CHAPTER III

RESEARCH METHODOLOGY

This chapter outlines the research methodology employed in this study. In particular, the model adopted, the six job factors used, the sampling procedure, the data collection method, and the techniques used in data analysis are described.

Analytical Framework and Model

The study is based on the analytical framework and model used by Barnowe, Mangione and Quinn (1972). It utilizes six job factors as the independent variables: relationship with the job, superior-subordinate relationship, relationship with peers, economic rewards, organisational climate, and off-the-job rewards. The dependent variable was job satisfaction.

Relationship With the Job

This variable measures the respondents' satisfaction with job content, job achievement and recognition, opportunities for self-development, and the use of their skills and knowledge.

Superior-Subordinate Relationship

This variable measures the respondents' satisfaction with the formal structures of the organisation and the extent of their acceptance of the formal structure.

Relationship With Peers

This variable measures the respondents' satisfaction from working together with others as a team and as a social unit, and whether the respondents enjoyed working with the people in their respective organisations.

Economic Rewards

This variable measures the respondents' satisfaction with pay, fringe benefits, and promotional opportunities.

Organisational Climate

This variable measures the respondents' satisfaction with the working conditions, the facilities available, and the administrative policies of the engineering firms.

Off-The-Job Rewards

This variable measures the respondents' perception of off-the-job rewards, such as social status, public respect, leisure time, contribution to social work, contribution to national development and involvement in community work.

Sampling Design

In line with the objectives of the study, the sampling process adopted was based on the usual resource constraints, the need for accuracy and the need to minimise sampling errors.

The population for the study was all engineers working in engineering consulting firms in the Klang Valley who were members of the Association of Consulting Engineers Malaysia (ACEM). Of the 78 engineering consulting firms listed in the 1994/1995 ACEM directory, 52 firms (66.7%) were located in the Klang Valley. These represented the sampling frame for the study (see Appendix I - Sampling Frame). 15 of these firms were then selected by simple random sampling, which represented 28.8% of the firms in the sampling frame and 19.2% of all the firms listed in the directory. Table 3.1 lists the 15 firms by firm size and the number of questionnaires distributed and returned. In each case, the number of questionnaires distributed was the maximum number agreed upon with the directors/partners of the firms for internal distribution to the engineers working in the respective firms. The completed questionnaires were collected two weeks after distribution. A total of 400 questionnaires were distributed and 177 were returned with valid responses (44.25% response rate).

Data Collection

Before the commencement of data collection, consideration was given to the need for both primary and secondary data on the job satisfaction of engineers, the type of data to be collected, and the method of collecting the data. Secondary data were collected from sources such as the Board of Engineers Malaysia, the Institution

of Engineers Malaysia and the Association of Consulting Engineers Malaysia. Primary

data were collected by means of the active collection method, i.e., a questionnaire.

TABLE 3.1

LIST OF ENGINEERING CONSULTING
FIRMS SELECTED

	Firm	Firm Size [a]	Questionnaire	
			Distributed	Returned
i	Arup Jururunding Sdn Bhd	58	34	26
ii	Engineering & Environmental Consultants Sdn Bhd	90	30	9
iii	HS Liao Sdn Bhd	38	30	14
iv	HSS Integrated Sdn Bhd	199	60	18
v	Juaraconsult Sdn Bhd	18	10	4
vi	Jurutera Perunding Bersama Sdn Bhd	19	19	5
vii	Jurutera Perunding LC Sdn Bhd	6	6	4
viii	KTA Tenaga Sdn Bhd	165	30	17
ix	Minconsult Sdn Bhd	163	25	10
x	Mektricon Sdn Bhd	6	6	6
xi	Perunding Bakti Sdn Bhd	19	10	8
xii	Perunding GEA (M) Sdn Bhd	24	15	3
xiii	Ranhill Bersekutu Sdn Bhd	213	30	0
xiv	Wan Mohamed & Khoo Sdn Bhd	51	50	17
xv	Zaidun-Leeng Sdn Bhd	45	45	36
	TOTAL:	1,114	400	177

[a] "Firm size" refers to the number of engineers working in the firm, including the partners of the firm.

Primary Data

Primary data on the level of job satisfaction, satisfaction on each of the

six job factors, personal characteristics, job attitude and job behaviour were collected

by means of a questionnaire distributed to the selected sample: see Appendix II - Questionnaire.

The questionnaire comprised four sections. Section I presented statements on the six job factors, with six statements to each factor, and the respondents were asked to indicate their agreement or disagreement on a seven point Likert Scale. The respondents were required to choose only one response on the scale: from strongly disagree to strongly agree. As this scale was relatively easy to comprehend, it was hoped that less mistakes would be encountered. As a check against respondents' bias towards selecting the alternative presented last, the split-ballot technique was incorporated in the 36 statements.

Section II required the respondents to rank, in order of importance, the six factors in terms of contribution to their job satisfaction.

Section III covered the measurement of the respondents' perceived job satisfaction, urge to resign and job attitudes based on their level of job satisfaction.

Finally, Section IV recorded the respondents' personal characteristics like gender, grade of membership in the Institution of Engineers Malaysia, qualifications obtained, engineering discipline, working experience, job designation, annual income, and firm size.

Secondary Data

Secondary data on engineers in Malaysia were obtained from the Board of Engineers Malaysia, the Institution of Engineers Malaysia, as well as the Association of Consulting Engineers Malaysia. Previous studies on the remuneration of engineers,

etc. were also obtained from the Institution of Engineers Malaysia as well as other sources.

Analytical Procedures

In order to reduce inaccuracies, the data collected were purified by a preanalytical process which included data editing, variable development, data coding, error check, data structure development, preanalytical computer check, tabulation and finally data storing into the computer. After this procedure had been completed, the data were analysed by means of the Statistical Package for the Social Sciences (SPSS+). Nine analyses were carried out, as follows:

Analysis of Respondents' Personal Characteristics

An analysis of the respondents' personal characteristics was carried out by distribution according to gender, grade of membership in the IEM, qualifications obtained, engineering discipline, years of working experience, job designation, gross annual income and firm size.

Analysis of Respondents' Perceived Job Satisfaction Levels

An analysis of the level of job satisfaction perceived by the respondents which gave the overall picture of job satisfaction in the profession.

Analysis of Respondents' Job Behaviour

This analysis covered the respondents' urge to resign and job attitude. The acute problem of high turnover of engineers would be revealed through this analysis.

Analysis of Respondents' Satisfaction with Job Factors

In this analysis, the level of satisfaction was obtained from the mean scores on each question of the respective job factor. The mean scores were then summed and averaged to determine the satisfaction level on each job factor.

Analysis of Ranking of Job Factors

From the respondents' feed-back in ranking the six job factors, the data were analysed to determine the overall ranking of these factors. The method used was by summing and averaging the rankings of each job factor so that the overall ranking was achieved.

Bivariate Analysis of Respondents' Personal Characteristics and Their Satisfaction With Job Factors

In these analyses, bivariate analysis using chi-square tests were conducted to determine whether there was any significant relationship between each personal characteristic and the job factors. If a relationship was found to be significant, cross-tabulation was carried out to determine the nature of the relationship.

Bivariate Analysis of Respondents' Personal Characteristics
and Their Job Satisfaction Levels

Bivariate chi-square and cross tabulations were carried out to determine if there was any significant relationship between the respondents' personal characteristics and their perceived job satisfaction levels.

Bivariate Analysis of Job Satisfaction Levels
and Job Behaviour

Bivariate chi-square analysis and cross tabulations were conducted to determine any significant relationship between job satisfaction levels and job behaviour.

Multivariate Analysis of Job Satisfaction and Job Factors

For this analysis, stepwise multiple regression was done to determine the relationship between job satisfaction and the six job factors. A linear model was developed which explained the importance of each job factor to job satisfaction and the extent of the contributions.