We Love To Hate Help Desk

Leesa Bauer, BSc Dip Ed

Faculty of Mathematical and Computing Sciences

University of Technology Sydney

Certificate

I certify that this thesis has not already been submitted for any degree and is not being submitted as part of candidature for any other degree.

I also certify that the thesis has been written by me and that any help that I have received in preparing this thesis, and all sources used, have been acknowledged in this thesis.

Signature of Candidate

Acknowledgements

Many people contributed in varied ways to make this work possible. It is the culmination of their encouragement, input and advice that has enabled me to complete this study. To my supervisor Kylie Sayer, thank you for your guidance in bringing all my ideas together. Her input enabled me to construct and complete this work. I am also indebted to Damon Rees who assisted me in the creation of the electronic survey.

The greatest debt of all goes to Lyndon Bauer, my brother who worked closely with me on this study. He gave up many hours of an evening to discuss issues, problems and approaches that provided essential clarity. He also provided much assistance with the statistical analysis for this study.

I would also like to thank my friends and family for supporting me throughout this study. A special thanks goes to my husband for his encouragement and assistance, which has made this time more enjoyable.

And finally, I would like to thank my work colleagues, especially the Help Desk team. You have provided the inspiration behind the study at hand.

Thesis Abstract

Customer satisfaction with the Information Technology Help Desk is the focus of this study. Technology in the workplace has increased exponentially. Therefore customers are more reliant on the Help Desk then ever before. This has raised the importance of the role that Help Desk plays in the functioning of an organisation.

The fundamental aim of this study is to answer the questions below;

1. Is dissatisfaction truly present for individual problems, or is it a generalisation or "urban myth"?

2. Which of the five hypotheses are the most significant in causing dissatisfaction amongst customers? The five hypotheses focus on the areas of Communication, Solutions, Service, Knowledge (up-to-date), and Morale.

A computer-based survey was used to query the customers. The survey questions linked back to the hypotheses. The customer was given the opportunity to make an optional comment to discover any sensitive issues that the survey did not address.

The average "overall satisfaction" rating for the survey suggested the general population is more satisfied then dissatisfied with the services of the Help Desk. From the study I was able to conclude that dissatisfaction is present for individual problems, but the dissatisfied customer only accounts for 8% of the surveyed population.

Having proven that customer dissatisfaction is present the next step was to determine the nature of the problem to provide useful information to reduce customer dissatisfaction. Investigating the surveys on the basis of problem category did this.

The results indicated that customer dissatisfaction was most prevalent in calls concerning changes made to PCs and server interruptions. Therefore the Help Desk needs to re-evaluate the processes for handling problems of this nature. In contrast customers were most satisfied with assistance for problems relating to desktop software and hardware. Therefore dissatisfaction is not an "urban myth".

Of all the five hypotheses, Help Desk morale stood out as producing more satisfaction than any of the other hypotheses including "overall satisfaction". Help Desk morale proved to be significantly different in nature when compared to the four other hypotheses. Therefore the moral of the Help Desk team is a fundamental ingredient for brewing a successful service. Get this wrong and all aspects of the team and the service will decline.

The most important influence on "overall satisfaction" was "satisfaction with keeping up with technological change", and the least important factor was "satisfaction with ability to predict problems through good communication". This would indicate an up-to-date Help Desk is more likely to have satisfied customers.

Table of Contents

List of Illustrations

List of Tables

Chapter 1- Research Purpose

Customer satisfaction with the Information Technology Help Desk is the focus of this study. According to Rhinelander et al. (1997) popular opinion of the Help Desk customer has suggested a disproportionately high level of dissatisfaction with the service.

Customer satisfaction with Help Desk services has been chosen as the focus of this study because Help Desk is the interface between the customer and the technology. Acting as the interface between technology and the customer, the majority of customer opinion will be established by the Help Desk. Therefore it is very important to ensure customer satisfaction is high as a result of their interaction with Help Desk. If customers are not satisfied with the services rendered they will simply take their business elsewhere. Customers require technology to enable them to successfully complete their job, therefore if this is inhibited, the future of the technology area will be under question.

In this chapter I discuss the approach adopted in this research, and relevance of the topic within the IT industry. I discuss the issues it raises, and provide an outline for the following chapters in this study.

- In Section 1.1 I discuss the context of this research. Here I give an overview of the importance the Help Desk has in enabling the customers to produce their own business deliverables. I also detail why customer satisfaction is so important. It is important to understand the IT Help Desk in terms of customer satisfaction to identify with the concerns that I have raised.

- In Section 1.2 I discuss that limitations of existing research, and the relevance of this study in light of existing research.

- In Section 1.3 the style of research is presented. This information is to give the reader an indication of the research format.

- To conclude this chapter, I present Section 1.4, which provides a summation of the main issues of the research.

1.1 Research Context

The rapid change and increased complexity of Information Technology in the last few years has raised the required level of skill for the Help Desk customer to produce their daily business deliverables. The resulting exponential increase in the reliance on the service provided by Help Desk has raised the importance of the role that Help Desk plays in the functioning of an organisation. Branuthal (1999) outlined that each employee's job revolves around computers and technology more now than ever before. Customers need an efficient and reliable interface to the Technology area to ensure they can effectively function in performing their own business processes.

Customers are demanding greater customisation of services provided. "The emerging role of the service professional is multifaceted, just as the emerging responsibility is multidimensional" (Murphy 1999, p.1). The customisation of services has meant a need for an increase in system functionality, which has increased the complexity of day to day tasks. The complexity and importance revolving around the role of the Help Desk has increased.

Customers are heavily reliant on the services provided by an organisation's Help Desk and the rest of the technology support team. "Creating a first class help desk is imperative. The functionality, or disfunctionality, of the help desk increasingly will be what drives the business unit's and end user's perception of the IT organisation" (Lusher 1995, p.1). A successful Help Desk must have high levels of customer satisfaction. Customer satisfaction needs to become priority number one for the Help Desk and more importantly the IT function as a whole.

Help Desks going into the new millennium should carry a profile that equals the traditional areas of finance, marketing, and sales within the organisation. The role that the Help Desk plays is so important that Help Desk management should report, "directly into executive management ...the customer wants to be more than a faceless name. The customer should be known and understood by the company" (Sudbury 1999, p.1). To enable such an approach around what the customer is demanding, the Help Desk needs to be one of the best-equipped teams, considering they have the greatest customer contact in comparison with the rest of the company.

Murphy (1999) mentions such techniques as defining expectations, listening, updating the customer, providing clarification, and responding to customer demands, as being imperative to keep the customer satisfied. The Help Desk needs to have the ability to advise, coach, guide, consult, and lead to provide the service customers are expecting. Each service interaction influences the customer's perception of Help Desk. Murphy (1999) emphasises the importance customer perception has on determining the value placed on the Help Desk.

Customer satisfaction becomes the focus for creating a successful Help Desk. Therefore it becomes very important to understand what discrete elements of the Help Desk's operation creates customers perception, and ultimately customer satisfaction or dissatisfaction. Chapter two defines and investigates these elements in greater detail through the definition of the five hypotheses that detail the constitutional elements of customer satisfaction.

1.2 Limitations of Existing Studies

Much of the published literature concerning the Help Desk Industry and customer satisfaction narratively discusses customer satisfaction with no specific factual supporting evidence. The authors investigate such things as, what is customer satisfaction, and how to implement a survey to measure it. Czegel (1999) suggests surveying as a good technique for measuring customer satisfaction. She looks at the frequency with which the survey should be implemented and suggests that the customer's response should be given in the format of a scale where the customer can rate their satisfaction. This type of information is useful for individuals who wish to implement their own surveys, but it doesn't help in the understanding of the elements responsible for customer satisfaction, or dissatisfaction.

A study by Schweich (1997) surveyed IT Help Desk customers to determine customer satisfaction. The main purpose of the study was to demonstrate how to create and implement a survey. The questions within the survey were general and did not attempt to pin point specific areas relating to customer satisfaction. "Did you get the assistance you needed? Was it delivered in a timely manner? Was the service friendly?" (Schweich 1997, p.2). There was also no discussion around each of the questions to demonstrate what aspect of customer satisfaction was being measured. The survey was too general to give a solid conclusion or an accurate reflection of what specific areas determine customer satisfaction and their importance relative to each other.

Shevline and Deutsch, (1999) commented on the inaccuracy with which customer satisfaction is measured. Simply asking customer how happy they are with Help Desk is not enough. The research has to be designed in such a way to address all the relevant factors in determining customer satisfaction. The questions must also be sculpted in such a fashion as to be direct and eliminate any ambiguity or

misinterpretation. Within this study I identified five areas responsible for determining customer satisfaction. I aim to rank them in order to find their importance in determining customer satisfaction. The culmination of the five identified areas gives a holistic approach to customer satisfaction that other studies have lacked.

It is also very popular for authors to discuss Service Level Agreements as a mechanism of maintaining customer satisfaction. The rate of caller abandonment, and queuing times are measured and reported on. In isolation such reports only provide metrics, they do not help one to understand how satisfied the customer is with the service provided.

Other literature briefly describes areas that should be considered when investigating customer satisfaction. Crotty (1999) highlights communication, and customisation around specific business requirements as areas that will drive customer satisfaction. Other areas such as Help Desk morale, and the quality of the Help Desk's knowledge, are overlooked as contributing to customer satisfaction. In such instances authors identify only one or two specific areas concerning customer satisfaction.

This investigation addresses customer satisfaction in a direct and holistic manner by going to the customer and recording their response to several discrete areas. Other studies are too general and do not provide factual evidence.

1.3 Format of the Research

The research approach taken in this study is one based on quantitative analysis. A survey comprising of six closed-ended questions provided a quantitative source of data to analyse. The results from the survey will reveal the relationship between the five hypotheses and customer satisfaction. This study is highly structured which allows the study to be easily replicated within a different organisation.

1.4 Summary

The functions preformed by the Help Desk have greatly increased in complexity over the last several years. During this time the users dependence on the Help Desk has increased exponentially to an extent that some business could not function without the services of Help Desk. As described by Menks (1999) customers require technology to enable them to successfully complete their job. It is therefore important that Help Desk can act as an enabler.

The Help Desk is the interface between the customer and the entire IT function. Therefore it is not only important that Help Desk are able to provide customer satisfaction, but the Help Desk must also be an ambassador for the entire IT group.

Customer satisfaction is the focus for creating a successful Help Desk. It is important to understand each element of the Help Desk's operation that creates customer perception, and ultimately customer satisfaction or dissatisfaction. This study investigates the areas of Communication, Solutions, Service, Knowledge, and Morale, to find their relevance in determining customer satisfaction. The study also allows

one to determine if dissatisfaction is truly present for individual problems, or is it a generalisation or "urban myth".

Generally other studies concerning customer satisfaction have only investigated one or two of the elements of customer satisfaction. Many suggestions are given on, how to address problems with customer satisfaction, without sufficiently defining, or understanding the problem that is at hand. This study defines the constitutional elements of customer satisfaction, and then ranks these elements in term of relevance in determining customer satisfaction.

Chapter 2 - Research Issue

The goal of this research is to test five hypotheses that define the elements of customer satisfaction, and then rank these hypotheses in terms of most likely to least likely to cause customer dissatisfaction. The five hypotheses in question were formulated from many sources of existing literature that is, Crotty, 1999; Kirk, 1999; Lusher, 1995; Marcella & Middleton, 1996; Menks,1999; Nordan et al, 1998; Rhinelander 1998. Within this chapter I present the five hypotheses in detail and sketch out their formulation by drawing together the ideas and findings of existing literature.

- In Section 2.1 I outline the research issues that I investigate within this study. Here I focus on the five hypotheses that define customer dissatisfaction with Help Desk.

- In Section 2.2 I discuss the ideas and findings from existing literature that provided the foundation for the five hypotheses that are tested within this study.

2.1 Testing of the Hypotheses

Through the process of a literature review several specific areas were clearly identified as important in determining customer satisfaction with the Help Desk. The following areas are listed below and constitute the basis for each of the five hypotheses;

- **Communication** – To act effectively the Help Desk must be well informed on current support activities and general IT knowledge. As outlined by Marcella and Middleton (1996) communication between the Help Desk and other IT support teams will effect the awareness of Help Desk.

- **Solutions** - Crotty (1999) explains that the Help Desk needs to understand the business requirements behind customer problems. This will enable Help Desk to present IT solutions that address the business requirements at hand.

- **Service** – Kirk (1996) describes the Help Desk as the face of the IT function. Therefore the Help Desk is associated with the majority of IT activities, since they are the interface between the customer and IT.

- **Knowledge** (Up-to-date) – Rhinelander et al. (1997) details that the Help Desk has had to keep pace with the rapid advent of technology to remain effective in the support of the customer requiring assistance with new technologies.

- **Morale** – Kirk (1998) discusses how Help Desk morale effects customer satisfaction since the Help Desk is responsible for the customer's comfort and ease in relaying their request.

2.2 Literature Review

The level of customer satisfaction can be objectively reported. A review of the literature has resulted in five hypotheses that define the five areas responsible for the cause of dissatisfaction among customers. The aim of this study is to determine the following:

- Is dissatisfaction truly present for individual problems, or is it a generalisation or "urban myth"? This will be determined by measuring the level of perceived satisfaction, in as objective a manner as possible, for individual services.
- Which of the five hypotheses are the most significant in causing dissatisfaction amongst users? This will be determined by ranking each of the five hypotheses against each other according to their impact on customer satisfaction.

Communication

Many people using a Help Desk will evaluate Help Desk personnel as being unhelpful. Problems are not solved, or they might have to repeat the details of their problem several times. The problem results from companies keeping the Help Desk "at arms length from the rest of IT" (Nordon et al. 1998, p.1). As a result, support requests get fumbled. This statement accurately summarises the problem. The communication channels between the Help Desk and the rest of Technology need to be widened. Information needs to flow freely in both directions. This commonly does not happen. The net effect isolates the Help Desk leaving them to act as the buffer for customer irritation, with little or no assistance at all.

Marcella and Middleton (1996) explain the need for improved communications between Help Desk and other IT teams to empower Help Desk in providing more solutions first hand. The Help Desk does not operate in a proactive manner because it operates as an island. This is a result of poor communication between the Help Desk and other IT departments. As Help Desk provides more solutions first hand customer satisfaction should increase.

Nordon (1998) described that past problems involving communication between support teams were blamed on unrefined and ill planned support infrastructure. Infrastructure defines the workflow and procedures that creates limitations for the transferral of information between support teams. The rate at which technological change has been adopted has accelerated over the last couple of years creating challenges in keeping communication channels flowing freely between support teams. In the past systems required a simplistic support infrastructure however, the current organisational environment requires a support infrastructure that is able to communicate freely and effectively between teams.

Historically Help Desk had fewer products to support and there were fewer components that could go wrong within each product. The emerging role of Help Desk will see its team members become the most diversely skilled technicians within the support organisation. Successful communication between the Help Desk and other IT support teams must take this into consideration when re-engineering communication procedures.

Service

The concentration of IT effort focuses on supporting IT systems therefore the Help Desk is better equipped to solve problems associated with technology rather then those relating to customer's business requirements.

Marcella and Middleton (1996) appear to be among the first to recognise that the pressure on the Help Desks is rapidly rising, and demanding a change in orientation from being technology based to customer based. Crotty (1999) further supported this argument with the opinion that Help Desk must be engineered around business requirements rather than technology to meet the demand of a higher level of service.

Rhinelander et al. (1997) discussed the frustration customers are experiencing because the solutions they are presented with are based on the available technology rather then their business requirements. Customers become frustrated because the technology they are provided with, is set up and supported with very little thought concerning their business requirements.

Rhinelander et al. (1997) gave the following example. Traditionally when customers have experienced problems the first reaction is to limit functionality so there is less

that can go wrong. This is also implemented as a cost saving technique, since it is perceived that support costs should decrease if there is less to go wrong. This is one of the major reasons why customers become so frustrated with the Help Desk. Limiting the functionality of technology was sought as a means to decrease the number of problems customers were experiencing.

Knowledge (Up-to-date)

Lusher (1995) identifies the changing role of the Help Desk with the advent of distributed computing. "The functionality, or disfunctionality, of the Help Desk increasingly will be what drives the business units' and end users' perception of the IS organisation" (Lusher 1995, P.1). As the Help Desk is more able to keep up with the pace of new technologies the level of customer satisfaction will also increase. Customers will bypass the Help Desk if they considered them to add no value, if their knowledge is not up-to-date. The above points develop an understanding of why customers might become so frustrated with Help Desks inability to assist them.

Quality of Service

A large gap exists between expectations of Help Desks and the resources provided to the area. It is a common expectation that Help Desks should be able to assist or solve the majority of IT problems and inquiries. This expectation is a traditional expectation, which has seen little change in the founding principles of the Help Desk structure, operation and value as described by Case (1999). Its performance is strictly measured, and its value is seen as menial relative to the rest of the support infrastructure. In contrast the tasks and functions performed by the Help Desk has greatly increased in complexity over the years. One of Crotty's (1999) strongest points centres on the exponential increase in dependence on the Help Desk. This dependence has increased to an extent that some businesses could not function without Help Desk services. It is ironic that "the image of the Help Desk among both

users and management is decisive in the allocation of resources and all too often it is poorly understood, even vilified, by both users and management" (Marcella 1996, p.9). The above outlines the massive difference between the value placed on the service provided by Help Desk and the expected performance. This is potentially a major contributing factor for an increase in customer dissatisfaction.

Kirk (1998) explains how important a solid management focus is for a Help Desk. Often in-experienced managers and staff find their way into the Help Desk because of the historical perception that the Help Desk is the starting point for a technology support career. It is evident that in-experienced management can only magnify stress within a Help Desk team. One would logically conclude that only experienced management should be placed in charge of a Help Desk. The placement of inexperienced management in Help Desk positions is explained by the gap between the value placed on Help Desk compared to the expected performance.

The value placed on work performed by answering phones is extremely low. The Help Desk is seen as an "entry level job" (Murphy 1999, p.1). It is not uncommon that the majority of Help Desk personnel will not have any job variation away from the phones. Negative values limit resources and passion for such a vital service. This is a cultural problem surrounding the Help Desk.

Morale

Many of the reviewed authors noted that poor morale surrounded the Help Desk in a majority of cases. The prevalence of low morale among Help Desk personnel was explained as resulting from inadequate communication, and poor planning.

Crotty (1999) describes the esteem and morale within Help Desks as low. He explained this as a direct effect of the inadequate communication between the Help

Desks and the rest of the support infrastructure. "The disfunctionality, of the Help Desk drives the business units' and end users' perception of the Help Desk" (Lusher 1995, p.1). The above demonstrates a correlation between the low morale of the Help Desk and customer dissatisfaction.

Nordon et al. (1998) linked low morale to poor planning. Here Nordon et al. (1998) discussed aligning people with support goals by structuring bonuses around these goals.

Accurately tracking the activity of employees can also assist in improving morale. Inadequate tracking increases the difficulty in employees learning from mistakes or even measuring performance increase and decrease. The danger of not tracking performance is that Help Desk never sees things getting better, or rather they see them as getting worse.

2.3 Summary

The rapid rate with which technology has grown in size and complexity has driven change. Traditionally technology teams have found moulding solutions around the requirements of the customers challenging. The increase in the rate at which technology is changing and growing has raised the complexity of this task. The emerging role of the Help Desk requires management that can wisely choose between a vast ever-changing variety of solutions, to find one that matches the requirements of their customers.

The research question can be divided into two sections;

1. Is dissatisfaction truly present for individual problems, or is it a generalisation or "urban myth".

2. Which of the five hypotheses are the most significant in causing dissatisfaction amongst customers?

   - Communication

   - Solutions

   - Service

   - Knowledge (Keeping up-to-date)

   - Morale

This will be determined by ranking each of the five hypotheses against each other according to their impact on customer satisfaction. Each of the five hypotheses addresses a specific area, that when combined plays a fundamental role in determining customer satisfaction or rather dissatisfaction. Customers require technology to enable them to successfully complete their job, therefore if this is inhibited, the future of the Help Desk and even the IT function will be under question.

Chapter 3 - Research Method

This chapter presents the research method used to direct the research into customer satisfaction of the IT Help Desk. The careful analysis of customer satisfaction will present an insight into how to construct a technology Help Desk to ensure a high level of satisfaction. The core aim of this chapter is to show how the study of customer satisfaction is best comprehended via a quantitative approach using the technique of survey research.

- In Section 3.1 I discuss why survey research as opposed to other forms of research, was chosen as the means for collecting information concerning customer satisfaction. I then breakdown survey research into its many types to explain why I chose a computer-based survey.
- In section 3.2 I discuss the survey design in terms of content and operation.
- In section 3.3 I detail the IT systems used to create the computer-based survey.
- In Section 3.4 I outline the methodology used to implement the research process.
- The summary section 3.5 outlines the choice of computer-based surveys for a research methodology, and reasons for such techniques.

3.1 Research Method

Selection of Research Type Quantitative versus Qualitative

Quantitative research was chosen over qualitative research because of the following reasons

- Closed ended with a numbered scale are quickly processed
- Large sample sizes can be processed with accuracy and ease.
- Statistical analyses of numbered scales removes subjectivity

One of the main reasons for my choosing to survey the customers was that I wanted to use statistical analyses of the surveyed data. Statistical analysis provides quantitative data as the foundation upon which conclusions can be drawn. In particular I chose to survey the customer via a majority of closed-ended questions, since closed-ended questions are well suited to quantitative analyse.

Selection of Research Type: Survey, Controlled Experiment, Case Study, and Participant Observation.

In conducting research there are many data sources available, of which survey research is one. As discussed by Crockett (1990) non-survey methodologies include controlled experiment, case study, and participant observation. Such a study would require two sets of customers and Help Desk staff, to form the control group and the experimental group. The creation of such groups within the Help Desk is impossible, because of resourcing. Help Desk would also need to be informed of the study, which may inturn influence working behaviour. Help Desk personnel where not informed of the study to ensure they did not modify any behaviour specifically for the purpose of study.

A case study is another method of data collection that does not involving surveying. " In preparing a case study the researcher seeks to collect and analyse as much data about the chosen subject as possible from a relatively small number of cases" (Crockett 1990, p.3). A small sample for this study could be defined as five individual calls that are logged to the help desk. Such a small in-depth study may not accurately reflect the nature of the five highlighted areas. The results of the study would depend greatly on the subjects chosen for the study.

Another non-survey methodology is that of focus groups. Such methods of data collection require the researcher and the participants to be available at one agreed time. I did not choose to use focus groups for two main reasons. Firstly considering time pressures this can become a complex if not impossible task. Secondly the intense nature of the data collection does not allow a large sample size therefore, "Bias is a factor to consider when a limited number of people are reached. Users who agree to attend the group discussion may not be representative of the entire population" (Anderson et al. 1997, p.179)

Electronic surveying enabled me to conveniently use a large sample with a minimum of cost in terms of time, money and resources. This was important since the investigation did not receive any financial sponsorship. I conducted the survey within my place of work, therefore I used the technical and human resources that were already available to me without any monetary outlay. Once the automated survey was created, it allowed me single handedly, to collect and processes hundreds of results within hours.

Participation should be higher then other mentioned methods of data collection since the people involved can chose any time of the day to partake. Participants are also more likely to give an accurate reflection of their satisfaction since their response is anonymous, unlike a focus group or case study. Also most people are also familiar with surveys and therefore find them easy to complete.

Limitations of Research Method

There are also some disadvantages of employing surveying as a data gathering technique. The initial creation of the survey took more time then first thought. Questions may also be subject to over interpretation, since there is no facilitator to

assist the participant. Response rates are also generally low. Anderson et al. (1997) quotes the expected response rate to be approximately 20%.

Types of Survey Techniques

There are several types of survey techniques that can be used. As outlined by Cowie (1999) such techniques include telephone Surveys, paper-based Surveys, and computer-based Surveys. I chose to implement a computer-based survey.

Telephone surveying was not a selected technique for data gathering because of the intense resource requirement to run the survey. Calling each customer would have ensured a higher return rate for the survey, but the time required to drive such a survey would have been excessive. Customers would also be less likely to give an accurate response since the survey is not anonymous. Also the time at which the customer is called might not be convenient, or they may not even be by their telephone. Therefore repeat calls would be required.

Written or paper based surveys were not selected as a means to conduct the survey primarily because paper based surveys are, "harder to distribute and collect" (Cowie 1999, p.62). This could potentially lower the response rate. After all the paper is collected, data entry is required to collate the results. This also presents such problems like illegible writing, partially completed surveys, and inaccurate data entry. Even though some people may be more familiar with paper based surveys, considering the time and resource contrast involved within this study, a paper-based survey would not be appropriate.

I chose to employ a computer-based survey mainly because, data entry is not required, the cost for distribution is negligible, it is comparatively convenient for customers to participate, and partially completed surveys prompt the customer to complete all required answers.

I chose to deploy the computer-based survey via an e-mail that doubles as a covering letter. The e-mail contains a link, which when clicked on delivers the survey instantly to the customers screen. Once the customer completes the survey they are required to click on a button to submit the results. At this point the survey's automated process checks that all questions have been completed. If all questions have not been completed the customer is prompted to complete each incomplete question.

3.2 Survey Design

When designing the survey a "user friendly" format, was of the highest priority. The second priority was to ensure that participation in the survey required minimal effort from the customer. Both of the above criteria would ensure a high return rate and an accurate account of the customer's exposure to the Help Desk.

A common problem associated with surveying, is partially complete responses. The survey is designed to prompt the customer to complete any partially completed responses. The customer can partially complete a survey, leaving it open on their screen until later, if they cannot complete it all in one sitting. They cannot submit it before it is complete. The survey has been kept to a minimum of questions to avoid any difficulties.

The survey contains six questions and a final section for an optional comment. Each of the questions are answered using a scale from one to ten where one equals "completely dissatisfied" and ten equals "completely satisfied". The survey has been designed with an even number of choices to avoid people "sitting on the fence". Only whole number can be selected.

Each survey is based upon one specific call placed to the Help Desk. The details of this call are summarised within the top section of the survey to refresh the respondent's memory. The intention of the survey is not for the participant to give a general reflection of the Help Desk, but rather for the customer to reflect on the specific call outlined in the survey.

All questions within the survey except one are closed ended. Crotty (1999) describes closed-ended questions creating a cheaper, easier to answer, easier to process survey process, as compared to open-ended questions. Closed-ended questions were chosen as the main medium for response because quantitative responses are easier to interpret in a statistical manner. It is also easier to process a large number of responses that are closed-ended as opposed to open-ended. "Closed ended questions allow respondents to answer the same question so that answers can be easily compared" (Foddy 1993, p.120). Respondents find closed-ended questions easier to answer because the nature of closed-ended questions relies on recognition, as opposed to recall.

The survey was designed with one open-ended question to provide the opportunity for the customer to convey any important issues that were not captured within the closed-ended questions. In some cases the extra information clarified the meaning of the respondents answers.

There are several types of closed-ended questions. Crotty (1999) describes a rating scale as the best variety of closed-ended question when trying to get a rating, for example "poor" to "excellent". I chose this type of closed-ended question because it supports a sliding scale of responses from "poor" to "excellent" or "dissatisfied" to "satisfied". A dichotomous scale does not allow the required variety of responses since it only offers the response of "yes" or "no". Multiple choice is too complex an alternative, since each response would have required a specific definition, which even then may not have accurately described the customer's experience.

Examples were also used within the survey. The purpose of the two examples within the survey is to give the respondent a better understanding of the question. The intention of the examples was to be used as a guide.

Survey Pilot

Piloting was used to test the following aspects of the survey;

- **Stage one**
  - Absence of technical bugs
- **Stage two**
  - Clarity and interpretation
  - Spelling and grammar
  - Ease of use
  - Ease of statistical processing

The survey underwent two stages of piloting. The first stage of the pilot focused on the mechanics of the computer-based survey, and the second stage focused on the comprehension of the survey. Colleagues were employed for the first stage of the pilot, since it would not have been acceptable to send a computer-based survey to a

customer that could not be electronically executed. Features that were tested included the survey's ability to force complete responses for all closed-ended questions, and survey's ability to prevent respondents from changing the form. During the first stage of piloting colleagues comments concerning comprehension were noted even though it was not the focus of the first stage of piloting.

The second stage of the pilot involved the Help Desk Customer. The survey was sent to nine customers. There are two specific reasons why the second stage of the pilot was executed. Firstly clear comprehension of the content was foremost. Secondly the pilot data required testing. This testing ensures that the data can be processed via the intended statistical methods.

The results of the piloting of the survey will be discussed in chapter five.

3.3 Technical Specification for Survey Design

It is important to capture the methodology concerning the technical specifications of the survey design to understand how the survey interfaces to the customer and the effort involved in creating the automation.

The automation of the survey can be broken down into four phases.

Phase One

Phase one focuses on the input of data into the "Call Tracking System". When a customer experiences technical difficulty they phone the Help Desk and log a call. A Help Desk member then inputs this information into the Call Tracking System. All information regarding the problem and the customer is stored within the record.

Phase Two

After all the required call records are captured, the information is then transferred into the survey system, which is powered by a Lotus Notes database.

Phase Three

The customer receives e-mail notification regarding the survey via an e-mail. The e-mail provides the customer with a link to the survey. When the customer clicks on the link the survey executes. This Survey System's function is to present the survey to the customer and then capture each response. This system is also used to administer and present the raw data from the responses.

Phase Four

In the final phase the data is exported out of the Survey System and into a spreadsheet where the data can be easily manipulated. Please refer to Figure 1: Systems Used To Create And Drive The Survey Process.

Stage One: Each Customer Call is Entered in the Call Tracking System

Call Tracking
Call Type:
Call Category:
Call Details:

Call Tracking
Call Type:
Call Category:
Call Details:

Call Tracking
Call Type:
Call Category:
Call Details:
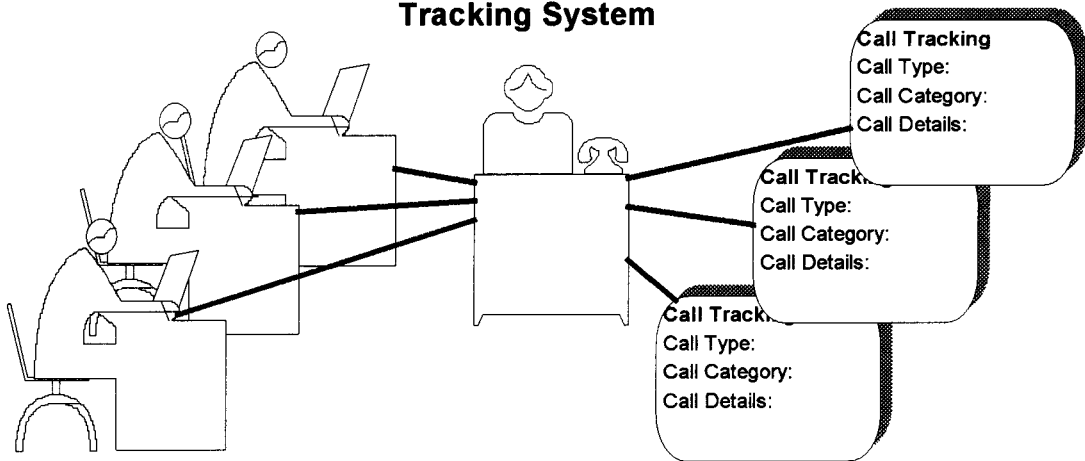
Stage Two: Call Information is Transferred Into The Survey System.

Call Tracking
Call Type:
Call Category:
Call Details:

Call Tracking
Call Type:
Call Category:
Call Details:

Call Tracking
Call Type:
Call Category:
Call Details:

Survey
Call Type:
Call Category:
Call Details:
Q1..Q2 ..Q3...Q4

Survey
Call Type:
Call Category:
Call Details:
Q1..Q2 ..Q3...Q4

Survey
Call Type:
Call Category:
Call Details:
Q1..Q2 ..Q3...Q4
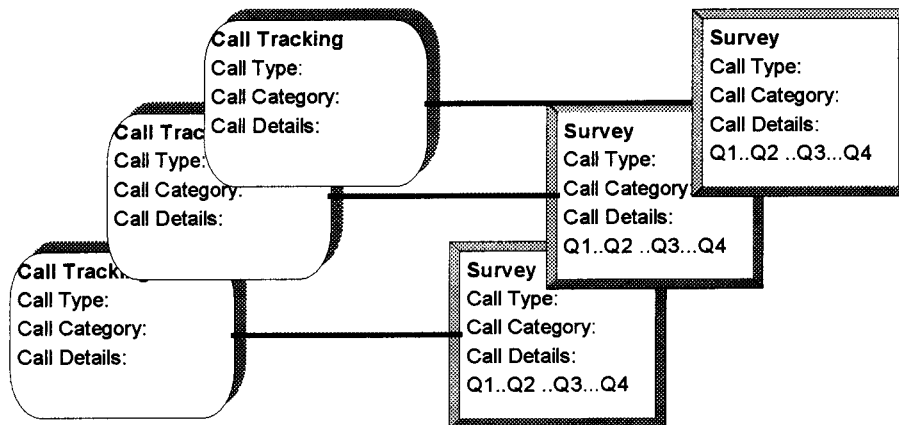
Stage Three: Each Customer Receives An Email That Links them To The Survey

Email
Dear Customer
To complete the
survey please click
on this link-->X

Survey
Call Type:
Call Category:
Call Details:
Q1..Q2 ..Q3...Q4

Page 36
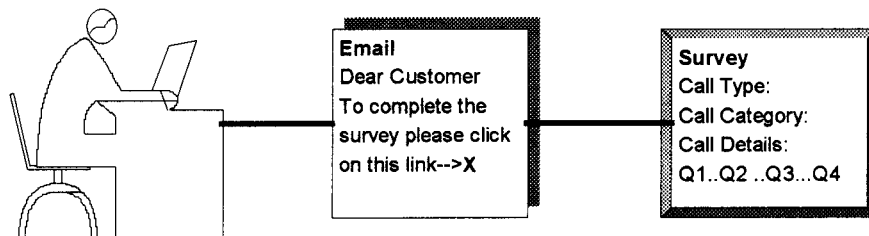
Stage Four: The Results From Each Survey Is Collated Into A Spreadsheet For Analysis

Survey		Spreadsheet						
Call Type:		Response	Q1	Q2	Q3	Q4	Q5	Q6
Call Category:		1	6	7	7	5	7	7
Call Details:		2	8	8	8	7	9	8
Q1..Q2 ..Q3...Q4		3	2	4	3	2	5	3

Survey
Call Type:
Call Category:
Call Details:
Q1..Q2 ..Q3...Q4

Survey
Call Type:
Call Category:
Call Details:
Q1..Q2 ..Q3...Q4
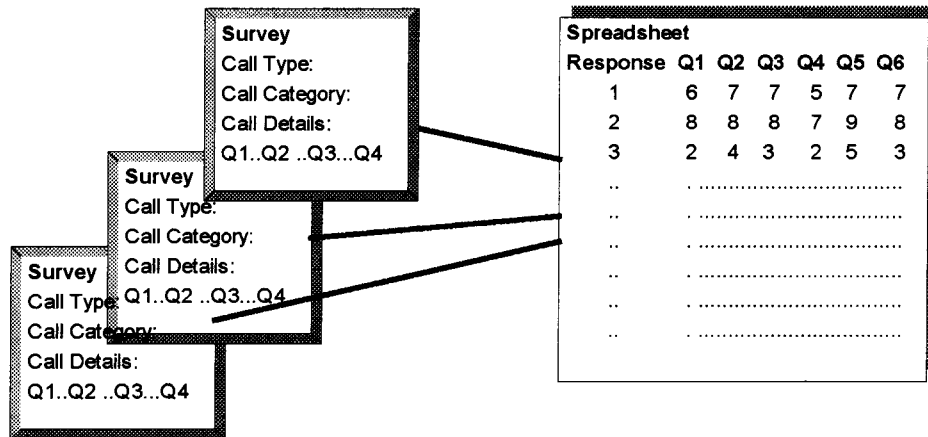
Figure 1: Systems Used To Create And Drive The Survey Process

3.4 Data Collection

This section will provide the procedure used for the implementation of the survey. All the calls that are raised on Friday 5/11/1999 and the following Monday 8/1/1999 make up the sample for this study. The only calls that were excluded from the sample were "wrong numbers" and "call transfer". Any calls that are received by the Help Desk but the caller has dialled the wrong number are recorded as "wrong numbers". These calls are not included in the sample because the caller will not experience all of the services offered by the Help Desk. Therefore the caller will not be in a position to complete an entire survey. When callers dial the Help Desk to have their call transferred to another person this is defined as "call transfer". These call types were also not included in the sample for the same reason as "wrong numbers" were not included.

For the purposes of this study the Friday and the following Monday will be named day one and day two respectively, and weekends will not be counted. The customer base is two thousand in number where 500 calls make up the sample size. The customer base is composed of internal company employees from eleven different offices around Australia. Seven of the eleven offices are located in Sydney. More background information regarding the site will be presented in chapter four.

Customers lodge their calls by phoning the Help Desk. I have chosen Friday and the following Monday as the days to take the sample of logged calls, since Monday and Friday normally have the highest call rate. My aim is to get a large sample size to ensure an accurate reflection of the population.

When the Help Desk takes a call, a summary of the call details is entered into an electronic call tracking system. Each call entered into the call tracking system is created with a number that uniquely identifies the call. The Help Desk does not necessarily solve each call that is logged by the Help Desk. The calls which are not solved by the Help Desk will be escalated to another IT member in a second line of support.

When a call is closed by the Help Desk or a second line support member the call status is updated from "open" to "closed" and a brief summary of the call solution is recorded.

On day five each call that was logged on day one and two will be used as the key to survey the corresponding customer. Both "Open" and "Closed" calls will be surveyed.

The initial section of the survey outlines the call. The call time, date, type and description are given to remind the customer of the call. The next section is composed of six closed-ended questions that focus on the service provided by Help Desk. The final section allows the customer to provide any additional feedback.

Once the survey is populated with the relevant information it is emailed to the customer. Any customer that has been sent a survey and has not responded will receive a reminder e-mail on day seven. Day nine, close of business marks the final cut off for accepting survey responses.

Below Table 1 summarises the process that was followed for the implementation of the survey.

Day	Date	Weekday	Activity
1	5/11/99	Friday	First day to collect sample calls
2	8/11/99	Monday	Second day to collect sample calls
3	9/11/99	Tuesday	
4	10/11/99	Wednesday	
5	11/11/99	Thursday	Issued survey
6	12/11/99	Friday	
7	15/11/99	Monday	Emailed a reminder to all customers that had not responded.
8	16/11/99	Tuesday	
9	17/11/99	Wednesday	Final cutoff for excepting survey responses

Table 1: Survey Implementation Activity

When completed, the computer-based surveys were saved within a Lotus Notes database. Each of the computer-based surveys are stored within this database. The data can then be manipulated to present a matrix format. The table below illustrates the format in which the data is presented for analysis.

Response number	Question 1	Question 2	Question 3	Question 4	Question 5
1	4	6	9	5	5
2	2	2	7	9	5

Table 2: Example Response Summary

Help Desk technicians and the customers, knew nothing concerning this study, until the data was collected. This was done to have as little impact as possible on the way in which they work.

The "Workflow Methodology", in Figure 2 summarises the process used to implement the survey.

```
                    ┌─────────────┐
                    │  Customer   │
                    │ phones Help │
                    │  Desk on    │
                    │   day 1     │
                    │  & or 2     │
                    └─────────────┘
                           │
                           ▼
              ┌──────────────────────────┐
              │ Problem recorded in call │
              │     tracking system      │
              └──────────────────────────┘
                           │
                           ▼
                      ◇ Is problem ◇     NO    ┌──────────┐      ┌──────────┐
                      ◇ handled by ◇──────────►│ Escalate │─────►│Second line│
                      ◇ Help Desk ◇            │problem to │      │works on the│
                           │                   │second line│      │  problem  │
                          YES                  └──────────┘      └──────────┘
                           │                                           │
                           ▼                                           │
                    ┌─────────────┐                                    │
                    │  Help Desk  │                                    │
                    │ works on the│                                    │
                    │   problem   │                                    │
                    └─────────────┘                                    │
                           │                                           │
                           ▼                                           │
                    ┌─────────────┐                                    │
                    │Status of call│◄──────────────────────────────────┘
                    │  is closed  │
                    └─────────────┘
                           │
                           ▼
                      ◇ Is it day 5? ◇    NO    ┌──────────┐
                           │          ─────────►│   Wait   │
                          YES                   └──────────┘
                           │
                           ▼
              ╭──────────────────────────╮
              │ Summary of call detail is │
              │recorded in an eletronic   │
              │ survey hosted by          │
              │   Lotus Notes DB          │
              ╰──────────────────────────╯
                           │
                           ▼
              ┌──────────────────────────┐
              │ Mail customer a link to   │
              │the electronic survey  to  │
              │       complete.           │
              └──────────────────────────┘
                           │
                           ▼
                 ◇ Wait untl day 7 ◇   NO    ┌──────────┐
                 ◇ Has the customer ◇───────►│Mail customer│
                 ◇  responded       ◇        │a REMINDER. │
                 ◇  to the survey   ◇        └──────────┘
                      │                            │
                     YES                           │
                      ▼                            │
              ┌──────────────────┐                 │
              │ Compile Report.  │◄────────────────┘
              └──────────────────┘
```

Figure 2: Workflow Methodology

3.5 Summary

Determining the appropriate content and type of survey depends on study objectives, sample size, equipment available and budget. A quantitative survey methodology with a rating scale was chosen because time was limited, there was ready access to the required technology to create a computer-based survey, and there were no available resources to assist in the manual processing of a survey. A computer-based process was also a quick and easy mechanism for the customers to complete the survey.

A quantitative approach was taken to investigate the research question. The approach was better suited in comparison to a qualitative approach for the following reasons;

- Closed ended with a numbered scale were quickly processed

- A larger number of responses, ie 220 were processed with accuracy and ease.

- Statistical analyses provided an objective means of analysis

The entire survey mechanism was designed to increase the accuracy of results. Each survey was centred on a specific call that was taken by the Help Desk. This methodology was used to prevent bias responses where customers remember negative experiences more strongly than positive experiences. The use of technology in the survey methodology also ensured all responses were complete, and no errors arose from incorrect data entry.

Chapter 4 - Site Description

This chapter presents information regarding the site used for the study. Background information concerning the site and a discussion concerning the site selection set the context for the study.

- In Section 4.1 I discuss why I chose the site in question.

- In Section 4.2 I describe the composition and nature of the Help Desk and surrounding support teams.

- In Section 4.3 I provide information regarding the corporation, to outline the corporate structure and culture.

4.1 Site Selection

The main reason for the choice of this study has come from the problems that surround me in my place of work. Up until 1999 I managed a third level support team. I had an efficient and effective team, which in general enjoyed their jobs and were well respected by other support teams. During the time I had observed the Help Desk it was evident that there were a number of problems. These problems had driven the group and its team members on a downward spiral in terms of effectiveness, efficiency, skill and morale.

At the beginning of 1999 I was offered the position to manage the Help Desk team to bring about a more effective team who could provide the service that would satisfy the customer in the new millennium. This real life position has been the major driver to determine the nature and source of customer satisfaction.

My close involvement with the Help Desk had also presented me with an inside view to the Help Desk that I had not seen before. I was situated in a convenient position to access any information regarding the performance of the Help Desk and customer satisfaction. I easily attained authorisation for the study since my management was also interested in the study. This ensured support from the management team. The environment also provided me with a number of people, consisting of both management and colleagues who would act as a source of ideas and information.

Working on the site of the study also increased the ease with which I could implement a computer-based survey. I was already extremely familiar with the systems, and infrastructure required to make a computer-based survey work. My position within the organisation also provided me with specialised technical advice and assistance for the very difficult and complex technical components involved in building the computer-based survey. Working on site allowed me to use the full flexibility of the technology available to me. If I had carried out this survey in another organisation they would probably use different systems. I also may not have had access to required confidential data.

4.2 Organisational Structure and Capabilities

The site in question is a multinational organisation that caters for the banking needs of corporate customers. There are more then twenty national and international sites that centrally link back to Sydney. Only the national sites use the Sydney based Help Desk. The IT Help Desk under investigation only supports internal customers which are also employed by the bank. Help Desk's support of the internal customers allows them to conduct business in managing and serving external customers.

The current strategy for the bank is to focus on retaining (external) customer loyalty by offering a range of quality products and services. The features of such products and services are dependent on reliability and competitive benefits derived from new technologies. In order to promote the bank, a high profile in the marketplace has been sought coupled with consistency and quality. This involves aggressive tendering for business when organisations review their banking needs. Therefore it is important for the Help Desk to give their internal customers the support they need to enable them to conduct business in a manner that will assist the external customer.

Within this section of the bank the management tends to be non-participative. Usually, strategy decisions are made at a senior level. A more participative, consultative management style would take advantage of the experience and knowledge which is closer to or in process with the day to day operations. A complex management hierarchy prevents information from freely flowing between different management levels. Individuals are controlled in their daily operations with little to no vision on the overall effect of their contribution. Communications channels, in all directions need to flow more freely, with individuals taking more responsibility in carrying through on matters.

Productivity is measured in financial terms. The emphasis of financial measures can be short term with energy being directed away from long term quality of product delivery. There is also a heavy emphasis on technical skills to support the internal customer. Both technical and business personnel need to have a better understanding of the skills employed by each other.

4.3 Help Desk

Help Desk is composed of six individual team members, one of which is a team co-ordinator. The group is a young team with an average age of twenty-five. The team is composed of four females and two males, one of which co-ordinates the team. The majority of experiences brought to the team are not IT related. Therefore the skill within the team does not have a heavy technical focus. Each of the team members was chosen on their ability to solve problems, and their general well balanced nature and approach to helping others.

The amount of education undertaken by the Help Desk staff is less than that of the other support teams because of one main reason. This reason is associated with resourcing. Education normally requires one to several days away from the working environment. This usually creates resource shortage. Other teams are not willing to provide assistance for more than one to two hours. This definitely inhibits the Help Desk's technical growth.

Help Desk's position within the IT function is considered to be inferior by other more technical support analysts. This opinion originates from the fact that the Help Desk is less technical. The Second Line Support Analysts have a slightly higher average age of twenty-eight, of which ninety-five percent are males. They frequently make derogatory comments concerning the Help Desk. One of which was to rename the "Help Desk" to "The Desk" since they considered there was no element of help concerning the team.

Their environment is cluttered with computer hardware, and large piles of old manuals in excess of ten years, mixed amongst the general rubbish of boxes and cardboard

coffee trays. Artificial plants remain standing with only a few remaining dusty plastic leaves, while the walls bare the scars of misguided trolleys.

The Help Desk is the main channel of communication for the customers concerning technology issues. The Help Desk can be contacted via phone and email. Customers are encouraged to only place calls with the Help Desk via the phone, as procedures surrounding communication via email are not well defined. During quiet periods one Help Desk member will answer calls. During busier times up to five Help Desk individuals will answer phones.

Sometimes customers will need to wait several minutes to have their call answered by the Help Desk. In such cases customers may try to contact a second line support analyst for assistance. If customer wishes to make a complaint the Help Desk Manager's direct phone number is available in the corporate directory.

Chapter 5 - Results

In this chapter I present the findings from the study. The results are divided into two main streams. The first stream is the pilot study and the second is the actual research itself. The pilot and research studies are then broken down further into two additional phases.

- In section 5.1 I outline the results from the two phased approach taken for the pilot study. The first phase details the technical results from the functional testing of the survey, while the second phase outlines the feedback regarding the survey comprehension.

- Section 5.2 provides a summation of the simple statistics. This includes the rate at which the surveys were returned and the number of received responses.

- Section 5.3 summarises the statistical methodology for the complex statistical analysis.

- In Section 5.4 I provide the details of the first phase of the research results. This analysis focuses on the relationship between the five hypotheses and "overall satisfaction" from the survey.

- Within section 5.5 I continue by investigating the second phase of the research results. This analysis focuses on the relationship between each call category and "overall satisfaction".

- Finally in section 5.6 I summarise the major research findings.

5.1 Pilot Study

The pilot study consists of two distinct stages. The first stage focuses on the electronic execution of the survey and the second stage focuses on the comprehension of the survey.

Stage One

Two colleagues were used to test the electronic functionality. The results of this stage is as follows

- Validation on the closed-ended responses required modification to allow the survey to be submitted, once all the mandatory answers had been completed.

- As expected, respondents could submit a survey with, or without completing the "optional", open-ended response.

- When the survey was initially opened on the screen, the cursor jumped to the first question, not allowing the respondent to read the pre-amble. This was modified so the survey opened up on the screen, at the top of the survey.

- As expected respondents could only create and modify text within the response area for each question. Therefore the respondent could not modify the actual survey questions or the preamble.

Stage Two

A sample size of nine customers were used to conduct stage two of the pilot study. The results were as follows:

- Seven of the nine electronic surveys were returned within the study window of four days.

- Five were returned within twenty-four hours.

- All of the returned forms were completed appropriately.

- Customers reported that the questionnaires were challenging but manageable.

- An extra question covering "overall satisfaction" was added to aid understanding, and also to allow analysis by multiple linear regression.

- The nature of the responses for the pilot was very similar to the actual research study. For example on an overall the customers were more satisfied then dissatisfied with the service from the Help Desk.

- The responses from the electronic surveys exported easily into a spreadsheet for statistical analysis, with no need for editing, or re-entry of data.

5.2 Research Study

The research study was conducted over two working days Friday 5th November 1999 and Monday 8th November 1999. 500 surveys were sent out and 220 were returned. 140 surveys were returned within 24 hours. Table 3 displays, the final response rate of 44 %, which is not as good as the pilot response rate of 77 %. The pilot study return rate was higher because it was sent to a targeted group of participants. "Response rates of 35% to 59% are often experienced in Help Desk surveys and provide reliable data" (Cowie 1999, p.74). The response rate is both the pilot and the research study was higher then the expected average that Anderson et al. (1997) quotes as approximately 20%.

Date	Time	Number of Returned Surveys	Percentage Of Surveys Returned Of The Total Sent Out	Percentage Of Returned Surveys Of The Total That Was Returned
12/11/99	8:00 am	22	4 %	10%
12/11/99	9:00 am	69	14 %	31%
12/11/99	10:00 am	93	19 %	42%
12/11/99	9:00 pm	140	28 %	63 %
15/11/99	9:00 pm	167	33 %	76 %
16/11/99	9:00 pm	220	44 %	100%

Table 3: Survey Response Rates

Figure 3 shows the highest response rate from 7:00 am to 10:00 am on the first day the surveys were issued.   By 10:00 am 42% of the returned surveys were submitted. This is indicative of the ease with which the surveys are completed.
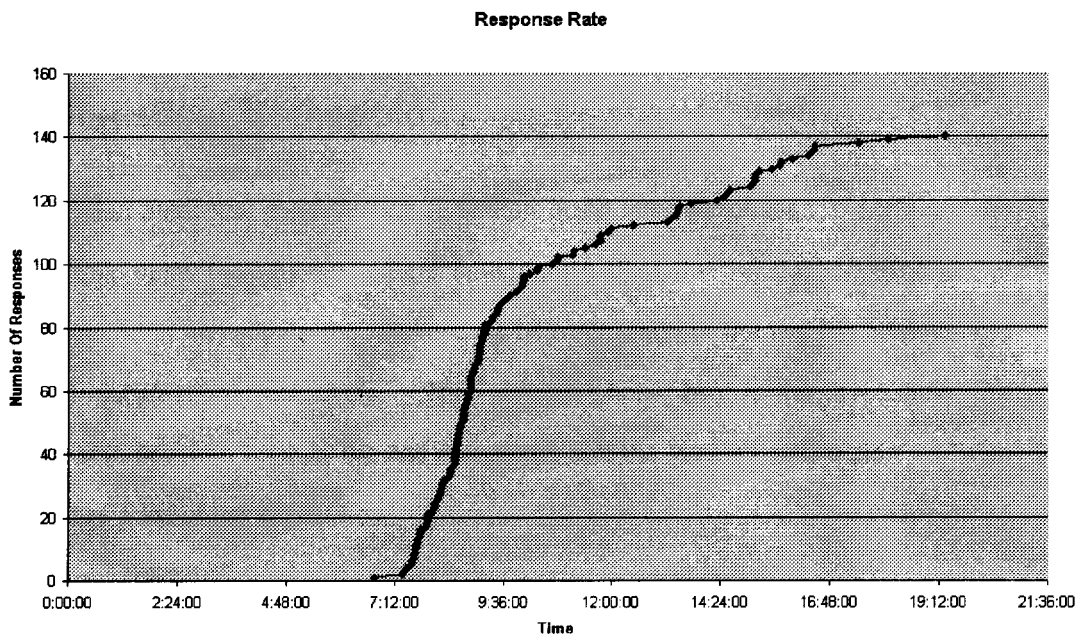
Figure 3: Survey Response Rate for 12/11/99

Each survey contains details of the call, and the call category. Table 4 provides the number and percentage of calls within each call category. The most common call category was "Desktop Software" which makes up 33% of the total calls.

Category	Number of calls	Percentage
Installation	4	2%
Changes	17	8%
Server	20	9%
Miscellaneous	28	13%
Services	37	17%
Hardware	41	19%
Desktop software	73	33%
Total	220	100%

Table 4: Categories of the Help Desk Calls

5.3 Statistical Methodology

The applied statistical methodology is broken down into two phases to compare the relationship of the hypotheses and call categories with overall satisfaction. The aim of phase one is to investigate the relationship between each of the five hypotheses and "overall satisfaction" inclusively. The aim of phase two is to investigate the relationship between each of the call categories and the "overall satisfaction". Table 4 provides a list of call categories.

Phase One

The statistical analysis is broken down in four distinct steps

A. **Mean** - Calculation of the mean for survey questions 1 to 6.

B. **ANOVA** –An ANOVA will test if the variation of the means for questions 1 to 6 are the same.

C. **T Test** – If the variation is different, this test determines which means are significantly different.

D. **Regression Analysis** – Investigates the relationship between "overall satisfaction" (question 6) and each of the hypotheses (questions 1 to 5). For example as "overall satisfaction" increases or decrease how are each of the hypotheses affected?

Phase Two

The statistical analysis is broken down in three distinct steps

A. **Mean** – The mean for "overall satisfaction" question 6, is broken down according to call category to determine the mean for "overall satisfaction" of each call category.

B. **ANOVA** –ANOVA will test if the variation of the means for "overall satisfaction" of each call category is the same.

C. **T Test** – If the variation is different, this stage determines which means are significantly different?

5.4 Phase One

A. Overall satisfaction

One of the major aims of the study was to objectively quantify satisfaction with individual Help Desk services, as opposed to a subjective impression of the overall satisfaction with the Help Desk. The survey instructions given to the customers clearly indicated that the subjects should rate their last service, and not give a long-term impression of the Help Desk.

The average "overall satisfaction" was 6.7. The distribution was slightly skewed towards good satisfaction with the mode of 8. There was a significant difference between the "overall satisfaction" expressed for different categories of Help Desk calls. This will be discussed in phase two.

There were 9 respondents with an "overall satisfaction" of 1, and 6 with an "overall satisfaction" of 2. These respondents were very dissatisfied, and made up less than 8% of the sample. Table 5 provides a selection of dissatisfied customer comments, and Table 10 in appendix one, provides a comprehensive collection of dissatisfied customer comments.

Customer Comments
When I arrived at work on Monday morning I had four critical pc's without power. Upon calling the help desk I was told that there was a server problem and that nothing would be done until that problem was rectified.
I guess they did everything in the power to sort the problem, but generally they did not understand the critical nature of the problem - The specific problem effected every user of the network.
Since placing this call – neither Geoff or myself have had any feedback. I was unaware that the call had been closed - and now I have to find out why it has been closed – it could be that the problem has been sorted, or it could be that someone feels that problem cannot be dealt with. I will now test to make sure the problem has actually been resolved. How is the caller expected to know that the call has been closed ?I have been waiting since 5/11 to hear some feedback on this - and for all I know, it may have been fixed on the 5th.
I was not very satisfied with the service - the file that I needed restored is used to complete my profit and loss on a day to day basis - and someone had deleted the file. I was advised that the only file which could be retrieved from back up was the one for the 30 October - the one I required was for the 4th November - so we had to redo the file for the last four days movement in profit and loss in order to start with the day. Later that afternoon it was found that the wrong disk was used to retrieve the backup and a later copy was on the file. At this late stage it was too late!
On this occassion Omark was ready for use 15 mins later - however I didn't receive a call back for approx 3 hours.

Table 5: Dissatisfied Customer Comments

There were 26 respondents with an "overall satisfaction" of 10, and 25 with a satisfaction of 9. This indicates that 23% of the surveyed sample were very satisfied.

Figure 4 shows the distribution for "overall satisfaction."
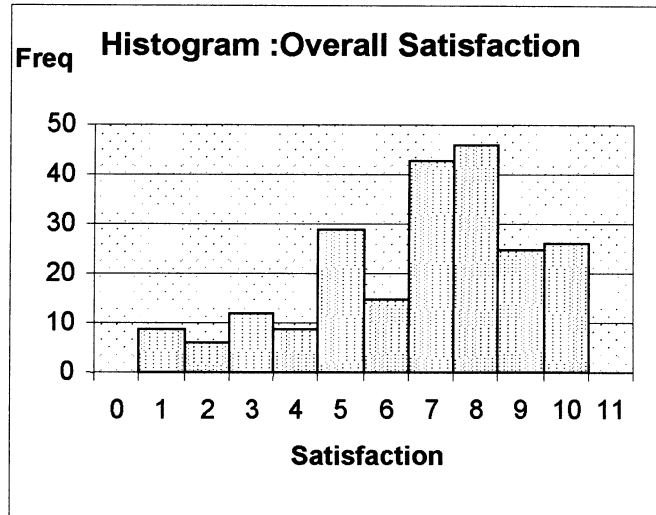
Figure 4: Histogram of Overall Satisfaction – Question 6

B. Is satisfaction with each hypothesis the same?

The aim of this phase is to explore whether there is a predominance of one or more of the hypothesised causes of dissatisfaction. A "null hypothesis" will be used to test if the results reveal a predominance of one or more areas of dissatisfaction. The proposed "null hypothesis" is that there is no difference between any of the mean satisfaction scores, inclusively for the hypotheses, and the "overall satisfaction".

Null Hypothesis

Mean of Quest1 Responses = Mean of Quest2 Responses =.... = Mean of Quest6 Responses

If null hypothesis is rejected then the alternative hypothesis would imply that the means are not equal. A precise measure of the discrepancies among the means is required to decide when the null hypotheses should be rejected. An analysis of variance will be used as this precise measure. An analysis of variance is often referred to as an ANOVA. An ANOVA will investigate the variation of the means for

survey questions one to six. If the variation of the means for each question is too great to be attributed to chance the null hypothesis will be rejected.

The application of an ANOVA is viable since the distribution of each of the scores is near normal, and there is no significant difference in the scores variance, please refer to Table 6. The conclusion that the distributions of the scores are normal was made via viewing Figure 5: Histogram of Satisfaction with Communication to Figure 4: Histogram of Overall Satisfaction – Question 6. The distributions for each of the histograms are not dramatically skewed. Normal distribution could be proven via complex statistical analysis, but this is not within the realms of the study.

Groups	Count	Sum	Average	Variance
Satisfaction with ability to predict problems through good communication.	220	1438	6.536364	6.0489
Satisfaction with ability to work with business and not just technology.	220	1454	6.609091	5.453798
Satisfaction with service provided.	220	1478	6.718182	5.472727
Satisfaction with keeping up with technological change.	220	1449	6.586364	5.156891
Satisfaction with help desk staff morale.	220	1626	7.390909	4.613616
Over all satisfaction.	220	1482	6.736364	5.674471

Table 6: Mean/Average Score for Question 1 – 6.

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	110.7129	5	22.14258	4.097896	**0.001072**	2.220908
Within Groups	7100.068	1314	5.4034			
Total	7210.781	1319				

Table 7: ANOVA – Analysis of Variance of the five hypotheses

Table 7 reveals that the P value = 0.001072. P < 0.01, thus the null hypothesis must be rejected. It can be concluded that one or more of the means for question 1through to 6 are significantly different from each other.

C. Which hypotheses are significantly different?

It can be concluded that there is a significant difference between one or more of the results for question 1 to 6, the next step is to find out which hypotheses are significantly different. To determine which of the five hypotheses are significantly different, the mean of each hypothesis will be compared with the mean for "overall satisfaction". This can be done using a two-sample T test with a Bonferoni adjustment for multiple comparisons.

The Bonferoni adjustment is used to deal with the multiple comparisons problem. In any statistical analysis a large number of simultaneous statistical comparisons will be made. As described by Freund (1982) in such cases the likelihood that the hypothesis is true but is rejected increases, this is referred to as Type I error. Gerald (1989) outlines that the Bonferoni adjustment is designed to account for this type of error. Multiplying the P value by the number of comparisons makes the adjustment.

When the mean from "satisfaction with Help Desk staff morale", (question 5) was compared to that of "overall satisfaction' (question 6) using a two sample t test the P =

0.0026. This value is then adjusted for 5 comparisons which gives P=0.013. Refer to Table 11 in the appendix. Therefore the P values is less than 0.05 which implies that "satisfaction with Help Desk staff morale" is significantly different.

The mean satisfaction with "Help Desk morale" is significantly higher that the mean "overall satisfaction". All the other mean satisfaction scores are lower than the "overall satisfaction".

The lowest mean satisfaction score was "satisfaction with ability to predict problems through good communication", but the P value was greater than 0.05 and thus the difference was not statistically significant. The next lowest mean satisfaction score was "satisfaction with keeping up with technological change", but it logically follows that it and the other two satisfaction scores would not be significantly different than the "overall satisfaction".

In summary the odd score was that of "satisfaction with Help Desk morale", which showed significantly more satisfaction than all the other scores. The other scores were not significantly different from each other.

D. Is there a relationship between each hypothesis and over-all satisfaction?

The next step is to explore the correlation between each of the five hypotheses and "overall satisfaction". For example do individuals with strong satisfaction with morale, also have strong "overall satisfaction", or are the two unrelated.

While the ANOVA ranked the amount of satisfaction with each of the hypotheses, regression analysis can determine how much each of the hypothesis influence the "overall satisfaction".

Table 14 in appendix one, gives the F statistic that indicates a significant relationship between the hypotheses and "overall satisfaction". The R Square suggests that 86% of the variation in the "overall satisfaction" can be attributed to variation in the 5 hypotheses, refer to Table 13: Regression Statistics in appendix one. Each of the five hypotheses show a significant relationship, and a positive correlation with "overall satisfaction", as detailed in

Figure 10 to Figure 14 in the appendices. There is no significant difference between the amount of correlation between the hypotheses, their raw rank scores and order of importance are shown in Table 8: Hypothesis Coefficient.

Survey Question	Hypothesis	Coefficient
4	Satisfaction with keeping up with technological change	0.262498
3	Satisfaction with service provided	0.238157
2	Satisfaction with ability to work with business and not just technology	0.228927
5	Satisfaction with help desk staff morale	0.21519
1	Satisfaction with ability to predict problems through good communication	0.149122

Table 8: Hypothesis Coefficient

All of the hypotheses positively correlated with "overall satisfaction", but "satisfaction with keeping up with technological change", had the strongest influence on "overall satisfaction". "Satisfaction with ability to predict problems through good communication", had the least influence on "overall satisfaction".

5.5 Phase Two

Chapter 2 Overall satisfaction for each call category

Table 9 lists the call categories in decreasing order of "overall satisfaction".

The greatest mean satisfaction is with desktop software, hardware, and miscellaneous. The lowest satisfaction was with server and changes.

Call Category	Mean Scores
Desktop software	7.09589
Hardware	7
Miscellaneous	7
Services	6.702703
Server	5.65
Changes	5.470588

Table 9: Mean Scores for Call Categories

B. Is overall satisfaction for each call category the same?

The aim of this step is to explore whether there is a predominance of one or more of the call categories for "overall satisfaction". A "null hypothesis" will be used to test if the results reveal a predominance of one or more call categories. **The proposed "null hypothesis" is that there is no difference between any of the mean satisfaction scores, for each call category.**

Table 17 in appendix one reveals a P Value for the Anova of 0.042, thus there is a significant difference in the "overall satisfaction" between some of the categories. Table 9 lists the categories in decreasing order of "overall satisfaction".

C. Which call categories are significantly different?

Table 18 in appendix one, gives the P Value of 0.009 regarding the comparison of satisfaction between the call categories of "Desktop software" and "Changes". A Bonferoni adjustment has not been used in this case because of the potential large number of comparisons.

Table 19 in appendix one, reveals of P Value of 0.012 for the comparison of satisfaction between the call categories "Desktop Software" and "Server". Essentially the services involved in the categories of "Server" and "Changes" produce significantly worse "overall satisfaction" than all the other categories.

The complete profile of hypothesis scores was extracted for both categories of "Server" and "Changes". An ANOVA was performed on each, with no significant differences found between the mean hypothesis scores. While Help Desk clients are most dissatisfied with these two categories, no specific hypothesis score stood out to help explain this.

5.6 Summary of Results

44% of surveys were returned within a time frame of seven working days. The average "overall satisfaction" rating for these surveys is 6. 7. Therefore the general population is more satisfied then dissatisfied with the services of Help Desk.

The statistical analysis was broken up into two phases. The first phase investigated the relationship between each of the five hypotheses and "overall satisfaction" inclusively. Of the five hypotheses, only Help Desk morale stood out as producing

more satisfaction in the Help Desk customer. The other four hypotheses produced very similar mean satisfaction scores.

The scores of the five hypotheses correlated positively with "overall satisfaction". 86% of the variation in "overall satisfaction" correlates with satisfaction with the 5 hypotheses. This suggests that all 5 hypotheses are important in determining overall satisfaction.

While there was no statistically significant difference between the amount of correlation of each score, the most important influence on "overall satisfaction" was "satisfaction with keeping up with technological change", and the least important factor was "satisfaction with ability to predict problems through good communication". Perhaps help desk clients would prefer help desk staff to be personally up to date, rather than be good at communicating with people who are up to date.

The second phase of statistical analysis investigates the relationship between each of the call categories and the "overall satisfaction". Clients were most happy with the service received for "Desktop Software" and "Hardware". They were statistically significantly less satisfied with the service on "Changes" and "Server".

Chapter 6 - Conclusion

The points below conclude and summarise the major aspects of this study.

6.1- Automation of the Survey

6.2 - Results Summary

6.3 - Further Research

6.4 - Conclusion

6.1 Automation of the Survey

The automation of the survey involved more effort and complexity than first thought. My initial planning of the technical scope accounted for approximately 80% of the final complexity required. This is indicative of the intricate detail required. The advantages of a computer-based survey is that samples sizes can be increased with no extra labour required for processing, and the process can be repeated with a minimum of effort.

Alternatively I could have employed a traditional technique to execute the survey. A paper-based survey would have required more input of effort around repetitive tasks such as printing, folding and posting of surveys. Therefore this technique is extremely labour intensive for large samples. Paper based surveys are also open to errors concerning data input where the responses are poorly written or illegible.

The computer-based survey employed within this study clearly increased the ease of response since 42% of all returned surveys were received within the first three hours. This would clearly be an impossible task for a paper driven survey. If this study was paper-based I would have had to extend the time for respondents to complete and

return the surveys. It would also be unlikely that 44% of all surveys sent out would be returned within seven working days.

6.2 Results Summary

The fundamental aim of this study was to test the two issues below;

- Is dissatisfaction truly present for individual problems, or is it a generalisation or "urban myth". This will be determined by measuring the level of perceived satisfaction, in as objective a manner as possible, for individual services.

- Which of the five hypotheses are the most significant in causing dissatisfaction amongst users?

The average "overall satisfaction" rating for these surveys is 6. 7. Therefore the general population is more satisfied then dissatisfied with the services of Help Desk. It can be concluded that dissatisfaction is present for individual problems, but the dissatisfied customer does not account for the majority of customers. In actual fact the dissatisfied customer only accounts for 8% of the population. The dissatisfaction is not an "urban myth" and is present for the individual problems involving calls relating to "Changes" and "Server" disruptions. Call types and satisfaction is discussed later in the conclusion.

Customer satisfaction regarding each of the five hypotheses and overall satisfaction showed the customer is more satisfied then dissatisfied with the services of the Help Desk. Of all the five hypotheses, Help Desk morale stood out as producing more satisfaction than any of the other hypotheses including "overall satisfaction".

The above result is possibly due to a change in leadership within the Help Desk team. The new team leader commenced his position with the Help Desk team two months prior to the study. The Help Desk team has been more productive and visually

happier since the new team leader has started. This could have been proven if the survey was issued before the new team leader started and compared with the results at hand.

The most important influence on "overall satisfaction" was "satisfaction with keeping up with technological change", and the least important factor was "satisfaction with ability to predict problems through good communication". This would indicate an up-to-date Help Desk is more likely to have satisfied customers. This result reflects the rapid pace at which technology is deployed to our working environment. It is logical that as the pace at which technology increases, the customer becomes more reliant on the Help Desk's ability to keep up-to-date with technological change. Further research may investigate the effect of the rapid rate at which technology is deployed to our working environment. Will this force the fundamental structure and composition of Help Desk to evolve as technology evolves?

The final ranking of each of the hypothesis effect on "overall satisfaction" is given below from most influential to least influential;

1. **Hypothesis Four**

    Knowledge: Satisfaction with the Help Desk's ability to keep up-to-date with the technological change.

2. **Hypothesis Three**

    Service: Satisfaction with the service the Help Desk provides as the face of the IT function.

3. **Hypothesis Two**

    Solutions: Satisfaction with the Help Desk's ability to provide business solutions as opposed to technology solutions

4. **Hypothesis Five**

Morale: Satisfaction with the Help Desk morale in providing IT assistance

5. **Hypothesis One**

    Communication: Satisfaction with the Help Desk level of communication with other IT teams.

The results may be potentially misleading if certain customers have a common reason for not taking part, for example a complex computer based survey may eliminate computer illiterate customers. In circumstances where the investigation is not limited by time and resourcing, the people who did not partake in the study should have been followed up with a phone survey to investigate the reason for their non-participation. Such resources were not available for this study.

The open-ended response, for any surveys that scored a three or less for any closed-ended response was investigated. The purpose of this measure was to discover any sensitive issues that the survey did not address. The main theme behind the dissatisfied customers was the lack of feedback and updates regarding problems that Help Desk was working on.

6.3 Further Research

The main area for further research centres around identifying trends revealed by certain categories of calls. Specific areas of dissatisfaction and satisfaction were associated with certain call categories.

When customer satisfaction was investigated on the basis of call category the results indicated that customer dissatisfaction was most prevalent in calls concerning "Changes" and "Server". Calls that are categorised as "Changes" normally involve a second line support analyst. In such cases the call will be escalated to a second line support analyst, in the mean time the customer will have to wait. Customers might

be particularly dissatisfied with these types of calls because the Help Desk person is unable to assist them, and they are required to wait for a second line support analyst. Further research could investigate the importance of resolution time, and the number of escalations has on customer satisfaction.

Calls categorised, as "Server" will normally involve problems that render entire systems unusable. Any server functions are normally critical in nature, and therefore cause an enormous amount of disruption to business. The critical nature of servers may have caused customers to be dissatisfied with this type of call. Further research would determine the severity of impact server outages have, and the associated nature of customer dissatisfaction.

Customers were most satisfied with the call categories of "Desktop Software", and "Hardware". A Help Desk member can answer the majority of calls concerning "Desktop Software" in the first call. Therefore the customer is more likely to receive an immediate solution. This may account for customer satisfaction concerning the call category of "Desktop Software". Again this identifies the possibility of further research concerning the effect of escalating calls between support analysts.

Customers also reported greater satisfaction with calls that fell into the category of "Hardware". Help Desk staff can assist with simple hardware problems that involve the resetting of a device. If the problem is more serious, then a second line support analyst may have to visit the customer and replace an item of hardware. Further research may investigate the nature of "Hardware" calls. One may wish to determine if satisfaction with "Hardware" calls are mainly due to the calls resolved by the Help Desk or the Second Line of Support.

6.4 Conclusion

Dissatisfaction with the Help Desk is not an "urban myth", but only 8% of the population were very dissatisfied. The large majority of customers are satisfied with the Help Desk. All of the five hypotheses did contribute to the "overall satisfaction" of the customer. Each of the hypotheses was ranked according to their effect on "overall satisfaction". None of the hypothesis revealed particular dissatisfaction. Instead dissatisfaction was present for certain types of calls.

The verbal dissatisfaction that was noted in the expression "the Desk" as opposed to "the Help Desk" is a result of the cultural dynamics between the support team. The term "the Desk has only been used by other support teams, but it is strong evidence on how the IT team itself treats the Help Desk. The role the Help Desk plays in providing an IT service is critical. Raising the profile of the Help Desk via education, and improved resourcing will provide the customer with a better service.

Appendix 1 - Results
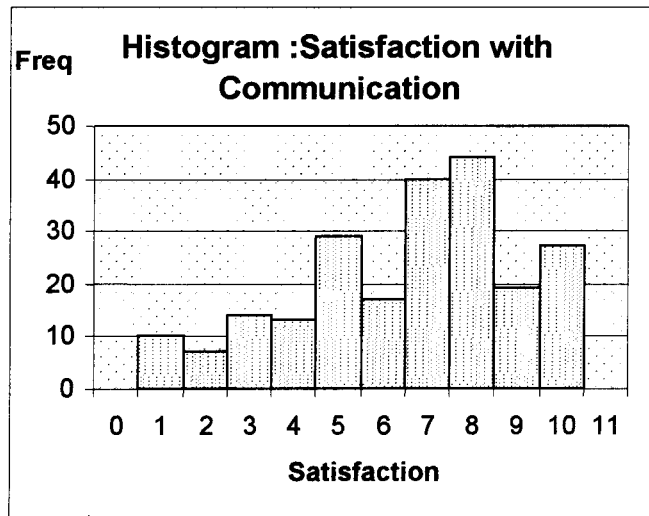
Figure 5: Histogram of Satisfaction with Communication
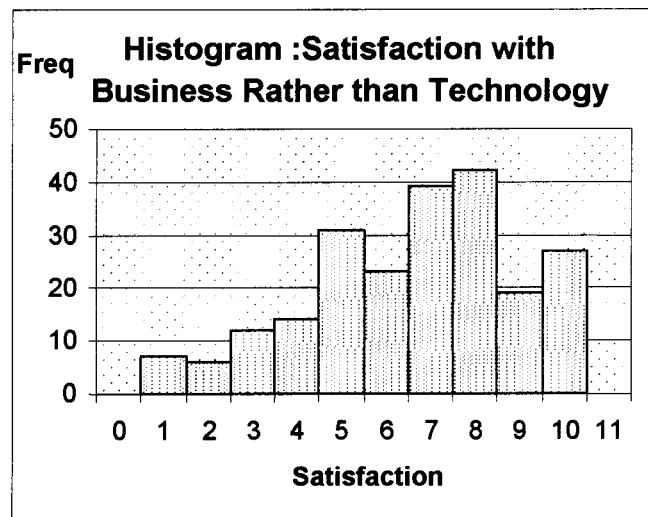
Figure 6: Histogram of Satisfaction with Business Rather than Technology
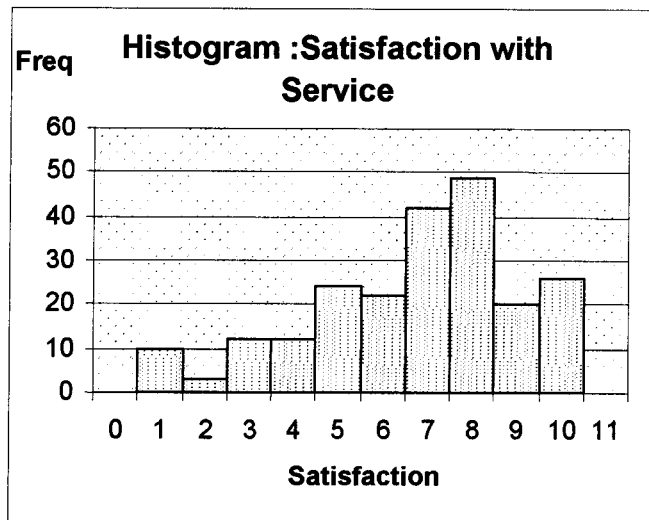
Figure 7: Histogram of Satisfaction with Service
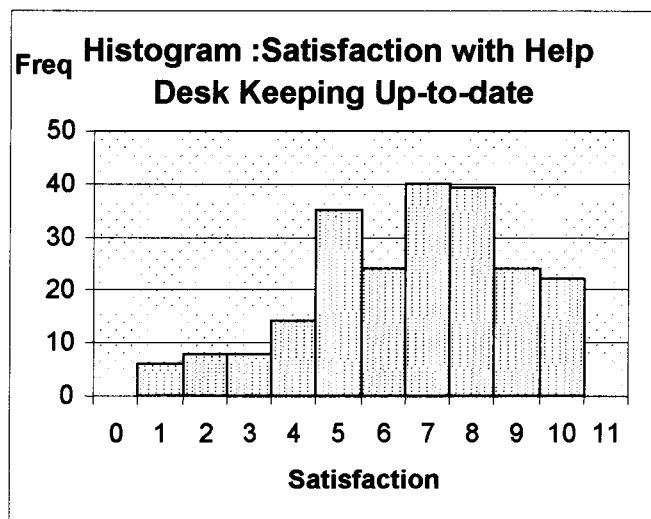
Figure 8: Histogram of Satisfaction with Help Desk Keeping Up-To-Date
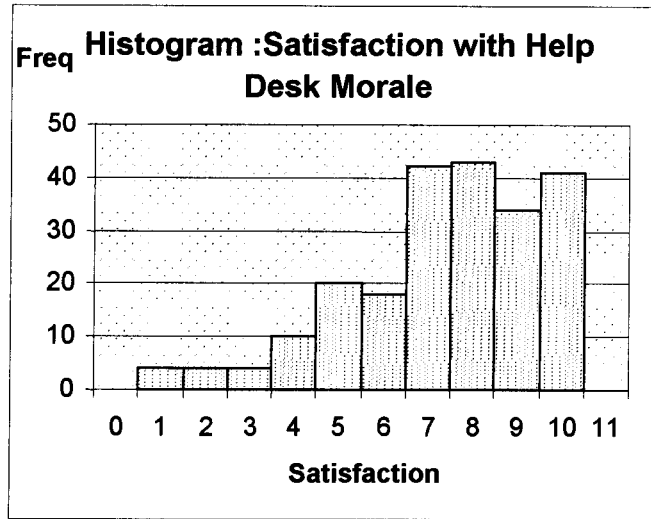
Figure 9: Histogram of Satisfaction with Help Desk Morale

Figure 10: Correlation of Communication and Overall Satisfaction – Q1

Figure 11: Correlation Solutions and Overall Satisfaction – Q2

Figure 12: Correlation of Service and Overall Satisfaction – Q3

Figure 13: Correlation of Up-To-Date and Overall Satisfaction – Q4

Figure 14: Correlation of Morale and Overall Satisfaction – Q5

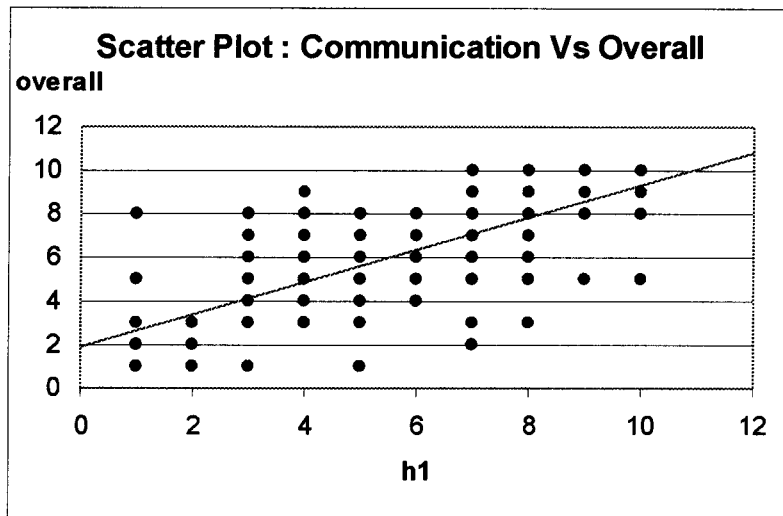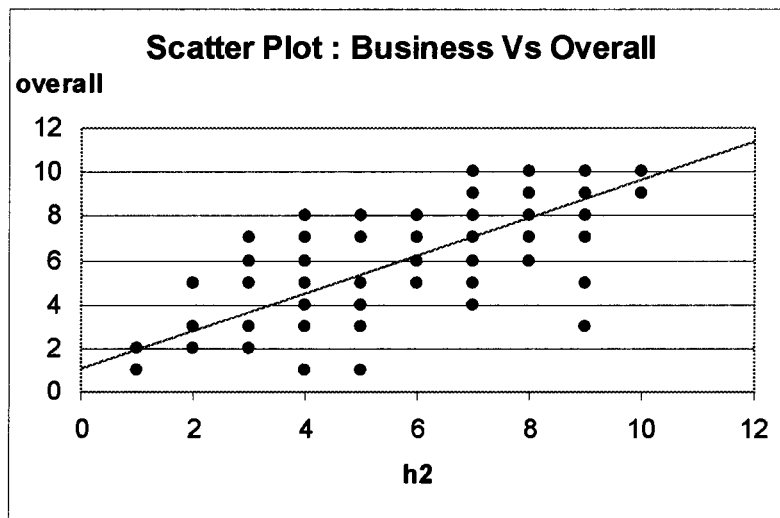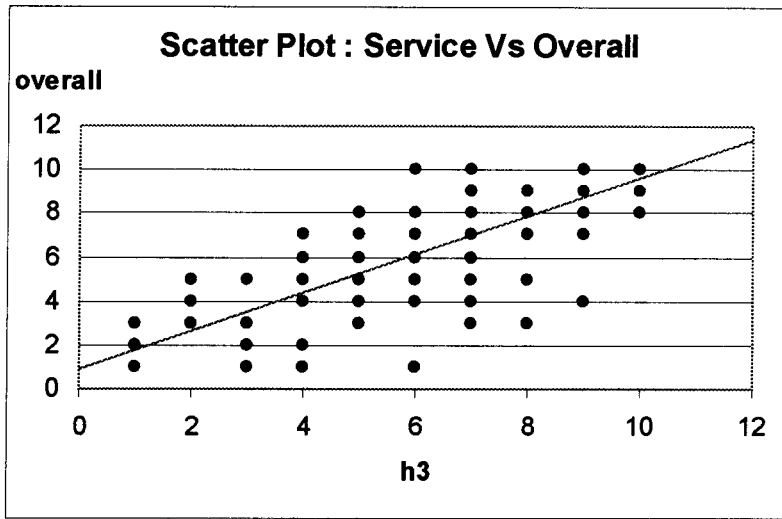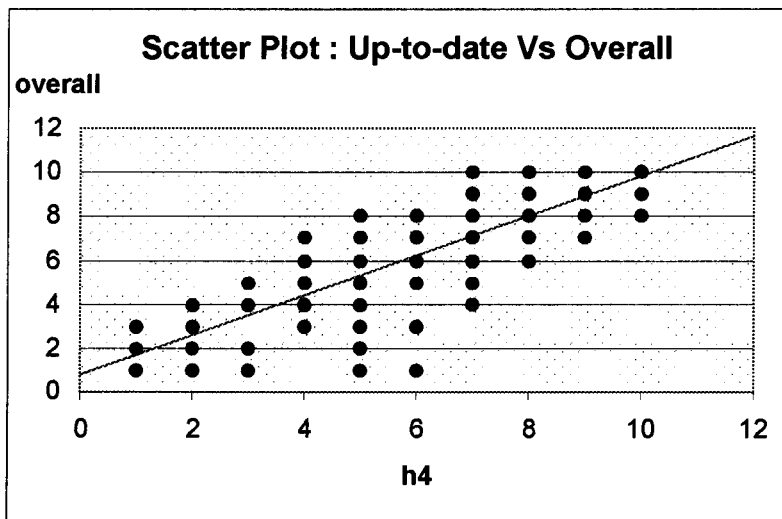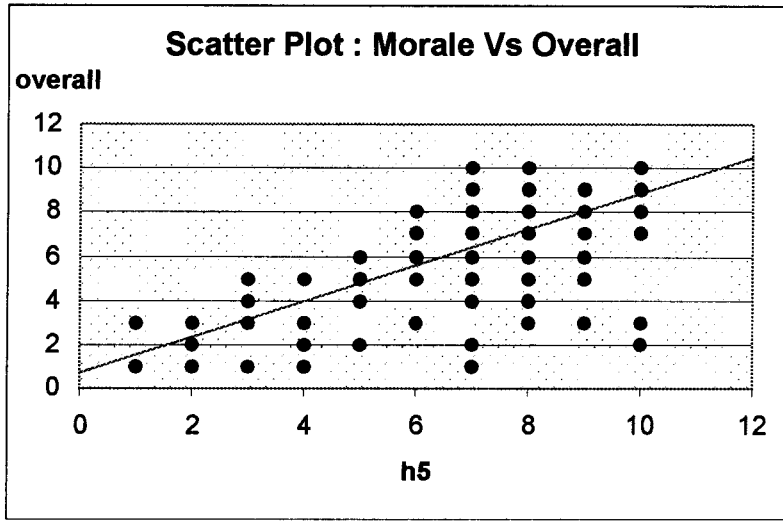| 1	2	3	4	5	6	Category	Type	Customer Comments
1	1	1	1	1	1	Hardware	System Unit	When I arrived at work on Monday morning I had four critical pc's without power. Upon calling the help desk I was told that there was a server problem and that nothing would be done until that problem was rectified.
1	1	1	1	1	1	Services	Lan Admin	I guess they did everything in the power to sort the problem, but generally they did not understand the critical nature of the problem - The specific problem effected every user of the network.
1	1	3	1	5	2	Changes	Access to Data	Please feel free to phone me regarding any of the above.Racquel x18124I have tried to use the Help Desk on several occasions - 1 out of 5 requests has been resolved satisfactorily.
1	2	4	3	4	2	Hardware	Printer	My answers to Q5 & 6 may be a little unfair, because in the instance of the colour printer, the service was actually pretty good, but the example is an outlier. In most other cases, I would rate the service a 1 on all the above questions. Specific to this case is the fact that the reason I could not access the colour printer is becuase it had been moved to another floor!!!. I would have thought that it would be standard practice to notify all users of a printer before it was moved to another floor. That way the user does not find out when it is too late and he or she is trying to print an urgent job with a short deadline.Without doubt, the service on the help desk has improved a great deal over recent times. There are some new voices on the other end of the phone and their manner is far more appropriate. There are however still individuals who do not at least give the impression that they empathise with the problem and give the distinct impression you are a bother to them and they just want to get you o
1	3	1	5	7	2	Services	Internet	The problem was actually related to my internet explorer crashing. I mentioned the problem months ago and was told that 'the new server will fix it'. Of course the problem never went away. Then when I moved up to level 5 I asked one of the technology guys about the problem and he said he thought it was actually related to having the incorrect service pack. He asked me to log the call and then fixed the problem before receiving notification from the help desk. Since then my explorer hasn't crashed once - it used to crash 5-10 times a day.I'm disappointed that it took so long to fix, and that no-one seemed to have a clue about fixing it when it was such a simple problem. I'm not sure what the solution is - perhaps the techo's should visit every problem and should have a more formal way of sharing knowledge/information.
1	4	8	2	10	3	Server Systems	Promis	The problem turned out to be a fault in the router s/w after upgrade to development ring (I was told).It's interesting to note the person used the word "again" in the problem description. So HD was aware of this problem, yet we are informed. Perhaps an email warning us of possible network dropout would prevent the confusion. That's why I rate Q1 very low. it's simply a lack of communication.

						Category	Sub-category	Comment
1	5	5	5	5	5	Desktop Software	Heat	I still have not received a response to my call
1	5	5	5	5	5	Desktop Software	Heat	My pc was never looked at by the second line support yet the call is closed and they have told me to removed my own memory if I feel it is faulty.
1	5	10	6	10	8	Services	Unlock Account	The response was prompt, and the fix was executed instantly. It would be great if this type of call was tracked for "repeats" as this is a regular occurrence, and is embarrassing when I am at a customer site. I am always treated in a friendly & very professional manner by the operators, even when I am err.. "stressed out"!
2	4	3	3	1	1	Changes	Access to Data	Since placing this call - neither Geoff or myself have had any feedback. I was unaware that the call had been closed - and now I have to find out why it has been closed - it could be that the problem has been sorted, or it could be that someone feels that problem cannot be dealt with. I will now test to make sure the problem has actually been resolved. How is the caller expected to know that the call has been closed ?I have been waiting since 5/11 to hear some feedback on this - and for all I know, it may have been fixed on the 5th.
2	4	1	5	2	1	Changes	Access to Data	If you look at the call details I was provided to do this survey, it demonstrates one of my complaints.The problem was detailed as "general question". I have rung the help desk several times this week and they were all in reference to a specific change request form that I had lodged. From looking at the date of this call I can only suspect this call was in regard to a change request that I submitted to have local administrator rights on 2 machines.I was dissatisfied with the service on this request for several reasons:1. Date work requested was 1/11/99. Required completion date was 3/11/99. The call report says this is finished, I have NOT been notified as such even yet.2. When I called on the 8/11/99, the job had a completely different description to what I so carefully detailed on the change request, it did not even have the required completion date.3. When I called, I was told someone would call me back, no-one called me back and I had to call again on 10/11/99.4. When I called on the 10/11/99, I discovere
2	1	1	2	2	1	Desktop Software	Windows NT	3 calls were made before a Help Desk person came to look at the problem, then no solution received, she went to get the second support person, and they said it's the AS/400 problem. It was not so. Actually it was caused by the network cable. As other team of the same network cable had a similar problem. The next morning the problem occured, I called twice, she came and said she would escalate the problem and would let me know but she never did. I used other Judy's PC as she does not come in on Friday. Friday afternoon, an IT person pushed in the network connection to my PC, and the problem was fixed, I do not whether Help Desk had fixed the network or because the connection was loose.Also when an upgrade or a new software is installed, an impact has been discovered by one IT member team, can Help Desk ensure/fix the rest of the IT teams who have the same configuration/software, instead of fixing on a call basis.I have not received a quick response from Help Desk.When a call is logged, problem should be rated
2	4	4	1	7	1	Services	File	I was not very satisfied with the service – the file that I

							Restore	needed restored is used to complete my profit and loss on a day to day basis - and someone had deleted the file. I was advised that the only file which could be retrieved from back up was the one for the 30 October - the one I required was for the 4th November - so we had to redo the file for the last four days movement in profit and loss in order to start with the day. Later that afternoon it was found that the wrong disk was used to retrieve the backup and a later copy was on the file. At this late stage it was too late!
3	5	6	6	7	1	Server Systems	OMARK	On this occassion Omark was ready for use 15 mins later - however i didn't receive a call back for approx 3 hours
3	5	3	5	4	3	Desktop Software	Kobra	Although we were told to log all calls woth the help desk, it has proved faster, easier and better to call IT on level 4 direct. Level 4 IT staff have also expressed this to be the better way for them, therefore a lot of work carried out for us is not logged with help desk by us.Also always seem to be put on hold before speaking to anyone.
3	3	5	4	10	3	Desktop Software	Lotus Notes	Problem related to Notes which I gather is a referral item for the Help Desk. No problem with that. But I was without internal communication capability for the whole of the day. In my job I need that. Desperately. Problem was finally fixed about 5pm. Weekend time was taken dealing with accumulated emails. The conversations were always professional and cordial on both sides, but Help Desk could have taken more ownership of the problem or ensure that someone else did. I must have made six calls that day to Help desk to find out progress. Exacerbated by "Musak" each time I called.What was needed was a system whereby orignal Help Desk operator is responsible for checking follow up and customer satisafaction. This happened to some extent, but delays in response of the Notes team compromised the overall result.
3	3	3	5	4	3	Services	Lan Admin	As a user I view the help desk as being part of the overall problem solving process so my responses will reflect the speed and efficiency in addressing the problem as well as my interaction with the desk. You have sent me two surveys for the 8/10 - they both relate to the same problem - which despite assurances reoccurred on the 9th. Apart from the delays in finding a solution to my problem (which was server related) I recall that on both occassions there was a delay in the desk answering my call and no follow up to advise that there was going to be a delay in fixing the problem. Please note I have not responded to the survey on the second call.
3	5	9	7	8	4	Server Systems	WIRO	We would appreciate it if we are informed of how long it will take them to get an IT staff to help us, especially in our area (Financial Markets Accounting) where we are in constant pressure from our dealers to get our daily p&l done by at least 10 am.
3	7	6	4	8	4	Services	Lan Admin	With regards to this specific problem, Help Desk was not able to tell me what went wrong and I did not know when the problem was fixed. I learnt from a colleague that that was caused by a router that had been replaced/maintained over the weekend. I could not confirm whether it was right or wrong. The improvement I hope from the Help Desk is to do a bit more on communication. Problems such as this which affects a number of users perhaps can be handled in a more proactive way, for example, broadcast it to people who may be affected once

								the problem becomes known. This way people will appreciate the information and be patient enough to wait until the problem are fixed; the Help Desk will receive less panic calls as a result. Should the problem can not be fixed in a short time, a follow up/update call will be appreciated. In a number of other occasions, I had my problems fixed/solved on spot. So I have a mix image on the Help Desk but can't pinpoint on what goes wrong. I therefore think that let's get the communi
3	2	3	5	8	5	Miscellaneous	Gen Question	I understand that helpdesk provide a range of service with regards to different software which is great to reach out and get so assistance , my problems come down to having software applications installed and when I go to use the software it doesn't work because it is not linked correctly. Maybe a test stage is needed to ensure that the job is done correctly the first time. I hope this information can help correct a few minor issues.
3	8	7	5	6	7	Install	S/W Install	I am fairly satisfied with the HelpDesk, however they generally do not have knowledge of how we, the BIC, fit into the scheme of things. We are responsible for looking after specific software and products, perosnally requesting them to be installed (usually by fax) and dis-installed on various people's PCs and making sure this is done within specified timeframes - each product usually having their own different passwords and licence conditions.One problem I do have, and I do not know if this relates to helpdesk or not, is that I fax my requests to IT and often these seem to go unnoticed. With this specific problem above, I originally faxed this to IT on 2/11. When Michael had not heard anything from IT I rang helpdesk on 5/11 who logged this request (yes they were quite pleasant and helpful) and told me to fax it again, which I did. Now it is 12/11 and Michael informs me that he has only just had RBB installed but still not Fitch IBCA. As you can appreciate this gets very frustrating having to liase with user
3	5	7	7	7	7	Miscellaneous	Gen Question	The reason I had to call the Help Desk on this occasion was to follow up on a Change Request that I had lodged a week earlier. I had requested that when the Change Request had been completed, that a confirmation phone call be made to myself so that I knew when the work had been completed.I did not receive a phone call confirming that the Change Request had been completed, hence the reason for my call.My call was handled in a satisfactory manner with the operator advising me "that the request had been closed off, therefore the change request must have been completed". However, if Technology had confirmed back to me as I had originally requested, I would not have had to make the follow up phone call.
4	4	7	3	8	4	Changes	Relocation	While I was completely satisfied with the Help Desk staff, I felt more than a little let down that my change/move request was not loaded in the system untill I called a third time.
4	4	4	3	5	4	Hardware	H/W installation	Like other dealings with the Help desk this particular one took far too long to solve - about 6 weeks for this one. No calls during the wait to let me know what was happening.
4	6	6	3	9	5	Desktop Software	Windows NT	My query was simple. I could not get a ping going with server SESORAA2. It was later in the day that Help desk got back to me. By that time, a ping to SESORAA2 had already been found to be accessible by me before they

								called. I got an email back informing me that a ping to sesoraa2 could now occur. I understand that sometimes systems break down. However, what would give me more confidence in Help Desk would be feedback regarding why the problem occured in the first instance. And further, how the problem can be avoided in the future.In another instance. Three days ago I placed a call to change the system time that is showing on my laptop. The real time now is 9:11. Laptop is showing 10:11. It's a small request I admit. However, no one has responded to date. Perhaps it would be better practice to have someone call me informing when they will be coming to fix the problem within 24 hrs, rather than let me sit here and wonder whether someone is coming.
5	1	3	5	3	1	Server Systems	DCPK	It took 4 days to get a response on fixing the problem and I only did get it resolved when I caught Romy as he was walking through the dealing room. This applicatation is critical to my role and the lack of urgency shown by IT to fix it on this occasion whilst not typical of responses to queries, it is indicative of a decline in service which probably started when Rob Mazzotti left. Having said that Romy does a excellant job from a user's perspective.
5	2	1	4	4	3	Desktop Software	Lotus Notes	i am still getting error message although been told that I am linked to the specified server
5	4	5	3	7	4	Hardware	Laptop	Problem still outstanding, and reason for delay has been conveyed to me (supplier looking into it) there have been continuous problems upto and since receiving my memory upgrade.
5	7	7	3	5	5	Hardware	System Unit	I feel that the help desk maybe could assist the technical people on level 4 by possibly offering suggestions/advice rather than just logging calls. I call the desk a number of times each week and noone has ever said "try this or try that".
6	3	4	4	6	5	Desktop Software	Windows NT	Help Desk or a sister unit could do more in educating users about their hardware or software. In many instances, users (with approprate training) could probably fix their own problems rather than call Help Desk.
7	2	1	3	2	2	Services	File Restore	It took 3 days for a confirmed negative reponse to say that the file could not be restored!!!!!
7	3	1	2	10	2	Services	Lan Admin	I feel that Help Desk should have been able to deal with my problem faster , much of my urgent work load was delayed beyond my control because help desk couldn't provide me with terminal access , I appreciate the security issue which exist regarding terminal access , however once official authorisation (from my manager was given) terminal access should be possible within about 2 hours , I had to wait over one week and I still haven't received all the correct access that I require to do my job. There is no point in having the most secure computer access for Westpac if the cost of work delays and misseddeadlines have a far larger impact on the Bank.
7	3	1	1	9	3	Desktop Software	Lotus Notes	I had no problem with the staff on the Help Desk who took the call. Wiht this particulare problem I worte to Louise in Notes support and gave great detail of the problem. After reading the memo she sent a note back saying I needed to pace a call with the Help Desk. This always confusdes me - why can't they show a little service and place the call for you and remind you that this is the way it should be done. So I then placed the call, and waited 1 day in which the Help Desk rang back and said they couldn't do

								anything about it, it was up to the developers. I asked could my call be passed onto them and they said no I would have to manage it myself and talk to the developers. I did this and 1 week last the change happened.Whatever happened to an easy keyword listing.
7	5	2	4	7	5	Services	Lan Admin	The reason it did not work was because someone had deleted my file - I phoned help desk and advised of this - but someone still came to see me re the macro - when this infact was not the current problem.
8	9	7	6	8	3	Desktop Software	Lotus Notes	This was in fact the second call i had made, the first was apparently not recorded. No one came to put the mainframe icon on my screen and instead of calling back i found somebody in the office that could do it for me.I was very disappointed that no one even called to say that they might be delayed,still to this day 12/11/99 no one has contacted me back about putting my icon on the screen.The overall service was fine, they knew what they were talking about and were very freindly however the fact that no body came to me when i requested help was very annoying.

Table 10: Comprehensive collection of dissatisfied customer comments

	Over satisfaction	all Satisfaction with Help Desk staff morale – Q5
Mean	6.736363636	7.390909091
Variance	5.674470735	4.613615608
Observations	220	220
Pooled Variance	5.144043171	
Hypothesised Mean Difference	0	
Df	438	
t Stat	-3.026800879	
P(T<=t) one-tail	0.001308671	
t Critical one-tail	1.648340913	
P(T<=t) two-tail	0.002617342	
t Critical two-tail	1.965395313	

Table 11: t-Test: Two-Sample Assuming Equal Variances – Question 5

	Over all satisfaction	Satisfaction with ability to predict problems through good communication. Q1
Mean	6.736363636	6.536363636
Variance	5.674470735	6.048899958
Observations	220	220
Pooled Variance	5.861685347	
Hypothesised Mean Difference	0	
Df	438	
t Stat	0.866393304	
P(T<=t) one-tail	0.193374431	
t Critical one-tail	1.648340913	
P(T<=t) two-tail	0.386748861	
t Critical two-tail	1.965395313	

Table 12: t-Test: Two-Sample Assuming Equal Variances – Question 1

Regression Statistics	
Multiple R	0.930462
R Square	**0.86576**
Adjusted R Square	0.862623
Standard Error	0.882915
Observations	220

Table 13: Regression Statistics

	df	SS	MS	F	Significance F
Regression	5	1075.888	215.1775	276.0317	**3.29947E-91**
Residual	214	166.8214	0.779539		
Total	219	1242.709			

Table 14: ANOVA – Relationship between "overall satisfaction" and the Hypotheses

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-0.6707	0.223024	-3.00728	0.002951	-1.110302977	-0.23109	-1.1103	-0.23109
Q1	0.149122	0.037965	3.927861	0.000116	0.074288609	0.223956	0.074289	0.223956
Q2	0.228927	0.049891	4.588529	7.6E-06	0.130585821	0.327268	0.130586	0.327268
Q3	0.238157	0.052496	4.53671	9.52E-06	0.134682441	0.341631	0.134682	0.341631
Q4	0.262498	0.053997	4.861366	2.25E-06	0.156064636	0.368932	0.156065	0.368932
Q5	0.21519	0.039357	5.467629	1.27E-07	0.137613005	0.292768	0.137613	0.292768

Table 15: – Correlation Coefficients for each of the Hypotheses

Groups	Count	Sum	Average	Variance
Changes	17	93	5.470588	7.139706
Desktop software	73	518	7.09589	4.643455
Hardware	41	287	7	5.9
Miscellaneous	28	196	7	3.407407
Server	20	113	5.65	6.45
Services	37	248	6.702703	7.381381

Table 16: Summary of Calls with Call Categories

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	65.11454	5	13.02291	2.347792	**0.042261**	2.257067
Within Groups	1164.844	210	5.546875			
Total	1229.958	215				

Table 17: ANOVA - Calls within Call Categories

	Desk top software	Changes
Mean	7.095890411	5.470588235
Variance	4.643455099	7.139705882
Observations	73	17
Pooled Variance	5.097318878	
Hypothesised Mean Difference	0	
Df	88	
t Stat	2.673177834	
P(T<=t) one-tail	**0.004477243**	
t Critical one-tail	1.662353952	
P(T<=t) two-tail	0.008954486	
t Critical two-tail	1.987291398	

Table 18: t-Test: Two-Sample – Desktop Software and Changes

	Desktop software	Server
Mean	7.095890411	5.65
Variance	4.643455099	6.45
Observations	73	20
Pooled Variance	5.020645793	
Hypothesised Mean Difference	0	
Df	91	
t Stat	2.556763394	
P(T<=t) one-tail	0.00611049	
t Critical one-tail	1.661771876	
P(T<=t) two-tail	**0.012220981**	
t Critical two-tail	1.986377356	

Table 19: t-Test: Two-Sample – Desktop Software and Server

Appendix 2 - Definition of Terms

For the purpose of the research I will define the following terms accordingly.

Help Desk

The operation that provides technical information to customers and solves technical problems by providing support and information. The Help Desk manages problem resolution through various support levels and priority levels.

Also known as Call Centre and First Line Support. (Etchison 1994, p.17)

Information Technology (IT)

Information Technology is a general term used to refer to all aspects of technology that encompass the creation, storage, display, exchange, and management of information for business, artistic, scientific, or personal use. (Nader 1998, p.292)

Customer

Any person who comes in contact with a Help Desk or Support Centre employee in person, over the phone, via-mail, or by other communication channels. Customers may be internal (employees of the company) or external (people outside the company who request information or help.)
Also known as user. (Etchison 1994, p.10)

Second Line Support

Second line support, are product and technology area specialists, who focus on one or a few aspects of the product in detail. When an incident either exceeds an established deadline for closure or is beyond the expertise level of

the Help Desk it is passed to the second line of support to isolate and resolve problems that could not be solved by a Help Desk. (Olsen 1997, p.33)

Mode

The mode is of a data set is the value, which occurs with the highest frequency.

If a data set = 1,2,6,7,7,8,5,3,7,7

7 is the mode.

(Freund 1982, p.46)

Mean

The mean of a set of values is the sum of the values divided by the number of values.

If a data set = 3,2,4,4,9,7,8,5,2,3,7,6

3+2+4+4+9+7+8+5+2+3+7+6 = 60   60/12 =5

5 is the Mean.

(Freund 1982, p.39)

Median

The median of a set of data is the value of the middle items, or the mean of the values of the two-middle item, when the data are arranged according to size.

If the data set = 9,16,11,10,13,12,6,9,12 arranged the data accordingly

6   9 9 10 11 12 12 13 16

11 is the Median.

(Freund 1982,p.39)

Appendix 3 - Sample Survey

Call Date:	
Call Time:	
Call Status:	
Problem Description:	

1. Help Desk Communication
Example
(a) I'm satisfied with Help Desk because they know what is going on around them. Today I rang them when I couldn't open my mailbox. Help Desk was aware of the problem, and informed me that the server had crashed and the problem would be fixed within half an hour.
(b) I'm dissatisfied with Help Desk because they don't know about problems around them. I called to report that nobody on my floor could access our phone directory "Gold". They didn't have a clue that the problem existed. A second line support happened to be walking past so I asked him. He said the system had been upgraded over the weekend. He got "Gold" working in 30 seconds, Help Desk should have known about this in the first place.

How satisfied were you with the Help Desk's ability to predict or pre-empt the above referenced problem, as a result of their communication with other IT support teams.

1	2	3	4	5	6	7	8	9	10
	Completely dissatisfied			Neither satisfied nor dissatisfied				Completely satisfied	

2. Customer Solutions

Example

(a) I'm satisfied with Help Desk's ability to assist me in getting my job done.

(b) I'm dissatisfied with Help Desk because the assistance they give me demonstrates no understanding of the job I need to do.

Rate how satisfied you were with Help Desk's ability to deal with your specific business requirement, rather than technology alone in assisting you with the referenced problem.

1	2	3	4	5	6	7	8	9	10
Completely dissatisfied				Neither satisfied nor dissatisfied				Completely satisfied	

3. Help Desk Service

Example

(a) I'm satisfied with help desk because I recognise that my problems are more to do with software choices, hardware reliability or training etc. Sure I give help desk an ear full, but when I think about it, they are doing a tough job well.

(b) I'm very dissatisfied with help desk because they just can't deal with the every day problems that I would expect them to deal with.

How satisfied were you with the service provided by the Help Desk, compared to the service provided by the other IT teams in assisting you with this specific problem.

1	2	3	4	5	6	7	8	9	10
Completely dissatisfied				Neither satisfied nor dissatisfied				Completely satisfied	

4. Help Desk Knowledge

Example

(a) I'm satisified with Help Desk because they have assisted me first hand with three different software packages. They could provide a solution because they had all the appropriate reference material, and the training.

(b) I'm dissatisfied with Help Desk because they could not assist me with a new software package since they had not been trained and where short on resources. The problem was escalated to the second line of support.

With specific reference to the above problem how satisfied are you with the way Help Desk has kept pace with changes in technology and work practice.

1	2	3	4	5	6	7	8	9	10
Completely dissatisfied				Neither satisfied nor dissatisfied				Completely satisfied	

5. Help Desk Morale

Example

(a) I'm satisfied with the morale of the Help Desk because they answer the phone is a pleasant manner, and are happy to help with all my questions.

(b) I'm dissatisfied with Help Desk because they don't give me polite greeting, and you can tell that they cannot wait to get you off the phone.

When Help Desk assisted you with this problem how satisfied were you with the tone, enthusiasm, and morale of the Help Desk personnel.

1   **2**   **3**   **4**   **5**   **6**   **7**   **8**   **9**   **10**

Completely dissatisfied   **Neither satisfied**   **Completely satisfied**
                            nor dissatisfied

Other Comments:
If you wish to provided additional comments please use the space provided.

Appendix 4 - Bibliography

1. Anderson, J. 1997, Sourcebook for the Help Desk, 2nd edn, Microsoft Press, Washington.

2. Braunthal, P. 1999, The IT Help Desk: Improving Customer and Employee Satisfaction While Reducing Costs, Forrester Brief, www.forrester.com.

3. Case, G.W. 1999, Re-engineering your Help Desk or Support Centre, Help Desk Institute, Sydney.

4. Cowie, J. 1999 Help Desk Performance Management, Surveys and Data Collection Help Desk Institute, Sydney.

5. Crockett, R.A. 1990, An Introduction to Sample Surveys, 2nd edn, Australian Bureau of statistics, Sydney.

6. Crotty, D. 1999, Breaking the Mould – Alternative Thinking for the New Millennium, Pacific Rim Customer Support Services and Help Desk Conference, Adelaide.

7. Czegel, B. 1999, Help Desk Practitioner's Handbook, Wiley Computer Publishing, New York.

8. Etchison, B. 1994, Dictionary of the Call Centre, Prentice Hall, Sydney.

9. Foddy, W. 1993, Constructing Questions for Interviews and Questionnaires, Cambridge University, Cambridge.

10. Freund, J.E. 1984, Modern Elementary Statistics, 6th Edition, Prentice Hall, New Jersey.

11. Gerald, T. 1989, Statistics and Calculations, 2nd Edition, Prentice Hall, New York.

12. Kirk, T. 1998, Effective Strategies for the Support Organisation. Part 1, Gartner Group, www.gartner.com.

13. Mack, R. 1998, Transition Study Results: End-User Support, Gartner Group, www.gartner.com.

14. Lusher, C. 1995, The Help Desk, Part 1: An Agent of Change, Gartner Group, www.gartner.com.

15. Marcella, R. & Middleton, I. 1996, The Role of The Help Desk in The Strategic Management of Information Systems, vol 12 MCB University Press, London, pp. 4-19.

16. Menks, G. 1999, The Last Frontier: Closing the Gap between Help Desks and Other IT Support Departments, Pacific Rim Customer Support Services and Help Desk Conference, Adelaide.

17. Murphy, R.K. 1999, The Emerging Role of Service, A New View, A New Value, AFSMI Organisation, New York, pp 1.

18. Schweich, T. A 1997, Measuring Help Desk Customer Satisfaction, Help Desk Institute, California, pp 2.

19. Nader, J.C. 1998, Prentice Halls' Illustrated Dictionary of Computer Terms, 3rd Edition, Prentice Hall, New York.

20. Nordan, M.M, Howe, D. C & Patel, D. S. 1998, Bridging the Help Desk Gap, Forrester Brief, www.forrester.com

21. Rhinelander, T. Deutsch, W. & Clemmer, K. 1997, Rethinking Desktop Support, Forrester Brief, www.forrester.com.

22. Shevlin, R. & Deutsch, W. 1999, Measuring IT's Customer Satisfaction, Forrester Brief, www.forrester.com.

23. Sudbury,N. 1999, Corporate Culture Shifts To Customer, Help Desk Institute, Australia, pp 1.