



# Service Quality Improvement in an Air-Conditioning Business

by

Ms. Amarang Jitawiriyakul

A Final Report of the Six-Credit Course  
CE 6998 - CE 6999 Project

Submitted in Partial Fulfillment  
of the Requirements for the Degree of  
Master of Science  
in Computer and Engineering Management  
Assumption University

November 2003



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Project Title            Service Quality Improvement in an Air-Conditioning Business

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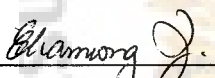
Project Advisor        Dr. Chamnong Jungthirapanich

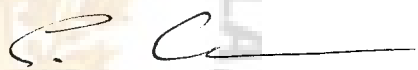
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The Graduate School of Assumption University has approved this final report of the six-credit course, CE 6998-CE 6999 PROJECT, submitted in partial fulfillment of the requirements for the degree of Master of Science in Computer and Engineering Management.

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## ABSTRACT

The important essence in air-conditioning business is to deliver customers the quality product and an impressive service. In order to remain in this highly competitive market, the company needs to have a competitive advantage in different options to attract new customers together with keeping the existing customers.

The objectives of the research are to grasp customer's perception and expectations towards the air-conditioning services and to study the outcomes of a service quality audit assist in identifying service strengths and weakness.

The descriptive research is designed to describe the current phenomena of the service. The survey is conducted by administering questionnaire for collecting data from respondents and processing data by SPSS program for a summary of the findings.

Based to the findings, customers strongly agree that current service is reliable with expertise and courtesy of service providers. It is likely to respond to the air-conditioning service objectives of providing quality services. However, communication is viewed as an important factor in enhancing the service because most respondents expect the company to improve services through advertising and public relations, embracing new technology, and service skills and knowledge development.

## ACKNOWLEDGEMENTS

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# **I. INTRODUCTION**

## **1.1 Background of the Study**

Changes of weather and temperature difference between the human body and the ambient surroundings lead to a change in his cosiness (for example sweating or freezing). This perception has lead to the development of a cooling system, called air-conditioning which has had an incredible impact on the way we live, giving us the option to work, play and relax in controlled environments. Recently, it has become a necessity of life such as in houses, workplaces, stores and shopping malls, cars, etc.

In order to maintain air-conditioners to be well operating, productively working, and ensure long useful life and minimize accident hazards, customers need to learn how to use air-conditioning properly through handbooks. In addition, it's more essential to receive a quality service in installation, maintenance and service after sales such as the regularly clean and periodically maintenance from reliable, professional technicians.

Nowadays, there is more highly competitiveness in an air-conditioning business, big firms often apply marketing strategies to cut down the selling price. In the meantime, air-conditioners from China are imported to compete at a cheaper price. These also affect small businesses to burden the high cost. To be able to survive in the market, we need to have a competitive advantage in different options to attract and fulfill customer satisfaction.

We realize that strong emphasis upon products and service quality has become the major key to success and effectiveness of the modern industrial firm. Thus, we should pay more attention to providing quality products and services through productive operation with honesty, prompt services and job warranty.

This project is to study and recommend improvement in service and operation process with the case of a distributor company, which is unsystematic, and managed in a family style. Most tasks are operated by a manual system; it's rather hard to keep track where the job procedure is. Not only is the job delayed, but also disputes often occur within the company to disclaim the responsibility. In addition, there are no sales and marketing department to expand the customer base.

Because the characteristics of services are intangible, understanding the customers and their expectations is essential in designing a quality service. As a member of the organization, it is necessary to know the meaning of quality in service from our customers. Firstly a survey methodology is planned to study customers' attitude towards current service; buying decision, level of customers' satisfaction in an existing service and customers' expectation towards air-conditioning business. Then we can use them as a guideline to improve quality of service.

## **1.2 Project Objectives**

This project is aimed to improve service quality by surveying customers' perception in order to meet the following objectives:

- (1) To study the current operating system.
- (2) To survey customers' perception toward current service.
- (3) To study opportunities to improve quality in an air-conditioning service.
- (4) To provide the quality service to satisfy the customers.

## **1.3 Project Scope**

This project focuses on the possible operations improvement in an air-conditioning business, starting receiving requests and orders, passing jobs to service departments, assigning the technicians to work, keeping tracks of customers' orders till

collecting money from customers when the job is done. Also, the administration works and management of information within companies are discussed.

However, the service improvement priorities will be related to recommendations of current customers, who are serviced by Airsico in year 2003.



## **H. LITERATURE REVIEW**

Today, more and more businesses are realizing the importance of service, which plays in the future success. It is important not only to provide the quality products to customers, but also to render great service for customer satisfaction. Generally speaking, businesses that do not provide good services will not survive. Air-conditioning business is involved in rendering services to survive in the competitive market as well, especially the air-conditioning distributors who do not have their own products. The high cost of quality products is burdensome for distributors. They could not cut product price in high competitions as manufacturers. Thus, they can differentiate themselves from competitors by services.

The service's unique characteristics of intangibility, nonstandardization, and inseparability lead them to possess high levels of experience and credence properties, which, in turn, make them more difficult to evaluate than tangible goods. Customers must experience the tangible service to really know it. Services are dominated by experience qualities, attributes that can be meaningfully evaluated only after purchase and during production-consumption. In service, both post-sale marketing through orchestrating a satisfying experience for customers during operation and word-of-mouth communication have prominent effects in winning customers' loyalty. As we see, quality service leader can create brand awareness and induce trial before the sales, but they demonstrate benefits and build brand preference most effectively after sales.

This project has collected concepts, which are involved in the subject to be the guidelines for study and to analyze data as follows:



## **2.1 Service Quality**

### **The Meaning of " Service Quality"**

Firstly, we need to understand the meaning of quality so that we will be able to measure and assess the current service, a difficult but often essential task. Usually, people understand the meaning of quality as the term of an excellent product or service that fulfills or exceeds our expectations. And these expectations are based on the intended use and the selling price.

The word of "quality" has a variety of meanings in addition to "fitness for use" and "quality is customer satisfaction (Juran)." According to American National Standards Institute (ANSI) and American Society for Quality Control (ASQC), quality is "the totality of features and characteristics of a product or services that bears on its ability to satisfy given needs." This needs involved reliability, usability, safety, durability, availability, economics (price), maintainability and environment.

This project focuses on service quality, so the key to ensuring good service quality is meeting or exceeding what customers expect from the service. Judgments of high and low service quality depend on how customers perceive the actual service performance in the context of what they expect. Therefore service quality, as perceived by customers, can be defined as the extent of discrepancy between customers' expectations or desires and their perceptions. And the key factors influencing customers' expectations are word-of-mouth communications, personal needs, past experience, and external communications (Zeithaml, Parasuraman, and Berry 1990).

### **Dimensions of Service Quality**

Services can be divided into two dimensions (Barron and Harris 1995):

- (1) Technical quality refers to the relatively quantifiable aspects of services what is being done.

- (2) Functional quality refers to how the technical quality is being delivered to customers.

Because quality service is integral to value creation for customers, it must always be a point of emphasis in the service strategy. There are three principles of creating great services; reliability, recovery, surprise and fairness. Surprising services is difficult to exceed customers' service expectations without the element of surprise. To improve quality is the extent to meet the customer' requirements. In addition, Leonard L. Berry suggest five service dimensions as follows:

- (1) Reliability — the ability to perform the promised service dependable and accurately
- (2) Tangibles — the appearance of physical facilities, equipment, personnel, and communications materials.
- (3) Responsiveness — the willingness to help customers and provide prompt service.
- (4) Assurance — the knowledge and courtesy of employees and their ability to convey trust and confidence.
- (5) Empathy — the caring, individualized attention provided customers.

Service quality is more directly related to time, and the interaction between employees and the customers. Evans and Lindsay identify the following dimensions of service quality.

- (1) Time and timeliness: How long customer must wait for service, and if it is completed on time.
- (2) Completeness: Is everything the customer asked for provided?
- (3) Courtesy: How employees treat customers?

- (4) Consistency: Is the same level of service provided to each customer each time?
- (5) Accessibility and convenience: How easy it is to obtain the service.
- (6) Accuracy: Is the services performed right every time?
- (7) Responsiveness: How well the company reacts to unusual situations, which happen frequently in a service company.

Parasuraman, Zeithaml and Berry identified ten general dimensions that represent the evaluative criteria customers use to assess service quality in Table 2.1.

Table 2.1. Ten Dimensions for Evaluating Service Quality (Parasuraman, Zeithaml and Berry1990).

Dimensions	Description
Tangible	Appearance of physical facilities, equipment, personnel, and communication materials. It includes the physical representative of service, such as tools and equipment of technicians.
Reliability	Ability to perform the promised service dependably and accurately. It involves accuracy in tracking cause of problem, providing service right at the first time.
Responsiveness	Willingness to help customers and provide prompt service. It involves timeliness of service, as employee is willing to answer customer question, firms can specify the time when technician will show up and resolve the problem quickly.
Competence	Possession of the required skills and knowledge to perform the service. It involves knowledge and skill of the technicians, the contact and operational support personnel.
Courtesy	Politeness, respect, consideration, and friendliness of contact personnel. It includes clean and neat appearance of public contact technicians and polite words of operator who receive request orders.
Creditability	Trustworthiness, believability, honesty of the service provider. It contributed by the company's name, reputation and guarantee of services.
Security	Freedom from danger, risks, or doubt. It involves physical safety, confidentiality of repair job done properly.

Table 2.1. Ten Dimensions for Evaluating Service Quality (Parasuraman, Zeithaml and Berry1990). (Continued)

Dimensions	Description
Communication	Keeping customers informed in language they can understand and listening to them. It involves explaining about the service and assuring the consumers that a problem will be solved.
Understanding the Customers	Making the effort to know customers and their needs. It involves learning the customer's specific requirements, providing individualized attention, and recognizing customer to be flexible enough to accommodate his schedule.

### The SERVQUAL Dimensions

Later on, PZB advocated that the ten dimensions could be collapsed into five dimensions shown in Table 2.2 (Baron and Harris 1995). Three dimensions as tangibles, reliability, and responsiveness are remaining. The other seven dimensions are divided into two new dimensions: assurance and empathy.

Five dimensions of measuring service quality.

- (1) Tangible
- (2) Reliability
- (3) Responsiveness
- (4) Assurance (including competence, courtesy, creditability, and security)
- (5) Empathy (including access, communication, understanding the customer)

Table 2.2. SERVQUAL Dimensions for Measuring Service Quality (Schiffman and Kanuk 1997).

Dimension	Description
Tangibles	The appearance of physical facilities, equipment, personnel and communication materials.
Reliability	Ability to perform the promised service dependably and accurately.
Responsiveness	Willingness to help customers and provide prompt service.
Assurance	Knowledge and courtesy of employees and their ability to inspire trust and confidence.
Empathy	Caring individualized attention the firm provides to its customers.

### The Psychology of Customer Satisfaction

Because services are performances rather than objects, they are difficult for customers to evaluate prior to purchase. With services, purchase precedes experience.

Dependable, accurate service increases the customers' confidence in the company; frequent service mistakes destroy the customers' confidence. Most customers appreciate a sincere apology when a service problem occurs, but the apology does not erase the memory of failed service. If the pattern of service mistakes develops, customers conclude that the company can not be depended on to provide the promised service (Leonard L. Berry).

The success of service business ultimately depends on customers' evaluation. Perceived quality is particularly rational perception whereas satisfaction is an emotional or feeling reaction. Perceived quality does influence satisfaction (Rust, Zahorik, and Keiningham 1996).



Satisfaction is the outcome of the evaluation a consumer makes of any specific transaction (Baron and Harris 1995: 165). Satisfied customers make repeat purchases and tell others about their good experience with the product. So, quality begins with customer needs and ends with customer satisfaction (Kotler et al. 1998).

In addition, satisfaction involves the concept of delight. Delight is the highest level of satisfaction and it translates into better outcomes than can be achieved through other levels of satisfaction.

Effective service marketing requires the understanding of thought process by consumers during each of these purchasing stages (Bateson 1992).

- (1) The Prepurchase Stage. Activities occurred before acquisition of the service. Consumer selects the most satisfied option from the relevant information.
- (2) The Consumption Stage. Activities of buying, using and disposing services. It is necessary to understand consumer's reaction to the interactive process.
- (3) The Postpurchase Stage. Recommend stimulates any further purchases since buying service is a major risk on the part of the consumer.

Consumers will face uncertain outcomes in making purchasing decisions. The amount of risk perceived depends on the specific consumer. High-risk perceiver is the narrow categoriser who limits choices of selection, low-risk or broad categoriser tends to make choice from wider range of alternatives (Schiffman and Kanuk 1997).

As shown in the Figure 2.1. that consumers evaluate services by comparing received services they perceive with their expectations.

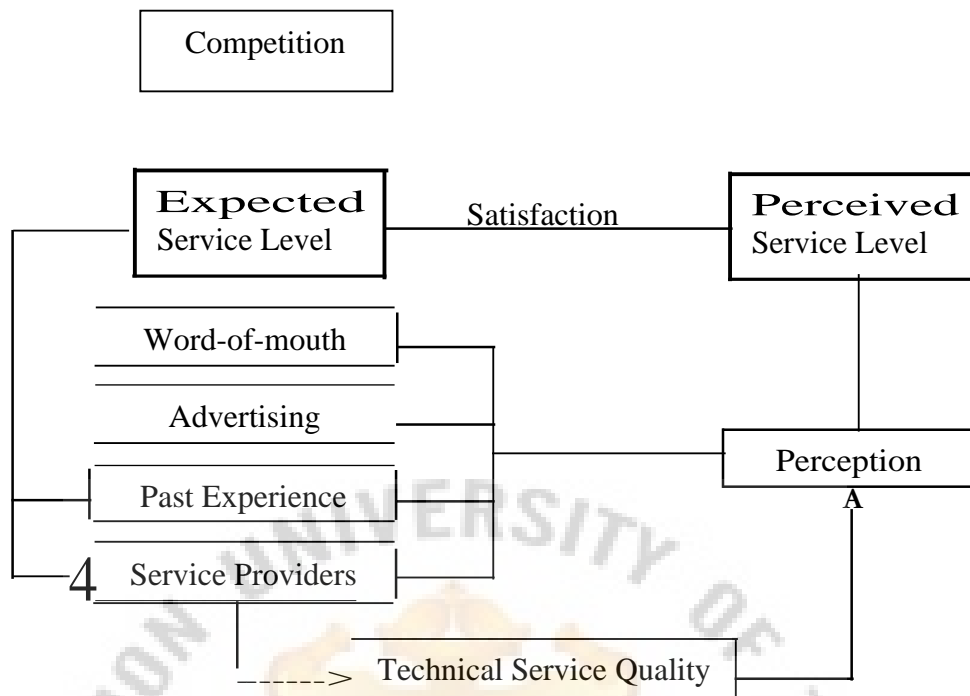


Figure 2.1. A Model of Consumer's Satisfaction (Bateson 1992: 87).

Past experience or word-of-mouth communication from others can influence expectations. They are beyond the control of management. Advertising and service providers can create expectations. They make promises and commitments as an implicit contract in the consumer's mind. Technical service quality perceived as the reality to measures the firm's service operation. The success or failure of the service firm can be partly attributed to ability or inability to manipulate the customer experience as the output of interpersonal interactions (clients vs. employee, clients vs. clients) and human environment interactions (employee vs. environment and supporting facilities, customer vs. service environment and supporting facilities).

Marketing aims to attract new customers by promising superior value, and keep current customers by delivering satisfaction (Kolter et al. 1998). Consumers usually make decisions based on perceived value and select the greatest delivered value.

Consumer value is the difference between the values of owning and using a product and costs of obtaining the product. Customer satisfaction depends on perceived performance in delivering product value to buyer's expectation. Thus, quality begins with customer needs and ends with customer satisfaction.

### Service Quality Model

The conceptual model of discrepancy shown in Figure 2.2 explains that consumers would perceive service quality through the provider's service delivery, including pre-contacts and post-contacts. This model serves as a concise framework for understanding, measuring, and improving service quality.

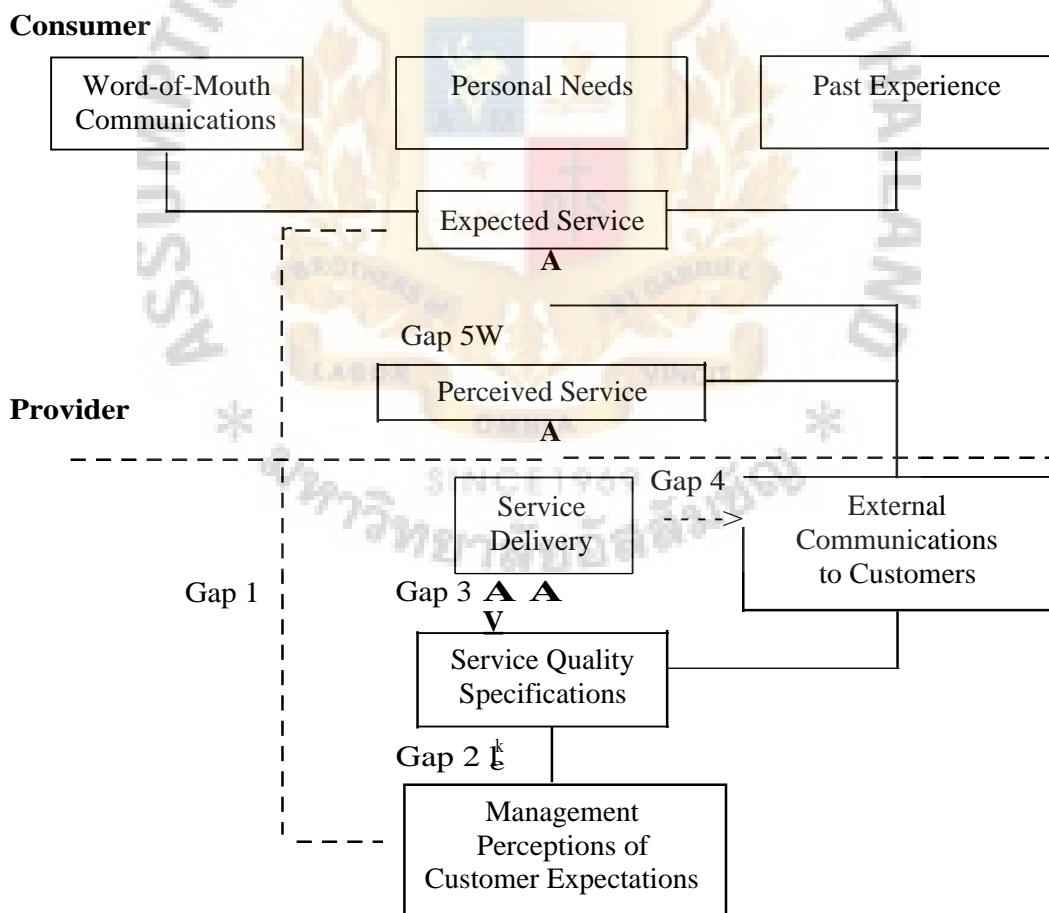


Figure 2.2. A Conceptual Model of Service Quality (Zeithaml, Parasuraman, and Berry 1990: 46).

Zeithaml, Parasuraman, and Berry (1990) suggest that the key to improve the quality of service is closing Gap 5 by closing Gaps 1 through 4 and keep them closed. Four key factors influencing expectations are word of mouth communications, personal needs and preferences, past experiences, and external communications.

Five gaps model can be described as follows:

Gap 1: the discrepancy between customer expectations and management perceptions of those expectations

It is difficult to comprehend when the customer do desire or remain absence of services. Such a gap requires building up the service operation to respond to that desire.

Gap 2: the discrepancy between management perceptions of customer expectations and service-quality specifications for service delivery.

If customer expectations have been accurately determined, the quality of service delivery should meet the customer's requirements. Five criteria for evaluating service quality are tangibles, responsiveness, empathy, assurance, and reliability.

Gap 3: the discrepancy between service-quality specification and actual service delivery.

This gap concerns the actual service performance. It depends on the ability to provide services according to the specification

Gap 4: the discrepancy between actual service delivery and the quality of that service delivery as described to the firm's external communications.

It might be termed the promised gap that lies between what the firm promises to deliver in its communication and what it actually delivers to the customer.

Gap 5 : the discrepancy between customers' expectation of service and perception.of the service actually delivered.

Consumers perceive quality from the actual service performance by the gap between expected service and perceived service.

### **Enhancing Service Quality**

#### **Service Quality Shortfalls**

Four potential shortfall within the service organization that may lead to a gap between what customers expect and what they receive (Lovelock 1996).

- (1) Not knowing what customer expects.
- (2) Specifying service quality standards that do not reflect what management believes to be customer's expectations.
- (3) Service performances that do not match specifications.
- (4) Not living up to the level of service performance that is promoted by marketing communication.

#### **Customer Service Function**

Customer service or the personal interaction with customers should be well designed, performed and communicated for customer satisfaction and efficient operation. Five service strategies of integrating customer service activities include:

- (1) Conducting ongoing research to determine customer's needs, wants, and satisfaction levels concerning each of their service encounters.
- (2) Identifying the key sources of customer satisfactions or dissatisfactions and relating them to current service elements.
- (3) Setting service level standards for each element with reference to how they relate to each other.
- (4) Deciding job and technology system to meet those standards.
- (5) Periodically revising standard the delivery system the light of changing customer preference, technological innovation, and competitive activities.



Five dimensions staff support areas and their definitions (Hayes 1998: 11):

- (1) Availability of support. The degree to which the customer can contact the provider
- (2) Responsiveness of support. The degree to which the provider reacts promptly to the customer
- (3) Timeliness of support. The degree to which the job is accomplished within the customer's stated time frame and/or within the negotiated time frame.
- (4) Completeness of support. The degree to which the job is totally finished.
- (5) Pleasantness of support. The degree to which the provider uses suitable professional behavior and manners while working with customers.

## **2.2 The Research Process**

Research can be described as a systematic and organized effort to investigate a required solution from a specific problem.

### **Steps in the Research Process**

- (1) Define Research Objectives.
- (2) Determine Research Design.
- (3) Develop the Data Collection Procedure.
- (4) Design the Sample.
- (5) Collect the Data.
- (6) Process and Analyze the Data.
- (7) Present Research Results.

### **Define Research Objectives**

Research Objective is the researcher's decision of the problem under study. It defines the purposes of the research and the standards for what the research should be accomplished.

## Determine Research Design and Sources of Data

Research design is based on the purpose of the study. Exploratory research is the initial research conducted to clarify the nature of problem. Descriptive research is used to describe marketing situations such as the market potential for a product or the demographic and attitudes of consumers (Kotler et al. 1998).

Respondents are major primary source of marketing data (Kinnear and Taylor 1996). The researcher can gather information from secondary or primary data or both. Secondary data provide a good starting point for research and often help define problems and research objectives (Kotler et al. 1998).

## Design the Data Collection Procedure

Data collection method for exploratory research is qualitative technique, such as focus group and in-depth interview. Descriptive research develops quantitative data by collecting data through the questionnaire interviewing. A questionnaire is the self-administered method. Attitude rating scale is used to measure an individual agreement to a single question (Aaker, Kumar, and Day 1998).

## Design the Sample

The sampling process to specify the target population, to decide sample size, and to select the specific procedure for determining the sample. Sampling plans are probability and nonprobability.

## Collect the Data

Collecting information through survey research is the moment response mood. It requires how to make the respondents understand and participate in filling out questionnaire or talking with researcher in a personal interview.

## Process and Analyze the Data

Data processing generally begins with editing before transferring data to the computer and then coding data by computer or hand tabulation. Data analysis is the logic application to understand the gathered data by the statistical analysis.

## Present Research Results

Report presentation must be completed and thoroughly objective. True objectivity must be kept constantly through the entire report process.

## Survey Research

Survey is a method of collecting primary data based on communication with representative sample of individuals either verbal or written interviewing (Zikmund 1997). It is used to typically identify characteristics of a particular group, to measure attitudes, and to describe behavioral patterns. Most surveys are descriptive, but they can be designed to provide casual explanations or to explore ideas. Communication modes include personal or telephone interviews, mail surveys and observation.

## Survey Instrument Design

### Structure-Unstructured Questions

- (a) Structured or fixed-alternative questions. The questions are fixed and the responses allowed are completely determined. The respondents select the answer closest to their own viewpoints.
- (b) Unstructured or open-ended questions. The questions asking for anticipated reactions toward the topic of unknown responses. The respondents can answer in their own words.

### Disguised-Undisguised Question

- (a) Disguised question is an indirectly hidden in the purpose of the study.

- (b) Undisguised is a straightforward question assumed that the respondent is willing to answer. The purpose of the research is obvious.

Major problem in developing questionnaire is framing alternative to be non-overlapping categories. Questions are typically classified as structured-disguised, structured-undisguised, unstructured-disguised, and structured-disguised.

In developing survey instrument, there are four major decision areas:

- (a) **Question Content.** It should provide the sufficient information with the proper scope related to the research.
- (b) **Question Wording.** The interviewer and the respondents should have the shared meaning. It concerns the technical writing.
- (c) **Response Structure.** The design of the explicit alternatives determined by research objectives and respondent degree related to the topic.
- (d) **Question Sequence.** It arranges all questions in order and relates each to the other in the question instrument.

Pretesting the questionnaire helps to reveal any errors and to develop the appropriate alternative forms.

#### Self-Report Attitude Scales

Self-report is a method of assessing attitudes in which individuals are asked about their benefits or feelings toward an object or class of objects. Several techniques are:

- (a) **Nominal Scales.** The respondent's beliefs are classified in two or more.
- (b) **Rating Scales.** It requires the respondents to indicate the position among ordered categories that corresponds their attitudes.

Some examples of attitude rating scales are:

- (a) Simple Attitude Scaling. The simplest scale using a yes/no or agree/disagree response to a single question. The respondent indicates the past experience, preference, and the like by checking an item in the checklists.
- (b) The likert Scale. Developed by Rensis Likert to measure agreement with a series of statements from very positive to very negative. Responses assigned weights of 5, 4, 3, 2, and 1 to indicate the degree of respondents' attitudes. The most favorable indicated by weight of 5 and next sequences rating 4, 3, 2, and 1 until reach the strongest negative side.
- (d) Semantic Differential. Developed by Charles Osgood to indicate the attitudes by the seven-point bipolar adjective scales, such as "modern and old-fashioned", "clean and dirty", "good and bad". The assigned weights are 7, 6, 5, 4, 3, 2, 1 or +3, +2, +1, 0, -1, -2, and —3 consequentially.

Data Analysis Theory (Aaker, Kumar, and Day 1998)

Some examples of data analysis theory are as follows:

- (a) Tabulating the Data. The primary use of tabulation is in determining frequency distribution of variables and calculating the descriptive statistics, particularly the means or percentages.
- (b) Cross-tabulations. Namely as cross-tabs, cross-classification, or contingency table analysis. It is an appropriate statistical analysis technique for studying the relationships among and between nominal variables.
- (c) Hypothesis Testing. It is purposively to make a judgement about the difference between two samples statistics or the sample statistics and a hypothesized population parameter.



(d) Factor Analysis. It is a method to reduce the number of dimensions by combining the same dimensions into one single factor. A correlation would reveal that the two measures are highly correlated (Churchill, JR. 1996).



### III. RESEARCH METHODOLOGY

#### 3.3 Overview of Operations of Air-Conditioning Business

This section is designed to give you a brief idea of company profile, its actual status and working condition, operation of air-conditioning business and services provided to customers in order to know the company's statement of problems and the important reasons of the project's objective about quality improvement.

##### Company Profile

Name:	Airsirco Engineering Co., Ltd. (ASC)
Location:	99/1008 Krungthep Kreetha Road, Sapansung, Bangkok 10250
Established:	April 27, 1982
Type of business:	- Sales, services and installation of air-condition and refrigeration - Design, installation and maintenance of pipeline system, cooling & refrigeration system, electricity system and other autonomic control system in the office building and factory.
Registered capital:	3 million bahts
Stock:	Held by Thai people only
Number of worker:	about 20 workers

Established in 1982, Airsirco Engineering Co.,Ltd. has served with a high quality in service and product in order to maximize the customer satisfaction . Major revenue comes from post-sales services and other services in the form of retail to customers in both household and factory. Nowadays the company has 18 employees that is 50% less

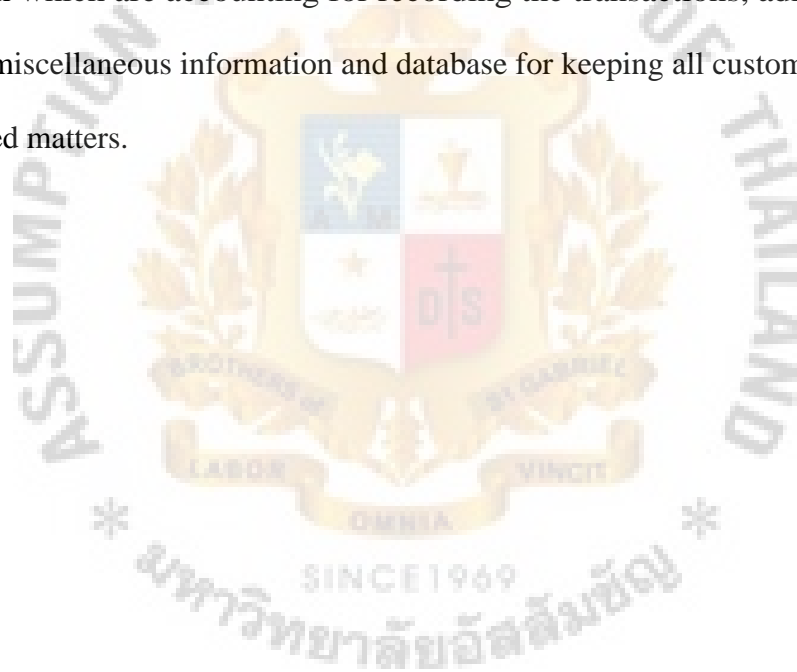
than the past due to the resignation and fraud of key employees that affected the bulk of work load to a current employees.

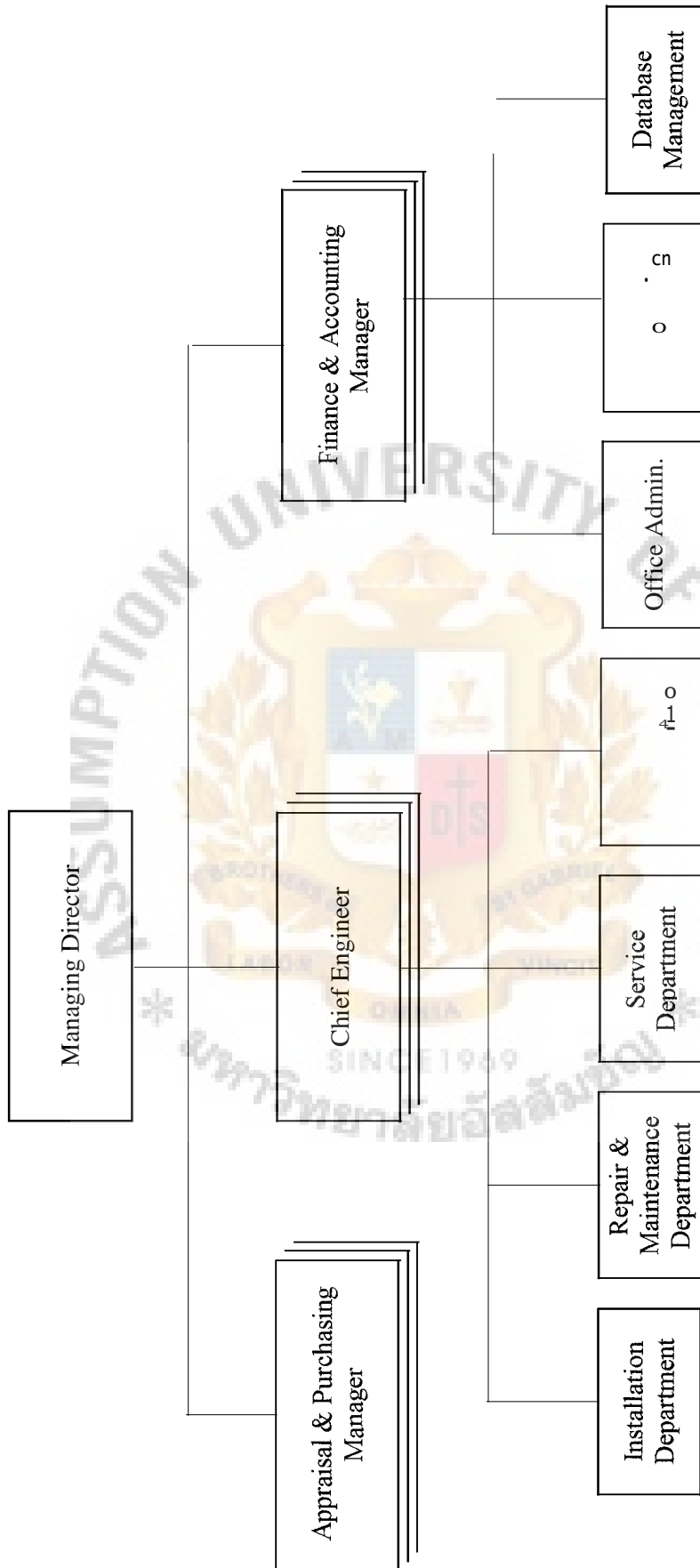
Organization Chart (See the Figure 3.1)

Currently company has divided into 3 departments as follows:

- (1) Appraisal & Purchasing Department
- (2) Engineering Department
- (3) Finance & Accounting Department

The company has currently used 3 computerized systems to process as a core operation which are accounting for recording the transactions, administration for keeping miscellaneous information and database for keeping all customers' information and related matters.





Organization Chart.

## The Process of Operation of the Company (See the Figure 3.2)

### (1) Receive the customer request

When operator receives the customers' request by phone, she informs the chief engineer. (Sometimes operator transfers the call directly to chief engineer.)

### (2) Analyze the request

Chief engineer needs to analyze the request before assigning the job. The request can be divided into three cases.

- (a) The company can estimate the cost and prepare a proposal to the customer immediately. In this case the chief engineer will transfer the request to appraisal manager to prepare a proposal.
- (b) The company needs to send a technician to survey the job before preparing a proposal.
- (c) Sometimes the chief engineer can assign a technician to perform the job without submitting the proposal. In case of customers, they must have a contract (free of service charge except cost of spare parts), insurance (free of all service charge in the duration of insurance) with the company or when service charge does not exceed the fixed credit.

### (3) Prepare the proposal.

The operator prepares the proposal, which is estimated by appraisal manager and approved by MD to customers. Three ways to submit a proposal to the customer are via verbal, fax, and letter.

- (4) Assign technicians to perform the job.

After receiving customer approval, operator record confirmed proposal whereas chief engineer analyzes each job, prepares job schedule by the importance of jobs and assigns job to technicians.

- (5) Check and inspect materials.

Technician checks materials from store whether they are available in stock or not and they are ready to work or not. If materials are not available in stock, the storekeeper needs to inform the purchasing manager to order those materials.

- (6) Prepare and update service report.

After finishing a job, technicians have to prepare a service report, ask the customer to sign the name in order to confirm and submit the report to the chief engineer to verify and approve. For some jobs that can not be finished in one day, technicians need to report the service progress to the chief engineer to set job schedule the next day.

- (7) Issue and bill invoice.

The copies of service report is sent to finance & accounting department after the job is finished by the chief engineer. Then accounting officer bills an invoice to the customer and records it in the journal when money is collected.

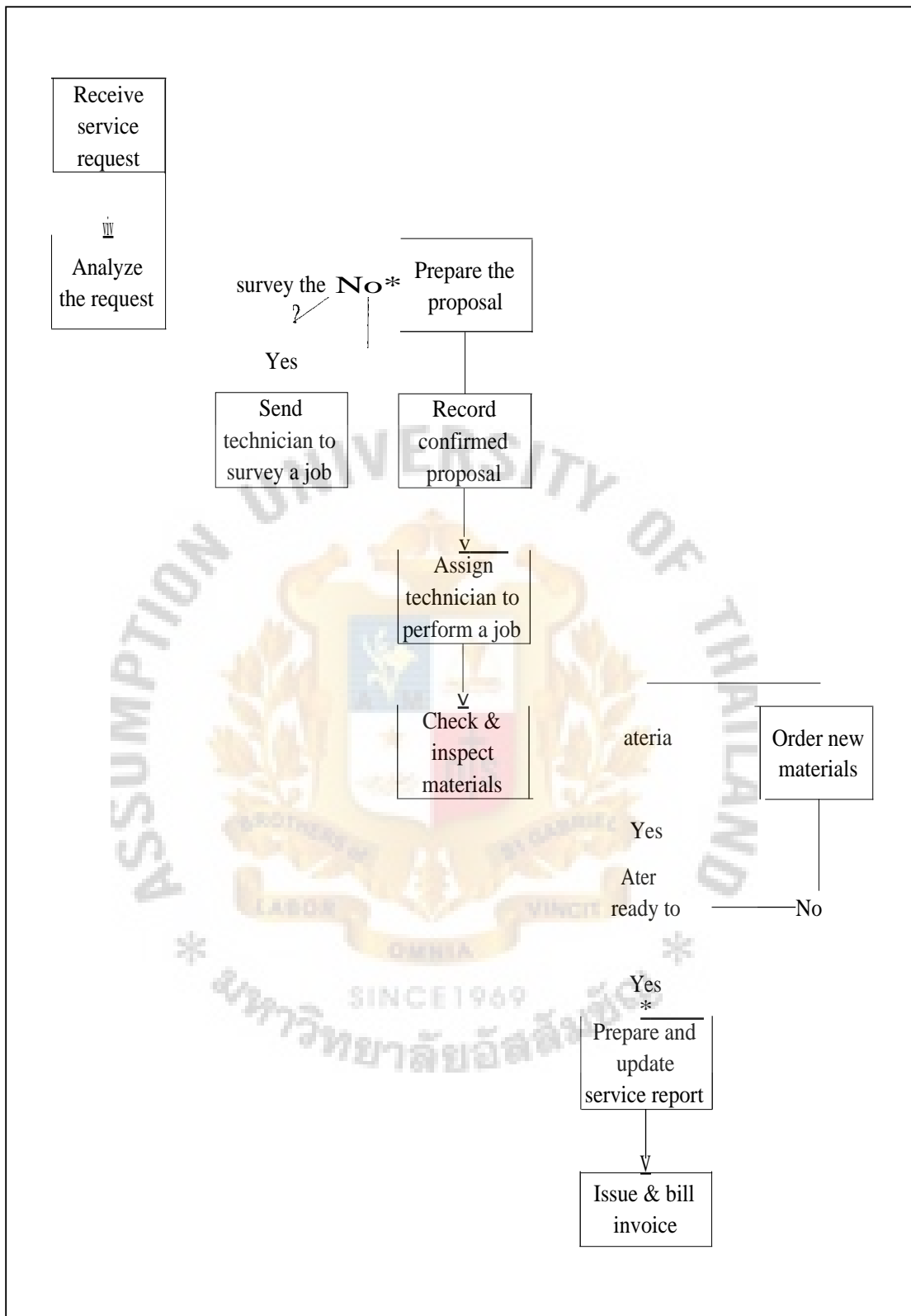


Figure 3.2. The Process of Operation of the Company.



### **3.2 Survey Methodology**

The quality improvement plan of this project starts from the step of selecting the improvement opportunity by identifying the general and specific issues within organization. Next, we select the highest priority problems that frequently occur and the failures that are most harmful. Then we track down actual working condition and current operating procedure to see what is the cause of the problem and how we can improve it.

Quality is defined conformity to customers' specification. To meet the objectives of the project, we do customers research by collecting data from questionnaire and interviewing to learn about the expectations and perceptions of customers. So, it requires the appropriate survey methods in developing and implementing data collection procedure, designing the sample, and analyzing the results.

Research conducted the structured and undisguised questionnaire for standardizing responses covered. The study has developed nonprobability sampling as convenience sampling by asking respondents to answer the questionnaires. Data processing is through SPSS program for the most accuracy in both interpretation and evaluation of the organized data.

We decide to interpret data by descriptive statistics, the first step in data analysis to summarize the data, and inferential statistics, dealing with inferences about populations based on the behavior of samples (Gay 1996). Each method will be used suitably to answer the statements of problems.

### **3.3 Research Sample**

**Due** to the time constraint and the enormous costs of conducting research over the population, the research sample is designed to pursue the objectives of study instead.

For the most accurate results, we infer a sample to the total population. Thus, the following four common steps to draw a sample are called for.

- (a) Define the Population.
- (b) Sampling Frame
- (c) Sample Size
- (d) Sampling Procedure

#### Define the Population

After considering many rationales, we decide to nominate a finite population. For customers, the inclusive population is defined as Household, Office Building and Factory, which is serviced by Airsirco in Year 2003.

#### Sampling Frame

We acquire sampling frame, a list of elements from which the sample will be drawn, by keeping track of current customer's record who has transactions with company in year 2003.

#### Sample Size

This project cites sample size by using Taro Yamane method (1967: 886). Taro Yamane method provides the formula to random sample for the science research. The research sample started with the limit of random sample size. We apply the method that yields the least number of samples but produces the most precise inference.

A Simplified Formula For Proportions Yamane provides a simplified formula to calculate sample sizes (n).

Formula:

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

where; N is the population size, and e is the level of precision or error(%).

For customers research, population size (N) is 310 respondents, and with desired precision of 0.05 (allow +5% of error) and a 95% confidence interval. The sample size can now be calculated by:

$$\frac{310}{1 + 310(0.05)^2}$$
$$= 174.647 = \text{Minimum sample size}$$

The 200 sample size is applied for this study.

#### Sampling Procedure

Sampling procedure is related to the sampling frame because we can employ the probability sampling method once the target population can be specified. Each respondent, sample will be drawn randomly with no limitation since every element in the frame has non-zero probability of selection.

Because the population size is rather small, the respondents are chosen from current lists in and customers' record respectively.

### 3.4 Data Collection

#### Questionnaire Development

The survey instrument has developed the structured-undisguised questions for asking about the respondents' perception.

For customer research, it is divided into 2 sections.

Section 1: Personal information

Section 2: Customer attitude and recommendation toward Airsirco services.

#### Section 1: Personal Information

There are 6 questions developed in multiple choices as the question type, which asks about respondents' profile.

## Section 2: Customers' attitude and recommendations toward Airsirco services

There are 6 questions, which are developed by multiple methods including multiple choices, Likert scaling and ranking questions to let customers describe their actual service experience and their expectations and making suggestions for service improvement

### Data Collection Procedure

Data is collected through observation, interviewing and questionnaires, which are spread by administrative officer of Airsirco. Then, we gather the set of questionnaires that respond to the sampling procedure. Respondents' receptiveness is one important factor, which affects the number of returned questionnaires.

### 3.5 Data Analysis

The survey has developed the self-reports, which respondents are directly asked to show their attitude or feeling by responding to the questionnaires. Also, we developed rating scales to indicate the degree of perception among each questionnaire statement.

We analyze data by the following methods:

- (a) Frequencies and Percentages.
- (b) Mean Evaluation.
- (c) Hypothesis Testing.

#### Frequencies and Percentages

Frequency tables are useful for summarizing categorical variables, which are variables with a limited number of distinct categories. So, we use this method for interpretation of personal data in Section I in customer research. And the results in question no.1 to no.6 are presented by comparing among their percentages with the bar chart. In case of ranking question, we also interpreted data with frequency and percentages method but applied with different weighed scores. And some respondents,

who do not specify the priority, we will weigh that score with mean of total scores. In addition, we use crosstabulation to find the relationship among questions in personal data and in other section.

#### Mean Evaluation

This method is used to measure the degree of general perception towards service satisfaction in each department of Airsirco based on SERVQUAL dimensions. Each question is named as variable, especially in Section 2 no.2-3 we will evaluate them by the value of coding phased items as follows:

5	Strongly Agree
4	Agree
3	Neutral
2	Disagree
1	Strongly Disagree

Then we set another rating schemes to evaluate the level of agreement by dividing range with number of rating level as shown in 4.4, 4.5. After finding the perception of each variable, we weigh the total mean dividing the sum of variable by the number of variables in each question, and with 5 for perception based on SERVQUAL.

#### Hypothesis Testing

Data were analyzed by nonparametric statistics for testing of the differences. Chi-Square Test was used as statistical technique for this research. We study six cases by testing hypotheses set to be alternative hypothesis. Each case has one hypothesis, and we set the null hypothesis to oppose each meaning. Due to the normal distribution, the result of testing hypotheses requires the hypothesis acceptance. We value 95% level of confidence, which means that if the value of sig. > 0.05 then do not accept the

alternative hypothesis. The solution of hypothesis testing will be presented in 4.3, 4.4, and 4.6.



## **IV. SURVEY RESULTS AND DISCUSSIONS**

The project has surveyed customers' attitude toward air-conditioning services of Airsirco. According to the research methodology, the questionnaires were distributed to 310 respondents. The 45 days of distribution period was May 16 — June 30, 2003. Although we made an effort to follow-up for returned questionnaires, we could not get them all. However, the returned respondents covered the minimum sample size. After getting all targeted responses, we come to the process of finding the results.

The findings are presented in the sequence as follows:

Part 1 Demographic items

Part 2 Customers' attitude toward reasons in buying decision

Part 3 Analysis of relationship between demographic items (sex, monthly income) and buying decision.

Part 4 Analysis of relationship between demographic items (sex, age) and level of satisfaction based on SERVQUAL.

Part 5 Customers' expectation toward the service quality improvement.

Part 6 Assess priorities of service quality improvement based on SERVQUAL.

Part 7 Analysis of relationship between demographic items (age, education) and service quality improvement based on SERVQUAL.

### **4.1 Customer Profile**

The personal data of respondents: gender, age, education level, occupation, monthly income, and marital status.



Gender, there are 72.5% of males and 27.5% of females from the total 200 respondents.

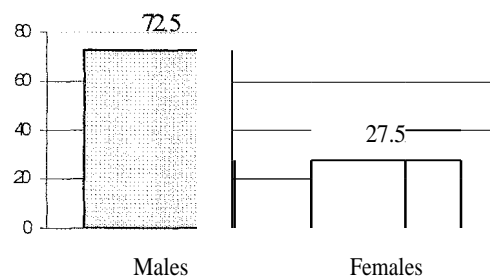


Figure 4.1. Gender of Respondents.

Age: Respondents are grouped into five age groups as shown in Figure 4.19. Most of them 33.5% are between 45 and 54 years, 27.5% are between 35 and 44 years, 20% are above 55 years, 12.5% are between 25 and 34 years, and 6.5% are less than 25 years.

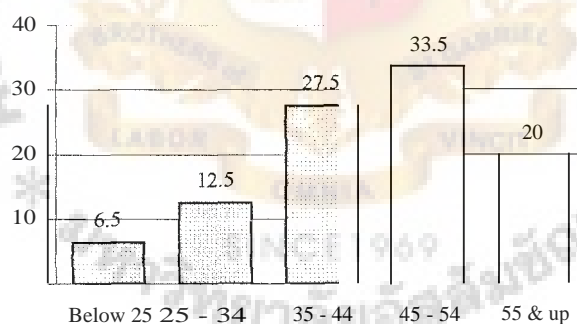


Figure 4.2. Age of Respondents.

Level of education: The survey has grouped 4 education levels. Among 200 samples, 45.5% are bachelor's degree holders, 28.5% are from high commercial schools or equivalent, 18% have above master's degree and 8% have a high school or equivalent level.

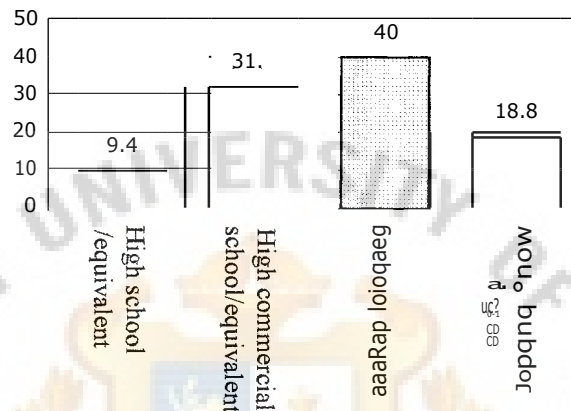


Figure 4.3. Education Level of Respondents.

Occupation: It is divided into five groups. 34% are employees of private companies, 27% have own business, 23% are government officials or state enterprises, 10% are hireling and 6% are housewife.

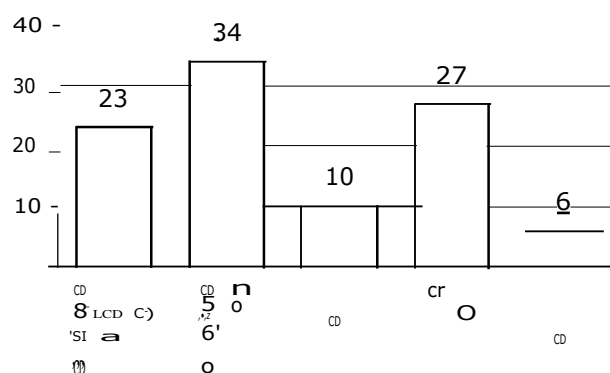


Figure 4.4. Occupation of Respondents.

Monthly income: Valued respondents are divided into four range of monthly income (in Baht): 38% having 30,001-60,000, 30% having 10,001-30,000, 28% having more than 60,000 and 4% having below 10,000.

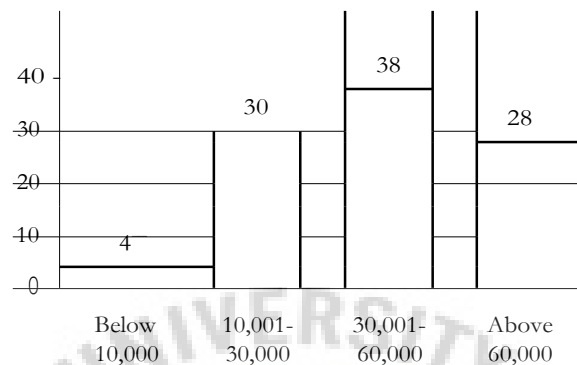


Figure 4.5. Monthly Income of Respondents.

Marital status: It is divided into four groups: 60.5% are married, 30.5% are single/unmarried, 6% are divorced/separated, 3% are widows.

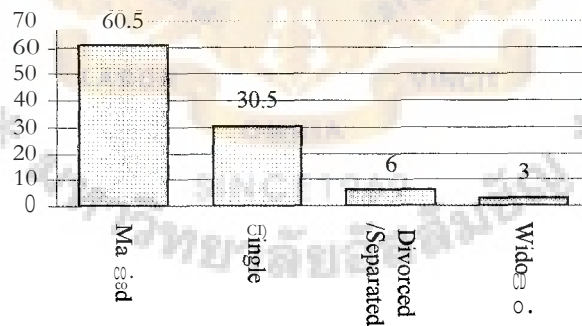


Figure 4.6. Marital Status of Respondents.

From the customer details shown in Figures 4.1 to 4.6, we conclude that among the total 200 customers, the majority is male (72.5%). Large groups of people are between 45 and 54 years (33.5%). Most of them are married (60.5%) and graduated

with bachelor's degree (45.5%). About income earnings, most of them earn the average range of 30,001-60,000 baht per month (38%) and currently working as employees of private companies (34%).

## 4.2 Customer's Attitude towards Buying Decision

Table 4.1. Reasons for Selecting Airsirco Services.

Variable	Customer's Attitude towards Factor in Buying Decision				Total	Total%
	Most important	Very important	Important	Unselected		
Reputation	13	21	130	36	211	10.48
Prompt service	16	22	46	116	138	6.85
Product & Service rates	16	8	142	34	206	10.23
Expertise of technicians	23	93	54	30	309	15.34
Modern equipment	11	10	139	40	192	9.53
Advertising & Public relations	4	2	154	40	170	8.44
Location	6	10	147	37	185	9.19
Courtesy of service providers	92	16	68	24	376	18.67
Word-of-mouth recommendation	19	22	126	33	227	11.27
Total					2,014	100

This part has developed ranking questions to indicate degree of respondent's perception toward factor in buying decision. There are nine checklists and each has one variable. And all results were coded for numerical analysis conducted by these coding phrased items: Most important = 1, Very important = 2, Important = 1, Do not select = 0

As exhibited in Table 4.1, the reason comes from those who are Airsirco customers. The major reason that they were interested in Airsirco services is because of courtesy of service providers (18.67%). 15.34% of respondents were motivated by expertise of technicians, 11.27% by word-of-mouth recommendation, 10.48% chose Airsirco because of company reputation, 10.23% of respondents were interested in the

product & service rates, 9.53% were interested in service because of modern equipment, 9.19% of respondents called service because of location. 8.44% of respondents chose service by public relations. Only 6.85% were interested in service due to prompt service.

#### **4.3 Analysis of Relationship between Demographic Items and Buying Decision.**

We use Chi-square test to prove the following cases:

- (1) There is a significant difference in attitude towards buying decision between males and females.
- (2) There is a significant difference in attitude towards buying decision between people who have monthly income lower than 30,000 baht and those who have 30,000 and higher.

The solutions of these two cases are presented by testing hypotheses as resulted in Tables 4.2 to 4.3.

Table 4.2. Crosstabs for Attitude towards Buying Decision by Gender.

Variable	Gender	Attitude towards Factor in Buying Decision				Sig.
		Most Imp.	Very Imp.	Important	Unselected	
Reputation	Males	8	13	100	24	0.277
	Females	5	8	30	12	
Prompt service	Males	9	14	24	98	0.000
	Females	7	8	22	18	
Product & Service rates	Males	10	6	108	21	0.296
	Females	6	2	34	13	
Expertise of technicians	Males	15	79	29	22	0.001
	Females	8	14	25	8	
Modern equipment	Males	3	6	106	30	0.004
	Females	8	4	33	10	
Advertising & Public relations	Males	2	0	111	32	0.059
	Females	2	2	43	8	
Location	Males	4	8	107	26	0.923
	Females	2	2	40	11	
Courtesy of service providers	Males	78	14	34	19	0.000
	Females	14	2	34	5	
Word-of-mouth recommendations	Males	16	9	97	23	0.003
	Females	3	13	29	10	

$H_0$  : There is no significant difference between gender in attitudes towards buying decision.

$H_1$  : There is a significant difference between gender in attitude towards buying decision.

If value of sig. > 0.05 means do not reject  $H_0$ , and do not accept  $H_1$

Results:

(a) There is a significant difference between gender in attitude of buying decision because of prompt service, expertise of technicians, modern equipment, courtesy of service providers, and word-of-mouth recommendations.

(b) There is no significant difference between gender in attitude of buying decision because of reputation, product & service rates, advertising & public relations, and location.

Table 4.3. Crosstabs for Attitude towards Reasons in Buying Decision by Monthly Income.

Variable	Income range	Attitude towards Factor in Buying Decision				Sig.
		Most Imp.	Very Imp.	Important	Unselected	
Reputation	Lower than 30,000	1	8	45	14	0.206
	30,000 & Higher	12	13	85	22	
Prompt service	Lower than 30,000	10	0	18	40	0.001
	30,000 & Higher	6	22	28	76	
Product & Service rates	Lower than 30,000	6	6	44	12	0.083
	30,000 & Higher	10	2	98	22	
Expertise of technicians	Lower than 30,000	6	32	22	8	0.482
	30,000 & Higher	17	61	32	22	
Modern equipment	Lower than 30,000	7	4	43	14	0.167
	30,000 & Higher	4	6	96	26	
Advertising & Public relations	Lower than 30,000	0	2	54	12	0.098
	30,000 & Higher	4	0	100	28	
Location	Lower than 30,000	4	4	51	9	0.205
	30,000 & Higher	2	6	96	28	
Courtesy of service providers	Lower than 30,000	28	6	27	7	0.605
	30,000 & Higher	64	10	41	17	
Word-of-mouth recommendations	Lower than 30,000	6	10	40	12	0.636
	30,000 & Higher	13	12	86	21	



$H_0$  : There is no significant difference in attitude towards buying decision between people whose monthly incomes are lower than 30,000 baht and those whose monthly incomes are 30,000 and higher.

$H_1$  : There is a significant difference in attitude towards buying decision between people whose monthly income are lower than 30,000 baht and those whose monthly income are 30,000 and higher.

If value of sig. > 0.05 means do not reject  $H_0$ , and do not accept  $H_1$

Results:

There is no significant difference in attitude towards buying decision between people whose monthly income are lower than 30,000 baht and those whose monthly income are 30,000 and higher in all variable of buying decision, except the reason of prompt service.

#### **4.4 Customers' Perception Based on SERVQUAL towards Level of Services Satisfaction.**

This section has developed the Likert scaling to indicate the degree of respondents' perception organization. There are 18 and 10 checklists in question no.2 and 3, respectively and each has one variable. All results were coded for numerical analysis conducted by these coding phrased items: Strongly Agree = 5, Agree = 4, Neutral = 3, Disagree = 2, Strongly Disagree = 1.

To get the general idea of customers' perception, we consider assessing the level of measurement by means of variables. SPSS data processing calculates descriptive statistics for all surveyed items.

Then, we compute the levels of measurement by:

$$\text{Level of Measurement} = \text{Maximum Coding Score} - \frac{\text{Minimum Coding Score}}{\text{Number of Rating Levels}}$$

Thus, I use  $0.8 \left( 5 - 1 / 5 = 0.8 \right)$  to rate the levels of agreement as the following scoring scheme:

Level of Measurement	Average Scoring
(1) Strongly Disagree	1.00 — 1.80
(2) Disagree	1.81 — 2.60
(3) Neutral	2.60 — 3.40
(4) Agree	3.41 — 4.20
(5) Strongly Agree	4.21 — 5.00

To evaluate level of customers' satisfaction (see section 2, question no.2), customers' perception of the service quality (measured by SERVQUAL) is determined by combining variables into five groups. Some items may be overlapping. Dimensions of service quality and their correspondent items are as follows:

- (1) Tangibles. (Item 2.2.2, 2.2.6, 2.3.8)
- (2) Reliability. (Item 2.2.1, 2.2.2, 2.3.6, 2.3.8 )
- (3) Responsiveness. (Item 2.1.1, 2.2.1, 2.2.4, 2.3.1, 2.3.3, 2.3.4)
- (4) Assurance.
  - (a) Competent. (Item 2.1.2, 2.1.3)
  - (b) Courtesy. (Item 2.2.3, 2.3.2, 2.3.7, 2.3.8)
  - (c) Creditability. (Item 2.1.4, 2.2.2, 2.3.6)
  - (d) Security. (Item 2.2.5, 2.3.5)
- (5) Empathy
  - (a) Access. (Item 2.3.1)
  - (b) Communication. (Item 2.1.2, 2.2.5, 2.3.5)
  - (c) Understanding the customer. (Item 2.1.1, 2.1.3, 2.3.2)

Customer's perception of SERVQUAL towards level of service satisfaction is overall described in the following table (in percentile).

Table 4.4. Level of Customer's Satisfaction Based on SERVQUAL.

Variables	St. Satisfy	Satisfy	Neutral	Mean
Tangibles	25.83%	64.34%	9.83%	4.16
Reliability	44.00%	51.60%	4.40%	4.40
Responsiveness	34.10%	61.50%	4.40%	4.30
Assurance	33.10%	62.10%	4.80%	4.28
Empathy	38.00%	58.70%	3.30%	4.35
Average mean				4.30

The average mean value of customers' perception based on SERVQUAL is calculated by the sum of each factors divided by five. Thus, the result equals 4.30. That means customer's satisfaction in current service based on service quality falls in strongly satisfy.

Then, we compare customer's perception of SERVQUAL towards level of service satisfaction between people who are males and those who are females. The results are shown in Table 4.5.

Table 4.5. Mean Evaluation of Customer's Satisfaction Level by Gender.

Variables	mean by Gender			
	Males		Females	
Tangible	4.179	19.327%	4.109	19.599%
Reliability	4.353	20.132%	4.295	20.488%
Responsiveness	4.351	20.119%	4.155	19.816%
Assurance	4.330	20.026%	4.188	19.977%
Empathy	4.411	20.397%	4.218	20.120%

From the result, we can conclude that people who are males are very satisfied with service in almost variables, especially in perception of empathy (mean = 4.411). They are satisfied with the company for its caring, individualized attention provides to customers when receiving service request, and for being enthusiastic to offer product and service, giving suggestion in production specification to match with customer's needs, and explaining how to use the product after installation and clues of problem that can occur.

For those who are females are strongly satisfied with the perception of reliability more than empathy. They are satisfied with the company's ability to perform the promised service dependably and accurately, precision and completeness of product and service delivery, periodically checking & maintenance schedules, and cleanness after service (Reliability, mean = 4.295).

The results can indicate that the gender influences factors in evaluation services satisfaction. With nature of female characteristics, they are interest in details, precision of service agreement, so they prefer if company can do as promised. Whereas males will be interested in product knowledge, the cause of problem, so they prefer service providers to give suggestion.

Then, we compare customers' perception of SERVQUAL towards level of service satisfaction between people who are males and those who are below 35 years and those who are 35 years & over. The results are shown in Table 4.6.

Table 4.6. Mean Evaluation of Customer's Satisfaction Level by Age Range.

Variables	mean by Age Range			
	Lower than 35		35 & upward	
Tangible	4.079	19.487	4.179	19.380
Reliability	4.263	20.367	4.355	20.196
Responsiveness	4.193	20.032	4.321	20.039
Assurance	4.195	20.040	4.314	20.006
Empathy	4.202	20.074	4.394	20.379
Total	20.931	100.000	21.563	100.000

From the result, we can conclude that people who are below 35 years are satisfied with all variables, especially in the perception of reliability. They are strongly satisfied with company ability to perform the promised service dependably and accurately, precision and completeness of product and service delivery, consistency checking & maintenance schedules, and clearance after service (Reliability, mean = 4.263).

For people who are 35 years & over are satisfied with the service in perception of empathy more than reliability. They are satisfied with the company in caring, individual attention provides to customers when receiving service request, for being enthusiastic to offer product and service, giving suggestion in production specification to match with customer's needs, and explaining how to use the product after installation and clues of problem that can occur (Empathy, mean = 4.394).

#### 4.5 Customer's Expectation towards the Service Quality Improvement.

In order to know weakness of current service and important factor in service quality improvement, we do survey to study customers' expectations. In case the company desires to improve its service quality, the company should consider service quality improvement priorities. The results are shown in the following table:

Table 4.7. Customer's Attitude towards Service Quality Improvement.

Variable	Customer's Expectation to Improve				Total	Total%	Cum%
	St. Agree	Agree	Neutral	Disagree			
Advertising & Public relations	5	87	92	16	97	19.17	19.17
Well-trained technicians	2	92	79	27	96	18.97	38.14
Computerized system & Technology	0	77	120	3	77	15.22	53.36
Service rates & Convenience payment	0	61	91	48	61	12.06	65.42
Increase no. of employees	0	59	133	8	59	11.66	77.08
Prompt service	2	32	40	126	36	7.11	84.19
Warranty service period	0	32	142	26	32	6.32	90.51
Varieties of services	2	27	153	18	31	6.13	96.64
Service-minded & Advice	0	9	58	133	9	1.78	98.42
Courtesy of employees	0	8	52	140	8	1.58	100.00
Total					506	100.00	

The outcomes show that advertising & public relations is the 1<sup>st</sup> priority in customers' recommendations to improve because they desire Airsirco to be well known in order to attract new customers, and maintain existing customers by some privileges offered. (eg. service discount and some premium).

Well-trained technician is the 2<sup>nd</sup> priority, customers recommend to improve. If a poor technician consults with his supervisor how to repair, while doing the job, it can influence quality of work, and the company's image in customer's perception. Customers prefer their machine repaired/installed right for first time, so there is no need to claim later. In addition, they desire the service providers to explain and give them more knowledge.

The 3<sup>rd</sup> priority is computer technology. Customers recommend Airsirco to improve a new computerized system and online system to facilitate access and request service, without wasting time for proposal because they could check product specification, service contract from the company websites and specify their needs.

Product and service rate is one of customers' recommendations because they prefer to pay less. In addition, some desire the company to improve payment system instead of mailing cheque or sending messenger to receive cheques.

Increasing the number of employees is also necessary in customers' perception. Perhaps, customers could not get a prompt service as they expected because of inadequate number of employees. Some recommends that company should have more staff in team in order to operate quicker.

Normally, customers want the company to serve them with willingness to help and provide prompt services. They recommend the company to give them a specific time when the repair person or technicians will come.

Warranty service period is necessary for air-conditioning service. Some customers may not be satisfied with the current warranty service period because service providers do not deliver preventive service on time. Thus, customers prefer the company to improve consistency of checking and maintenance, service guarantee.

Customers prefer more alternatives in buying decision, whereas some desire to call Airsirco service in the other related field (eg. repair household equipment, pump). Thus, they recommend the company to improve in varieties of service.

Minority desires the company to improve in service-mindedness to properly advise products and services to their needs, and courtesy of service providers.

#### 4.6 Assess Priorities of Service Quality Improvement Based on SERVQUAL.

Then we evaluate service improvement priorities (see section 2, question no.3) based on SERVQUAL, customers' perception of the service quality is determined by combing variables into five groups. Some items may be overlapping. Dimensions of service quality and their correspondent items are as follows:



(1) Tangibles. (Item 3.6, 3.8, 3.10)

(2) Reliability. (Item 3.9)

(3) Responsiveness. (Item 3.1, 3.4)

(4) Assurance.

(a) Competent. (Item 3.7)

(b) Courtesy. (Item 3.3)

(c) Creditability. (Item 3.2, 3.9)

(d) Security. (Item 3.2)

(5) Empathy

(a) Access. (Item 3.1, 3.6, 3.8)

(b) Communication. (Item 3.5, 3.7)

(c) Understanding the customer. (Item 3.4)

Then, we analyze customers' perception towards service quality improvement based on SERVQUAL. The outcomes are shown in Figures 4.7 — 4.12.

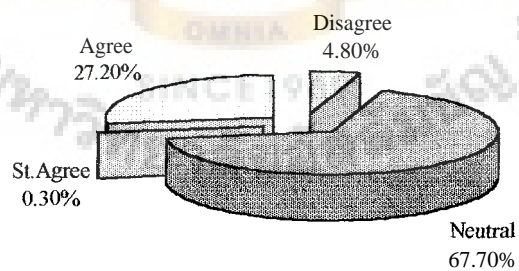


Figure 4.7. Perception towards Service Improvement in Tangibles.

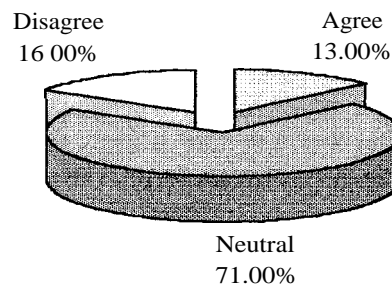


Figure 4.8. Perception towards Service Improvement in Reliability.

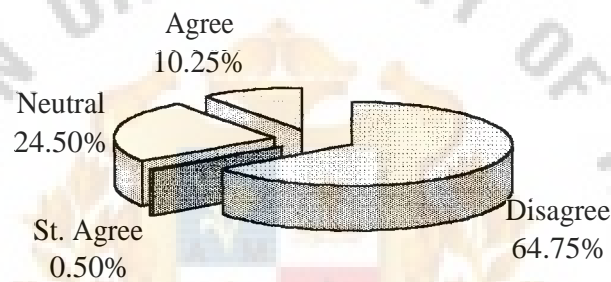


Figure 4.9. Perception towards Service Improvement in Responsiveness.

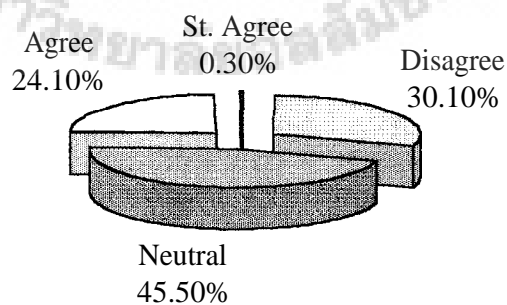


Figure 4.10. Perception towards Service Improvement in Assurance.

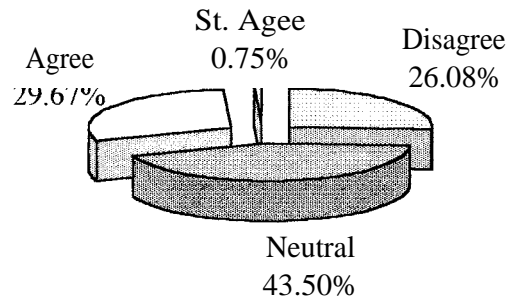


Figure 4.11. Perception towards Service Improvement in Empathy.

From the results, we can conclude that most customers prefer the company to improve in the perception of empathy as its 1<sup>st</sup> priority (strongly agree = 0.75%, agree = 29.67%). For the 2<sup>nd</sup> priority, they recommend to improve the perception of tangible (strongly agree = 0.30%, agree = 27.20%). Assurance is the 3<sup>rd</sup> priority customers expect (strongly agree = 0.30%, agree = 24.10%).

Thus, we track perception of empathy, consisting of access, communication and understanding the customers to analyze customer's expectation, with variables of empathy they prefer to improve it as the 1<sup>st</sup> priority. The result is shown in Table 4.8 (in percentage).

Table 4.8. Customer' s Perception towards Empathy.

Variables	St. Agree	Agree	Neutral	Disagree
Access	0.30	28.00	48.80	22.80
Communication	1.80	44.80	42.80	10.80
Understanding the customer		4.50	29.00	66.50

The outcome indicates that customers prefer the company to improve its communications as the 1<sup>st</sup> priority (strongly agree = 1.80%, agree = 44.80%), which compose of advertising & public relations and well-trained technicians.

To improve advertising & public relations, customers recommend that they desire Airsirco to be well known in order to attract new customers, and maintain existing customers by some privileges offered.

Well-trained technicians are also important. If a poor technician consults his supervisor how to repair, while he is doing the job, it can influence the quality of work, and the company's image in customer's perception. Customers prefer their machine repaired/installed right for first time, so there is no need to claim later. In addition, they desire the service providers to explain and give them more knowledge.

#### **4.7 Analysis of Relationship between Demographic Items and Service Quality**

##### **Improvement Based on SERVQUAL.**

We analyzed customers' perception by keeping track of all variable items in empathy to crosstab with demographic data. The results are shown in Tables 4.9 — 4.10.

Table 4.9. Crosstabs of Customer's Perception of Empathy between People Who Are Below 35 Years and Those Who Are 35 & Over.

Variable	Age range	Customer's Expectation to Improve				Sig.
		St. Agree	Agree	Neutral	Disagree	
Prompt service	Below 35 years	0	5	10	23	
	35 & over	2	27	30	103	0.64
Service-minded & Advice	Below 35 years	0	0	11	27	
	35 & over	0	9	47	106	0.323
Well-trained technicians	Below 35 years	0	13	21	4	
	35 & over	2	79	58	23	0.161
Increase no. of employees	Below 35 years	0	11	25		
	35 & over	0	48	108	6	0.907
Advertising & Public relations	Below 35 years	2	15	13	8	
	35 & over	3	72	79	8	0.005
Computerized system & Tech.	Below 35 years	0	9	27	2	
	35 & over	0	68	93	1	0.018

$H_0$  : There is no significant difference between people who are below 35 years and those who are 35 years & over in perception of empathy towards service improvement.

$H_1$  : There is a significant difference between people who are below 35 years and those who are 35 years & over in perception of empathy towards service improvement.

If value of sig. > 0.05 means do not reject  $H_0$ , and do not accept  $H_1$

Results:

(a) There is a significant difference between people who are below 35 years and those who are 35 years & over in perception of empathy towards service improvement in advertising & public relations and the computerized system & new technology.

(b) There is no significant difference between people who are below 35 years and those who are 35 years & over in perception of empathy towards service improvement in delivery of the prompt service with service-mindedness and advice by increasing number of well-trained technician.

Table 4.10. Crosstabs of Customer's Perception of Empathy between People Whose Education Level Are Below Bachelor's Degree or Equivalent and Those Whose Education Level Are Above Bachelor's Degree.

Variable	Level of Education	Customer's Expectation to Improve				Sig.
		St. Agree	Agree	Neutral	Dis agree	
Prompt service	< Bachelor's degree/equivalent	0	25	21	49	
	Above Bachelor's degree	2	7	19	77	0
Service-minded & Advice	< Bachelor's degree/equivalent	0	7	31	57	
	Above Bachelor's degree	0	2	27	76	0.071
Well-trained technicians	< Bachelor's degree/equivalent	2	45	35	13	
	Above Bachelor's degree	0	47	44	14	0.455
Increase no. of employees	< Bachelor's degree/equivalent	0	36	57	2	
	Above Bachelor's degree	0	23	76	6	0.029
Advertising & Public relations	< Bachelor's degree/equivalent	5	37	45	8	
	Above Bachelor's degree	0	50	47	8	0.09
Computerized system & Technology	< Bachelor's degree/equivalent	0	37	56	2	
	Above Bachelor's degree	0	40	64	1	0.785

$H_0$  : There is no significant difference between people whose education levels are below bachelor's degree or equivalent and those whose education level are above bachelor's degree in perception of empathy towards service improvement.

$H_1$  : There is a significant difference between people whose education levels are below bachelor's degree or equivalent and those whose education level are above bachelor's degree in perception of empathy towards service improvement.

If value of sig. > 0.05 means do not reject  $H_0$ , and do not accept  $H_1$

Results:

- (a) There is a significant difference between people whose education levels are below bachelor's degree or equivalent and those, whose education levels are above bachelor's degree in perception of empathy towards service improvement in delivering prompt services and increasing in number of employees.
- (b) There is no significant difference between people whose education level are below bachelor's degree or equivalent and those whose education levels are above bachelor's degree in perception of empathy towards service improvement in service-mindedness and advice, well-trained technician, Advertising & Public relations, Computerized system & Technology.

#### 4.8 Reliability Analysis

\*\*\*\*\* Method 1 (space saver) will be used for this analysis \*\*\*\*\*

##### RELIABILITY ANALYSIS - SCALE (ALPHA)

Statistics for	Mean	Variance	Std Dev	N of Variables
SCALE	127.4350	57.1314	7.5585	43

Reliability Coefficients

N of Cases — 200.0

N of Items = 43

Alpha = .7246

Cronbach alpha (scale reliability coefficient) is a tool for assessing the reliability of scales. It is used for testing survey's internal consistency. Normally, the range of the alpha is from 0 to 1.0. The higher alpha approaching to 1, the higher reliability result is. According to J.C. Nunnally (1998), the alpha of a scale should be greater than .70 for items to be used together as a scale (Nunnally, 1978). Thus, the outcome indicates that the survey could be probably accepted with alpha 0.7246.

#### **4.9 Service Quality Improvement Plan**

##### **Understanding the Current Services**

The use of customer survey is solidly important because it reveals the strengths and weaknesses of a company's service from the prospective of those who have experienced it. As a result, we found the strength of Airsirco services in customers' perception from the survey for the level of customer's satisfaction, and motivation to consider and call for Airsirco services. The higher satisfaction level in service, the higher strengths the company has.

##### **Company's Strengths**

Most customers are satisfied with Airsirco services in perception of reliability (44%), ability to perform the promised service dependably and accurately. The company can deliver air-conditioners on time as promised with precision of products and all accessories. Also, they are satisfied with consistency of preventive service and the presence of repair person showing up on time.

In addition, the three highest reasons why customers chose Airsirco service are because of they prefer the courtesy of service providers, the expertise of technicians and word-of-mouth recommendations of loyal customers (18.67%, 15.34%, and 11.27%, respectively).



The company strengths are what we mentioned above. The company should maintain and continuously improvement by adjusting some services to satisfy the needs of each specified groups.

For example, the company can concentrate on delivering services to customers, who are males with enthusiasm, giving suggestions in production specification to match with customer's needs, and explain how to use the product after installation and clues of problem that can occur, referred to outcomes in Table 4.5. At the same time, the company should considerately offer services to people who are lower than 35 years with reliability; to perform the promised service dependably and accurately, precision and completeness of product and service delivery, consistency in checking & maintenance schedules, and clearance after service.

#### Company's Weaknesses

To track customers' perception in a low level of satisfaction and their recommendation on the company's weaknesses, we found that most customers rather agree with company's improvement plan. They expect the company to improve in perception of empathy (30.42%), especially in aspect of communication: advertising and public relations, and well-trained service providers to give customers more knowledgeable suggestions. Also, they recommend the company to improve current service in perception of tangible (27.50%), to embrace new technology (e.g. online system), increasing the number of service providers and varieties of services.

#### Recommendations to Improve Service Quality

- (1) Encourage and enable service providers and management to realize in the importance of the quality services, to understand customers' perception towards current services, and improvement needed.

(2) Setting service-quality goals and service strategy

To set service goals and standards based on customers' requirements, they need to be specific and accepted by employees and cover important job dimensions. Also, they can be measured, reviewed with appropriate feedback. In addition, effective goals should be challenging but realistic.

(3) Define the standard price for goods and services

The price list is as a tool in facilitating communication between company and customers. The company can offer goods and services with the variety of alternatives. Also, it is a good opportunity for customers to consider which choice they mostly prefer and optimize their requirements and budgets. Besides, the standard price of service includes the raw materials cost, labor cost and other related expenses.

(3) Facilitating communication with new technology and well-trained employees

Communication between service providers and customers is clearly central to quality service and particularly vulnerable to mishap. As service providers have more opportunities to meet and talk with customers. The image of company is actually presented by service providers. It is necessary that company should have well-trained employees in skills and expertise in work, appearance of personnel and technicians, including the way to give customers knowledge and suggestions.

Also, the company should train service providers to act as sales representatives when they operate each job. They may suggest the new products and services, or request customers to suggest service to their relations. The company can improve in advertising and public relations via

employees, loyal customers and by making relationships with the people in area zones related to the operating jobs, and post announcement, etc.

In addition, the company should study the potentials for the company to improve communications with customers through technology (as well as to improve internal communications). In particular, managers should consider the possibilities of using communications technologies to expand access to needed information, provide more relevant information, reduce the time and effort necessary to obtain information, and deliver information in a more pleasing form.

#### (4) Enhance the service skills and knowledge

Focusing on the development of critical service skills and knowledge is one of the most steps a company can take in the service-improvement journey. The up-front investment required to identify learning priorities for implementing the service strategy will pay for itself many times in better quality, more loyal customers, lower employee turnover, and less waste in training and education. Documenting learning priorities in writing provides tangible direction for skill and knowledge development programming and funding.

The company should start strong, teach the big picture and formalize learning as a process in first orientation. Using a combination of learning method; listening, reading, observing, and practicing, because no one method is appropriate for all learning situations, nor best for all people. Finally, the company should evaluate skill and knowledge development efforts in the spirit of continuous improvement.

Besides, it needs to encourage its employees to realize a strong sense of being important for the organization. Delivering a quality service can not do without their collaboration. Customers generally do not give firms extra credit for doing what they are supposed to do, because the repair firms are supposed to keep their service appointments. Therefore, the company that surprise customers with unusual caring, commitment, or resourcefulness during the service process receive the extra credit. Exceeding customer's expectations requires the element of surprise, and the best opportunity to offer surprise is during the service process when customers interact with servers and experience the service environment.

Create the emotional bonds with customers by surprising them with details (caring, individualized attention). Also, the company can earn an extra credit through an extra effort when service providers go out of their way to help them, when they refuse to give up until a persistent problem is solved, and when they throw out the "rulebook" if that is what's necessary. All we mentioned above is necessary in employees' training.

## V. CONCLUSIONS AND RECOMMENDATIONS

### 5.1 Research Summary

This research aims to grasp customer' perception and expectations towards air-conditioning service by surveying the opinions of current Airsirco customers. The outcomes of a service quality audit assist in identifying service strengths and weaknesses, adding the prospective study of service implementation in areas of mutual opportunities that benefit customers and the company. Moreover, the obtained results will be profitable to develop further related services.

Customer's perception can define the ways of experiencing products and services. Ordinarily, customers make decisions based on what they perceive. Perception can be performed to extend the personal interpretation since it is one of the psychological factors. Unlike the product, services should be controlled by special efforts to ensure the quality all the time. Therefore, perception can influence customer behavior.

Customer values the satisfaction of service quality by evaluating discrepancies between the expectation of services and the perception of the services delivered. Self-perception theory suggests that consumers yield to meaningful image that is consistent with their own concepts. Marketing is aimed to attract new customers and retain current customers by delivering satisfaction.

The descriptive research is designed to describe the service phenomena and to determine factors influencing the service quality improvement. Summated rating scale is used as survey instrument to collect data from respondents. SPSS data processing analyzes the summary findings. Crosstab is used to find the relationships among variables.

## 5.2 Conclusion of the Findings

### 5.2.1 Respondent's Information

The majority of respondents are males (72.5%). Most of them are aged between 45 - 54 (33.5%). They are married (60.5%) and hold Bachelor's degree (45.5%). Most are private company employees (34%) and most earn income rates at 30,001 — 60,000 (38%).

### 5.2.2 What Is the Reason of Selecting Airsirco Services?

The major reason that customers are interested in the Airsirco services is courtesy of service providers (18.67% of all respondents). 15.34% are those, who are interested in expertise of technicians. 11.27% decide to select Airsirco services by word-of-mouth recommendations, 10.48% have heard of the company's reputation, and 10.23% are interested in products and service rates.

### 5.2.3 Analysis of Relationship between Demographics Items (Sex, Monthly Income) and Buying Decision towards Airsirco Services.

- (1) There is a significant difference in attitude towards buying decision between males and females

The result of testing the hypothesis shows that gender have significant difference in attitude of buying decision with the reason of prompt service, expertise of technicians, modern equipment, courtesy of service providers, and word-of-mouth recommendations.

- (2) There is no significant difference in attitude towards buying decision between people whose monthly income are lower than 30,000 baht and those whose monthly income are 30,000 and higher, except the reason of prompt service.

#### 5.2.4 Level of Customer Satisfaction Based on SERVQUAL

Dimensions of Service Quality (SERVQUAL) include tangibles, reliability, responsiveness, assurance, and empathy. Level of customer satisfaction based on service quality has fallen in the strongly satisfactory level (total mean = 4.30). All of these, reliability is viewed as the most satisfy criteria (mean = 4.40) and tangibles performed as the least satisfy one (mean = 4.16).

Among five dimensions, assurance and empathy are grouped by combining more than one variable. Assurance consists of competence, courtesy, creditability, and security. Empathy contains access, communication, and understanding the customers.

Each service quality criteria that are mostly concerned are as follows:

- (a) Tangibles refer to the physical appearance of service.
- (b) Reliability refers to ability to perform the promised services.
- (c) Responsiveness means the willingness to provide prompt services.
- (d) Assurance is service provider's ability to convey trust and confidence.
- (e) Empathy described as caring, individualized attention the company provides to customers.

Analyzed by gender, we found that customers who are males prefer service in empathy (mean = 4.411), where as those who are females prefer in perception of reliability (mean = 4.295). For comparison by age range, we can conclude that most customers who are below 35 years are strongly satisfied service with reliability (mean = 4.263), whereas those who are 35 years & over are strongly satisfied in perception of empathy (mean = 4.394).

#### 5.2.5 Which Aspect of Service the Customers Expect to Improve as the 1<sup>st</sup> Priority?

The majority expect the company to improve in advertising & public relations (19.17%). 18.97% of all respondents recommend the company to enhance skills and expertise of technicians, whereas 15.22% of all respondents desire the company to have computerized system and online system. Some expect the company to improve service rates and payment system (12.06%), increasing in the number of employees (11.66%). There are those who desire the company to deliver more prompt service (7.11%). Warranty service period is also recommended to be improved (6.32%). Besides, some desire the company to improve in varieties of services, service-mindedness in properly advice product and service with their needs, and courtesy of service providers (6.13%, 1.78%, and 1.58% respectively).

#### 5.2.6 Assess Priorities of Service Quality Improvement Based on SERVQUAL

The outcomes indicate that most customers agree with the company to improve current services. They recommend the company to improve services in the perception of empathy (29.90%), particularly in the aspect of communication.

#### 5.2.7 Analysis of Relationship between Demographics Items (Age, Level of Education) and Perception of Empathy.

- (1) The result of testing the hypothesis shows that there is a significant difference between people whose age are below 35 years and those who are 35 years and over in perception of empathy towards service improvement in advertising and public relations, and the computerized system & new technology.
- (2) There is no significant difference between attitudes of people whose education level are below bachelor's degree or equivalent and those whose



education level are above bachelor's degree in perception of empathy towards service improvement, except the reason of delivering prompt service and increasing in the number of employees.

### 5.3 Recommendations

To evaluate the quality of services is more difficult than products. Services have different characteristics from products. The actual quality of services can be measured in many different ways. The effective service marketing requires the understanding of consumer behavior.

More competitions in air-conditioning services mean that the company should offer more competitive advantages in services such as adding more service features, ensuring the technician's competence, and monitoring customer needs and expectations, etc. To elaborate the meaning of services, each company should have clear marketing focus to differentiate one's services from the others. In case study of Airsirco, the company should set a marketing team to develop appropriate marketing strategies to create impressive brand image.

Focusing on the service quality, the study emphasizes on five dimensions; Tangibles, Reliability, Responsiveness, Assurance, and Empathy. The survey results show that customers are interested most in empathy. Empathy refers to caring or individualized attention provided by the firm. It consists of three factors: Access, Communication, and Understanding the customers. Actually, they act as the important factors to support the better services. From the study, Communication is the most valuable factor. It is keeping customers informed in the language they can understand and listening to them.

## 5.4 Further Study

The research has focused on delivering quality service. To understand to customers' specification, the company may continuously learn about expectations and perceptions of non-customers. Non-customer research reveals how competitors perform on service and provides a basis for comparison. Important expectations for the service that competitors feel better offer an agenda for actions.

The use of multiple research approaches (both of customers research and noncustomer research) is important because each approach has limitations as well as strengths. A combination of approaches enables a firm to tap the strengths of each and compensate for weaknesses. Continuous data collection and dissemination informs and educates the decision makers about the pattern of change e.g. shifting service priorities for customers, declining or improving service performance in some facet of the company's service, declining or improving service performance of competitors.



## APPENDIX A

### A QUESTIONNAIRE (ENGLISH VERSION)

## **SECTION 1      Personal Information**

Please (X) the assigned number that best describes you. Kindly complete every question.

### **1. Gender**

1) Males

2) Females

### **2. Age**

1) Below 25 years

4) 45 — 55 years

2) 25 — 34 years

5) 55 & upward

3) 35 — 44 years

### **3. Highest educational level**

1) Below high school

2) High school or equivalent

3) High commercial school or equivalent

4) Bachelor's degree

5) Above bachelor's degree

### **4. Occupation**

1) Govt./State enterprise

2) Company employees

3) Hireling

4) Ownbusiness/Entrepreneur

5) Housewife

6) Others (please specify).....

### **5. Monthly income (before tax deduction)**

1) Below 10,000 baht

3) 30,001 — 60,000 baht

2) 10,001 — 30,000 baht

4) Above 60,000 baht

### **6. Marital status**

1) Married

3) Divorce/Separated

2) Single

4) Widower

## **SECTION 2 Customer's Perception towards Airsirco Co.,Ltd. Services**

1. Please rank the reason in selecting Airsirco services (specify only 3 statements with the degree of important; 3 = Most Important, 2 = Very Important, 1 = Important)

_____ Company reputation	_____ Advertising & Public relations
_____ Prompt services	_____ Product and service rate
_____ Company location	_____ Courtesy of service providers
_____ Expertise technicians	_____ Word-of-mouth recommendations
_____ Modern equipment	

2. Level of satisfaction towards Airsirco services. Please (X) the assigned number indicating your degree of agreement to each of the following statements.

**1= Strongly Dissatisfy 2 = Dissatisfy 3 = Neutral 4 = Satisfy 5 = Strongly Satisfy**

### 2.1) Sales

2.1.1 Enthusiastic to offer product and services	1	2	3	4	5
2.1.2 Suggestion in products and service contract	1	2	3	4	5
2.1.3 Properly advice product specification	1	2	3	4	5
2.1.4 Preventive warranty service after installation	1	2	3	4	5

### 2.2) Delivery & Installation

2.2.1 On time delivery	1	2	3	4	5
2.2.2 Precision of product and accessories	1	2	3	4	5
2.2.3 Well-mannered in delivery & install service	1	2	3	4	5
2.2.4 Installation time	1	2	3	4	5
2.2.5 Suggestion after installation	1	2	3	4	5
2.2.6 User manual	1	2	3	4	5

### 2.3) Repair & Maintenance

2.3.1 Ease to request services	1	2	3	4	5
2.3.2 Courtesy in order receiving	1	2	3	4	5
2.3.3 Waiting times for repair person	1	2	3	4	5
2.3.4 Timeliness in repair and maintenance	1	2	3	4	5
2.3.5 Explanation of useful information	1	2	3	4	5
2.3.6 Checking & Maintenance schedule	1	2	3	4	5
2.3.7 Courtesy of repair person	1	2	3	4	5
2.3.8 Cleanness after services	1	2	3	4	5

3. Customer's attitude towards quality service improvement.

Please (X) the assigned number indicating your degree of agreement to each of the following statements.

1= Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree

1) Prompt service	1	2	3	4	5
2) Service rates & Convenience in payment	1	2	3	4	5
3) Courtesy of service providers	1	2	3	4	5
4) Service-minded & Advice	1	2	3	4	5
5) Advertising & Public relations	1	2	3	4	5
6) New technology e.g. computerized sys., online sys.	1	2	3	4	5
7) Well-trained technicians	1	2	3	4	5
8) Increasing the number of employees	1	2	3	4	5
9) Warranty service period	1	2	3	4	5
10) Varieties of services	1	2	3	4	5

Airsirco would like to express appreciation to your responses. Your valuable ideas will support service quality improvement in the future. We hope to serve your needs with higher quality.



## **APPENDIX B**

A QUESTIONNAIRE (THAI VERSION)

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2.2.1 frInilWaLLa'allihi'll.401S1P1`131111991fi'IIAUM 1 2 3 4 5

2.2.2 Pl`J'18J<sup>I</sup>IST.19.1NtriltdatL LtfillLIMTUyIIn101 1 2 3 4 5

2.2.3 3.11M1Y111'6111111fil'ILAMA 1,1,MilVivil LAT<sup>2</sup>DA 1 2 3 4 5

2.2.4 1,994rgildinglfr10111,n5<sup>4</sup>t1 1 2 3 4 5

2.2.5 milMquurtlqiinlslilLmi`a4viiiInisAn& 1 2 3 4 5

2.2.6 Ltflilii9n'il'Ot1151111f1;'01 1 2 3 4 5

2.3) n'll'UirrIT'iita0111,1

2.3.1 tranfrkarptiiinmaittn18431gruvil 1 2 3 4 5

2.3.2 nrnalnMAIT'6116n.Inqq1,d'i1111411,PAAITPlitl 1 2 3 4 5

2.3.3 i9q1c/i11111.4n9nthari113.11LLA.11,4141 1 2 3 4 5

2.3.4 1,9MillilqiirtUrrnsitriblgWVillin'ff**STI Lin I,d94** 1 2 3 4 5

2.3.5 n151VYPITaiintittni\*hlpiluitainAtniaViralrilU 1 2 3 4 5

2.3.6 fYITLITs filIP1T99 1P1 `t.9213.11i'IIA1.4) 1 2 3 4 5

2.3.7 a491IY1VITtIIAlilt1111.4117f1154a11111,1 1 2 3 4 5

2.3.8 nifinislf1913.12inqfrifinTAVIXATin1Viiin'w 1 2 3 4 5

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| 3) kralett1L1,q7,5'68tMFTEITav11:1FW114                             | 1 | 2 | 3 | 4 | 5 |
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