the study

Competency is of paramount importance from the national point of view especially in a developing country like India. It is defined as a process for developing the work force of any organization by using their skills and knowledge in an organized manner. The employees are not just a packet of acquaintance and skills but they are the important assets which are a key to success in the current changing environment. The process of identifying such potential and enhancing it by providing a healthy working environment, welfare measures and opportunity for career growth. The relationship between the employee competencies and QWL, the two studied constructs is an important area of research. Besides, the Indian telecom industry is one of the rapidly growing telecom markets in the world and its fast track growth has made it a key contributor in the nation's economy.

1.10 Limitations of the study

Despite the earnest attempt and intention of the researcher to elicit all the required data on Indian telecom industry middle level managers, it is subject to certain limitations due to the fact that the data is based on individual opinion, which may bring in some biasness. Though random sampling technique has been adopted, yet due to resource constraints the researcher limited up to some selected cities of north Indian region for eliciting the responses from the participants of eight organizations working at middle level. Thus, the conclusions drawn cannot be generalized for all the public and private telecom sector organizations in India. In addition the diversity in the behavior of the respondents while responding has its impact on the validity and universality of the conclusion drawn.

1.11 Chapter outline

In order to follow the objectives of the present study, the entire work has been broadly divided into seven chapters.

The first chapter introduces the entire research study. The objectives and motivation of the present study, the scope of the study and its limitations have been discussed in this chapter. The research layout and methodology of the study, sampling method, the constructs, the hypothesis, and the dimension selected for the study has also been discussed in this chapter.

The second chapter related to the intensive review of the existing literature on competency, quality of work life and their conceptualization and integration.

The third chapter deals with the current scenario and expansion of the Indian telecom sector. The chapter highlights the significant role of the sector in the Indian economic and structural changes over the years.

Fourth chapter has been framed to highlight the research methodology, sampling technique and examines the methods through which competencies at managerial level and quality of work life can be measured and compared to reach empirically based conclusions.

In the fifth and sixth chapters, the researcher has discussed and developed the empirical model of the relationship between the two studied constructs from the data

collected from a sample of 1021 (valid sample remained 1000) of the middle level management employed in both public and private sector organizations of the surveyed regions (service areas) of the Indian telecom industry during the period of 2012-13.

The concluding seventh chapter focuses on the results and findings of the study, conclusions arrived at, suggestions and the policy implications. It encompasses the contribution and limitation of the present study and scope for further research.

Chapter - 2

Review of Literature

This chapter presents the literature related to the variables employees competencies and QWL and basic theoretical and empirical aspects of these variables to determine the correlation between studied variables. The main construct 'competency' and 'quality of work life' are discussed on the basis of existing review of literature.

2.1 Theoretical perspectives of the variables

An overview of literature in varied areas of research related to the variables selected for study is presented in this section with a view to draw conceptual, theoretical and empirical development of the variables and their assessment.

2.1.1 Competency defined

Globalization has changed the dimensions of the international business environment which has become highly competitive. According to the Kogut (1999) in present economic environment there is uncertainty over comparative advantages. The comparative advantage theory emphasized that the competitive strength is determined by the ability to earn higher profit with a lower cost. The human resource management acts as a key strength for improving the organizations' economic growth by lowering the cost of human capital, Ibrahimkhan (2006). Velde (2001) mentioned that now days the human resource management give more emphasis on the development and implementation of competency for improving the job performance of the employees which results in achieving the organizational competitiveness. Cardy and Selvarajan (2006), to compete with the upcoming challenges, it is essential for the organization to re examine the competencies of employees in order to succeed in the rapidly changing global economy. An increase in the competitiveness of an enterprise's workforce enhances its opportunities to be successful. This study presents a literature review on job competency in business settings to examine relevant definitions, categorization and models of competency.

The word competence is derived from Latin word 'competere' which means 'to be suitable'. Competency can be defined as an underlying characteristic required

for executing a given job, activity or role effectively. It comprises three elements viz; knowledge, skills, attitude. Competencies act as an inner tool to motivate the employees and to guide the business towards achieving the organizational goals which results in the increase in the value and effectiveness. Competency is the tool which integrates all the human resource functions like career development, training and development, recruitment, performance management, performance appraisal, succession planning etc. Thus, competency is a combination of knowledge, skills and attitude of an individual that enable the individual to perform any given task or job more efficiently. Competency is important for an organization as it describes what superior performers actually do on a job that produces superior results. Boyatzis (1982) "A capacity that exists in a person that leads to behaviour that meets the job demands within parameters of organizational environment and that in turn brings about desired results". Spencer and Spencer (1993) similarly defined competency as "an underlying characteristic of an individual that is causally related to criterion-referenced effective and/or superior performance in a job or situation". They elaborated on their definition explaining that underlying characteristic meant "the competency is a fairly deep and enduring part of a person's personality . . . causes or predicts behavior and performance" and criterion-referenced meant "the competency actually predicts who does something well or poorly, as measured on a specific criterion or standard". Spencer and Spencer (1993), explored an idea of competency by developing the Job Competence Assessment Method (JCAM), which is designed to encourage an organization to establish a competency model by analyzing the key characteristics of people with average to superior job performance rather than traditional job descriptions. Marrelli (1998) defined competencies as "measureable human capabilities that are required for effective work performance demands". According to The National Vocational Council for Vocational Qualification UK NVCVQ (1997), performance standards can be described as the ability to perform in given job as per the standard required in the employment. Competencies are defined as "the skills, knowledge, abilities and other characteristics that someone needs to perform a job effectively", Jackson and Schuler (2003)

Cardy and Selvarajan (2006) concluded the peer researchers thought as "competencies was the characteristics which could significantly distinguish high-

qualified employees from others who showed inferior performance". Hoffmann (1999) defined competency on the basis of past research as (a) underlying qualification and attributes of a person, (b) observable behaviors, and (c) standard of individual performance. Lucia and Lepsinger (1999) "a competency is a cluster of related knowledge, skills, and attitudes that affects a major part of one's job with role or responsibility, that correlates with performance on the job, that can be a measure against well-accepted standards, and can be improved via training and development".

Table 2.1: Different definitions of competency given by researchers

Authors	Definitions
Hayes (1979)	Are generic knowledge motive, trait social role or a skill of a person linked to superior performance on the job.
Boyatzis (1982)	A capacity that exists in a person that leads to a behavior that meets the job demands within parameters of organizational environment, and that, in turn brings about desired results.
Albanese (1989)	Competencies are personal characteristics that contribute to effective managerial performance.
Woodrufee (1991)	1 Competency: a person related concept that refers to the dimension of behavior lying behind competent performer. 2 Competence: a work related concept that refers to area of work at which a person is competent 3 Competencies: often refereed as the combination of the above two.
UK NVCVQ (1997)	The national vocational council for vocational qualification described competency as performance standards, the ability to perform in work roles or jobs to the standard required in the employment
Marrelli (1998)	Competencies are measurable human capabilities that are required for effective work performance demands
UNIDO (2002)	A competency is a set of skills, related knowledge and attributes that allow an individual to successfully perform a task or an activity within a specific function or a job
Rankin (2002)	Competencies are definition of skills and behaviors that organization expects their staff to practice in work
Jackson and Schuler (2003)	Competencies are the skills, knowledge, abilities and other characteristics that someone needs to perform a job effectively.

2.1.1.1 Components of competency

Competency has the following three major component : (i) knowledge (ii) skills (iii) attitude (KSA).

Tucker and Cofsky (1994) have identified the components of competency as knowledge, skills, self concept, motives and traits (Figure 1).

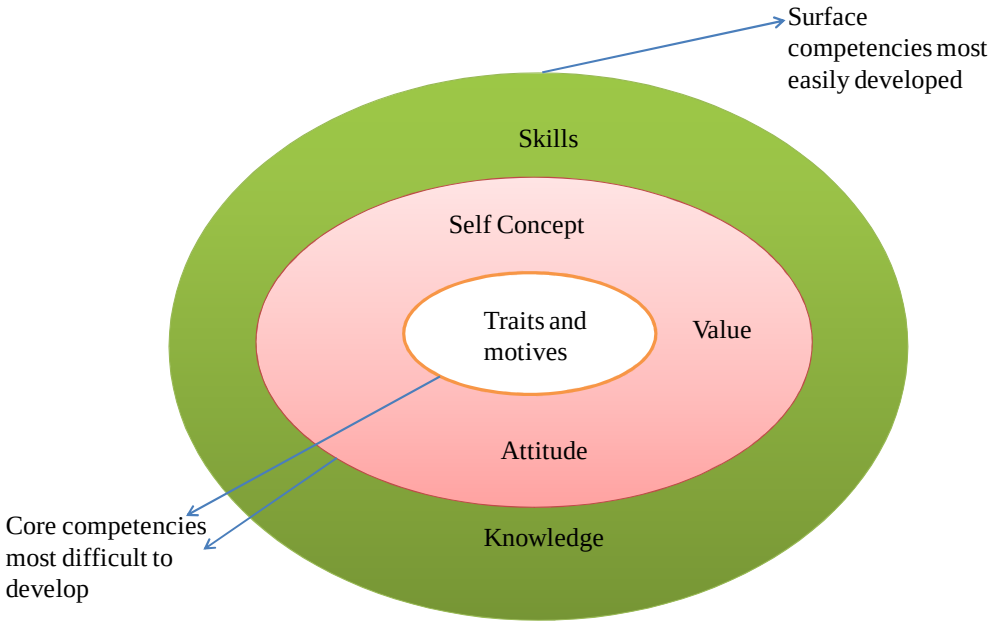


Fig. 2.1 Components of competencies

In the recent times the competency mapping is widely used by managers and HR professionals. The movement of competency finds its origin during the mid 1950s and early 1970s. Johan Flanagan (1954) was the first person to work on the concept of competency and developed a technique termed as critical incident technique which is a set of procedures for systematically identifying behaviors that contribute to success or failures of individual or organization in specific situation.

Later, David McClelland (1973) discovered and developed the term competency which predicts job performance and the approach of this concept concentrates on the radical departure of job analysis. He went on to argue that the actual predictors of the job performance are personal characteristics or 'competencies'.

Thus, the study of competencies started in early 1970s when the psychologists and human resource management experts were finding new ways of improving the job performance.

At that time several studies pointed out that job performance was not affected by the aptitude test, grades and credentials. Boyatzis (1982) conducted a study on two thousands managers holding forty one different positions in twelve organizations in order to explore the characteristics of managers that enable them to be more effective and productive at different positions. He also proposed a model which defines the relationship between management function and organizational environment. Evarts (1988) defined "competency as an underlying characteristics of a manager which casually relates to his/her superior performance in the job". Jacob (1989), states that to accomplish the managerial objectives successfully it is necessary to have an observable skill or ability. Hornby and Thomas (1989) defined it as the "ability to perform effectively and the functions are associated with a work situation". Hamel and Prahalad (1990) defined core competence as "the collective learning in the organization, especially how to coordinate production skills and integrate multiple streams of technologies".

In recent times, for the term 'competence and competency' many meanings and new labels have evolved through common usage, Strewart (1992).

Spencer and Spencer (1993) analysed 650 jobs to validate the Mc Clleland job competence assessment methodology and proposed generic job models which includes: motives, traits, self concept, attitude or values, content knowledge or cognitive behavioural skills. Spencer and Spencer (1993, 94) defined "any individual characteristic that can be measured or counted reliably and that can be shown to differentiate significantly between superior and average performer or between effective and ineffective performer".

According to the Hoffman (1999) generally 'competency' represents the behaviour that an individual needs to demonstrate, while the term 'competence' represents the standards of performance. "Competency is a cluster of related knowledge, skills and attitudes that affect a major part of one's job (role and responsibility), that correlate with performance and measured against well accepted standards and that can be improved with training and development," this definition of competency was given by numerous specialists of HRD in Johannesburg, South Africa in (2003). Competencies are basically behavioural but some of them may be

learned through training and development, Mc Clleland (1998). Rothwell (2002) categorizes the core skills into foundational and intermediate competencies. Competencies are also context specific Boyatzis (1982); Delamare Le Deist and Winterton (2005); Youn, Stepich and Cox (2006). Competencies must be integrated throughout all human resource practices for the successful implementation of competency concept in the organization, Lucia and Lepsinger (1999); Fulmer and Conger (2004); and Alain and Kramer (2006). Competency includes knowledge and skills alongside attitude, behaviors, work habits, abilities and personal characteristics, Green (1999); Lucia and Lepsinger (1999); Naquin and Witson, (2002) Gangani, (2004); Nitardy and Mclean (2002).

Beck (2003) mentioned that competence management on a corporate level not only improves the competence of its employees but it also improves their performance. Deist and Winterton (2005) define the usage of competence in the context of training and development in USA, UK, France and Germany and also clarify the fuzzy concept of competence with a holistic competence typology. The managerial competencies lead to marketing effectiveness in the corporate organization, N. Gladson Nwokah, Augustine I. Ahiauzu (2008).

The past studies showed that through implementation of sophisticated human resource development and workplace learning strategies in the organization helps in selecting and developing best performers by enhancing their competencies so as to enable employees to respond quickly and flexibly to business needs.

Competent human resources are the essence of successful organizations. Human resources are the valuable assets for every organization and it is the responsibility of the organization to manage the talent through efficient and effective competency mapping, Farah Naqvi (2009). The review of literature highlight that the competency movement has started in various countries, like Australia, Comford and Anthansor (1995) U.S Boyatzis and Kolb (1995), U.K Newton, Wilkenson, (1995), Scandinavian Countries, Mabon (1995) and Israel, Reichel (1996). The employees who possess a specific set of competencies proved to be better performers and challenges for others, Schroder (1989); Rachin, et al, (1995). In many organizations competency framework is the basis of promotion opportunities and organizational

career paths, Thomson and Mabey (1994). Competency based structured interview and other assessment techniques are used to select health care professionals, Patterson, Lane, Ferguson and Norfolk (2001). Competency frameworks can be used as a basis for workplace learning, Dr. Thomas N. Garvan and David Mc Guire (2001). Lucian Cerusca and Cristnia Dima (2003) laid emphasis on the competency mapping and linked it to performance and one's career development. Modern organizations are undergoing heavy transformation and to cope with this transformational process it is required to manage the human resource. Organizations are giving more attention in understanding and developing the competencies of employees and making use of the tool of competency mapping to increase the productivity and employees' performance with a good work culture. Competency is an effective tool for the organization as well as for the individual's career development, Dileep Kumar M. (2006). A study has also been done on the relationship between human resource management competencies and performance of HRM activities of County Chairs, Jannes Rtrument Lindner (2001).

In the literature competency has been defined from various perspectives. The American heritage dictionary of English language (2000) has provided a general depiction for this as "the state or quality of being properly or well qualified". Numerous scholars have attempted to pin down a definition for competency. Quinn, Faerman, Thompson, and McGrath (1990) suggested that competencies are the combination of knowledge and skills for implementing given roles and responsibilities successfully. To accomplish the desired results of a job, one must be effective in a particular competency with specific qualifications and personal attributes. The functional perspective of competency is defined as how the objectives of organizations were best achieved by improving members' performance, Burgoyue (1993). For an organization competencies act as an important tool for developing the personnel plan, performance management and training program in a consistent manner, Klemp (1980). To be more effective and efficient in a job an individual should exhibit underlying characteristics encouraging to that particular job, Boyatzis (1982) and Kravetz (2008).

Job descriptions list only responsibilities or expected results of a job, while the competencies are viewed more broadly and include many factors which affect employee's job success but are not included in the job description, Hayward (2002). Similarly, personal traits are also not included in competencies. People bring their underlying characteristics such as physical and mental traits into the workplace. These traits include qualities such as diligence, effectiveness which is inherent or learned early in life and not at work, Nahavandi (2006).

There is a difference between competencies and knowledge, skills, and abilities (KSAs). Knowledge can be defined as a "body of information about the theoretical and practical understanding of a subject, acquired by a person through experience or education. Skills refer to the application of data or information with manual, verbal, or mental proficiency. Skills can be tested to measure quantity and quality of performance, usually within an established time limit. Examples of skills include typing and computation using decimals. Ability means the strength to accomplish something, especially the physical and mental quality to perform activities. Examples include planning and implementation", Kravetz (2008). KSAs are the important part of competencies and are highly dependent on individual's behavior. Each competency is a set of KSAs while vice-versa may not be true and having KSAs does not mean that one has a certain sets of competencies. An individual may know how to do a certain task without being able to complete the task competently, Kravetz (2008).

The Department of Education Science and Training and the Australian National Training Authority in 2002 has also proposed the similar set of guidelines. The framework was based on the results of the research project conducted in 2001 and contained eight primary skills that work together with the personal attributes, such as: "loyalty, commitment, honesty and integrity, enthusiasm, reliability, personal presentation, commonsense, positive self-esteem, sense of humor, balanced attitude to work and home life, ability to deal with pressure, motivation, and adaptability, covering the practice of small, medium and large-sized enterprises" requirements for employability skills, Curtis and McKenzie (2002). The results were concluded in the 2002 Australia White Paper as the 'Employability Skills Framework'. The framework defined the eight employability skills as follows:

(i) communication skills that contribute to productive and harmonious relations between employees and customers;

(ii) teamwork skills that contribute to productive working relationships and outcomes;

(iii) problem solving skills that contribute to productive outcomes;

(iv) initiative and enterprise skills that contribute to innovative outcomes;

(v) planning and organizing skills that contribute to long-term and short-term strategic planning;

(vi) self-management skills that contribute to employee satisfaction and growth;

(vii) learning skills that contribute to ongoing improvement and expansion in employee and company operations and outcomes; and

(viii) technology skills that contribute to effective execution of tasks

2.1.1.2 Categorization of competency

Competencies could be categorized on the basis of the characteristics of behaviors, Guglieliemino (1979). His analysis of previous research findings on top-level management skills led him to summarize three managerial competency dimensions as follows: (i) conceptual capacity, including decision making, creativity, and problem-solving; (ii) capacity to interact with people utilizing skills such as communication, leadership, negotiation, analysis, self-growth; and (iii) technical expertise such as time management and creation of business plans. His grouping was supported by, Derouen and Kleiner (1994). Byham and Moyer (1996) made similar groups including motives, behaviour, and knowledge/skills competencies. Siriwaiprapan (2000) proposed five common domains of employee competency development in his study of Thai human resource practitioners' perceptions of HR initiatives. His five common domains were as follows:

(i) Organizational competence: capacity to understand and internalize "organization-specific knowledge, such as business types, organizational cultures, policies, procedures, goals and objectives, etc".

(ii) Social competence: "basic abilities for social interaction and communication', including skills in making connections, maintaining interpersonal relationships, and taking pleasure in the significance of peer relationships";

(iii) Cognitive competence: “the ability to learn and to perform analytical thinking, planning, and problem solving, which enable an individual to take responsibility for handling contingencies that may arise”.

(iv) Self-competence: “ability to adjust to change, readiness to learn, readiness to develop oneself, readiness and ability to initiate action, trust, endurance, receptiveness, broad-mindedness and self-discipline, self-esteem, individuality, and self-determination”;

(v) Job competence: “the knowledge, theory, methods, and skills to carry out employees’ work assignments and to affect their sense of self-efficacy and self-confidence about a certain job”.

In the business management field, management competency grouped into two categories as: technical and generic competencies. Technical competency related to KSAs, “which basically consist of having knowledge and knowing how to apply it to a job”, Agut and Grau (2002). In contrast generic competency referred to individual characteristics “that involve coping with less routine, programmed, technique tasks that are also part of the job”. For example initiative to implement a new plan.

Development Dimensions International (DDI), a U.S. human resources consulting firm, based on its long-term experience with the industry proposed four dimensions: (i) individual performance; (ii) effective communication with others; (iii) facilitation of individuals or teams to achieve company goals; and (iv) outcome-orientation. Moreover, the relative importance of each dimension varied with place, time, and people. DDI suggested that competencies have different layers based on the functions of jobs. For an organization core competencies were needed by all members if they were to achieve a core competitive advantage for the organization. The second layer was managerial competencies which were required of employees’ of management. For every work unit, it had specific functional competencies based on its unique operational function (Development Dimensions International, n.d.). To develop a successful competency profile DDI suggested that a competency analysis should include at least four Ws, i.e., “what that person knows, what they can do, what they have experience, and what motivates them” (Development Dimensions International).

Hong (1997), divided job competencies into six groups: (i) professional capacity which was associated with knowledge and skills for certain occupations; (ii) management capacity such as executing capacity, planning capacity, and time management; (iii) interpersonal relationship skills such as communication and timework; (iv) attitude, including initiative, enthusiasm, and ability to learn; (v) value systems such as decision making and time orientation; and (vi) types of intelligence, such as problem solving.

2.1.1.3 Paradigm shifts on competency

Recently, several paradigm shifts in the conception and application of competency are taking place. These new paradigms are providing insight into current perspectives about the competency. In the competition to conduct business at the lowest cost possible. Companies have moved towards a performance-based pay system, differentiating employee rewards in accordance with performance in order to minimize their personnel costs. Companies increasingly reward their workforce, focusing on employees with the greatest potential and those with the skills most valuable to the company. Further research has emphasized the importance of soft skills when discussing job competency. Each researchers Spencer and Spencer (1993) argued that high-quality performance was not only determined by better technical skills but also by the manifestation of underlying characteristics. Likewise, Buhler (2001) and Ganzel (2001) maintained that soft skills were the key in determining the actual tasks being performed because soft skills such as emotional management ability led to superior performance more than did intelligence. In line with the continuously changing business environment, competent professionals should not only have adequate professional knowledge and be proficient at task-oriented skills, but also be sensitive to changes and adapt to the new challenges in the workplace, Abanteriba (2006).

Siriwaiprapan (2000) observed that thinking skills such as analytical thinking, problem solving, and planning have become more important in tackling contingencies when jobs change unpredictably. As the business environment becomes increasingly knowledge-oriented, “jobs require employees who can think, make decisions, conceptualize, analyze and resolve problems, implement new ideas, communicate well, and adapt to change”, Velde (2004). Therefore, numerous contemporary social

movements and educational authorities have become proponents of building strong character, an effort originally proposed by Richard Riley, the former U.S. Minister of Education, Huang (2003).

To succeed under the current market trends in the global economy, future employees need to be ready for either local or international work opportunities. A growing number of scholars have given international perspectives to the concept of competency. Reich (1991) recognized that the world has become a highly global network, suggesting that a symbolic analytic worker needed to be able to identify, solve and broker problems.

Dlabay (1997) suggested that economic, politic -legal, technology, culture, and human relations skills were basic courses of international business instruction. Three chief competencies for expatriates, including adaptation, interpersonal relationship, and culture shock management were highlighted by , Feng and Pearson (2002). Hodges and Burchell (2003) suggested that highly competitive business environment required graduates to acquire the ability to understand situations in order to communicate effectively. Das (2012) suggested that competency can be conceptualized as one of the four major components of determining and measuring organizational effectiveness.

2.1.1.4 Competency in Indian Telecom sector

After adopting economic liberalization policies in the last decade of the previous century, the growth in India's GDP have clearly shown and the contribution of telecom sector in this growth story is notable. Currently the Indian telecom industry is the major contributor to the Indian economy by creating jobs and by steady flow of money to the exchequer through services tax. In service industry the organizations are highly dependent on the employee's capacity and ability due to the intrinsic characteristics of services like intangibility and perishability. Thus, in India the HR experts have started recognizing the importance of competency framework in the service industries. The Indian Telecom sector firms are widely using competency mapping as a "process to identify key competencies for the organization and/or a particular job". The competencies are used in the various processes like recruitment, training, performance management of the organization. The process starts with job

analysis to gather the information from the employees regarding what are the key behaviours necessary to perform their respective jobs, after that job description is being developed and on the basis of competencies of the respective job description and performance evaluation is being done. Current studies show that the service sector is highly dependent on customer satisfaction and it is related with the ability and behaviors of the employees of the organization. Therefore, it is important for an organization to include the customers' views and opinion in identifying competencies for a particular job which involves frequent customer interaction.

2.1.1.5 Summing up literature on competency

Since, David McClelland (1973) used the term competency as a decisive factor of assessment in the higher education system; various studies have been conducted in business management and human resources management. Competencies are more behavior based in comparison to KSAs and job description. Competency is set of several KSAs and it includes various factors which affect the success of the job but are not part of the job description. Competency can be defined in three terms i.e. attributes and qualification, behavior and individual's performance. In brief, the main aim of competency is to map the performance and to provide well trained employees for achieving the organizational goals effectively and efficiently.

Even competencies have been categorized in the literature from various perspectives such as conceptual capacity, behavior, and knowledge/skills competencies which form common groups. According to the iceberg model, knowledge and skills were visible and appeared at the top of the iceberg and easily developed and can be improved through education and job training. On the other hand, motives and traits appeared at the base of the iceberg, because both were more likely to be hidden and comprised the innermost part of an individual's personality and were difficult to develop and improve through education and job training. Hard skills are those skills which are related to the professional knowledge and task-oriented skills, while the soft skills are associated with the individual's behavior which is necessary for successful interpersonal interaction**.** Hard skills are related to intelligence quotient (IQ) as it requires more intellectual thought process factoring in an individual. On the other hand, soft skills are mainly related to the emotional quotient (EQ). In comparison to the idea of the iceberg model, hard skills tend to refer to visible

competencies, and soft skills are similar to hidden ones in the iceberg model. As there is overlapping between hard and soft skills, it is difficult to precisely categorize and itemize visible and hidden competencies because of a lack of exact definitions in the literature.

Currently, several paradigm shifts in the conception and application of competency are occurring. First, companies have moved towards a performance-based pay system, differentiating employee rewards in accordance with performance. Secondly, more and more research has emphasized the importance of soft skills when the global business environment becomes increasingly knowledge oriented and keeps changing quickly. Thirdly, to succeed under the market trends in the global economy, future employees need to employ international perspectives to the concept of competency.

2.1.2 Quality of Work Life

Today we are living in a constantly changing and time determined life. There are several factors which affects the quality of life existence like family, safety, work and Lesuire, Ellinger and Nissen (1987); Ballou and Godwin (2007); Huang, Lawer and Lei (2007). Today employees feel disenchanted with their work life which causes dissatisfaction with job in the form of frustration, tediousness and anger during their working career and it can be costly to both the individual and the organization. Although many organizations try to reduce the job dissatisfaction but it is very difficult to identify all the factors which influence the quality of work life, Walton (1973); May and Lau (1999) and Huang et al. (2007).

Enormous literature appeared globally on quality of work life. In India various studies has been conducted on various aspects of QWL by the scholars and practitioners but still no ample attempt has been taken in India to measure the quality of work life.

In 1950s, QWL was introduced however its research base was laid in 1972 in the first international conference on QWL at Arden House where noteworthy decision was taken to develop the QWL as a credible and functional measure to make the working environment more humanitarian for employees, Wyatt and Wah (2001); Kotze (2005); Hannif; Koonmee and Virakul (2007) and Burgess and Connell (2008).

In the mid 1970s QWL was considered as one of the important aspect to increase employee identification, develop a sense of belongingness and pride in their work, Davis and Cherns (1975); Sashkin and Burke (1987). Shekharan (1985) stated that, the concept of QWL initially included the working hours, employees working conditions and issues of wages but now the concept has been extended by including factors like level of satisfaction, employees job competence, their involvement in the job and achievement on the job etc.

Skrovan (1983); Reid (1992) and Sirgy et al. (2001) emphasized that QWL construct deal with the well being of employees and people oriented process which deals with the employee relation within the work environment. Dolan, Gracia, Cabezas and Tzafrir (2008) stressed upon the importance of QWL for employees and the way the organization deals with this issue. QWL can be seen as a set of organizational interventions, a movement which is felt by employees in an organization, Kotze (2005) and Wyatt and Wah (2001).

According to Kumar and Tripathi (1993), "QWL is a philosophy of management that believes in co-operative relationship between employees and managers whereby every employee has the ability and right to offer his intelligence to provide useful inputs to decision making at various levels in the organization".

Ellinger and Nissen (1987); Casio (1989); Singhapakdi and Vitell (2007) define quality of work life as the "perceptions of an environment based on mutual respect and support which encourages individual participation and open communication ultimately affecting employee job, business, future and feeling of self worth of employees". An employee spends a large part of his day working; therefore it is essential to find out new ways to improve the QWL along with the factors affecting employee's perception of QWL. Haung et al. (2007) and May and Lau (1999) examined that employees expect challenges and achievement, career development and growth, balance between work and family life, a harmonious organizational climate and a supportive managerial style in terms of QWL. Kaushik and Tonk (2010) and Koonmee, Sanghapakdi, Virakul and Lee (2010) observed that an employee QWL is dependent upon situational and personal factors which includes personal (subjective) and external (objective) aspects of work-related rewards and

experiences. In the modern organization relationship between the quality of work life and employee health and performance has become an explicit objective for many of the human resource policies, Dolan, Saba, Jackson and Schuler (2007).

Extensive research has thus been conducted on QWL from a series of disciplines regarding its definition and measurement. Hannif et al (2008) suggest QWL can be classified into three categories namely (a) employees' job satisfaction; (b) a "dynamic, multidimensional construct incorporating any number of measures- objective and subjective- relating to employment quality"; (c) a concept going beyond job satisfaction and encompassing subjective wellbeing.

According to Kumar and Tripathi (1993) there are many approaches for achieving QWL in organizations, like job design, workers' participation and welfare.

Overtime, the definition of quality of work life has focused on the employees need as well as organizational effectiveness and seeks new methods and approaches to improve the work environment to make it more productive and satisfying. These approaches and methods laid more importance on enhancing employee identification, sense of belonging and pride in their work, Nadler and Lawler (1983); Kerce and Booth- Kewley (1993); Brooks and Gawel (2001). Thus, QWL plays a major role to humanize the work place and providing a good quality of work life to the employees, which results in an overall enhancement in the productivity of the organization by providing employees an opportunity to use their capacities and for self improvement, Kotze, 2005; Krim and Arthur (1989).

The reviewed literature also express QWL as a movement, Ellinger and Nissan (1987) define it as "an environment based on mutual respect which supports and encourages individual participation and open communication in matters which affect our jobs business as also our futures and feelings of self worth".

Bachner and Bentley (1983), describe QWL as a psychological democratic process whereby employee participation is invited at all levels of decision making, change and organizational success. This enhances employee self respect and reduces feelings of inability.

Positive QWL creates an environment which provide employee with steady employment, adequate remuneration, fair treatment and security at work place. Recent research has shown workers desire for greater freedom for self expression and for self growth. The employee thus expects the organization to provide opportunity to fulfill these needs. Therefore, current research focuses on defining QWL from the perspective of employees and fulfillment of these needs, Kotze (2005). Sirgy et al (2001) and Lee, Singhapakdi and Sirgy (2007) describe QWL as a construct which incorporates the welfare of employees. These researchers has stressed on employee satisfaction resulting from employee participation in the workplace activities, resources and outcomes.

The needs which are derived from the employee's participation in the workplace are mentioned as economic and family needs, social needs, health and safety needs, esteem needs, actualization needs, knowledge and aesthetic needs. The fundamental principle of this approach to QWL is that employees seek to accomplish their basic needs through work, satisfaction from their jobs to the extent that the job meets these needs. Cascio (1998); and Koonmee et al. (2010) describes "QWL as the perception of the organizational environment which meets the full range of employees' needs related to their well being at work".

The focus of QWL is employee wellbeing and satisfaction within the work environment Orpen, (1983); Danna and Griffin (1999); Booth-Kewley (1993); Brooks and Gawel (2001); Kerce and Sirgy et al. (2001); Van der Doef and Maes (2002) and Huang et al. (2007) stated that quality of work life is different from job satisfaction since job satisfaction is constructed as one of many outcomes of QWL. Therefore it is essential to go beyond the job satisfaction and try to include those aspects of workplace which effect the satisfaction with job, overall life , subjective well being and happiness.

According to Kandasamy and Sreekumar (2009) and Skrovan (1983), "QWL is a continuing process which means utilizing all resources especially human resources". It also improves the way things get done by assuring the long-term effectiveness and success of the organisation and develop the awareness and understanding of the concerns among all members of the organisation to be more

responsive to those concerns and needs. According to Chung, Killingworth and Nolan (1997); Kandasamy and Sreekumar, (2009); Kotzé (2005); Martel and Dupuis (2006); Rathi (2010) a vast literature has been done on QWL but still the definition and application is not clear and it seems that there is no clarity on the QWL construct and reliable instrument which can measure its consistency.

QWL consists of the work environment, work experiences and work rewards which meet the employee needs and determine personal and situational factors, Kaushik and Tonk (2008); Koonmee et al. (2010). QWL includes assurance of employment competence improvement, employees health and safety, work life balance and career planning, Van de Looij and Benders (1995) and Ruzevicius (2006). Evaluation of quality of life must encompass all the above elements and the results can be used to develop and implement social programs in organizations at national and international level.

Keith (1989) lays down that QWL refers to "favorableness or unfavorableness of a job environment for people". QWL concept given by , Boisvert and Theriault (1974) is as follows:

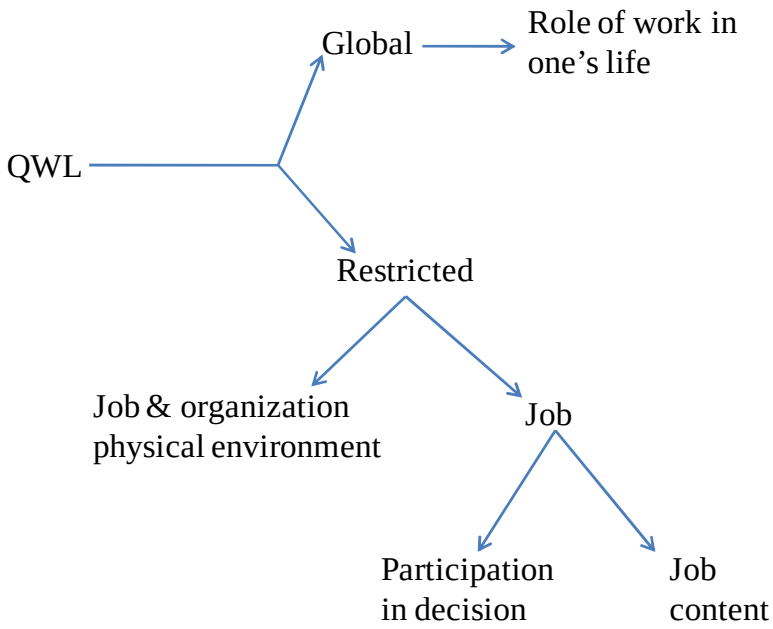


Fig. 2.2 Concept of quality of work life

2.1.2.1 Dimensions of quality of work life

Walton (1974) attributes the evolution of QWL to various phases in history. He identified eight dimensions, which make up the QWL framework.

(i) Adequate income and fair compensation: For individual money is still an important source of motivation, employees want to have adequacy and fairness in their compensation. Employees link their pay with performance and responsibility.

(ii) Safe and healthy working conditions: Since 1950s emergence of ergonomics has laid emphasis on improvement of the equipment design and plant layout to improve the physical as well as psychological comfort and safety of the employees. Thus, an organization needs to create a healthy and safe working environment for the employees.

(iii) Immediate opportunity to use and develop human capacities: Organizations should develop their employees through training, recognition, promotion and competency development and the job or task should be challenging enough which can extend their skills, abilities, and knowledge. It will create a positive impact on employee's autonomy, self esteem, motivation and involvement.

(iv) Opportunity for continued growth and security: In an organization proper opportunities for training and career advancement should be given to the employees by providing a platform for continual growth and income security.

(v) Social integration in the work organisation: The work environment should provide opportunities for preserving an employee's personal identity and self-esteem including freedom from prejudice, a sense of community interpersonal openness and the absence of stratification in the organisation.

(vi) Constitutionalism in the work organisation: Right to free speech, equitable treatment and personal privacy in the workplace must be ensured.

(vii) Work and the total life space: an individual's work should be balanced with his personal life. Career stress, travelling and work schedules should not be taken too high so as to intervene with his personal life and leisure.

(viii) Social relevance of work life: For an organization it is important to be socially responsible in terms of its products, employment practices, marketing techniques and waste disposal because it can influence an employee's career and importance of his work.

Cohen et al. (1997) postulates that growth satisfaction, organisational commitment, job satisfaction, group effectiveness and social satisfaction were the dimensions which was used to measure QWL in terms of its relationship between QWL and self management leadership.

In relation to this, Donaldson, Sussman, Dent, Severson and Stoddard (1999), recognized and deliberated job satisfaction, job security, quality of supervision, work environment and co-worker satisfaction as dimensions of QWL and found them to be important predicators of overall organizational effectiveness. Danna and Griffen (1999) described QWL in the form of hierarchy which includes satisfaction with the life at the top of the hierarchy, satisfaction with the job at the middle level and satisfaction with the work specific facet at the low level of hierarchy. According to Lewis et al. (2001) "QWL factors include reduced work stress; organisational commitment and belonging; positive communication; recognition; predictability of work activities; fairness; clear locus of control and organisational decisions".

Wyatt and Wah (2001) examined four dimensions, (i) a favourable working environment, (ii) personal growth and autonomy, (iii) rewarding nature of the job, and (iv) perception of stimulating opportunities and co-workers which constitutes the QWL of employees. Maslow (1954); McClelland (1961) ; Herzberg (1966); and Alderfer (1972;) developed a need satisfaction model and the purpose of this model that employees seeks to fulfill their basic needs through their job. Further, Sirgy et al. (2001) mentioned that employees needs can be satisfied though proper working environment, supervisor behavior, job responsibilities and other programmes and they derive satisfaction from their jobs to the extent that their jobs meet these needs.

On the basis of need satisfaction and bottom-up spill over theory QWL can be measured in terms of employee need satisfaction which can be categorized into lower- and higher-order needs. Lower-order QWL needs comprised of: (a) Health

and safety needs; (b) economic and family needs while higher-order QWL comprised of: (c) social needs (d) esteem needs; (e) self-actualization needs; (f) knowledge needs; and (g) aesthetic needs.

QWL can be measured within four contexts: (a) the physical environment of the work place; (b) the nature of the job; (c) the organisational management and policies and (d) the psychosocial conditions of the employees, Martel and Dupuis (2006).

Huang et al. (2007) measured QWL within four dimensions: "(a) work-life balance; (b) job characteristics (which included factors such as scope of work, job challenge, degree of autonomy, variety of skills, participation in decision making, communication with supervisors, income and recognition fairness); (c) supervisory behaviour; and (d) compensation and benefits". The findings of his study showed that there is a significant impact of QWL on organisational commitment.

In a recent study, Pranee (2010) includes issues such as "occupational hazards and safety, human resource development through welfare measures, professional training, working conditions and consultative work as well as participative mechanisms" in the QWL and the study suggests that QWL also involves "schemes for sharing the results from the gains of productivity and is furthermore equally concerned with the quality of products and improvements".

In conclusion it can be seen that the QWL is a combination of various constructs and dimensions which are relevant to the organisational environment. The extensive literature reveals that QWL is a wide ranging concept, which includes participative management, satisfaction towards work and improved work environment.

Table: 2.2. Components of QWL in the view of different researchers along with type of industries.

Author	Component	Type of the Industries	Out comes
Walton (1975) USA	i. Adequate and fair compensation, ii. Safe and healthy working conditions, iii. Immediate opportunity to use and develop human capacities, iv. Opportunity for continued growth and security, v. Social integration in the work organization, vi. Constitutionalism in the work organization, vii. Work and total life space and viii. Social relevance of work life.	Service industries	All these components are the associated with QWL
Levine, Taylor and Davis (1984) Europe	i. Respect from supervisor and trust on employee's capability; ii. Change of work; iii. Challenge of the work; iv. Future development opportunity arising from the current work; v. Self esteem; vi. Scope of impacted work and life beyond work itself; vii. Contribution towards society from the work	Insurance Company	QWL Policies may vary as per the size of the organization and employees group
Mirvis and Lawler (1984) UK	i. Safe work environment, ii. Equitable wages, iii. Equal employment opportunities and iv. Opportunities for advancement	Corporation service	QWL was associated with satisfaction, wages, hours and working condition
Baba and Jamal (1991) UK	i. Job satisfaction, ii. Job involvement, iii. Work role ambiguity, iv. Work role conflict, v. Work role overload, vi. Job stress, vii. Organizational commitment and viii. Turn-over intentions	Nurse in Hospital	Monotony in the job due to routine work activities can affect QWL Negatively

Author	Component	Type of the Industries	Out comes
Lau and Bruce (1998) US	i. Job security ii. Reward systems iii. Training iv. Carrier advancements opportunities v. Participation in decision in decision making	Manufacturing industries	QWL is workplace strategies operations and environment that promote and maintain employees satisfaction
Ellis and Pompli (2002) Canberra	i. Poor working environments, ii. Resident aggression, iii. Workload, inability to deliver quality of care preferred, iv. Balance of work and family, v. Shift work, vi. Lack of involvement in decision making, vii. Professional isolation, viii. Lack of recognition, ix. Poor relationships with supervisor/peers, x. Role conflict, xi. Lack of opportunity to learn new skills.	Nurse in Hospital	All these factors associated with job dissatisfaction and QWL
Thomas (2007) China	i. Favorable work environment, ii. Personal growth and autonomy iii. Nature of job, iv. Stimulating opportunities and co-work life	All type of industries	All these components are associated with the quality of work life of Employees
Guna seelan Rethinam & Maimunah Ismail (2008) Malaysia	i. Health and well-being ii. Job security iii. Job satisfaction, iv. Competence development and v. The balance between work non work life	Information technology (IT) professionals	All these components are associated with the quality of work life of IT Employees
Hosseini (2010)	i. Adequate and fair compensation, ii. Safe and healthy working conditions, iii. Immediate opportunity to use and develop human capacities,	Insurance workers of Mazandaran province	Results have shown that among the eight dimensions of quality of worklife, pay fair and adequate pay size, Integration and social

Author	Component	Type of the Industries	Out comes
	iv. Opportunity for continued growth and security, v. Social integration in the work organization, vi. Constitutionalism in the work organization, vii. Work and total life space and viii. Social relevance of work life.		cohesion, growth opportunities, continuing security, the integration and development of human Capabilities are related to performance.
Raduan Che Rose (2006 B) Malayasis	i. Career satisfaction ii. Career achievement iii. Career balance	Managers from the free trade zones in Malaysia for both the multinational corporations (MNCs) and the small-medium industries (SMIs)	The result indicates that three exogenous variables are significant: career satisfaction, career achievement and career balance, with 63% of the variance in QWL
G Nasl Saraji, H Dargahi (2006) Tehran	i. Fair pay and Autonomy ii. Job security, iii. Reward systems, iv. Training and career advancements opportunities, v. Participation in decision making vi. Interesting and satisfying work. vii. Trust in senior management. viii. Recognition of efforts ix. Health and safety standards at work. x. Balance between the time spent at work and the time spent with family and friends xi. Amount of work to be done xii. Level of stress experienced at work xiii. Occupational health and safety at work	Tehran University of Medical Sciences (TUMS) Hospital' employees	The results showed that the majority of employees were dissatisfied with occupational health and safety, intermediate and senior managers, their income, balance between the time they spent working and with family

Author	Component	Type of the Industries	Out comes
Saklani, D.R., (1979) India	i. Adequate and fair compensation ii. Fringe benefits and welfare measures iii. Job security iv. Physical work environment v. Work load and jobs stress vi. Opportunity for continued growth vii. Human relations and social aspect of work life viii. Participation in decision making Reward and penalty system ix. Equity, justice and grievance handling x. Equity justice xi. Work and total life space xii. Image of organization	The sample comprised respondents of both managerial and non-managerial categories drawn from 24 organizations of different types.	Apart from monetary consideration, employees in India accord a high value to the factors that satisfy self esteem and self-actualization needs of a higher order.
Stephen, A. (2012). India	i. Adequate and fair compensation ii. Fringe benefits and welfare measures iii. Job security	Employers and employees of various small scale industrial units in Chennai, Coimbatore and Madurai cities in Tamil Nadu, India	The findings of the study regarding perception of employers and employees on QWL variables, revealed ten important QWL factors in SSI. These are social support, interpersonal relationship, Recognition, autonomy, working environment, relationship with boss, working hours, governance by rule of law, role clarity and fringe benefits.
Muftah, H. A., & Lafi, H. (2011)	i. Physical, ii. Psychological iii. Social factors	Employees working in the Oil and Gas companies in the State of Qatar	The result of this study supports that the most important determinant of QWL is physical factors, followed by psychological factors and then social factors, The study indicated that QWL is positively and significantly related to employee satisfaction.

2.1.2.2 Quality of work life within the organizational framework

Quality of work life plays an important role in an employee's life because he/she spend a great deal of their time at their work place and plan their daily routine life, their living standards and social life according to the demand of job. Therefore in most of the organizations, QWL is a major element as employees define themselves in terms of their work. The importance of QWL can be seen from the fact that the lives of employees are tied and organized as per the actions of their organizations.

It has been proved from the past research and studies that QWL is an important determinant of various organizational outcomes like lower absenteeism and turnover rate, lower tardiness frequency, increased task performance and it also influences the behavioural response of an employee in the form of turnover intention, job involvement, organisational identification, job satisfaction, organisation and career commitment, organisational turnover, job effort, job performance, intention to quit, and personal alienation, Kerce and Booth-Kewley, (1993); Donaldson et al. (1999); Sirgy et al. (2001); Wilson, DeJoy, Vandenberg, Richardson and McGrath, (2004); Wright and Cropanzano, (2004); Ballou and Godwin, 2007; Huang et al. (2007); Lee et al. (2007); Wright and Bonett, (2007); Srivastava, (2008); Kaushik and Tonk (2008) and Koonmee et al. (2010).

Literature also revealed that QWL apart from predicting organizational outcomes it also affects the non – working life of an individual and is significant determinant of health, life satisfaction and psychological wellbeing of employees, Martel and Dupuis (2006); Sirgy et al. (2001); Srivastava (2008); Wilson et al. (2004).

Saklani (2010) states the "new-found concern for QWL in corporate life" is due to the "realisation that human resource is the most important asset which must be released and developed".

Kotzé (2005) mentioned that QWL of employees can be influenced by the changes in the value system and beliefs. He also pointed out the importance of differential ethnic composition memberships of organisations and competent employees. In 1930s, Robert Hoppock explored the different levels of job satisfaction related to the work level (professionals, managerial and executive) the individual who possess high occupation level has the highest satisfaction in his job.

Moen (2000) found the relationship between the QWL and gender, the findings shows that QWL is different for men and women. It can be summarized from the literature that QWL is not influenced by a single demographic variable but some of them might have a moderating effect on QWL.

The past studies unveils the job aspects from which an employee articulate his dissatisfaction in the form of frustration related to career desire and fulfilling work, Kaushik and Tonk (2007); Lee et al. (2007); Pranee (2010); Saklani (2010); Sirgy et al. (2001). These all are the intrinsic facets of work as they are embedded in the work itself. Wyatt and Wah (2001) suggested some other intrinsic factors like opportunity for growth and development, decision making control and autonomy and meaningfulness with job these are some factors which are inseparable from a high QWL, Huang et al. (2007); Pranee (2010); Sirgy et al. (2001); Van der Doef and Maes (1999) Ducharme and Martin (2000); Wyatt and Wah (2001) Maharaj and Schlechter (2007); Wyatt and Wah (2001) and Pranee (2010). It can be concluded that employee who possess a degree of autonomy of decision making can get overall job satisfaction and employees who possess worthwhile and meaningful work "can create a total quality situation".

Lowe et al. (2003) observed the relationship between work-life experiences and personal life of employees and found that if certain conditions such as high intrinsic and extrinsic rewards, good social support, influence over workplace decisions and available resources exist in the organization then only employees are likely to perceive their workplace in a positive way.

Pranee (2010) identified four organisational factors competence, managing systems (procedural controls over the production processes), operational climate (working environment) and technology which affects the QWL for sustainable development of employees within an organisation.

Gröpel and Kuhl (2009); Pranee (2010) and Rathi (2010) mentioned that it is the core responsibility of the organization to create a healthy working environment where employees gain both job and psychological satisfaction. It is also believed that the employees who possess worthwhile and meaningful job and good working conditions can experience satisfied personal life and quality in working life. This would result in the increase in the productivity and profitability of both the organisation and the employees.

Chapter - 3

Growth of Indian Telecom Sector

The present chapter presents an overview of the fast emerging Indian telecommunication industry. Section 3.1 introduces the industry. Evolution of the Indian telecom sector is described in section 3.2 while section 3.3 deals with the current scenario of the Indian telecom sector. In section 3.4 government policies and initiatives are highlighted.

3.1 Introduction

The onset of the economic reforms in India in 1991 in the form of globalization, privatization and liberalization made India realize that the development of effective and efficient means of communications and information technology is crucial for development.

The Indian telecommunication industry is one of the fastest growing sectors in the world. Government policies and regulatory framework implemented by Telecom Regulatory Authority of India (TRAI) have provided a favorable environment for telecom companies which are the service providers. This has made the sector more competitive, efficient and accessible such that it provides telecommunication services at affordable tariffs to the consumers. In terms of wireless subscribers India's telecommunication market is the second largest market in the world TRAI annual report (2013-14). In the last two decades, the industry has registered an exponential growth and has caught the imagination of one and all by revolutionizing the way, we communicate and share information. The services are globally recognized as one of the driving forces of the economic development of the country, TRAI Annual report (2013-14). The sector also acts as one of the major support services needed for rapid growth and modernization of various sectors of the economy. The exceptional growth of the Indian telecom industry has motivated the Government of India to provide a business friendly environment for companies in this sector by initiating several measures.

According to UST Global driven by 3G & 4G services, in 2016- 17 it is expected that there will be huge machine to machine growth in India. According to GSMA (Group Special Mobile Association), smart phones will account for two out of

every three mobile connections globally by 2020. Due to low tariffs and falling handset prices, India will become the fourth largest market for the smart phones by 2020.

Mobile penetration and broadband services will lead to an increase in the per capita GDP by 0.81 per cent and 1.38 per cent respectively in the developing countries, Joshi (2014). According to Earnst and Young (2011), Indian telecom played a vital role in the making of Indian economy, by connecting a vivacious economy of more than a billion people together, and with the rest of the globe. This is an extraordinary achievement in terms of nation's socioeconomic development. Nasit (2011), has reinstated the role of the sector in India's trajectory of growth post liberalization.

Shah (2008) has highlighted the transformation of the sector in terms of growth, technology and market structure in the last decade through policy reforms introduced by the Government of India. Post liberalization, the sector has been transformed from a government monopoly to a competitive environment allowing multiple private players to enter and provide the services to the customers.

Tarab (2012), affirmed that the growth and the development of the telecom sector is a joint effort of the government and private service providers. Foreign direct investment, active participation of private players, reforms measures initiated by the government and wireless technology has strategically geared the development and growth of the Indian telecom sector.

3.2 Evolution of the Indian telecom sector

The Indian telecommunication services began in 1851 under the ownership of British government with the initiation of the first operational landlines in Kolkata. In 1881, telegraph facilities were open for the public. In 1883, the telephone services were merged with the postal system (Tarab, 2012).

In independent India, the foreign telecommunication companies were nationalized to form telephone, telegraph and postal services under the ministry of communication by the Government of India. To improve the performance, GOI placed the Indian telecom sector under state control. In 1980, the manufacturing of the telecom equipments was given to private companies which introduced reforms in the telecommunication sector.

Table 3.1: Evolution of the Telecom Industry

1984	Manufacturing of subscriber terminal equipment opened to private sector
1985	Telecom was constituted into a separate department with a separate board.
1986	MTNL (Mahanagar Telephone Nigam Limited) & VSNL (Videsh Sanchar Nigam Limited) created as corporations
1988	Government introduces in-dialing scheme. PABX services only within a building or in adjoining building
1989	Telecom commission formed
1991	Telecom equipment manufacturing opened to private sector. Major international players like Alcatel, AT&T, Ericsson, Fujitsu and Siemens entered equipment manufacturing market.
1992	VAS sector opened for private competition
1993	Private networks allowed in Industrial areas
1994	Licenses for radio paging (27 cities) issued.
May, 1994	New Telecom policy announced
Sep, 1994	Broad guidelines for private operator entry into basic services announced
Nov, 1994	Licenses for cellular mobiles for four metros issued
Dec, 1994	Tenders floated for bids in cellular mobile services in 19 circles, excluding the four metros, on a duopoly basis
Jan 1995	Tenders floated for second operator in basic services on a circle basis
July, 1995	Cellular tender bid opened
Aug, 1995	Basic service tender bid opened, the bids caused lot of controversy. A majority of bids were considered low.
Jan, 1996	Rebidding takes place for basic services in thirteen circles. Telecom Regulatory Authority of India (TRAI) formed by ordinance.
Oct, 1996	LOIs being issued for basic services
March, 1997	TRAI Act was passed in Parliament
June, 1998	Several VASs available through private operators becomes operational
March, 1999	Announcement of National Telecom Policy
Jan, 2000	Amendments of National Telecom Policy
Aug, 2000	Announcement of Domestic Long Distance competition Policy
Oct, 2000	Planned Corporatization of DoT.

Source: BSNL.co.in

3.3 Current scenario of Indian telecom sector

The Indian telecommunication industry consists of two categories: fixed service providers (FSPs) and cellular service provider (CSPs). The sector provides some basic services like telephone, radio, television, internet etc. The GSM (global system for mobile communication) and CDMA (code division multiple access) along with fixed Line, PMRTS (public mobile radio trunking services) and WLL (wireless local loop) are the advanced services provided by the sector.

3.3.1 Growth of telephones

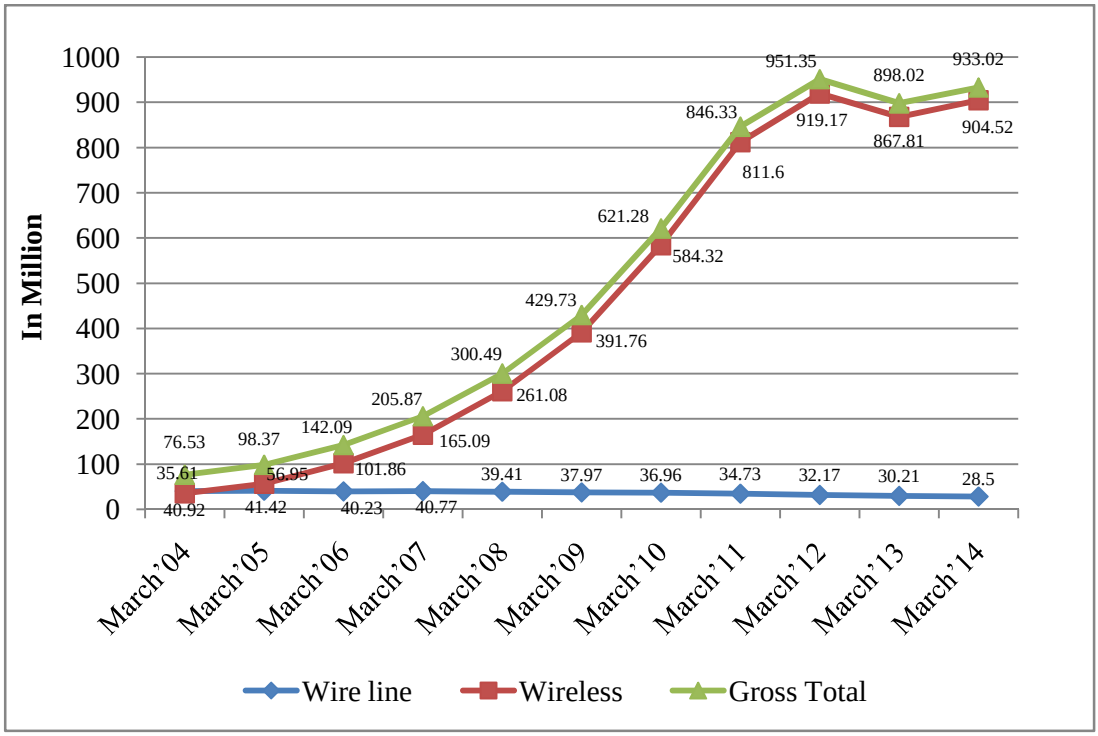
Over the years, the Indian telecom sector has seen a huge development in terms of growth of telephones mainly due to private participation through investment in this sector. Table 3.2 reflects positive growth in case of wireless and slightly negative growth in case of wire line telephones in the last decades since 2004.

Table 3.2: Growth of Telephones (in millions)

S.No.	Years	Wire line	Wireless	Gross Total	Annual Growth %
1	March'04	40.92	35.61	76.53	40
2	March'05	41.42	56.95	98.37	29
3	March'06	40.23	101.86	142.09	44
4	March'07	40.77	165.09	205.87	45
5	March'08	39.41	261.08	300.49	46
6	March'09	37.97	391.76	429.73	43
7	March'10	36.96	584.32	621.28	45
8	March'11	34.73	811.60	846.33	36
9	March'12	32.17	919.17	951.35	12
10	March'13	30.21	867.81	898.02	-6
11	March'14	28.50	904.52	933.02	4

Source: Dept. of Telecommunication (DoT), Annual Reports, 2010-11 and 2013-14.

Fig. 3.1: Growth of telephones over years



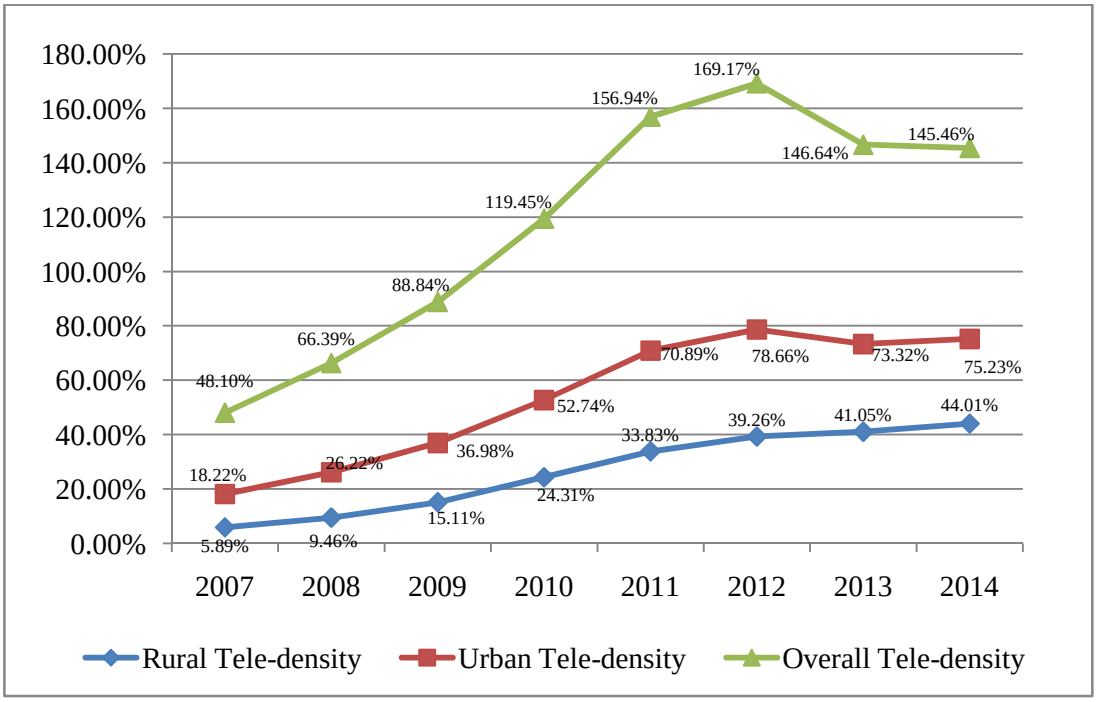
Source: DoT, Annual Report 2010-11 and 2013-14.

3.3.2 Growth in tele-densities

The total subscribers in India increased from 957.61 million at the end of September, 2014 to 962.63 million at the end of October, 2014 showing a monthly growth rate of 0.532 per cent (TRAI). The telecom revolution has affected both the rural and the urban market. It shows a phenomenal growth which can be attributed to the country's large population, high economic growth and competition in the sector, affordable handsets, reduced tariffs, infrastructure sharing and the introduction of positive regulatory reforms. At the end of October, 2014 the overall tele-density in India was 77.07 and 45.39 per cent in urban and rural areas respectively.

There is a huge growth in the tele-densities, in March 2004, it was 7.02 per cent which has increased up 53.46 per cent in March 2010 and about 74.5 per cent in January 2014.

Figure 3.2: Trends in tele-density from 2007 to 2014.



Source: DoT Annual Report 2013-14

Figure 3.2, indicates that at the end of the financial year 2014, the tele-density has increased to 75.23 percent from 73.32 per cent in April, 2013. During the year 2013-14, the urban tele-density declined from 146.64 percent to 145.46 percent while the rural tele-density increased from 41.05 per cent to 44.01per cent.

3.3.3 Wireless vs. wire line

There has been a continuous growth in the wireless telephone in contrast to the decrease in the wire line telephones. Table 3.3 and Fig 3.3 show the percentage share of wireless and wire line in the last four year.

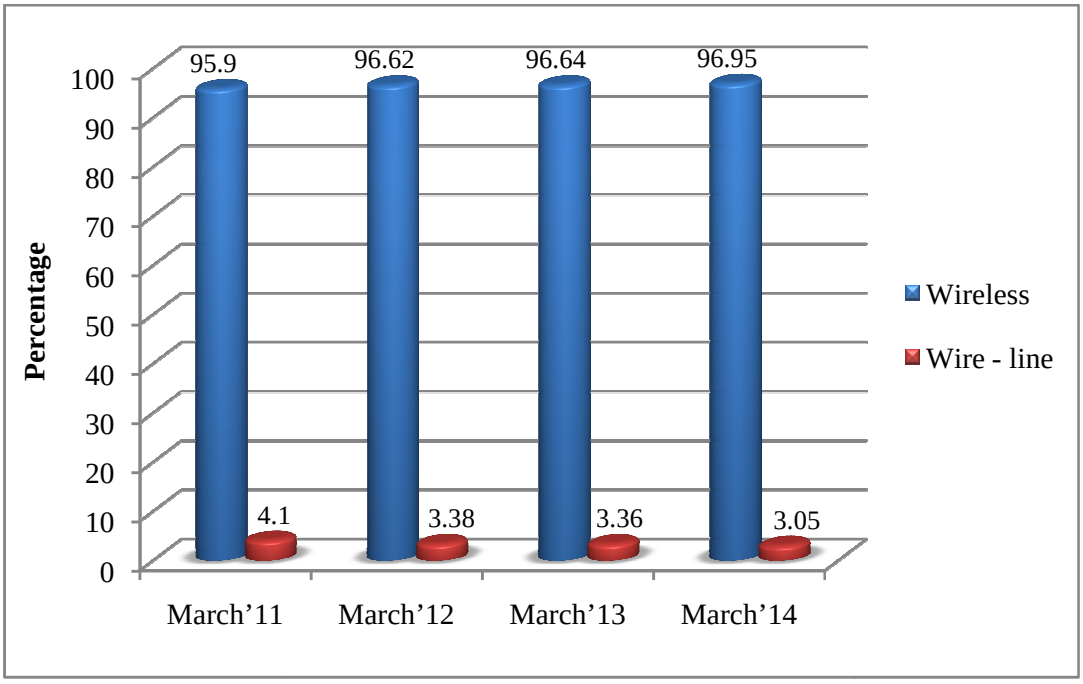
Table 3.3: wireless vs. wire line telephones

Sr. No.	Segment	March'11	March'12	March'13	March'14
1.	Wireless	95.90	96.62	96.64	96.95
2.	Wire - line	4.10	3.38	3.36	3.05

Source: DoT Annual Report, 2013-14

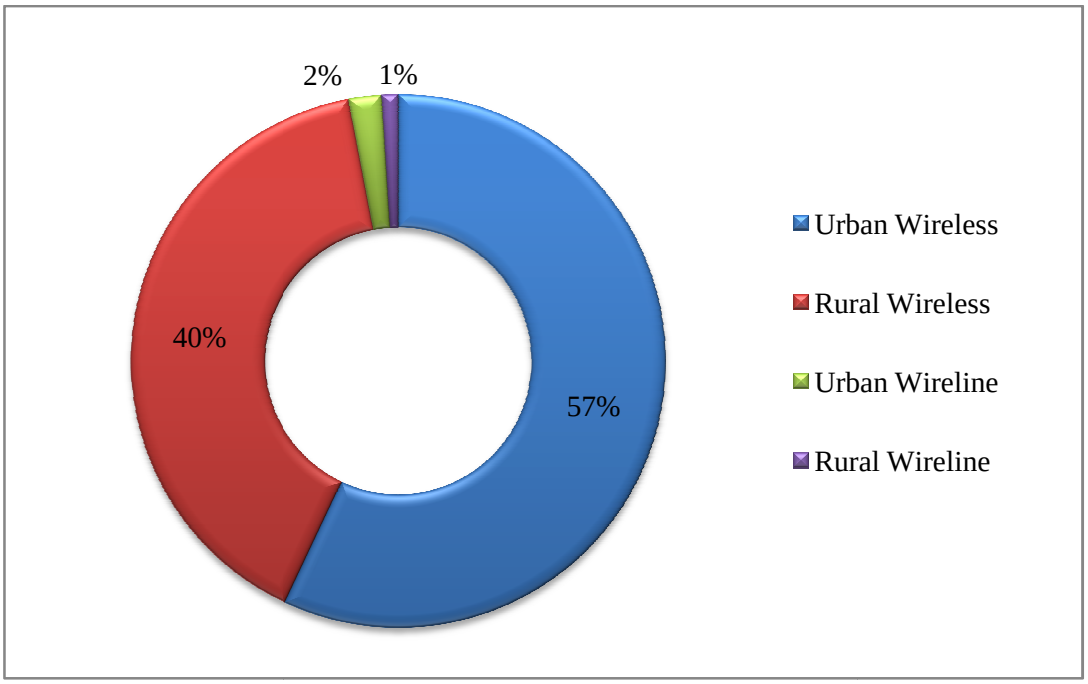
The figure shows that that there is a positive growth in the shares of wireless and negative growth in the wire line telephones in the last four years.

Fig. 3.4 : Percentage share of wireless and wire line



Source: DoT Annual Report, 2013-14

Composition of Telephone subscriber in India



Source: TRAI annual report 2013-14

3.3.4 Growth in Public vs. Private

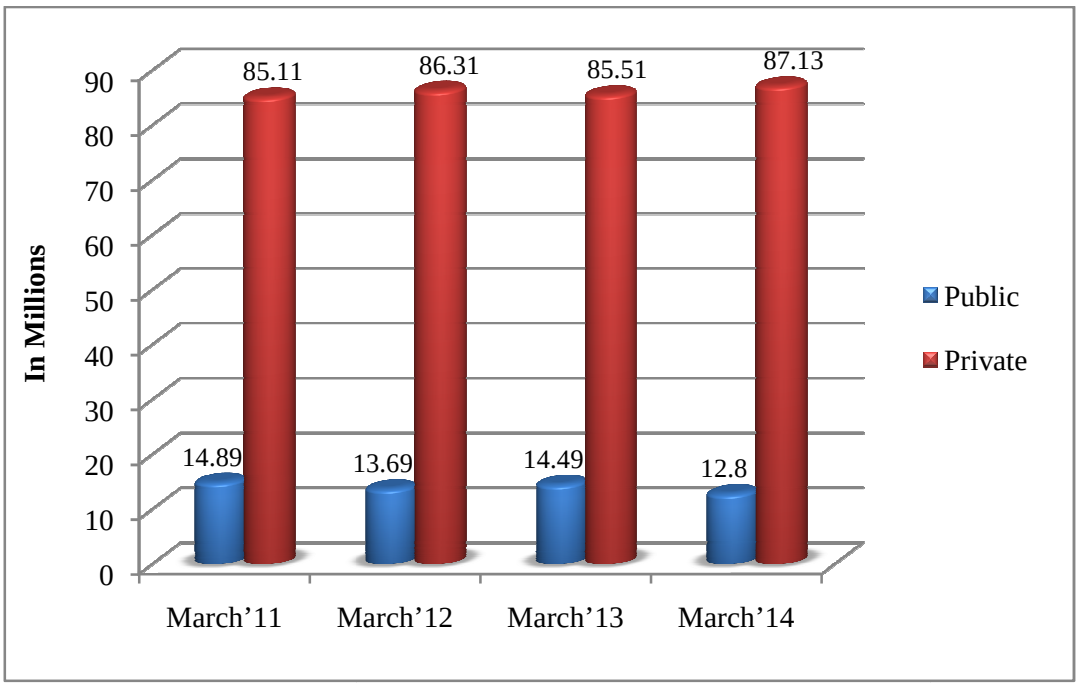
In the last decade there is an uninterrupted rise in the number of wireless phones of the private telecom companies as compared to public sector in the Indian telecom sector.

Table 3.4: Public and private wireless telephones (in millions)

Segment	March'11	March'12	March'13	March'14
Public	14.89	13.69	14.49	12.8
Private	85.11	86.31	85.51	87.13

Source: Dot Annual Report, 2013-14

Figure 3.5: **Number of wireless telephone in public and private sector**



Source: DoT Annual Report, 2013-14

It can be explained from the above figure that the number of connections in private sector are much more compared to public sector. Consequently**,** the Indian telecommunication industry is one of the lowest tariffs providers in the world. The Indian consumers are benefiting from low tariff, a rate which is a major reason for explosive growth in this sector, Nasit (2011).

3.3.5 Growth Drivers

As the subscriber base is increasing day by day therefore, huge investment and developments have taken place in the sector.

Foreign Direct Investment

The Government of India has raised the limit to 75 per cent subject to following conditions.

- Applicable only for basic cellular, unified access services, national/international long distance, v-sat, public mobile radio trunked services (PMRTS), global mobile personal communication services (GMPCS) and other services.
- FDI up to 49 per cent on automatic route and beyond that on Government route.
- FDI shall be subject to laws of India and not the laws of the foreign countries.

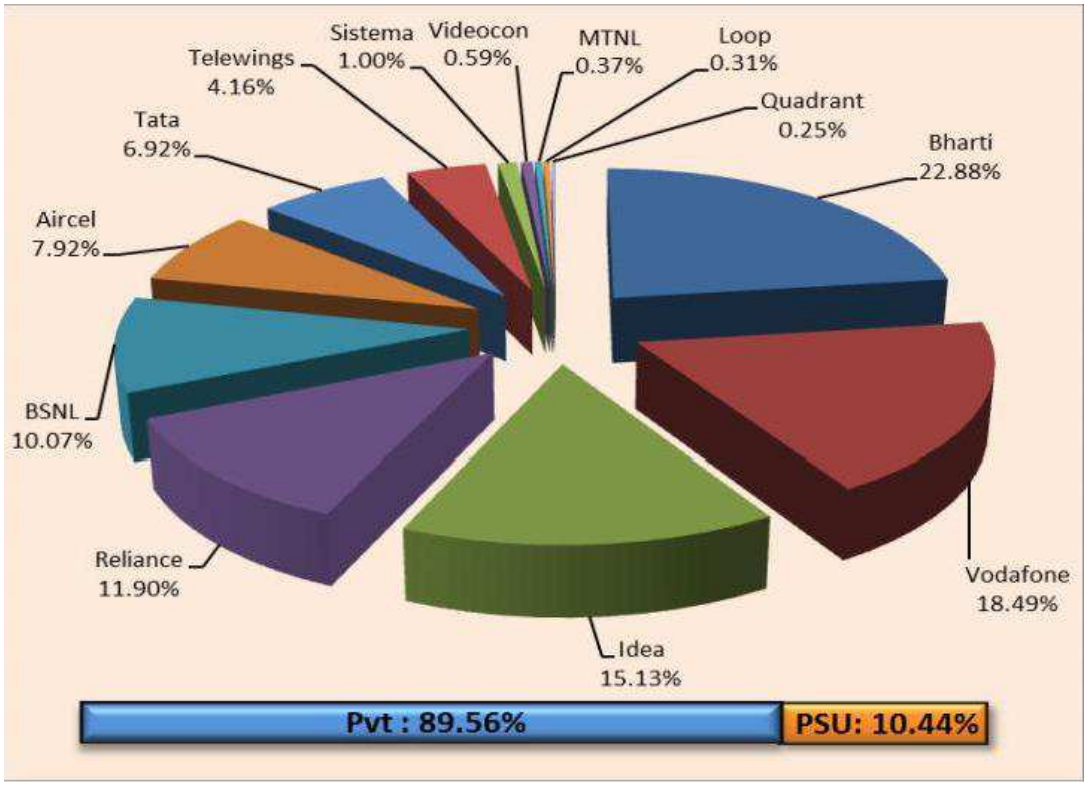
The following developments are the major growth drivers in the sector:

- Bharti Infratel has planned to acquire the telecom towers of Idea cellular and Vodafone at a valuation of US$ 785.82 millions in India. It is also planning for taking over the telecom towers in Srilanka and Bangladesh.
- SoftBank (Japanese company) has planned to invest US$ 10 billion in Indian IT sector in the coming next year.
- Ericsson has won US$ 9.42 million three years operations support system (OSS) deal from Mukesh Ambani headed Reliance Jio Infocomm, the only pan-India 4G license holder in India. Under the deal Ercisson will provide the telecom unit of Reliance Industries its service fulfillment software solutions comprising nine suites (DoT, annual report 2013-14).
- Reliance Jio Infocomm Ltd. has signed an agreement with generic tools infrastructure (GTI) Ltd. to share the telecom towers, it is the seventh tower sharing agreement that Relaince Jio has signed with the telecom owners in India.
- The Chennai-based Exotic Global Trades Pvt. Ltd. has recently launched its telecom product under ISUN brand in mobile phones and tablet personal computers which is bundled with various BSNL (Bharat sanchar nigam limited) schemes.

As per IMF income will expand at a compound average growth rate of 5.7 percent to US$ 1,869.3 during 2013-18. The GOI plans to cut the license fees up to 33 per cent for the operators who are providing services for more than 95 per cent of the residential areas in calling circle. As per the national e-governance plan, the Department of Information Technology intends to set up over one million internet-enabled common centers across the India.

3.3.6 Market key players

As on June, 2014, the private service providers held 89.56 per cent of market share of wireless subscribers whereas the public sector held only 10.44 per cent market share. There are many wireless network operators in India having different subscriber base and market share. In terms of total subscribers in the wireless market share, Bharti Airtel is the market leader with a 22.88 per cent share of total subscription followed by Vodaphone (18.49 per cent), Idea (15.13 per cent) Reliance (11.90 per cent) and so on. Figure 3.5 shows the subscriber base and market share of different service providers.



Source: TRAI annual report 2013-14

3.4 Government policies and initiatives

Recently the Government of India has fast tracked reforms in the telecom sector and plans to clear the proposal allowing spectrum trading. The DoT will provide a defence band to the ministry of defence called defence interest zone (DIZ). The GOI has given the orders to the telecom firms to implement full mobile number portability by May 2015, TRAI Annual Report (2013-14).

DoT has planned to frame a policy for the country's telecommunication industry that will provide an easy exit to companies who want to leave the business without losing out any valuable assets. The telecommunication department is exploring a proposal from the National Manufacturing Competitiveness Council to float a US$ 1 billion government sponsored fund to seed 'Make in India' technologies to boost local gear manufacturing. The proposed telecom manufacturing fund will impart impartiality in start-ups promoted by technocrats and scientists of Indian origin on condition that product development and manufacturing will happen only in India.

It can be concluded that the development in the Indian telecom sector has become a key contributor in India's economic and social upgradation. Every functional division and service provider of the telecom sector of the country is trying to provide world class telecom infrastructure in its area of operation and enhance its services to the customers. Thus, it is helping the country to achieve great success in the global scenario. In view of this and the significant role of the sector in the Indian economy, the competitiveness of the human capital of the telecommunication industry is one of the core areas which need to be explored and researched.

Chapter - 4

Research Methodology

This chapter comprise of 8 sections. Section 4.1 records design of the empirical research work. Section 4.2 describes the target population and sampling strategy. In section 4.3 measuring instruments are developed comprising competencies at managerial level and quality of work life. Section 4.4 deals with the procedure of data gathering. Pilot study is presented in section 4.5. Section 4.6 contains statistical processing of data. Statistical hypotheses have been developed in section 4.7.

This chapter examines the methods through which competencies at managerial level and quality of work life can be measured and compared to reach conclusions based on empirical analysis.

4.1 Design of the research work

According to Creswell (2003) research design involves formulating research problems, describing the site chosen for data collection, field ethical requirements, procedures for collection, analysis of the data and the role of the researcher during the data collection process. The outcome of the research is based on the proper selection of the right research process within the research design, Hussey and Hussey (1997). Thus, a research design could be seen as a blueprint, framework or plan for collecting and using data in order to obtain the desired information with sufficient precision, Struwig and Stead (2001); Mouton (2002).

In order to achieve the empirical objectives of this research work, a cross-sectional design has been used. According to Sekaran (2000) a cross-sectional design is a research study which is conducted in one shot to collect data and might last for weeks or months. Fife-Schaw (2002) argued that a cross sectional study is suitable for comparing subgroups and relationship between the variables. The response rates normally remains high therefore, it involves eliciting information at a single time from individuals in different conditions and conclusions can be drawn in a short period of time.

In the present research an internet-based survey methodology mixed with the self-administered mail questionnaires and face-to-face interview survey methodology was adopted to collect data from the target population. The collected data was analyzed using appropriate parametric methods.

4.2 Target population and sampling strategy

Baker (1994) says that the core of any research accomplishment is mainly based on the selection of a target population. “For the generalization of a research, determination of target population is essential, as target population sets the boundaries, which are considered as potential limitations on hypotheses generated within the conceptual framework”, Eisenhardt (1989). Therefore, adopting an appropriate strategy help the researcher to point out the most effective way of examining the proposed theories and hypothesis.

As has already been previously stated, the target population selected for this thesis was the middle-level personnel of the telecom sector in India. The information collected from the Indian telecom sector indicates that the total middle-level staff during the financial year 2012-2013 was 221747 which is almost 64 per cent of the total employees in the sector. The middle level management personnel is a link between the upper and lower levels and plays a significant role in managerial decision making and functioning.

4.2.1 Sampling frame

Sampling frame is also known as ‘working population’. It is simply a listing of the individuals in the target population. It is also the base of selecting a sample. In the present study, the sample frame is based on statistics provided by the Department of Telecommunications, Ministry of Communication and Information Technology, Government of India, New Delhi. According to Sproull (1995) surveying the whole population for a single study is difficult and expensive. Thus, in the present study, the sample frame comprises the middle-level employees working at the district level.

4.2.2 Sampling

Kerlinger and Lee (2000) argued that sampling is merely a process of selecting a unit from a universe as representative of that universe. The main criteria

of sample selection is to ensure that sample the representation of the total population from which it is selected, and therefore is a reliable one, Brewerton and Millward (2001).

4.2.3 Sample size

Sample size should be appropriate else it would yield improper results, if it is larger or lower than the estimated size.

For example, more chances of failure in convergence and improper solutions prevails if the sample size is lower than the estimated size, (e.g., negative error variance estimated for the measured variable), and lower accuracy of parameter, Hair et al. (2006); Comrey and Lee (1992). On the other hand, if the sample size is larger than what is needed will result in wastage of time, money and respondents' responses, Bryman and Bell (2007); Zikmund (2003); Hair et al. (2006). So it becomes essential to know an appropriate sample size so that results based on this can be generalized for the targeted population. Thus, for this thesis, the sample was selected as per the rules of thumb within multivariate analysis and the data analysis technique viz: structured equation modeling using CBSEM (e.g. AMOS 18, Mplus7), and factor analysis.

In order to determine a suitable sample size, the level of precision (*sampling error*), and the degree of variability criteria is usually adopted, Miaoulis and Michener (1976).

(i) For the large populations, Cochran (1963:75) proposed the following equation to yield a representative sample for proportions.

$$n_0 = \frac{Z^2 pq}{e^2} \quad (4.1)$$

Where

n_0 = sample size,

Z^2 = abscissa of the normal curve that cuts off an area α at the tails (1 – α equals the desired confidence level, e.g., 95%),

e = desired level of precision,

p = estimated proportion of an attribute that is present in the population,

q = 1-p.

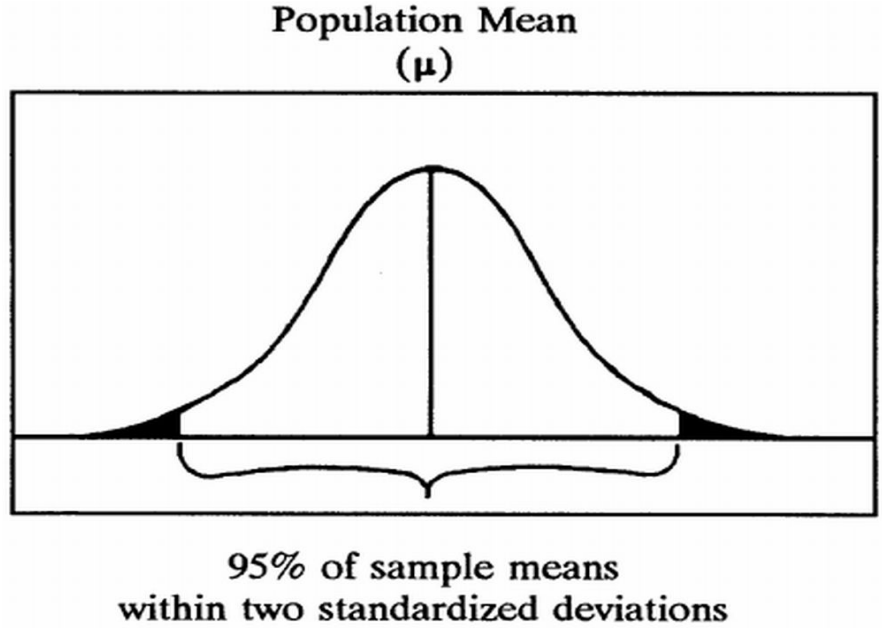


Figure 4.1

The total numbers of employees in telecom sector on 31st December 2012 were 346480, out of which target population (middle level personnel) considered for this study was 221747 (approx. 64 per cent).

With the confidence level 95% (if so desired) and size of population 5000 (in round off) for precision level ±3%, and ±5%, the sample size would be 1067 or rounded off as 1100 and 384 or 400 round off respectively.

(ii) Yamane (1967) has also proposed a simplified formula to calculate sample sizes.

$$n = \frac{N}{1+N*e^2} \qquad (4.2)$$

Where,

n = sample size,

N = population size,

e = level of precision.

With the rounded off population size 300000 in the present study the sample size would be 1107 or 1100 and 399 or 400 (in round off) respectively for precision level ±3%, and ±5%.

(iii) Krejcie and Morgan (1970) provided a formula for determining the sample size when population size is known:

$$\text{Sample size} = \frac{X^2 NP(1-p)}{d^2\,(N-1)+X^2P(1-p)} \quad (4.3)$$

χ^2 = table value of chi-square for d.f. = 1 for desired confidence level:
0.10 = 2.71 0.05 = 3.84 0.01 = 6.64 0.001 = 10.83

N = population size

p = population proportion (assumed to be 0.50)

d = degree of accuracy (expressed as a proportion)

With the confidence level 95% (if so desired) and population size 300000 (round off); the sample size would be 1063 or 1100 (in round off) and 384 or 400 (in round off) respectively for precision level ±3%, and ±5%.

Fowler (2002) proposed that the size of the sample may be determined on the basis of data analysis techniques. The present study is based on structural equation modeling that comprises multivariate analysis including statistical techniques such as: confirmatory factor analysis (CFA), structural path analysis (β), causal modeling with latent variables, analysis of variance and multiple regressions. For getting the authenticity and robustness in results using SEM, though empirical literature provides a number of rules of thumb a few considered are as follows:

No consensus exists on the issue of sample size. Kline (1998) argues that SEM is a technique for large samples. As proposed by Jackson (2003) the N:q rule is applicable when the estimation method used is maximum likelihood (ML), which is mostly used in SEM or ML estimation, Jackson (2003) argued that researchers take into consideration the minimum sample size in terms of the ratio of cases (N) to the number of model parameters that require statistical estimates *(q).* An ideal sample size-to-parameters ratio would be 20:1. He again indicated that, “one should have at least 20 cases for every estimated parameter (i.e., a 20:1 ratio); a 10:1 ratio is less ideal but may suffice”, Jackson (2003). It is also suggested that larger samples are needed for missing or non-normally distributed data as compared to complete, normally distributed data. MacCallum et. al (1996) suggests that “sample-size

requirements depend on the preferred power, the null hypothesis being tested, and the overall model complexity…also encourage researchers to use larger sample sizes when testing more complex models".

All researchers do not agree that sample size is model specific. Jackson (2003) found "a small effect of sample size on model fit when he tested the hypothesis that an inadequate sample would result in poor-fitting models". Jackson's work suggests that the reliability of observed measures and the number of indicators per factor are important determinants of model fit.

Following the criteria of variable to number of cases ratio, Kline (1998); and Jackson (2001, 2003), as in the present research work it is proposed to examine 14 constructs with 65 items within the basic model, the desired sample size is 910 (i.e., 65x14=910). The valid sample in this study remained 1000, which is justified based on the observations made in this section.

4.2.4 Sampling strategy

The Indian telecom sector is organized into twenty two 'service areas', out of these seven 'service areas' were selected by random sampling methodology. These are Gujarat, Haryana, Jammu and Kashmir, Rajasthan, Tamil Nadu, and Uttar Pradesh- [East], Delhi. The type of probability sampling applied was simple random sampling (SRS). Therefore, the middle-level personnel from Indian Telecom organizations (private and public) were invited to participate in the research. An internet-based survey method was used to collect the information. The reasons for adopting a web-based survey as opposed to a paper-based survey are as follows:

- All middle-level personnel from Indian telecom organizations usually have access to the internet and email via their mobile phones, so the author of this thesis hoped would increase participation as Martins (2010) observed that the online surveys are flexible since the respondents having internet access, can answer questions at any time and in any place.
- As this study considered a wide geographical area (seven service areas), making use of an online-survey was more economical and provided easy follow-up.

- On a regular basis the response rate could be easily tracked and reminder emails could be sent out to attract participation.

The method of collection included the following steps:

- The permission was obtained from concerned organizations to conduct the research. The information about the research procedure and possible outcomes was provided to them before seeking their permission.
- Participants were also informed about the objectives and the importance of the study, were assured of the confidentiality of their responses and were given sufficient time to complete the questionnaire.

The invitation to participate in the research study was sent out to 1400 middle-level personnel across the telecom sector within seven 'service areas' mentioned earlier. In total, 1021 participants completed the online questionnaire, out of which 21 questionnaires were excluded from the study due to incompleteness.

4.3 Measuring instruments

The questionnaire consisted of three sections:

(a) **Demographic profile:** This part of the questionnaire comprised of twenty biographical questions related to organization, designation, age, family size, family income, tenure within the organization, etc.

(b) **Competencies at middle-level personnel:** This part contained six dimensions proposed to be measured by twenty six questions.

(c) **Part 3: Quality of work life: F**orty one QWL questions for eight constructs formed this part of the questionnaire.

4.3.1 Competencies at middle-level personnel: nature and composition

This section of the questionnaire contains six dimensions: achievement/result orientation, basic knowledge and innovation, skill and attributes, meta qualities, communication, and decisiveness.

Validity and Reliability: Validity represents the quality of a questionnaire in such that it measures what it says it does. Reliability represents the consistency of a

measurement, Salkind (2008). The reliability is based on the total sample of 1000 respondents. Internal reliability of the questionnaire has been tested on the goodness of fit index (GFI), the non-normed fit index (NNFI) and the RMSEA criteria. The cronbach alpha for six dimensions ranged between 0.78 to 0.83.

4.3.1.1 Validity of the competency model and rationale for inclusion

Structural equation modeling has been used to assess the validity of the conceptual model. Boyatzis (1982) determined the characteristics of managers that enable them to be effective and efficient in various managerial positions, based on study which was conducted on two thousands managers holding forty one different positions in twelve organizations.

Human capital is clearly emerging as a key engine of economic growth, and it is evident that the skills and competencies of the workforce impact positively on productivity and competitiveness. Indian organizations are witnessing change in the system, management cultures and philosophy due to the alignment of Indian industries to global industries. There is a need for multi skill development. In this regard investment in human capital would appear to be a prerequisite to economic success. A more integrated approach to the measurement of competencies and skills is therefore important. To explore the role of competencies in determining the QWL is mainly focused on. As already indicated before, six dimensions are proposed to be measured by twenty six questions targeted at middle level personnel of the selected sample organizations.

4.3.2 Quality of work life: nature and composition

QWL is a philosophy or a set of principles, which state that, “people are trustworthy, responsible and capable of making a valuable contribution to the organization”, Rose, Beh, Uli and Idris (2006).

The part III of the questionnaire deals with QWL containing 39 questions for eight constructs suggested by Walton (1973) viz, a fair and appropriate salary, working conditions, use of one’s capacities at the work, opportunities available at work, social integration at work, constitutionalism/respect to the laws at work, the space that the work occupy in one’s life, social relevance and importance of work.

Validity and Reliability Confirmatory analysis by means of linear structural equation modeling has been applied to examine the factor structure of the questionnaire. The correlation between the scales within the QWL construct ranged from 0.810 to 0.824; these are strongly correlated within the QWL construct. It indicates that the construct validity of the questionnaire is satisfactory.

The reliability is based on the total sample of 1000 respondents. Internal reliability of the questionnaire are tested on the criteria of goodness of fit index (GFI) 0.992, the non-normed fit index (NNFI) 0.997 and the RMSEA 0.000; indicates a good fit of the model. The results prove thus that the eight scales of the questionnaire has satisfactory internal reliability. Cronbach alpha, measures internal consistency reliability, the degree to which responses are consistent across the items within a measure.

$$\text{Cronbach alpha, } \alpha_C = \frac{n\ddot{r}_{ij}}{1+(n-1)\ddot{r}_{ij}} \tag{4.4}$$

where *n* is the number of *items* (not cases) and $\ddot{r}_{ij}$ is the average Pearson correlation between all pairs of items. The cronbach alpha for these eight scales ranged from 0.79 to 0.86.

4.3.2.1 Rationale for inclusion

There seems to be no clear definition of the QWL construct, making it difficult to measure and interpret it. The point of view from which QWL is defined will determine the criteria relevant in its evaluation Kotzé (2005).

An overview of studies indicate that, some QWL measurements are limited evaluating employees experiences of satisfaction or dissatisfaction, or look at job-related perceptions and attitudes of individuals, while others measure only job characteristics, Wilcock and Wright (1991); Kerce and Booth-Kewley (1993).

The QWL for an employee is determined by the two way flow of personal and situational factors involving personal (subjective) and external (objective) aspects of work related rewards and experiences, Kaushik and Tonk (2008); Koonmee et al. (2010). Thus an integrated approach to the measurement of QWL is needed. The questionnaire dealing with QWL includes eight dimensions related to personal and

structural factors. This has widened the view of the work situation making it more comprehensive.

4.4 Procedure of data collection

The questionnaires were mailed as well as supplied individually to the selected target group (the respondents of respective companies' middle-level personnel). The author of this thesis organized contact programme at the company level and the participants were instructed and informed regarding the completion of the questionnaire, the objectives and importance of the study, what is being measured and what will happen to the outcome. Participants were assured of the confidentiality of their responses.

4.5 Pilot study

The framing of the initial version of the measuring survey instrument is followed by purification of the questions within the instrument. A pilot study is normally carried out before the process of main data collection so that its feasibility in terms of reliability and validity to improve the instrument design can be checked, Zikmund (2003). Ticehurst and Veal (2000) also stressed the significance of the pilot study so that possible weaknesses and flaws in the survey instrument can be weeded out.

The pilot study was conducted on seventy randomly selected telecom sector middle level employees'. Sixty questionnaires were collected before the cutoff date; out of them five were rejected due to the presence of a large number of missing data. Two questions were eliminated during the screening test of reliability and exploratory factor analysis (EFA) at the individual construct level related to measurement of sampling adequacy and total variance. A psychometric test (Mann-Whitney-U-test) was also applied to investigate whether "the length of the measuring instrument might discourage respondents to pay equal attention to the questions at the beginning of the instrument compared to the questions at the end of the instrument", so that the modified version of the measuring instrument could be substituted for the existing one. However, no difference was observed.

4.6 Statistical processing of data

The statistical and quantitative processing of data was done with the help of software IBM SPSS Statistics 20 with Amos 18, gretl, and Mplus 6. The following processes formed the part of the quantitative techniques used for data analysis:

4.6.1 Descriptive statistics

Huysamen, (2001) stated that "descriptive statistics are used to describe the basic features of the data in a study and provides simple summaries about the sample and the measures". The use of tables and graphs, and measurement of central tendency and variability are being included in this head. The underlying descriptive statistical techniques used in this research study are:

Mean ($\bar{X}$)

It represents the average score in a distribution.

$$\bar{X} = \sum_{i=1}^{n} X_i/\text{n} \tag{4.5}$$

where $\sum_{i=1}^{n} X_i$ is defined to mean $X_1 + X_2 + \ldots + X_n$.

Standard deviation (SD)

According to Howell (2004) "Standard deviation is described as the positive square root of the variance and basically measures the average of the deviations of each score from the mean",

$$\text{SD} = \sqrt{\frac{\sum(X-\overline{X})^2}{N-1}} \tag{4.6}$$

Skewness and Kurtosis

The degree of asymmetry in distribution is measured through skewness. The best known example of a symmetrical or normal distribution is represented by a bell shaped structure. There are two types of asymmetrical distribution: (i) negatively skewed (i.e. skewed to the left) (ii) positively skewed (i.e. skewed to the right).

The word kurtosis means curvature, D'Agostino *et al*. (1990). It is generally defined as a measure reflecting the degree to which a distribution is peaked. There are three types of kurtosis, mesokurtic (which has a degree of peakedness that is

considered moderate, is represented by a normal distribution), leptokurtic (with a high degree of peakedness), and platykurtic (with a low degree of peakedness).

Skewness and kurtosis, represent the third and fourth moments of a distribution. The word moment is employed to represent to the sum of the deviations from the mean in reference to sample size.

$$\mathbf{m_i} = \frac{(X-\overline{X})^r}{n} \tag{4.7}$$

Where, m_i represents the sample statistic for the i^{th} moment about the mean.

4.6.2 Inferential statistics

Huysamen (2001) says that "inferential statistics are used to reach conclusions which extend beyond the immediate data alone i.e. to make inferences from the data obtained to more general conditions".

4.6.2.1 Reliability of instruments

The Cronbach alpha and confirmatory factor analysis (CFA) could be used to determine the reliability of the instruments. According to Murphy and Davidshofer (2005), "the Cronbach alpha measure estimates the reliability based on the number of the items in the test and the average inter-correlation among test items".

Cronbach's Alpha (α) is a measure of internal consistency that is popular in the field of psychometrics. It can be mathematically represented as follows:

$$\alpha = \frac{k}{k-1}\left(1 - \frac{1}{s_T^2}\sum_{i=1}^{k} s_i^2\right) \tag{4.8}$$

Let k be the number of items (or questions), s_i^2 the variance associated with item i, and s_T^2 the variance associated with the total (or sum) of all k item scores.

4.6.2.2 Factor analysis

Suppose there is a data matrix X, having n observation with p random variables, X(n _ p) or X_{ij} , where, i = 1,…, n and j = 1,…, p :

$$X = \begin{pmatrix} x_{11} & \cdots & x_{1p} \\ \vdots & \ddots & \vdots \\ x_{n1} & \cdots & x_{np} \end{pmatrix}$$

Where, rows $x_i = (x_{i1},\ldots,x_{ip})^T \in \mathbb{R}^{\mathbb{P}}$ represent the i-th observation of a p-dimensional random variable $x \in \mathbb{R}^{\mathbb{P}}$.

The main objective of factor analysis (FA) is to find a small set of **f** unobserved/ latent / hypothesized variables (factors), to explain the outcome of **p** observed variables in the data matrix **X**, so FA is known as data reduction procedure. In this method all the information in X can be reproduced by a smaller number of factors. These factors are latent (unobserved) common characteristics of the observed $x \in \mathbb{R}^{\mathbb{P}}$. It occurs when every observed $x = (x_1,\ldots,x_p)^T$ can be presented in the following set of p equations:

$$x_1 = q_{11}f_1 + q_{12}f_2 + \ldots + q_{1(k-1)}f_{(k-1)} + q_{1k}f_k + u_1$$
$$x_2 = q_{21}f_1 + q_{22}f_2 + \ldots + q2_{(k-1)}f_{(k-1)} + q_{2k}f_k + u_2$$
$$\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots$$
$$x_{p-1} = q_{(p-1)1}f_1 + q_{(p-1)2}f_2 + \ldots + q_{(p-1)(k-1)}f_{(k-1)} + q_{(p-1)k}f_k + u_{(p-1)}$$
$$x_p = q_{p1}f_1 + q_{p2}f_2 + \ldots + q_{p(k-1)}f_{(k-1)} + q_{pk}f_k + u_p$$

where, f_1, f_2….f_{k-1} and f_k denote the k common factors ; q_{11}, q_{12}, …$q_{p(k-1)}$ and q_{pk} are coefficients associated with the p regressions of the observed variables on the common factors. u_1, u_2,….u_{p-1} and u_p represent residual components of x_1, x_2, … x_{p-1} and x_p, respectively. These equation can be summed up as follows:

$$x_j = \sum_{l=1}^{k} q_{jl}f_l + \mu_j \text{ , } j = 1,\ldots,p. \qquad (4.9)$$

where f_l, for $l = 1,\ldots,k$ denotes the factors. The number of factors, k, should always be much smaller than p.

If a p-dimensional random vector $X = (X_1,\ldots,X_p)^T$ is considered with mean μ and covariance matrix $Var(X) = \Sigma$.

$$Var(X) = \Sigma = \begin{pmatrix} \sigma_{x_1x_1} & \cdots & \sigma_{x_1x_p} \\ \vdots & \ddots & \vdots \\ \sigma_{x_px_1} & \cdots & \sigma_{x_px_p} \end{pmatrix},$$

A model similar to (4.9) can be written for X in matrix notation, namely

$$X = QF + \mu \qquad (4.10)$$

Where, F is the k-dimensional vector of the k factors $(F_1,\ldots F_k)^T$, $\mathcal{Q}$ is a (p ×k) matrix of the factor loadings, and μ is a (p ×1) matrix of mean of variable j. When using the factor model (4.10) it is often assumed that the factors F are centered, uncorrelated and standardized: E(F) = 0 and Var(F) = Ik. If the last p-k eigenvalues of Σ are equal to zero, X can easily be expressed by the factor model (4.10).

The factor analysis is used to split the influences of the factors into common and specific ones. As depicted in equation 4.10, highly informative factors that are common to all of the components of X and factors that are specific to certain components. The factor analysis model used in praxis is a generalization of (4.10):

$$X = \mathcal{Q}F + U + \mu \qquad (4.11)$$

where Q is a (p × k) matrix of the (non-random) loadings of the common factors F(k ×1) and U is a (p ×1) matrix of the (random) specific factors. It is assumed that the factor variables F are uncorrelated random vectors and that the specific factors are uncorrelated and have zero covariance with the common factors. More precisely, it is assumed that:

$$EF = 0,$$
$$\text{Var}(F) = I_k, \quad (4.12)$$
$$EU = 0,$$
$$\text{Cov}(U_i, U_j) = 0,\ i \neq j$$
$$\text{Cov}(F, U) = 0 .$$

Define

$$\text{Var}(U) = \psi = \text{diag}(\psi_{11}, \ldots, \psi_{pp}).$$

The generalized factor model (4.11) together with the assumptions given in (4.12) constitutes the orthogonal factor model.

There are two types of factor analysis (FA), exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). EFA is being used when researcher wish to explore the pattern in data and to test explicitly the stated hypotheses, EFA is used where data is not subject substantive constraints and the pattern of relationships between observed and latent variables is not restricted. So, EFA is data driven,

Brown (2006: 14). Where each common factor is assumed to affect every observed variable and that the common factors are either all correlated or uncorrelated. On the contrary, CFA is theory-driven, where substantively meaningful constraints commonly placed on factor model has setting the effect of one latent variable to equal zero on a subset of the observed variables. CFA is allowed to the test the hypotheses about a particular factor structure, Albright, J.J. and Park, H.M. (2009).

CFA is actually a special case of the structural equation model (SEM), also termed as covariance structure, McDonald (1978) or the linear structural relationship (LISREL) model, Jöreskog and Sörbom (2004).

4.7 Structural equation modelling

The reason for using SEM in the present research is discussed in this section. In structural equation models (SEMs) or simultaneous equation models, are actually multivariate regression models. Under this equation system response variable in one regression equation might appear as a predicator in other equation, Fox, J. (2002).

According to Garson (2004) “structural equation modeling is a family of statistical techniques which incorporates and integrates path analysis”. In factor analysis “various types of models to depict relationships among observed variables, with the same fundamental goal of providing a quantitative test of a theoretical model hypothesized by a researcher are used”, Schumacker and Lomax (2004). Kline (2011) is of the opinion that the term “structural equation modeling does not designate a single statistical technique but instead refers to a family of related procedures. Other terms such as covariance structure analysis, covariance structure modeling, or analysis of covariance structures are also used in the literature to classify these techniques together under a single label”. He further stated that, “the computer tools for SEM require you to provide a lot of information about things such as which variables are assumed to affect other variables and the directionalities of these effects”.

The determination whether the theoretical model is supported by the observed sample data or not is the main objective of SEM, Fan, Thompson and Wang (1999); Schumacker and Lomax (2004). According to Garson (2004) “it is important to note

that SEM is usually viewed as a confirmatory rather than exploratory procedure". The ultimate goal of SEM is to attain whether the final retained model (if any): has a clear theoretical rationale (i.e., it makes sense); differentiates between what is known and what is unknown.

There are two components in a SEM model, the 'measurement model' and the 'structural model'. Measurement model, involves a smaller set of latent variables which are linked with a set of observed variables, and being tested through CFA. On the other hand, the structural model deals the latent variables which are linked to the observed variables through a series of recursive and non-recursive relationships. The SEM process involves two steps: (i) validating the measurement model (primarily using Confirmatory Factor Analysis) (ii) fitting the structural model (accomplished through path analysis with latent variables), Garson (2004).

4.7.1 Characteristics of structural equation modeling

Various types of theoretical models including regressions, path and confirmatory factor models can be tested through SEM. There are two types of variables found in SEM, latent variables and observed variables. According to Kline (2011), "observed variables can be categorical, ordinal, or continuous, but all latent variables in SEM are continuous and there are other statistical techniques for analyzing models with categorical latent variables, but SEM deals with continuous latent variables only". The main components of SEM can briefly be summarized as follows:

Regression Model

In a regression model a single dependent observed variable is predicted by independent observed variables.

$$Y_i = \beta_1 + \beta_2 X_{2i} + \ldots + \beta_n X_{ni} + u_i \qquad (4.13)$$

where, Y is dependent variable, $X_1, X_2, \ldots X_n$ are independent variables, $\beta_1, \beta_2, \ldots \beta_n$ are slope coefficients and u_i are disturbance terms.

Path model

According to Kline (2011) "a path model is a structural model for observed variables. A structural model represents hypotheses about effect priority".

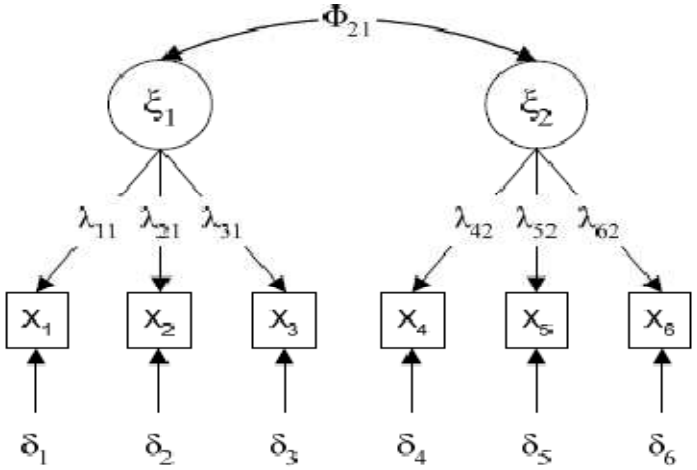
Confirmatory factor models

According to Schumacker and Lomax (2004), "confirmatory factor analysis, consist of observed variables which are hypothesized to measure one or more latent variables both independent and dependent".

Confirmatory factor models are generally showed as path diagrams where circles represent the latent variables and observed variables are displayed by squares. Causal influence is denoted by Single-headed arrows (→) and covariance between two latent variables is represented by double-headed arrows represent. Latent variables 'cause' the observed variables, as can be seen by the single-headed arrows pointing towards the manifest variables from the circles.

Suppose there are two latent variables or common factors ξ_1 and ξ_2 displayed in circles (Figure 4.2). The factor ξ_1 influences three observed variables x_1 through x_3 (in squares), while factor ξ_2 impels the other three observed variables x_4 through x_6 (in squares). It is expected that the two ξ_i covary, shown by ϕ_{21} on the two-headed arrow. Factor loadings are represented by λ_{ij} , where i indicates observed variable and j represents the factor. The squared factor loading λ_{ij}^2 is termed as a

Figure 4.2 : Path diagram of a confirmatory factor model



communality, it represents the proportion of variance in the observed variable (i^{th}) that is explained by the latent variable (j^{th}), Brown (2006). The δ_i shows that *unique factors* because they affect a single observed variable. The δ_i incorporates all the variance in each x_i, such as measurement error, which is not captured by the common factors.

The assumption is that the error terms have a mean of zero, E (δ) = 0, when latent and observed variables are taken as mean centered and that the common and unique factors are uncorrelated, E (ξδ')=0. The confirmatory factor model can be expressed into the following set of regression equations:

$$\mathbf{X_1 = \lambda_{11}\xi_1 + \delta_1 \;\; X_2 = \lambda_{21}\xi_1 + \delta_2 \; X_3 = \lambda_{31}\xi_1 + \delta_3} \quad (4.14)$$
$$\mathbf{X_4 = \lambda_{42}\xi_2 + \delta_4 \;\; X_5 = \lambda_{52}\xi_2 + \delta_5 \; X_6 = \lambda_{62}\xi_2 + \delta_6}$$

where, each x_i is a linear function of one or more common factors plus an error term (there is no intercept as the variables are mean centered).These equations can be summarized into matrix equation as follows:

$$\mathbf{X = \Lambda\xi + \delta} \quad (4.15)$$

where, X is the vector of observed variables. Λ is the matrix of factor loadings connecting the ξi to the x_i, ξ is the vector of common factors, and δ is the vector of unique factors.

Correlation Analysis

The degree of linear association between two variables is measured by the Pearson product moment correlation coefficient. In inferential statistical tests correlation is not considered but comes under descriptive statistical measures. In correlation the main emphasis is given to the strength of association and its direction. the correlation coefficient value ranges between 1 and -1.

Null hypothesis $H_0 : \rho = 0$

Alternative hypothesis $H_0 : \rho \neq 0$

$$r = \frac{\sigma_{XY}}{\sqrt{\sigma_{XX}\sigma_{YY}}} \quad (4.16)$$

where, Pearson product-moment correlation coefficient is represented by the letter *r*. The *r* is an estimate of ρ (the Greek letter rho), which is the correlation between the two variables in the underlying population.

4.7.2 Advantages of SEM

SEM technique having the following multiple advantage:

i. Kline (2005) observed that "it allows researchers to think in terms of models. Many applications of SEM are a blend of exploratory and confirmatory analyses"

ii. It provides the investigator to accomplish simultaneous as well as systematic evaluation of variables from which causal inference can be drawn, Back (2001).

iii. It is usual practice that basic methods only utilize a limited number of variables which are not capable of dealing with the complicated theory while SEM facilitates investigators on modeling complex phenomenon for statistical testing, Garson (2004); Schumacker and Lomax (2004).

iv. Currently, measurement error has become a huge issue in an empirical study in various disciplines. SEM technique allows it to be accounted for when analyzing the data statistically, Garson (2004); Schumacker and Lomax (2004).

v. SEM besides analyzing complicated theoretical models of complex phenomena also permits the investigator to measure mediating effects by adding additional path hypothesized model, Back (2001); Schumacker and Lomax (2004).

4.7.3 SEM models

Schumacker and Lomax (2004) argue that "various theoretical models can be tested in SEM which hypothesizes how variables define constructs and how these constructs are related to each other".

Steps to build SEM models

Schumacker and Lomax (2004), proposed five steps which they termed as the 'building blocks' of SEM analysis. These are:

Model specification

Model specification is a mathematical expression of the theory in terms of equation allowing the use of all the relevant available information and theory research. Thus before data collection and analysis, a model should be specified

which can be confirmed with variance and covariance data. Dealing with 'what to include', in model specification, Kline (2011) suggested that new research areas can have limited existing literature. Therefore, the decisions about what to include in the model must be based on researcher's experience as well as published reports. Reasonable specifications may also be based on experts opinion in the specialized areas. Contrary, in help established areas there is too *much* information in the literature that it is practically not possible to include all of it. To cope with such conditions the researcher must rely on his or her judgment regarding the most crucial variables.

Model identification

Before estimating parameters model identification should be done. There are two general requirements for identifying requirements which are necessary but not sufficient for model identification, Kline (2011), viz;

i. The degrees of freedom of model must be at least zero ($df_M \geq 0$).
ii. Every latent variable (including the residual terms) must be assigned a scale (metric).

For the requirement of $df_M \geq 0$ as the counting rule, Kline mentioned some authors: Kaplan (2009) says that "models that violate the counting rule are not identified. Specifically, they are under-identified or underdetermined (when observations are less than the estimated parameters)". The investigator may face two other situations i.e. over-identified (observations are more than parameters) and just-identified or just-determined (when observations are equal to the estimated parameters) models. Kline (2011) indicates that "most structural equation models with zero degrees of freedom ($df_M = 0$) that are also identified can perfectly reproduce the data (sample covariances), but such models test no particular hypothesis". He further indicated that "the terms *just-identified* and *overidentified* do not automatically apply to a structural equation model unless it meets both of the two necessary requirements for identification *and* additional, sufficient requirement for that particular type of model described, viz;

i. A just-identified structural equation model is identified and has the same number of free parameters as observations ($df_M = 0$).

ii. An overidentified structural equation model is identified and has fewer free parameters than observations ($df_M > 0$)".

Considering CFA model, if all of the unknown parameters can be rewritten in terms of the variances and covariances of x variables it is said to be identified. As reported in figure 1.0 the unknown parameters of CFA model are ϕ_{21}, six λ_{ij}, and six $\delta_{i,}$. Information provided is variances and covariances of observed variables including σ_{11}, σ_{21}, σ_{22}, σ_{31} … σ_{66}. The number of input information is 21 = 6(6+1)/2 = p(p+1)/2, where p is the number of observed variables. Degrees of freedom are 8 =21(known) -13 (unknowns). Thus it can be said that this CFA model is over-identified.

Though latent variables are unobserved and their scales are unknown, so for identification of a CFA model imposition of some constraints are necessary. In order to identify the model, it therefore becomes necessary to set the metric of the latent variables in some manner. The model identification depends on the description of parameters which are fixed, free, or constrained. "If two or more parameter values generates the same covariance matrix, then they are equivalent and if a parameter has the same value in all equivalent sets, then the parameter is identified", Berg ,Y. Van Der (2011).

Estimation

Model investigates the different techniques for estimating the population parameters within a SEM environment. The estimation process includes the use of a specific fitting function to minimize the difference between the implied matrix and the sample covariance matrix of the observed or indicator variables.

When observed variables x are taken as mean centered, the sample covariance matrix for *x*, indicated by *S*, can be decomposed as follows:

$$\Sigma = \mathbf{\Lambda \Phi \acute{\Lambda}} + \mathbf{\Theta} \qquad (4.17)$$

where, Φ = covariance matrix of the ξ factors and

Θ = the covariance matrix of the unique factors δ.

Estimation proceeds by finding the parameters $\widehat{\Lambda}$, $\widehat{\boldsymbol{\Phi}}$, and $\widehat{\Theta}$ so that predicted *x* covariance matrix Σ (sigma) is as close to the sample covariance matrix *S* as possible. There are several different fitting functions which exist to determine the degree of association of the implied covariance matrix to the sample covariance matrix, of which maximum likelihood is the most common ones (Albright and Park, 2009).

Model testing

Model testing is done after calculating the parameter estimates to determine how well the data fit the model at what extent the theoretical model is supported by the collected sample data.

Goodness of Fit

GFI is used to determine how well the theoretical model matches the observed data, a large class of omnibus tests exists, out of these, some commonly used fit indices are described below:

Chi-square (χ^2) test

Chi-square (χ^2) is a classic goodness-of-fit measure to determine overall model fit. Its null hypothesis is that "the implied or predicted covariance matrix Σ is equivalent to the observed sample covariance matrix *S"*, or Σ=S. Jöreskog (1969) indicated that "a large χ^2 and rejection of the null hypothesis means that model estimates do not sufficiently reproduce sample covariance; the model does not fit the data well. By contrast, a small χ^2 and failure to reject the null hypothesis is a sign of a good model fit. However, the χ^2 test is widely recognized to be problematic". Brown (2006) says that "the χ^2 test becomes invalid when distributional assumptions are violated that leads to the rejection of good models or the retention of bad ones. χ^2 is based on a very narrow and finding hypothesis of Σ=S",. Kline (2011) informed that "an attempt to reduce the sensitivity of the model chi-square to sample size, some researchers in the past divided this statistic by its expected value, or normed chi-square (NC) = χ_M^2 / df_M , which generally reduced the value of this ratio compared with χ_M^2 . There are three problems with NC: (1) χ_M^2 is sensitive to sample size only for incorrect models; (2) df_M has nothing to do with sample size; and (3) there were really never any clear-cut guidelines about maximum values of the NC

that are *acceptable* (e.g., NC < 2.0—3.0). Because there is little statistical or logical foundation for NC, it should have no role in model fit assessment".

Due to these drawbacks of χ^2 test, various other alternative fit statistics have been developed, each one having its own merits and demerits.

Root Mean Square Error of Approximation (RMSEA)

RMSEA was introduced by Steiger and Lind (1980). RMSEA "incorporates a penalty function for poor model parsimony" and hence is sensitive to the number of parameters estimated and relatively insensitive to sample size, Brown (2006). The Amos User's Guide suggests that "a value of the RMSEA of about 0.05 or less would indicate a close fit of the model in relation to the degrees of freedom," though this figure is also not free of defects and is based on subjective judgment, Arbuckle, (2005). According to Kline (2011) RMSEA is scaled as a badness-of-fit index where a value of zero indicates the best fit.

$$\text{RMSEA} = \sqrt{\frac{\chi^2_{M-}df_M}{df_M}} \tag{4.18}$$

Kline elaborates that "calculated *p* values for the test of the one-sided hypothesis *H*0: ε0 ≤ .05, or the close-fit hypothesis. This test is an accept–support test where failure to reject this null hypothesis favors the researcher's model". The threshold of .10 in the poor-fit hypothesis is also proposed by Browne and Cudeck (1993), who suggested that, "RMSEA ≥ .10 *may* indicate a serious problem".

Goodness-of-Fit Index (GFI)

According to Kline (2011) "the Jöreskog–Sörbom GFI is an absolute fit index that estimates the proportion of covariance in the sample data matrix explained by the model". Jöreskog (2004) argued that "GFI estimates, how much better the researcher's model fits compared with no model at all".

A general formula is

$$\text{GFI} = 1\text{-}\frac{C_{res}}{C_{tot}} \tag{4.19}$$

where, C_{res} = the residual and

C_{tot} = total variability in the sample covariance matrix.

The value of GFI varies with sample size. GFI is less affected by model size than the RMSEA. The value of GFI ranges between 0–1.0. The values > 1.0 represents the over-identified models where χ_M^2 is close to zero, and values < 0 represents the small samples or poorly fit.

Comparative fit index (CFI)

Kline (2011) indicates that the "Bentler *Comparative fit index* (CFI) is an incremental fit index that measures the relative improvement in the fit of the researcher's model over that of a baseline model, typically the independence model". For models where $\chi_M^2 \leq df_M$, CFI = 1.0; otherwise, the formula is

$$\text{CFI} = 1 - \frac{\chi_M^2 - df_M}{\chi_B^2 - df_B} \tag{4.19}$$

where, the numerator and the denominator represent the estimate the chi-square non-centrality parameter for, respectively, the researcher's model and the baseline model. If the value of CFI = 1.0 means only that $\chi_M^2 < df_M$, not that the model has perfect fit ($\chi_M^2 = 0$).

CFI evaluates "the fit of a user-specified solution in relation to a more restricted, nested baseline model," in which the "covariances among all input indicators are fixed to zero", Brown (2006). The value of CFI ranges from 0 for a poor fit to 1 for a good fit.

Tucker-Lewis index (TLI)

It is an index for comparative fit that "includes a penalty function for adding freely estimated parameters", Brown (2006). The value of TLI ranges from 0 to 1.

Hu and Bentler (1999) provide "rules of thumb for deciding which statistics to report and choosing cut-off values for declaring significance. When RMSEA values are close to .06 or below and CFI and TLI are close to .95 or greater, for example, the model may have a reasonably good fit". Therefore, it is suggested to consider not only $\chi 2$ but RMSEA and CFI/TLI also.

Normed Fit Index (NFI)

The NFI, also termed as the Bentler Bonett normed fit index and it was developed as an alternative to CFI as it does not require making chi-square assumptions. Its values range between 0 and 1 (perfect fit). Values greater than 0.95 represents good, between 0.90 and 0.95 as acceptable and below 0.90 represents modification in the model, Garson (2004); Tabachnick and Fidell (2007).

$$\mathbf{NFI} = \Delta_1 = \mathbf{1} - \frac{\widehat{C}}{\widehat{C_b}} = \mathbf{1} - \frac{\widehat{F}}{\widehat{F_b}} \qquad \textbf{(4.20)}$$

Where $\widehat{\boldsymbol{C}} = \mathbf{n}\widehat{\boldsymbol{F}}$ is the minimum discrepancy of the model being evaluated and $\widehat{C_b}$ = n $\widehat{F_b}$ is the minimum discrepancy of the baseline model.

Non-normed fit index (NNFI)

The NNFI, also known as the Tucker Lewis index (TLI) or the Bentler-Bonett non-normed fit index and it is similar to the NFI, but penalizes for model complexity. It is less affected by sample size than the NFI. NNFI = 1 indicates a good fit, equal to 0.90 represents acceptable model fit and a NNFI below 0.90 represents the need of moderation in the model. Hu and Bentler (1999) suggested the value of NNFI >0.95 is the cut-off point for a good model fit.

Standardized root mean square residual (SRMR)

Kline (2011) says that a "statistic called the Root Mean Residual Square (RMR) was originally associated with LISREL but is now calculated by other SEM computer tools, too". It is a measure of the mean absolute covariance residual.

If the value of RMR = 0 then it represents a perfect model fit and if the value is greater than 0 then it indicate worse fit. He further suggested that if RMR is computed with unstandardized variables then its range depends on the scales of the observed variables.

These model fit indices can be reviewed on the basis three criteria, Schumacker and Lomax (2004), "non-statistical significance of chi-square (χ^2) test, and RMSEA values (≤ 0.05 is considered acceptable), could be grouped under the first criteria. These tests can be termed as global fit measures. The second criteria is the statistical significance of individual parameter estimates for the paths in the model (t value),

and the third criterion considers the magnitude and the direction of the parameter estimates, focusing on whether a positive or a negative coefficient makes sense for the parameter estimate". They further remark that SEM fit indices "has no single statistical test of significance which identifies a correct model given the sample data, especially since equivalent models or alternative models can exist which yield exactly the same data-to-model fit".

Score reliability in SEM

According to Kline (2011) score reliability, "the degree to which scores in a particular sample are free from random measurement error is estimated as one minus the proportion of total observed variance due to random error. These estimates are reliability coefficients, and reliability for the scores of variable *X* is often designated with the symbol r_{XX}. Because r_{XX} is a proportion of variance, its theoretical range is 0-1.00".

A conceptual equation is

$$\alpha_C = \frac{n\bar{r}_{ij}}{1+(n-1)\bar{r}_{ij}} \tag{4.21}$$

where n = the number of *items* (not cases) and

ij r = average Pearson correlation between all pairs of items.

The value of Cronbach's alpha ranges from 0 to 1.0. Garson (2004) establishes that "a common rule is that the indicators should have a Cronbach's alpha of 0.7 to judge the set reliable".

4.8 Statistical hypotheses

Brewerton and Millward (2001) argue that a hypothesis is "a tentative proposition made as a basis for further exploration, often based on limited evidence. A null hypothesis (i.e. the assumption that the hypothesis is unfounded) may only be rejected in light of sufficient evidence that the alternate hypothesis is supported".

The following hypotheses were formulated in the present research

H_0 : There is no positive relationship between the Quality of work life and competencies of employees at the middle level in Telecom sector of India

H_1 : There is a positive relationship between the Quality of work life and Competencies of employees at the middle level in Telecom sector of India.

4.9 Summary and conclusions

The present chapter focuses on the research methodology, explanation of empirical research and research design. The varied section describes the target population, sampling strategy and measuring instruments, encompassing employees' competencies at managerial level and quality of work life. The processing of data and hypothesis formulation is also examined in this chapter.

Special emphasis was placed on the rationale of, the motivation for using the selected measurement instruments. The reliability and validity of each instrument has been explored extensively. The data collection method and the statistical processing of data are explained with special focus on multivariate analysis including exploratory factor analysis, confirmatory factor analysis and structural equation modeling. The research hypotheses were formulated to test the dependent relationships of the empirical data.

Chapter 5

Empirical model of relationship between the employee's competencies and QWL in the Indian telecom sector: Part 1 Factor Analysis

This chapter is organized in six sections. Pilot study is presented in section 5.1. Modified tentative model is developed in section 5.2. Demographic variables are described in section 5.3. Section 5.4 deals with the main study wherein data attributes like outlier, normality, multicollinearity, etc. are analyzed. In section 5.5 factor analysis and exploratory factor analysis are described. The chapter is summarized and concluded in the last section.

5.1 Pilot study

In chapter four it has been mentioned that a pilot study would help in developing the consistent instrument, which in turn materializes the planned objectives of the study. For this purpose a pilot study was conducted for the present research during the month of February-June 2012 and which was followed by full scale data collection.

The pilot study primarily concentrates on the purification of the instrument. This includes testing the instruments, sequence, wording, layout of the questionnaire, familiarity with respondents, response rate, completion time and analysis process of the questionnaire, Ticehurst and Veal (2000). Some questionnaires were also sent to the academicians to test the face validity but very little corrections were suggested.

According to Diamantopoulos and Siguaw (2000) sample size for pilot study should be up to 100 respondents or between 10 to 30, Luck and Rubin (1987). Thus, for the pilot test for this thesis seventy instruments were distributed among the randomly selected middle-level personnel. Sixty instruments were collected by the cutoff date, out of which ten were excluded due to large number of missing data. Hence, the response rate of the pilot study remained 71.40 per cent. The respondents took about 15 to 20 minutes to complete the survey instrument.

Table 5.1 Measurement of sampling adequacy and total variance

Factor	No. of Items	Cronbach α	EFA no. of factor	KMO	Bartlett's Test Sphericity	Variance Explained (in per cent)
Competencies						
Achievement/result orientation (ACHRO)	4	0.836	1	0.782	0.000	68.57
Basic knowledge and innovation (BKNOI)	3	0.864	1	0.627	0.000	79.47
Skill and attributes (SKLAT)	6	0.895	1	0.876	0.000	67.90
Meta qualities (MTKV)	5	0.842	1	0.731	0.000	63.35
Communication (KMUN)	3	0.746	1	0.613	0.000	67.67
Decisiveness (DCCV)	5	0.876	1	0.780	0.000	67.87
Quality of Work Life						
A fair and appropriate salary (Remuneration) (SAL)	4	0.836	1	0.829	0.000	67.95
Working conditions (WRK)	6	0.513	1	0.786	0.000	90.04
Working conditions* (WRK)	5	0.877	1	0.645	0.000	86.69
Use of capacities at the work (KPW)	5	0.502	1	0.605	0.000	81.62
Use of capacities at the work** (KPW)	4	0.842	1	0.731	0.000	63.35
Opportunities available at work (APO)	5	0.869	1	0.614	0.000	92.79
Social integration at work (SOIN)	9	0.901	1	0.636	0.000	72.36
Constitutionalism (Respect to the Laws) at work (KONS)	4	0.811	1	0.760	0.000	64.34
The space that the work occupy in one's life (SPL)	3	0.936	1	0.764	0.000	88.71
Social relevance and importance of work (SORI)	5	0.817	1	0.784	0.000	72.34

* WRK: after deleting one item, "Regarding tiredness that your work cause to you, how do you feel? (WC6)".

** KPW: after deleting one item, "Regarding responsibilities conferred work given to you, how do you feel? (CW5)".

Internal consistency is measured by the Cronbach's α test, which ensures that "measures are free from the error and therefore yield consistent results", Peter, 1979). To validate that scale selected exploratory factor analysis (EFA) was conducted for the present study and it is supported by the data.

The overall reliability of the instrument within piloting was α=0.853 or 85per cent which is above than the recommended threshold 0.7, Nunnally and Bernstein (1994). The individual construct reliability ranges from 0.746 to 0.936 (Table 5.1). The two constructs which produced lower reliability than the cut off value were 'working conditions (WRK)' and 'use of capacities at the work (KPW)' (i.e. 0.513 and 0.502 respectively). After deleting WC6 from WRK and CW5 from KPW the reliability α for the remaining five and four questions combined improved to 0.877 and 0.842 respectively which were in the acceptable range, Cronbach (1951).

The EFA results displayed that Kaiser-Mayer-Olkin (KMO) statistics which is measurement of sampling adequacy was higher than the minimum recommended value of 0.60 (Kaiser, 1974) for all the constructs. The significance of Bartlett's test of sphericity for all the constructs indicates that the correlation among the measurement items was higher than 0.3 and were suitable for EFA, Hair et al. (2006) and the total variance extracted by the questions within construct were higher than 0.60, Hair et al. (2006).

It is normally seen respondents do not pay equal attention to the questions in the starting of the instrument compared to the questions in the end of the instrument due to the length of measuring instrument. It was prescribed to observe the difference during the pilot study and if the difference is observed then divergent versions of instrument would be used to collect full-scale data. For this reason, the Mann-Whitney-U-test was applied between first-five questions (i.e. AR1 to B1) and last-five questions (i.e. SR1 to SR5) with categorical variable gender (male/female) to observe the chances of potential differences. Table 5.2, shows that asym. significant (2-tailed) values in all variables were higher than 0.05 probability value which indicates no difference between male and female respondents in all these questions, Pallent (2007).

By comparing Z score of ACHRO with SORI questions it is observed that none of construct/factor is totally higher than other (e.g. AR1>SR1, AR2>SR2 and so on), this shows that there was no effect of length of the instrument on the respondents. On the basis of pilot study result the normal layout of the instrument (Appendix-A) was developed for full scale data collection..

Table 5.2: Mann-Whitney-U-test to observe difference between first-five and last-five questions within instrument

	AR1	**AR2**	**AR3**	**AR4**	**B1**
Mann-Whitney U	285.000	264.500	264.500	268.000	294.000
Wicoxon W	516.000	495.500	495.500	499.000	525.000
Z	-0.399	-0.873	-0.873	-0.759	-0.286
Asymp.Sig.(2-tailed)	0.690	0.383	0.383	0.448	0.775
	SR1	SR2	SR3	SR4	SR5
Mann-Whitney U	289.500	262.500	260.000	272.000	286.500
Wicoxon W	520.500	493.500	491.000	707.000	517.500
Z	-0.335	-0.894	-0.995	-0.680	-0.438
Asymp.Sig.(2-tailed)	0.738	.371	.320	0.496	0.662

5.2 Modified tentative model

The tentative model that was proposed initially was modified after examining the sampling adequacy and total variance. Two items were dropped from the initial tentative model. These were (a) ‘Regarding tiredness that your work causes to you, how you feel?’ (WC6) from WRK construct and (b) ‘Regarding work responsibility given to you, how do you feel?’ (CW5) from KPW construct.

5.3 Descriptive statistics

Descriptive statistics provides a bird’s eye view of the study and sample. Huysamen (2001) is of the opinion that “descriptive statistics are used to describe the basic features of the data in a study and provide simple summaries about the sample and the measures”.

5.3.1 Biographical profile of the sample

The biographical profile is reported in Table 5.3.

Table 5.3 Biographical profile of the respondents

Demographic Variable	Frequency	Percentage	Cumulative Percentage
Gender			
Male	655	65.5	65.5
Female	345	34.5	100
TOTAL	1000	100	
Age			
Under 25 years	300	30.0	30.0
26 to 36 years	350	35.0	65.0
37 to 46 years	246	24.6	89.6
47 to 56 years	83	8.3	97.9
57 years and older	21	2.1	100
TOTAL	1000	100	
Marital Status			
Married	678	67.8	67.8
Unmarried	322	32.2	100
TOTAL	1000	100	
Organization			
Airtel	237	23.7	23.7
Idea	200	20.0	43.7
Vodaphone	209	20.9	64.6
Aircel	194	19.4	84.0
MTS	90	9.0	93.0
Tata Docomo	50	5.0	98.0
BSNL	20	2.0	100
TOTAL	1000	100	
Total years of work Experience			
0-5 yrs	365	36.5	36.5
6-10 yrs	300	30.0	66.5
11-15 yrs	175	17.5	84.0

Demographic Variable	Frequency	Percentage	Cumulative Percentage
16-20 yrs	110	11.0	95.0
21-25 yrs	50	50.0	100
TOTAL	1000	100	
Income Level (per annum)			
3, 00,000 – 3, 50,000	165	16.5	16.5
3, 51,000 - 4, 00,000	228	22.8	39.3
4, 00,000 – 4, 50,000	200	20.0	59.3
4, 51, 000 – 5, 00,000	257	25.7	85.0
5, 00,000 – above	150	15.0	100
TOTAL	1000	100	
Number of dependents in family			
Old age (above 65 yrs	344	34.4	34.4
Children (Below 14 yrs)	656	65.6	100
TOTAL	1000	100	
Number of earning members			
One	354	35.4	35.4
Two	370	37.0	72.4
Three	174	17.4	89.8
More than three	102	10.2	100
TOTAL	1000	100	
Days of working			
5 days	60	6.0	6.0
6 days	940	94.0	100
TOTAL	1000	100	
Family member working in the same profession			
Yes	165	16.5	16.5
No	835	83.5	100
TOTAL	1000	100	
Distance from office to home (Kms)			
Less than 10kms	436	43.6	43.6
More than 10 kms	564	56.4	100
TOTAL	1000	100	

Demographic Variable	Frequency	Percentage	Cumulative Percentage
Mode of transportation			
Public transport	225	22.5	22.5
Private transport	560	56.0	78.5
Office transport	215	21.5	100
TOTAL	1000	100	
Commuting Cost (monthly)			
Below Rs.3000 per month	267	26.7	26.7
Above Rs. 3000 per month	733	73.3	100
TOTAL	1000	100	
Commuting time			
Less than one hr	589	58.9	58.9
More than one hr	411	41.1	100
TOTAL	1000	100	
Suffering from any ailment			
Yes	354	35.4	35.4
No	646	64.6	64.6
TOTAL	1000	100	100
Get together			
With juniors	221	22.1	22.1
With seniors	341	34.1	56.1
With Peer Groups	438	43.8	100
TOTAL	1000	100	
Family members are invited in gathering			
Yes	768	76.8	76.8
No	232	23.2	100
TOTAL	1000	100	
How they feel			
Enjoy	477	47.7	47.7
Feeling Awkward	200	20.0	67.7
Normal	234	23.4	91.1
Depressed	89	8.9	100
TOTAL	1000	100	

Gender

The number of female participants accounted for 345 participants (34.5 per cent) of total sample (1000), while the number of male participants was 655 (65.5 per cent). Male outnumbered female participants.

Age

Employees between 26 to 36 years (N=350) represents the largest proportion, 35.0 per cent of the sample, followed by the age group under 25 years (N=300) representing 30.0 per cent of the sample. Two hundred and forty six participants (24.6 percent) were between 37 to 46 years old. Eighty three participants (8.3 per cent) were between 47 to 56 years old. The smallest proportion (2.1 per cent) represents employees 57 years and older (N=21). The above figures indicated that majority of the sample employees represented youth power. Table 5.3 reports the frequencies, and percentages associated with age.

Marital Status

Out of 1000 employees, 67.8 per cent (678) are married while 32.2per cent (322) are unmarried.

Total years of work Experience

It was noticed that the largest majority of the sample employees (66.5 per cent) had work experience of less than 10 years which reinstates that the sample comprises young professionals who are willing to quit for better QWL.

Income Level

It was discernible that there were no employees who had pay structure less than 3, 00,000 per annum. Twenty six percent of the respondents had salary structure between 4, 51, 000 – 5, 00,000 per annum, followed by 22.8 per cent who had pay structure between 3, 51,000 - 4, 00,000 per annum**,** while 15.0per cent of the employees had pay structure above 5, 00,000 per annum.

Number of earning members in the family

Families with two and one earning members were observed at the first (37.0per cent) and second (35.4per cent) rank relegating three and more earning members in the responding families with 17.4 per cent and 10.2 per cent respectively.

Organization

It was observed that the majority of the sample employees' 23.7 per cent was working in Airtel followed by Vodafone (20.9 per cent) and Idea (20.0 per cent), while smallest were employed in BSNL (only 2.0 per cent).

Family members working in the same profession

Only 16.5 per cent of the respondents had their family members were working in the same profession.

Days of working

Six per cent of the respondents were working in the environment of 5 days week, while rests of the employees (94.0 per cent) were engaged in 6 days work environment.

Number of dependents in the family

Children below 14 years were more (65.6 per cent) than old age (above 65 yrs) fellows in the families.

Distance from office to home

About fifty six percent employees were coming to offices from more than 10 kms distances.

Mode of transportation

Private transportation were used by the majority of respondents (56.0 per cent), followed by public (22.50 per cent) and official vehicles (21.50 per cent).

Commuting time

Time spent to commute was less than one hour for 58.9 per cent of the surveyed employees, while 41.1per cent said that they spent more than one hour per day to commute.

Commuting cost (per month)

The 73.3 per cent of the respondents bears more than Rs. 3000 per month while, 26.7 per cent claimed for less than Rs. 3000 per month as commuting cost.

Suffering from any ailment

The 64.60 per cent respondent refused for any type of suffering, while 35.4 per cent suffered from some or other ailment.

Get together

Majority of the respondents (43.80 per cent) socialized or partied with peer groups, 34.1per cent with seniors, and rest 22.1per cent with juniors.

Family members are invited in gathering

The 76.8per cent respondents accepted family gets together while 23.2per cent denied it.

How they feel?

The majority of the respondents (47.70 per cent) enjoyed, 23.4per cent felt normal, 20.0 per cent felt awkward, while only 8.9 per cent felt depressed.

5.4 Sample Survey Attributes

5.4.1 Outliers examination

An outlier can be defined as “a case with such an extreme value on one variable (a univariate outlier) or such a strange combination of scores on two or more variable (multivariable outlier) or observation(s) which is distinct from other observations due to high or low scores”, Hair et al. (2006). According to Kline (2005) outliers can categorized in two types: univariate outliers- “a case of an extreme value on single variable”, and multivariate outlier- “case of odd combination of extreme values in two or more than two variables”.

Hair et al. (2006) pointed out widely accepted rules of thumb, “within univariate outliers a case is outlier if: (a) standard score for small sample size (80 or fewer) is ± 2.5 or beyond, while for large sample size (larger than 80 cases) standard score can be considered up to 4. (b) Value more than ± 3.0 standard deviations away from the mean is regarded as an outlier”.

5.4.1.1 Detection of univariate outliers

For detection of univariate outliers, z-scores of each variable were estimated. The results reveal that data set contains no univariate outlier (Table 5.4).

Table 5.4: Univariate outliers

Sl. No.	Variable	Case of outlier	Standardised values i.e. Z-scores > ± 3.0
	QWL	No Case	…
1	SAL	No Case	…
2	WRK	No Case	...
3	KPW	No Case	…
4	APO	No Case	…
5	SOIN	No Case	…
6	KONS	No Case	…
7	SPL	No Case	…
8	SORI	No Case	…
	COMP	No Case	…
9	ACHRO	No Case	…
10	BKNOI	No Case	…
11	SKLAT	No Case	…
12	MTKV	No Case	…
13	KMUN	No Case	…
14	DCCV	No Case	…

5.4.1.2 Detection of multivariate Outliers

Multivariate outliers were detected by using Mahalanobis D^2 measure. Mahalanobis D^2 is also termed as multidimensional version of a z-score. According Hair et al. (2006) if, $D^2/df < 2.5$ in small sample and 3 or 4 in large sample it is considered to be possible outliers.

Table 5.5: Multivariate Outlier detection

Count	Case of outlier	Mahalanobis D^2	D^2/df^a	p-value
1	1	207.13553	14.7954	0.00000
2	8	41.59280	2.970914	0.00014
3	15	33.26885	2.376346	0.00263
4	24	50.78136	3.62724	0.00000
5	27	36.72976	2.623554	0.00081
6	48	56.96212	4.068723	0.00000
7	59	161.87077	11.5622	0.00000
8	122	35.76915	2.554939	0.00113
9	152	162.25412	11.58958	0.00000
10	469	64.85668	4.63262	0.00000
11	482	65.33737	4.666955	0.00000
12	487	71.31243	5.093745	0.00000
13	491	67.01359	4.786685	0.00000
14	501	185.86078	13.27577	0.00000
15	511	35.12399	2.508856	0.00141
16	524	39.26926	2.804947	0.00033
a df = 14				

Table 5.5 depicts that there were only sixteen observations of extreme outliers in sample of 1000 (i.e. $p<0.005$).

Figure 5.1 Box-Plot representing multivariate outliers

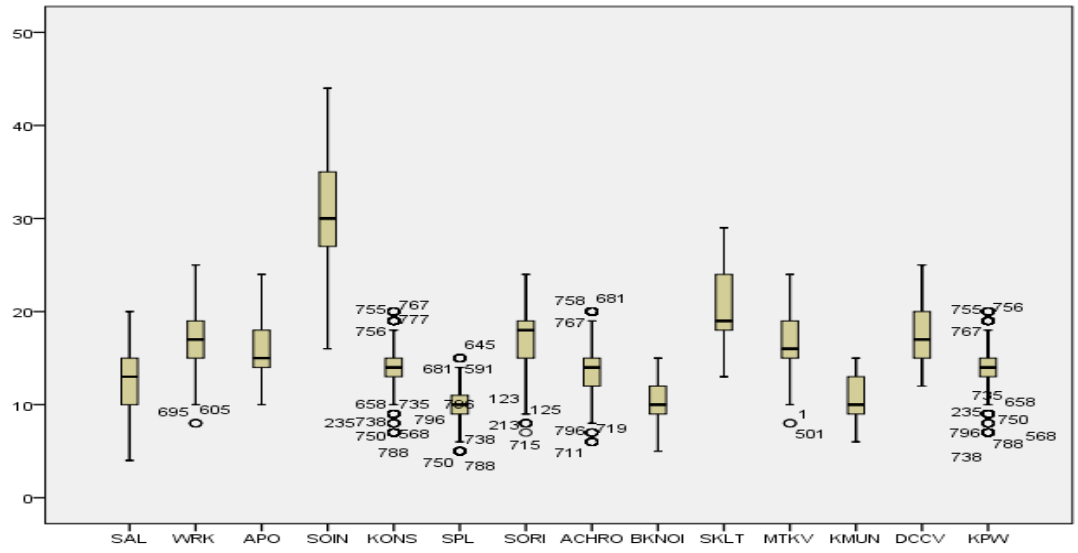


Figure 5.1 indicates that forty three observations were found as mild-outlier outlier (i.e. inter quartile range (IQR)> 1.5).

5.4.2 Normality, homoscedasticity and non-response bias of data

5.4.2.1 Normality

Normal distribution can be defined as fundamental assumption of numerous statistical procedures. Therefore, it is a primary concern for the analyst to validate the assumption of normality when carrying out statistical analysis using parametric methods. Hair et al. (2006) argue that the contravention of normality within multivariate analysis can cause underestimation of fit indices and standardized residuals of estimations. Hair et al. (2006) further suggested that, "if the variable/ items satisfy the multivariate normality than it also satisfies the univariate normality, while the reverse is not necessarily true".

Normality in a data set can be detected through graphical exploration as well as through formal test (*Q–Q* plot, histogram or box plot). Graphical methods are used to check the normality of a sample data, but due to underlying subjectivity formal conclusive evidence cannot be provided. Therefore, formal statistical tests are used to confirm the conclusion drawn from graphical methods in most of the cases.

In the present research study, normality was tested by applying both formal as well as diagrammatic representation. Under the formal test Shapiro-Wilk (SW), Kolmogorov-Smirnov (KS) and Jarque-Bera (JB) were considered, while in diagrammatic analysis histogram, q-q plot, detrended q-q plot, and box-plot were applied (Table 5.6).

The null hypothesis of normality is that the data set is taken from normal distribution.

$H_0 : f(x, \Theta) \in N(\mu, \sigma^2)$ against $H_a : f(x, \Theta) \notin N(\mu, \sigma^2)$.

Where, a random sample is assumed, wherein $X_1, X_2, \ldots, X_n$ are independently and identically distributed random variables from a continuous univariate distribution with an unknown probability density function (PDF) f (x, Θ), where $\Theta = (\theta_1, \theta_2, \ldots, \theta_p)'$ is a vector of real-valued parameters.

In making comparison, all tests should have the same probability of rejecting the null hypothesis when the distribution is truly normal (i.e. they have to have the same Type I error which is α, the significance level).

Table 5.6 Tests of Normality

Items	df	Formal Test for Normality Assumption						Diagrammatic Analyses for Normality				SD	Skew	Kurt.
		Shapiro-Wilk		Kolmogorov-Smirnov[a]		Jarque-Bera		Normality present, Yes, No, and P, Yes => Partially present						
		Statistic	Sig.	Statistic	Sig.	Statistic	Sig.	Histogram	Q-Q	Dtrend q-q plot	Box plot			
QWL														
SAL														
S1	1000	0.889	0.000	0.234	0.000	16.0752	0.000	No	Yes	No	No	1.088	-0.080	0.077
S2	1000	0.897	0.000	0.237	0.000	37.2498	0.000	No	Yes	No	No	1.063	-0.361	-0.610
S3	1000	0.896	0.000	0.234	0.000	21.2334	0.000	No	Yes	No	Yes	1.005	0.274	-0.455
S4	1000	0.902	0.000	0.202	0.000	37.8047	0.000	No	Yes	Yes	Yes	1.106	-0.044	-0.947
WRK														
WC1	1000	0.883	0.000	0.229	0.000	5.2861	0.071	No	Yes	No	No	0.909	-0.178	-0.034
WC2	1000	0.866	0.000	0.279	0.000	33.9288	0.000	No	Yes	No	No	0.896	-0.374	-0.502
WC3	1000	0.896	0.000	0.204	0.000	13.4487	0.000	No	Yes	No	No	0.937	-0.094	-0.533
WC4	1000	0.900	0.000	0.222	0.000	18.4429	0.000	No	Yes	No	No	0.996	0.127	-0.612
WC5	1000	0.873	0.000	0.261	0.000	0.0112	0.000	No	Yes	No	No	0.845	0.006	0.017

Items	df	Formal Test for Normality Assumption						Diagrammatic Analyses for Normality				SD	Skew	Kurt.
		Shapiro-Wilk		Kolmogorov-Smirnov[a]		Jarque-Bera		Normality present, Yes, No, and P, Yes => Partially present						
		Statistic	Sig.	Statistic	Sig.	Statistic	Sig.	Histogram	Q-Q	Dtrend q-q plot	Box plot			
KPW														
CW1	1000	0.788	0.000	0.355	0.000	113.752	0.000	No	No	No	No	0.759	-0.764	0.644
CW2	1000	0.820	0.000	0.331	0.000	57.8381	0.000	No	Yes	No	No	0.841	-0.575	-0.258
CW3	1000	0.873	0.000	0.274	0.000	30.689	0.000	No	Yes	No	Yes	0.947	0.416	-0.207
CW4	1000	0.886	0.000	0.215	0.000	15.044	0.000	P, Yes	Yes	No	No	0.891	-0.282	-0.205
APO														
OW1	1000	0.803	0.000	0.301	0.000	125.521	0.000	No	P, Yes	No	No	0.89	-0.863	0.219
OW2	1000	0.714	0.000	0.346	0.000	136.207	0.000	No	P, Yes	No	No	0.86	-0.563	-1.417
OW3	1000	0.867	0.000	0.243	0.000	11.0302	0.000	No	Yes	No	No	0.83	-0.210	-0.294
OW4	1000	0.765	0.000	0.270	0.000	152.53	0.000	No	Yes	No	No	1.142	0.946	-0.299
OW5	1000	0.811	0.000	0.321	0.000	70.6646	0.003	No	P, Yes	No	No	1.092	0.633	-0.307
SOIN														
SI1	1000	0.895	0.000	0.180	0.000	43.2439	0.000	No	Yes	P, Yes	Yes	1.311	-0.57	-1.011
SI2	1000	0.818	0.000	0.293	0.000	92.8298	0.000	No	P, Yes	No	Yes	1.128	-0.590	-0.915
SI3	1000	0.841	0.000	0.250	0.000	21.1304	0.000	No	Yes	No	No	0.76	-0.170	-0.624

Items	df	Formal Test for Normality Assumption						Diagrammatic Analyses for Normality				SD	Skew	Kurt.
		Shapiro-Wilk		Kolmogorov-Smirnov[a]		Jarque-Bera		Normality present, Yes, No, and P, Yes => Partially present						
		Statistic	Sig.	Statistic	Sig.	Statistic	Sig.	Histogram	Q-Q	Dtrend q-q plot	Box plot			
SI4	1000	0.825	0.000	0.302	0.000	44.9188	0.000	No	Yes	No	No	0.86	0.341	-0.782
SI5	1000	0.874	0.000	0241	0.000	50.5706	0.000	No	Yes	No	Yes	1.09	0.459	-0.608
SI6	1000	0.897	0.000	0.225	0.000	21.7252	0.000	No	Yes	No	No	1.06	0.018	-0.719
SI7	1000	0.881	0.000	0.254	0.000	35.0246	0.000	No	P,Y	No	No	0.92	-0.459	-0.035
SI8	1000	0.889	0.000	0.213	0.000	16.5887	0.000	No	Yes	No	No	0.99	-0.180	-0.516
SI9	1000	0.838	0.000	0.272	0.000	75.1341	0.000	No	P, Yes	No	No	1.08	-0.304	-1.198
KONS														
C1	1000	0.774	0.000	0.364	0.000	138.284	0.000	No	P, Yes	No	No	0.74	-0.813	0.818
C2	1000	0.811	0.000	0.339	0.000	64.1965	0.000	No	P, Yes	No	No	0.83	-0.612	-0.208
C3	1000	0.871	0.000	0.276	0.000	32.5629	0.001	No	Yes	No	Yes	0.95	0.432	-0.185
C4	1000	0.886	0.000	0.215	0.000	15.0444	0.000	No	Yes	No	No	0.89	-0.282	-0.205
SPL														
SL1	1000	0.811	0.000	0.339	0.000	64.1965	0.000	No	P, Yes	No	No	0.83	-0.612	-0.208
SL2	1000	0.871	0.000	0.276	0.000	32.5629	0.000	No	Yes	No	Yes	0.95	0.432	-0.185
SL3	1000	0.886	0.000	0.215	0.000	17.7192	0.000	P, Yes	Yes	No	No	0.90	-0.309	-0.204

Items	df	Formal Test for Normality Assumption						Diagrammatic Analyses for Normality				SD	Skew	Kurt.
		Shapiro-Wilk		Kolmogorov-Smirnov[a]		Jarque-Bera		Normality present, Yes, No, and P, Yes => Partially present						
		Statistic	Sig.	Statistic	Sig.	Statistic	Sig.	Histogram	Q-Q	Dtrend q-q plot	Box plot			
SORI														
SR1	1000	0.885	0.000	0.231	0.000	14.6364	0.000	No	Yes	No	No	0.89	-0.201	-0.432
SR2	1000	0.859	0.000	0.281	0.000	31.9806	0.000	No	P, Y	No	No	0.86	-0.383	-0.422
SR3	1000	0.900	0.000	0.221	0.000	4.2669	0.118	P,Yes	Yes	No	No	0.97	-0.141	-0.147
SR4	1000	0.868	0.000	0.268	0.000	44.0315	0.000	No	Yes	No	No	0.98	-0.265	-0.880
SR5	1000	0.875	0.000	0.266	0.000	137.978	0.000	P,Y	Yes	No	No	0.797	-0.880	0.470
COMP														
ACHRO														
AR1	1000	0.865	0.000	0.279	0.000	26.891	0.000	No	P, yes	No	No	0.85	-0.385	-0.229
AR2	1000	0.867	0.000	0.259	0.000	39.7383	0.000	No	P, Yes	No	No	0.94	-0.187	-0.901
AR3	1000	0.907	0.000	0.199	0.000	17.2382	0.000	P, Yes	Yes	No	No	1.03	0.004	-0.640
AR4	1000	0.850	0.000	0.309	0.000	32.6183	0.000	No	P, Yes	No	No	0.95	0.439	-0.111

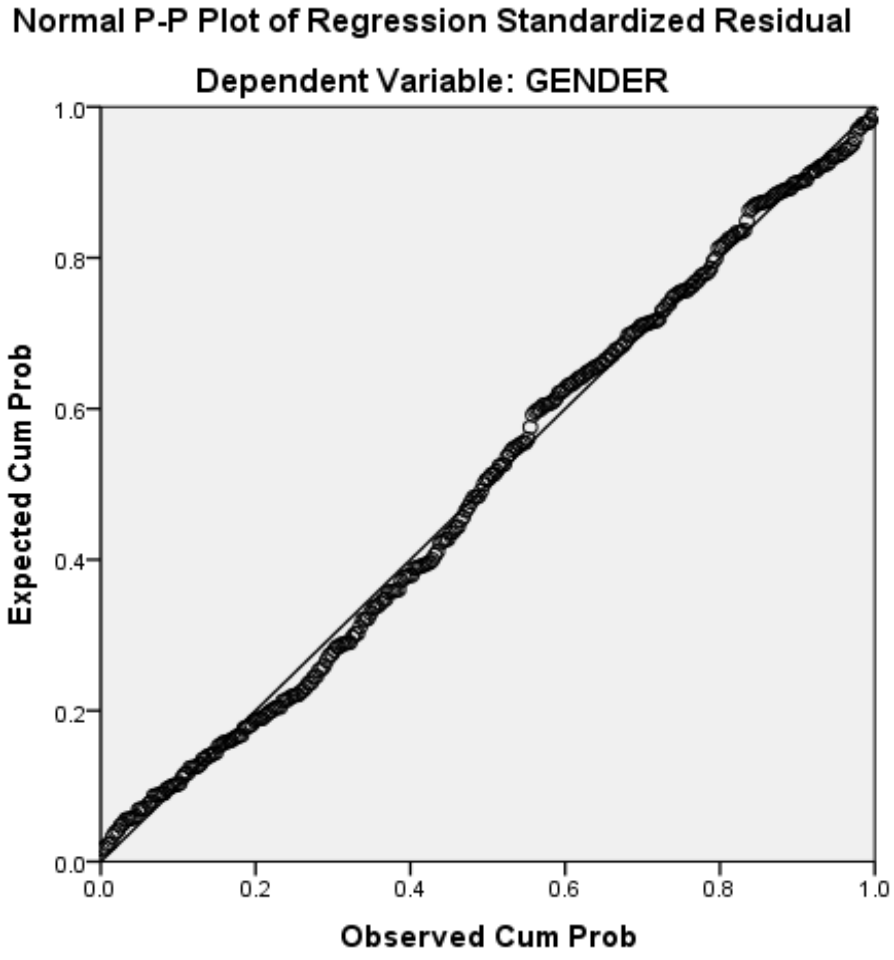
Items	df	Formal Test for Normality Assumption						Diagrammatic Analyses for Normality				SD	Skew	Kurt.
		Shapiro-Wilk		Kolmogorov-Smirnov[a]		Jarque-Bera		Normality present, Yes, No, and P, Yes => Partially present						
		Statistic	Sig.	Statistic	Sig.	Statistic	Sig.	Histogram	Q-Q	Dtrend q-q plot	Box plot			
BKNOI														
B1	1000	0.851	0.000	0.248	0.000	45.9058	0.000	No	Yes	No	No	0.90	0.061	-1.042
B2	1000	0.878	0.000	0.226	0.000	25.5555	0.000	No	Yes	Yes	No	0.90	-0.057	-0.773
B3	1000	0.850	0.000	0.309	0.000	32.6183	0.000	No	Yes	No	No	0.95	0.439	-0.111
SKLAT														
SK1	1000	0.850	0.000	0.309	0.000	32.6183	0.000	No	Yes	No	No	0.95	0.439	-0.111
SK2	1000	0.685	0.000	0.385	0.000	190.578	0.000	No	P, Yes	No	No	0.70	1.065	-0.211
SK3	1000	0.798	0.000	0.263	0.000	41.1791	0.000	No	P, Yes	No	No	0.69	0.216	-0.894
SK4	1000	0.873	0.000	0.244	0.000	39.3699	0.000	No	P, Yes	No	No	0.95	-0.115	-0.943
SK5	1000	0.671	0.000	0.410	0.000	61.2068	0.000	No	P, Yes	No	No	0.97	0.518	-0.627
SK6	1000	0.827	0.000	0.286	0.000	12.4203	0.002	No	P, Yes	No	No	0.72	-0.250	-0.218
MTKV														
M1	1000	0.886	0.000	0.215	0.000	17.7192	0.000	P, Yes	Yes	No	No	0.90	-0.309	-0.204
M2	1000	0.819	0.000	0.336	0.000	70.8523	0.000	No	P, Yes	No	No	0.85	-0.650	-0.117
M3	1000	0.857	0.000	0.203	0.000	62.6064	0.000	No	Yes	No	No	1.02	-0.178	-1.173

Items	df	Formal Test for Normality Assumption						Diagrammatic Analyses for Normality				SD	Skew	Kurt.
		Shapiro-Wilk		Kolmogorov-Smirnov[a]		Jarque-Bera		Normality present, Yes, No, and P, Yes => Partially present						
		Statistic	Sig.	Statistic	Sig.	Statistic	Sig.	Histogram	Q-Q	Dtrend q-q plot	Box plot			
M4	1000	0.883	0.000	0.231	0.000	7.5253	0.023	No	Yes	No	No	0.87	-0.006	-0.421
M5	1000	0.868	0.000	0.195	0.000	46.365	0.000	No	Yes	Yes	No	0.95	0.216	-0.962
KUMN														
CM1	1000	0.857	0.000	0.204	0.000	61.6596	0.000	No	Yes	No	No	1.01	-0.187	-1.158
CM2	1000	0.883	0.000	0.231	0.000	7.5253	0.000	No	Yes	No	No	0.87	-0.006	-0.421
CM3	1000	0.868	0.000	0.195	0.000	46.365	0.000	No	Yes	Yes	No	0.95	0.216	-0.962
DCCV														
D1	1000	0.803	0.000	0.301	0.000	125.521	0.000	No	P, Yes	No	No	0.86	-0.863	0.219
D2	1000	0.851	0.000	0.248	0.000	45.9058	0.000	No	Yes	No	No	0.90	0.061	-1.042
D3	1000	0.878	0.000	0.226	0.000	25.5555	0.000	No	Yes	No	No	0.90	-0.057	-0.773
D4	1000	0.850	0.000	0.308	0.000	32.6183	0.000	No	P, Yes	No	No	0.95	0.439	-0.111
D5	1000	0.685	0.000	0.385	0.000	190.578	0.000	No	No	No	No	0.70	1.065	-0.211

The results of Shapiro-Wilk (SW), Kolmogorov- Smirnov (KS) and Jarque-Bera (JB) tests depict that all the variables were statistically significant so violated the assumption of normality. Field (2006) mentioned that the K-S test for large sample size cannot be measured as deviation of data from normal distribution. The q-q plots for 61 out of 65 variables indicated the normality. It is also supported by the normal probability plot (P-P plot of the regression standardized residual) employed to assess multivariate normality.

Table 5.6 indicates that all the variables were within the normal range of skewness and kurtosis which is ≤ 2.58, c.f. Hair et al. (2006). However, the scores have both positive and negative skewness and kurtosis values. Pallant (2007) suggests that negative or positive skewness and kurtosis does not indicate any problem until and unless they are within normal range.

Figure 5.2



5.4.2.2 Homoscedasticity

Homoscedasticity, or equal (homo) spread (scedasticity) or equal variance. Given the value of X, the variance of U_i is the same for all observations i.e., the conditional variance of U_i are identical. Symbolically,

$$\textbf{var}\ (U_i \mid X_i) = E\ [U_i - E(U_i \mid X_i)]^2$$
$$= E(U_i^2 \mid X_i)$$
$$= \sigma^2.$$

where, **var** stands for variance.

When the conditional variance of Y varies with X, this situation is termed as heteroscedasticity or unequal variance, symbolically can be represented as

$$\text{Var}\ (U_i \mid X_i) = \sigma_i^2$$

According to Field (2006) the assumption of equal variation between variables is pre-requisite in multiple regressions. For assessing the homoscedasticity, the Levene's test of equal variance is commonly used, Hair et al. (2006); Field (2006); Pallant (2007).

Table 5.7 Leven's test of homogeneity of variances

Test of Homogeneity of Variances				
	Levene's Statistic	**Df1**	**Df2**	**Significance**
QWL				
SAL	0.960	1	998	0.328
WRK	0.068	1	998	0.795
KPW	0.419	1	998	0.517
APO	3.472	1	998	0.063
SOIN	1.598	1	998	0.206
KONS	1.687	1	998	0.194
SPL	0.537	1	998	0.464
SORI	3.960	1	998	0.047
COMP				
ACHRO	0.620	1	998	0.431
BKNOI	3.252	1	998	0.072
SKLAT	2.760	1	998	0.097
MTKV	3.228	1	998	0.073
KMUN	419	1	998	0.517
DCCV	3.306	1	998	0.070

Table no. 5.7 indicates that significant values are higher than minimum significant value i.e. $p<0.05$, for all the variables of 'SORI' which indicates that variance for all the variables was homogenous within the groups male and female and not violated the assumption of homogeneity of variance.

5.4.2.3 Multicollinearity

In a regression model multicollinearity prevails when there is a strong correlation between two or more predictors. A high multicollinearity makes precise estimation difficult; t ratio becomes statistically insignificant with very high R^2. Variance inflation factors (VIF) was estimated for all the variables.

VIF(j) = 1/(1 - R(j)^2),

where R(j) = multiple correlation coefficient between variable j and the other independent variables, values > 10.0 may represents a collinearity. The results indicated that the VIF values ranges from 1.151 to 3.310 for all the variables, which shows the absence of collinearity problem in the data set.

5.4.2.4 Non- response biasness

The underlying characteristic of the data collection method is to ensure the collection of all the sampled units. Abbasi (2011) by quoting Armstrong and Overton (1977), and Churchill (1979) asserted that the problem of non-response biasness is common in survey research, which occurs when respondents differ in meaningful way from non-respondents.

Mann-Whitney-U-test is used to detect the chances of any potential non-response biasness between early and late respondents (Table 5.8).

In this method first 50 observations were considered as early respondents and last 50 were taken as late respondents. The results indicated that significance value in any variable is not less than or equal to 0.5 probability value (insignificant), therefore, there is no statistically significant difference between early and late respondents. Thus, in the present study non-response bias is not a concern.

Table 5.8: Mann-Whitney-U-test observing non-response biasness

1	**SAL**	**WRK**	**KPW**	**APO**	**SOIN**	**KONS**	**SPL**
Mann-Whitney U	778.000	720.000	773.000	841.500	787.000	791.500	746.000
Wicoxon W	1945.000	1045.000	1098.000	3691.500	1112.000	1116.500	1071.000
Z	-1.681	-1.763	-1.336	-0.773	-1.205	-1.188	-1.558
Asymp.Sig.(2-tailed)	0.093	0.078	0.181	0.439	0.228	0.235	0.119
2	SORI	ACHRO	BKNOI	SKLAT	MTKV	KMUN	DCCV
Mann-Whitney U	761.000	701.500	871.000	752.500	851.500	906.500	912.500
Wicoxon W	1086.000	1026.500	1196.000	1077.500	1176.500	3756.500	3762.500
Z	-1.419	-1.910	-0.540	-1.498	-0.690	-0.252	-0.201
Asymp.Sig.(2-tailed)	0.156	0.056	0.589	0.134	0.490	0.801	0.841
Grouping variable: Respondent (1=early, 2=late)							

5.5 Factor analysis

For further analysis of the measurement instruments factor analysis is essential, as Tabachnick and Fidell (2007) have remarked that the factor analysis is the best way to understand the underlying structure about particular theory and its variables in analysis. The two techniques of factor analysis generally used in empirical investigations are exploratory factor analysis (EFA), and confirmatory factor analysis (CFA). Both analyses intend to reproduce the observed relationships among a group of indicators with a smaller set of latent variables.

Kline (2010) has suggested that the technique of EFA may be a better option in a less mature research area where basic measurement questions are not yet resolved. It also requires fewer assumptions than CFA, which tests stronger hypotheses than EFA. In assessment research, EFA tends to be used in earlier studies and CFA in later studies in the same area. Therefore, in this thesis, the EFA was applied first to test the measurement items used and then CFA was conducted to confirm theory about the latent variables.

5.5.1 Exploratory factor analysis

EFA was accomplished in this thesis to study the structure of the measurement items corresponding to the variables incorporated in conceptual framework.

Kline (2010) argues that in EFA, each indicator is regressed on every factor in the model. The statistical estimates for this part of EFA are actually regression coefficients that may be in either standardized or un-standardized form, just as in the technique of multiple regressions. The difference is that predictors in ordinary regression are observed variables, but the predictors in EFA and CFA are latent variables.

The EFA model can symbolically be expressed as follows:

$$\mathbf{Y = X\beta + \varepsilon.}$$

where, Y denotes the matrix of measured variables, X a matrix of common factors, and β and ε represents the matrix of weights (factor loadings) and the matrix of unique factors, or error variation respectively.

For extracting the factors, the current study employed the two common techniques principal axis factoring (PAF) and principal component analysis (PCA), Hair *et al.* (2006); Tabachnic and Fidell (2007), and it was followed by a varimax (orthogonal) rotation; because it was observed by many empiricists, Tabachnick and Fidell (2007); Pallant (2007), that orthogonal rotation has higher generalizabliity and replicability power compared to the oblique rotational method and the results generated by the orthogonal rotations are best fitted with the past and future data, while within oblique rotation, the obtained results are best fitted with the data collected from the current survey research, Rennie (1997). The promax (oblique) rotation was also adopted by considering certain probable problems within orthogonal environment. The results for promax rotation with PAF and PCA extraction methods, which are contained in Tables 5.18 and 5.19; are also comparable to outcomes of orthogonal rotations, as reported in Tables 5.13 and 5.14.

The Kaiser-Meyer-Olkin (KMO) value is 0.962, and Bartlett's test is statistically significant (p = 0.000), therefore factor analysis is appropriate.

Table 5.9: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		**0.962**
Bartlett's Test of Sphericity	Approx. Chi-Square	**17060.980**
	Df	**91**
	Sig.	**0.000**

Information about communalities as explained by each item is given in Table 5.10. All items under principal axis factoring (PAF) extraction, show their initial communalities (initial estimate for each indicator equals the SMC of that indicator with all others in the sample) and extraction or final communalities (derived from converged iterative estimation) above 0.7 and initial are lower than extraction communalities because sample SMC values are usually attenuated by measurement error, but iterative estimation account for this effect, Kline (2010). The results of the principal component analysis (PCA) technique indicate that initial communalities are assigned one for each item, because PCA works on the initial assumption that all variance is common. The extraction or final communalities reflect the common variance in the data structure and its values are higher than its counterpart under PAF.

Table 5.10: Communalities shared by individual items

Principal Axis Factoring (PAF) Varimax rotation			**Principal Component Analysis (PCA) Varimax rotation**	
Items	Initial	Extraction	Initial	Extraction
SAL	0.800	0. 823	1.000	0.844
WRK	0.788	0.812	1.000	0.836
KPW	0.801	0.824	1.000	0.845
APO	0.789	0.813	1.000	0.837
SOIN	0.799	0.822	1.000	0.844
KONS	0.789	0.812	1.000	0.836
SPL	0.786	0.811	1.000	0.835
SORI	0.786	0.810	1.000	0.835
ACHRO	0.796	0.828	1.000	0.857
BKNOI	0.793	0.822	1.000	0.852
SKLAT	0.797	0.828	1.000	0.857
MTKV	0.794	0.825	1.000	0.854
KMUN	0.801	0.833	1.000	0.860
DCCV	0.797	0.829	1.000	0.857

Table 5.11: Total variance explained (PAF)

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	Per cent of Variance	Cumulative per cent	Total	Per cent of Variance	Cumulative per cent	Total	Per cent of Variance	Cumulative per cent
1	7.070	50.502	50.502	6.888	49.197	49.197	6.520	46.568	46.568
2	4.779	34.138	84.639	4.604	32.887	82.084	4.972	35.516	82.084
3	0.211	1.509	86.148						
4	0.203	1.449	87.597						
5	0.196	1.397	88.993						
6	0.190	1.360	90.354						
7	0.186	1.331	91.685						
8	0.183	1.310	92.994						
9	0.177	1.265	94.260						
10	0.169	1.210	95.470						
11	0.166	1.187	96.656						
12	0.161	1.147	97.804						
13	0.158	1.128	98.931						
14	0.150	1.069	100.000						

Extraction Method: Principal Axis Factoring

Table 5.12: Total variance explained (PCA)

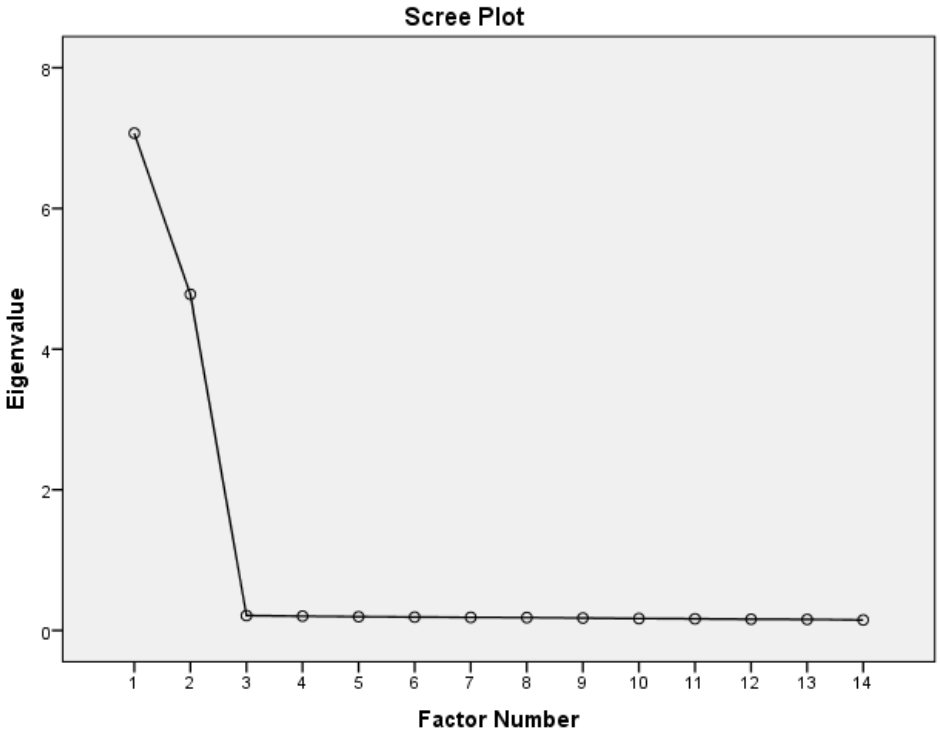
Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	Per cent of Variance	Cumulative per cent	Total	Per cent of Variance	Cumulative per cent	Total	Per cent of Variance	Cumulative per cent
1	7.070	50.502	50.502	7.070	50.502	50.502	6.704	47.888	47.888
2	4.779	34.138	84.639	4.779	34.138	84.639	5.145	36.751	84.639
3	0.211	1.509	86.148						
4	0.203	1.449	87.597						
5	0.196	1.397	88.993						
6	0.190	1.360	90.354						
7	0.186	1.331	91.685						
8	0.183	1.310	92.994						
9	0.177	1.265	94.260						
10	0.169	1.210	95.470						
11	0.166	1.187	96.656						
12	0.161	1.147	97.804						
13	0.158	1.128	98.931						
14	0.150	1.069	100.000						

Extraction Method: Principal Component Analysis

Table 5.11 and 5.12 are showing the total variance explained extracted from principal axis factoring (PAF) and principal component analysis (PCA) methods respectively under varimax (orthogonal) rotation. The values of factors before extraction (initial eigenvalues) are same for both PAF and PCA, while as anticipated, the eigenvalues for the two retained factors in the PAF solution are lower than the corresponding two factors in the PCA solution. It happens because common variance only is analyzed in PAF, but common variance is just a fraction of total variance, Kline (2010). In case of PCA the cumulative percentage value, for initial eigenvalues, extraction sums of squared loadings and for rotation sums of squared loadings up to two retained factors are equal (84.64per cent). It is observed that the values of all absolute residual correlations are < .05, which depicts that the two-factor model explains the observed correlations reasonably well.

Kline (2010) prescribes two kinds of criteria: theoretical and statistical in order to "decide how many factors to retain". Of the two, theoretical criteria may result in less capitalization on sample-specific (chance) variation than statistical criteria. The theory proposed two factors and kaiser criterion or k1 rule, and cattell scree test (Figure 5.3) are also indicated for the two factors to retain.

Figure 5.3: Scree Plot of all the dimensions



The rotated factor matrix (Table 5.13) and the rotated component matrix (Table 5.14), both depicted two factors (Although EFA was also conducted for more than two factors as depicted by Table 5.15, only two factors were significantly retained, as informed by 'goodness of fit indices for EFA 1 to 5 factors models presented in Table 5.17); it is also supported by the scree plot test revealed in figure 5.3. Henseler et al. (2009) recommended that absolute correlation between construct and its measuring item (i.e. factor loading) should be higher than 0.7 ($\approx \sqrt{0.5}$). Moreover, Churchill (1979) suggests deleting items having factor loading < 0.4. Comfrey (1973) indicated useful guidelines for this purpose where any loadings greater than ± 0.71 is excellent, ± 0.63 is very good, ± 0.55 is good, ± 0.45 is fair, and ± 0.32 is poor. Items were loaded on two factors ranging from 0.898 to 0.910, and .911 to 0.925 respectively for rotated factor matrix and rotated component matrix; which is corresponding to the minimum factor loadings criterions, Hair et al. (2006); Chruchill (1979); Pallant (2007).

Table 5.13: Rotated Factor Matrix[a]

	Factor	
	1	**2**
SAL	.905	.060
WRK	.898	.072
KPW	.906	.062
APO	.899	.074
SOIN	.904	.070
KONS	.899	.068
SPL	.898	.063
SORI	.898	.059
ACHRO	.059	.908
BKNOI	.083	.903
SKLAT	.061	.908
MTKV	.062	.906
KMUN	.061	.910
DCCV	.073	.907

Extraction Method: Principal Axis Factoring

Rotation Method: Varimax with Kaiser Normalization

a. Rotation converged in 3 iterations

Table 5.14: Rotated Component Matrix[a]

	Component	
	1	**2**
SAL	.917	.059
WRK	.911	.071
KPW	.917	.061
APO	.912	.073
SOIN	.916	.069
KONS	.912	.067
SPL	.912	.062
SORI	.912	.058
ACHRO	.058	.924
BKNOI	.082	.919
SKLAT	.060	.924
MTKV	.061	.922
KMUN	.061	.925
DCCV	.072	.923

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

Extraction Method: Principal Component

Table 5.15 CF-Varmix Rotated Loadings (EFA with 1 to 5 factor models)

Items	EFA with 1 factor		EFA with 2factor				EFA with 3 factor					
	F1		F1		F2		F1		F2		F3	
	Loadi-ngs	Est./ S.E.	Loadi-ngs	Est./ S.E.	Loadi-ngs	Est./ S.E.	Loadi-ngs	Est./ S.E.	Loadi-ngs	Est./ S.E.	Loadi-ngs	Est./ S.E.
SAL	0.907	147.703	0.905	145.872	0.061	3.129	0.906	146.169	0.061	3.147	-0.026	-0.808
WRK	0.901	138.953	0.898	135.815	0.073	3.724	0.898	136.105	0.073	3.734	-0.030	-0.875
KPW	0.908	148.623	0.906	146.545	0.062	3.207	0.906	146.895	0.062	3.218	-0.029	-0.853
APO	0.902	140.300	0.899	136.977	0.075	3.812	0.899	136.950	0.074	3.809	0.021	1.040
SOIN	0.907	147.531	0.904	144.349	0.071	3.642	0.904	144.325	0.071	3.652	0.026	1.159
KONS	0.901	139.239	0.899	136.691	0.069	3.505	0.899	136.658	0.069	3.507	0.028	1.176
SPL	0.900	137.725	0.898	135.846	0.064	3.240	0.898	135.784	0.064	3.244	0.014	0.825
SORI	0.899	137.069	0.898	135.669	0.060	3.040	0.898	135.612	0.060	3.041	0.016	0.929
ACHRO	0.143	4.567	0.059	3.107	0.908	146.063	0.059	3.111	0.906	136.966	-0.060	-1.688
BKNOI	0.166	5.315	0.082	4.335	0.903	139.060	0.080	4.214	0.924	28.545	0.313	1.129
SKLAT	0.145	4.608	0.060	3.176	0.908	146.169	0.060	3.178	0.906	133.629	-0.040	-0.790
MTKV	0.146	4.660	0.062	3.260	0.906	143.285	0.062	3.262	0.904	133.139	-0.048	-1.088
KUMN	0.146	4.639	0.061	3.228	0.911	149.931	0.061	3.233	0.910	141.197	-0.071	-2.589
DCCV	0.157	5.006	0.073	3.835	0.908	145.579	0.073	3.836	0.906	135.905	-0.055	-1.399

Items	EFA with 4 factor							
	F1		F2		F3		F4	
	Loadings	Est./S.E.	Loadings	Est./S.E.	Loadings	Est./S.E.	Loadings	Est./S.E.
SAL	0.906	145.910	0.061	3.130	-0.037	-1.313	-0.075	-1.998
WRK	0.898	135.888	0.073	3.728	-0.041	-1.385	0.042	1.201
KPW	0.906	146.783	0.062	3.223	-0.039	-1.366	-0.060	-1.707
APO	0.899	136.783	0.074	3.813	0.027	1.148	0.022	0.661
SOIN	0.905	143.963	0.071	3.651	0.033	1.337	-0.074	-1.942
KONS	0.899	136.557	0.069	3.509	0.034	1.344	0.036	1.083
SPL	0.898	135.639	0.064	3.245	0.016	0.732	0.060	1.685
SORI	0.898	135.482	0.060	3.043	0.020	0.888	0.058	1.638
ACHRO	0.059	3.110	0.907	143.447	-0.047	-1.688	-0.002	-0.081
BKNOI	0.081	4.327	0.914	68.352	0.231	1.865	0.002	0.513
SKLAT	0.060	3.173	0.908	141.246	-0.023	-0.681	-0.076	-2.182
MTKV	0.062	3.262	0.905	140.480	-0.034	-1.078	0.018	0.577
KUMN	0.061	3.235	0.911	147.262	-0.067	-2.938	0.028	0.916
DCCV	0.073	3.837	0.907	142.761	-0.041	-1.414	0.031	1.015

Items	EFA with 5 factor									
	F1		F2		F3		F4		F5	
	Loadings	Est./S.E.	Loadings	Est./S.E.	Loadings	Est./S.E.	Loadings	Est./S.E.	Loadings	Est./S.E.
SAL	0.906	145.598	0.061	3.136	-0.066	-1.760	-0.043	-1.527	-0.023	-0.418
WRK	0.898	135.658	0.073	3.726	0.048	1.263	-0.047	-1.577	-0.022	-0.468
KPW	0.907	144.373	0.062	3.215	-0.077	-3.087	-0.050	-1.757	0.052	0.764
APO	0.899	136.349	0.074	3.815	0.018	0.353	0.034	1.229	0.060	0.376
SOIN	0.905	141.902	0.071	3.648	-0.074	-1.851	0.038	1.480	-0.060	-1.131
KONS	0.899	136.429	0.069	3.505	0.035	0.953	0.039	1.423	0.031	0.717
SPL	0.898	135.435	0.064	3.242	0.063	1.789	0.017	0.702	-0.018	-0.342
SORI	0.898	135.230	0.060	3.047	0.064	1.816	0.021	0.838	-0.019	-0.356
ACHRO	0.059	3.109	0.907	144.186	-0.002	-0.068	-0.037	-1.400	-0.018	-0.493
BKNOI	0.082	4.337	0.910	104.380	0.005	0.621	0.0189	2.468	-0.005	-0.463
SKLAT	0.060	3.173	0.908	143.254	-0.073	-2.200	-0.008	-0.263	-0.024	-0.444
MTKV	0.062	3.263	0.906	139.071	0.005	0.097	-0.028	-2.874	0.075	1.592
KUMN	0.061	3.235	0.912	144.557	0.040	0.791	-0.073	-1.606	-0.055	-1.364
DCCV	0.073	3.837	0.907	143.513	0.025	0.775	-0.030	-1.063	0.029	0.724

Table 5.16: Factor Correlation Matrices

Factor Correlation Matrix			Component Correlation Matrix		
Factor	**1**	**2**	**Factor**	**1**	**2**
1	1.000		1	1.000	0.142
2	0.46	1.000	2	0.42	1.000

Extraction Method: PAF Extraction Method: PC

Rotation Method: Promax with Kaiser Normalization

Table 5.17: Goodness of fit for EFA 1 to 5 Factors Models

FACTORS	F1	F2	F3	F4	F5	Ideal value
χ^2 *test for model fit*						
Value	7106.644	52.545	34.214	21.141	14.894	χ^2 /DF= 2 to 4*
Degree of freedom	77	64	52	41	31	
p-value	0.0000	0.8462	0.9731	0.9957	0.9935	>0.05
RMSEA						
Estimate	0.302	0.000	0.000	0.000	0.000	≤0.06 to 0
90 percent C.I.	0.296- 0.308	0.000-0.011				
Probability RMSEA≤ 0.05	0.000	1.000				>0.05
CFI	0.588	1.000	1.000	1.000	1.000	≥ 0.95
TLI	0.514	1.001	1.002	1.003	1.003	≥ 0.95
SRMR	0.304	0.004	0.003	0.002	0.002	≤ 0.08

Table 5.18: Pattern Matrix[a] (PAF)

	Factor	
	1	**2**
SAL	.908	-.006
WRK	.900	.006
KPW	.908	-.005
APO	.901	.008
SOIN	.906	.004
KONS	.901	.002
SPL	.901	-.003
SORI	.901	-.007
ACHRO	-.007	.911
BKNOI	.017	.904
SKLAT	-.006	.911
MTKV	-.004	.909
KMUN	-.005	.913
DCCV	.006	.909
Extraction Method: Principal Axis Factoring. Rotation Method: Promax with Kaiser Normalization.		
a. Rotation converged in 3 iterations.		

Table 5.19: Pattern Matrix[a] (PCA)

	Component	
	1	2
SAL	.920	-.006
WRK	.913	.007
KPW	.920	-.005
APO	.914	.008
SOIN	.918	.004
KONS	.914	.002
SPL	.914	-.003
SORI	.914	-.007
ACHRO	-.007	.927
BKNOI	.017	.921
SKLAT	-.006	.927
MTKV	-.004	.925
KMUN	-.005	.928
DCCV	.007	.925
Extraction Method: Principal Component Analysis. Rotation Method: Promax with Kaiser Normalization.		
a. Rotation converged in 3 iterations.		

5.6 Chapter summary

The analysis of the empirical examination was presented in this chapter. The biographical composition of the sample was described and illustrated. In the descriptive statistics means and standard deviations were described and discussed. A systematic reliability analysis and validity analysis regarding both constructs was presented.

Chapter 6

Empirical model of relationship between the employee's competencies and QWL in the Indian telecom sector: Part 2 Structural Equation Modeling (SEM)

This chapter is organized in four sections. Structural equation modeling is contained in section 6.1. Empirical confirmatory factor analysis model is formulated in section 6.2, while confirmatory factor analysis is reported in section 6.3. The chapter is summarized and concluded in the last section.

6.1 Structural Equation Modeling (SEM)

Structural Equation Modeling (SEM), comprises of two models the measurement model and the structural model. Measurement Model is also termed as confirmatory factor analysis (CFA). It defines the constructs (latent variables) that the model uses, and allocates observed variables to each, while structural model also known as regression or path analysis defines the hypothetical relationship among the latent variables, Hair et al. (2006); Gefen et al. (2000). It is imperative to clarify that latent variable is representation of the theoretical construct which cannot be observed directly and can have exogenous form (i.e. independent variable) or endogenous form (i.e. dependent variable) in model, Hair et al. (2006).

Structural Equation Modeling, the multivariate analysis technique is being used to determine the relationship between the two constructs (competencies and QWL). Confirmatory factor analysis, path analysis and regression analysis within SEM are used to test the proposed hypotheses. Various indices (goodness-of- fit tests) such as NFI, RFI, RMSEA and CFI are used to test for model adequacy/fit and determine if the pattern of variances and co-variances in the data is consistent with the theoretical (paths) model specified by the researcher.

6.2 Empirical confirmatory factor analysis model

Based on literature review, the empirical confirmatory factor analysis model can be formulated and expressed as the following set of regression equations:

$$\mathbf{SAL} = \lambda_{11}\xi_1 + \delta_1 \quad \mathbf{WRK} = \lambda_{21}\xi_1 + \delta_2 \quad \mathbf{KPW} = \lambda_{31}\xi_1 + \delta_3 \quad \mathbf{APO} = \lambda_{41}\xi_1 + \delta_4$$

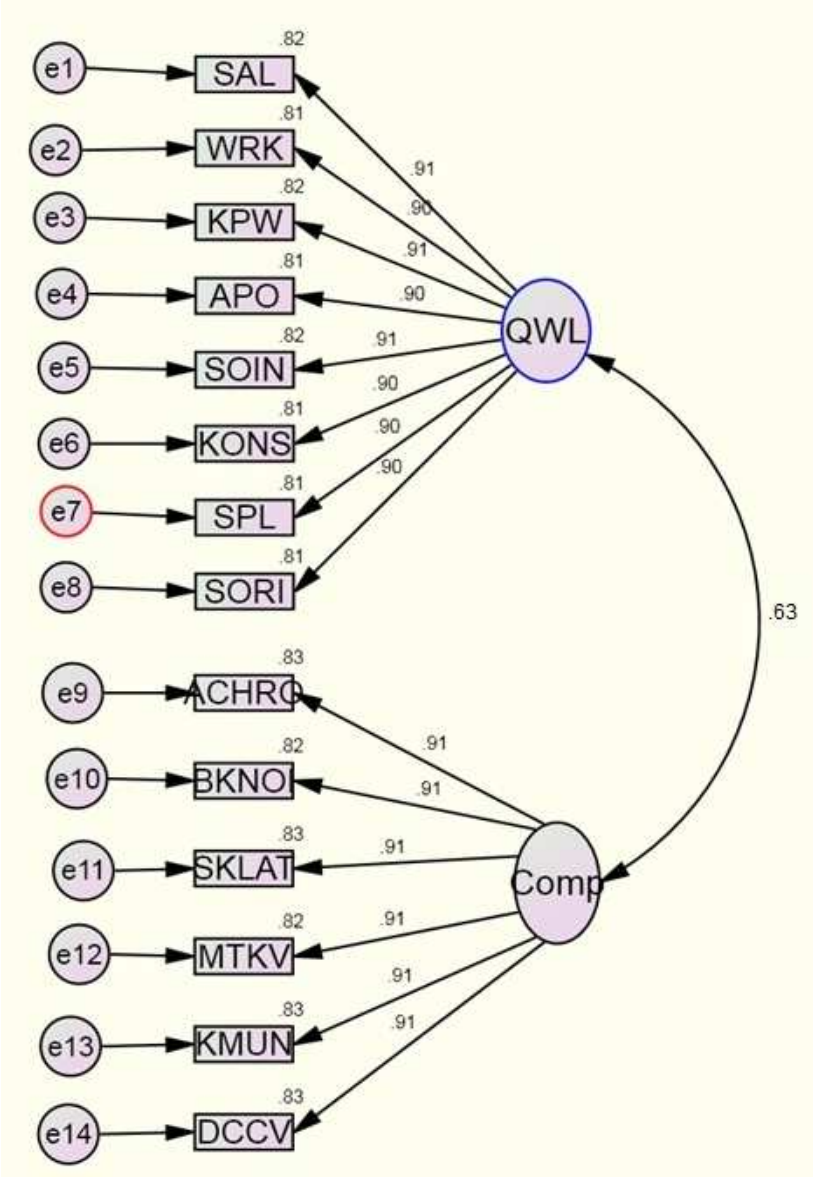
$$\mathbf{SOIN} = \lambda_{51}\xi_1 + \delta_5 \quad \mathbf{KONS} = \lambda_{61}\xi_1 + \delta_6 \quad \mathbf{SPL} = \lambda_{71}\xi_1 + \delta_7 \quad \mathbf{SORI} = \lambda_{81}\xi_1 + \delta_8$$

$$\textbf{ACHRO} = \lambda_{92}\xi_2 + \delta_9 \quad \textbf{BKNOI} = \lambda_{102}\xi_2 + \delta_{10} \quad \textbf{SKLAT} = \lambda_{112}\xi_2 + \delta_{11}$$

$$\textbf{MTKV} = \lambda_{122}\xi_2 + \delta_{12} \quad \textbf{KMUN} = \lambda_{132}\xi_2 + \delta_{13} \quad \textbf{DCCV} = \lambda_{142}\xi_2 + \delta_{14}$$

Where, SAL, WRK, KPW, APO, SOIN, KONS, SPL, SORI *and* ACHRO, BKNOI, SKLAT, MTKV, KMUN, DCCV are linear function of QWL (quality of work life) and Comp (competency) respectively, plus error terms (there is no intercept since the variables are mean centered).

Figure 6.1: Complete CFA Model (Standardized)



Both the constructs "**quality of work life (qwl)**" and "**competencies (comp)**" are associated with each other, as indicated by the covariance coefficient (0.63), which is highly statistically significant.

6.3 Empirical results of confirmatory factor analysis model

Brown T. A. and Moore M. T. (2010) mentioned that to evaluate the acceptability of the CFA model there are three major aspects of the results that should be examined. (i) presence or absence of localized areas of strain in the solution; (ii) overall goodness of fit and (iii) the interpretability, size, and statistical significance of the model's parameter estimates. According to Kline (2011) "when theory is not specific about the number of factors, this is often the first step in a series of analyses: if a single-factor model cannot be rejected, there is little point in evaluating more complex ones. Even when theory is more precise about the number of factors, it should be determined whether the fit of a simpler, one-factor model is comparable". So before estimating the two factor model it was decided to estimate one factor model initially.

The analysis was performed by using the statistical software *IBM SPSS Statistics 20, Amos 18 and Mplus version 6.12.*

Table 6.1: Goodness of fit for CFA models

MODELS →	**MODEL 1 (single-factor)**	**MODEL 2 (two-factor)**	**Ideal value**
$\chi^2\ test\ for\ model\ fit$			
Value	7106.644	56.267	χ^2 /DF= 2 to 4*
Degree of freedom	77	76	
p-value	0.0000	0.9563	>0.05
RMSEA			
Estimate	0.302	0.000	≤0.06 to 0
90 percent C.I.	0.296- 0.308	0.000-0.000	
Probability RMSEA≤ 0.05	0.000	1.000	>0.05
CFI	0.588	1.000	≥ 0.95
TLI	0.514	1.001	≥ 0.95
SRMR	0.286	0.007	≤ 0.08
PCFI	0.498	0.835	> 0.5
PNFI	0.496	0.832	> 0.5

6.3.1 Model identification and goodness of fit testing

According to Kline (2011) for identifying any structural equation model there are two general requirements which are necessary but insufficient for the model identification, viz (i) The degrees of freedom for the model must be at least zero ($df_M \geq 0$) (ii) A scale should be assigned to every latent variable.

The requirement for $df_M \geq 0$ is described as the counting rule, Kaplan (2009). The models that break the counting rule or do not fit in this rule are under identified or under determined i.e. when observations are less than the estimated parameters, Raykov and Marcoulides, (2006). There are two other situations which might be faced by the researcher is over identified when the observation are more than parameters and just identified when the observations are equal to the estimated parameters, Byrne (2010).

Kilne remarked that in a structural equation model the terms *just-identified* and *over identified* do not apply until and unless it meets both of the two necessary requirements for the model identification *and* in addition, sufficient requirements for that particular type of model described later. This means:

a) A just-identified structural equation model is identified and has the same number of free parameters as observations ($df_M = 0$).

b) An over identified structural equation model is identified and has fewer free parameters than observations ($df_M > 0$).

The goodness of fit is highly dependent on the fact that how accurately the CFA estimates the parameters i.e., factor loadings, factor correlations, error covariance and are able to establish the relationships that were observed in the sample data. *Standardized residuals* and *modification indices* are the two statistics which are frequently used in order to identify specific areas of misfit in a CFA solution. The number of data points, consisting the number of variances and covariance, can be calculated by $p\ (p+1)/2$, where p equals the number of observed variables.

6.3.1.1 Model identification

In *model 1(single-factor)*, the number of data points is = 14(15)/2=105, and it requires 28 free parameters, including 15 variances of exogenous variables (of the single factor and fourteen measurement errors) and 13 factor loadings (A1 indicator was fixed to 1.0 to scale the single factor), so model 1 is over-identified and there will be df_M = 77= (105-28) when its fit is tested (Table 5.20).

For *model 2*, the number of data points is = 14(15)/2=105, and 29 free parameters are needed for model 2, including 16 variances of exogenous variables (of the two factors and fourteen measurement errors) and 12 factor loadings (indicators SAL, and ACHRO to 1.0 to scale the two factors), and one covariance; so model 2 is over-identified and there will be df_M = 76 = (105-29) when its fit is tested (Table 6.1).

6.3.1.2 Goodness of fit testing

In model 1 $\chi 2$ value is **7106.644** with df_M = 77 and a probability (P*)* level equal to 0.000. This P- value is highly significant which is sufficient to reject the null hypothesis: the model fits the data well. In other words, the $\chi 2$ GOF statistic indicates that the actual observed covariance matrix (S) does not match the estimated covariance matrix (Σ). This model is also rejected on the ground of RMSEA, CFI, TLI, and SRMR.

For model 2 $\chi 2$ value is **56.267** with df_M = 76 and p-value (p = 0.9563) is insignificant which means that there is no evidence to reject the null hypothesis: the model fits the data well. The fitness of this model is also proved by RMSEA, CFI, TLI, and SRMR.

Comparing the two models (1 and 2), it is noticed that model 1 (χ^2 = **7106.644** with df_{M1} = 77, p< 0.0000; RMSEA = 0.302; CFI = 0.588; TLI = 0.514; SRMR = 0.286) was not satisfactory, while model 2 (χ^2 = 56.267 with df_{M1} = 76, p = 0.9563; RMSEA = 0.000; CFI = 1.000; TLI = 1.001; SRMR = 0.007) was distinctly satisfactory.

6.3.2 Reliability analysis

Reliability implies that if anyone repeats the measurement used, the result will always be the same or in other words it can be considered the measurement

instrument yields consistent results and error free, Peter (1979); Cooper and Schilinder (1998); Zikmund (2003); Nachmias and Nachmias (2007).

6.3.2.1 Measurement of item-level reliability

Kline says that "the internal consistency of observed variables with each other should be assessed and it could be viewed through the score reliability (r_{XX}), which is nothing but the degree to which scores in a particular sample are free from random measurement error. It is estimated as one minus the proportion of total observed variance due to random error". Chin (1998) suggests that the value of absolute correlation i.e. standardized factor loadings should ≤ .05. However, value above 0.7 i.e. ($\cong \sqrt{0.5}$), Henseler et al. (2009) and value ≥ 0.4, Churchill (1979) are suggested. In General, the value of reliability coefficients ≤ 0.90 are measured 'excellent', values ≤ 0.80 are 'very good', and values ≤ 0.70 are 'adequate'. In the present study the value of factor standardized loadings were ranging from 0.90 to 0.91 which was corresponding to the existing criteria in psychometric reliability test.

6.3.2.2 Measurement of construct-level reliability

It is also known as internal consistency reliability, and measures the degree to which responses are consistent across the items within a measure. According to Kline (2011) "if internal consistency is low, then the content of the items may be so heterogeneous that the total score is not the best possible unit of analysis for the measure".

In the current thesis to test construct-level reliability Cronbach's α is applied and the result is reported in Table 5.1, which indicates that the Cronbach's α more than the prescribed value 0.6 ,Cronbach (1951).

6.3.3 Validity Analysis

Routio (2009) indicates that validity refers to the concept and it measures what it intends to measure. Hair et al. (2006) assert that "the validity is the extent to which a set of measuring items correctly represents the underlying theoretical proposed concept".

6.3.3.1 Evaluation of convergent validity

According to Nachmias and Nachmias (2007) convergent validity, is concerned with measuring the degree of a positive relationship among scale items developed to measure the same concept/construct. Convergent validity can be assessed by confirmatory factor analysis through three main criteria: (i) Kline (2011) prescribes that to measure a common factor all indicators should have relatively high standardized factor loadings on that factor (e.g., > .70). (ii) Composite reliability (CR), which is a measure of the overall reliability of a set of heterogeneous but similar indicators, and is concerned with testing the reliability of a construct/ latent variable. It should be above 0.7 and ideally 0.8 or higher. (iii) Average variance extracted (AVE), which is the average amount of variation that a latent construct is able to explain in the observed variables to which it is theoretically related. Fornell and Larcker (1981) proposed that AVE>0.5.

Table 5.21 reveals that AVE for the each construct is higher than the required value as suggested by Fornell and Larcker (1981), and each construct is able to explain more than half of the variance to its measuring items on average.

Table 6.2: Inter-construct Correlation and AVE for CFA Model

	AVE	$\sqrt{\mathbf{AVE}}$	**CR**	**QWL**	**Comp**
QWL	0.82	0.91	0.97	1.000	
Comp	0.83	0.91	0.84	0.146	1.000

6.3.3.2 Evaluation of discriminant validity

Schumacker and Lomax (2010) explain that measures should not theoretically be related are in reality not related. Kline (2011) suggests that estimated correlations between the factors should not be excessively high (e.g., < .90 in absolute value). It was proposed by Fornell and Larcker (1981) that "square-root of AVE for each constructs should be greater than the other construct's correlation with any other (i.e. inter-construct correlation)". Table 5.21 reports that none of the inter-construct correlation value was above the square-root of the AVE and satisfied the criterion of the discriminant validity. Chin (1998) prescribed to examine the cross-loading within factor loading for the item-level discriminant validity. Table 5.22 confirms that each of the measuring item within construct was higher (with respect to its factor loading)

than all of its cross-loadings in row and column. Infact, all cross-loading were lower than the 0.4 values recommended by Hair et al., (2006).

Table 6.3 Factor loading with Cross-loadings

Factors → / Items ↓	F1	F2
	QWL	**Comp**
SAL	0.905	0.061
WRK	0.898	0.073
KPW	0.906	0.062
APO	0.899	0.075
SOIN	0.904	0.071
KONS	0.899	0.069
SPL	0.898	0.064
SORI	0.898	0.060
ACHRO	0.059	0.908
BKNOI	0.082	0.903
SKLAT	0.060	0.908
MTKV	0.062	0.906
KUMN	0.061	0.911
DCCV	0.073	0.908

6.3.4 Evaluation of confirmatory factor analysis model

The goodness of fit indices (χ^2 = 56.267 with df_{M1} = 76, p = 0.9563; RMSEA = 0.000; CFI = 1.000; TLI = 1.001; SRMR = 0.007), as given in Table 5.20 indicated good fit for the CFA for QWL and Comp**.**

The regression coefficients for QWL presented in Table 5.23, are high and statistically significant. Hence the construct validity is ensured and it can be concluded that the construct significantly explained the variables.

Table 6.4 Regression statistics for "Quality of Work Life (QWL)"

Name of the variable	Unstd. Est.	C.R.	Std. Est.	C.R.	R^2	C.R.	P value
A fair and appropriate salary (Remuneration) (SAL)	1.000	999.000	0.907	148.322	0.823	74.161	0.000
Working conditions (WRK)	0.643	46.456	0.901	139.047	0.812	69.523	0.000
Use of capacities at the work (KPW)	0.943	47.464	0.908	149.193	0.824	74.596	0.000
Opportunities available at work (APO)	0.596	46.587	0.902	140.314	0.813	70.157	0.000
Social integration at work (SOIN)	0.764	47.324	0.907	147.731	0.823	73.866	0.000
Constitutionalism(Respect to the Laws) at work (KONS)	0.870	46.498	0.901	139.455	0.812	69.727	0.000
The space that the work occupy in one's life (SPL)	1.174	46.359	0.900	138.112	0.810	69.056	0.000
Social relevance and importance of work. (SORI)	1.130	46.303	0.900	137.582	0.810	68.791	0.000

The regression coefficients depicted that the "use of capacities at the work (KPW)" (estimate of 0.908) explaining 82.40per cent of the variances was the most influencing variable for the middle level personnel in telecom sector of India followed by the "fair and appropriate salary (Remuneration) (SAL)" and "social integration at work (SOIN)" with the estimate of 0.907, equally explaining 82.30per cent of the variances, and "opportunities available at work (APO)" (estimate of 0.902) explaining 81.30per cent of the variances. "working conditions (WRK)" and "constitutionalism (Respect to the Laws) at work (KONS)" with the estimate of 0.901, are equally explaining 81.20 per cent of the variances and "the space that the work occupy in once life (SPL)" and "social relevance and importance of work" (SORI) (estimate of 0.900) explaining 81.20 per cent of the variances were the least influencing variables for the middle level personnel in telecom sector of India.

Table 6.5 Regression statistics for "Competencies (Comp)"

Name of the variable	Unstd. Est.	C.R.	Std. Est.	C.R.	R^2	C.R.	P value
Achievement/result orientation (ACHRO)	1.000	999.000	0.910	148.198	0.828	74.099	0.000
Basic knowledge and innovation (BKNOI)	0.652	47.297	0.906	143.142	0.822	71.571	0.000
Skill and attributes (SKLAT)	0.927	47.838	0.910	148.468	0.828	74.234	0.000
Meta qualities (MTKV)	0.887	47.557	0.908	145.672	0.825	72.836	0.000
Communication (KMUN)	1.003	48.229	0.913	152.465	0.833	76.233	0.000
Decisiveness (DCCV)	1.030	47.905	0.911	149.143	0.829	74.572	0.000

The regression coefficients for **Comp** reported in Table 6.5, are high and statistically significant. Thus, the construct validity is ensured and it can be concluded that the construct significantly explained the variables.

The regression coefficients revealed that the "communication (KMUN)" (estimate of 0.913) explaining 83.30 per cent of the variances was the most influencing variable for the middle level personnel in telecom sector of India followed by the "decisiveness (DCCV)" (estimate of 0.911) explaining 82.90 per cent of the variances. The "achievement/result orientation (ACHRO)" and "skill and attributes (SKLAT)" with estimate of 0.910, equally explaining 82.80 per cent of the variances. Meta qualities (MTKV) with estimate of 0.908, explaining 82.50 per cent of the variances is followed by the "basic knowledge and innovation (BKNOI)" (estimate of 906), explaining 82.20 per cent of the variances.

Both the constructs "**quality of work life (QWL)**" and "**employees' competencies (Comp)**" are associated with each other, as indicated by the covariance coefficient (0.633), which is statistically significant at high level.

Overall, CFA is a statistical technique used to verify the factor structure of a set of observed variables. The results of the CFA indicate that all the constructs are valid and explain the related measured variables significantly. Figure 5.4 shows the complete path model with standardized values of all the factors. Beginning with the

completely standardized solution, the factor loadings can be interpreted along the lines of standardized regression coefficients in multiple regressions. Analyzing the SEM correlation coefficients between the various variables, the model indicates moderate correlations between QWL and employees' competencies (0.63).

Therefore, the model (relationship between employee competencies and QWL) is accepted as a model with a moderate fit. The hypothesis that there is a positive relationship between employee's competencies and QWL is accepted as suggested by the results of the study. The QWL components in order of priority are: use of capacities at work, social integration, fair pay, opportunities at work, constitutionalism, working environment, overall life space and social relevance of work. These components have a significant impact on employees' competencies and are factors enhancing the individual's competencies. The results showed that the average components of competencies are significant. Prioritizing these components are: communication, decisiveness, skills and attributes, achievement, meta qualities, knowledge and innovation.

6.4 Chapter summary

The analysis of the empirical examination was presented in this chapter. The biographical composition of the sample was described and illustrated. In the descriptive statistics means and standard deviations were described and discussed. A systematic reliability analysis and validity analysis regarding both constructs was presented.

To determine the relationship between the various constructs of QWL and employees' competencies structural equation modeling (SEM) was used to test the theoretical model. A summary of analysis identifying the path estimates, model fit and correlation coefficients and regression statistics were presented.

Chapter - 7

Summary and Conclusions

Human resources are one of the significant resources on which companies build their competitive advantage. In today's dynamic business environment organizations need to explore new and innovative ways of doing business to meet the challenges. Since the beginning of the 1980s, vast literature emphasizes on more strategic role of human resources (Guest, 1987). For sustainable competitive advantage it is essential for the organizations to manage their human resources efficiently. Work plays an important role in employees' lives, therefore organizations need to focus on the employees' job satisfaction to be more successful and to attain their objectives. The work conditions not only affect the employee physical but also psychological and social wellbeing.

As the quality of work life plays a vital role in the employee perception and the competencies of employees create meaning in employees' work environment, it is important to explore the relationship between these two constructs.

The main objective of the study was to determine the relationship between employees' competencies and quality of work life and study variables that are likely to influence the quality of work life within the organization thereby impacting employee competency. To determine the relationship between the two constructs structural equation modeling (SEM) technique was used.

The target population selected for this thesis was the middle-level personnel of the telecom sector in India. The middle level staff comprises a significant number in the sector as is indicated by the information collected from the Indian telecom sector showing that the total middle-level staff during the financial year 2012-2013 was 22174. Besides, the middle level personnel serves as the link between the upper and lower levels hence their significance in managerial decision making and functioning cannot be ignored.

The present research study will help the management of the Indian telecom industry to improve the employees' quality of work life by implementing the new policies and resources on those areas which could make a significant difference.

To accomplish the present research work, firstly a detailed study of the Indian telecom sector, structure, employee status and their roles and responsibilities was performed. Henceforth, a 67-item questionnaire was developed on the basis of dimensions developed by Walton (1973) for QWL and dimensions for competencies were developed on the basis of existing literature and inputs from the academic and industry experts**.** The pilot study was conducted on seventy randomly selected telecom sector employees. Before the cutoff date, sixty questionnaires were collected out of which five questionnaires were weeded out due the presence of large amount of missing data. Two items were excluded after conducting reliability test and exploratory factor analysis (EFA) at the individual construct level (measurement of sampling adequacy and total variance). Mann-Whitney-U-test was also applied which is a psychometric test to investigate whether "the length of the measuring instrument might discourage respondents to pay equal attention to the questions at the beginning of the instrument compared to the questions at the end of the instrument", so that the modified version could be substituted for the existing one of the measuring instrument. However, no difference was observed. Thus, the final modified questionnaire was distributed, among 1,500 respondents from the telecom sector. A total of 1,021 filled in questionnaires were received from which 21 were rejected due to the presence of incomplete sections and missing data. Thus, a sample of 1,000 employees, comprising of middle level personnel, remained the valid sample on which the present study was done.

The present chapter pulls the thread together by recapitulating the objectives of the study and its findings. The summary of findings and the theoretical implications of the study have been presented. The discussion related to the practical implications of the findings, contributions and the limitations of the study and the scope for future research is contained in the present chapter.

7.1 Summary of conclusions

7.1.1 Conclusions of literature review

The existing literature on competency and quality of work life was reviewed since these constructs form the theme of this research study. The research questions, research gap and problem statement was the outcome of extensive literature survey.

Quality of Work Life

Though enormous literature has been developed on quality of work life. Both in India and internationally, there is a general lack of a clear definition regarding the QWL construct. The literature on QWL unveils that constant discussion is going on between the two determinants of quality of work life i.e. personal factors (dispositional tendencies) or organizational factors (job characteristics), Kerce and Booth-Kewley (1993); Kotze (2005).

Research has proved that QWL is an important determinant of various enviable organizational outcomes such as increased task performance, lower absenteeism, lower tardiness frequency and has a significant impact on employee behavioral responses such as organizational identification, organisation and career commitment, turnover intention, job satisfaction, job involvement, job effort, job performance, intention to quit, organizational turnover and personal alienation, Kerce and Booth-Kewley (1993); Donaldson et al. (1999); Sirgy et al. (2001); Wilson, DeJoy, Vandenberg, Richardson and McGrath (2004); Wright and Cropanzano (2004); Ballou and Godwin (2007); Huang et al. (2007); Lee et al. (2007); Wright and Bonett (2007); Srivastava (2008); Kaushik and Tonk (2008) and Koonmee et al.(2010).

The conclusion can be drawn that QWL is one of the most essential factor for an employee which associate the employees with the organization in the long run because employees spend a half of their lives in the job or work related activities and even plan their days, living standards and social interaction around the demands of their work. To a large extent, it can be said that QWL is a major component of the organizations as employees define themselves and others in terms of their work.

Competency

The literature review on employee competency highlights that competency is an essential and vital part of the effectiveness and performance of the organization as well as of an individual.

Spencer and Spencer (1993) suggested that high-quality performance was not only determined by better technical skills but also by the manifestation of underlying characteristics. Development Dimensions International indicated that to develop a successful competency profile a competency analysis should include at least four Ws, i.e., what that person knows, what they can do, what experience they have, and what motivates them. It also indicated that competencies have different layers. Core competencies were needed by all members of an organization if they were to achieve a core competitive advantage for the organization. The second layer was managerial competencies which were required of members of management. For every work unit, specified functional competencies based on its unique operational function was identified.

Agut and Grau, (2002) mentioned that competencies are of two categories: technical and generic competencies. Technical competency related to KSAs, 'which basically consist of having knowledge and knowing how to apply it to a job', for example information technology. On the other hand, generic competency referred to individual characteristics 'that involve coping with less routine, programmed, technique tasks that are also part of the job', for example initiative to implement a new plan.

Thus, employee competency is equally important for the functioning and performance of the organization, focusing on better understanding. The development and enhancing of the skills of employees within an organization and providing recommendations to improve the employee performance form an essential part of QWL impact on competencies.

Integration of employee competencies and quality of work life.

For sustainable competitive advantage it is essential for the organizations to manage their human resources efficiently. The working environments of the organization not only influence their physical but also psychological and social wellbeing.

Employee competency and quality of work life directly affects the company's ability to retain its talent, and if it is not measured, it cannot be effective. It can be seen through the past research that the employees who possess high level of mental ability are the great performer, more committed and more efficient in comparison to the low level of psychological well being, Wright and Bonett (2007). QWL and competencies are increasingly being identified as progressive indicators related to the function and sustainability of business organizations.

In general the present study studied that managers within the organizations should be more attentive regarding their competencies, as this might influence the building of good quality of work life within the organizations.

By and large, the present research findings suggested that quality of work life should be recognized as a significant predecessor for employees' competencies.

7.1.2 Conclusions of empirical research

The empirical research findings confirmed previous research as well as generated a new field of study. The present study explored and researched that there is a significant relationship between the employees' competencies and quality of work life. The results of the CFA indicate that all the constructs are valid and explain the related measured variables significantly. Analyzing the SEM correlation coefficients between the various variables, the model indicates moderate covariance between QWL and competency (0.63).

The QWL components in order of priority are: use of capacities at work, social integration, fair pay, opportunities at work, constitutionalism, working environment, overall life space and social relevance. These components have a significant impact on employees' competencies and are factors enhancing the individual's competencies. The results showed that the average components of competencies are significant. Prioritizing these components are: communication, decisiveness, skills and attributes, achievement, meta qualities, knowledge and innovation.

Therefore, the model (relationship between competency and QWL) is accepted as a model with a moderate fit and the results supported the hypothesis of the present study.

It is, therefore, recommended that managers should use appropriate strategies to monitor the fate of employees work and the working environment provided to them by the organization. The study also highlight that managers should establish mutual trust, interpersonal communication between the employees. The findings of this research study are useful since it not only provides valuable information about but also an understanding of the relationship between employee competencies and quality of work life as shown in the empirical analysis of the middle level personnel of the Indian telecom industry. Thus, the research has practical implications which may be useful for the organizations. In general the present study showed that managers within the organizations should be more attentive regarding their competencies, as this might influence the building of good quality of work life within the organizations.

7.2 Research contributions

The present research provides fruitful implications for both practitioners and academicians.

- On the academic part, this study makes a noteworthy contribution to the literature of organizational behaviour and human resource management by exploring the impact of quality of work life on employees' competencies in the context of the Indian telecom sector. On the whole, this study is expected to enlarge areas of comprehension of organizational behaviour and HR issues in the sparsely researched telecom sector in India.

- From the practitioners' side, important influential role of quality of work life on employees' competencies is highlighted. It has been proved by research that to hire a new employee is more expensive than to retain one, Therefore, organizations should promote better quality of work life and to keep the employees satisfied with their jobs and thereby retain them and enhance their competencies.

- Besides, to improve the quality of work life, it is suggested that an organization must consider continuously matters such as increasing employees' remunerations to increase the employees performance and healthy working conditions at the workplace especially employees' safety at work which in

some instances happen to be below the government stipulated safety standards, Chinomona, Lin, Wang and Cheng (2010).

- The results shows that use of capacities at work has the highest correlation and management should review its policy to use and develop the individual capacity at work, it is supported by previous studies also, Othman,Ahmad; Anlieng Cheak (2009). The organization should create an environment where employees have freedom to do work effectively and encourage the use of skills and knowledge in the current job.

- This research suggests that implementing policies and programs which will enhance the interpersonal communication among the employees, build good relationship with employer and provide friendly environment in the organization, make employees take pleasure in the work and establish career development systems. This would increase the employees focus on their work.

- The present study establish that better quality of work life improve the individuals' decision making skills as is evidenced in literature also. The organizations which provide a better QWL will have high employee satisfaction, which in turn, will provide higher growth and profitability.

- At the individual level the study helps to maintain the work - life balance. The positive work environment motivates the employees to use their skills and attributes for the attainment of organizational goals i.e. enhance their competencies for organizational goals. The employees who have valuable and significant work and have a healthy working environment can experience better quality of work life and personal life. To improve the QWL, an organization need to create an environment where employees gain mental and physical job satisfaction which keeps them motivated, which results in increasing in the performance of the both organization and the employees.

- The present study proved that organization should encourage information flow through two way communications which seems to be an important aspect of the competency. It is one of the factor which affect the quality of work life also proved by earlier research; Sinha, Chandranshu (2012).

- The study indicates that management should review the job design for effective implementation of the job and motivate the employees to plan and implement their activities. The findings of the research proved that the components identified and structural relationship presented for the component of QWL and competency was suitable.

Therefore, organizations must develop their human resources to gain competitive advantage in the competitive world. Further the organizations can develop one of their valuable assets i.e. human resources by providing high quality of work life for developing their competencies to elicit the favorable job related responses in return. Finally, it can be concluded that the positive relationship between employee QWL and competencies as revealed by the present empirical analysis of the middle level personnel of the Indian telecom sector will create a win-win situation whereby the employees are motivated to be more productive and the organization's profitability is increased in the process.

7.3 Limitations of the Research and Scope for Future Research

The present research study is subject to the following limitations:-

At the onset the use of the Walton's quality constructs is an obvious limitation as they were designed for use in a completely different context. Though the questionnaire developed on this basis seemed to demonstrate good psychometric properties and had obtained satisfactory reliability and validity scores, future research can further revise and refine the instrument for specific use in the Indian context and also in other sectors.

Due to the constraint of time and resources at the disposal of the researcher the focus of the study remained confined to a specific level i.e. middle level management within eight organizations in the north region. This restricted scope of the study to a relatively small area.

Another limitation relate to the basis of study which is single source survey, viz; data (sample survey using the questionnaire to collect information). Although great care was taken to motivate employees to provide valid information, parameter

estimates may be inflated by common-method variance. Future research can be done by using multiple methods of measurement and sources of data.

Future research can be directed towards the validity of the empirical results to enhance the meaningful contribution of the present research work and better understanding of the employee competencies and quality of work life constructs within the organizational context.

7.4 Chapter Summary

The present chapter deals with the conclusions, recommendations and limitations of the study. The conclusions were drawn on the basis of empirical research and the theoretical context. The results of the present research work direct some points towards the new findings within the working environment and suggested new recommendations to enhance the research especially within this context.

This research study attempted to explore an integrated model consisting of employee competency and QWL. Above all, the main objective of this research work was to determine the implied theoretical relationship between the dimensions comprising the construct ‘employee competency’ and the construct ‘QWL’ (six and eight factors respectively).

To the extent that this type of an integrated model had not been tested in this context before, this study makes a significant contribution in building the theory and practice in the area of organizational psychology, in the Indian telecom industry.

SEM technique is used to test the more complex and integrated model which takes into account interaction effects among the constructs which other statistical techniques cannot do. The present study uses the SEM technique to confirm the conceptual model as well as the hypothesized relationships among the constructs. A positive relationship was found between employee competencies and quality of work life.

The results of this research study make several contributions to research literature. This should create the path for further exploration regarding the competency concept within organizations together with other possible influencing factors.

This research reminds the policy makers about the findings of the Hawthrone experiment conducted by Elton Mayo at Bell laboratories and also about the history of various legislatures enacted for the welfare of labor like minimum wages, bonus act, compensation act etc.

The opening up of the economy has led to massive growth of the private sector which is now partners in the economic development of the country. However the private companies work on principles of capitalism and hence ignore employee welfare.

Various studies have revealed clear conflict between the owners, management and other stake holders including employees. This research would once reiterate the need for providing better working environment to the employees and not to map them in accordance with their contribution in profit making.

This research will also be a guide to practitioners and organizations that “happy and healthy employee would ensure heavy bottom line”.

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Annexure-A

QUESTIONNAIRE

The purpose of this questionnaire is to study the determinants of Quality of work life and competency mapping among employees of Telecom sector. The information provided by you will be kept confidential and used only for the purpose of research work for PhD. You are please requested to cooperate.

[A] Demographic Profile (Tick the right one)

1. Name of the Organization…….

2. Designation

   a. Top Level ☐ b. Manager ☐ c. Junior officer ☐

3. Age: ……..

4. Gender: Male ☐ Female ☐

5. Marital status: Married ☐ Single ☐

6. Number of dependents in family:

   Old age (above 65 yrs) ☐ Under age (below 14 yr) ☐

7. Are you in Nuclear family ☐ Joint family ☐

8. Total years of work experience ☐

9. Income of the respondent annually in figures…… . And in words……

10. No. of Earning members : if Joint family ☐ Nuclear family ☐

11. How many days in a week you come to office? 5 days ☐ 6 days ☐

12. Any other family member working in the same profession…….

13. Distance from home to office…….. Kms.

14. Mode of transportation from home to office (Please specify)……

15. Commenting cost (cost incurred in to and fro)…….. in Rs. (daily)

16. How much time you spend travelling to work (two-way)?..... in hours

17. Do you suffer from any stress-related disease (Please Specify).....

18. Do you have get together functions with

Peer Groups ☐ Junior ☐ Seniors ☐

19. Are family members also invited in such gatherings? Yes ☐ No ☐

20. How they feel -

Enjoy ☐ Feeling Awkward ☐ Normal ☐ Depressed ☐

[B] Please rate each competency using the 5 point rating scale

COMPETENCIES AT MANAGERIAL LEVEL

1. Achievement/Result Orientation:

1.	Addressing immediate client needs	5	4	3	2	1
2.	Managing job expectations	5	4	3	2	1
3.	Planning for action	5	4	3	2	1
4.	Having a strategic look	5	4	3	2	1

2. Basic Knowledge and Information

1.	Command of basic facts	5	4	3	2	1
2.	Relevant professional Knowledge	5	4	3	2	1
3.	Knowledge of standards and specifications	5	4	3	2	1

3. Skills

1.	Continuing sensitivity to events	5	4	3	2	1
2.	Analytical, problem solving and decision making skill	5	4	3	2	1
3.	Social skills and abilities	5	4	3	2	1
4.	Emotional resilience	5	4	3	2	1
5.	Pro-activity	5	4	3	2	1
6.	Leadership	5	4	3	2	1

4. Meta Qualities

1.	Innovation & Creativity	5	4	3	2	1
2.	Analytical Thinking	5	4	3	2	1
3.	Balanced learning habits and skills	5	4	3	2	1
4.	Self knowledge	5	4	3	2	1
5.	Adaptability	5	4	3	2	1

5. Communication

1.	Clarifying Understanding	5	4	3	2	1
2.	Fostering two way understanding	5	4	3	2	1
3.	Communication complex messages	5	4	3	2	1

6. Decisiveness

1.	Using negotiating techniques	5	4	3	2	1
2.	Anticipating and presenting change positively	5	4	3	2	1
3.	Importing solutions	5	4	3	2	1
4.	Creating new concept models	5	4	3	2	1
5.	Considering human and environmental impacts	5	4	3	2	1

[C] **Quality of work life**

Regarding - A Fair and Appropriate Salary (Remuneration)

1.1 how satisfied is you with your salary (remuneration)

a. very dissatisfied
b. dissatisfied
c. neither satisfied nor dissatisfied
d. satisfied
e. very satisfied

1.2 How satisfied are you with your salary, if you compared to your colleagues' (in other department, organizations) salary

a. very dissatisfied
b. dissatisfied

c. neither satisfied nor dissatisfied

d. satisfied

e. very satisfied

1.3 How satisfied are you with the participation in results that you receive from the company?

a. very dissatisfied

b. dissatisfied

c. neither satisfied nor dissatisfied

d. satisfied

e. very satisfied

1.4 How satisfied are you with the extra benefits (Insurance, transport, mobile etc) that your company offers to you?

a. very dissatisfied

b. dissatisfied

c. neither satisfied nor dissatisfied

d. satisfied

e. very satisfied

Regarding Your Working Conditions

2.1 How satisfied are you with your weekly work (quantity of worked hours)

a. very dissatisfied

b. dissatisfied

c. neither satisfied nor dissatisfied

d. satisfied

e. very satisfied

2.2 According to your work load (quantity of work), how do you feel?

a. very dissatisfied

b. dissatisfied

c. neither satisfied nor dissatisfied

d. satisfied

e. very satisfied

2.3 According to the use of technology in your tasks (with respect to customers) how do you feel?

a. very dissatisfied
b. dissatisfied
c. neither satisfied nor dissatisfied
d. satisfied
e. very satisfied

2.4 How satisfied are you with the working conditions in your workplace?

a. very dissatisfied
b. dissatisfied
c. neither satisfied nor dissatisfied
d. satisfied
e. very satisfied

2.5 How satisfied are you with the security equipments, individual and collective protection provided by your company?

a. very dissatisfied
b. dissatisfied
c. neither satisfied nor dissatisfied
d. satisfied
e. very satisfied

2.6 Regarding tiredness that your work cause to you, how do you feel?

a. very dissatisfied
b. dissatisfied
c. neither satisfied nor dissatisfied
d. satisfied
e. very satisfied

3.0 Regarding the Use of Your Capacities at the Work

3.1 Are you satisfied with the autonomy (opportunity to make decisions) that you have at your work

a. very dissatisfied
b. dissatisfied
c. neither satisfied nor dissatisfied

d. satisfied

e. very satisfied

3.2 Are you satisfied with the importance of the task/work/activity that you do?

a. very dissatisfied

b. dissatisfied

c. neither satisfied nor dissatisfied

d. satisfied

e. very satisfied

3.3 Regarding the multi-task (possibility to performance several tasks and works) at work, how do you feel?

a. very dissatisfied

b. dissatisfied

c. neither satisfied nor dissatisfied

d. satisfied

e. very satisfied

3.4 How satisfied are you with your performance evaluation (awareness of how good or bad have been your performance at work?

a. very dissatisfied

b. dissatisfied

c. neither satisfied nor dissatisfied

d. satisfied

e. very satisfied

3.5 Regarding possibilities conferred (work responsibility given to you), how do you feel?

a. very dissatisfied

b. dissatisfied

c. neither satisfied nor dissatisfied

d. satisfied

e. very satisfied

4.0 Regarding Opportunities That You Have At Your Work

4.1 How satisfied are you with you opportunity of personal growth?

a. very dissatisfied
b. dissatisfied
c. neither satisfied nor dissatisfied
d. satisfied
e. very satisfied

4.2 How satisfied are you with the training (before commencement of Job) you participate

a. very dissatisfied
b. dissatisfied
c. neither satisfied nor dissatisfied
d. satisfied
e. very satisfied

4.3 How satisfied are you with the training (after training need analysis) you participate

a. very dissatisfied
b. dissatisfied
c. neither satisfied nor dissatisfied
d. satisfied
e. very satisfied

4.4 Regarding the situations and the frequency that occur the resigning at your work, how do you feel?

a. very dissatisfied
b. dissatisfied
c. neither satisfied nor dissatisfied
d. satisfied
e. very satisfied

4.5 Regarding the incentive that your company gives you to further study (which helps in your career development), how do you feel?

a. very dissatisfied
b. dissatisfied
c. neither satisfied nor dissatisfied

d. satisfied

e. very satisfied

5.0 Regarding Social Integration At Your Work

5.1 Regarding the discrimination on behalf of cast in your work place, how you feel?

a. very dissatisfied

b. dissatisfied

c. neither satisfied nor dissatisfied

d. satisfied

e. very satisfied

5.2 Regarding the discrimination on behalf of religious in your work place, how you feel?

a. very dissatisfied

b. dissatisfied

c. neither satisfied nor dissatisfied

d. satisfied

e. very satisfied

5.3 Regarding the discrimination on behalf of gender in your work place, how you feel?

a. very dissatisfied

b. dissatisfied

c. neither satisfied nor dissatisfied

d. satisfied

e. very satisfied

5.4 Regarding your relationship with your bosses at your work, how do you feel?

a. very dissatisfied

b. dissatisfied

c. neither satisfied nor dissatisfied

d. satisfied

e. very satisfied

5.5 Regarding your relationship with your colleagues at your work, how do you feel?

a. very dissatisfied
b. dissatisfied
c. neither satisfied nor dissatisfied
d. satisfied
e. very satisfied

5.6 Regarding your relationship with your sub- ordinates at your work, how do you feel?

a. very dissatisfied
b. dissatisfied
c. neither satisfied nor dissatisfied
d. satisfied
e. very satisfied

5.7 Regarding your teams commitment to work, how do you feel?

a. very dissatisfied
b. dissatisfied
c. neither satisfied nor dissatisfied
d. satisfied
e. very satisfied

5.8 Regarding your colleagues' commitment to work, how do you feel?

a. very dissatisfied
b. dissatisfied
c. neither satisfied nor dissatisfied
d. satisfied
e. very satisfied

5.9 How satisfied are you with the valorization of your ideas and initiative at work?

a. very dissatisfied
b. dissatisfied
c. neither satisfied nor dissatisfied
d. satisfied
e. very satisfied

6.0 Regarding the Constitutionalism (Respect to the Laws) at Your Work

6.1 How satisfied are you with the company for respecting the worker's right

a. very dissatisfied
b. dissatisfied
c. neither satisfied nor dissatisfied
d. satisfied
e. very satisfied

6.2 How satisfied are you with your freedom of expression (opportunity to give opinions) at work?

a. very dissatisfied
b. dissatisfied
c. neither satisfied nor dissatisfied
d. satisfied
e. very satisfied

6.3 How satisfied are you with the norms and rules at your work

a. very dissatisfied
b. dissatisfied
c. neither satisfied nor dissatisfied
d. satisfied
e. very satisfied

6.4 Regarding the respect to your individuality at work, how do you feel?

a. very dissatisfied
b. dissatisfied
c. neither satisfied nor dissatisfied
d. satisfied
e. very satisfied

7.0 Regarding the Space that the Work Occupy in Your Life

7.1 How satisfied are you with the work influence on your family life routine?

a. very dissatisfied
b. dissatisfied
c. neither satisfied nor dissatisfied
d. satisfied
e. very satisfied

7.2 How satisfied are you with the work influence on your possibilities of leisure (at home)?

a. very dissatisfied
b. dissatisfied
c. neither satisfied nor dissatisfied
d. satisfied
e. very satisfied

7.3 How satisfied are you with your schedule of work and rest (during work)?

a. very dissatisfied
b. dissatisfied
c. neither satisfied nor dissatisfied
d. satisfied
e. very satisfied

8.0 Regarding the social relevance and importance of work

8.1 Regarding the proud of performing your work, how do you feel?

a. very dissatisfied
b. dissatisfied
c. neither satisfied nor dissatisfied
d. satisfied
e. very satisfied

8.2 Are you satisfied with the image of this company have to society?

a. very dissatisfied
b. dissatisfied
c. neither satisfied nor dissatisfied
d. satisfied
e. very satisfied

8.3 How satisfied are you with the corporate social responsibility (contribution to the society) that the company have?

a. very dissatisfied
b. dissatisfied
c. neither satisfied nor dissatisfied
d. satisfied
e. very satisfied

8.4 How satisfied are you with the services and the quality of the products that the company makes?

a. very dissatisfied
b. dissatisfied
c. neither satisfied nor dissatisfied
d. satisfied
e. very satisfied

8.5 How satisfied are you with the human resource politic (the way that company treats employees) that the company has?

a. very dissatisfied
b. dissatisfied
c. neither satisfied nor dissatisfied
d. satisfied
e. very satisfied

Publications from Present Research

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- Manisha Choudhary and Latika Dhuria (2013), "A literature review on quality of work life & competency mapping", published in *International Conference proceedings*, ISBN no. 978-93-83343-02-7, Vol 6, No. 6 pg 25-30.

- Manisha Choudhary and Dipti Sharma (2012), "Competency Mapping: an approach to enhance the employees performance" published in *International Journal of Innovation, Management and Technology*, ISSN: 2010-0248 Singapore, Vol 2, pg 32-38.

- Manisha Choudhary and Dipti Sharma (2015) "The influence of quality of work life on employee job satisfaction", published in *International conference on evidence based management proceedings* held at BITS Pilani in March, 23-24.

- Manisha Choudhary and Dipti Sharma (communicated) "The impact of quality on work life on employees' competencies" under review process for *International Journal of Business and Systems Research*, Inderscience Ltd.

Biographical profile of researcher

Manisha Choudhary, is born in Alwar district of Rajasthan on 03rd January 1987. She has received her B.Sc. Biotechnology degree from university of Rajasthan (India) in 2007 and MBA in human resource management and marketing management in 2009 from Rajasthan Technical University, Kota, Rajasthan (India). She has teaching experience of three years in various disciplines of management and engineering. Presently, she is pursuing her doctoral study in department of management of studies at Malaviya National Institute of Technology Jaipur, India. Her research interest is focused around multidisciplinary aspect of human resources management.