

A STUDY OF SERVICE QUALITY IN  
INFORMATION TECHNOLOGY (IT)  
IMPLEMENTATIONS

By

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Research report submitted in partial fulfilment  
of the requirements for the degree of  
Master of Business Administration

June 1995

To my wife Chye Har,  
my children Zhao Min  
and Zhaoli,  
for their love  
and support

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## ABSTRAK

Kajian ini dijalankan untuk meneliti kualiti perkhidmatan dalam implementasi penyelesaian Teknologi Maklumat (IT). Kajian ini bertujuan untuk mengukur kualiti perkhidmatan sebagai suatu "Jurang Jangkaan-Tanggapan" di antara pembekal penyelesaian teknologi maklumat dan pelanggannya.

Maklumat dikumpulkan melalui soalselidik yang disesuaikan dari "SERVQUAL" yang direka oleh Parasuraman. Data ini adalah untuk memahami jangkaan pelanggan dalam aspek kualiti perkhidmatan dan juga tanggapan mereka mengenai kualiti perkhidmatan yang diterima. 71 borang soalselidik telah diterima yang merupakan 40% daripada jumlah borang soalselidik yang telah dikeluarkan.

Keputusan analisis menunjukkan bahawa soal utama tujuan kajian ini telah dijawab: Jurang memang wujud dalam kualiti perkhidmatan dan terdapat dalam semua lima dimensi kualiti perkhidmatan. "Kebolehpercayaan" didapati adalah dimensi di mana pelanggan berasa paling tidak puashati.

Jurang kualiti perkhidmatan juga terdapat dalam pelbagai sektor industri yang telah dikaji, di mana pengeluar komputer dan alat-alatan komunikasi merekodkan jurang kualiti perkhidmatan yang paling tinggi di antara industri-industri lain.

Keputusan kajian menunjukkan bahawa pembekal penyelesaian teknologi maklumat masih terdapat banyak kesempatan untuk memperbaiki dan meningkatkan kualiti perkhidmatan mereka. Dimensi yang lebih kritikal patut diberi keutamaan: Pembekal penyelesaian maklumat teknologi patut memperolehi pandangan dari pelanggan mereka dari masa ke masa supaya dapat memahami tahap jangkaan mereka.

## ABSTRACT

This research was conducted to study the service quality in the implementation of Information Technology (IT) solutions. The study was intended to measure the service quality as an "Expectation-Perception Gap" between the IT vendors providing the IT solutions and the customers purchasing and implementing the solutions.

Data was collected through questionnaires built from the framework of "SERVQUAL" scale designed by Parasuraman et al. Questionnaire data were collected to understand the customers' expectations of service quality and perceptions of actual service quality they received. 71 questionnaires were returned recording about 40% of return rate.

Analysis of results indicates that the three basic questions are explained. The gaps do exist in service quality in the implementation of IT solutions, and they exist in each of the five dimensions of service quality. Reliability is the dimension with the largest gap.

Service quality gaps are found to be present across all segments of industries, with manufacturers of computers, components and communication products recording the largest gaps among the different industries.

The results of study suggest that IT vendors still have rooms for improvements in quality of service provided. Reliability and responsiveness are two critical dimensions to focus on in quality improvement. Nevertheless, IT vendors should continue to obtain feedback from their customers in order to find out their level of expectations from time to time, so as to continuously improve their quality of service.

engineered at the manufacturing plant and then delivered intact to customer. Most services cannot be measured, counted, inventorized in advance of sale to ensure quality delivery (of service). The performance of service often differs among vendors (employees of vendors) and customers, and also differs from day to day.

In most services, quality occurs during service delivery, usually in the interaction between the customer and contact personnel of the service organization (service provider). Therefore customers and service providers are usually inseparable. Furthermore, the service quality is highly dependent on the performance of employees of the service providers. Hence the service process is an integral part to the management of service quality. We shall look at how critical are these service delivery situations to the evaluation process of service quality.

## 1.2 SCOPE OF THE STUDY

This paper has chosen to focus on a very fast expanding and changing service industry - the Information Technology (IT) industry. The study intended to find out the service quality in the implementation of Information Technology (IT) solutions. We have to understand what IT customers want and how the customers will evaluate the delivered service. The customer's definition of service quality specifications is of great importance here.

This study was based on the framework hypothesized by Parasuraman et al. (1985) which states that service quality problems are related to the difference between perceptions of actual customer service quality and customer expectations. The study intended to measure the service quality as an "Expectation-Perception Gap" between the IT vendors

providing the IT solutions and the customers purchasing and implementing the solutions (i.e. differences in the perceptions of service quality from vendors' and customers' perspectives).

The study was intended to explore this service quality gap between the IT vendors and customers, as it was designed to examine both the expectations and perceptions of the components of service quality regarding the quality of service provided by IT vendors. It is expected that a gap exists between the expectations and perceptions, and the gap would vary.

As the IT industry is considered the fastest growing with rapid changes everyday, we hope that the findings will help the IT vendors understand the quality of their service better and how and where to improve for the benefits of the customers as well as the IT industry as a whole.

This study intended to find answers to the following questions like: Does service quality gap exist in the implementation of IT solutions? If service quality gap does exist, where does it exist? Are there variations in service quality gaps across industries implementing IT solutions?

We hoped that from the study service quality can be better understood and can be further improved. The understanding of the customer's expectation has become very critical to the success of IT implementation, and hence the success of the IT vendors. We also hoped to find out more about the significance of the dimensions of service quality.

### **1.3 QUALITY CONCEPTS**

The following are the definitions of some of the related concepts.

- a) **Quality**  
Quality can be defined broadly as superiority or excellence (Zeithaml, 1988).
- b) **Perceived Quality**  
The consumer's judgement about a product's or a service's overall excellence or superiority (Zeithaml, 1988)
- c) **Service Encounters**  
A service encounter refers to as the moment of truth or critical incident (Albrecht and Zemke, 1985). A service encounter is any direct interaction between a service provider and its customer.
- d) **Expectations**  
Expectations are desires, wants, i.e. what we feel a service provider should offer. Expectations are formed on the basis of previous experience of a company and its marketing mix, competitors and word-of-mouth communications.
- e) **Service Quality**  
Service quality is meeting customer needs and requirements and how well the service level delivered matches customers' expectations (Lewis and Booms, 1983). Service quality is a consumer judgement and results from comparisons by consumers of expectations of service with their perceptions of actual service delivered (Gronroos, 1984).
- f) **Service Quality Gap**  
Service quality is a function of the gap between consumers' expectations of a service and their perceptions of the actual service delivery by an organization (Parasuraman et al., 1985, Zeithaml et al., 1988).

## 1.4 QUESTIONS INVESTIGATED

To focus on the main issue of study that is service quality, three important questions were investigated in this study:

- 1) Does service quality gap exist in the implementation of IT solutions by IT vendors?
- 2) If service quality gap does exist, where does it exist (i.e. which dimensions of service quality are having significant gaps)?
- 3) Does the service quality gap vary across different industries implementing IT solutions?

## Chapter 2

### LITERATURE REVIEW

#### 2.1 HISTORY OF RESEARCH

As the society becomes more advanced and well-informed, customers today are becoming more aware of alternatives on offer, both services or products and providers or vendors. Customers' expectations of service and quality are raised when they are more critical of the quality of service they experienced (Leonard and Sasser, 1982). "Expectations" are what people feel a service or product should offer and relate to the company and its marketing mix, both the traditional elements (of marketing mix: product, price, place and promotion) and the extended elements of physical evidence, process and people (Booms and Bitner, 1981).

Thompson, Desouza, and Gale (1985) reveal that delivering high service quality produces measurable benefits in profit, cost savings and market share. Consequently a more in-depth understanding of service quality and how it is achieved in organizations has become a priority for research. To that end, Parasuraman, Zeithaml and Berry has developed a "Service Quality Model" in 1985 to illustrate that the customers' perceptions of quality are influenced by a series of gaps occurring in organizations.

These gaps are:

a) **Gap 1**

Difference between consumer expectations and managers' perceptions of consumers' expectations.

b) **Gap 2**

Difference between managers' perceptions of consumers' expectations and service quality specifications actually set.

c) **Gap 3**

Difference between service quality specifications and the actual service delivery.

d) **Gap 4**

Difference between actual service delivery and the external communications about the service.

In the "Conceptual Model of Service Quality" (Parasuraman et al, 1985) (Figure 2.1), we notice that these gaps on the service provider's side can impede delivery of services that consumers perceive to be of high quality.

The "Service Quality" (GAP 5) depends on the nature of the four other gaps. Putting the conceptual service quality model in the form of a structural equations model, the perceived service quality (Gap 5) is the unobservable dependent variable and the four gaps on the marketer's side (Gap 1 to Gap 4) are the unobservable independent variables.

In the model the "Perceived Service Quality" is defined as the difference between consumer expectations and perception gap, i.e. Gap 5. This gap is in turn depends on the size and direction of the four gaps above which are associated with the delivery of service quality on the marketer's side.

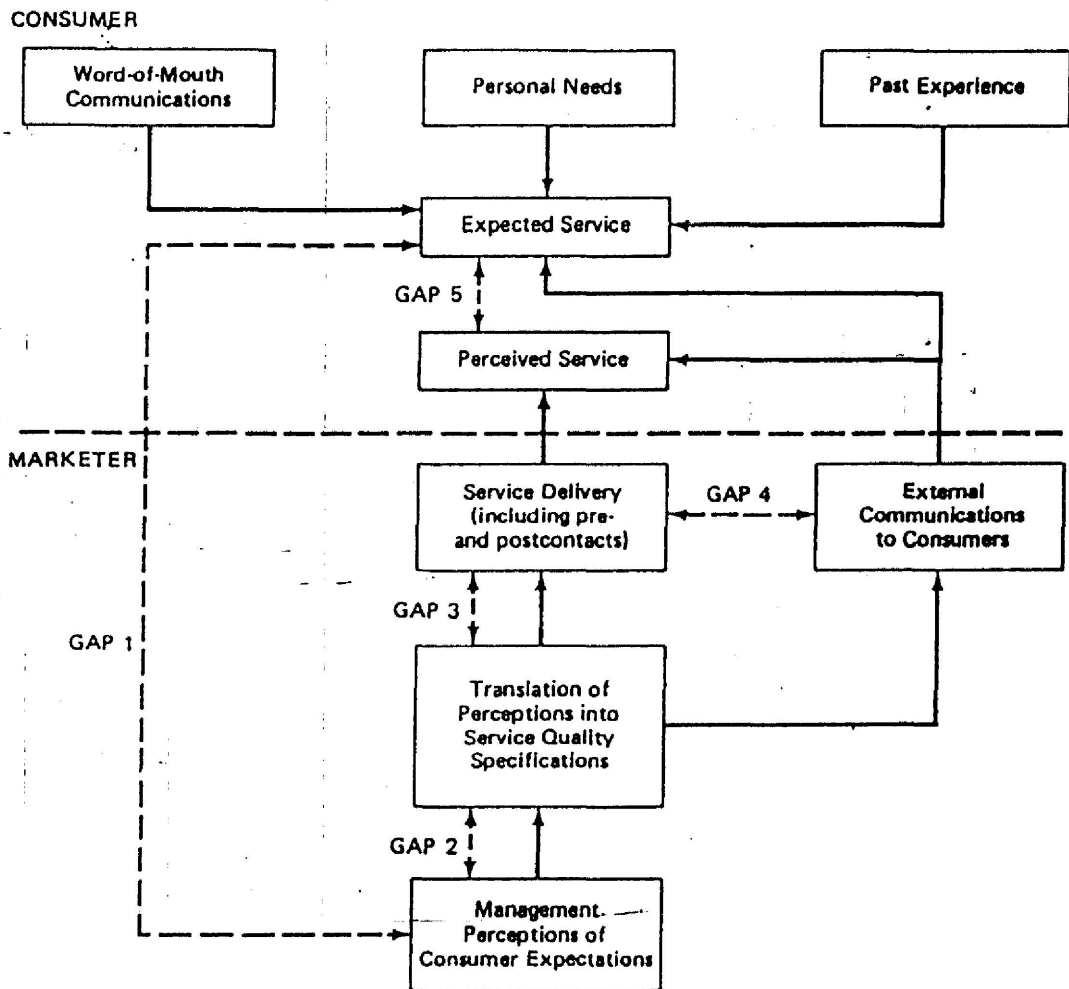


Figure 2.1  
Conceptual Model of Service Quality

Source: Adapted from Valarie A. Zeithaml, A. Parasuraman & Leonard L. Berry, "Communication & Control Processes in the Delivery of Service Quality", Journal of Marketing, Vol. 52, 35-48, American Marketing Association.

## 2.2 DIMENSIONS OF SERVICE QUALITY

The theoretical construct derived from the earlier model has provided a better understanding of service quality. An "Extended Model of Service Quality" was later defined by Parasuraman et al. Figure 2.2 illustrates the various organizational constructs and their relationships to the service quality gaps.

As conceptualized by Parasuraman et al. (1988), service quality is a 5-dimensional construct, consisting of tangibles, reliability, responsiveness, assurance, and empathy. Formal research studies find that reliability is paramount to service customers. Systematic investigation by Parasuraman et al. (1985) through a series of studies in sectors ranging from "pure" services (e.g. insurance) to services associated with tangible products (e.g. appliance repair) shows that reliability is the foremost criterion customers consider in evaluating a company's quality of service.

With subsequent factor analysis and testing, Parasuraman et al. (1988) found that reliability is not the sole determinant of customer's service-quality evaluations. Their research suggests that there are five general dimensions that influence customer's assessments of service quality:

- a) **Tangibles**  
The physical facilities, equipments appearance of personnel.
- b) **Reliability**  
The ability to perform the desired service dependably, accurately, and consistently.
- c) **Responsiveness**  
The willingness to provide prompt service and help customers.

d) **Assurance**

Employees' knowledge, courtesy, and ability to convey trust and confidence.

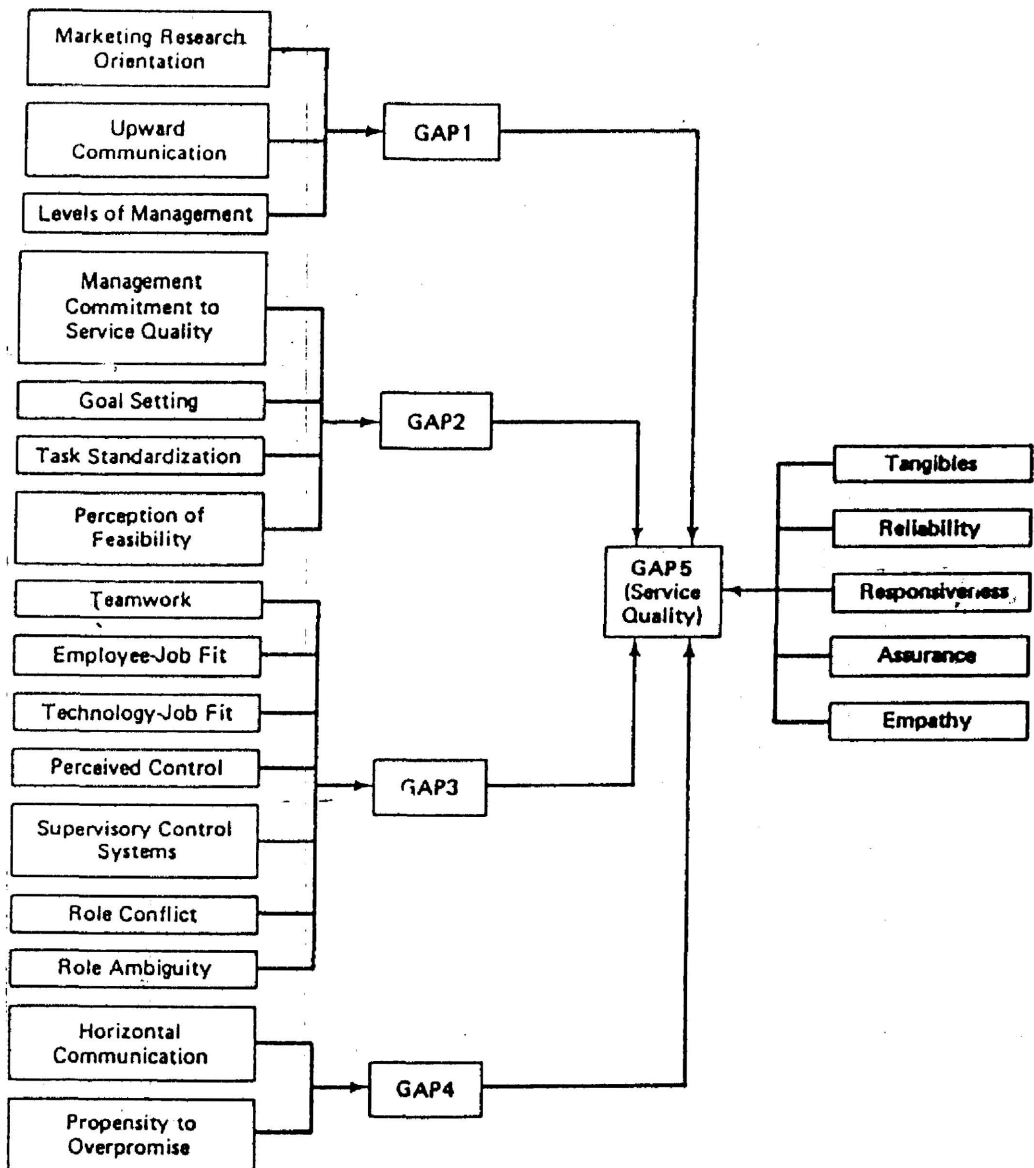
e) **Empathy**

The provision of caring, and individualized attention to customers.

Parasuraman et al. suggest that the criteria used by consumers which are important in forming their expectations and perceptions of service fit the determinants above:

These determinants formed the basis of a multiple-item scale called "**SERVQUAL**" (Parasuraman et al., 1986, 1988), a scale developed by Parasuraman et al. to measure service quality as perceived by consumers (Gap 5). The SERVQUAL scale operationalizes and measures service quality along the five distinct dimensions mentioned above. SERVQUAL scores along these dimensions can be viewed as indicators of the construct of perceived service quality. The SERVQUAL scale is used widely today to measure the service expectations and perceptions of the consumers.

In this study, we will use this tool which has been tested for



**Figure 2.2**  
**Extended Model of Service Quality**

Source: Adapted from Valarie A. Zeithaml, A. Parasuraman & Leonard L. Berry, "Communication & Control Processes in the Delivery of Service Quality", Journal of Marketing, Vol. 52, 35-48, American Marketing Association.

## Chapter 3

### METHODOLOGY

#### 3.1 POPULATION AND SAMPLE

##### 3.1.1 Population and Sample

The population of this study is the practicing Information Technology (IT) or Information Systems (IS) professionals and managers who are involved in making decisions relating to purchases of IT equipments, services and solutions in the Northern region of Peninsula Malaysia. A sample of over 160 Information Technology (IT) professionals was selected randomly from this population to participate in the survey.

##### 3.1.2 Sample Characteristics

In order to ensure the quality of the data to be collected, additional effort was taken to ensure that the respondents selected fulfill the following criteria:

- a) Have at least one year of working experience in a supervisory/management position;
- b) Have two or more years of experience in implementing computer-based information systems;
- c) Working with a company with paid-up capital of not less than 2 million Ringgit, having a workforce of not less than 200, a multinational corporation (MNC), a large government agency or statutory body, or a public-listed company.

## **3.2 STUDY DESIGN**

This study was conducted as a field study to examine the expectations and perceptions of customers implementing IT solutions purchased from a particular IT vendor.

The data were collected over a five-week period. This study was cross-sectional in nature. The unit of analysis for this study was the customer of IT solutions or implementations.

## **3.3 VARIABLES AND MEASUREMENT**

### **3.3.1 The Variables**

From the structural equation model formulated in the Extended Model of Service Quality (Figure 2.2), the perceived service quality gap is the dependent variable and the five determinants (dimensions) of service quality are the independent variables.

### **3.3.2 The Questionnaire**

The questionnaire used in the survey was adopted from the finalized form of "SERVQUAL" scale developed and refined by Parasuraman et al. The SERVQUAL scale represents one of the major outcomes of the programmatic research initiated by Parasuraman et al. (1986, 1988). The service industry referred to in this survey is the Information Technology (IT) industry.

SERVQUAL scale contains twenty-two pairs of Likert-type items. One-half of these items (22) are intended to measure consumers' expected levels of service (expectations) for IT service industry. The other 22 matching items are intended to

measure the perceived level of service (perceptions) provided by the service organization.

The items are presented in a 7-point scale response format, which anchored with "Strongly Agree" (7) and "Strongly Disagree" (1). The middle scale (4) denotes "Neutral" response, i.e. "Neither Agree Nor Disagree".

These two sections of the scale represent the two main components of service quality, i.e. "expectations" (E) and "perceptions" (P) which were designed to measure consumers' "desired level" (expected) of service from the IT implementation and the "existing level" (perceived) of service from their respective major IT vendors.

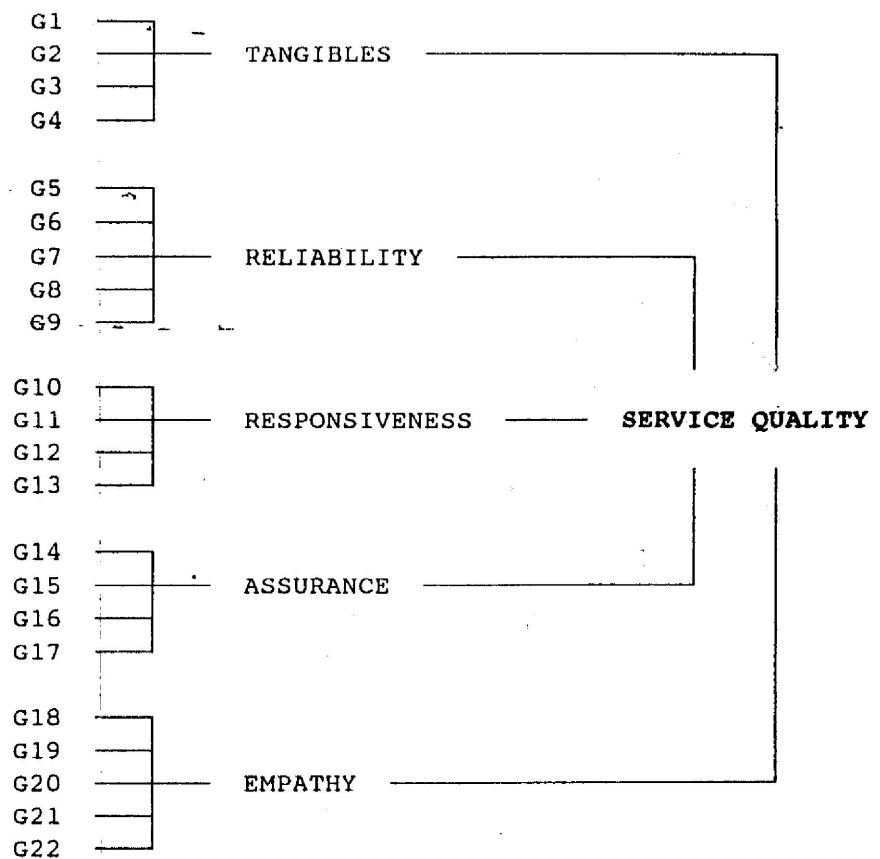
### 3.3.3 The SERVQUAL and the Dimensions of Service Quality

The questionnaire was intended to measure the attributes of the five dimensions or determinants of service quality as conceptualized by Parasuraman et al. This five determinants are measured by the "difference" or "gap". Gap (G) is equal to Perception (P) minus Expectation (E).

The detailed breakdown of the questions measuring each determinant are shown here in Figure 3.1.

The twenty-two pairs of items (#1 to #22) were grouped into five categories, with each group measuring one dimension of service quality.

Two groups of questions have been negatively coded to ensure that the questions did not fall into a pattern during answering. These two groups (items #10 to #13 and items #18 to #22) measure "Responsiveness" and "Empathy" respectively.



where G = P - E, and the G# number indicates the item number # in the SERVQUAL scale.

**Figure 3.1**  
**Service Quality as conceptualized by Parasuraman, Zeithaml, and Berry (1988) as fit by SERVQUAL scale**

Along with SERVQUAL, the survey instrument used in this study also contained questions pertaining to the industry characteristics of the respondents' organizations. These classificatory questions were later used for analytical purposes.

Altogether there were five sections including three additional sections for classificatory questions. These sections were:

- Section I:        Expectations of service quality
- Section II:      Perceptions of service quality received
- Section III:     About the respondent's IT vendor
- Section IV:     About the respondent's organization
- Section V:      About the respondent himself or herself

#### 3.3.4 Administration of Questionnaires

The questionnaires were mailed to the selected respondents. A cover letter, with brief introduction of the study was attached to each set of questionnaire. A postage-prepaid return envelope was included for the convenience of the respondents. Telephone calls were made to the selected respondents to introduce the author and the objective of the study to obtain agreement from them to participate in the study. This significantly improved the rate of return.

A total of 162 questionnaires were mailed to selected sample of respondents using random sampling from trade listing. It included the multinationals, local manufacturers, government, and statutory bodies. A total of 71 usable responses were received, achieving a response rate of 43.8%.

#### 3.4 DATA-ANALYSIS METHODS

The data collected was computed statistically for detailed analysis of the expectation-perception gap in service quality. "SPSS for Windows" package was used for statistical analysis. Service quality was measured by calculating the difference between corresponding items (i.e. Perceptions minus Expectations).

Statistical techniques used in the analysis include:

- a) Frequencies (distribution) for sample characteristics;
- b) Descriptive for the service quality gaps;
- c) Paired-samples t-test for hypothesis testing for difference between means of expectations and perceptions of service quality;
- d) One-Way ANOVA for hypothesis testing of service quality gap across different industries;
- e) Friedman Two-Way ANOVA for testing the whether the service quality determinants vary within each industry.

## Chapter 4

### DATA ANALYSIS AND RESULTS

#### 4.1 DATA ANALYSIS

##### 4.1.1 Data Collected

###### a) The Respondents

The data collected indicates a good response from the IT/IS managers or department heads, who are usually the decision makers or key recommender for IT purchases, making the data more representative of the overall population of IT professionals. 40% of these respondents are IS managers or department heads with another 29.6% of them systems analysts or senior systems analysts. 12.7% are practicing IS executives.

Generally the respondents are from young IT professionals - 71% of the respondents are within the age group of 26 to 35 years. There are 77.5% male respondents as compared to 22.5% female.

Being professionals, the respondents are from good educational background, with 67.6% of them graduates with first degree and 18.3% with diploma. All of them have three or more years of working experience in IT. Among them, up to two-thirds (66.2%) have more than six years of IT experience.

###### b) The Organizations

The response rate from the multinationals (MNCs) with facilities established in industrial areas in Penang and

Prai is the highest. This is partly due to the fact that more than 50% of the questionnaires were sent to these multinational corporations. The responses obtained from the type of organizations were tabulated as follows:

**Table 4.1**  
**Type of Organizations**

Type of Organizations	Response Rate	% in Sample
1) Multinationals (MNCs)	66.2%	52.5%
2) Local Companies	23.9%	33.3%
3) Government and Statutory Bodies	9.9%	13.0%
4) Others	0.0%	1.2%

Further breakdown on the responses revealed the following statistics:

**Table 4.2**  
**Type of Industries**

Type of Industries	Response Rate
1) Manufacturing (excluding computers)	60.6%
2) Manufacturers of computers, components and comm. products	15.5%
3) Government and Statutory Bodies	9.9%
4) Service Industry	12.7%
5) Others	1.4%

Of these organizations, 85.9% have Local Area Networks (LANs) installed in their organizations, 57.7% of them have workstations and 70.4% with minicomputers, and 29.6% of these organizations have large mainframe

installed. This made up a reputable profile for the respondents' credentials.

c) **The IT Vendors**

Most of the responding organizations were serviced by large IT vendors (46.5% were doing business with vendors with more than 100 employees). Of the IT vendors, 66.2% were suppliers of application solutions and 87.3% were suppliers of computer hardwares and peripherals. Only 28.2% of them were providing IT consultancy services.

Almost half of these IT firms are local companies (46.5%) of Another one-third (33.8%) were international IT firms.

## 4.2 RESULTS

### 4.2.1 Does Service Quality Gaps Exist?

The results tabulated from the questionnaires received were listed in the table shown below (Table 4.3). Each of the 22 pairs of scale items was calculated for the mean of the first half - Expectations (E), and the second half - Perceptions (P).

From the analysis, the "differences in agreement scores" between the respondents' expectations (E) and perceptions (P) on the individual items were tabulated. The tabulations were done by first finding out the "gap" for each individual response ( $G = P - E$ ), followed by finding the mean for each item.

Table 4.3  
Means of Expectations and Perceptions

Item No	SERVQUAL Scale Items	Mean of E	Mean of P
1)	Have up-to-date equipment	6.49	6.61
2)	Physical facilities should be visually appealing	5.27	5.25
3)	Employees well dressed and appear neat	5.59	5.92
4)	Facilities should be keeping with type of services provided	5.99	5.59
5)	When promise to do something by a certain time vendors should do so	6.77	5.28
6)	Sympathetic & reassuring when customers have problems	6.25	5.38
7)	Should be dependable	6.35	5.46
8)	Provide services at the time they promised to do so	6.75	5.20
9)	Should keep records accurately	6.45	5.21
10)	Tell customers when services will be performed	5.28	4.90
11)	Expect prompt service form employees of vendors	5.65	4.94
12)	Always willing to help customers	6.25	5.58
13)	Respond to customer requests promptly	5.90	4.79
14)	Able to trust employees of vendors	5.32	5.46
15)	Able to feel safe in transactions with vendors' employees	5.44	5.49
16)	Should be polite	6.27	5.77
17)	Should get adequate support from firms to do their jobs	6.41	5.35
18)	Expected to give customers individual attention	5.27	4.61
19)	Employees expected to give customers personal attention	5.00	4.63
20)	Expected to know needs of their customers	5.42	5.18
21)	Have customers' best interests at heart	5.30	5.03
22)	Have operating hours convenient to all customers	5.18	4.87

Scores for the total scale and each factor range from -6 to +6 where positive scores reflect perceptions exceeding expectations, i.e.  $P - E > 0$ . The 22 items also were categorized into five service quality dimensions as in the model conceptualized earlier (Table 4.4).

**Table 4.4**  
**Table of Analysis of Gap Means**

	Dimensions of Service Quality	Gap for each item G = P-E	Gap Mean	Standard Deviation
1)	<b>Tangibility</b>	G1	-0.89	1.29
		G2	-0.01	1.65
		G3	0.32	1.25
		G4	-0.39	1.18
2)	<b>Reliability</b>	G5	-1.49	1.45
		G6	-0.87	1.28
		G7	-0.89	1.23
		G8	-1.55	1.41
		G9	-1.24	1.58
3)	<b>Responsiveness</b>	G10	-0.38	2.17
		G11	-0.70	1.94
		G12	-0.68	1.31
		G13	-1.11	1.69
4)	<b>Assurance</b>	G14	0.14	1.61
		G15	0.06	1.44
		G16	-0.49	1.17
		G17	-1.06	1.37
5)	<b>Empathy</b>	G18	-0.66	1.84
		G19	-0.37	1.42
		G20	-0.24	1.84
		G21	-0.27	1.66
		G22	-0.31	1.99

For all the 22 pairs of items, only three of them: items #3, #14 and #15 are having positive gap where Perception (P) is greater than Expectation (E). However for items #14 and #15, though having positive gaps ( $P - E > 0$ ), the gaps are statistically not significant (Table 4.5).

This suggests that as perceived by customers, the quality of service provided by their respective IT vendors "exceed" their expectations in only one area where "Employees of IT vendors are well dressed and appear neat."

In general, the means of 19 other items show that  $E > P$ , i.e. customers' expectations of service quality are higher than their perceptions of quality of service actually received. We could note that "service quality gap" does exist in the implementation of IT solutions by IT vendors.

Service Quality Gaps in IT Implementations  
Expectations vs Perceptions of Service Quality

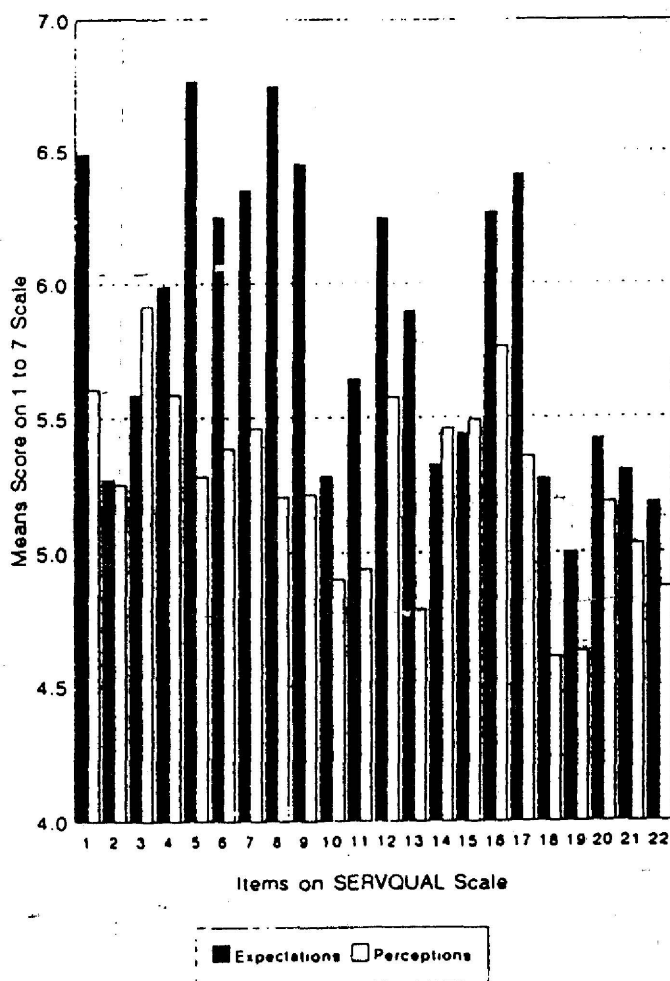
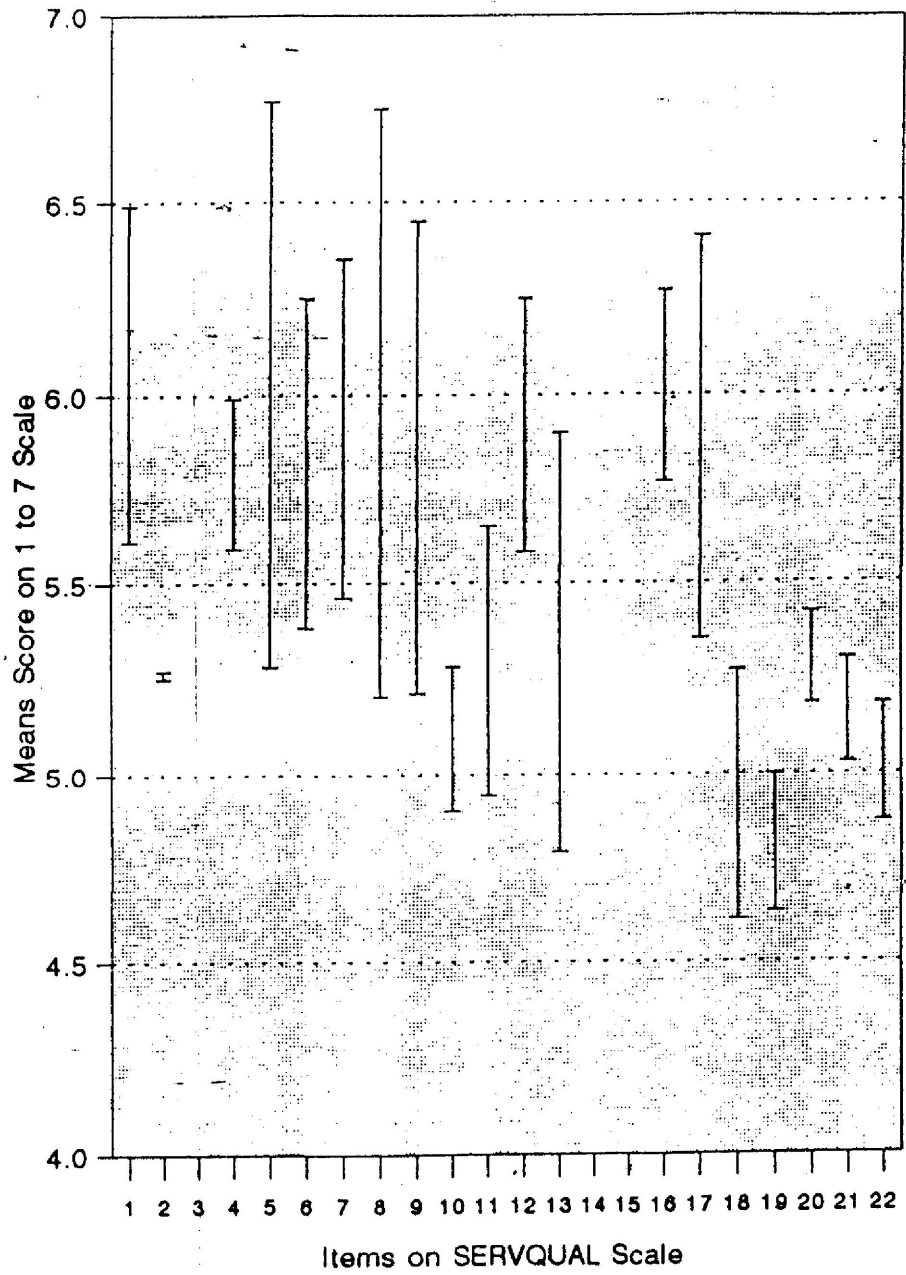


Figure 4.1

Service Quality Gaps (Expectations vs Perceptions)

# Service Quality Gaps in IT Implementations Expectations vs Perceptions of Service Quality



**Figure 4.2**  
**Service Quality Gaps**